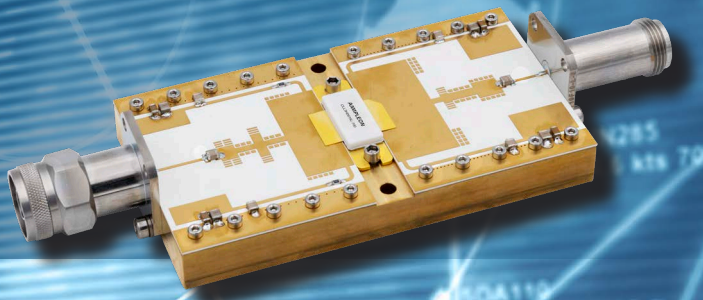
AMPLEON

High-power GaN RF transistors for L- and S-band radar - Engineered for long-pulse performance

High-efficiency RF power transistors for L- and S-band radar, optimized for demanding radar applications



Radar transmitters are evolving quickly and system designers face the challenge of delivering more power, supporting longer pulses, and ensuring reliable operation under thermally demanding conditions.

Ampleon's dedicated L- and S-band portfolio addresses these needs with frequency-optimized GaN RF transistors that combine high efficiency, superior thermal performance, and outstanding ruggedness. Covering L-band and S-band, these devices deliver more than 700 W output power while maintaining cooler operation and stable performance, even at multi-millisecond pulse widths and duty cycles up to 20 %.

For amplifier designers, this means fewer trade-offs: the combination of high output power and excellent thermal headroom reduces system cooling requirements, simplifies design, and extends overall transmitter lifetime. Internal input matching further accelerates integration.

More power, less heat: compared with alternative devices, Ampleon's 700 W line-up delivers up to 2x the RF output power while still showing lower transient thermal impedance (Z_{th}). With ~60 % drain efficiency, these transistors lower power dissipation and junction temperature rise, enabling long-term reliability and robust performance under harsh conditions.

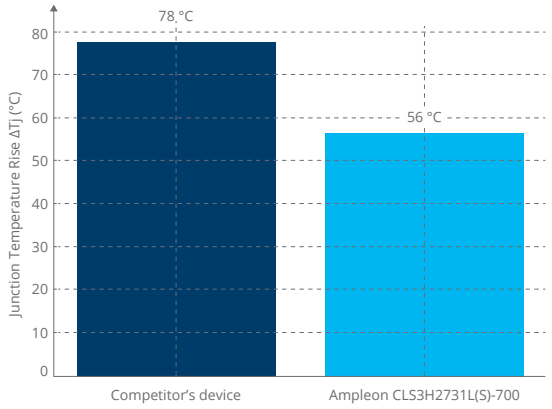
Key features

- Optimized for L-band (960–1400 MHz), Low S-band (2700–3100 MHz) and High S-band (3100–3500 MHz)
- Output power >700 W in compact flanged and ceramic packages
- Long-pulse support up to 300 µs and beyond, with up to 20 % duty cycle
- ~60 % drain efficiency for reduced Pdiss
- Low transient thermal impedance (Z_{th}) for cooler operation
- Internally matched input for faster, easier design-in
- Excellent ruggedness and reliability under harsh operating conditions

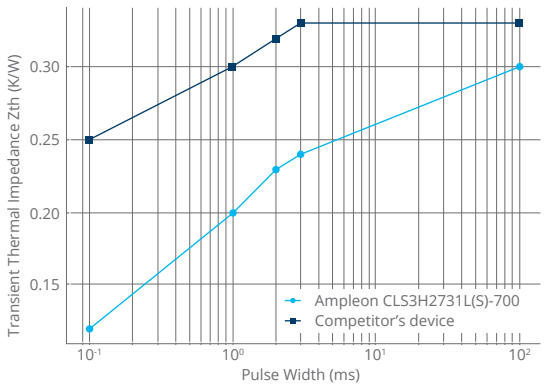
Key benefits

- "More power, less heat" – extended system lifetime and reliability
- Superior thermal performance – lower junction temperature rise per watt
- Stable long-pulse operation – ideal for modern radar waveforms
- High efficiency reduces cooling requirements and eases SWaP constraints
- Flexible package options support diverse mechanical and thermal needs
- Simplified amplifier design accelerates time-to-market

Junction Temperature Rise (ΔTj) at typical long-pulse conditions



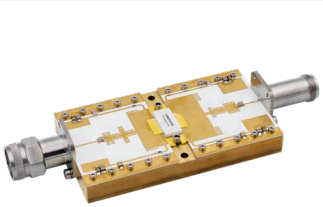
Thermal Impedance (Zth) across Pulse Width



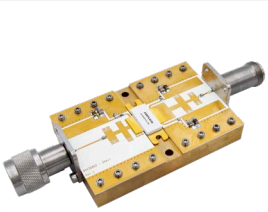
Application overview

Report number	Type number	Technology	Package outline	F_{range} (MHz)	P_{out} (W)	η_D (%)	V_{DS} (V)	Demo signal
AR201110	CLL3H0914L(S)-700	GaN 50 V	SOT502A(B)	960–1215	> 725	> 52	50	Pulsed CW
AR191060	CLL3H0914L(S)-700	GaN 50 V	SOT502A(B)	1200–1400	700	> 61	50	Pulsed CW
AR211131*	CLS3H2731L(S)-700	GaN 50 V	SOT502A(B)	2700–3100	700	56–58	50	Pulsed CW
AR251999*	CLS3H3135L(S)-700	GaN 50 V	SOT502A(B)	3100–3500	700	58	50	Pulsed CW

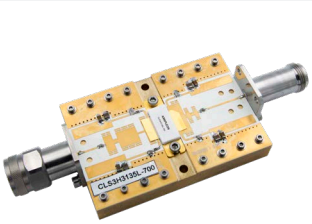
* For access, please contact our local sales representative via: www.ampleon.com/contact



CLL3H0914L(S)-700 demo board



CLS3H2731L(S)-700 demo board



CLS3H3135L(S)-700 demo board

Contact information

www.ampleon.com/long-pulse-radar-systems#contact

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Date of release: September 8, 2025

Document identifier: AMP LL 2025 0908

Printed in the Netherlands