

# Advance PTGA090304MD

## Wideband LDMOS Two-stage Integrated Power Amplifier 2 X 15 W, 48 V, 575 – 960 MHz

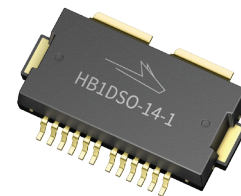
### Description

The PTGA090304MD is a wideband, two-stage, LDMOS integrated power amplifier. Fabricated with Wolfspeed's 50 V LDMOS process, it incorporates internal matching for operation from 575 MHz to 960 MHz, and dual independent outputs of 15 W each. It is available in a 14-lead plastic overmold package with gull wing leads.

**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

- On-chip matching for broadband operation
- Designed for ultra wideband performance
- Integrated temperature compensation
- Integrated ESD protection
- Pb-free and RoHS compliant



PTGA090304MD  
Package PG-HB1DSO-14-1

### Target RF Characteristics

#### Single-carrier WCDMA Specifications (tested in Wolfspeed Class AB test fixture, combined outputs)

$V_{DD} = 50\text{ V}$ ,  $I_{DQ1(A+B)} = 34\text{ mA}$ ,  $I_{DQ2(A+B)} = 144\text{ mA}$ ,  $P_{OUT} = 36\text{ dBm avg}$ ,  $f = 960\text{ MHz}$ , 3GPP WCDMA signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	$G_{ps}$	—	33	—	dB
Drain Efficiency	$\eta_D$	—	19	—	%
Adjacent Channel Power Ratio	ACPR	—	-46	—	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

**Typical Performance, 920 – 960 MHz** (tested in Wolfspeed narrowband test fixture)

$V_{DD} = 50\text{ V}$ ,  $I_{DQ1(A+B)} = 34\text{ mA}$ ,  $I_{DQ2(A+B)} = 144\text{ mA}$ ,  $P_{OUT} = 36\text{ dBm}$  avg, 3GPP WCDMA signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Frequency (MHz)	Gain (dB)	PAE (%)	ACPR (dBc)
920	33.4	19.6	-46.4
940	33.3	19.3	-46.3
960	33.2	19.1	-46.0

**Typical Broadband Performance, 575 – 960 MHz** (tested in Wolfspeed broadband test fixture)

$V_{DD} = 50\text{ V}$ ,  $I_{DQ1(A+B)} = 34\text{ mA}$ ,  $I_{DQ2(A+B)} = 144\text{ mA}$ ,  $P_{OUT} = 36\text{ dBm}$  avg, 3GPP WCDMA signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Frequency (MHz)	Gain (dB)	Eff (%)	PAR (dB)	ACPR (dBc)
575	28.5	18.0	9.2	-38.3
590	29.6	18.1	9.2	-40.5
660	31.9	18.4	9.3	-46.2
746	30.8	17.3	9.4	-47.0
860	30.1	16.0	9.4	-46.2
960	30.2	15.1	9.2	-45.1

**DC Characteristics**

Stage 1	Conditions	Symbol	Min	Typ	Max	Unit
Drain Leakage Current	$V_{DS} = 48\text{ V}$ , $V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1	$\mu\text{A}$
	$V_{DS} = 105\text{ V}$ , $V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10	$\mu\text{A}$
Gate Leakage Current	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1	$\mu\text{A}$
On-State Resistance (Main)	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	TBD	—	$\Omega$
	(Peak) $V_{GS} = 10\text{ V}$ , $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	TBD	—	$\Omega$
Operating Gate Voltage (Main)	$V_{DS} = 48\text{ V}$ , $I_{DQ1} = 34\text{ mA}$	$V_{GS1}$	—	5.62	—	V

**DC Characteristics** (cont.)

Stage 2	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	105	—	—	V
Drain Leakage Current	$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1	$\mu\text{A}$
	$V_{DS} = 105\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10	$\mu\text{A}$
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1	$\mu\text{A}$
On-State Resistance (Main)	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	TBD	—	$\Omega$
	(Peak) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	TBD	—	$\Omega$
Operating Gate Voltage (Main)	$V_{DS} = 48\text{ V}, I_{DQ2} = 144\text{ mA}$	$V_{GS2}$	—	5.54	—	V

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	105	V
Gate-Source Voltage	$V_{GS}$	-6 to +12	V
Operating Voltage	$V_{DD}$	0 to +55	V
Junction Temperature	$T_J$	225	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to +150	$^{\circ}\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Value	Unit
Thermal Resistance Stage 1 ( $T_{CASE} = 70^{\circ}\text{C}$ )	$R_{\theta JC}$	TBD	$^{\circ}\text{C}/\text{W}$
Stage 2 ( $T_{CASE} = 70^{\circ}\text{C}$ )	$R_{\theta JC}$	TBD	$^{\circ}\text{C}/\text{W}$

**Moisture Sensitivity Level**

Level	Test Standard	Package Temperature	Unit
3	IPC/JEDEC J-STD-020	260	$^{\circ}\text{C}$

**Ordering Information**

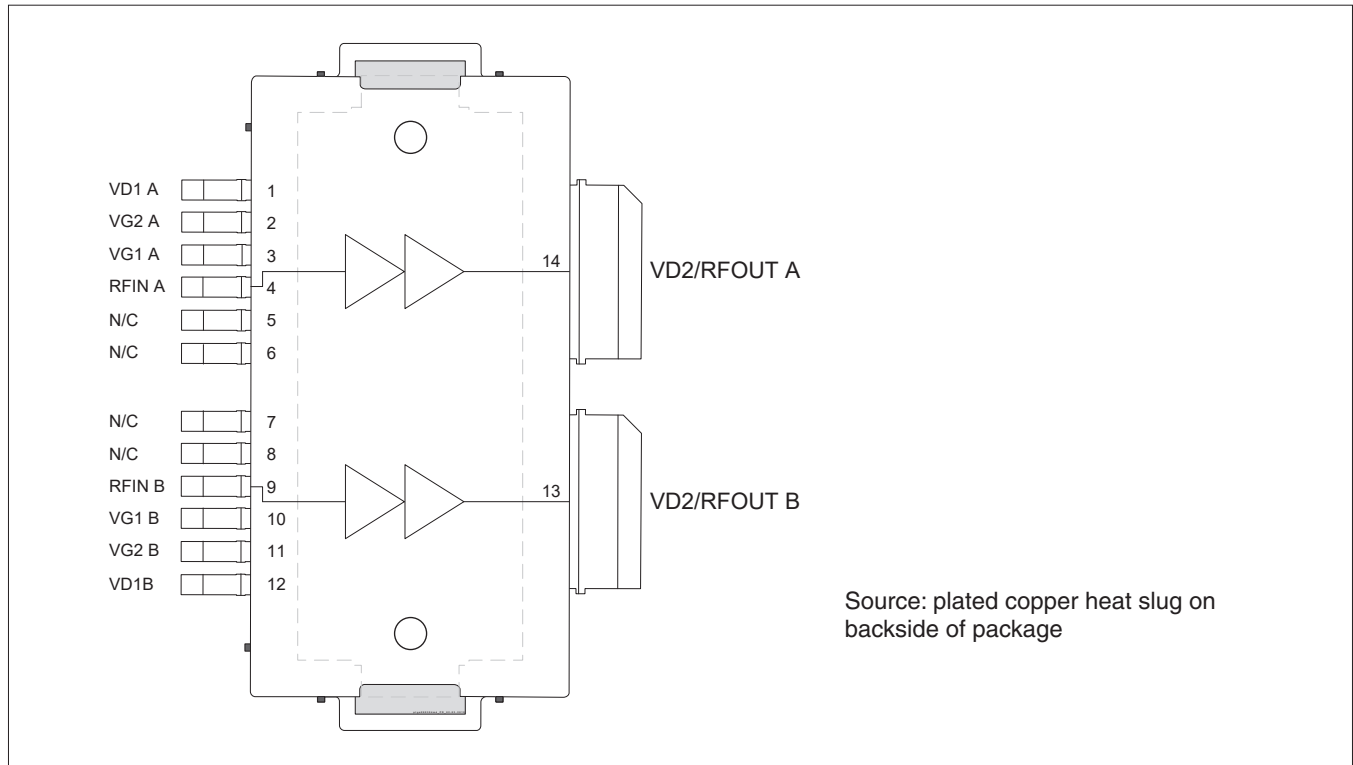
Type and Version	Order Code	Package	Shipping
PTGA090304MD V1 R5	TBD	PG-HB1DSO-14-1	Tape & Reel, 500 pcs



### Evaluation Boards

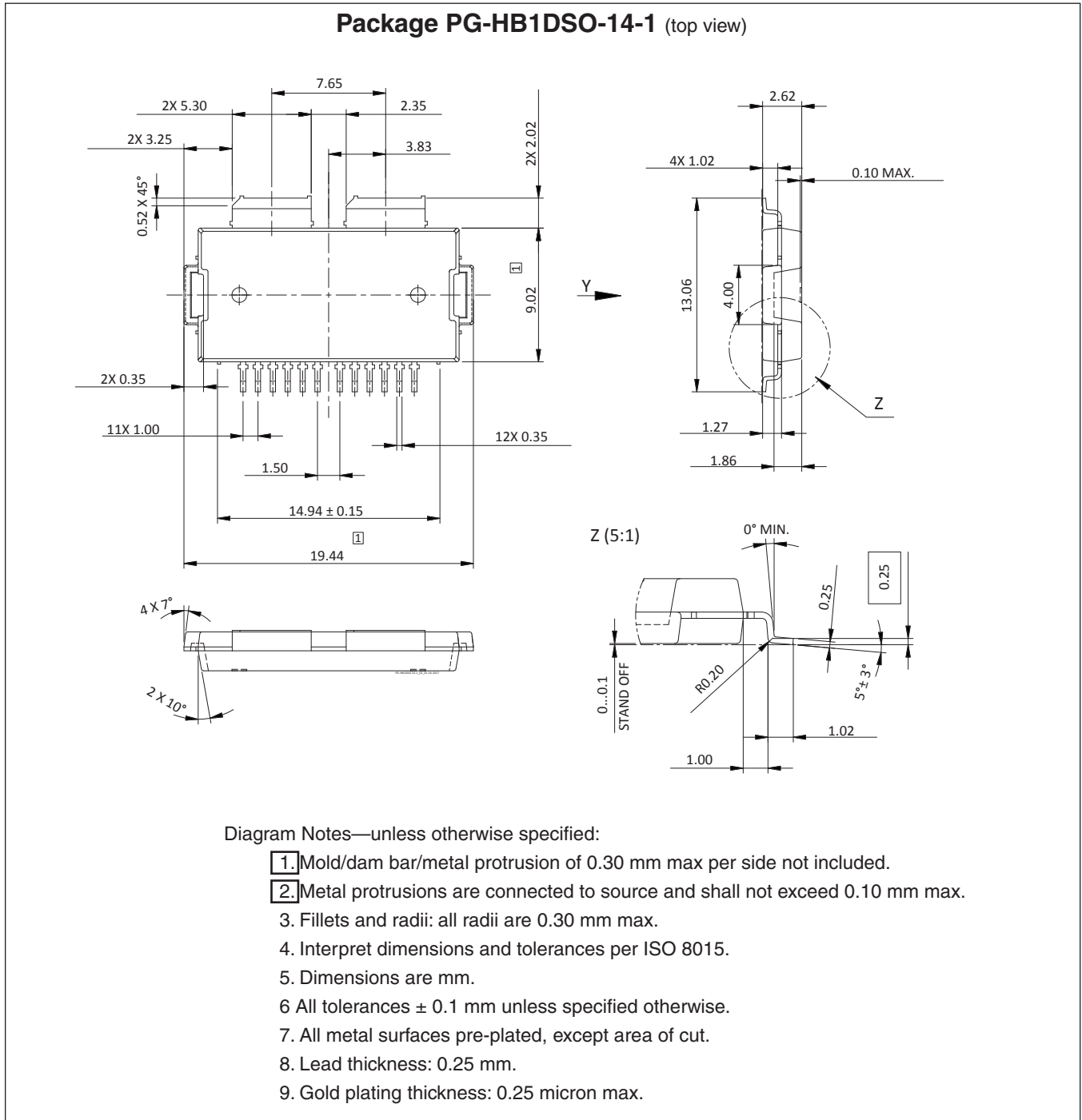
Order Code	Frequency	Description
LTN/PTGA090304MD E1	920 – 960 MHz	Class AB with combined outputs, R04350
LTN/PTGA090304MD E2	728 – 768 MHz	Class AB with combined outputs, R04350
LTN/PTGA090304MD E3	575 – 960 MHz	Class AB with combined outputs, R04350

### Pinout Diagram (top view)



Lead connections for PTGA090304MD

Package Outline Specifications



**Package Outline Specifications** (cont.)

**Package PG-HB1DSO-14-1** (bottom view)

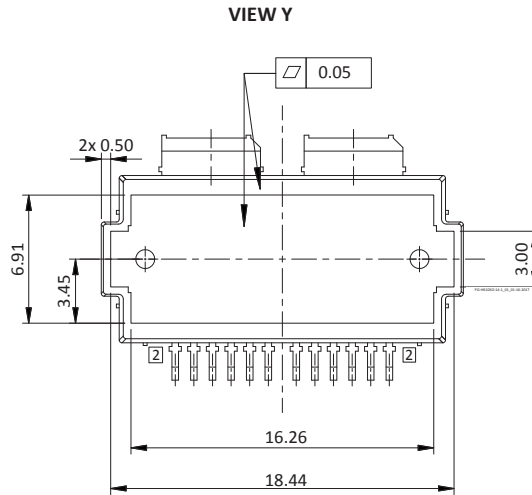


Diagram Notes—unless otherwise specified:

- 1. Mold/dam bar/metal protrusion of 0.30 mm max per side not included.
- 2. Metal protrusions are connected to source and shall not exceed 0.10 mm max.
- 3. Fillets and radii: all radii are 0.30 mm max.
- 4. Interpret dimensions and tolerances per ISO 8015.
- 5. Dimensions are mm.
- 6 All tolerances  $\pm 0.1$  mm unless specified otherwise.
- 7. All metal surfaces pre-plated, except area of cut.
- 8. Lead thickness: 0.25 mm.
- 9. Gold plating thickness: 0.25 micron max.

## Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2018-03-15	Advance	All	Data Sheet reflects advance specification for product development
02	2018-05-01	Advance	All	Converted to Wolfspeed Data Sheet

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## Notes

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