

Preliminary GTRA360502M

Thermally-Enhanced High Power RF GaN on SiC HEMT
50 W, 48 V, 3400 – 3800 MHz

Description

The GTRA360502M is a 50-watt (P3dB) GaN on SiC high electron mobility transistor (HEMT) for use in multi-standard cellular power amplifier applications. It features input matching, high efficiency, and a thermally-enhanced, overmold package.

Features

- GaN on SiC HEMT technology
- Asymmetric Doherty design
 - Main: P1dB = 20 W Typ
 - Peak: P1dB = 37 W Typ
- Typical pulsed CW performance, 3500 MHz, 48 V
 - Output power at P_{3dB} = 50 W
 - Gain = 15 dB
 - Efficiency = 55%
- Low thermal resistance

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



GTRA360502M
Package: PG-DFN-6.5x7-1

Target RF Characteristics

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

V_{DD} = 48 V, I_{DQ} = 26 mA, P_{OUT} = 7 W avg, V_{GS(PEAK)} = V_{GS} @ I_{DQ} = 43 mA – 2.5 V, f = 3600 MHz, 3GPP, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G _{ps}	—	15	—	dB
Drain Efficiency	η _D	—	55	—	%
Adjacent Channel Power Ratio	ACPR	—	-22	—	dBc

All published data at T_{CASE} = 25°C unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

RoHS
COMPLIANT

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	(main) $V_{GS} = -8\text{ V}$, $I_D = 0.36\text{ mA}$	$V_{(BR)DSS}$	150	—	—	V
	(peak) $V_{GS} = -8\text{ V}$, $I_D = 0.60\text{ mA}$	$V_{(BR)DSS}$	150	—	—	V
Drain-source Leakage Current	$V_{GS} = -8\text{ V}$, $V_{DS} = 10\text{ V}$	I_{DSS}	—	—	5	mA
Gate Threshold Voltage	(main) $V_{DS} = 10\text{ V}$, $I_D = 26\text{ mA}$	$V_{GS(th)}$	—	-3	—	V
	(peak) $V_{DS} = 10\text{ V}$, $I_D = 43\text{ mA}$	$V_{GS(th)}$	—	-3	—	V

Recommended Operating Conditions

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Operating Voltage		V_{DD}	0	—	50	V
Gate Quiescent Voltage	$V_{DS} = 48\text{ V}$, $I_D = \text{TBD mA}$	$V_{GS(Q)}$	—	TBD	—	V

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DSS}	125	V
Gate-source Voltage	V_{GS}	-10 to +2	V
Operating Voltage	V_{DD}	55	V
Gate Current	(main)	I_G	2.5 mA
	(peak)	I_G	4.3 mA
Drain Current	(main)	I_D	0.97 A
	(peak)	I_D	1.6 A
Junction Temperature	T_J	225	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

Operation above the maximum values listed here may cause permanent damage. Maximum ratings are absolute ratings; exceeding only one of these values may cause irreversible damage to the component. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. For reliable continuous operation, the device should be operated within the operating voltage range (V_{DD}) specified above.

Thermal Characteristics

Thermal resistance, junction to case ($T_{FLANGE} = 70^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Thermal Resistance	Main:	$R_{\theta JC}$	TBD °C/W
	Peak:	$R_{\theta JC}$	TBD °C/W

Moisture Sensitivity Level

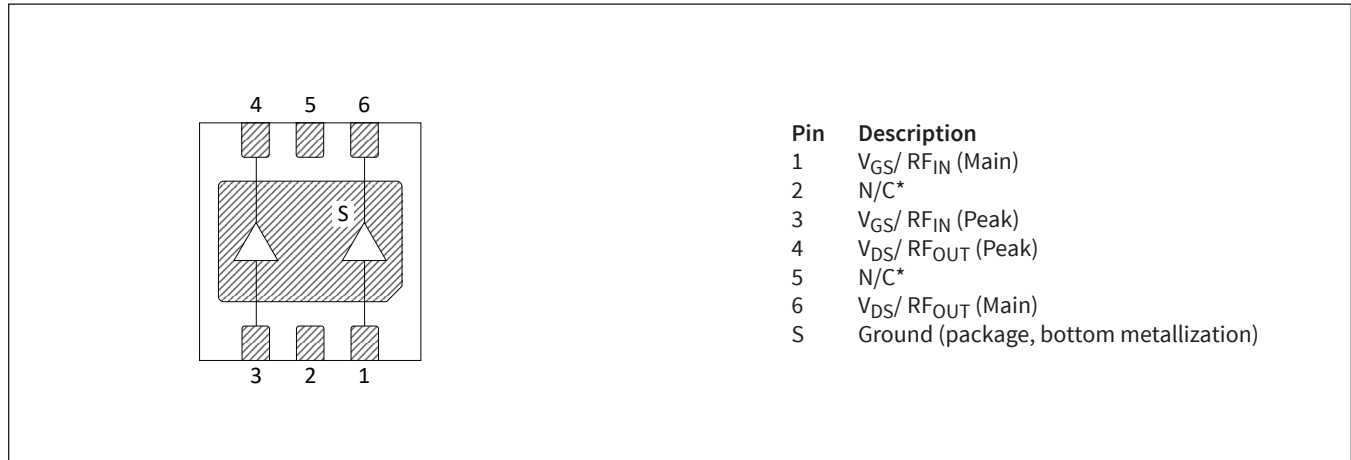
Level	Test Signal	Package Temperature	Unit
3	IPC/JEDEC J-STD-020	260	°C



Ordering Information

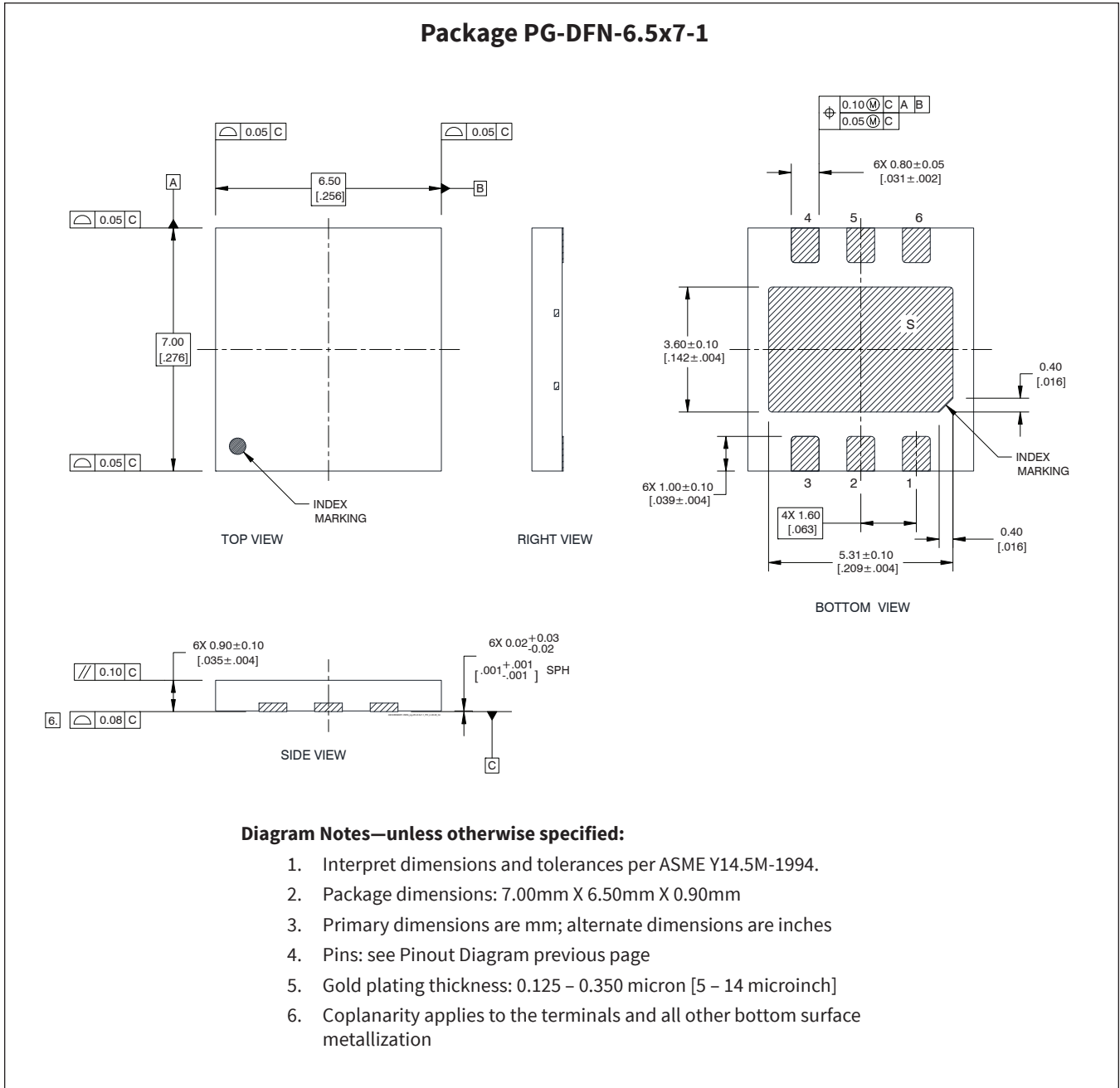
Type and Version	Order Code	Package	Shipping
GTRA360502M V1 (TBD)	TBD	PG-DFN-6.5x7-1, overmold	TBD

Pinout Diagram (bottom view)



* It is recommended that all pins labelled "NC" be connected to ground

Package Outline Specifications





Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2020-07-16	Preliminary	All	Data Sheet reflects preliminary specification for product development

For more information, please contact:

4600 Silicon Drive
Durham, North Carolina, USA 27703
www.wolfspeed.com/rf

Sales Contact
rfsales@cree.com

Notes & Disclaimer

Specifications are subject to change without notice. “Typical” parameters are the average values expected by Cree in large quantities and are provided for information purposes only. Cree products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death. No responsibility is assumed by Cree for any infringement of patents or other rights of third parties which may result from use of the information contained herein. No license is granted by implication or otherwise under any patent or patent rights of Cree.

© 2020 Cree, Inc. All rights reserved. Wolfspeed® and the Wolfspeed logo are registered trademarks of Cree, Inc.