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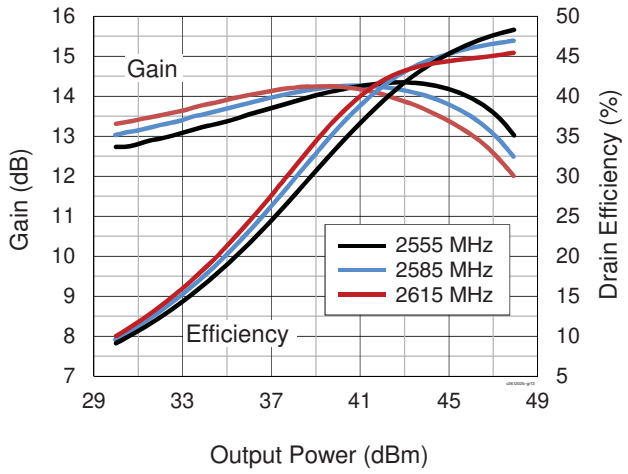
Thermally-Enhanced High Power RF LDMOS FET
120 W, 28 V, 2496 – 2690 MHz

Description

The PXAC261202FC is a 120-watt LDMOS FET with an asymetric design for use in multi-standard cellular power amplifier applications in the 2496 to 2690 MHz frequency band. It features dual-path design, input and output matching, and a thermally-enhanced package with earless flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXAC261202FC
Package H-37248-4

Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 220 mA
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW



Features

- Broadband internal matching
- CW performance in a Doherty configuration, 2555 MHz, 28 V
  - Output power at P_{1dB} = 80 W
  - Gain = 13.6 dB
  - Efficiency = 48%
- Single-carrier WCDMA performance in a Doherty configuration, 2555 MHz, 28 V, 8 dB PAR
  - Output power 28 W
  - Gain = 14.3 dB
  - Efficiency = 44.5%
  - ACPR –30 dBc @ 5 MHz
- Integrated ESD protection: Human Body Model, Class 1C (per JESD22-A114)
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

Two-carrier WCDMA Specifications (tested in Infineon Doherty test fixture)
V_{DD} = 28 V, $V_{GS(peak)}$ = 0.9 V, I_{DQ} = 230 mA, P_{OUT} = 28 W average, f_1 = 2610 MHz, f_2 = 2620 MHz. 3GPP WCDMA signal: 3.84 MHz bandwidth, 8 dB PAR @0.01% CCDF.

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	12.5	13.5	—	dB
Drain Efficiency	η_D	41.0	45	—	%
Intermodulation Distortion	IMD	—	–29.5	–26.0	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}	—	—	1.0	µA
		V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	µA
Gate Leakage Current		V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1.0	µA
On-state Resistance	(main)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.19	—	Ω
	(peak)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.16	—	Ω
Operating Gate Voltage	(main)	V_{DS} = 28 V, I_{DQ} = 0.23 A	V_{GS}	2.1	2.6	3.1	V
	(peak)	V_{DS} = 28 V, I_{DQ} = 0 A	V_{GS}	0.4	0.9	1.4	V

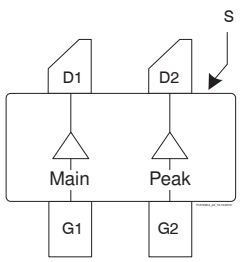
Maximum Ratings

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, 100 W CW)	$R_{\theta JC}$	0.48	°C/W

Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PXAC 261202FC V1	PXAC261202FCV1XWSA1	H-37248-4, ceramic open-cavity, earless	Tray
PXAC 261202FC V1 R250	PXAC261202FCV1R250XTMA1	H-37248-4, ceramic open-cavity, earless	Tape & Reel, 250 pcs

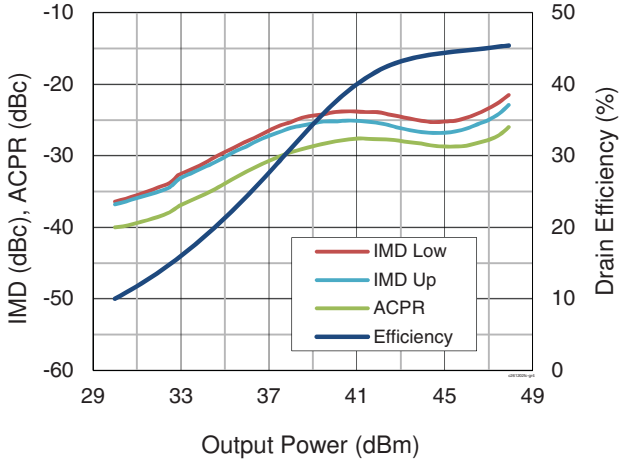
Pinout Diagram (top view)



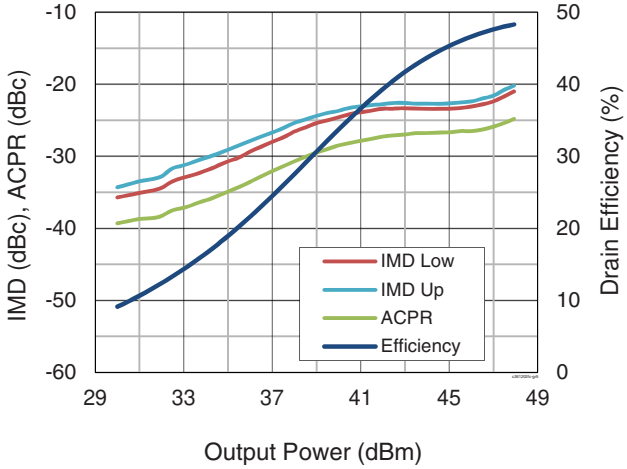
Pin	Description
D1	Drain device 1 (main)
D2	Drain device 2 (peak)
G1	Gate device 1 (main)
G2	Gate device 2 (peak)
S	Source (flange)

Typical Performance (data taken in Infineon Doherty reference test fixture)

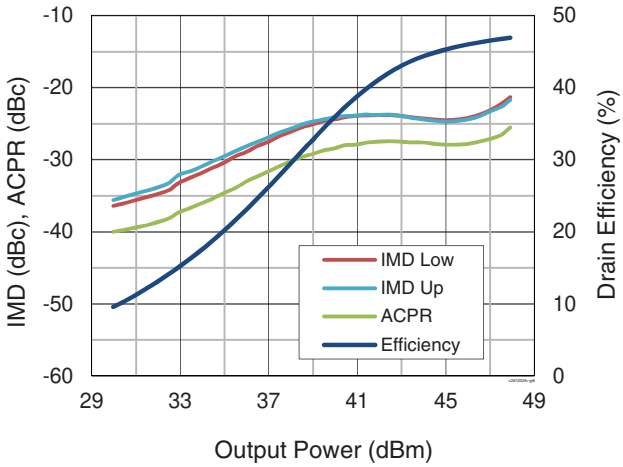
Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 220 mA, f = 2615 MHz,
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW



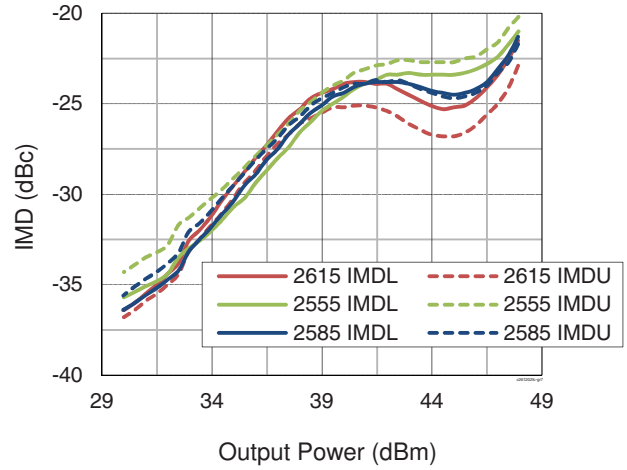
Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 220 mA, f = 2555 MHz
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW



Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 220 mA, f = 2585 MHz
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW

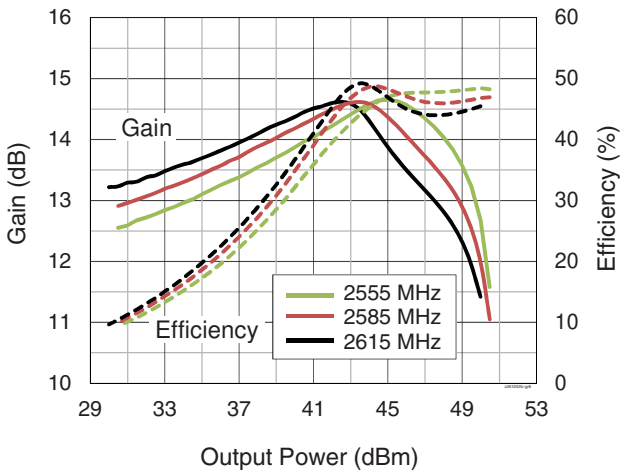


Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 220 mA
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW

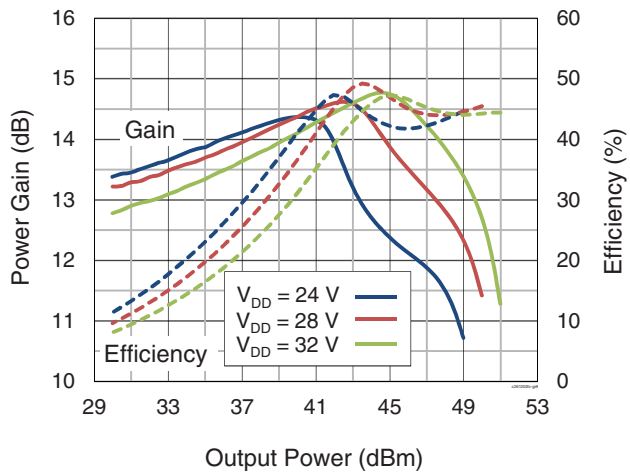


Typical Performance (cont.)

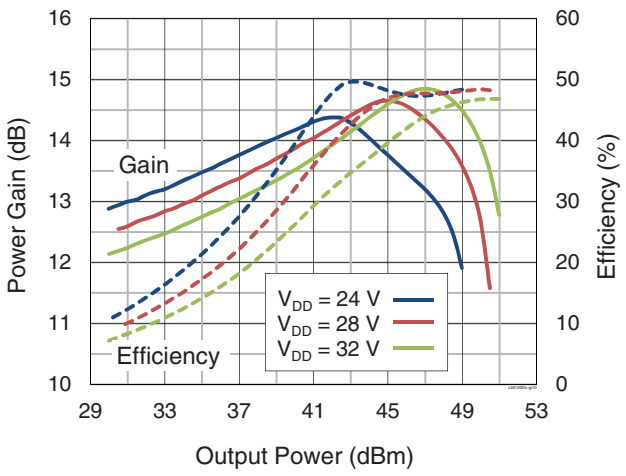
CW Performance
V_{DD} = 28 V, I_{DQ} = 220 mA



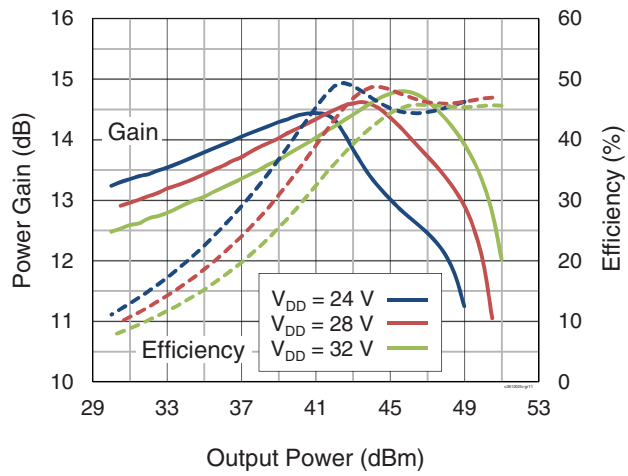
CW Performance at selected V_{DD}
I_{DQ} = 220 mA, f = 2615 MHz



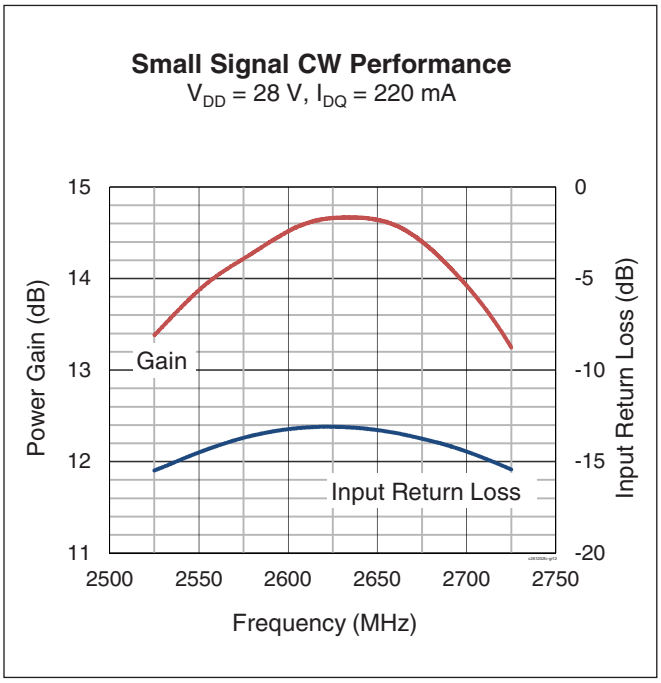
CW Performance at selected V_{DD}
I_{DQ} = 220 mA, f = 2555 MHz



CW Performance at selected V_{DD}
I_{DQ} = 220 mA, f = 2585 MHz

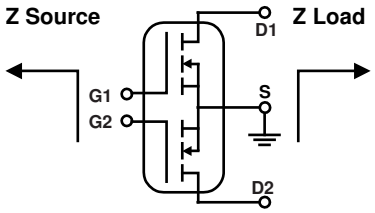


Typical Performance (cont.)



See next page for load pull information

Load Pull Performance



Main side pulsed CW signal: 160 µsec, 10% duty cycle; 28 V, I_{DQ} = 250 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 [%]
2490	7.15 – j17.1	3.49 – j6.98	16.5	48.38	68.9	52	6.98 – j4.51	18.7	46.76	47.4	61.3
2590	9 – j17.7	3.56 – j6.97	16.7	48.29	67.5	51.8	5.66 – j3.59	19	46.5	47.7	61.1
2690	12.8 – j18.2	3.62 – j7.38	16.6	48.23	66.5	51.3	4.89 – j4.12	18.8	46.75	47.3	60.1

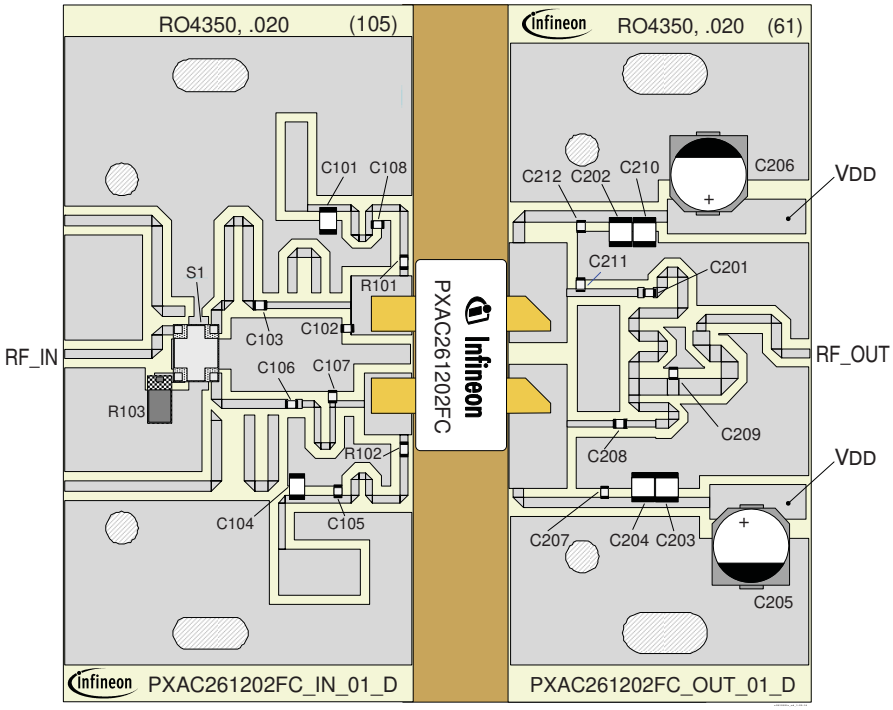
Peak side pulsed CW signal: 160 µsec, 10% duty cycle; V_{GS} = 1.3 V, I_{DQ} = 0 mA

Class C		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 [%]
2490	14.7 – j15.8	1.58 – j6.3	12.80	50.13	103.04	51.60	2.63 – j5.85	13.80	49.45	88.10	59.80
2590	9.9 – j9.9	1.67 – j6.51	13.10	49.89	97.50	51.40	3.28 – j5.65	14.20	48.50	70.79	59.70
2690	5.5 – j8.3	2.04 – j7.0	13.10	49.50	89.13	52.50	2.97 – j6.11	13.80	48.50	70.79	57.80

Reference Circuit, tuned for 2620 – 2690 MHz

DUT	PXAC261202FC
Reference Fixture Part No.	LTA/PXAC261202FC V1
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, ε_r = 3.66

Find Gerber files for this reference fixture on the Infineon Web site at (**www.infineon.com/rfpower**)



Reference circuit assembly diagram (not to scale)

Component Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101, C104	Chip capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C102	Chip capacitor, 1 pF	ATC	ATC800A0R8CT250T
C103, C105, C106, C108	Chip capacitor, 10 pF	ATC	ATC800A100JT250T
C107	Chip capacitor, 1 pF	ATC	ATC800A1R0CT250T
R101, R102	Resistor, 10 ohms	Panasonic – ECG	ERJ-3GEYJ100V
R103	Resistor, 50 Ω	Anaren	C16A50Z4
S1	Directional coupler	Anaren	X3C25P1-05S
Output			
C201, C207, C208, C212	Chip capacitor,	ATC	ATC800A100JT250T
C202, C203, C204, C210	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C205, C206	Capacitor, 220 µF, 35 V	Panasonic – ECG	EEE-FP1V221AP
C209, C211	Chip capacitor, 1 pF	ATC	ATC800A0R8CT250T

Package Outline Specifications

Package H-37248-4

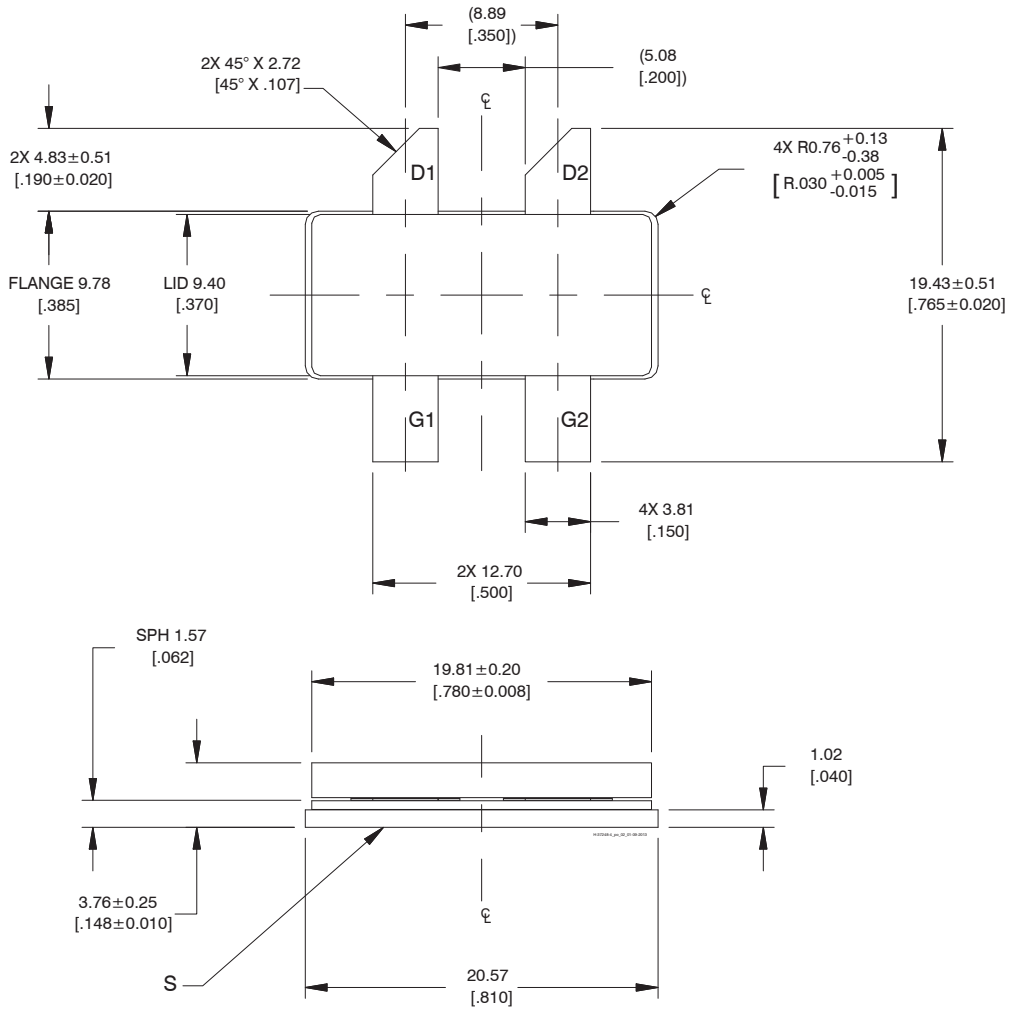


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances ± 0.127 [.005].
4. Pins: D – drain, S – source, G – gate, V – drain voltage (V_{DD}).
5. Lead thickness: 0.10 +0.076/–0.025 [.004 +.003/–.001].
6. Gold plating thickness: 1.14 ± 0.38 micron [45 ± 15 microinch].

Find the latest and most complete information tabout products and packaging at the Infineon Internet page (**www.infineon.com/rfpower**)

Revision History

Revision	Date	Data Sheet	Page	Subjects (major changes since last revision)
01	2013-09-26	Advance	All	Proposed specification for new product development.
02	2014-02-26	Production	All 3 – 5, 6, 7	Data Sheet reflects released product data and specifications. Typical Performance graphs, load pull and reference circuit information added.

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