ON Semiconductor®

# Initial Product/Process Change Notification

Document # : IPCN22735X
Issue Date: 6 August 2019

| | |
|---|---|
| **Title of Change:** | MiniGates Fab, Assembly Material and Test Change (SC88A/SOT953/SOT553) with datasheet update |
| **Proposed First Ship date:** | 6 February 2020 |
| **Contact Information:** | Contact your local ON Semiconductor Sales Office or <logic.fpcn@onsemi.com> |
| **Samples:** | *Samples should be available after completion of qualification.*<br>Contact your local ON Semiconductor Sales Office or <PCN.Samples@onsemi.com><br>Sample requests are to be submitted no later than 30 days from the date of first notification, Initial PCN or Final PCN, for this change.<br>Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements. |
| **Type of Notification:** | This is an Initial Product/Process Change Notification (IPCN) sent to customers. An IPCN is an advance notification about an upcoming change and contains general information regarding the change details and devices affected. It also contains the preliminary reliability qualification plan.<br>The completed qualification and characterization data will be included in the Final Product/Process Change Notification (FPCN). This IPCN notification will be followed by a Final Product/Process Change Notification (FPCN) at least 90 days prior to implementation of the change. In case of questions, contact <PCN.Support@onsemi.com> |
| **Change Part Identification:** | For NC7 parts, marking style will be different. For NL17 and SL17 part, the CS code on the reel label will be changed from US to JP. |
| **Change Category:** | ☑ Wafer Fab Change ☑ Assembly Change ☑ Test Change ☑ Other Datasheet |

**Change Sub-Category(s):**

| | | |
|---|---|---|
| ☐ Manufacturing Site Addition | ☑ Material Change | ☑ Datasheet/Product Doc change |
| ☑ Manufacturing Site Transfer | ☐ Product specific change | ☑ Shipping/Packaging/Marking |
| ☑ Manufacturing Process Change | | ☐ Other: _____ |

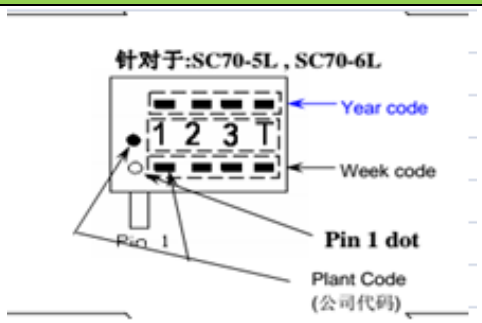
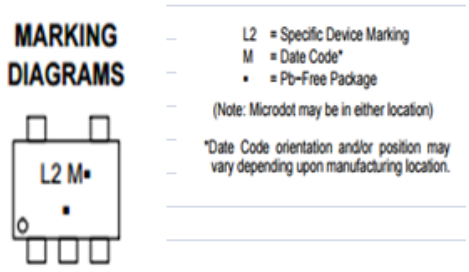
| | | |
|---|---|---|
| **Sites Affected:** | ON Semiconductor Sites:<br>ON ISMF, Malaysia<br>ON Leshan, China<br>ON Cebu, Philippines<br>ON S. Portland, Maine | External Foundry/Subcon Sites:<br>Foundry<br>Subcontractor in China |

**Description and Purpose:**

This IPCN is issued to qualify new die source in Japan for TinyLogic® and standardize the assembly and test site to increase the front end and back end capacity and standardizing materials.

**NC7xxxP5X Series :**

| | Before Change Description | | After Change Description |
|---|---|---|---|
| LeadFrame | LF SC70 5L Cu A194 STAMPED PPF | LF SC 88A 5L C194 STAMPED | SC88A OP14 |
| Die Attach | DA EPOXY ABLESTICK 2200D | DA EPOXY HE ABLESTIK 84-1LMISR4 5CC | Au Eutectic |
| Bond Wire | Au | Au | Cu |
| Mold Compound | MC SUMITOMO G600 HF | MC GREEN PA CK5000A 13MMX3.9G | Henkel GR640 HV-L1 |
| Assembly Site | Subcon China | ON Philippines | ON in China |
| Die Source | ONsemi US Fab | ONsemi US Fab | External Fab Japan |
| Plating | Preplated | 100% Sn | 100% Sn |

| | From | To |
|---|---|---|
| Product marking change |  Above marking is for subcon China, ON Philippines is without the plant code dot. |  |

**NL17xxxDFT2G Series:**

| | Before Change Description | After Change Description |
|---|---|---|
| Bond Wire | Au ** and Cu | Cu |
| Mold Compound | Hitachi GE200F or Henkel GR640 HV-L1 | Henkel GR640 HV-L1 |
| Die Source | External Foundry Israel | External Fab Japan |

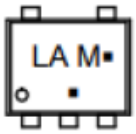
** Only these parts are using Au wire before change (NL17SG00DFT2G/NL17SG02DFT2G/NL17SG04DFT2G/NL17SG07DFT2G/NL17SG08DFT2G/NL17SG125DFT2G/NL17SG126DFT2G/NL17SG14DFT2G/NL17SG17DFT2G/NL17SG32DFT2G/NL17SG34DFT2G/NL17SG86DFT2G/NL17SGU04DFT2G)

No change in marking.

**NL17xxXV5T2G Series:**

| | Before Change Description | After Change Description |
|---|---|---|
| Bond Wire | Au | Cu |
| Assy Site## | ON Seremban, Malaysia | ON Leshan, China |
| Die Source | External Foundry Israel | External Fab Japan |

## Except NL17SV32XV5T2G has no site change, it is currently running in ON Leshan.

| | From | To |
|---|---|---|
| Product marking change |  LA =Device Code, M = Date Code (orientation at 0 degree), Dot(.)=Lead Free Package |  LA =Device Code, M = Date Code (orientation at 90 degree), Dot(.)=Lead Free Package |

**NL17xxxP5T5G Series:**

| | Before Change Description | After Change Description |
|---|---|---|
| Bond Wire | Au | Cu |
| Die Source | External Foundry Israel | External Fab Japan |

No change in marking.

**Datasheet Changes:**

Provided here are comparison between the new and old datasheets regarding changing specifications and/or specification conditions.

- Areas of change are circled red.
- Items from the old datasheet that will be changed are highlighted red.
- The corresponding value on the new datasheet is highlighted in green.

There will be other changes that represent a cleanup and standardization to the datasheet to represent a family oriented specification format. These changes will include forms of the following:

- Correction of clerical errors such as spelling.
- Formatting to create family standards.
- Addition of new package types and possible removal of packages no longer available.
- Standardization of the switching waveforms test circuit figures.
- Formatting of the Device ordering information to provide more information to the customer regarding marking and Pin 1 orientation in tape or reel.

# NL17SG

- **Maximum voltage rating changed from 5.5 volts to 4.3 volts.**

Existing datasheet

MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.6 | V |
| $V_{OUT}$ | DC Output Voltage | Output at High or Low State<br>Power−Down Mode ($V_{CC}$ = 0 V) | −0.5 to $V_{CC}$ +0.5<br>−0.5 to +4.6 | V |

MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | $V_{CC}$ ≥ 0.9 V<br>$V_{CC}$ < 0.9 V | −0.5 to +5.5<br>−0.5 to +4.6 | V |
| $V_{OUT}$ | DC Output Voltage | | −0.5 to $V_{CC}$ + 0.5 | V |

MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.6 | V |
| $V_{OUT}$ | DC Output Voltage | | −0.5 to $V_{CC}$ +0.5 | V |

MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +5.5 | V |
| $V_{OUT}$ | DC Output Voltage | | −0.5 to $V_{CC}$ + 0.5 | V |

New

MAXIMUM RATINGS

| Symbol | Characteristics | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +4.3 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.3 | V |
| $V_{OUT}$ | DC Output Voltage | Active−Mode (High or Low State)<br>Tri−State Mode (Note 1)<br>Power−Down Mode ($V_{CC}$ = 0 V) | −0.5 to $V_{CC}$ + 0.5<br>−0.5 to +4.3<br>−0.5 to +4.3 | V |

- **Electrostatic Discharge/Latchup adjusted to align with JEDEC Standard.**

Existing datasheet

| | | | | |
|---|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage | Human Body Model (Note 2)<br>Machine Model (Note 3) | >1500<br>>100 | V |
| $I_{LATCHUP}$ | Latchup Performance Above $V_{CC}$ and Below GND at 125°C (Note 4) | | ±100 | mA |
| $V_{ESD}$ | ESD Withstand Voltage | Human Body Model (Note 2)<br>Machine Model (Note 3) | >2000<br>>100 | V |
| $I_{LATCHUP}$ | Latch−up Performance above $V_{CC}$ and below GND at 125°C (Note 4) | | ±75 | mA |
| $V_{ESD}$ | ESD Withstand Voltage Human Body Mode (Note 2)<br>Machine Model (Note 3) | | > 3000<br>> 200 | V |
| $I_{LATCHUP}$ | Latchup Performance Above $V_{CC}$ and Below GND at 125°C (Note 4) | | ±100 | mA |
| $V_{ESD}$ | ESD Withstand Voltage | Human Body Model (Note 2)<br>Machine Model (Note 3) | >2000<br>>150 | V |
| $I_{LATCHUP}$ | Latchup Performance | Above $V_{CC}$ and Below GND at 125°C (Note 4) | ±100 | mA |

New

| | | | | |
|---|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage (Note 3) | Human Body Model<br>Charged Device Model | 2000<br>1000 | V |
| $I_{Latchup}$ | Latchup Performance (Note 4) | | ±100 | mA |

- **High-Level Output Voltage adjusted to remove limits at 0.9V**
- **Low-Level Output Voltage adjusted to remove limits at 0.9V**

Existing datasheet

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OH}$ = −20 μA | 0.9 | 0.75 | | 0.75 | | V |
| | | | $I_{OH}$ = -0.3 mA | 1.1 to 1.3 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -1.7 mA | 1.4 to 1.6 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -3.0 mA | 1.65 to 1.95 | Vcc-0.45 | | Vcc-0.45 | | |
| | | | $I_{OH}$ = -4.0 mA | 2.3 to 2.7 | 2.0 | | 2.0 | | |
| | | | $I_{OH}$ = -8.0 mA | 3.0 to 3.6 | 2.48 | | 2.48 | | |
| $V_{OL}$ | Low-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OL}$ = 20 μA | 0.9 | | 0.1 | | 0.1 | V |
| | | | $I_{OL}$ = 0.3 mA | 1.1 to 1.3 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 1.7 mA | 1.4 to 1.6 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 3.0 mA | 1.65 to 1.95 | | 0.45 | | 0.45 | |
| | | | $I_{OL}$ = 4.0 mA | 2.3 to 2.7 | | 0.4 | | 0.4 | |
| | | | $I_{OL}$ = 8.0 mA | 3.0 to 3.6 | | 0.4 | | 0.4 | |

New

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OH}$ = −20 μA | 0.9 | | | | | V |
| | | | $I_{OH}$ = -0.3 mA | 1.1 to 1.3 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -1.7 mA | 1.4 to 1.6 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -3.0 mA | 1.65 to 1.95 | Vcc-0.45 | | Vcc-0.45 | | |
| | | | $I_{OH}$ = -4.0 mA | 2.3 to 2.7 | 2.0 | | 2.0 | | |
| | | | $I_{OH}$ = -8.0 mA | 3.0 to 3.6 | 2.48 | | 2.48 | | |
| $V_{OL}$ | Low-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OL}$ = 20 μA | 0.9 | | | | | V |
| | | | $I_{OL}$ = 0.3 mA | 1.1 to 1.3 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 1.7 mA | 1.4 to 1.6 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 3.0 mA | 1.65 to 1.95 | | 0.45 | | 0.45 | |
| | | | $I_{OL}$ = 4.0 mA | 2.3 to 2.7 | | 0.4 | | 0.4 | |
| | | | $I_{OL}$ = 8.0 mA | 3.0 to 3.6 | | 0.4 | | 0.4 | |

- **Removed Limits at 0.9 Volts for Positive Input Threshold Voltage, Negative Threshold Voltage and Hysteresis Voltage.**
- **Removed minimum limits from Positive Input Threshold Voltage specification.**
- **Removed maximum limits from Negative Threshold Voltage specification.**
- **Corrected limits to align with die process.**

**Existing datasheet**

| Symbol | Parameter | Condition | $V_{CC}$ (V) | $T_A$ = 25°C | | | −55°C ≤ $T_A$ ≤ 125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $V_{T+}$ | Positive−Going Input Threshold Voltage | | 0.9 | 0.64 | 0.7 | 0.86 | 0.62 | 0.87 | V |
| | | | 1.1 | 0.73 | 0.81 | 0.95 | 0.71 | 1 | |
| | | | 1.4 | 0.86 | 0.94 | 1.16 | 0.84 | 1.2 | |
| | | | 1.65 | 0.95 | 1.06 | 1.25 | 0.94 | 1.3 | |
| | | | 2.3 | 1.22 | 1.36 | 1.6 | 1.18 | 1.65 | |
| | | | 3.0 | 1.51 | 1.8 | 2.05 | 1.38 | 2.1 | |
| $V_{T-}$ | Negative−Going Input Threshold Voltage | | 0.9 | 0.09 | 0.23 | 0.30 | 0.08 | 0.33 | V |
| | | | 1.1 | 0.15 | 0.33 | 0.39 | 0.12 | 0.43 | |
| | | | 1.4 | 0.3 | 0.47 | 0.54 | 0.25 | 0.55 | |
| | | | 1.65 | 0.35 | 0.6 | 0.65 | 0.3 | 0.65 | |
| | | | 2.3 | 0.55 | 0.85 | 0.88 | 0.5 | 0.88 | |
| | | | 3.0 | 0.95 | 1.13 | 1.16 | 0.9 | 1.16 | |
| $V_H$ | Hysteresis Voltage | | 0.9 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | V |
| | | | 1.1 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 1.4 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 1.65 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 2.3 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 3.0 | 0.25 | 0.65 | 0.85 | 0.3 | 0.9 | |

**New**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$ = 25 °C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $V_{T+}$ | Positive Input Threshold Voltage | | 0.9 | - | 0.7 | - | - | - | V |
| | | | 1.1 to 1.3 | - | 0.81 | 0.95 | - | 0.95 | |
| | | | 1.4 to 1.6 | - | 0.94 | 1.16 | - | 1.16 | |
| | | | 1.65 – 1.95 | - | 1.06 | 1.3 | - | 1.3 | |
| | | | 2.3 to < 2.7 | - | 1.36 | 1.73 | - | 1.73 | |
| | | | 2.7 to 3.6 | - | 1.8 | 2.24 | - | 2.24 | |
| $V_{T-}$ | Negative Input Threshold Voltage | | 0.9 | - | 0.23 | - | - | - | V |
| | | | 1.1 to 1.3 | 0.15 | 0.33 | - | 0.15 | - | |
| | | | 1.4 to 1.6 | 0.3 | 0.47 | - | 0.3 | - | |
| | | | 1.65 – 1.95 | 0.35 | 0.6 | - | 0.35 | - | |
| | | | 2.3 to < 2.7 | 0.55 | 0.85 | - | 0.55 | - | |
| | | | 2.7 to 3.6 | 0.95 | 1.13 | - | 0.95 | - | |
| $V_H$ | Low-Level Input Voltage | | 0.9 | - | 0.27 | - | - | - | V |
| | | | 1.1 to 1.3 | 0.2 | 0.35 | 0.8 | 0.2 | 0.8 | |
| | | | 1.4 to 1.6 | 0.25 | 0.41 | 0.86 | 0.25 | 0.86 | |
| | | | 1.65 – 1.95 | 0.30 | 0.46 | 0.9 | 0.30 | 0.9 | |
| | | | 2.3 to < 2.7 | 0.40 | 0.56 | 1.05 | 0.40 | 1.05 | |
| | | | 2.7 to 3.6 | 0.49 | 0.59 | 1.1 | 0.49 | 1.1 | |

- **Power Off Leakage Current specification added.**
- **Input Leakage Current specification adjusted to remove crossover with Power-Off Leakage Current specification.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $I_{OFF}$ | Power Off Leakage Current | $V_{IN}$ = 3.6 V or $V_{OUT}$ = 3.6 V | 0 | - | - | 1.0 | - | 5.0 | µA |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $I_{IN}$ | Input Leakage Current | 0 ≤ $V_{IN}$ ≤ 3.6 V | 0 to 3.6 | | ±0.1 | | ±1.0 | µA |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $I_{IN}$ | Input Leakage Current | 0 ≤ $V_{IN}$ ≤ 3.6 V | 0.9 to 3.6 | | ±0.1 | | ±1.0 | µA |

- **Propagation Delay specification adjusted to remove limits at 0.9 volts.**
- **Minimum Limits removed from all Propagation Delay specifications.**

**Existing datasheet**

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25° C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A or B to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | - | 12.2 | 14.4 | - | 18.0 | ns |
| | | | 1.1 to 1.3 | - | 8.8 | 12.4 | - | 16.2 | |
| | | | 1.4 to 1.6 | - | 5.0 | 8.5 | - | 10.0 | |
| | | | 1.65 to 1.95 | - | 3.6 | 6.2 | - | 6.7 | |
| | | | 2.3 to 2.7 | - | 2.7 | 3.9 | - | 4.4 | |
| | | | 3.0 to 3.6 | - | 2.1 | 3.1 | - | 3.7 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | - | 13.0 | 16.0 | - | 18.0 | ns |
| | | | 1.1 to 1.3 | - | 7.8 | 12.0 | - | 16.0 | |
| | | | 1.4 to 1.6 | - | 5.9 | 9.3 | - | 11.2 | |
| | | | 1.65 to 1.95 | - | 4.5 | 6.9 | - | 7.1 | |
| | | | 2.3 to 2.7 | - | 3.0 | 4.4 | - | 5.0 | |
| | | | 3.0 to 3.6 | - | 2.4 | 3.4 | - | 3.9 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | - | 14.0 | 17.2 | - | 20.0 | ns |
| | | | 1.1 to 1.3 | - | 11.0 | 14.1 | - | 17.8 | |
| | | | 1.4 to 1.6 | - | 8.0 | 12.1 | - | 15.9 | |
| | | | 1.65 to 1.95 | - | 6.0 | 9.2 | - | 9.6 | |
| | | | 2.3 to 2.7 | - | 3.9 | 5.7 | - | 6.1 | |
| | | | 3.0 to 3.6 | - | 3.0 | 4.4 | - | 4.8 | |

**New**

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25° C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A or B to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | - | 12.2 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 8.8 | 12.4 | - | 16.2 | |
| | | | 1.4 to 1.6 | - | 5.0 | 8.5 | - | 10.0 | |
| | | | 1.65 to 1.95 | - | 3.6 | 6.2 | - | 6.7 | |
| | | | 2.3 to 2.7 | - | 2.7 | 3.9 | - | 4.4 | |
| | | | 3.0 to 3.6 | - | 2.1 | 3.1 | - | 3.7 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | - | 13.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 7.8 | 12.0 | - | 16.0 | |
| | | | 1.4 to 1.6 | - | 5.9 | 9.3 | - | 11.2 | |
| | | | 1.65 to 1.95 | - | 4.5 | 6.9 | - | 7.1 | |
| | | | 2.3 to 2.7 | - | 3.0 | 4.4 | - | 5.0 | |
| | | | 3.0 to 3.6 | - | 2.4 | 3.4 | - | 3.9 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | - | 14.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 11.0 | 14.1 | - | 17.8 | |
| | | | 1.4 to 1.6 | - | 8.0 | 12.1 | - | 15.9 | |
| | | | 1.65 to 1.95 | - | 6.0 | 9.2 | - | 9.6 | |
| | | | 2.3 to 2.7 | - | 3.9 | 5.7 | - | 6.1 | |
| | | | 3.0 to 3.6 | - | 3.0 | 4.4 | - | 4.8 | |

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25 °C | | | $T_A$ = −55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | – | 27.3 | – | – | – | ns |
| | | | 1.1 to 1.3 | – | 13.0 | 22.6 | 1.0 | 35.9 | |
| | | | 1.4 to 1.6 | – | 7.5 | 10.5 | 1.0 | 11.3 | |
| | | | 1.65 to 1.95 | – | 6.0 | 7.8 | 1.0 | 8.2 | |
| | | | 2.3 to 2.7 | – | 4.3 | 5.4 | 1.0 | 5.8 | |
| | | | 3.0 to 3.6 | – | 3.5 | 4.4 | 1.0 | 4.6 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | – | 29.5 | – | – | – | ns |
| | | | 1.1 to 1.3 | – | 14.3 | 25.1 | 1.0 | 41.8 | |
| | | | 1.4 to 1.6 | – | 8.0 | 11.5 | 1.0 | 12.6 | |
| | | | 1.65 to 1.95 | – | 6.3 | 8.4 | 1.0 | 8.7 | |
| | | | 2.3 to 2.7 | – | 4.6 | 5.7 | 1.0 | 6.1 | |
| | | | 3.0 to 3.6 | – | 3.7 | 4.6 | 1.0 | 5.0 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | – | 40.5 | – | – | – | ns |
| | | | 1.1 to 1.3 | – | 19.6 | 35.7 | 1.0 | 58.1 | |
| | | | 1.4 to 1.6 | – | 10.7 | 15.8 | 1.0 | 17.6 | |
| | | | 1.65 to 1.95 | – | 7.8 | 10.7 | 1.0 | 11.7 | |
| | | | 2.3 to 2.7 | – | 5.4 | 6.9 | 1.0 | 8.1 | |
| | | | 3.0 to 3.6 | – | 4.3 | 5.2 | 1.0 | 6.1 | |

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25° C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A or B to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | - | 12.2 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 8.8 | 12.4 | - | 16.2 | |
| | | | 1.4 to 1.6 | - | 5.0 | 8.5 | - | 10.0 | |
| | | | 1.65 to 1.95 | - | 3.6 | 6.2 | - | 6.7 | |
| | | | 2.3 to 2.7 | - | 2.7 | 3.9 | - | 4.4 | |
| | | | 3.0 to 3.6 | - | 2.1 | 3.1 | - | 3.7 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | - | 13.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 7.8 | 12.0 | - | 16.0 | |
| | | | 1.4 to 1.6 | - | 5.9 | 9.3 | - | 11.2 | |
| | | | 1.65 to 1.95 | - | 4.5 | 6.9 | - | 7.1 | |
| | | | 2.3 to 2.7 | - | 3.0 | 4.4 | - | 5.0 | |
| | | | 3.0 to 3.6 | - | 2.4 | 3.4 | - | 3.9 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | - | 14.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 11.0 | 14.1 | - | 17.8 | |
| | | | 1.4 to 1.6 | - | 8.0 | 12.1 | - | 15.9 | |
| | | | 1.65 to 1.95 | - | 6.0 | 9.2 | - | 9.6 | |
| | | | 2.3 to 2.7 | - | 3.9 | 5.7 | - | 6.1 | |
| | | | 3.0 to 3.6 | - | 3.0 | 4.4 | - | 4.8 | |

# NL17SV

- **Maximum voltage rating changed from 4.6 volts to 4.3 volts to represent new die. (Excluding Automotive Devices)**
- **Thermal Resistance and Power Dissipation updated.**
- **Electrostatic Discharge updated to reflect JEDEC standard.**

## Existing datasheet

**MAXIMUM RATINGS**

| Symbol | Rating | Value | Units |
|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | −0.5 to +4.6 | V |
| $V_I$ | DC Input Voltage | −0.5 to +4.6 | V |
| $V_O$ | DC Output Voltage | −0.5 to $V_{CC}$ + 0.5 | V |

| | | | |
|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance (Note 1) | 250 | °C/W |
| $P_D$ | Power Dissipation in Still Air at 85°C | 250 | mW |

| | | | |
|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage<br>Human Body Model (Note 2)<br>Machine Model (Note 3) | 3000<br>200 | V |
| $V_{ESD}$ | ESD Withstand Voltage<br>Human Body Model (Note 2)<br>Machine Model (Note 3) | 2000<br>300 | V |
| $V_{ESD}$ | ESD Withstand Voltage<br>Human Body Model (Note 2)<br>Machine Model (Note 3) | 4000<br>200 | V |

## New

**MAXIMUM RATINGS**

| Symbol | Characteristics | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +4.3 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.3 | V |
| $V_{OUT}$ | DC Output Voltage | Active−Mode (High or Low State)<br>Tri−State Mode (Note 1)<br>Power−Down Mode ($V_{CC}$ = 0 V) | −0.5 to $V_{CC}$ + 0.5<br>−0.5 to +4.3<br>−0.5 to +4.3 | V |

| | | | | |
|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance (Note 2) | SC−88A<br>SC−74A<br>SOT−553<br>SOT−953<br>UDFN6 | 659<br>555<br>562<br>560<br>382 | °C/W |
| $P_D$ | Power Dissipation in Still Air | SC−88A<br>SC−74A<br>SOT−553<br>SOT−953<br>UDFN6 | 190<br>225<br>222<br>223<br>327 | mW |

| | | | | |
|---|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage (Note 3) | Human Body Model<br>Charged Device Model | 2000<br>1000 | V |
| $I_{Latchup}$ | Latchup Performance (Note 4) | | ±100 | mA |

- **High Level Input Voltage and Low Level Input Voltage limits adjusted at 0.9 Volts.**

**Existing datasheet**

**DC CHARACTERISTICS – Digital Section** (Voltages Referenced to GND)

| Symbol | Parameter | Condition | $V_{CC}$ | $T_A$ = 25°C Min | $T_A$ = 25°C Max | $T_A$ = −40 to 85°C Min | $T_A$ = −40 to 85°C Max | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High Level Input Voltage | | 0.90 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.6 | | 1.6 | | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.0 | | 2.0 | | |
| $V_{IL}$ | Low Level Input Voltage | | 0.90 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.7 | | 0.7 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | | 0.8 | |

**New**

**DC ELECTRICAL CHARACTERISTICS**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$ = 25°C Min | $T_A$ = 25°C Max | $T_A$ = -55°C to +125°C Min | $T_A$ = -55°C to +125°C Max | Unit |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High-Level Input Voltage | | 0.9 | $V_{CC}$ | | $V_{CC}$ | | V |
| | | | 1.1 to 1.3 | 0.7x$V_{CC}$ | | 0.7x$V_{CC}$ | | |
| | | | 1.4 to 1.6 | 0.65x$V_{CC}$ | | 0.65x$V_{CC}$ | | |
| | | | 1.65 to 1.95 | 0.65x$V_{CC}$ | | 0.65x$V_{CC}$ | | |
| | | | 2.3 to 2.7 | 1.6 | | 1.6 | | |
| | | | 3.0 to 3.6 | 2.0 | | 2.0 | | |
| $V_{IL}$ | Low-Level Input Voltage | | 0.9 | | GND | | GND | V |
| | | | 1.1 to 1.3 | | 0.3x$V_{CC}$ | | 0.3x$V_{CC}$ | |
| | | | 1.4 to 1.6 | | 0.35x$V_{CC}$ | | 0.35x$V_{CC}$ | |
| | | | 1.65 to 1.95 | | 0.35x$V_{CC}$ | | 0.35x$V_{CC}$ | |
| | | | 2.3 to 2.7 | | 0.7 | | 0.7 | |
| | | | 3.0 to 3.6 | | 0.8 | | 0.8 | |

- **High Level Output Voltage and Low Level Output Voltage adjusted to remove Limits at 0.9 Volts.**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High Level Output Voltage | $I_{OH}$ = −100 µA | 0.90 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | $I_{OH}$ = −2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 2.0 | | 2.0 | | |
| | | $I_{OH}$ = −12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.8 | | 1.8 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| | | $I_{OH}$ = −18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.7 | | 1.7 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | |
| | | $I_{OH}$ = −24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| $V_{OL}$ | Low Level Output Voltage | $I_{OL}$ = 100 µA | 0.90 | | 0.1 | | 0.1 | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.2 | | 0.2 | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.2 | | 0.2 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | |
| | | $I_{OL}$ = 2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | |
| | | $I_{OL}$ = 12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.4 | | 0.4 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.6 | | 0.6 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High Level Output Voltage | $I_{OH}$ = −100 µA | 0.90 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | $I_{OH}$ = −2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 2.0 | | 2.0 | | |
| | | $I_{OH}$ = −12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.8 | | 1.8 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| | | $I_{OH}$ = −18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.7 | | 1.7 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | |
| | | $I_{OH}$ = −24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| $V_{OL}$ | Low Level Output Voltage | $I_{OL}$ = 100 µA | 0.90 | | 0.1 | | 0.1 | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.2 | | 0.2 | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.2 | | 0.2 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | |
| | | $I_{OL}$ = 2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | |
| | | $I_{OL}$ = 12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.4 | | 0.4 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.6 | | 0.6 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | |

- **Remove minimum limits from all propagation delay specifications.**

**Existing datasheet**

**AC CHARACTERISTICS** (Input $t_r = t_f$ = 3.0 nS)

| Symbol | Parameter | −40°C Condition | −40°C $V_{CC}$ | −40°C Min | 25°C Typ | 25°C Max | 85°C Min | 85°C Max | Units |
|---|---|---|---|---|---|---|---|---|---|
| $T_{PHL}$ $T_{PLH}$ | Propagation Delay | $C_L$ = 15 pF, $R_L$ = 1.0 MΩ | 0.90 | | 13 | | | | nS |
| | | $C_L$ = 15 pF, $R_L$ = 2.0 kΩ | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 3.0 | 6.0 | 15.8 | 1.0 | 18.6 | nS |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.0 | 3.2 | 8.7 | 1.0 | 9.7 | |
| | | $C_L$ = 30 pF, $R_L$ = 500 Ω | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 2.0 | 6.0 | 1.0 | 6.8 | nS |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 0.8 | 1.2 | 4.1 | 0.7 | 4.7 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.7 | 1.0 | 3.3 | 0.6 | 4.0 | |

**New**

**AC CHARACTERISTICS** (Input $t_r = t_f$ = 3.0 nS)

| Symbol | Parameter | −40°C Condition | −40°C $V_{CC}$ | −40°C Min | 25°C Typ | 25°C Max | 85°C Min | 85°C Max | Units |
|---|---|---|---|---|---|---|---|---|---|
| $T_{PHL}$ $T_{PLH}$ | Propagation Delay | $C_L$ = 15 pF, $R_L$ = 1.0 MΩ | 0.90 | | 13 | | | | nS |
| | | $C_L$ = 15 pF, $R_L$ = 2.0 kΩ | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 15.8 | | 18.6 | nS |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.2 | 8.7 | | 9.7 | |
| | | $C_L$ = 30 pF, $R_L$ = 500 Ω | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | | 6.8 | nS |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.2 | 4.1 | | 4.7 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.3 | | 4.0 | |

# NC7SP

- **Adjusted Absolute Maximum Voltage to match new process.**

Existing datasheet

**Absolute Maximum Ratings** (Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.6V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.6V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.6V |

New

**Absolute Maximum Ratings** (Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.3V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.3V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.3V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.6 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.6 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.6 | V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.3 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.3 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.3 | V |

- **Adjusted Power Dissipation to reflect new die.**
- **Adjusted Thermal Resistance to reflect new die.**

Existing datasheet

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation at +85°C | SC70-5 | | 150 | mW |
| | | MicroPak™-6 | | 130 | |
| | | MicroPak2™-6 | | 120 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC70-5 | | 425 | | °C/W |
| | | MicroPak™-6 | | 500 | | |
| | | MicroPak2™-6 | | 560 | | |

New

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation In Still Air | SC-74A | | 225 | mW |
| | | SC70-5 | | 190 | |
| | | MicroPak™-6 | | 327 | |
| | | MicroPak2™-6 | | 327 | |

| | | | | | |
|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC-74A | | 555 | °C/W |
| | | SC70-5 | | 659 | |
| | | MicroPak™-6 | | 382 | |
| | | MicroPak2™-6 | | 382 | |

- **High Level Input Voltage and Low Level Input Voltage specification adjusted to remove limits at 0.9 Volts.**
- **High Level Output Voltage and Low Level Output Voltage specifications adjusted to remove limits at 0.9 Volts.**

## Existing datasheet

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 2.1 | | 2.1 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.9 | | 0.9 | |
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-20µA | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-0.5mA | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-1mA | 1.07 | | 0.99 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-1.5mA | 1.24 | | 1.22 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-2.1mA | 1.95 | | 1.87 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-2.6mA | 2.61 | | 2.55 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=20µA | | 0.1 | | 0.1 | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.1 | | 0.1 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.1 | | 0.1 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.1 | | 0.1 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.1 | | 0.1 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=0.5mA | | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=1mA | | 0.31 | | 0.37 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=1.5mA | | 0.31 | | 0.35 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=2.1mA | | 0.31 | | 0.33 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=2.6mA | | 0.31 | | 0.33 | |

## New

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | $V_{CC}$ | | $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 2.1 | | 2.1 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | GND | | GND | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.9 | | 0.9 | |
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-20µA | | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-0.5mA | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-1mA | 1.07 | | 0.99 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-1.5mA | 1.24 | | 1.22 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-2.1mA | 1.95 | | 1.87 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-2.6mA | 2.61 | | 2.55 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=20µA | | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.1 | | 0.1 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.1 | | 0.1 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.1 | | 0.1 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.1 | | 0.1 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=0.5mA | | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=1mA | | 0.31 | | 0.37 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=1.5mA | | 0.31 | | 0.35 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=2.1mA | | 0.31 | | 0.33 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=2.6mA | | 0.31 | | 0.33 | |

## Existing datasheet

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | $T_A$ = −40°C to +85°C | | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.6 | | 1.6 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 2.1 | | 2.1 | | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.7 | | 0.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.9 | | 0.9 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | 0.1 | | 0.1 | V | $I_{OL}$ = 20 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.1 | | 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.1 | | 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.1 | | 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.1 | | 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | | $I_{OL}$ = 0.5 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.31 | | 0.37 | | $I_{OL}$ = 1 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.31 | | 0.35 | | $I_{OL}$ = 1.5 mA |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.31 | | 0.33 | | $I_{OL}$ = 2.1 mA |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.31 | | 0.33 | | $I_{OL}$ = 2.6 mA |

## New

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | $T_A$ = −40°C to +85°C | | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | $V_{CC}$ | | $V_{CC}$ | | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.6 | | 1.6 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 2.1 | | 2.1 | | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | GND | | GND | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.7 | | 0.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.9 | | 0.9 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | | | | V | $I_{OL}$ = 20 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.1 | | 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.1 | | 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.1 | | 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.1 | | 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | | $I_{OL}$ = 0.5 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.31 | | 0.37 | | $I_{OL}$ = 1 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.31 | | 0.35 | | $I_{OL}$ = 1.5 mA |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.31 | | 0.33 | | $I_{OL}$ = 2.1 mA |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.31 | | 0.33 | | $I_{OL}$ = 2.6 mA |

- **Positive Threshold Voltage adjusted to remove lower limts and remove limits at 0.90 Volts.**
- **Negative Threshold Voltage adjusted to remove upper limits and remove limits at 0.90 Volts.**
- **Hysteresis Voltage adjusted to remove limits at 0.90 Volts.**

**DC Electrical Characteristics**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$=+25°C Min. | $T_A$=+25°C Max. | $T_A$=−40°C to +85°C Min. | $T_A$=−40°C to +85°C Max. | Units |
|---|---|---|---|---|---|---|---|---|
| $V_P$ | Positive Threshold Voltage | | 0.90 | 0.30 | 0.60 | 0.30 | 0.60 | V |
| | | | 1.10 | 0.40 | 1.00 | 0.40 | 1.00 | |
| | | | 1.40 | 0.50 | 1.20 | 0.50 | 1.20 | |
| | | | 1.65 | 0.70 | 1.50 | 0.70 | 1.50 | |
| | | | 2.30 | 1.00 | 1.90 | 1.00 | 1.90 | |
| | | | 3.00 | 1.50 | 2.60 | 1.50 | 2.60 | |
| $V_N$ | Negative Threshold Voltage | | 0.90 | 0.10 | 0.60 | 0.10 | 0.60 | V |
| | | | 1.10 | 0.15 | 0.70 | 0.15 | 0.70 | |
| | | | 1.40 | 0.20 | 0.80 | 0.20 | 0.80 | |
| | | | 1.65 | 0.25 | 0.90 | 0.25 | 0.90 | |
| | | | 2.30 | 0.40 | 1.15 | 0.40 | 1.15 | |
| | | | 3.00 | 0.6 | 1.50 | 0.60 | 1.50 | |
| $V_H$ | Hysteresis Voltage | | 0.90 | 0.07 | 0.50 | 0.07 | 0.50 | V |
| | | | 1.10 | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | | 1.40 | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | | 1.65 | 0.10 | 1.00 | 0.10 | 1.00 | |
| | | | 2.30 | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | | 3.00 | 0.60 | 1.80 | 0.60 | 1.80 | |

**DC Electrical Characteristics**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$=+25°C Min. | $T_A$=+25°C Max. | $T_A$=−40°C to +85°C Min. | $T_A$=−40°C to +85°C Max. | Units |
|---|---|---|---|---|---|---|---|---|
| $V_P$ | Positive Threshold Voltage | | 0.90 | | | | | V |
| | | | 1.10 | | 1.00 | | 1.00 | |
| | | | 1.40 | | 1.20 | | 1.20 | |
| | | | 1.65 | | 1.50 | | 1.50 | |
| | | | 2.30 | | 1.90 | | 1.90 | |
| | | | 3.00 | | 2.60 | | 2.60 | |
| $V_N$ | Negative Threshold Voltage | | 0.90 | | | | | V |
| | | | 1.10 | 0.15 | | 0.15 | | |
| | | | 1.40 | 0.20 | | 0.20 | | |
| | | | 1.65 | 0.25 | | 0.25 | | |
| | | | 2.30 | 0.40 | | 0.40 | | |
| | | | 3.00 | 0.6 | | 0.60 | | |
| $V_H$ | Hysteresis Voltage | | 0.90 | | | | | V |
| | | | 1.10 | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | | 1.40 | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | | 1.65 | 0.10 | 1.00 | 0.10 | 1.00 | |
| | | | 2.30 | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | | 3.00 | 0.60 | 1.80 | 0.60 | 1.80 | |

- **Removed Minimum limits from all propagation delays and Output enable Time and Output Disable Time specifications.**

**Existing datasheet**

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | Typ | Max | $T_A$ = −40°C to +85°C Min | Max | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PZL}$ $t_{PLZ}$ | Propagation Delay | 0.90 | | 24 | | | | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 4.0 | 9 | 18.7 | 3.5 | 30.9 | ns | $C_L$ = 10 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 2.0 | 6 | 12.4 | 1.5 | 13.9 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.5 | 5 | 9.6 | 1.0 | 12.1 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.0 | 4 | 9.0 | 0.8 | 10.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 1.0 | 3 | 8.7 | 0.5 | 9.0 | | | |
| $t_{PZL}$ $t_{PLZ}$ | Propagation Delay | 0.90 | | 27 | | | | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 5.0 | 10 | 20.2 | 4.5 | 33.9 | ns | $C_L$ = 15 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 3.0 | 7 | 13.3 | 2.5 | 16.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 2.0 | 5 | 10.3 | 2.0 | 12.6 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.5 | 4 | 9.4 | 1.0 | 10.2 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 1.0 | 3 | 9.1 | 0.5 | 9.7 | | | |
| $t_{PZL}$ $t_{PLZ}$ | Propagation Delay | 0.90 | | 34 | | | | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 6.0 | 12 | 24.0 | 5.0 | 43.0 | ns | $C_L$ = 30 pF, $R_U$ = 5000 Ω, $R_D$ = 5000 Ω | Figures 1, 2 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 4.0 | 8 | 16.0 | 3.0 | 18.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 2.0 | 6 | 12.0 | 2.0 | 14.0 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.0 | 5 | 11.0 | 1.0 | 12.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 0.8 | 4 | 10.0 | 0.5 | 11.0 | | | |

**New**

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | Typ | Max | $T_A$ = −40°C to +85°C Min | Max | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PZL}$ $t_{PLZ}$ | Propagation Delay | 0.90 | | 24 | | | | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 9 | 18.7 | | 30.9 | ns | $C_L$ = 10 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 6 | 12.4 | | 13.9 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 5 | 9.6 | | 12.1 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 4 | 9.0 | | 10.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 3 | 8.7 | | 9.0 | | | |
| $t_{PZL}$ $t_{PLZ}$ | Propagation Delay | 0.90 | | 27 | | | | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 10 | 20.2 | | 33.9 | ns | $C_L$ = 15 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 7 | 13.3 | | 16.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 5 | 10.3 | | 12.6 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 4 | 9.4 | | 10.2 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 3 | 9.1 | | 9.7 | | | |
| $t_{PZL}$ $t_{PLZ}$ | Propagation Delay | 0.90 | | 34 | | | | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 12 | 24.0 | | 43.0 | ns | $C_L$ = 30 pF, $R_U$ = 5000 Ω, $R_D$ = 5000 Ω | Figures 1, 2 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 8 | 16.0 | | 18.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 6 | 12.0 | | 14.0 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 5 | 11.0 | | 12.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 4 | 10.0 | | 11.0 | | | |

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | Typ. | $T_A$=-40 to +85°C Min. | Typ. | Min. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.5 | 12.0 | 23.4 | 5.0 | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 13.8 | 3.0 | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 10.6 | 2.0 | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 7.6 | 1.0 | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 6.4 | 0.5 | 8.9 | | |
| $t_{PZL}$,$t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.4 | 5.0 | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 14.5 | 3.0 | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 11.7 | 2.0 | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 9.1 | 1.0 | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 8.1 | 0.5 | 10.1 | | |
| $t_{PHZ}$,$t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.8 | 5.0 | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 17.1 | 3.0 | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 16.5 | 2.0 | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 15.2 | 1.0 | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 14.8 | 0.5 | 16.3 | | |

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | Typ. | Max. | $T_A$=-40 to +85°C Min. | Max. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 12.0 | 23.4 | | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 13.8 | | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 10.6 | | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 7.6 | | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 6.4 | | 8.9 | | |
| $t_{PZL}$,$t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 24.4 | | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 14.5 | | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 11.7 | | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 9.1 | | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 8.1 | | 10.1 | | |
| $t_{PHZ}$,$t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 24.8 | | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 17.1 | | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 16.5 | | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 15.2 | | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 14.8 | | 16.3 | | |

- **Maximum limits adjusted for the NC7SP125 and NC7SP126 on some propagation delays, Output Enable times and Output Disable Times.**
- **Minimum limits removed from all propagation delays, Output Enable Times and Output Disable Times.**

## Existing datasheet

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C | | | $T_A$=-40 to +85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=10pF, $R_L$=1MΩ | | 26 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 4.0 | 10.0 | 19.1 | 3.5 | 39.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 2.0 | 6.0 | 11.2 | 1.5 | 14.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 1.5 | 5.0 | 8.6 | 1.0 | 11.6 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 4.0 | 6.3 | 0.8 | 8.2 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 5.3 | 0.5 | 7.2 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 29 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 4.0 | 8.0 | 17.5 | 3.5 | 40.4 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 2.0 | 6.0 | 11.9 | 1.5 | 14.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 1.5 | 5.0 | 9.7 | 1.0 | 12.3 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 4.0 | 7.7 | 0.8 | 10.5 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 6.9 | 0.5 | 8.6 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 4.0 | 8.0 | 20.5 | 3.5 | 42.0 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 2.0 | 6.0 | 15.3 | 1.5 | 18.0 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 1.5 | 5.0 | 14.7 | 1.0 | 17.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 4.0 | 13.7 | 0.8 | 15.0 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 13.5 | 0.5 | 14.8 | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_L$=1MΩ | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 10.0 | 20.5 | 4.5 | 42.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 7.0 | 11.8 | 2.5 | 15.4 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.0 | 9.1 | 2.0 | 12.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.5 | 4.0 | 6.6 | 1.0 | 8.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 5.6 | 0.5 | 7.5 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 31 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 11.0 | 18.2 | 4.5 | 43.3 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 7.0 | 12.5 | 2.5 | 15.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.0 | 10.2 | 2.0 | 12.9 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.5 | 4.0 | 8.0 | 1.0 | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 7.2 | 0.5 | 8.9 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 30 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 11.0 | 21.6 | 4.5 | 44.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 7.0 | 15.9 | 2.5 | 18.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.0 | 15.2 | 2.0 | 18.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.5 | 4.0 | 14.1 | 1.0 | 15.4 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 13.9 | 0.5 | 15.1 | | |

Continued on following page...

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C | | | $T_A$=-40 to +85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Typ. | Min. | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.5 | 12.0 | 23.4 | 5.0 | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 13.8 | 3.0 | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 10.6 | 2.0 | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 7.6 | 1.0 | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 6.4 | 0.5 | 8.9 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.4 | 5.0 | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 14.5 | 3.0 | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 11.7 | 2.0 | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 9.1 | 1.0 | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 8.1 | 0.5 | 10.1 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.8 | 5.0 | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 17.1 | 3.0 | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 16.5 | 2.0 | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 15.2 | 1.0 | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 14.8 | 0.5 | 16.3 | | |

## New

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C | | | $T_A$=-40 to +85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=10pF, $R_L$=1MΩ | | 26 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 10.0 | 26 | | 39.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 6.0 | 11.2 | | 14.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 8.6 | | 11.6 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 6.3 | | 8.2 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 5.3 | | 7.2 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 29 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 8.0 | 26 | | 40.4 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 6.0 | 11.9 | | 14.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 9.7 | | 12.3 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 7.7 | | 10.5 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 6.9 | | 8.6 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 8.0 | 20.5 | | 42.0 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 6.0 | 15.3 | | 18.0 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 14.7 | | 17.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 13.7 | | 15.0 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 13.5 | | 14.8 | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_L$=1MΩ | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 10.0 | 27 | | 42.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 7.0 | 11.8 | | 15.4 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 9.1 | | 12.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 6.6 | | 8.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 5.6 | | 7.5 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 31 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 11.0 | 27 | | 43.3 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 7.0 | 12.5 | | 15.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 10.2 | | 12.9 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 8.0 | | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 7.2 | | 8.9 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 30 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 11.0 | 21.6 | | 44.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 7.0 | 15.9 | | 18.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 15.2 | | 18.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 14.1 | | 15.4 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 13.9 | | 15.1 | | |

Continued on following page...

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C | | | $T_A$=-40 to +85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Typ. | Min. | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 12.0 | 30 | | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 13.8 | | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 10.6 | | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 7.6 | | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 6.4 | | 8.9 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 30 | | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 14.5 | | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 11.7 | | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 9.1 | | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 8.1 | | 10.1 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 24.8 | | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 17.1 | | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 16.5 | | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 18.5 | | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 14.8 | | 16.3 | | |

# NC7SV

- **Adjusted Absolute Maximum Voltage to match new process.**

Existing datasheet

**Absolute Maximum Ratings**(Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.6V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.6V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.6V |

New

**Absolute Maximum Ratings**(Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.3V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.3V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.3V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.6 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.6 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.6 | V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.3 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.3 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.3 | V |

- **Adjusted Power Dissipation to reflect new die.**
- **Adjusted Thermal Resistance to reflect new die.**

Existing datasheet

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation at +85°C | SC70-5 | | 150 | mW |
| | | MicroPak™-6 | | 130 | |
| | | MicroPak2™-6 | | 120 | |

| | | | | | |
|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC70-5 | | 425 | °C/W |
| | | MicroPak™-6 | | 500 | |
| | | MicroPak2™-6 | | 560 | |

New

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation In Still Air | SC-74A | | 225 | mW |
| | | SC70-5 | | 190 | |
| | | MicroPak™-6 | | 327 | |
| | | MicroPak2™-6 | | 327 | |

| | | | | | |
|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC-74A | | 555 | °C/W |
| | | SC70-5 | | 659 | |
| | | MicroPak™-6 | | 382 | |
| | | MicroPak2™-6 | | 382 | |

- **High Level Input Voltage and Low Level Input Voltage specification adjusted limits at 0.9 Volts.**
- **High Level Output Voltage and Low Level Output Voltage specifications adjusted to remove limits at 0.9 Volts.**

## Existing datasheet

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.0 | | 2.0 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.8 | | 0.8 | |

## New

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | $V_{CC}$ | | $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.0 | | 2.0 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | GND | | GND | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.8 | | 0.8 | |

## Existing datasheet

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-100µA | $V_{CC}$-0.1 | | $V_{CC}$-0.1 | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$-0.1 | | $V_{CC}$-0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-2mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-4mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-6mA | 1.25 | | 1.25 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 2.00 | | 2.00 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-12mA | 1.8 | | 1.8 | |
| | | 2.70≤ $V_{CC}$ ≤ 3.60 | | 2.2 | | 2.2 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-18mA | 1.7 | | 1.7 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.4 | | 2.4 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-24mA | 2.2 | | 2.2 | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=100µA | | 0.1 | | 0.1 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.2 | | 0.2 |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.2 | | 0.2 |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.2 | | 0.2 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.2 | | 0.2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=2mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=4mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=6mA | | 0.3 | | 0.3 |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=12mA | | 0.4 | | 0.4 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 |
| | | 2.30≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=18mA | | 0.6 | | 0.6 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=24mA | | 0.55 | | 0.55 |

## New

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-100µA | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$-0.1 | | $V_{CC}$-0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-2mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-4mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-6mA | 1.25 | | 1.25 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 2.00 | | 2.00 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-12mA | 1.8 | | 1.8 | |
| | | 2.70≤ $V_{CC}$ ≤ 3.60 | | 2.2 | | 2.2 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-18mA | 1.7 | | 1.7 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.4 | | 2.4 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-24mA | 2.2 | | 2.2 | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=100µA | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.2 | | 0.2 |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.2 | | 0.2 |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.2 | | 0.2 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.2 | | 0.2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=2mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=4mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=6mA | | 0.3 | | 0.3 |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=12mA | | 0.4 | | 0.4 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 |
| | | 2.30≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=18mA | | 0.6 | | 0.6 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=24mA | | 0.55 | | 0.55 |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | $T_A$ = +25°C Max | $T_A$ = −40°C to +85°C Min | $T_A$ = −40°C to +85°C Max | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | V | $I_{OH}$ = −100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | | $I_{OH}$ = −6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 2.0 | | 2.0 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.8 | | 1.8 | | | $I_{OH}$ = −12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.7 | | 1.7 | | | $I_{OH}$ = −18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | $I_{OH}$ = −24 mA |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | 0.1 | | 0.1 | V | $I_{OL}$ = 100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.2 | | 0.2 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | | $I_{OL}$ = 6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.4 | | 0.4 | | $I_{OL}$ = 12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.6 | | 0.6 | | $I_{OL}$ = 18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | | $I_{OL}$ = 24 mA |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | $T_A$ = +25°C Max | $T_A$ = −40°C to +85°C Min | $T_A$ = −40°C to +85°C Max | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | | | | | V | $I_{OH}$ = −100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | | $I_{OH}$ = −6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 2.0 | | 2.0 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.8 | | 1.8 | | | $I_{OH}$ = −12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.7 | | 1.7 | | | $I_{OH}$ = −18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | $I_{OH}$ = −24 mA |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | | | | V | $I_{OL}$ = 100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.2 | | 0.2 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | | $I_{OL}$ = 6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.4 | | 0.4 | | $I_{OL}$ = 12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.6 | | 0.6 | | $I_{OL}$ = 18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | | $I_{OL}$ = 24 mA |

- **Positive Threshold Voltage adjusted to remove lower limits and remove limits at 0.90 Volts.**
- **Negative Threshold Voltage adjusted to remove upper limits and remove limits at 0.90 Volts.**
- **Hysteresis Voltage adjusted to remove limits at 0.90 Volts.**

Existing datasheet

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_P$ | Positive Threshold Voltage | 0.90 | | 0.30 | 0.70 | 0.30 | 0.70 | V |
| | | 1.10 | | 0.40 | 1.00 | 0.40 | 1.00 | |
| | | 1.40 | | 0.50 | 1.25 | 0.50 | 1.40 | |
| | | 1.65 | | 0.70 | 1.50 | 0.70 | 1.50 | |
| | | 2.30 | | 1.00 | 1.80 | 1.00 | 1.80 | |
| | | 2.70 | | 1.50 | 2.20 | 1.50 | 2.20 | |
| $V_N$ | Negative Threshold Voltage | 0.90 | | 0.10 | 0.60 | 0.10 | 0.60 | V |
| | | 1.10 | | 0.15 | 0.70 | 0.15 | 0.70 | |
| | | 1.40 | | 0.20 | 0.80 | 0.20 | 0.80 | |
| | | 1.65 | | 0.25 | 0.90 | 0.25 | 0.90 | |
| | | 2.30 | | 0.40 | 1.15 | 0.40 | 1.15 | |
| | | 2.70 | | 0.60 | 1.50 | 0.60 | 1.50 | |
| $V_H$ | Hysteresis Voltage | 0.90 | | 0.07 | 0.50 | 0.07 | 0.50 | V |
| | | 1.10 | | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | 1.40 | | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | 1.65 | | 0.15 | 1.00 | 0.15 | 1.00 | |
| | | 2.30 | | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | 2.70 | | 0.60 | 1.20 | 0.60 | 1.20 | |

New

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_P$ | Positive Threshold Voltage | 0.90 | | | | | | V |
| | | 1.10 | | | 1.00 | | 1.00 | |
| | | 1.40 | | | 1.25 | | 1.40 | |
| | | 1.65 | | | 1.50 | | 1.50 | |
| | | 2.30 | | | 1.80 | | 1.80 | |
| | | 2.70 | | | 2.20 | | 2.20 | |
| $V_N$ | Negative Threshold Voltage | 0.90 | | | | | | V |
| | | 1.10 | | 0.15 | | 0.15 | | |
| | | 1.40 | | 0.20 | | 0.20 | | |
| | | 1.65 | | 0.25 | | 0.25 | | |
| | | 2.30 | | 0.40 | | 0.40 | | |
| | | 2.70 | | 0.60 | | 0.60 | | |
| $V_H$ | Hysteresis Voltage | 0.90 | | | | | | V |
| | | 1.10 | | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | 1.40 | | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | 1.65 | | 0.15 | 1.00 | 0.15 | 1.00 | |
| | | 2.30 | | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | 2.70 | | 0.60 | 1.20 | 0.60 | 1.20 | |

- **Removed Minimum limits from all propagation delays and Output enable Time and Output Disable Time specifications.**

Existing datasheet

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 13 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 3.0 | 6.0 | 9.8 | 1.9 | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.0 | 3.5 | 5.3 | 0.8 | 5.7 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.9 | 3.0 | 4.3 | 0.8 | 4.6 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 2.0 | 2.8 | 0.7 | 3.0 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.5 | 1.0 | 2.6 | 0.5 | 2.8 | | | |
| $t_{PZH}$ $t_{PZL}$ | Output Enable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 3.0 | 6.0 | 9.7 | 2.0 | 16.4 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.2 | 4.0 | 6.0 | 1.0 | 7.5 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 3.0 | 4.5 | 0.9 | 5.0 | | $S_1$ = GND for $t_{PZH}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 2.0 | 3.0 | 0.7 | 3.4 | | $S_1$ = $V_I$ for $t_{PZL}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.5 | 1.2 | 2.6 | 0.4 | 2.9 | | $V_I$ = 2 x $V_{CC}$ | |
| $t_{PHZ}$ $t_{PLZ}$ | Output Disable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 2.0 | 5.0 | 9.5 | 2.0 | 14.0 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.2 | 3.0 | 5.5 | 1.1 | 7.0 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 2.0 | 5.6 | 0.8 | 5.8 | | $S_1$ = GND for $t_{PHZ}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 1.5 | 4.2 | 0.5 | 5.0 | | $S_1$ = $V_I$ for $t_{PLZ}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.5 | 1.0 | 3.9 | 0.4 | 4.2 | | $V_I$ = 2 x $V_{CC}$ | |

New

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 13 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 9.8 | | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.5 | 5.3 | | 5.7 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 3.0 | 4.3 | | 4.6 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 2.0 | 2.8 | | 3.0 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 2.6 | | 2.8 | | | |
| $t_{PZH}$ $t_{PZL}$ | Output Enable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 9.7 | | 16.4 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 6.0 | | 7.5 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 3.0 | 4.5 | | 5.0 | | $S_1$ = GND for $t_{PZH}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 2.0 | 3.0 | | 3.4 | | $S_1$ = $V_I$ for $t_{PZL}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.2 | 2.6 | | 2.9 | | $V_I$ = 2 x $V_{CC}$ | |
| $t_{PHZ}$ $t_{PLZ}$ | Output Disable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 9.5 | | 14.0 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 5.5 | | 7.0 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.6 | | 5.8 | | $S_1$ = GND for $t_{PHZ}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 1.5 | 4.2 | | 5.0 | | $S_1$ = $V_I$ for $t_{PLZ}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.9 | | 4.2 | | $V_I$ = 2 x $V_{CC}$ | |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 12 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 2.0 | 5.9 | 10.0 | 1.0 | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.0 | 3.2 | 6.1 | 0.9 | 7.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 2.0 | 5.2 | 0.7 | 6.2 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 1.8 | 3.7 | 0.6 | 4.4 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.7 | 1.5 | 3.3 | 0.5 | 3.8 | | | |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 12 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.9 | 10.0 | | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.2 | 6.1 | | 7.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.2 | | 6.2 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 1.8 | 3.7 | | 4.4 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.5 | 3.3 | | 3.8 | | | |

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | | $T_A$=-40 to 85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_U$=$R_D$=1kΩ | | 13 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | 3.0 | 6.0 | 15.0 | 1.0 | 18.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 1.0 | 3.2 | 8.7 | 1.0 | 9.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | 1.0 | 2.0 | 6.0 | 1.0 | 6.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.8 | 1.2 | 3.6 | 0.7 | 4.7 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.7 | 1.0 | 3.3 | 0.6 | 4.0 | | |

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | | $T_A$=-40 to 85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_U$=$R_D$=1kΩ | | 13 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | | 6.0 | 15.0 | | 18.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 3.2 | 8.7 | | 9.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | | 2.0 | 6.0 | | 6.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 1.2 | 3.6 | | 4.7 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 1.0 | 3.3 | | 4.0 | | |

**Qualification Plan:**

**QV DEVICE Name: NC7SP125P5X**
**RMS 51765**
**PACKAGE SC88A**

| Test | Specification | Condition | Interval | Results |
|---|---|---|---|---|
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/804 |
| HTSL | JESD22-A103 | Ta=150°C | 2016 hrs | 0/234 |
| TC | JESD22-A104 | Ta= -65°C to +150°C | 500 cyc | 0/297 |
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/273 |
| UHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/234 |
| HTOL | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 1008 hrs | 0/252 |
| ELFR | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 48 hrs | 0/1600 |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/90 |

**QV DEVICE Name: NL17SG14P5T5G**
**RMS 56472**
**PACKAGE SOT953**

| Test | Specification | Condition | Interval | Results |
|---|---|---|---|---|
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/720 |
| HTSL | JESD22-A103 | Ta=150°C | 2016 hrs | 0/249 |
| TC | JESD22-A104 | Ta= -65°C to +150°C | 500 cyc | 0/234 |
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/252 |
| uHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/234 |
| HTOL | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 1008 hrs | 0/252 |
| ELFR | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 48 hrs | 0/1600 |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/90 |

**QV DEVICE Name: NL17SV16XV5T2G**
**RMS 51763**
**PACKAGE SOT553**

| Test | Specification | Condition | Interval | Results |
|---|---|---|---|---|
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/753 |
| HTSL | JESD22-A103 | Ta=150°C | 2016 hrs | 0/252 |
| TC | JESD22-A104 | Ta= -65°C to +150°C | 500 cyc | 0/252 |
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/249 |
| UHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/252 |
| HTOL | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 2016 hrs | 0/252 |
| ELFR | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 48 hrs | 0/1600 |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/90 |

**List of Affected Parts:**

**Note**: Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the **PCN Customized Portal.**

| Part Number | Qualification Vehicle |
|---|---|
| NC7SP00P5X | NC7SP125P5X |
| NC7SP02P5X | NC7SP125P5X |
| NC7SP04P5X | NC7SP125P5X |
| NC7SP05P5X | NC7SP125P5X |
| NC7SP08P5X | NC7SP125P5X |
| NC7SP125P5X | NC7SP125P5X |
| NC7SP126P5X | NC7SP125P5X |
| NC7SP14P5X | NC7SP125P5X |
| NC7SP17P5X | NC7SP125P5X |
| NC7SP32P5X | NC7SP125P5X |
| NC7SP34P5X | NC7SP125P5X |
| NC7SP38P5X | NC7SP125P5X |
| NC7SP86P5X | NC7SP125P5X |
| NC7SPU04P5X | NC7SP125P5X |
| NC7SV00P5X | NC7SP125P5X |
| NC7SV02P5X | NC7SP125P5X |
| NC7SV04P5X | NC7SP125P5X |
| NC7SV05P5X | NC7SP125P5X |
| NC7SV08P5X | NC7SP125P5X |
| NC7SV125P5X | NC7SP125P5X |
| NC7SV126P5X | NC7SP125P5X |
| NC7SV14P5X | NC7SP125P5X |
| NC7SV17P5X | NC7SP125P5X |
| NC7SV32P5X | NC7SP125P5X |
| NC7SV34P5X | NC7SP125P5X |
| NC7SV86P5X | NC7SP125P5X |
| NC7SVL04P5X | NC7SP125P5X |
| NC7SVL08P5X | NC7SP125P5X |
| NC7SVL32P5X | NC7SP125P5X |
| NC7SVU04P5X | NC7SP125P5X |
| NL17SG00DFT2G | NC7SP125P5X |

| | |
|---|---|
| NL17SG00P5T5G | NL17SG14P5T5G |
| NL17SG02DFT2G | NC7SP125P5X |
| NL17SG02P5T5G | NL17SG14P5T5G |
| NL17SG04DFT2G | NC7SP125P5X |
| NL17SG04P5T5G | NL17SG14P5T5G |
| NL17SG07DFT2G | NC7SP125P5X |
| NL17SG07P5T5G | NL17SG14P5T5G |
| NL17SG08DFT2G | NC7SP125P5X |
| NL17SG08P5T5G | NL17SG14P5T5G |
| NL17SG125DFT2G | NC7SP125P5X |
| NL17SG125P5T5G | NL17SG14P5T5G |
| NL17SG126DFT2G | NC7SP125P5X |
| NL17SG126P5T5G | NL17SG14P5T5G |
| NL17SG126P5T6G | NL17SG14P5T5G |
| NL17SG14DFT2G | NC7SP125P5X |
| NL17SG14P5T5G | NL17SG14P5T5G |
| NL17SG17DFT2G | NC7SP125P5X |
| NL17SG17P5T5G | NL17SG14P5T5G |
| NL17SG32DFT2G | NC7SP125P5X |
| NL17SG32P5T5G | NL17SG14P5T5G |
| NL17SG34DFT2G | NC7SP125P5X |
| NL17SG34P5T5G | NL17SG14P5T5G |
| NL17SG86DFT2G | NC7SP125P5X |
| NL17SG86P5T5G | NL17SG14P5T5G |
| NL17SGU04DFT2G | NC7SP125P5X |
| NL17SGU04P5T5G | NL17SG14P5T5G |
| NL17SV00XV5T2G | NL17SV16XV5T2G |
| NL17SV02XV5T2G | NL17SV16XV5T2G |
| NL17SV04XV5T2G | NL17SV16XV5T2G |
| NL17SV08XV5T2G | NL17SV16XV5T2G |
| NL17SV16XV5T2G | NL17SV16XV5T2G |
| NL17SV32XV5T2G | NL17SV16XV5T2G |

Japanese translation of the notification starts here.

通知の日本語訳はここから始まります。

**Note***: The Japanese version is for reference only. In case of any differences between the English and Japanese version, the English version shall control.*

注：日本語版は参照用です。英語版と日本語版の違いがある場合は、英語版が優先されます.

ON Semiconductor®

# 初回製品 / プロセス変更通知

文書番号# : IPCN22735X
発行日 : 6 August 2019

| | |
|---|---|
| **変更件名:** | データシート更新を伴う MiniGates ウェハー工場、組立材料および検査変更 (SC88A/SOT953/SOT553) |
| **初回出荷予定日:** | 6 February 2020 |
| **連絡先情報:** | 現地のオン・セミコンダクター営業所または <logic.fpcn@onsemi.com> にお問い合わせください。 |
| **サンプル:** | 現地のオン・セミコンダクター営業所または <PCN.Samples@onsemi.com> にお問い合わせください。<br>サンプルは、この変更の初回通知、初回 PCN の日付から 30 日以内に要求してください。<br>サンプル納入時は、依頼日、数量、特別梱包材/ラベル条件によって異なります。 |
| **通知種別:** | これは、お客様宛の初回製品 / プロセス変更通知 (IPCN) です。IPCN は、近日中に実施される変更に関する事前通知であり、変更の詳細および影響を受けるデバイスについての一般情報が記載されます。また、暫定的な信頼性認証計画も記載されます。<br>最終的な認定データおよび特性データは最終製品 / プロセス変更通知 (FPCN) に含まれます。この IPCN は、変更実施から少なくとも 90 日前に発行される最終製品 / プロセス変更通知 (FPCN) に先だって通知されます。ご不明な点がありましたら、<PCN.Support@onsemi.com> にお問い合わせください。 |
| **変更部品の識別:** | NC7 製品においては、マーキングスタイルは異なるものになります。NL17 製品および SL17 製品では、リールラベルの CS コードは US から JP に変更されます。 |
| **変更カテゴリ:** | ☑ ウェハファブの変更　☑ アセンブリの変更　☑ 試験の変更　☑ その他　データシート |

**変更サブカテゴリ:**

| | | |
|---|---|---|
| ☐ 製造拠点の追加 | ☑ 材料の変更 | ☑ データシート/製品資料の変更 |
| ☑ 製造拠点の移転 | ☐ 製品仕様の変更 | ☑ 出荷/パッケージング/表記 |
| ☑ 製造プロセスの変更 | | ☐ その他 : _____ |

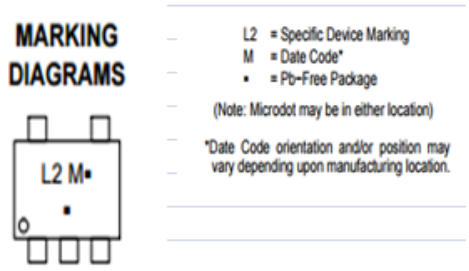
| | | |
|---|---|---|
| **影響を受ける拠点:** | **オン・セミコンダクター拠点:**<br>ON ISMF, Malaysia<br>ON Leshan, China<br>ON Cebu, Philippines<br>ON S. Portland, Maine | **外部製造工場 / 下請業者拠点:**<br>Foundry<br>Subcontractor in China |

**説明および目的:**

この IPCN はフロントエンドおよびバックエンドの生産能力を高めるため、また材料を標準化するために、TinyLogic®用に日本における新規のダイ供給拠点を認定し、組立および検査拠点を標準化することを目的として発行されたものです。

**NC7xxxP5X シリーズ:**

| | 変更前の表記 | | 変更後の表記 |
|---|---|---|---|
| **リードフレーム** | LF SC70 5L Cu A194 STAMPED PPF | LF SC 88A 5L C194 STAMPED | SC88A OP14 |
| **ダイ接着剤** | DA EPOXY ABLESTICK 2200D | DA EPOXY HE ABLESTIK 84-1LMISR4 5CC | Au Eutectic |
| **ボンドワイヤー** | Au | Au | Cu |
| **モールド・コンパウンド** | MC SUMITOMO G600 HF | MC GREEN PA CK5000A 13MMX3.9G | Henkel GR640 HV-L1 |
| **組立拠点** | Subcon China | ON Philippines | ON in China |
| ダイ供給 | ONsemi US Fab | ONsemi US Fab | External Fab (日本) |
| めっき | Preplated | 100% Sn | 100% Sn |

| | 変更前 | 変更後 |
|---|---|---|
| **製品マーキング変更** |  Above marking is for subcon China, ON Philippines is without the plant code dot. |  |

**NL17xxxDFT2G Series:**

| | 変更前の表記 | 変更後の表記 |
|---|---|---|
| **ボンドワイヤー** | Au ** and Cu | Cu |
| **モールド・コンパウンド** | Hitachi GE200F or Henkel GR640 HV-L1 | Henkel GR640 HV-L1 |
| ダイ供給 | External Foundry (イスラエル) | External Fab(日本) |

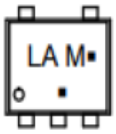
** これらの製品のみ、変更前は Au ワイヤを使用しています
(NL17SG00DFT2G/NL17SG02DFT2G/NL17SG04DFT2G/NL17SG07DFT2G/NL17SG08DFT2G/NL17SG125DFT2G/NL17SG126DFT2G/NL17SG14DFT2G/NL17SG17DFT2G/NL17SG32DFT2G/NL17SG34DFT2G/NL17SG86DFT2G/NL17SGU04DFT2G)

マーキングに変更はありません。

**NL17xxXV5T2G シリーズ:**

| | 変更前の表記 | 変更後の表記 |
|---|---|---|
| **ボンドワイヤー** | Au | Cu |
| **組み立て拠点** | ON Seremban, Malaysia | ON Leshan, China |
| ダイ供給 | External Foundry (イスラエル) | External Fab (日本) |

## ただし、NL17SV32XV5T2G は拠点の変更はなく、現在オン楽山で実施されています。

| | 変更前 | 変更後 |
|---|---|---|
| **製品表示変更** |  LA =Device Code, M = Date Code (orientation at 0 degree), Dot(.)=Lead Free Package |  LA =Device Code, M = Date Code (orientation at 90 degree), Dot(.)=Lead Free Package |

**NL17xxxP5T5G シリーズ:**

| | 変更前の表記 | 変更後の表記 |
|---|---|---|
| **ボンドワイヤー** | Au | Cu |
| ダイ供給 | External Foundry (イスラエル) | External Fab (日本) |

マーキングに変更はありません。

**データシートの変更:**

仕様および/または仕様条件の変更に関する新旧データシート間での比較を以下に示します。

- 変更箇所は赤色の丸で囲まれています。
- 旧データシートから変更される項目は赤色でハイライトされています。
- 新データシートで対応する値は緑色でハイライトされています。

他にも、ファミリーに合わせて仕様フォーマットを表現するためにデータシートの整理と標準化をしたことによる変更があります。これらの変更は、以下のような形で行われます。

- スペルなどの事務的なミスの訂正。
- ファミリーの標準を作成するための書式設定。
- 新しいパッケージタイプの追加、および入手できなくなったパッケージの削除見込み。
- スイッチング波形試験回路図の標準化。
- マーキング、およびテープまたはリールでのピン 1 の向きに関して、お客様にさらなる情報を提供するための、デバイス注文情報の書式設定。

# NL17SG

- **最大定格電圧が 5.5V から 4.3V に変更。**

Existing datasheet

MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.6 | V |
| $V_{OUT}$ | DC Output Voltage | Output at High or Low State<br>Power−Down Mode ($V_{CC}$ = 0 V) | −0.5 to $V_{CC}$ +0.5<br>−0.5 to +4.6 | V |

MAXIMUM RATINGS

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | $V_{CC}$ ≥ 0.9 V<br>$V_{CC}$ < 0.9 V | −0.5 to +5.5<br>−0.5 to +4.6 | V |
| $V_{OUT}$ | DC Output Voltage | | −0.5 to $V_{CC}$ + 0.5 | V |

MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | −0.5 to +4.6 | V |
| $V_{OUT}$ | DC Output Voltage | −0.5 to $V_{CC}$ +0.5 | V |

MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | −0.5 to +5.5 | V |
| $V_{IN}$ | DC Input Voltage | −0.5 to +5.5 | V |
| $V_{OUT}$ | DC Output Voltage | −0.5 to $V_{CC}$ + 0.5 | V |

New

MAXIMUM RATINGS

| Symbol | Characteristics | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +4.3 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.3 | V |
| $V_{OUT}$ | DC Output Voltage | Active−Mode (High or Low State)<br>Tri−State Mode (Note 1)<br>Power−Down Mode ($V_{CC}$ = 0 V) | −0.5 to $V_{CC}$ + 0.5<br>−0.5 to +4.3<br>−0.5 to +4.3 | V |

- **JEDEC 規格に合わせるために静電放電/ラッチアップを調整。**

Existing datasheet

| | | | | |
|---|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage | Human Body Model (Note 2)<br>Machine Model (Note 3) | >1500<br>>100 | V |
| $I_{LATCHUP}$ | Latchup Performance Above $V_{CC}$ and Below GND at 125°C (Note 4) | | ±100 | mA |
| $V_{ESD}$ | ESD Withstand Voltage | Human Body Model (Note 2)<br>Machine Model (Note 3) | >2000<br>>100 | V |
| $I_{LATCHUP}$ | Latch−up Performance above $V_{CC}$ and below GND at 125°C (Note 4) | | ±75 | mA |
| $V_{ESD}$ | ESD Withstand Voltage Human Body Mode (Note 2)<br>Machine Model (Note 3) | | > 3000<br>> 200 | V |
| $I_{LATCHUP}$ | Latchup Performance Above $V_{CC}$ and Below GND at 125°C (Note 4) | | ±100 | mA |
| $V_{ESD}$ | ESD Withstand Voltage | Human Body Model (Note 2)<br>Machine Model (Note 3) | >2000<br>>150 | V |
| $I_{LATCHUP}$ | Latchup Performance | Above $V_{CC}$ and Below GND at 125°C (Note 4) | ±100 | mA |

New

| | | | | |
|---|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage (Note 3) | Human Body Model<br>Charged Device Model | 2000<br>1000 | V |
| $I_{Latchup}$ | Latchup Performance (Note 4) | | ±100 | mA |

- **H レベル出力電圧の 0.9V における規格を削除**
- **L レベル出力電圧の 0.9V における規格を削除**

Existing datasheet

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OH}$ = −20 μA | 0.9 | 0.75 | | 0.75 | | V |
| | | | $I_{OH}$ = -0.3 mA | 1.1 to 1.3 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -1.7 mA | 1.4 to 1.6 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -3.0 mA | 1.65 to 1.95 | Vcc-0.45 | | Vcc-0.45 | | |
| | | | $I_{OH}$ = -4.0 mA | 2.3 to 2.7 | 2.0 | | 2.0 | | |
| | | | $I_{OH}$ = -8.0 mA | 3.0 to 3.6 | 2.48 | | 2.48 | | |
| $V_{OL}$ | Low-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OL}$ = 20 μA | 0.9 | | 0.1 | | 0.1 | V |
| | | | $I_{OL}$ = 0.3 mA | 1.1 to 1.3 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 1.7 mA | 1.4 to 1.6 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 3.0 mA | 1.65 to 1.95 | | 0.45 | | 0.45 | |
| | | | $I_{OL}$ = 4.0 mA | 2.3 to 2.7 | | 0.4 | | 0.4 | |
| | | | $I_{OL}$ = 8.0 mA | 3.0 to 3.6 | | 0.4 | | 0.4 | |

New

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OH}$ = −20 μA | 0.9 | | | | | V |
| | | | $I_{OH}$ = -0.3 mA | 1.1 to 1.3 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -1.7 mA | 1.4 to 1.6 | 0.75x$V_{CC}$ | | 0.75x$V_{CC}$ | | |
| | | | $I_{OH}$ = -3.0 mA | 1.65 to 1.95 | Vcc-0.45 | | Vcc-0.45 | | |
| | | | $I_{OH}$ = -4.0 mA | 2.3 to 2.7 | 2.0 | | 2.0 | | |
| | | | $I_{OH}$ = -8.0 mA | 3.0 to 3.6 | 2.48 | | 2.48 | | |
| $V_{OL}$ | Low-Level Output Voltage | $V_{IN}$ = $V_{IH}$ or $V_{IL}$ | $I_{OL}$ = 20 μA | 0.9 | | | | | V |
| | | | $I_{OL}$ = 0.3 mA | 1.1 to 1.3 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 1.7 mA | 1.4 to 1.6 | | 0.25x$V_{CC}$ | | 0.25x$V_{CC}$ | |
| | | | $I_{OL}$ = 3.0 mA | 1.65 to 1.95 | | 0.45 | | 0.45 | |
| | | | $I_{OL}$ = 4.0 mA | 2.3 to 2.7 | | 0.4 | | 0.4 | |
| | | | $I_{OL}$ = 8.0 mA | 3.0 to 3.6 | | 0.4 | | 0.4 | |

- 入力の正のしきい値電圧、負のしきい値電圧、ヒステリシス電圧の 0.9V における規格を削除。
- 入力の正のしきい値電圧の仕様から下限値を削除。
- 負のしきい値電圧の仕様から上限値を削除。
- ダイプロセスに対応して規格の修正。

**Existing datasheet**

| Symbol | Parameter | Condition | $V_{CC}$ (V) | $T_A$ = 25°C | | | −55°C ≤ $T_A$ ≤ 125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $V_{T+}$ | Positive−Going Input Threshold Voltage | | 0.9 | 0.64 | 0.7 | 0.86 | 0.62 | 0.87 | V |
| | | | 1.1 | 0.73 | 0.81 | 0.95 | 0.71 | 1 | |
| | | | 1.4 | 0.86 | 0.94 | 1.16 | 0.84 | 1.2 | |
| | | | 1.65 | 0.95 | 1.06 | 1.25 | 0.94 | 1.3 | |
| | | | 2.3 | 1.22 | 1.36 | 1.6 | 1.18 | 1.65 | |
| | | | 3.0 | 1.51 | 1.8 | 2.05 | 1.38 | 2.1 | |
| $V_{T-}$ | Negative−Going Input Threshold Voltage | | 0.9 | 0.09 | 0.23 | 0.30 | 0.08 | 0.33 | V |
| | | | 1.1 | 0.15 | 0.33 | 0.39 | 0.12 | 0.43 | |
| | | | 1.4 | 0.3 | 0.47 | 0.54 | 0.25 | 0.55 | |
| | | | 1.65 | 0.35 | 0.6 | 0.65 | 0.3 | 0.65 | |
| | | | 2.3 | 0.55 | 0.85 | 0.88 | 0.5 | 0.88 | |
| | | | 3.0 | 0.95 | 1.13 | 1.16 | 0.9 | 1.16 | |
| $V_H$ | Hysteresis Voltage | | 0.9 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | V |
| | | | 1.1 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 1.4 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 1.65 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 2.3 | 0.15 | 0.5 | 0.75 | 0.2 | 0.8 | |
| | | | 3.0 | 0.25 | 0.65 | 0.85 | 0.3 | 0.9 | |

**New**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$ = 25 °C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $V_{T+}$ | Positive Input Threshold Voltage | | 0.9 | - | 0.7 | - | - | - | V |
| | | | 1.1 to 1.3 | - | 0.81 | 0.95 | - | 0.95 | |
| | | | 1.4 to 1.6 | - | 0.94 | 1.16 | - | 1.16 | |
| | | | 1.65 – 1.95 | - | 1.06 | 1.3 | - | 1.3 | |
| | | | 2.3 to < 2.7 | - | 1.36 | 1.73 | - | 1.73 | |
| | | | 2.7 to 3.6 | - | 1.8 | 2.24 | - | 2.24 | |
| $V_{T-}$ | Negative Input Threshold Voltage | | 0.9 | - | 0.23 | - | - | - | V |
| | | | 1.1 to 1.3 | 0.15 | 0.33 | - | 0.15 | - | |
| | | | 1.4 to 1.6 | 0.3 | 0.47 | - | 0.3 | - | |
| | | | 1.65 – 1.95 | 0.35 | 0.6 | - | 0.35 | - | |
| | | | 2.3 to < 2.7 | 0.55 | 0.85 | - | 0.55 | - | |
| | | | 2.7 to 3.6 | 0.95 | 1.13 | - | 0.95 | - | |
| $V_H$ | Low-Level Input Voltage | | 0.9 | - | 0.27 | - | - | - | V |
| | | | 1.1 to 1.3 | 0.2 | 0.35 | 0.8 | 0.2 | 0.8 | |
| | | | 1.4 to 1.6 | 0.25 | 0.41 | 0.86 | 0.25 | 0.86 | |
| | | | 1.65 – 1.95 | 0.30 | 0.46 | 0.9 | 0.30 | 0.9 | |
| | | | 2.3 to < 2.7 | 0.40 | 0.56 | 1.05 | 0.40 | 1.05 | |
| | | | 2.7 to 3.6 | 0.49 | 0.59 | 1.1 | 0.49 | 1.1 | |

- 電源オフリーク電流仕様を追加。
- 電源オフリーク電流仕様とのクロスオーバーを除去するために入力リーク電流仕様を調整。

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $I_{OFF}$ | Power Off Leakage Current | $V_{IN}$ = 3.6 V or $V_{OUT}$ = 3.6 V | 0 | - | - | 1.0 | - | 5.0 | μA |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $I_{IN}$ | Input Leakage Current | 0 ≤ $V_{IN}$ ≤ 3.6 V | 0 to 3.6 | | ±0.1 | | ±1.0 | μA |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $I_{IN}$ | Input Leakage Current | 0 ≤ $V_{IN}$ ≤ 3.6 V | 0.9 to 3.6 | | ±0.1 | | ±1.0 | μA |

- 伝播遅延仕様の 0.9V における規格を削除。
- すべての伝播遅延仕様から下限値を削除。

**Existing datasheet**

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25° C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A or B to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | - | 12.2 | 14.4 | - | 18.0 | ns |
| | | | 1.1 to 1.3 | - | 8.8 | 12.4 | - | 16.2 | |
| | | | 1.4 to 1.6 | - | 5.0 | 8.5 | - | 10.0 | |
| | | | 1.65 to 1.95 | - | 3.6 | 6.2 | - | 6.7 | |
| | | | 2.3 to 2.7 | - | 2.7 | 3.9 | - | 4.4 | |
| | | | 3.0 to 3.6 | - | 2.1 | 3.1 | - | 3.7 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | - | 13.0 | 16.0 | - | 18.0 | ns |
| | | | 1.1 to 1.3 | - | 7.8 | 12.0 | - | 16.0 | |
| | | | 1.4 to 1.6 | - | 5.9 | 9.3 | - | 11.2 | |
| | | | 1.65 to 1.95 | - | 4.5 | 6.9 | - | 7.1 | |
| | | | 2.3 to 2.7 | - | 3.0 | 4.4 | - | 5.0 | |
| | | | 3.0 to 3.6 | - | 2.4 | 3.4 | - | 3.9 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | - | 14.0 | 17.2 | - | 20.0 | ns |
| | | | 1.1 to 1.3 | - | 11.0 | 14.1 | - | 17.8 | |
| | | | 1.4 to 1.6 | - | 8.0 | 12.1 | - | 15.9 | |
| | | | 1.65 to 1.95 | - | 6.0 | 9.2 | - | 9.6 | |
| | | | 2.3 to 2.7 | - | 3.9 | 5.7 | - | 6.1 | |
| | | | 3.0 to 3.6 | - | 3.0 | 4.4 | - | 4.8 | |

**New**

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25° C | | | $T_A$ = -55°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | |
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A or B to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | - | 12.2 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 8.8 | 12.4 | - | 16.2 | |
| | | | 1.4 to 1.6 | - | 5.0 | 8.5 | - | 10.0 | |
| | | | 1.65 to 1.95 | - | 3.6 | 6.2 | - | 6.7 | |
| | | | 2.3 to 2.7 | - | 2.7 | 3.9 | - | 4.4 | |
| | | | 3.0 to 3.6 | - | 2.1 | 3.1 | - | 3.7 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | - | 13.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 7.8 | 12.0 | - | 16.0 | |
| | | | 1.4 to 1.6 | - | 5.9 | 9.3 | - | 11.2 | |
| | | | 1.65 to 1.95 | - | 4.5 | 6.9 | - | 7.1 | |
| | | | 2.3 to 2.7 | - | 3.0 | 4.4 | - | 5.0 | |
| | | | 3.0 to 3.6 | - | 2.4 | 3.4 | - | 3.9 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | - | 14.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 11.0 | 14.1 | - | 17.8 | |
| | | | 1.4 to 1.6 | - | 8.0 | 12.1 | - | 15.9 | |
| | | | 1.65 to 1.95 | - | 6.0 | 9.2 | - | 9.6 | |
| | | | 2.3 to 2.7 | - | 3.9 | 5.7 | - | 6.1 | |
| | | | 3.0 to 3.6 | - | 3.0 | 4.4 | - | 4.8 | |

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25 °C Min | Typ | Max | $T_A$ = −55°C to +125°C Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | – | 27.3 | – | – | – | ns |
| | | | 1.1 to 1.3 | – | 13.0 | 22.6 | 1.0 | 35.9 | |
| | | | 1.4 to 1.6 | – | 7.5 | 10.5 | 1.0 | 11.3 | |
| | | | 1.65 to 1.95 | – | 6.0 | 7.8 | 1.0 | 8.2 | |
| | | | 2.3 to 2.7 | – | 4.3 | 5.4 | 1.0 | 5.8 | |
| | | | 3.0 to 3.6 | – | 3.5 | 4.4 | 1.0 | 4.6 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | – | 29.5 | – | – | – | ns |
| | | | 1.1 to 1.3 | – | 14.3 | 25.1 | 1.0 | 41.8 | |
| | | | 1.4 to 1.6 | – | 8.0 | 11.5 | 1.0 | 12.6 | |
| | | | 1.65 to 1.95 | – | 6.3 | 8.4 | 1.0 | 8.7 | |
| | | | 2.3 to 2.7 | – | 4.6 | 5.7 | 1.0 | 6.1 | |
| | | | 3.0 to 3.6 | – | 3.7 | 4.6 | 1.0 | 5.0 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | – | 40.5 | – | – | – | ns |
| | | | 1.1 to 1.3 | – | 19.6 | 35.7 | 1.0 | 58.1 | |
| | | | 1.4 to 1.6 | – | 10.7 | 15.8 | 1.0 | 17.6 | |
| | | | 1.65 to 1.95 | – | 7.8 | 10.7 | 1.0 | 11.7 | |
| | | | 2.3 to 2.7 | – | 5.4 | 6.9 | 1.0 | 8.1 | |
| | | | 3.0 to 3.6 | – | 4.3 | 5.2 | 1.0 | 6.1 | |

| Symbol | Parameter | Test Condition | $V_{CC}$ (V) | $T_A$ = 25° C Min | Typ | Max | $T_A$ = -55°C to +125°C Min | Max | Unit |
|---|---|---|---|---|---|---|---|---|---|
| $t_{PLH}$, $t_{PHL}$ | Propagation Delay, A or B to Y | $C_L$ = 10 pF, $R_L$ = 1 MΩ | 0.9 | - | 12.2 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 8.8 | 12.4 | - | 16.2 | |
| | | | 1.4 to 1.6 | - | 5.0 | 8.5 | - | 10.0 | |
| | | | 1.65 to 1.95 | - | 3.6 | 6.2 | - | 6.7 | |
| | | | 2.3 to 2.7 | - | 2.7 | 3.9 | - | 4.4 | |
| | | | 3.0 to 3.6 | - | 2.1 | 3.1 | - | 3.7 | |
| | | $C_L$ = 15 pF, $R_L$ = 1 MΩ | 0.9 | - | 13.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 7.8 | 12.0 | - | 16.0 | |
| | | | 1.4 to 1.6 | - | 5.9 | 9.3 | - | 11.2 | |
| | | | 1.65 to 1.95 | - | 4.5 | 6.9 | - | 7.1 | |
| | | | 2.3 to 2.7 | - | 3.0 | 4.4 | - | 5.0 | |
| | | | 3.0 to 3.6 | - | 2.4 | 3.4 | - | 3.9 | |
| | | $C_L$ = 30 pF, $R_L$ = 1 MΩ | 0.9 | - | 14.0 | - | - | - | ns |
| | | | 1.1 to 1.3 | - | 11.0 | 14.1 | - | 17.8 | |
| | | | 1.4 to 1.6 | - | 8.0 | 12.1 | - | 15.9 | |
| | | | 1.65 to 1.95 | - | 6.0 | 9.2 | - | 9.6 | |
| | | | 2.3 to 2.7 | - | 3.9 | 5.7 | - | 6.1 | |
| | | | 3.0 to 3.6 | - | 3.0 | 4.4 | - | 4.8 | |

# NL17SV

- **新規のダイを示すために最大定格電圧を 4.6V から 4.3V に変更(車載品番を除く)**
- **熱抵抗と消費電力を更新。**
- **JEDEC 規格を反映するために静電放電を更新。**

**Existing datasheet**

MAXIMUM RATINGS

| Symbol | Rating | Value | Units |
|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | −0.5 to +4.6 | V |
| $V_I$ | DC Input Voltage | −0.5 to +4.6 | V |
| $V_O$ | DC Output Voltage | −0.5 to $V_{CC}$ + 0.5 | V |

| | | | |
|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance (Note 1) | 250 | °C/W |
| $P_D$ | Power Dissipation in Still Air at 85°C | 250 | mW |

| | | | |
|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage<br>Human Body Model (Note 2)<br>Machine Model (Note 3) | 3000<br>200 | V |
| $V_{ESD}$ | ESD Withstand Voltage<br>Human Body Model (Note 2)<br>Machine Model (Note 3) | 2000<br>300 | V |
| $V_{ESD}$ | ESD Withstand Voltage<br>Human Body Model (Note 2)<br>Machine Model (Note 3) | 4000<br>200 | V |

**New**

MAXIMUM RATINGS

| Symbol | Characteristics | | Value | Unit |
|---|---|---|---|---|
| $V_{CC}$ | DC Supply Voltage | | −0.5 to +4.3 | V |
| $V_{IN}$ | DC Input Voltage | | −0.5 to +4.3 | V |
| $V_{OUT}$ | DC Output Voltage | Active−Mode (High or Low State)<br>Tri−State Mode (Note 1)<br>Power−Down Mode ($V_{CC}$ = 0 V) | −0.5 to $V_{CC}$ + 0.5<br>−0.5 to +4.3<br>−0.5 to +4.3 | V |

| | | | | |
|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance (Note 2) | SC−88A<br>SC−74A<br>SOT−553<br>SOT−953<br>UDFN6 | 659<br>555<br>562<br>560<br>382 | °C/W |
| $P_D$ | Power Dissipation in Still Air | SC−88A<br>SC−74A<br>SOT−553<br>SOT−953<br>UDFN6 | 190<br>225<br>222<br>223<br>327 | mW |

| | | | | |
|---|---|---|---|---|
| $V_{ESD}$ | ESD Withstand Voltage (Note 3) | Human Body Model<br>Charged Device Model | 2000<br>1000 | V |
| $I_{Latchup}$ | Latchup Performance (Note 4) | | ±100 | mA |

- **H レベル入力電圧と L レベル入力電圧の 0.9V における規格を調整。**

Existing datasheet

**DC CHARACTERISTICS – Digital Section** (Voltages Referenced to GND)

| Symbol | Parameter | Condition | $V_{CC}$ | $T_A$ = 25°C Min | $T_A$ = 25°C Max | $T_A$ = −40 to 85°C Min | $T_A$ = −40 to 85°C Max | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High Level Input Voltage | | 0.90 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.6 | | 1.6 | | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.0 | | 2.0 | | |
| $V_{IL}$ | Low Level Input Voltage | | 0.90 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.7 | | 0.7 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | | 0.8 | |

New

**DC ELECTRICAL CHARACTERISTICS**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$ = 25°C Min | $T_A$ = 25°C Max | $T_A$ = -55°C to +125°C Min | $T_A$ = -55°C to +125°C Max | Unit |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | High-Level Input Voltage | | 0.9 | $V_{CC}$ | | $V_{CC}$ | | V |
| | | | 1.1 to 1.3 | 0.7x$V_{CC}$ | | 0.7x$V_{CC}$ | | |
| | | | 1.4 to 1.6 | 0.65x$V_{CC}$ | | 0.65x$V_{CC}$ | | |
| | | | 1.65 to 1.95 | 0.65x$V_{CC}$ | | 0.65x$V_{CC}$ | | |
| | | | 2.3 to 2.7 | 1.6 | | 1.6 | | |
| | | | 3.0 to 3.6 | 2.0 | | 2.0 | | |
| $V_{IL}$ | Low-Level Input Voltage | | 0.9 | | GND | | GND | V |
| | | | 1.1 to 1.3 | | 0.3x$V_{CC}$ | | 0.3x$V_{CC}$ | |
| | | | 1.4 to 1.6 | | 0.35x$V_{CC}$ | | 0.35x$V_{CC}$ | |
| | | | 1.65 to 1.95 | | 0.35x$V_{CC}$ | | 0.35x$V_{CC}$ | |
| | | | 2.3 to 2.7 | | 0.7 | | 0.7 | |
| | | | 3.0 to 3.6 | | 0.8 | | 0.8 | |

- **H レベル出力電圧と L レベル出力電圧の 0.9V における規格を削除。**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High Level Output Voltage | $I_{OH}$ = −100 µA | 0.90 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | |
| | | $I_{OH}$ = −2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 2.0 | | 2.0 | | |
| | | $I_{OH}$ = −12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.8 | | 1.8 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| | | $I_{OH}$ = −18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.7 | | 1.7 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | |
| | | $I_{OH}$ = −24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| $V_{OL}$ | Low Level Output Voltage | $I_{OL}$ = 100 µA | 0.90 | | 0.1 | | 0.1 | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.2 | | 0.2 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | |
| | | $I_{OL}$ = 2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | |
| | | $I_{OL}$ = 12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.4 | | 0.4 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.6 | | 0.6 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | High Level Output Voltage | $I_{OH}$ = −100 µA | 0.90 | | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | |
| | | $I_{OH}$ = −2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | $I_{OH}$ = −6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 2.0 | | 2.0 | | |
| | | $I_{OH}$ = −12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.8 | | 1.8 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| | | $I_{OH}$ = −18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.7 | | 1.7 | | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | |
| | | $I_{OH}$ = −24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | |
| $V_{OL}$ | Low Level Output Voltage | $I_{OL}$ = 100 µA | 0.90 | | 0.1 | | 0.1 | V |
| | | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.2 | | 0.2 | |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | |
| | | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.2 | | 0.2 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | |
| | | $I_{OL}$ = 2.0 mA | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 4.0 mA | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | $I_{OL}$ = 6.0 mA | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | |
| | | $I_{OL}$ = 12 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.4 | | 0.4 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 18 mA | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.6 | | 0.6 | |
| | | | 2.70 < $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | |
| | | $I_{OL}$ = 24 mA | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | |

- **すべての伝播遅延仕様から下限値を削除。**

Existing datasheet

**AC CHARACTERISTICS** (Input $t_r = t_f$ = 3.0 nS)

| Symbol | Parameter | −40°C Condition | −40°C $V_{CC}$ | 25°C Min | 25°C Typ | 25°C Max | 85°C Min | 85°C Max | Units |
|---|---|---|---|---|---|---|---|---|---|
| $T_{PHL}$, $T_{PLH}$ | Propagation Delay | $C_L$ = 15 pF, $R_L$ = 1.0 MΩ | 0.90 | | 13 | | | | nS |
| | | $C_L$ = 15 pF, $R_L$ = 2.0 kΩ | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 3.0 | 6.0 | 15.8 | 1.0 | 18.6 | nS |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.0 | 3.2 | 8.7 | 1.0 | 9.7 | |
| | | $C_L$ = 30 pF, $R_L$ = 500 Ω | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 2.0 | 6.0 | 1.0 | 6.8 | nS |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 0.8 | 1.2 | 4.1 | 0.7 | 4.7 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.7 | 1.0 | 3.3 | 0.6 | 4.0 | |

New

**AC CHARACTERISTICS** (Input $t_r = t_f$ = 3.0 nS)

| Symbol | Parameter | −40°C Condition | −40°C $V_{CC}$ | 25°C Min | 25°C Typ | 25°C Max | 85°C Min | 85°C Max | Units |
|---|---|---|---|---|---|---|---|---|---|
| $T_{PHL}$, $T_{PLH}$ | Propagation Delay | $C_L$ = 15 pF, $R_L$ = 1.0 MΩ | 0.90 | | 13 | | | | nS |
| | | $C_L$ = 15 pF, $R_L$ = 2.0 kΩ | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 15.8 | | 18.6 | nS |
| | | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.2 | 8.7 | | 9.7 | |
| | | $C_L$ = 30 pF, $R_L$ = 500 Ω | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | | 6.8 | nS |
| | | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.2 | 4.1 | | 4.7 | |
| | | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.3 | | 4.0 | |

# NC7SP

- 新規プロセスに合わせて絶対最大電圧を調整。

Existing datasheet

**Absolute Maximum Ratings**(Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.6V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.6V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.6V |

New

**Absolute Maximum Ratings**(Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.3V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.3V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.3V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.6 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.6 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.6 | V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.3 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.3 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.3 | V |

- 新規のダイを反映するために消費電力を調整。
- 新規のダイを反映するために熱抵抗を調整。

Existing datasheet

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation at +85°C | SC70-5 | | 150 | mW |
| | | MicroPak™-6 | | 130 | |
| | | MicroPak2™-6 | | 120 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC70-5 | | 425 | | °C/W |
| | | MicroPak™-6 | | 500 | | |
| | | MicroPak2™-6 | | 560 | | |

New

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation In Still Air | SC-74A | | 225 | mW |
| | | SC70-5 | | 190 | |
| | | MicroPak™-6 | | 327 | |
| | | MicroPak2™-6 | | 327 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC-74A | | 555 | | °C/W |
| | | SC70-5 | | 659 | | |
| | | MicroPak™-6 | | 382 | | |
| | | MicroPak2™-6 | | 382 | | |

- **H レベル入力電圧と L レベル入力電圧の仕様から 0.9V における規格を削除。**
- **H レベル出力電圧と L レベル出力電圧の仕様から 0.9V における規格を削除。**

## Existing datasheet

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 2.1 | | 2.1 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.9 | | 0.9 | |
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-20µA | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-0.5mA | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-1mA | 1.07 | | 0.99 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-1.5mA | 1.24 | | 1.22 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-2.1mA | 1.95 | | 1.87 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-2.6mA | 2.61 | | 2.55 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=20µA | | 0.1 | | 0.1 | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.1 | | 0.1 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.1 | | 0.1 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.1 | | 0.1 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.1 | | 0.1 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=0.5mA | | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=1mA | | 0.31 | | 0.37 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=1.5mA | | 0.31 | | 0.35 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=2.1mA | | 0.31 | | 0.33 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=2.6mA | | 0.31 | | 0.33 | |

## New

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | Vcc | | Vcc | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 2.1 | | 2.1 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | GND | | GND | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.9 | | 0.9 | |
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-20µA | | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$ - 0.1 | | $V_{CC}$ - 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-0.5mA | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-1mA | 1.07 | | 0.99 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-1.5mA | 1.24 | | 1.22 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-2.1mA | 1.95 | | 1.87 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-2.6mA | 2.61 | | 2.55 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=20µA | | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.1 | | 0.1 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.1 | | 0.1 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.1 | | 0.1 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 0.1 | | 0.1 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=0.5mA | | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=1mA | | 0.31 | | 0.37 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=1.5mA | | 0.31 | | 0.35 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=2.1mA | | 0.31 | | 0.33 | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=2.6mA | | 0.31 | | 0.33 | |

## Existing datasheet

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | $T_A$ = −40°C to +85°C | | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.6 | | 1.6 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 2.1 | | 2.1 | | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.7 | | 0.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.9 | | 0.9 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | 0.1 | | 0.1 | V | $I_{OL}$ = 20 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.1 | | 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.1 | | 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.1 | | 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.1 | | 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | | | $I_{OL}$ = 0.5 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.31 | | 0.37 | | | $I_{OL}$ = 1 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.31 | | 0.35 | | | $I_{OL}$ = 1.5 mA |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 0.31 | | 0.33 | | | $I_{OL}$ = 2.1 mA |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 0.31 | | 0.33 | | | $I_{OL}$ = 2.6 mA |

## New

**DC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | $T_A$ = −40°C to +85°C | | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | Min | Max | | |
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | Vcc | | Vcc | | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.65 x $V_{CC}$ | | 0.65 x $V_{CC}$ | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.6 | | 1.6 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 2.1 | | 2.1 | | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | GND | | GND | V | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.35 x $V_{CC}$ | | 0.35 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.7 | | 0.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.9 | | 0.9 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | | | | V | $I_{OL}$ = 20 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.1 | | 0.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.1 | | 0.1 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.1 | | 0.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.1 | | 0.1 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.30 x $V_{CC}$ | | 0.30 x $V_{CC}$ | | | $I_{OL}$ = 0.5 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.31 | | 0.37 | | | $I_{OL}$ = 1 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.31 | | 0.35 | | | $I_{OL}$ = 1.5 mA |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 0.31 | | 0.33 | | | $I_{OL}$ = 2.1 mA |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 0.31 | | 0.33 | | | $I_{OL}$ = 2.6 mA |

- 正のしきい値電圧から下限値と 0.90V における規格を削除。
- 負のしきい値電圧から上限値と 0.90V における規格を削除。
- ヒステリシス電圧の 0.90V における規格を削除。

**DC Electrical Characteristics**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$=+25°C Min. | $T_A$=+25°C Max. | $T_A$=−40°C to +85°C Min. | $T_A$=−40°C to +85°C Max. | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{P}$ | Positive Threshold Voltage | | 0.90 | 0.30 | 0.60 | 0.30 | 0.60 | V |
| | | | 1.10 | 0.40 | 1.00 | 0.40 | 1.00 | |
| | | | 1.40 | 0.50 | 1.20 | 0.50 | 1.20 | |
| | | | 1.65 | 0.70 | 1.50 | 0.70 | 1.50 | |
| | | | 2.30 | 1.00 | 1.90 | 1.00 | 1.90 | |
| | | | 3.00 | 1.50 | 2.60 | 1.50 | 2.60 | |
| $V_{N}$ | Negative Threshold Voltage | | 0.90 | 0.10 | 0.60 | 0.10 | 0.60 | V |
| | | | 1.10 | 0.15 | 0.70 | 0.15 | 0.70 | |
| | | | 1.40 | 0.20 | 0.80 | 0.20 | 0.80 | |
| | | | 1.65 | 0.25 | 0.90 | 0.25 | 0.90 | |
| | | | 2.30 | 0.40 | 1.15 | 0.40 | 1.15 | |
| | | | 3.00 | 0.6 | 1.50 | 0.60 | 1.50 | |
| $V_{H}$ | Hysteresis Voltage | | 0.90 | 0.07 | 0.50 | 0.07 | 0.50 | V |
| | | | 1.10 | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | | 1.40 | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | | 1.65 | 0.10 | 1.00 | 0.10 | 1.00 | |
| | | | 2.30 | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | | 3.00 | 0.60 | 1.80 | 0.60 | 1.80 | |

**DC Electrical Characteristics**

| Symbol | Parameter | Conditions | $V_{CC}$ (V) | $T_A$=+25°C Min. | $T_A$=+25°C Max. | $T_A$=−40°C to +85°C Min. | $T_A$=−40°C to +85°C Max. | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{P}$ | Positive Threshold Voltage | | 0.90 | | | | | V |
| | | | 1.10 | | 1.00 | | 1.00 | |
| | | | 1.40 | | 1.20 | | 1.20 | |
| | | | 1.65 | | 1.50 | | 1.50 | |
| | | | 2.30 | | 1.90 | | 1.90 | |
| | | | 3.00 | | 2.60 | | 2.60 | |
| $V_{N}$ | Negative Threshold Voltage | | 0.90 | | | | | V |
| | | | 1.10 | 0.15 | | 0.15 | | |
| | | | 1.40 | 0.20 | | 0.20 | | |
| | | | 1.65 | 0.25 | | 0.25 | | |
| | | | 2.30 | 0.40 | | 0.40 | | |
| | | | 3.00 | 0.6 | | 0.60 | | |
| $V_{H}$ | Hysteresis Voltage | | 0.90 | | | | | V |
| | | | 1.10 | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | | 1.40 | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | | 1.65 | 0.10 | 1.00 | 0.10 | 1.00 | |
| | | | 2.30 | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | | 3.00 | 0.60 | 1.80 | 0.60 | 1.80 | |

- すべての伝播遅延と出力イネーブル時間と出力デセイブル時間の仕様から下限値を削除。

**Existing datasheet**

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | Typ | Max | $T_A$ = −40°C to +85°C Min | Max | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | | 24 | | | | ns | $C_L$ = 10 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 4.0 | 9 | 18.7 | 3.5 | 30.9 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 2.0 | 6 | 12.4 | 1.5 | 13.9 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.5 | 5 | 9.6 | 1.0 | 12.1 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.0 | 4 | 9.0 | 0.8 | 10.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 1.0 | 3 | 8.7 | 0.5 | 9.0 | | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | | 27 | | | | ns | $C_L$ = 15 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 5.0 | 10 | 20.2 | 4.5 | 33.9 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 3.0 | 7 | 13.3 | 2.5 | 16.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 2.0 | 5 | 10.3 | 2.0 | 12.6 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.5 | 4 | 9.4 | 1.0 | 10.2 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 1.0 | 3 | 9.1 | 0.5 | 9.7 | | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | | 34 | | | | ns | $C_L$ = 30 pF, $R_U$ = 5000 Ω, $R_D$ = 5000 Ω | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 6.0 | 12 | 24.0 | 5.0 | 43.0 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 4.0 | 8 | 16.0 | 3.0 | 18.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 2.0 | 6 | 12.0 | 2.0 | 14.0 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | 1.0 | 5 | 11.0 | 1.0 | 12.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | 0.8 | 4 | 10.0 | 0.5 | 11.0 | | | |

**New**

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | Typ | Max | $T_A$ = −40°C to +85°C Min | Max | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | | 24 | | | | ns | $C_L$ = 10 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 9 | 18.7 | | 30.9 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 6 | 12.4 | | 13.9 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 5 | 9.6 | | 12.1 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 4 | 9.0 | | 10.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 3 | 8.7 | | 9.0 | | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | | 27 | | | | ns | $C_L$ = 15 pF, $R_U$ = 5000Ω, $R_D$ = 5000Ω | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 10 | 20.2 | | 33.9 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 7 | 13.3 | | 16.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 5 | 10.3 | | 12.6 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 4 | 9.4 | | 10.2 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 3 | 9.1 | | 9.7 | | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | | 34 | | | | ns | $C_L$ = 30 pF, $R_U$ = 5000 Ω, $R_D$ = 5000 Ω | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 12 | 24.0 | | 43.0 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 8 | 16.0 | | 18.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 6 | 12.0 | | 14.0 | | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 5 | 11.0 | | 12.0 | | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 4 | 10.0 | | 11.0 | | | |

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | Typ. | $T_A$=-40 to +85°C Min. | Typ. | Min. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.5 | 12.0 | 23.4 | 5.0 | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 13.8 | 3.0 | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 10.6 | 2.0 | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 7.6 | 1.0 | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 6.4 | 0.5 | 8.9 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω, $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.4 | 5.0 | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 14.5 | 3.0 | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 11.7 | 2.0 | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 9.1 | 1.0 | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 8.1 | 0.5 | 10.1 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω, $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.8 | 5.0 | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 17.1 | 3.0 | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 16.5 | 2.0 | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 15.2 | 1.0 | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 14.8 | 0.5 | 16.3 | | |

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | Typ. | Max. | $T_A$=-40 to +85°C Min. | Max. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 12.0 | 23.4 | | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 13.8 | | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 10.6 | | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 7.6 | | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 6.4 | | 8.9 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω, $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 24.4 | | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 14.5 | | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 11.7 | | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 9.1 | | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 8.1 | | 10.1 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω, $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 24.8 | | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 17.1 | | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 16.5 | | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 15.2 | | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 14.8 | | 16.3 | | |

- **NC7SP125 および NC7SP126 で一部の伝播遅延と出力イネーブル時間と出力デセイブル時間の上限値を調整。**
- **すべての伝播遅延と出力イネーブル時間と出力デセイブル時間から下限値を削除。**

## Existing datasheet

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | $T_A$=+25°C Typ. | $T_A$=+25°C Max. | $T_A$=-40 to +85°C Min. | $T_A$=-40 to +85°C Max. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=10pF, $R_L$=1MΩ | | 26 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 4.0 | 10.0 | 19.1 | 3.5 | 39.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 2.0 | 6.0 | 11.2 | 1.5 | 14.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 1.5 | 5.0 | 8.6 | 1.0 | 11.6 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 4.0 | 6.3 | 0.8 | 8.2 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 5.3 | 0.5 | 7.2 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 29 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 4.0 | 8.0 | 17.5 | 3.5 | 40.4 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 2.0 | 6.0 | 11.9 | 1.5 | 14.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 1.5 | 5.0 | 9.7 | 1.0 | 12.3 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 4.0 | 7.7 | 0.8 | 10.5 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 6.9 | 0.5 | 8.6 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 4.0 | 8.0 | 20.5 | 3.5 | 42.0 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 2.0 | 6.0 | 15.3 | 1.5 | 18.0 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 1.5 | 5.0 | 14.7 | 1.0 | 17.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 4.0 | 13.7 | 0.8 | 15.0 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 13.5 | 0.5 | 14.8 | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_L$=1MΩ | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 10.0 | 20.5 | 4.5 | 42.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 7.0 | 11.8 | 2.5 | 15.4 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.0 | 9.1 | 2.0 | 12.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.5 | 4.0 | 6.6 | 1.0 | 8.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 5.6 | 0.5 | 7.5 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 31 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 11.0 | 18.2 | 4.5 | 43.3 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 7.0 | 12.5 | 2.5 | 15.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.0 | 10.2 | 2.0 | 12.9 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.5 | 4.0 | 8.0 | 1.0 | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 7.2 | 0.5 | 8.9 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 30 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 11.0 | 21.6 | 4.5 | 44.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 7.0 | 15.9 | 2.5 | 18.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.0 | 15.2 | 2.0 | 18.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.5 | 4.0 | 14.1 | 1.0 | 15.4 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.0 | 13.9 | 0.5 | 15.1 | | |

Continued on following page...

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | $T_A$=+25°C Typ. | $T_A$=+25°C Max. | $T_A$=-40 to +85°C Typ. | $T_A$=-40 to +85°C Min. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.5 | 12.0 | 23.4 | 5.0 | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 13.8 | 3.0 | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 10.6 | 2.0 | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 7.6 | 1.0 | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 6.4 | 0.5 | 8.9 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.4 | 5.0 | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 14.5 | 3.0 | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 11.7 | 2.0 | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 9.1 | 1.0 | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 8.1 | 0.5 | 10.1 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 13.0 | 24.8 | 5.0 | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 8.0 | 17.1 | 3.0 | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 6.0 | 16.5 | 2.0 | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.0 | 5.0 | 15.2 | 1.0 | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | 0.8 | 4.0 | 14.8 | 0.5 | 16.3 | | |

## New

**AC Electrical Characteristics**

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | $T_A$=+25°C Typ. | $T_A$=+25°C Max. | $T_A$=-40 to +85°C Min. | $T_A$=-40 to +85°C Max. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=10pF, $R_L$=1MΩ | | 26 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 10.0 | 26 | | 39.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 6.0 | 11.2 | | 14.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 8.6 | | 11.6 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 6.3 | | 8.2 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 5.3 | | 7.2 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 29 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 8.0 | 26 | | 40.4 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 6.0 | 11.9 | | 14.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 9.7 | | 12.3 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 7.7 | | 10.5 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 6.9 | | 8.6 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=10pF, $R_U$=5000Ω $R_D$=5000Ω | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 8.0 | 20.5 | | 42.0 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 6.0 | 15.3 | | 18.0 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 14.7 | | 17.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 13.7 | | 15.0 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 13.5 | | 14.8 | | |
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_L$=1MΩ | | 28 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 10.0 | 27 | | 42.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 7.0 | 11.8 | | 15.4 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 9.1 | | 12.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 6.6 | | 8.6 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 5.6 | | 7.5 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 31 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 11.0 | 27 | | 43.3 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 7.0 | 12.5 | | 15.5 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 10.2 | | 12.9 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 8.0 | | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 7.2 | | 8.9 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=15pF, $R_U$=5000Ω $R_D$=5000Ω | | 30 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 11.0 | 21.6 | | 44.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 7.0 | 15.9 | | 18.8 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 5.0 | 15.2 | | 18.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 4.0 | 14.1 | | 15.4 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 3.0 | 13.9 | | 15.1 | | |

Continued on following page...

**AC Electrical Characteristics** (Continued)

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=+25°C Min. | $T_A$=+25°C Typ. | $T_A$=+25°C Min. | $T_A$=-40 to +85°C Typ. | $T_A$=-40 to +85°C Min. | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| $t_{PHL}$, $t_{PLH}$ | Propagation Delay | 0.90 | $C_L$=30pF, $R_L$=1MΩ | | 34 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 12.0 | 30 | | 51.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 13.8 | | 17.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 10.6 | | 14.0 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 7.6 | | 9.9 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 6.4 | | 8.9 | | |
| $t_{PZL}$, $t_{PZH}$ | Output Enable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 37 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 30 | | 51.9 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 14.5 | | 17.9 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 11.7 | | 14.7 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 9.1 | | 11.1 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 8.1 | | 10.1 | | |
| $t_{PHZ}$, $t_{PLZ}$ | Output Disable Time | 0.90 | $C_L$=30pF, $R_U$=5000Ω $R_D$=5000Ω | | 36 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 13.0 | 24.8 | | 53.5 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 8.0 | 17.1 | | 21.1 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 6.0 | 16.5 | | 20.5 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 5.0 | 18.5 | | 16.7 | | |
| | | 3.00 ≤ $V_{CC}$ ≤ 3.60 | | | 4.0 | 14.8 | | 16.3 | | |

# NC7SV

- 新規プロセスに合わせて絶対最大電圧を調整。

Existing datasheet

**Absolute Maximum Ratings**(Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.6V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.6V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.6V |

New

**Absolute Maximum Ratings**(Note 1)

| | |
|---|---|
| Supply Voltage ($V_{CC}$) | −0.5V to +4.3V |
| DC Input Voltage ($V_{IN}$) | −0.5V to +4.3V |
| DC Output Voltage ($V_{OUT}$) | |
| HIGH or LOW State (Note 2) | −0.5V to $V_{CC}$ +0.5V |
| $V_{CC}$ = 0V | −0.5V to 4.3V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.6 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.6 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.6 | V |

| Symbol | Parameter | | Min. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | | -0.5 | 4.3 | V |
| $V_{IN}$ | DC Input Voltage | | -0.5 | 4.3 | V |
| $V_{OUT}$ | DC Output Voltage | HIGH or LOW State[4] | -0.5 | $V_{CC}$ to +0.5 | V |
| | | $V_{CC}$=0V | -0.5 | 4.3 | V |

- 新規のダイを反映するために消費電力を調整。
- 新規のダイを反映するために熱抵抗を調整。

Existing datasheet

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation at +85°C | SC70-5 | | 150 | mW |
| | | MicroPak™-6 | | 130 | |
| | | MicroPak2™-6 | | 120 | |

| | | | | | |
|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC70-5 | | 425 | °C/W |
| | | MicroPak™-6 | | 500 | |
| | | MicroPak2™-6 | | 560 | |

New

| | | | | | |
|---|---|---|---|---|---|
| $P_D$ | Power Dissipation In Still Air | SC-74A | | 225 | mW |
| | | SC70-5 | | 190 | |
| | | MicroPak™-6 | | 327 | |
| | | MicroPak2™-6 | | 327 | |

| | | | | | |
|---|---|---|---|---|---|
| $\theta_{JA}$ | Thermal Resistance | SC-74A | | 555 | °C/W |
| | | SC70-5 | | 659 | |
| | | MicroPak™-6 | | 382 | |
| | | MicroPak2™-6 | | 382 | |

- **H レベル入力電圧と L レベル入力電圧の仕様で 0.9V における規格を調整。**
- **H レベル出力電圧と L レベル出力電圧の仕様から 0.9V における規格を削除。**

## Existing datasheet

DC Electrical Characteristics

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C Min. | $T_A$=25°C Max. | $T_A$=-40 to 85°C Min. | $T_A$=-40 to 85°C Max. | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.0 | | 2.0 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.8 | | 0.8 | |

## New

DC Electrical Characteristics

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C Min. | $T_A$=25°C Max. | $T_A$=-40 to 85°C Min. | $T_A$=-40 to 85°C Max. | Units |
|---|---|---|---|---|---|---|---|---|
| $V_{IH}$ | HIGH Level Input Voltage | 0.90 | | $V_{CC}$ | | $V_{CC}$ | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | .65 x $V_{CC}$ | | .65 x $V_{CC}$ | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 1.6 | | 1.6 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.0 | | 2.0 | | |
| $V_{IL}$ | LOW Level Input Voltage | 0.90 | | | GND | | GND | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | .35 x $V_{CC}$ | | .35 x $V_{CC}$ | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.7 | | 0.7 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.8 | | 0.8 | |

## Existing datasheet

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-100µA | $V_{CC}$-0.1 | | $V_{CC}$-0.1 | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$-0.1 | | $V_{CC}$-0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-2mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-4mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-6mA | 1.25 | | 1.25 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 2.00 | | 2.00 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-12mA | 1.8 | | 1.8 | | |
| | | 2.70≤ $V_{CC}$ ≤ 3.60 | | 2.2 | | 2.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-18mA | 1.7 | | 1.7 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.4 | | 2.4 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-24mA | 2.2 | | 2.2 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=100µA | | 0.1 | | 0.1 | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.2 | | 0.2 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.2 | | 0.2 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.2 | | 0.2 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.2 | | 0.2 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=2mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=4mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=6mA | | 0.3 | | 0.3 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=12mA | | 0.4 | | 0.4 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 | |
| | | 2.30≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=18mA | | 0.6 | | 0.6 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=24mA | | 0.55 | | 0.55 | |

## New

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $I_{OH}$=-100µA | | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | $V_{CC}$-0.1 | | $V_{CC}$-0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | $V_{CC}$-0.2 | | $V_{CC}$-0.2 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OH}$=-2mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OH}$=-4mA | .75 x $V_{CC}$ | | .75 x $V_{CC}$ | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OH}$=-6mA | 1.25 | | 1.25 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 2.00 | | 2.00 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-12mA | 1.8 | | 1.8 | | |
| | | 2.70≤ $V_{CC}$ ≤ 3.60 | | 2.2 | | 2.2 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OH}$=-18mA | 1.7 | | 1.7 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 2.4 | | 2.4 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OH}$=-24mA | 2.2 | | 2.2 | | |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | $I_{OL}$=100µA | | | | | V |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | | 0.1 | | 0.1 | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 0.2 | | 0.2 | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | | 0.2 | | 0.2 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 0.2 | | 0.2 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.2 | | 0.2 | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $I_{OL}$=2mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $I_{OL}$=4mA | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $I_{OL}$=6mA | | 0.3 | | 0.3 | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=12mA | | 0.4 | | 0.4 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 | |
| | | 2.30≤ $V_{CC}$ ≤ 2.70 | $I_{OL}$=18mA | | 0.6 | | 0.6 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 0.4 | | 0.4 | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $I_{OL}$=24mA | | 0.55 | | 0.55 | |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | $T_A$ = +25°C Max | $T_A$ = −40°C to +85°C Min | $T_A$ = −40°C to +85°C Max | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | V | $I_{OH}$ = −100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | | $I_{OH}$ = −6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 2.0 | | 2.0 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.8 | | 1.8 | | | $I_{OH}$ = −12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.7 | | 1.7 | | | $I_{OH}$ = −18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | $I_{OH}$ = −24 mA |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | 0.1 | | 0.1 | V | $I_{OL}$ = 100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.2 | | 0.2 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | | $I_{OL}$ = 6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.4 | | 0.4 | | $I_{OL}$ = 12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.6 | | 0.6 | | $I_{OL}$ = 18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | | $I_{OL}$ = 24 mA |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C Min | $T_A$ = +25°C Max | $T_A$ = −40°C to +85°C Min | $T_A$ = −40°C to +85°C Max | Units | Conditions |
|---|---|---|---|---|---|---|---|---|
| $V_{OH}$ | HIGH Level Output Voltage | 0.90 | | | | | V | $I_{OH}$ = −100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $V_{CC}$ − 0.1 | | $V_{CC}$ − 0.1 | | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | $V_{CC}$ − 0.2 | | $V_{CC}$ − 0.2 | | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 0.75 x $V_{CC}$ | | 0.75 x $V_{CC}$ | | | $I_{OH}$ = −4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.25 | | 1.25 | | | $I_{OH}$ = −6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 2.0 | | 2.0 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.8 | | 1.8 | | | $I_{OH}$ = −12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 1.7 | | 1.7 | | | $I_{OH}$ = −18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.4 | | 2.4 | | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 2.2 | | 2.2 | | | $I_{OH}$ = −24 mA |
| $V_{OL}$ | LOW Level Output Voltage | 0.90 | | | | | V | $I_{OL}$ = 100 µA |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.1 | | 0.1 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.2 | | 0.2 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.2 | | 0.2 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.2 | | 0.2 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.2 | | 0.2 | | |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 2 mA |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 0.25 x $V_{CC}$ | | 0.25 x $V_{CC}$ | | $I_{OL}$ = 4 mA |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 0.3 | | 0.3 | | $I_{OL}$ = 6 mA |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.4 | | 0.4 | | $I_{OL}$ = 12 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 0.6 | | 0.6 | | $I_{OL}$ = 18 mA |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.4 | | 0.4 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.55 | | 0.55 | | $I_{OL}$ = 24 mA |

- 正のしきい値電圧から下限値と 0.90V における規格を削除。
- 負のしきい値電圧から上限値と 0.90V における規格を削除。
- ヒステリシス電圧の 0.90V における規格を削除。

Existing datasheet

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_P$ | Positive Threshold Voltage | 0.90 | | 0.30 | 0.70 | 0.30 | 0.70 | V |
| | | 1.10 | | 0.40 | 1.00 | 0.40 | 1.00 | |
| | | 1.40 | | 0.50 | 1.25 | 0.50 | 1.40 | |
| | | 1.65 | | 0.70 | 1.50 | 0.70 | 1.50 | |
| | | 2.30 | | 1.00 | 1.80 | 1.00 | 1.80 | |
| | | 2.70 | | 1.50 | 2.20 | 1.50 | 2.20 | |
| $V_N$ | Negative Threshold Voltage | 0.90 | | 0.10 | 0.60 | 0.10 | 0.60 | V |
| | | 1.10 | | 0.15 | 0.70 | 0.15 | 0.70 | |
| | | 1.40 | | 0.20 | 0.80 | 0.20 | 0.80 | |
| | | 1.65 | | 0.25 | 0.90 | 0.25 | 0.90 | |
| | | 2.30 | | 0.40 | 1.15 | 0.40 | 1.15 | |
| | | 2.70 | | 0.60 | 1.50 | 0.60 | 1.50 | |
| $V_H$ | Hysteresis Voltage | 0.90 | | 0.07 | 0.50 | 0.07 | 0.50 | V |
| | | 1.10 | | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | 1.40 | | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | 1.65 | | 0.15 | 1.00 | 0.15 | 1.00 | |
| | | 2.30 | | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | 2.70 | | 0.60 | 1.20 | 0.60 | 1.20 | |

New

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | $T_A$=-40 to 85°C | | Units |
|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Max. | Min. | Max. | |
| $V_P$ | Positive Threshold Voltage | 0.90 | | | | | | V |
| | | 1.10 | | | 1.00 | | 1.00 | |
| | | 1.40 | | | 1.25 | | 1.40 | |
| | | 1.65 | | | 1.50 | | 1.50 | |
| | | 2.30 | | | 1.80 | | 1.80 | |
| | | 2.70 | | | 2.20 | | 2.20 | |
| $V_N$ | Negative Threshold Voltage | 0.90 | | | | | | V |
| | | 1.10 | | 0.15 | | 0.15 | | |
| | | 1.40 | | 0.20 | | 0.20 | | |
| | | 1.65 | | 0.25 | | 0.25 | | |
| | | 2.30 | | 0.40 | | 0.40 | | |
| | | 2.70 | | 0.60 | | 0.60 | | |
| $V_H$ | Hysteresis Voltage | 0.90 | | | | | | V |
| | | 1.10 | | 0.08 | 0.60 | 0.08 | 0.60 | |
| | | 1.40 | | 0.09 | 0.80 | 0.09 | 0.80 | |
| | | 1.65 | | 0.15 | 1.00 | 0.15 | 1.00 | |
| | | 2.30 | | 0.25 | 1.10 | 0.25 | 1.10 | |
| | | 2.70 | | 0.60 | 1.20 | 0.60 | 1.20 | |

- すべての伝播遅延と出力イネーブル時間と出力デセイブル時間の仕様から下限値を削除。

Existing datasheet

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = −40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 13 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 3.0 | 6.0 | 9.8 | 1.9 | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.0 | 3.5 | 5.3 | 0.8 | 5.7 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 0.9 | 3.0 | 4.3 | 0.8 | 4.6 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 2.0 | 2.8 | 0.7 | 3.0 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.5 | 1.0 | 2.6 | 0.5 | 2.8 | | | |
| $t_{PZH}$ $t_{PZL}$ | Output Enable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 3.0 | 6.0 | 9.7 | 2.0 | 16.4 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.2 | 4.0 | 6.0 | 1.0 | 7.5 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 3.0 | 4.5 | 0.9 | 5.0 | | $S_1$ = GND for $t_{PZH}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 2.0 | 3.0 | 0.7 | 3.4 | | $S_1$ = $V_I$ for $t_{PZL}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.5 | 1.2 | 2.6 | 0.4 | 2.9 | | $V_I$ = 2 x $V_{CC}$ | |
| $t_{PHZ}$ $t_{PLZ}$ | Output Disable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 2.0 | 5.0 | 9.5 | 2.0 | 14.0 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.2 | 3.0 | 5.5 | 1.1 | 7.0 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 2.0 | 5.6 | 0.8 | 5.8 | | $S_1$ = GND for $t_{PHZ}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 1.5 | 4.2 | 0.5 | 5.0 | | $S_1$ = $V_I$ for $t_{PLZ}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.5 | 1.0 | 3.9 | 0.4 | 4.2 | | $V_I$ = 2 x $V_{CC}$ | |

New

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = −40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 13 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 9.8 | | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.5 | 5.3 | | 5.7 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 3.0 | 4.3 | | 4.6 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 2.0 | 2.8 | | 3.0 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 2.6 | | 2.8 | | | |
| $t_{PZH}$ $t_{PZL}$ | Output Enable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 6.0 | 9.7 | | 16.4 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 4.0 | 6.0 | | 7.5 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 3.0 | 4.5 | | 5.0 | | $S_1$ = GND for $t_{PZH}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 2.0 | 3.0 | | 3.4 | | $S_1$ = $V_I$ for $t_{PZL}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.2 | 2.6 | | 2.9 | | $V_I$ = 2 x $V_{CC}$ | |
| $t_{PHZ}$ $t_{PLZ}$ | Output Disable Time | 0.90 | | 14 | | | | ns | $C_L$ = 30 pF | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.0 | 9.5 | | 14.0 | | $R_U$ = 1kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.0 | 5.5 | | 7.0 | | $R_D$ = 1kΩ | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.6 | | 5.8 | | $S_1$ = GND for $t_{PHZ}$ | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 1.5 | 4.2 | | 5.0 | | $S_1$ = $V_I$ for $t_{PLZ}$ | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.0 | 3.9 | | 4.2 | | $V_I$ = 2 x $V_{CC}$ | |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = −40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 12 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | 2.0 | 5.9 | 10.0 | 1.0 | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | 1.0 | 3.2 | 6.1 | 0.9 | 7.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | 1.0 | 2.0 | 5.2 | 0.7 | 6.2 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | 0.8 | 1.8 | 3.7 | 0.6 | 4.4 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | 0.7 | 1.5 | 3.3 | 0.5 | 3.8 | | | |

| Symbol | Parameter | $V_{CC}$ (V) | $T_A$ = +25°C | | | $T_A$ = −40°C to +85°C | | Units | Conditions | Figure Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max | | | |
| $t_{PHL}$ $t_{PLH}$ | Propagation Delay | 0.90 | | 12 | | | | ns | $C_L$ = 15 pF, $R_L$ = 1 MΩ | Figures 1, 2 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | | 5.9 | 10.0 | | 14.9 | | $C_L$ = 15 pF, $R_L$ = 2 kΩ | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 3.2 | 6.1 | | 7.0 | | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | | 2.0 | 5.2 | | 6.2 | | $C_L$ = 30 pF | |
| | | 2.30 ≤ $V_{CC}$ < 2.70 | | 1.8 | 3.7 | | 4.4 | | $R_L$ = 500Ω | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 1.5 | 3.3 | | 3.8 | | | |

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | | $T_A$=-40 to 85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_U$=$R_D$=1kΩ | | 13 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | 3.0 | 6.0 | 15.0 | 1.0 | 18.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | 1.0 | 3.2 | 8.7 | 1.0 | 9.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | 1.0 | 2.0 | 6.0 | 1.0 | 6.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | 0.8 | 1.2 | 3.6 | 0.7 | 4.7 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | 0.7 | 1.0 | 3.3 | 0.6 | 4.0 | | |

| Symbol | Parameter | $V_{CC}$ | Conditions | $T_A$=25°C | | | $T_A$=-40 to 85°C | | Units | Figure |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | Min. | Max. | | |
| $t_{PZL}$, $t_{PLZ}$ | Propagation Delay | 0.90 | $C_L$=15pF, $R_U$=$R_D$=1kΩ | | 13 | | | | ns | Figure 5 Figure 6 |
| | | 1.10 ≤ $V_{CC}$ ≤ 1.30 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | | 6.0 | 15.0 | | 18.6 | | |
| | | 1.40 ≤ $V_{CC}$ ≤ 1.60 | | | 3.2 | 8.7 | | 9.7 | | |
| | | 1.65 ≤ $V_{CC}$ ≤ 1.95 | $C_L$=30pF, $R_U$=$R_D$=1kΩ | | 2.0 | 6.0 | | 6.8 | | |
| | | 2.30 ≤ $V_{CC}$ ≤ 2.70 | | | 1.2 | 3.6 | | 4.7 | | |
| | | 2.70 ≤ $V_{CC}$ ≤ 3.60 | | | 1.0 | 3.3 | | 4.0 | | |

**認定計画 :**

**デバイス名: NC7SP125P5X**
**RMS 51765**
**パッケージ: SC88A**

| テスト | 仕様 | 条件 | 間隔 | テスト |
|---|---|---|---|---|
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/804 |
| HTSL | JESD22-A103 | Ta=150°C | 2016 hrs | 0/234 |
| TC | JESD22-A104 | Ta= -65°C to +150°C | 500 cyc | 0/297 |
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/273 |
| UHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/234 |
| HTOL | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 1008 hrs | 0/252 |
| ELFR | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 48 hrs | 0/1600 |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/90 |

**デバイス名: NL17SG14P5T5G**
**RMS 56472**
**パッケージ: SOT953**

| テスト | 仕様 | 条件 | 間隔 | テスト |
|---|---|---|---|---|
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/720 |
| HTSL | JESD22-A103 | Ta=150°C | 2016 hrs | 0/249 |
| TC | JESD22-A104 | Ta= -65°C to +150°C | 500 cyc | 0/234 |
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/252 |
| uHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/234 |
| HTOL | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 1008 hrs | 0/252 |
| ELFR | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 48 hrs | 0/1600 |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/90 |

**デバイス名: NL17SV16XV5T2G**
**RMS 51763**
**パッケージ: SOT553**

| テスト | 仕様 | 条件 | 間隔 | テスト |
|---|---|---|---|---|
| PC | J-STD-020 JESD-A113 | MSL 1 @ 260 °C | | 0/753 |
| HTSL | JESD22-A103 | Ta=150°C | 2016 hrs | 0/252 |
| TC | JESD22-A104 | Ta= -65°C to +150°C | 500 cyc | 0/252 |
| HAST | JESD22-A110 | 130°C, 85% RH, 18.8psig, bias | 192 hrs | 0/249 |
| UHAST | JESD22-A118 | 130°C, 85% RH, 18.8psig, unbiased | 96 hrs | 0/252 |
| HTOL | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 2016 hrs | 0/252 |
| ELFR | JESD22-A108 | Ta=125°C, 100 % max rated Vcc x 1.2 | 48 hrs | 0/1600 |
| RSH | JESD22- B106 | Ta = 265C, 10 sec | | 0/90 |

**影響を受ける部品の一覧:**

注: 部品一覧には標準部品番号 (既製品) のみが記載されています。本 PCN の影響を受けるカスタム部品番号は、PCN メールで提供される顧客個別の付録、または PCN カスタマイズポータルに記載されています。

| 部品番号 | 認定試験用ビークル |
|---|---|
| NC7SP00P5X | NC7SP125P5X |
| NC7SP02P5X | NC7SP125P5X |
| NC7SP04P5X | NC7SP125P5X |
| NC7SP05P5X | NC7SP125P5X |
| NC7SP08P5X | NC7SP125P5X |
| NC7SP125P5X | NC7SP125P5X |
| NC7SP126P5X | NC7SP125P5X |
| NC7SP14P5X | NC7SP125P5X |
| NC7SP17P5X | NC7SP125P5X |
| NC7SP32P5X | NC7SP125P5X |
| NC7SP34P5X | NC7SP125P5X |
| NC7SP38P5X | NC7SP125P5X |
| NC7SP86P5X | NC7SP125P5X |
| NC7SPU04P5X | NC7SP125P5X |
| NC7SV00P5X | NC7SP125P5X |
| NC7SV02P5X | NC7SP125P5X |
| NC7SV04P5X | NC7SP125P5X |
| NC7SV05P5X | NC7SP125P5X |
| NC7SV08P5X | NC7SP125P5X |
| NC7SV125P5X | NC7SP125P5X |
| NC7SV126P5X | NC7SP125P5X |
| NC7SV14P5X | NC7SP125P5X |
| NC7SV17P5X | NC7SP125P5X |
| NC7SV32P5X | NC7SP125P5X |
| NC7SV34P5X | NC7SP125P5X |
| NC7SV86P5X | NC7SP125P5X |
| NC7SVL04P5X | NC7SP125P5X |
| NC7SVL08P5X | NC7SP125P5X |
| NC7SVL32P5X | NC7SP125P5X |
| NC7SVU04P5X | NC7SP125P5X |
| NL17SG00DFT2G | NC7SP125P5X |
| NL17SG00P5T5G | NL17SG14P5T5G |

| | |
|---|---|
| NL17SG02DFT2G | NC7SP125P5X |
| NL17SG02P5T5G | NL17SG14P5T5G |
| NL17SG04DFT2G | NC7SP125P5X |
| NL17SG04P5T5G | NL17SG14P5T5G |
| NL17SG07DFT2G | NC7SP125P5X |
| NL17SG07P5T5G | NL17SG14P5T5G |
| NL17SG08DFT2G | NC7SP125P5X |
| NL17SG08P5T5G | NL17SG14P5T5G |
| NL17SG125DFT2G | NC7SP125P5X |
| NL17SG125P5T5G | NL17SG14P5T5G |
| NL17SG126DFT2G | NC7SP125P5X |
| NL17SG126P5T5G | NL17SG14P5T5G |
| NL17SG126P5T6G | NL17SG14P5T5G |
| NL17SG14DFT2G | NC7SP125P5X |
| NL17SG14P5T5G | NL17SG14P5T5G |
| NL17SG17DFT2G | NC7SP125P5X |
| NL17SG17P5T5G | NL17SG14P5T5G |
| NL17SG32DFT2G | NC7SP125P5X |
| NL17SG32P5T5G | NL17SG14P5T5G |
| NL17SG34DFT2G | NC7SP125P5X |
| NL17SG34P5T5G | NL17SG14P5T5G |
| NL17SG86DFT2G | NC7SP125P5X |
| NL17SG86P5T5G | NL17SG14P5T5G |
| NL17SGU04DFT2G | NC7SP125P5X |
| NL17SGU04P5T5G | NL17SG14P5T5G |
| NL17SV00XV5T2G | NL17SV16XV5T2G |
| NL17SV02XV5T2G | NL17SV16XV5T2G |
| NL17SV04XV5T2G | NL17SV16XV5T2G |
| NL17SV08XV5T2G | NL17SV16XV5T2G |
| NL17SV16XV5T2G | NL17SV16XV5T2G |
| NL17SV32XV5T2G | NL17SV16XV5T2G |

## Appendix A: Changed Products

| Product | Customer Part Number | Qualification Vehicle |
|---|---|---|
| NC7SP00P5X | | NC7SP125P5X |
| NC7SP02P5X | | NC7SP125P5X |
| NC7SP04P5X | | NC7SP125P5X |
| NC7SP05P5X | | NC7SP125P5X |
| NC7SP08P5X | | NC7SP125P5X |
| NC7SP125P5X | | NC7SP125P5X |
| NC7SP126P5X | | NC7SP125P5X |
| NC7SP14P5X | | NC7SP125P5X |
| NC7SP17P5X | | NC7SP125P5X |
| NC7SP32P5X | | NC7SP125P5X |
| NC7SP34P5X | | NC7SP125P5X |
| NC7SP38P5X | | NC7SP125P5X |
| NC7SP86P5X | | NC7SP125P5X |
| NC7SPU04P5X | | NC7SP125P5X |
| NC7SV00P5X | | NC7SP125P5X |
| NC7SV02P5X | | NC7SP125P5X |
| NC7SV04P5X | | NC7SP125P5X |
| NC7SV05P5X | | NC7SP125P5X |
| NC7SV08P5X | | NC7SP125P5X |
| NC7SV125P5X | | NC7SP125P5X |
| NC7SV126P5X | | NC7SP125P5X |
| NC7SV14P5X | | NC7SP125P5X |
| NC7SV17P5X | | NC7SP125P5X |
| NC7SV32P5X | | NC7SP125P5X |
| NC7SV34P5X | | NC7SP125P5X |
| NC7SV86P5X | | NC7SP125P5X |
| NC7SVL04P5X | | NC7SP125P5X |
| NC7SVL08P5X | | NC7SP125P5X |
| NC7SVL32P5X | | NC7SP125P5X |
| NC7SVU04P5X | | NC7SP125P5X |
| NL17SG00DFT2G | | NC7SP125P5X |
| NL17SG00P5T5G | | NL17SG14P5T5G |
| NL17SG02DFT2G | | NC7SP125P5X |
| NL17SG02P5T5G | | NL17SG14P5T5G |
| NL17SG04DFT2G | | NC7SP125P5X |
| NL17SG04P5T5G | | NL17SG14P5T5G |
| NL17SG07DFT2G | | NC7SP125P5X |
| NL17SG07P5T5G | | NL17SG14P5T5G |
| NL17SG08DFT2G | | NC7SP125P5X |
| NL17SG08P5T5G | | NL17SG14P5T5G |
| NL17SG125DFT2G | | NC7SP125P5X |
| NL17SG125P5T5G | | NL17SG14P5T5G |
| NL17SG126DFT2G | | NC7SP125P5X |
| NL17SG126P5T5G | | NL17SG14P5T5G |
| NL17SG126P5T6G | | NL17SG14P5T5G |
| NL17SG14DFT2G | | NC7SP125P5X |
| NL17SG14P5T5G | | NL17SG14P5T5G |
| NL17SG17DFT2G | | NC7SP125P5X |
| NL17SG17P5T5G | | NL17SG14P5T5G |
| NL17SG32DFT2G | | NC7SP125P5X |
| NL17SG32P5T5G | | NL17SG14P5T5G |
| NL17SG34DFT2G | | NC7SP125P5X |
| NL17SG34P5T5G | | NL17SG14P5T5G |
| NL17SG86DFT2G | | NC7SP125P5X |
| NL17SG86P5T5G | | NL17SG14P5T5G |
| NL17SGU04DFT2G | | NC7SP125P5X |
| NL17SGU04P5T5G | | NL17SG14P5T5G |
| NL17SV00XV5T2G | | NL17SV16XV5T2G |
| NL17SV02XV5T2G | | NL17SV16XV5T2G |

| | | |
|---|---|---|
| NL17SV04XV5T2G | | NL17SV16XV5T2G |
| NL17SV08XV5T2G | | NL17SV16XV5T2G |
| NL17SV16XV5T2G | | NL17SV16XV5T2G |
| NL17SV32XV5T2G | | NL17SV16XV5T2G |