

Advance PXAE213708NB

Thermally-Enhanced High Power RF LDMOS FET 400 W, 29 V, 2110 – 2180 MHz

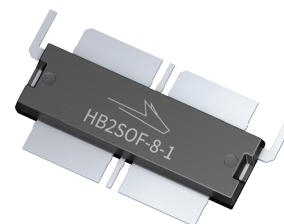
Description

The PXAE213708NB is a 400-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 2110 to 2180 MHz frequency band. Features include input matching, high gain and thermally-enhanced package with earless flange. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

Advance Specification Data Sheets describe products that are being considered by Wolfspeed for development and market introduction. The target performance shown in Advance Specifications is not final and should not be used for any design activity. Please contact Wolfspeed about the future availability of these products.

Features

- Broadband internal input and output matching
- Asymmetrical Doherty design
 - Main: $P_{3dB} = 160$ W Typ
 - Peak: $P_{3dB} = 290$ W Typ
- Typical Pulsed CW performance, 2180 MHz, 28 V, Doherty configuration, 10 μ s pulse width, 10% duty cycle, class AB
 - Output power at $P_{3dB} = 400$ W
 - Power Added Efficiency at $P_{3dB} = 60.3\%$
 - Power Gain = 13.7 dB
- Integrated ESD protection
- Low thermal resistance
- Pb-free and RoHS compliant



PXAE213708NB
Package PG-HB2SOF-8-1

Target RF Characteristics

Single-carrier WCDMA Specifications (tested in Wolfspeed Doherty test fixture)

$V_{DD} = 29$ V, $I_{DQ} = 750$ mA, $V_{GSPEAK} = 1.5$ V, $P_{OUT} = 54$ W avg, $f = 2180$ MHz, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	—	16	—	dB
Drain Efficiency	η_D	—	51	—	%
Adjacent Channel Power Ratio	ACPR	—	-27	—	dBc
Output PAR at 0.01% probability on CCDF	OPAR	—	8.7	—	dB

All published data at $T_{CASE} = 25^\circ\text{C}$ unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics (each side)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1	μA
	$V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10	μA
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1	μA
On-State Resistance (main)	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	TBD	—	Ω
	(peak) $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	TBD	—	Ω
Operating Gate Voltage (main)	$V_{DS} = 28\text{ V}$, $I_{DQ} = 750\text{ mA}$	V_{GS}	—	2.9	—	V
	(peak) $V_{DS} = 28\text{ V}$, $I_{DQ} = 0\text{ mA}$	V_{GS}	—	1.5	—	V

Maximum Ratings

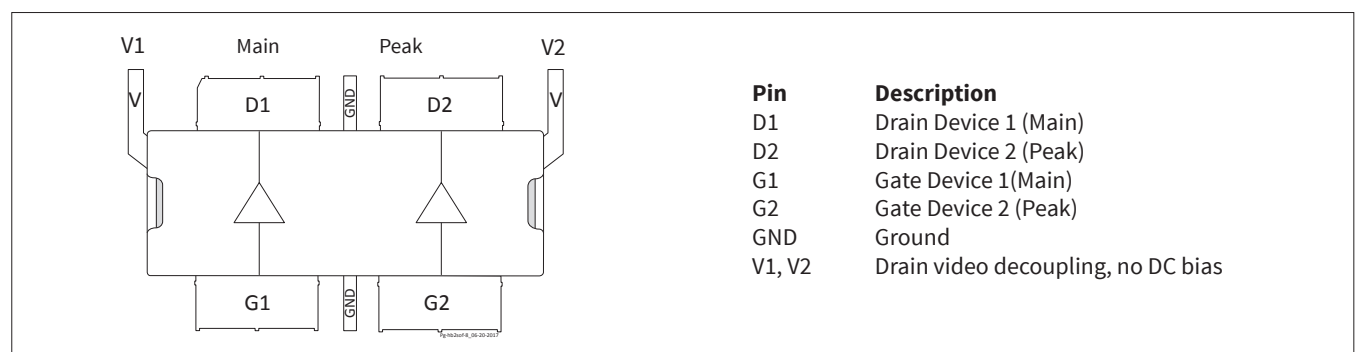
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	-6 to +10	V
Operating Voltage	V_{DD}	0 to +32	V
Junction Temperature	T_J	225	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 to +150	$^{\circ}\text{C}$

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance	$R_{\theta JC}$	TBD	$^{\circ}\text{C/W}$

Ordering Information

Type and Version	Order Code	Package Description	Shipping
PXAE213708NB V1 R2	TBD	PG-HB2SOF-8-1	Tape & Reel, 250 pcs

Pinout Diagram (top view)

Lead connections for PXAE213708NB

Technical drawing of the PCB layout for the 100W 48VDC/10A converter. The drawing includes a top view (A) and a side view (B).

Top View (A):

- Overall dimensions: 32.26 (width) x 19.46 (height).
- Component area dimensions: 2 x 14.12 and 2 x 10.6.
- Mounting holes: 4 x 11.29 and 2.83.
- Ground pads: 2 x 0.8 (G1) and 2 x 4.75 (G2).
- Chamfers: 2 x 0.63 x 45° (V) and 2 x 4.44 (V).
- Chamfers: 2 x 1.02 (W) and 2 x 1.00 (W).
- Dimensions: 7.19, 2.03, 9.96, 2 x 4.75, 2 x 0.8, 7.06, 2 x 14.12, 2 x 10.6, 2 x 4.44, 2 x 0.63 x 45°.

Side View (B):

- Overall height: 19.46.
- Component height: 3.30.
- Board thickness: 1.57.
- Dimensions: 9.96, 0.25, 3.81.

PCB 100W 48VDC/10A

1. Mold/Dam Bar/Metal protusion of 0.30mm max per side not included.
2. Fillets and radii: all radii are 0.3 mm max unless specified otherwise
3. Interpret dimensions and tolerances per ISO 8015
4. Dimensions are mm
5. Exposed metal surface are tin plated, may not be covered by mold compound
6. Does not include mold/dam bar/metal protusion.
7. All tolerances $\pm 0.1\text{mm}$ unless specified otherwise
9. All metal surfaces pre-plated, except area of cut
9. Lead thickness: 0.25 mm
10. Pins: D1, D2 – drain; G1, G2 – gate; GND – ground; V – Drain video decoupling, no DC bias

Package Outline Specifications (cont.)

Package PG-HB2SOF-8-1 (bottom view)

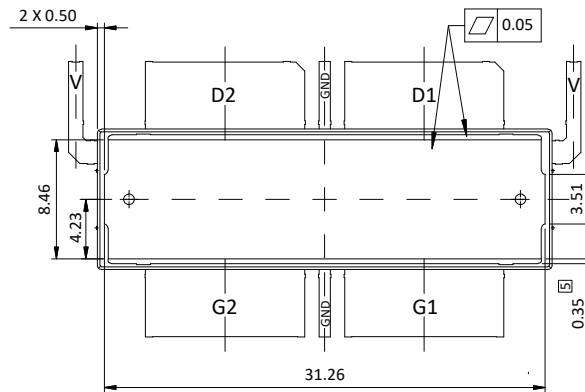


Diagram Notes—unless otherwise specified:

1. Mold/Dam Bar/Metal protusion of 0.30mm max per side not included.
2. Fillets and radii: all radii are 0.3 mm max unless specified otherwise
3. Interpret dimensions and tolerances per ISO 8015
4. Dimensions are mm
5. Exposed metal surface are tin plated, may not be covered by mold compound
6. Does not include mold/dam bar/metal protusion.
7. All tolerances ± 0.1 mm unless specified otherwise
9. All metal surfaces pre-plated, except area of cut
9. Lead thickness: 0.25 mm
10. Pins: D1, D2 – drain; G1, G2 – gate; GND – ground; V – Drain video decoupling, no DC bias

Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2018-03-26	Advance	All	Data Sheet reflects advance specification for product development
02	2018-09-26	Advance	All 2	Converted to Wolfspeed Data Sheet Corrected ordering information

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Notes

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