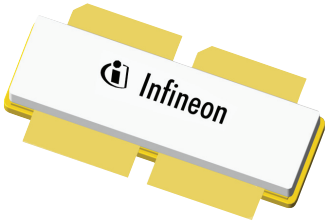
green Product

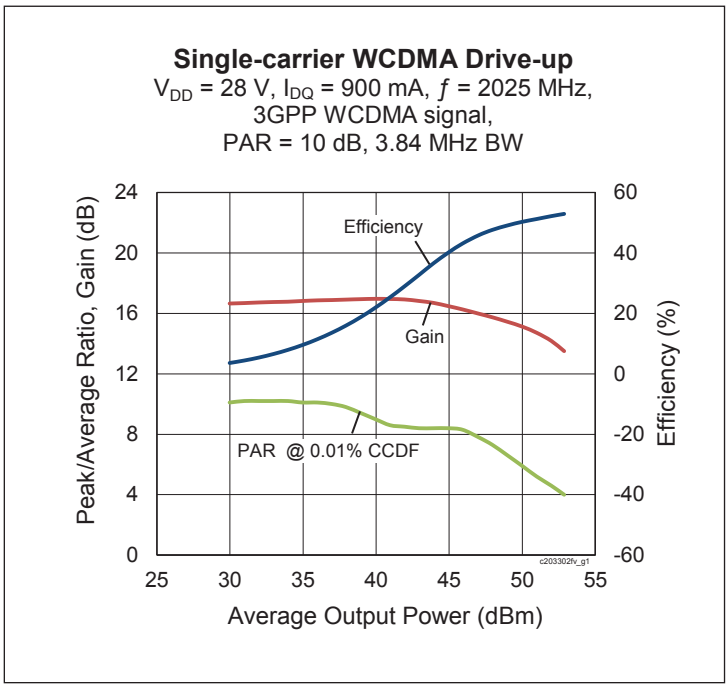
Thermally-Enhanced High Power RF LDMOS FET
330 W, 28 V, 1880 – 2025 MHz

Description

The PXAC203302FV is a 330-watt LDMOS FET with an asymmetrical design intended for use in multi-standard cellular power amplifier applications in the 1880 to 2025 MHz frequency band. Features include dual-path design, input matching, high gain and thermally-enhanced package with earless flanges. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXAC203302FV
Package H-37275-4





Features

- Broadband internal input and output matching
- Asymmetrical Doherty design
  - Main : P_{1dB} = 130 W Typ
  - Peak : P_{1dB} = 200 W Typ
- Typical Pulsed CW performance, 2025 MHz, 28 V, combined outputs, Doherty Configuration
  - Output power at P_{1dB} = 250 W
  - Efficiency = 55%
  - Gain = 16 dB
- Capable of handling 10:1 VSWR @28 V, 250 W (CW) output power
- Human Body Model Class 2 (per ANSI/ESDA/JEDEC JS-001)
- Integrated ESD protection
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

Single-carrier WCDMA Specifications (tested in Infineon Doherty test fixture)
V_{DD} = 28 V, I_{DQ} = 900 mA, V_{GSPEAK} = 1.1 V, P_{OUT} = 56 W avg, f_1 = 2025 MHz, 3GPP signal, channel bandwidth = 3.84MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	15	16	—	dB
Drain Efficiency	η_D	45	49	—	%
Adjancent Channel Power Ratio	ACPR	—	–30.5	–26	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics (each side)

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
On-State Resistance (main)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.088	—	Ω
(peak)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.088	—	Ω
Operating Gate Voltage (main)	V_{DS} = 28 V, I_{DQ} = 900 mA	V_{GS}	2.5	2.7	2.8	V
(peak)	V_{DS} = 28 V, I_{DQ} = 0 A	V_{GS}	0.6	1.1	1.4	V
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1	µA

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 (main, T_{CASE} = 70°C, 56.2 W CW)	$R_{\theta JC}$	0.62	°C/W
(peak, T_{CASE} = 70°C, 260 W CW)	$R_{\theta JC}$	0.35	°C/W

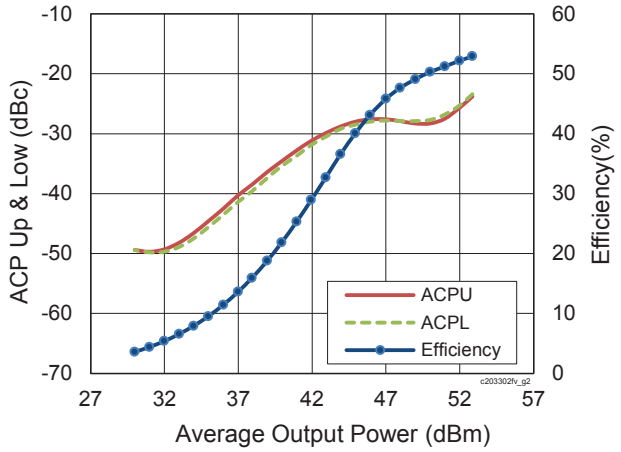
Ordering Information

Type and Version	Order Code	Package Description	Shipping
PXAC203302FV V1 R0	PXAC203302FVV1R0XTMA1	H-37275-4, earless flange	Tape & Reel, 50 pcs
PXAC203302FV V1 R250	PXAC203302FVV1R250XTMA1	H-37275-4, earless flange	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

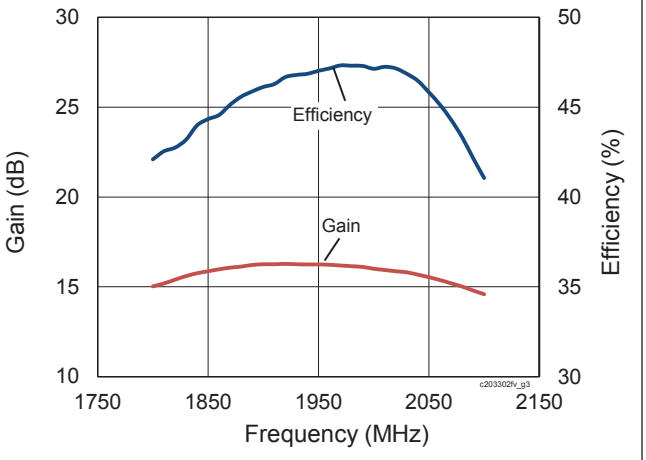
Single-carrier WCDMA Drive-up

V_{DD} = 28 V, I_{DQ} = 900 mA, f = 2025 MHz,
3GPP WCDMA signal, PAR = 10 dB,
BW = 3.84 MHz



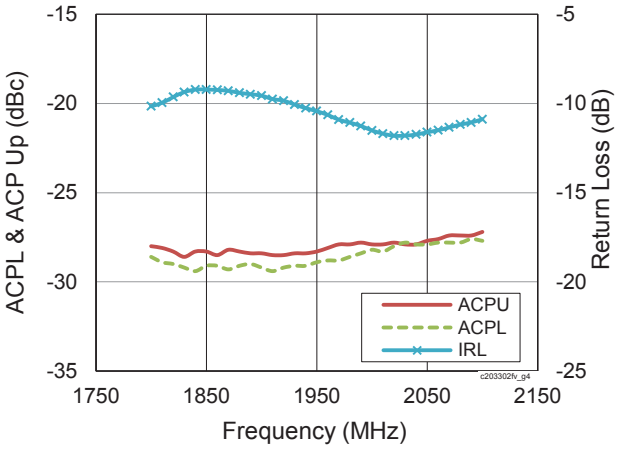
Single-carrier WCDMA Broadband Performance

V_{DD} = 28 V, I_{DQ} = 900 mA, P_{OUT} = 47.5 dBm,
3GPP WCDMA signal, PAR = 10 dB



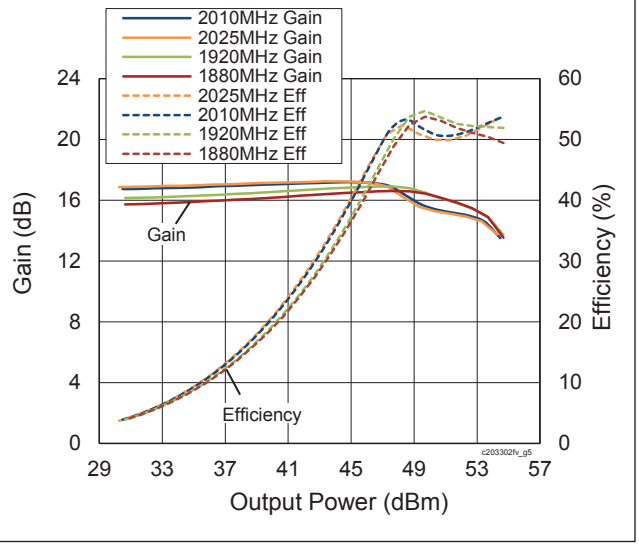
Single-carrier WCDMA Broadband Performance

V_{DD} = 28 V, I_{DQ} = 900 mA, P_{OUT} = 47.5 dBm,
3GPP WCDMA signal, PAR = 10 dB

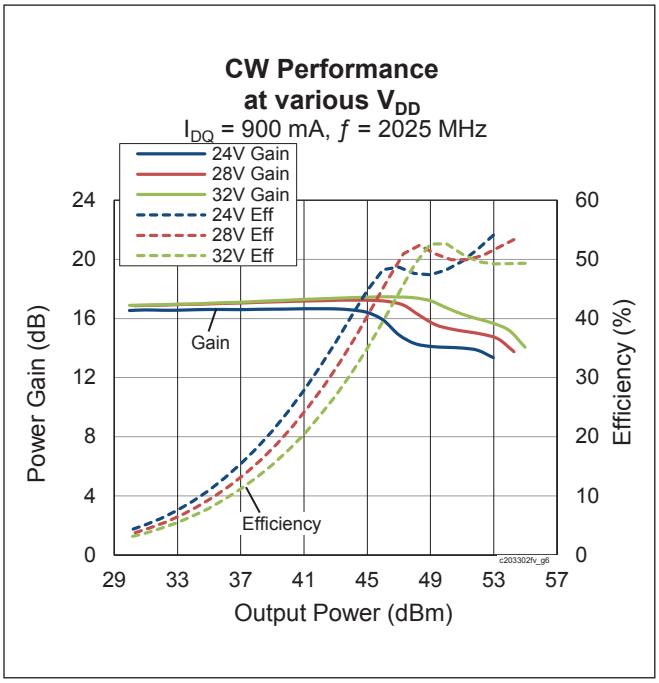


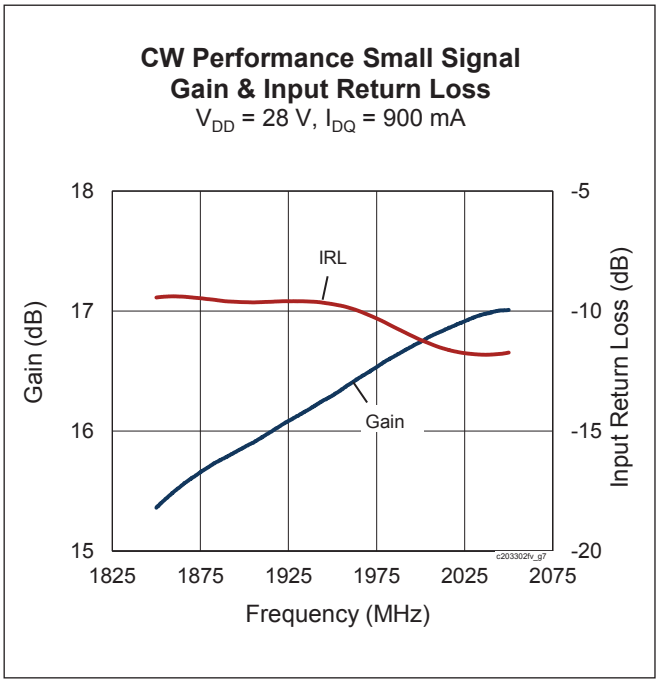
CW Performance

V_{DD} = 28 V, I_{DQ} = 900mA



Typical Performance (cont.)





Load Pull Performance

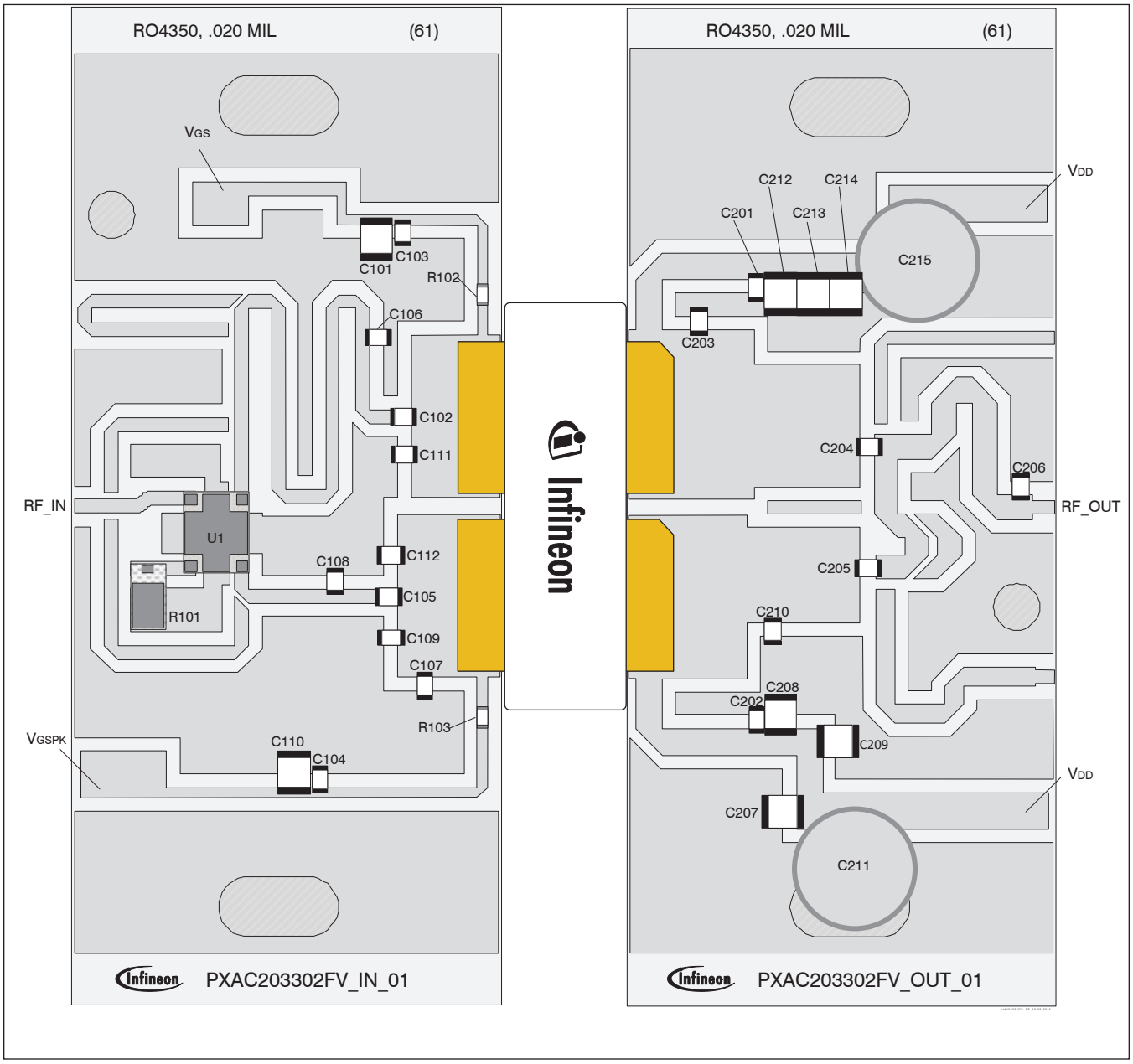
Main Side Load Pull Performance – Pulsed CW signal: 160 µs, 10% duty cycle, 28 V, I_{DQ} = 800 mA, Class AB

		P_{1dB}									
		Max Output Power					Max Drain Efficiency				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	η_D [%]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	η_D [%]
1880	2.78 – j6.42	1.33 – j2.33	18.5	52.5	179	55.1	3.40 – j1.31	21.2	50.0	100	66.7
1900	2.94 – j6.93	1.31 – j2.40	18.5	52.5	176	54.4	2.82 – j1.21	21.2	50.1	102	65.5
1920	3.81 – j7.27	1.30 – j2.46	18.5	52.4	174	53.8	2.61 – j1.25	21.0	50.4	108	65.6
2010	6.13 – j8.11	1.17 – j2.61	18.4	52.1	164	50.6	2.19 – j1.29	21.2	50.0	100	63.2
2025	8.73 – j8.92	1.29 – j2.65	18.8	52.2	168	53.9	2.19 – j1.35	21.2	50.1	101	62.9

Peak Side Load Pull Performance – Pulsed CW signal: 160 µs, 10% duty cycle, 28 V, V_{GS} = 1.4 V, Class C

		P_{1dB}									
		Max Output Power					Max Drain Efficiency				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	η_D [%]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	η_D [%]
1880	1.47 – j3.68	2.40 – j2.40	15.4	54.0	250	54.8	1.69 – j0.40	16.5	52.0	159	65.4
1900	1.52 – j4.02	2.08 – j2.31	15.8	54.0	249	55.8	1.58 – j0.55	16.9	52.1	164	66.9
1920	1.54 – j4.21	2.29 – j2.39	15.9	53.9	247	55.6	1.44 – j0.58	17.0	51.9	156	66.7
2010	2.84 – j4.51	2.51 – j2.67	16.1	53.7	236	54.5	1.50 – j1.19	17.2	52.1	162	64.3
2025	4.34 – j5.13	2.68 – j2.58	16.4	53.8	192	55.2	1.37 – j1.22	17.3	51.9	155	64.6

Reference Circuit , 1880 – 2025 MHz



Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

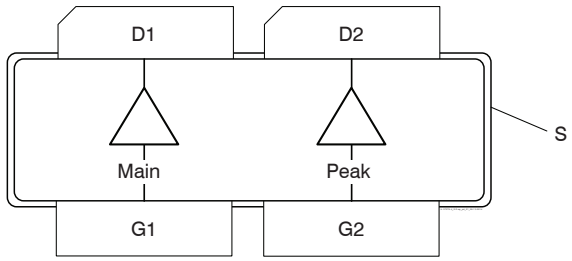
Reference Circuit Assembly

DUT	PXAC203302FC V1
Test Fixture Part No.	LTA/PXAC203302FC V1
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, ε_r = 3.66, f = 1880 – 2025 MHz
Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower	

Components Information

Component	Description	Manufacturer	P/N
Input			
C101, C110	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C102, C103, C104, C105	Capacitor, 15 pF	ATC	ATC600F150JT250XT
C106, C111	Capacitor, 1 pF	ATC	ATC600F1R0BT250XT
C107	Capacitor, 2.7 pF	ATC	ATC600F2R7BT250XT
C108	Capacitor, 1.6 pF	ATC	ATC600F1R6BT250XT
C109	Capacitor, 0.5 pF	ATC	ATC600F0R5BT250XT
C112	Capacitor, 0.8 pF	ATC	ATC600F0R8BT250XT
R101, R102	Resistor, 10 Ω	Panasonic Electronic Components	ERJ-3GEYJ100V
R103	Resistor, 50 Ω	Richardson	C16A50Z4
U1	Hybrid Coupler	Anaren	X3C19P1-05S
Output			
C201, C202	Capacitor, 15 pF	ATC	ATC600F150JT250XT
C203	Capacitor, 1.6 pF	ATC	ATC600F1R6BT250XT
C204, C205	Capacitor, 6.8 pF	ATC	ATC600F6R8BT250XT
C206	Capacitor, 0.3 pF	ATC	ATC600F0R3BT250XT
C207, C208, C209, C212, C213, C214	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C210	Capacitor, 0.5 pF	ATC	ATC600F0R5BT250XT
C211, C215	Capacitor, 220 µF	Cornell Dubilier Electronics (CDE)	SK221M050ST

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)

Lead connections for PXAC203302FV

Package Outline Specifications

Package H-37275-4

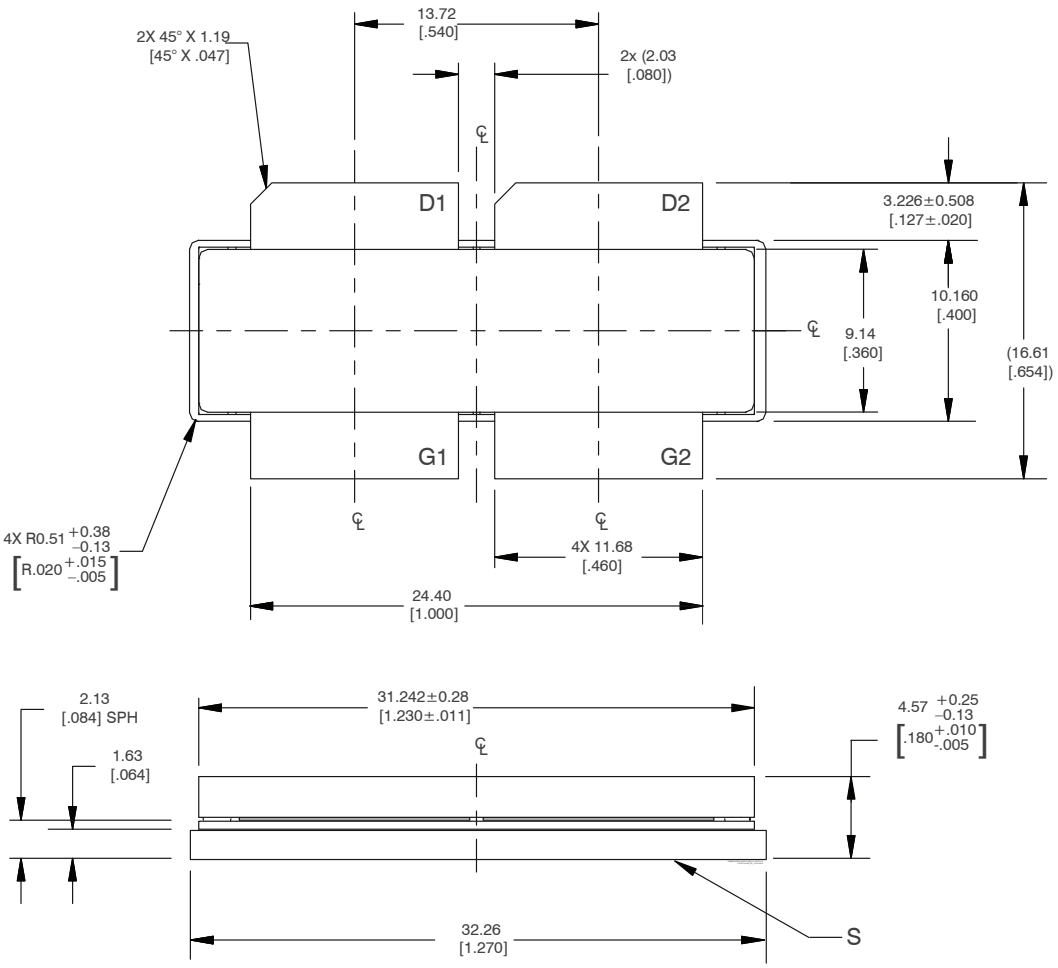


Diagram Notes—unless otherwise specified:

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] unless specified otherwise.
4. Pins: D1, D2 – drains; G1, G2 – gates; S – source.
5. Lead thickness: 0.127 + 0.051 mm [0.005 ± 0.002 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 Type	Page	Subjects (major changes since last revision)
01	2014-10-08	Advance	All	Data Sheet reflects advance specification for product development
02	2015-06-09	Production	All All	Data Sheet reflects released product specification Revised all data and includes updated final specs, typical performance graphs, loadpull, reference circuit, package outline
02.1	2016-06-22	Production	2	Updated ordering information

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