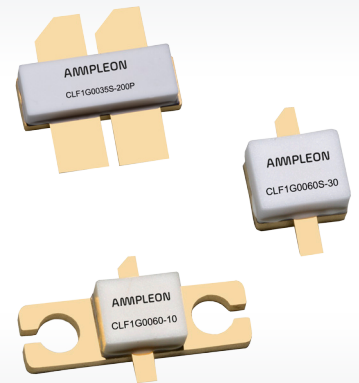


First generation GaN broadband amplifier family

## Gain a Clear Advantage as Ampleon Takes GaN Mainstream



With 35+ years of experience delivering RF power transistors, Ampleon is leading the industry in offering GaN RF power devices through a secure and reliable mainstream supply chain for wireless infrastructure, Industrial, Scientific, Medical (ISM) and Aerospace & Defense applications.

### Key Features

- High frequencies, bandwidth up to 6 GHz
- High efficiencies
- Excellent linearity
- High power density
- High thermal conductivity
- Operation at higher temperatures, without loss of reliability (250 °C compared to 225 °C for Si LDMOS)
- Excellent ruggedness

### Applications

- Commercial wireless infrastructure (base stations)
- Radar systems up to C band
- Broadband and narrowband general purpose amplifiers
- Public mobile radios
- Industrial, Scientific, Medical applications
- Air traffic control
- Test instrumentation
- EMC testing

Ampleon's first generation GaN process technology features best-in-class linearity while at the same time allowing designers to maintain power, ruggedness and efficiency. This enables an uncompromised amplifier design that can reduce component count and reduce amplifier footprint.

Our leading back-end assembly facility consistently leverages the high power density of GaN into smaller and more broadband circuitry. Through a broad portfolio of high performance GaN and LDMOS products, Ampleon offers you an unbiased choice in enabling optimized designs for your application.

## GaN Product Overview

Type	Package	Load optimized	f (MHz)	P <sub>3dB</sub> (W)	V <sub>DS</sub> (V)	Linear * <sup>2)</sup> G <sub>p</sub> (dB)	η <sub>D</sub> (%)	Test signal
CLF1G0060(S)-10	SOT1227	for P <sub>3dB</sub> for η <sub>D</sub>	3000 3000	16.0 12.8	50 50	16.5 17.5	55.5 60.3	100μs/10% 100μs/10%
CLF1G0060(S)-30	SOT1227	for P <sub>3dB</sub> for η <sub>D</sub>	3000 3000	50.0 48.0	50 50	16.1 16.4	62.0 66.0	100μs/10% 100μs/10%
CLF1G0035(S)-50	SOT467C	for P <sub>3dB</sub> for η <sub>D</sub>	3000 3000	65.5 58.7	50 50	14.1 15.0	58.6 62.1	CW CW
CLF1G0035(S)-100	SOT467C	for P <sub>3dB</sub> for η <sub>D</sub>	3000 3000	141.8 130.0	50 50	13.1 14.5	56.0 59.1	100μs/10% 100μs/10%
CLF1G0035(S)-100P * <sup>1)</sup>	SOT1228	for P <sub>3dB</sub> for η <sub>D</sub>	3000 3000	65.5 58.7	50 50	14.1 15.0	58.6 62.1	CW CW
CLF1G0035(S)-200P * <sup>1)</sup>	SOT1228	for P <sub>3dB</sub> for η <sub>D</sub>	3000 3000	141.8 130.0	50 50	13.1 14.5	56.0 59.1	100μs/10% 100μs/10%

All data in this table based on load-pull data

\*<sup>1)</sup> = Data for one section of the push-pull transistor

\*<sup>2)</sup> = Linear gain is gain at back-off (no compression)

## Setting New Performance Boundaries for RF Power Amplifiers

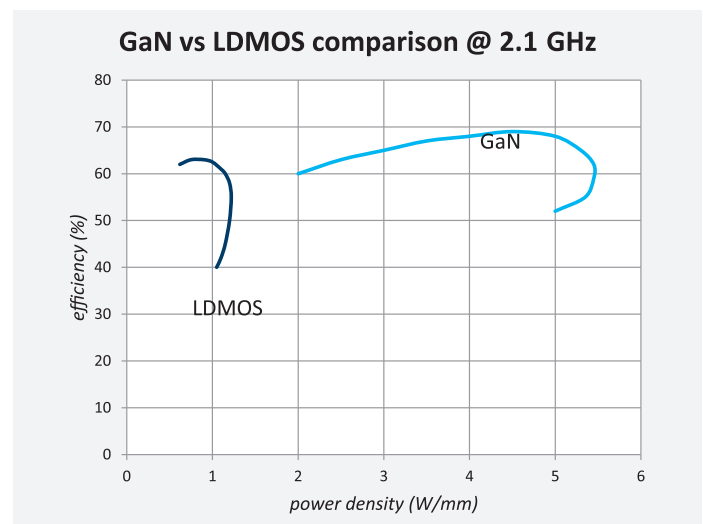
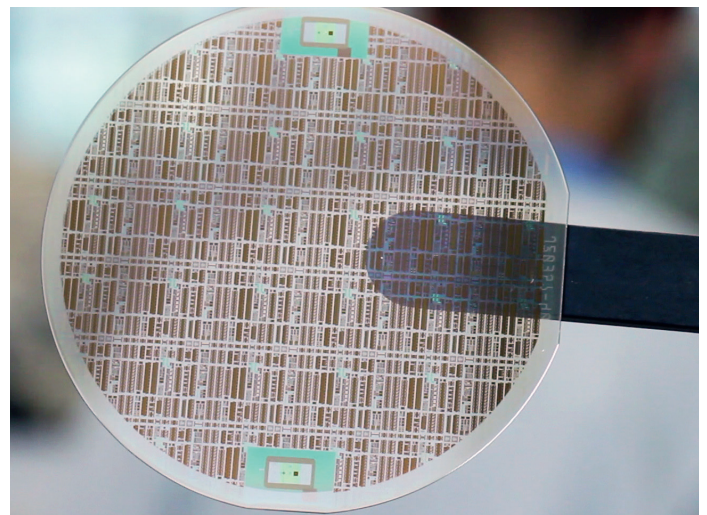
GaN products are termed High-Electron Mobility Transistors (HEMT), a name that captures one of the intrinsic benefits of GaN – the high electron drift velocity. However these transistors are depletion-mode devices, so they are normally on and require a negative gate bias to switch them off. This biasing is not straightforward, so Ampleon also has a tried and tested bias circuit available.

A further advantage of GaN is that it is a very hard structure, so is capable of withstanding very high temperatures. Ampleon's GaN transistors will be specified to a maximum temperature of 250 °C, compared to 225 °C for Si LDMOS. With such high temperature capability there is a greater need to have packages capable of exploiting this feature. For this customers benefit from Ampleon's 35 year legacy in RF power products.

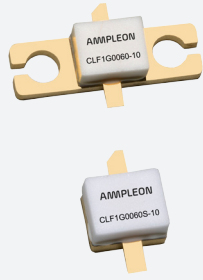
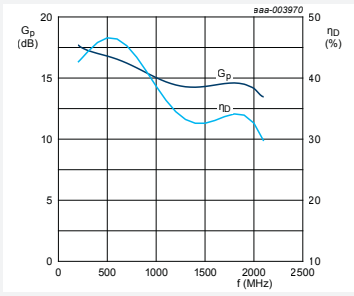
Simply put, GaN makes a step increase in efficiency and power density performance over Si LDMOS in most applications, best shown in figure. It is expected by independent market analysis firms, that GaN product sales will grow into new application areas beyond aerospace and defense applications. This growth needs to be supported by mainstream RF Power companies such as Ampleon, who have invested in GaN technology for years.

Currently Ampleon is the only non-ITAR GaN supplier with the best-in-class technology and industrial base that brings customer excellence in product reliability, cost and a high degree of confidence in the supply chain.

## Transparent GaN Wafer

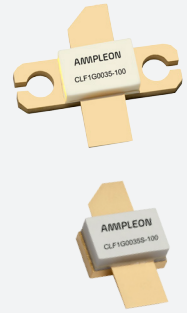
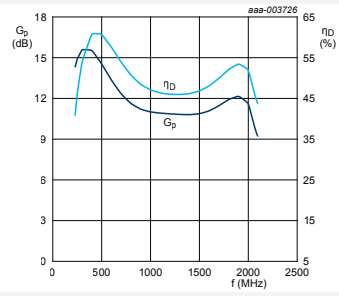


### CLF1G0060(S)-10



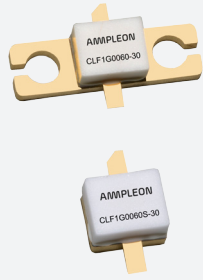
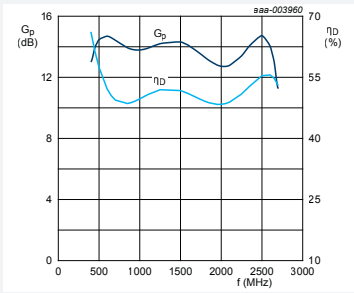
IMD3 at 5 W peak power better than -39 dBc

### CLF1G0035(S)-100



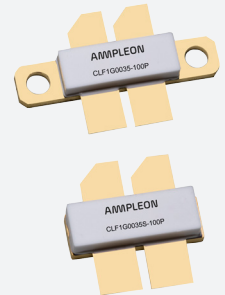
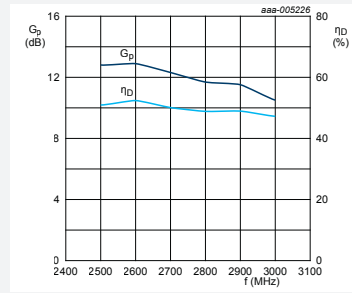
IMD3 at 20 W peak power better than -39 dBc

### CLF1G0060(S)-30



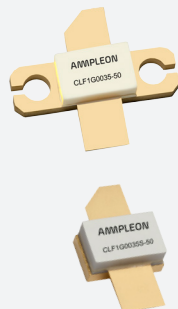
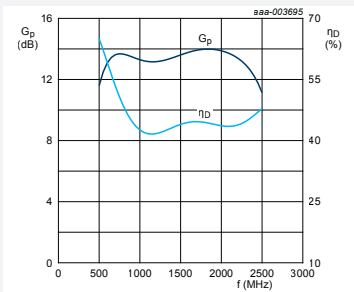
IMD3 at 10 W peak power better than -38 dBc

### CLF1G0035(S)-100P



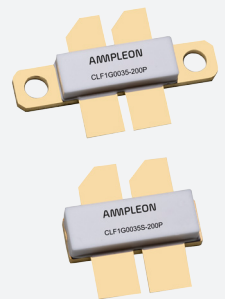
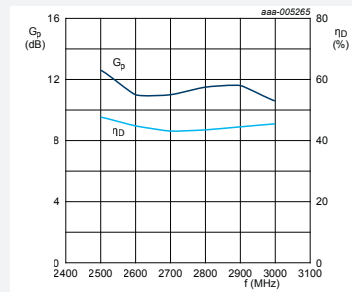
IMD3 at 20 W peak power better than -40 dBc

### CLF1G0035(S)-50



IMD3 at 10 W peak power better than -38 dBc

### CLF1G0035(S)-200P



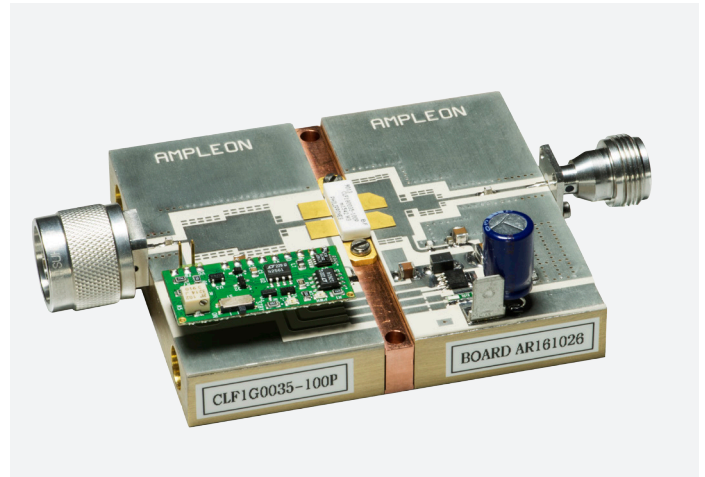
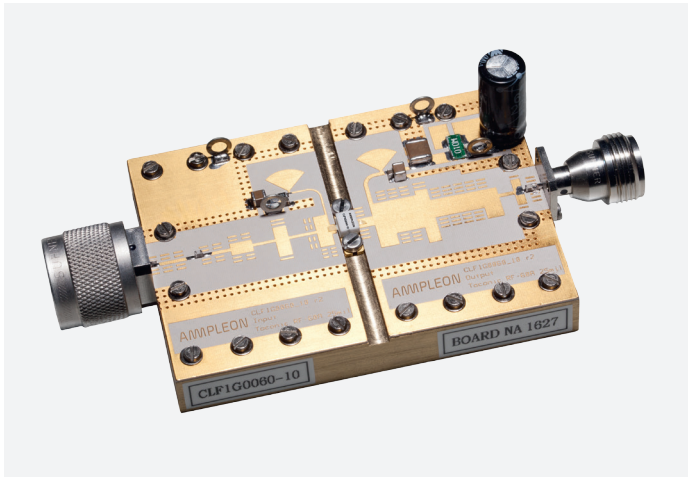
IMD3 at 20 W peak power better than -37 dBc

## Support

Datasheets, test reports and simulation models are online available for all types.

To support customers in designing in new GaN products, Ampleon supplies samples and demonstration boards.

## GaN Demo Boards



## Additional Information

For more information, please visit: [www.ampleon.com/gan](http://www.ampleon.com/gan)