PRELIMINARY WSGPA01

GaN on SiC General Purpose Amplifier

Description

The WSGPA01 is a GaN on SiC Discrete General Purpose Amplifier (GPA) designed for applications up to 5 GHz. The device operates from supply voltages up to 50 V and can achieve a P_{3dB} of 10 W, if matched appropriately. It is housed in a 3 mm X 4 mm DFN package. While it is designed for communications infrastructure applications with crest factor reduced and digitally pre-distorted LTE or 5G NR signals, it may be suitable for other applications at frequencies up to 5 GHz, restricted only by its maximum operating conditions.

Features

- Wolfspeed GaN on SiC Discrete High Electron Mobility Transistor (HEMT)
- Frequency range : up to 5 GHz
- Supply voltage : up to 50 V
- P_{3dB} : up to 10 W
- Maximum junction temperature : 225 °C
- Pb-free and RoHS compliant



WSGPA01
Package PG-DFN-3x4-1

Target RF Characteristics

Single-carrier WCDMA Performance (tested in Wolfspeed applications circuit for 3.4 – 3.6 GHz)
V_{DD} = 48 V, I_{DQ} = 25 mA, f = 3.5 GHz, channel bandwidth = 3.84 MHz, input PAR = 10 dB @ 0.01% CCDF

Characteristics	Symbol	Min	Typ	Max	Unit
Average Output Power	P_{avg}	—	26.5	—	dBm
Gain	G_{ps}	—	18	—	dB
Drain Efficiency	ηD	—	19	—	%
Adjacent Channel Power Ratio	ACPR	—	–42	—	dBc
Output PAR @ 0.01% CCDF	OPAR	—	0	—	dB

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

RoHS COMPLIANT

DC Characteristics

Characteristics	Conditions	Symbol	Min	Typ	Max	Unit
Drain Leakage Breakdown Voltage (main)	V_{GS} = –8 V, I_G = TBD mA	$V_{(BR)DSS}$	150	—	—	V
(peak)	V_{GS} = –8 V, I_G = TBD mA	$V_{(BR)DSS}$	150	—	—	V
Gate Leakage Current	V_{GS} = –8 V, V_{DS} = 10 V	I_{GSS}	—	—	5	mA
Gate Threshold Voltage (main)	V_{DS} = –10 V, I_D = TBD mA	$V_{GS(th)}$	—	TBD	—	V
(peak)	V_{DS} = –10 V, I_D = TBD mA	$V_{GS(th)}$	—	TBD	—	V

Recommended Operating Conditions

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

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
Junction Temperature	T_J	225	°C
Gate Current	I_G	TBD	mA
Drain Current	I_D	TBD	A
Storage Temperature Range	T_{STG}	–65 to +150	°C

Thermal Characteristics

Characteristics	Symbol	Value	Unit
Thermal Resistance	$R_{\theta JC}$	TBD	°C/W

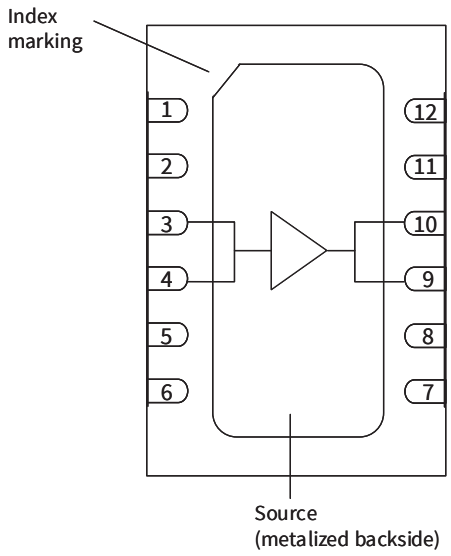
Moisture Sensitivity Level

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

Ordering Information

Type and Version	Order Code	Package	Shipping
WSGPA01-V1	TBD	PG-DFN-3x4-1	TBD

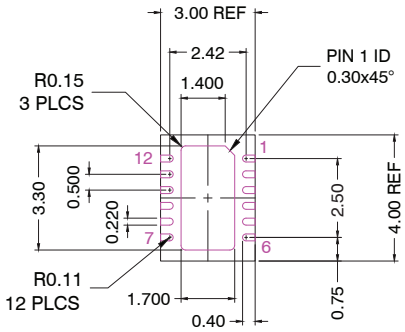
Pinout Diagram (top view)



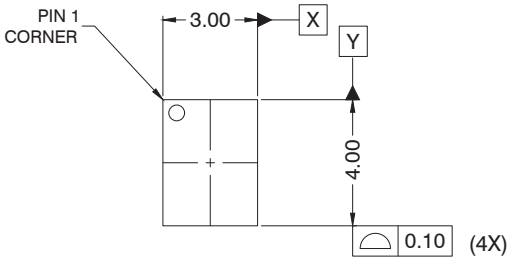
Pin	Description
1	NC
2	NC
3	$RF_{IN} + V_{GS}$
4	$RF_{IN} + V_{GS}$
5	NC
6	NC
7	NC
8	NC
9	$RF_{OUT} + V_{DS}$
10	$RF_{OUT} + V_{DS}$
11	NC
12	NC
PKG	GND

Package Outline Specifications

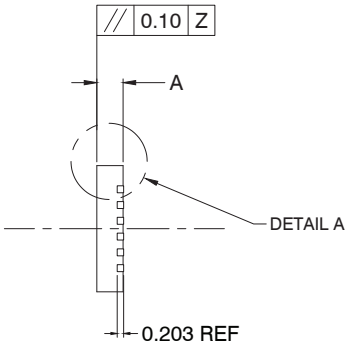
Package PG-DFN-3x4-1



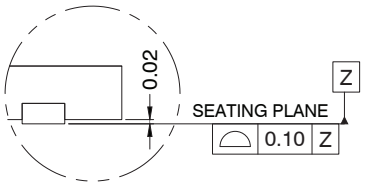
BOTTOM VIEW



TOP VIEW



SIDE VIEW



DETAIL A
ROTATED 90°

DIMENSION	MINIMUM	NOMINAL	MAXIMUM
A	0.80	0.85	0.90
NUMBER OF LAND PADS: 13			

Diagram Notes–unless otherwise specified:

1. All dimensions and tolerance conform to ASME Y14.5M-1994

Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2020-06-14	Preliminary	All	Data Sheet reflects preliminary specification for product development
01.1	2020-07-10	Preliminary	4	Updated package drawing

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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.

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