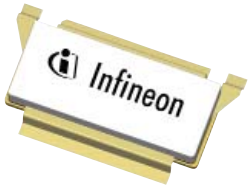
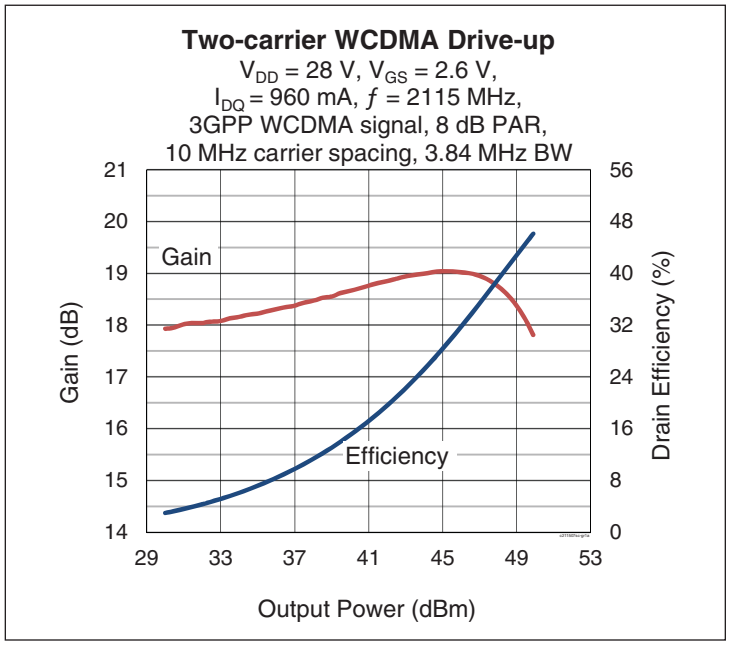
Thermally-Enhanced High Power RF LDMOS FET
150 W, 28 V, 2110 – 2170 MHz

Description

The PXFC211507SC is a 150-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 2110 to 2170 MHz frequency band. Features include input and output matching, high gain and a thermally-enhanced package with earless flanges. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXFC211507SC
Package H-37248G-4/2
(formed leads)





Features

- Broadband internal input and output matching
- Typical Pulsed CW performance, 2170 MHz, 28 V, 10 µs pulse width, 10% duty cycle
  - Output power at P_{1dB} = 150 W
  - Efficiency = 56%
  - Gain = 19 dB
- Typical single-carrier WCDMA performance, 2170 MHz, 28 V, 8 dB PAR @ 0.01% CCDF, Test Model 1 with 64DPCH
  - Output power = 32 W
  - Efficiency = 32%
  - Gain = 20 dB
- Capable of handling 10:1 VSWR @28 V, 150 W (CW) output power
- Integrated ESD protection
- ESD Rating: Human Body Model, Class 2 (per ANSI/ESDA/JEDEC JS-001
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

Two-carrier WCDMA Specifications (tested in Infineon test fixture)
V_{DD} = 28 V, I_{DQ} = 960 mA, P_{OUT} = 32 W avg, f_1 = 2160 MHz, f_2 = 2170 MHz, 3GPP WCDMA signal, 3.84 MHz channel bandwidth, 8 dB peak/average @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	19	20.4	—	dB
Drain Efficiency	η_D	29	32.9	—	%
Intermodulation Distortion	IMD	—	–30.5	–28	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 10 mA	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1	µA
	V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10	µA
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1	µA
On-State Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ} = 960 mA	V_{GS}	2.3	2.6	2.9	V

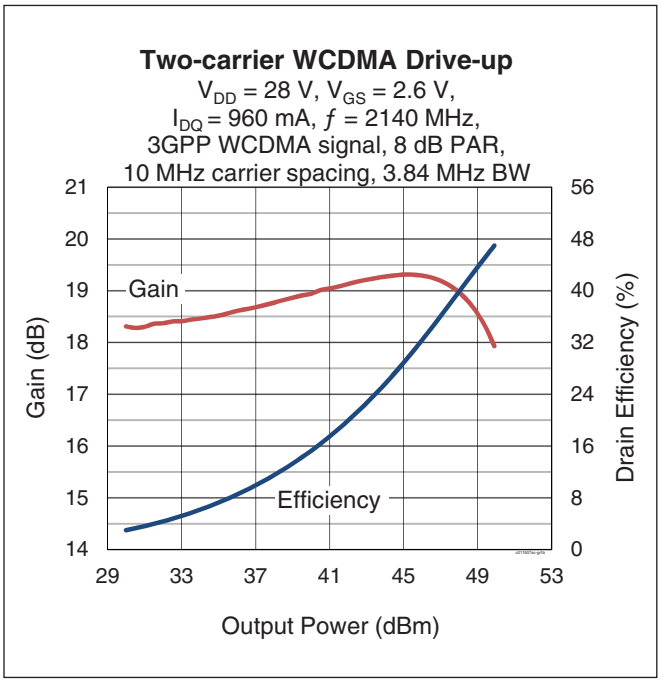
Maximum Ratings

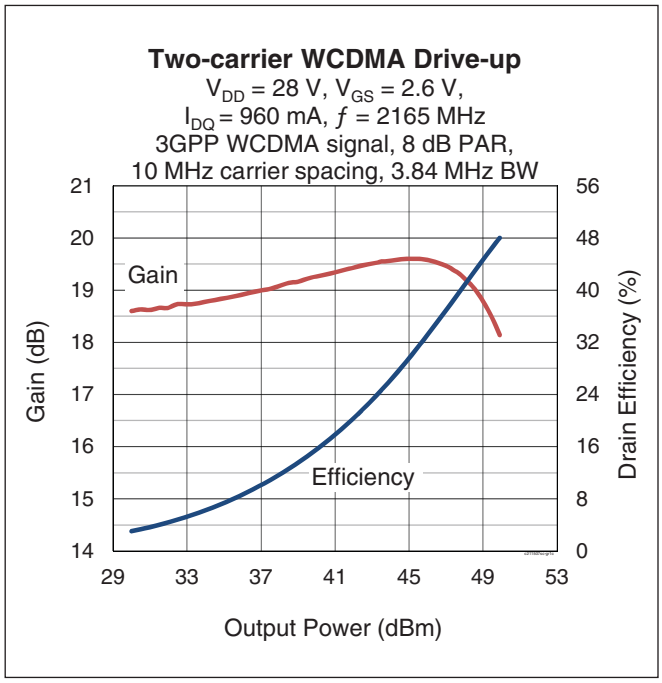
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	–6 to +10	V
Operating Voltage	V_{DD}	0 to +32	V
Junction Temperature	T_J	225	°C
Storage Temperature Range	T_{STG}	–65 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 150 W CW, 28 V)	$R_{\theta JC}$	0.56	°C/W

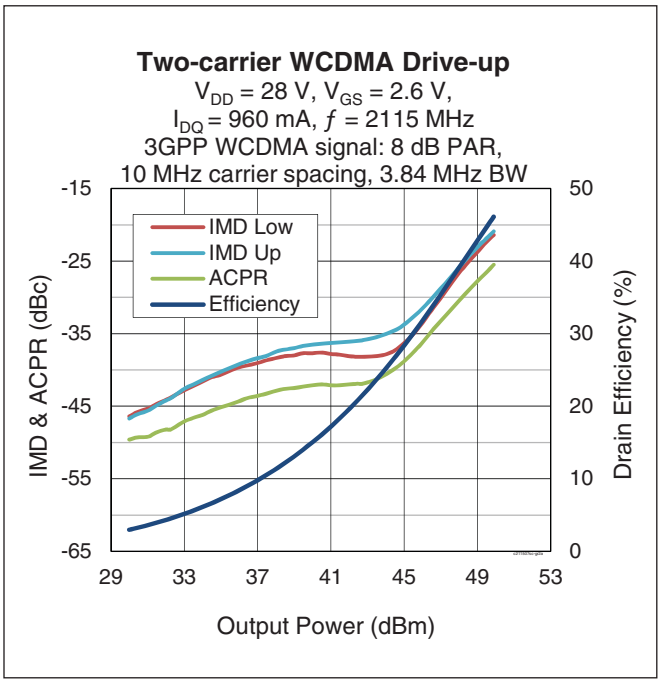
Ordering Information

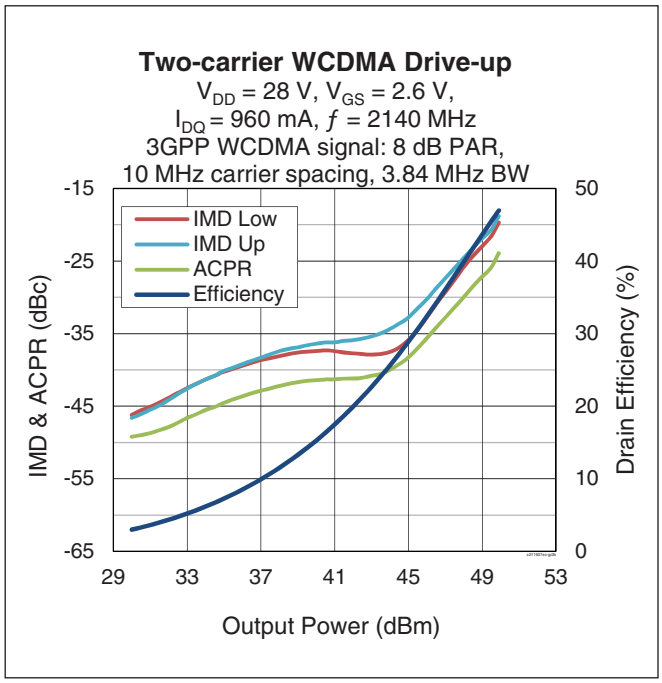
Type and Version	Order Code	Package and Description	Shipping
PXFC211507SC V1 R250	PXFC211507SCV1R250XTMA1	H-37248G-4/2, earless flange, formed leads	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

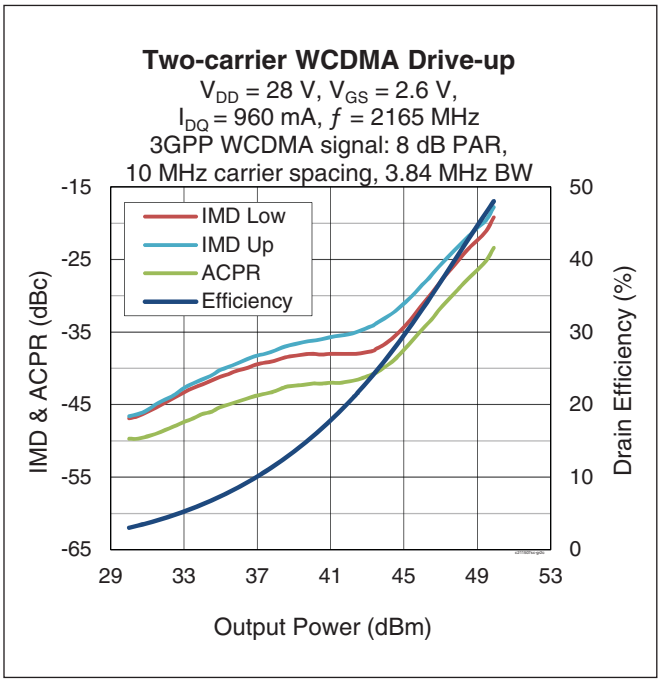


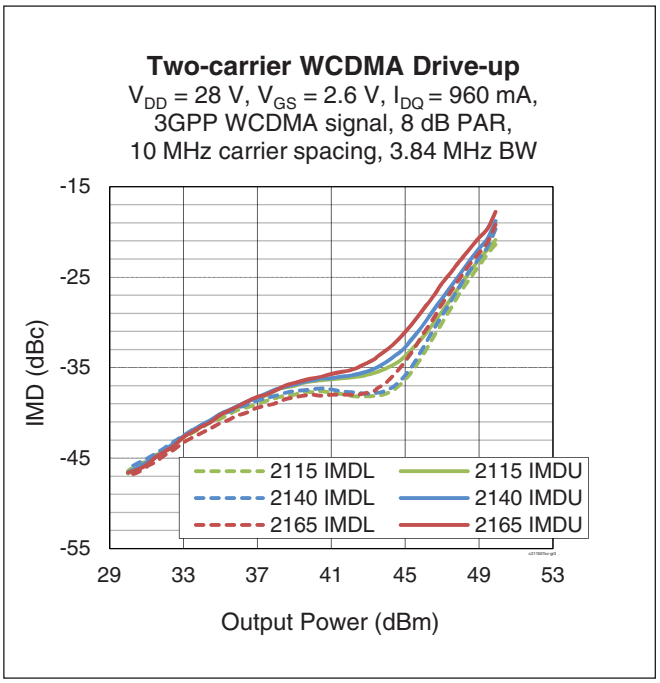


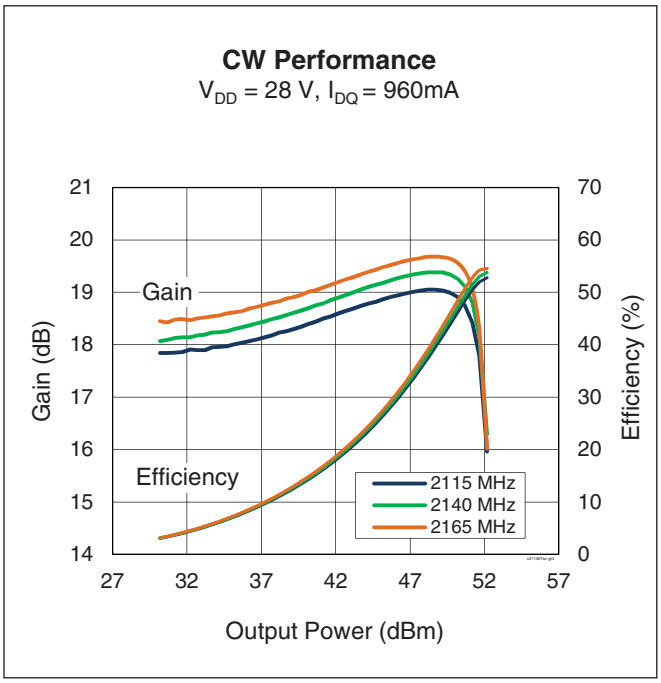


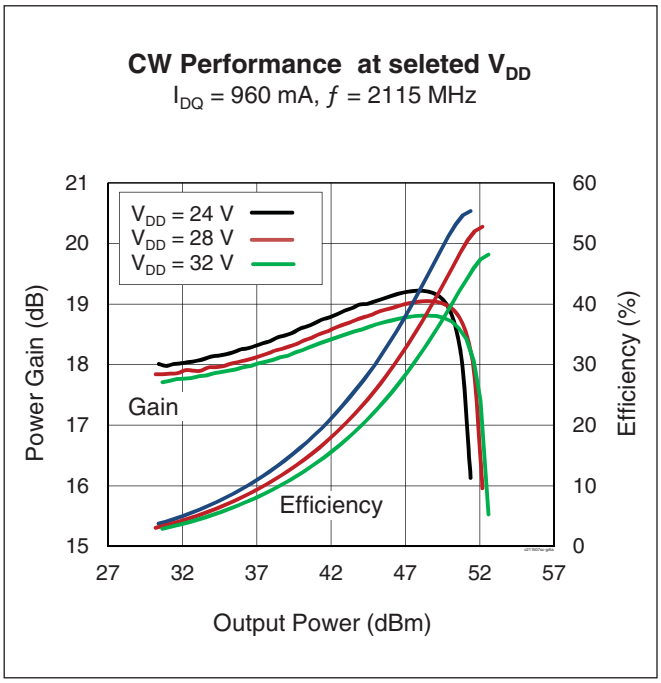


Typical Performance (cont.)



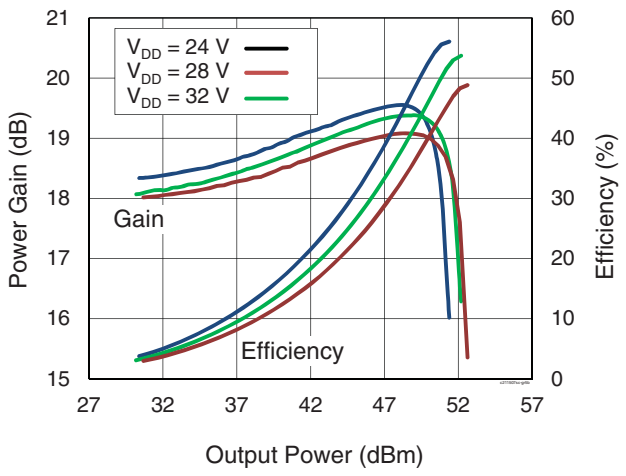




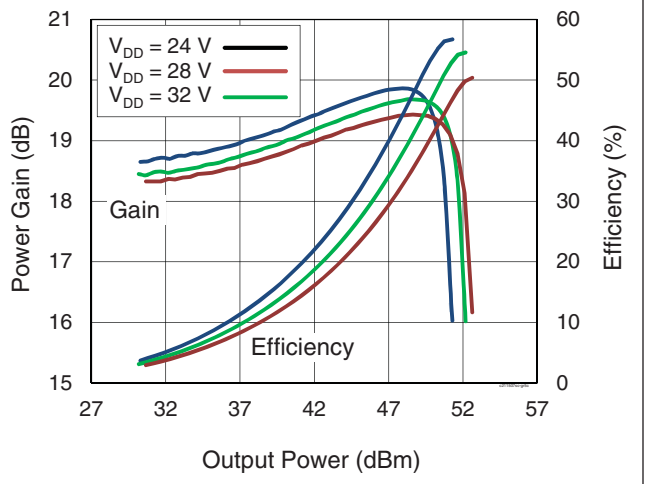


Typical Performance (cont.)

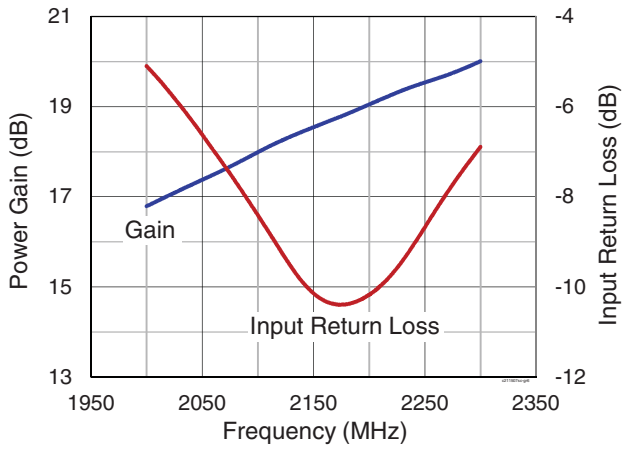
CW Performance at selected V_{DD}
I_{DQ} = 960 mA, f = 2140 MHz



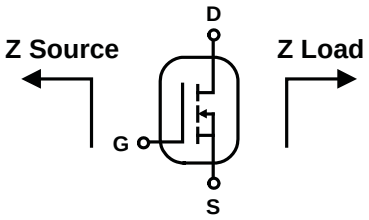
CW Performance at selected V_{DD}
I_{DQ} = 960 mA, f = 2165 MHz



Small Signal CW Performance
V_{DD} = 28 V, I_{DQ} = 960 mA



Load Pull Performance



Pulsed CW signal: 10 µs, 10% duty cycle, V_{DD} = 28 V, I_{DQ} = 960 mA

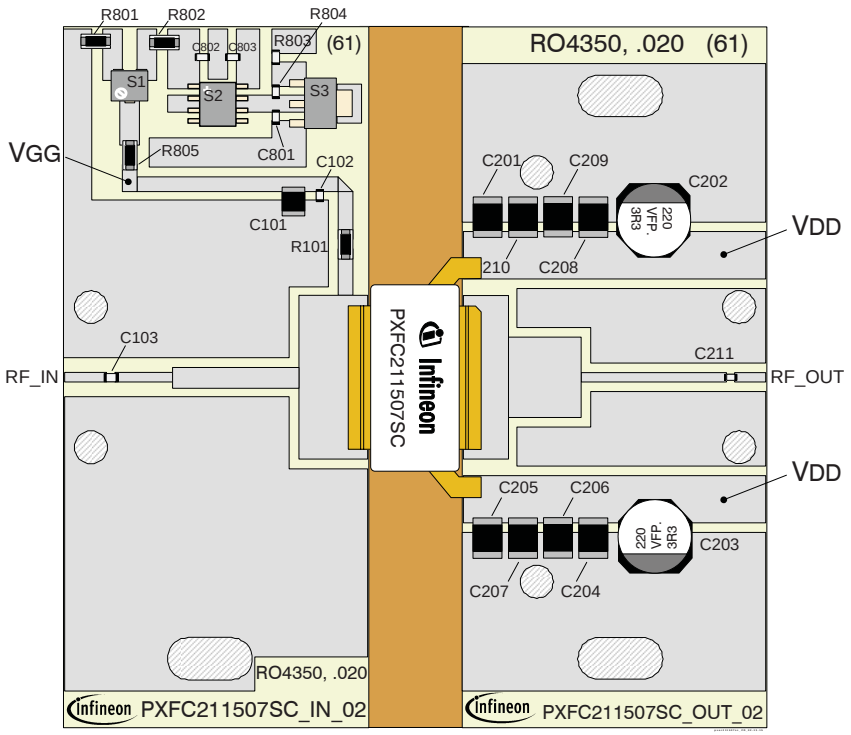
Class AB		P_{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]
2110	2.10 – j6.55	1.52 – j4.82	18.9	52.10	163	53.7	2.30 – j3.60	21.1	50.90	123	62.5
2140	2.31 – j6.77	1.58 – j4.87	19.2	52.10	163	54.0	2.22 – j3.56	21.4	50.80	120	62.4
2170	3.07 – j7.01	1.57 – j4.95	19.4	52.20	166	54.0	2.21 – j3.64	21.7	50.90	123	62.5

Reference Circuit Assembly, 2110 – 2170 MHz

DUT	PXFC211507SC V1
Reference Circuit No.	LTN/PXFC211507SC V1
Order Code	LTNPTFC211507SCE3TOBO1
PCB	Rogers 4350, 0.508 mm [0.020”] thick, 2 oz. copper, ε_r = 3.66

Find Gerber files for this test fixture on the Infineon Web site at **http://www.infineon.com/rfpower**

Reference Circuit (cont.)



Reference circuit assembly diagram (not to scale)

Components Information

Component	Description	Manufacturer	P/N
In			
C101	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C102, C103	Capacitor, 10 pF	ATC	ATC800A100JW150XB
C801, C802, C803	Capacitor, 0.001 µF	Panasonic	ECJ-1VB1H102K
R101, R801, R805	Resistor, 10 ohms	Panasonic Electronic Components	ERJ-8GEYJ100V
R802	Resistor, 100 ohms	Panasonic Electronic Components	ERJ-8GEYJ101V
R803	Resistor, 1.3k ohms	Panasonic Electronic Components	ERJ-3GEYJ132V
R804	Resistor, 1.2k ohms	Panasonic Electronic Components	ERJ-3GEYJ122V
S1	Variable resistor, 2k ohms	Bourns Inc.	3224W-1-202E
S2	Voltage Regulator	Fairchild Semiconductor	LM7805CT
S3	Transistor	Fairchild Semiconductor	BCP56
Out			
C201, C204, C205, C206, C207, C208, C209, C210	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C202, C203	Capacitor, 220 µF	Panasonic Electronic Components	EEE-FP1V221AP
C211	Capacitor, 10 pF	ATC	ATC800A100JW150XB

Package Outline Specifications

Package H-37248G-4/2 (formed leads)

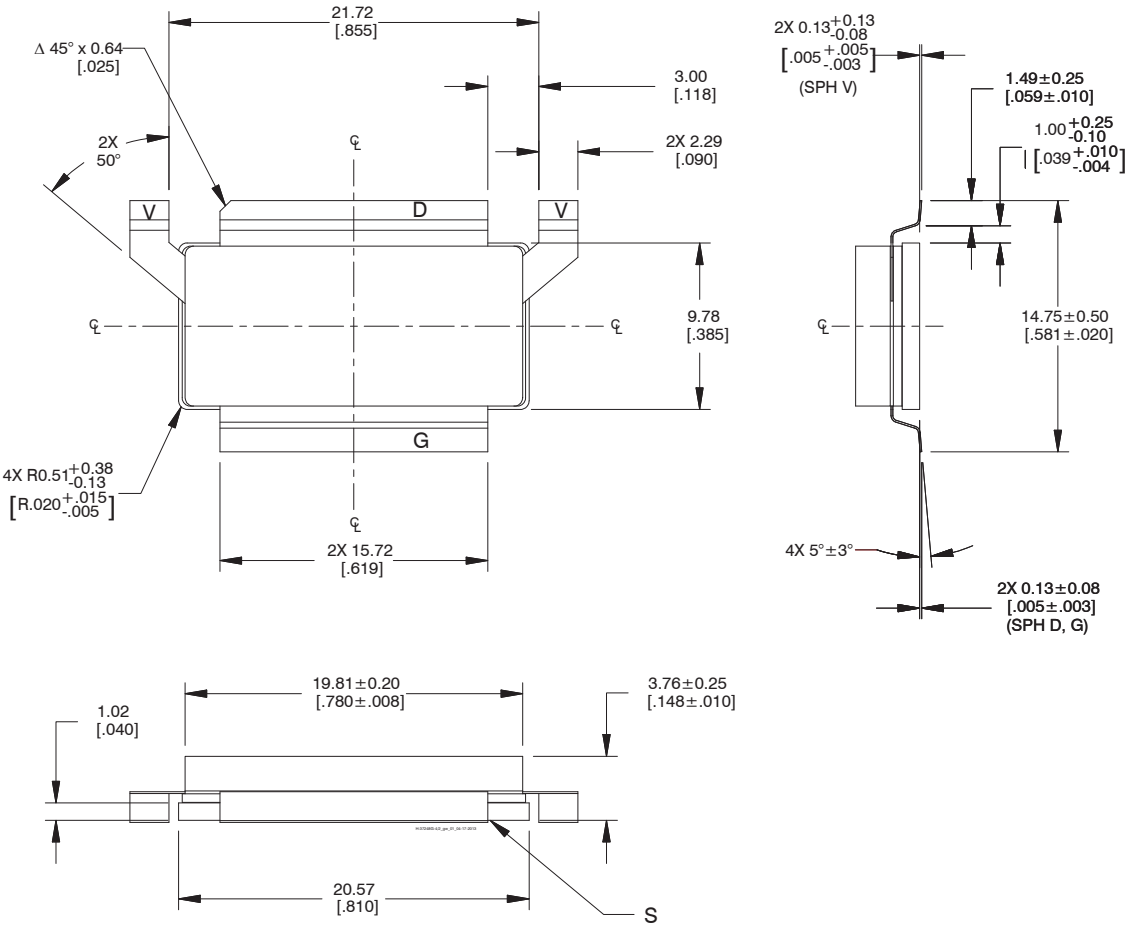


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994
2. Primary dimensions are mm, alternate dimensions are inches
3. All tolerances ± 0.127 [0.005]
4. Pins: D – drain, G – gate, S – source (flange), V – supply voltage
5. Lead thickness: 0.10 +0.051/–0.025 mm [.004 +.002/–.001 inch]
6. Gold plating thickness: 1.14 ± 0.38 micron [45 ± 15 microinch]

Find the latest and most complete information about products and packaging at the Infineon Internet page
http://www.infineon.com/rfpower

Revision History

Revision	Date	Data Sheet	Page	Subjects (major changes at each revision)
01	2014-05-09	Advance	all	Proposed specification for new product development.
02	2015-03-03	Production	all	Complete final specifications, including production data, performance curves, reference circuit layout and load pull information.

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