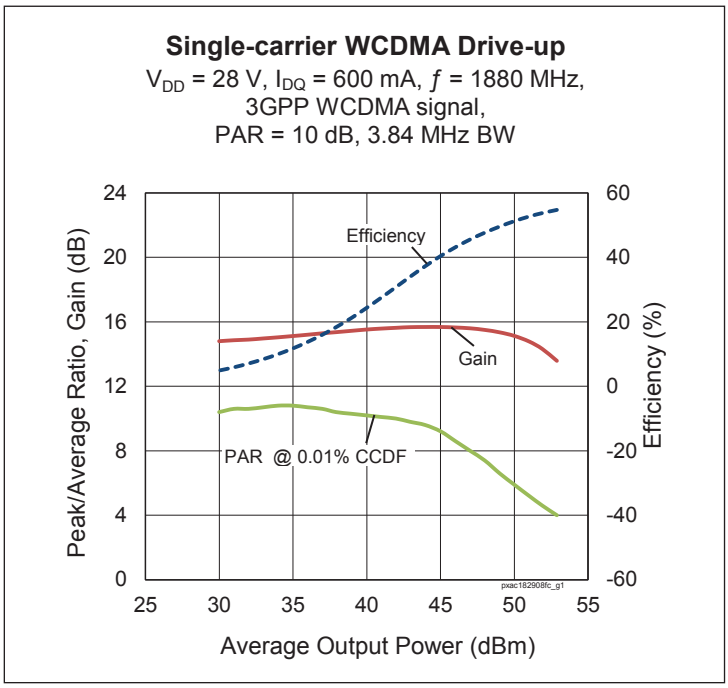
green Product

Thermally-Enhanced High Power RF LDMOS FET
240 W, 28 V, 1805 – 1880 MHz

Description

The PXAC182908FV is a 240-watt LDMOS FET with an asymmetrical design intended for use in multi-standard cellular power amplifier applications in the 1805 to 1880 MHz frequency band. Features include dual-path design, input and output 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.

PXAC182908FV
Package H-37275G-6/2



Features

- Broadband internal input and output matching
- Asymmetrical Doherty design
  - Main : P_{1dB} = 120 W Typ
  - Peak : P_{1dB} = 220 W Typ
- Typical Pulsed CW performance, 1842.5 MHz, 28 V, combined outputs
  - Output power at P_{1dB} = 240 W
  - Efficiency = 52.6%
  - Gain = 14.5 dB
- Capable of handling 10:1 VSWR @28 V, 240 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} = 600 mA, V_{GSPEAK} = 0.70 V, P_{OUT} = 70 W avg, f_1 = 1880 MHz, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	14	15	—	dB
Drain Efficiency	η_D	49.5	51	—	%
Adjancent Channel Power Ratio	ACPR	—	–27.5	–25	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} = 60 V, V_{GS} = 0 V	I_{DSS}	—	—	10	µA
On-State Resistance (main)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.11	—	Ω
(peak)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.06	—	Ω
Operating Gate Voltage (main)	V_{DS} = 28 V, I_{DQ} = 600 mA	V_{GS}	2.45	2.70	2.95	V
(peak)	V_{DS} = 28 V, I_{DQ} = 0 A	V_{GS}	0.45	0.60	0.80	V
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1	µA

Maximum Ratings

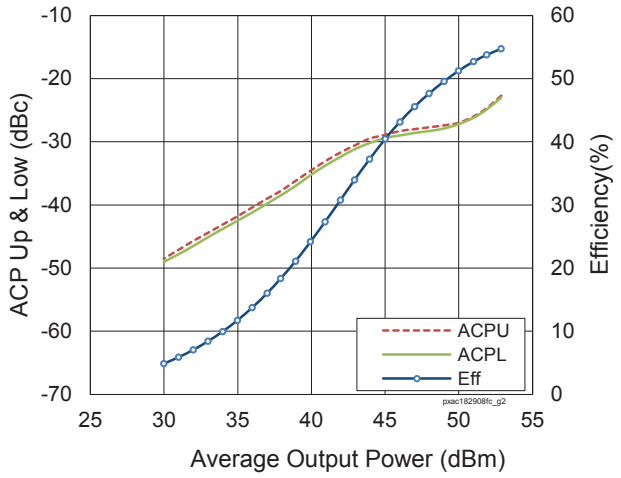
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	–6 to +10	V
Operating Voltage	V_{DD}	0 to +32	V
Junction Temperature	T_J	225	°C
Storage Temperature Range	T_{STG}	–65 to +150	°C
Thermal Resistance (main, T_{CASE} = 70°C, 56 W CW)	$R_{\theta JC}$	0.56	°C/W
(peak, T_{CASE} = 70°C, 200 W CW)	$R_{\theta JC}$	0.29	°C/W

Ordering Information

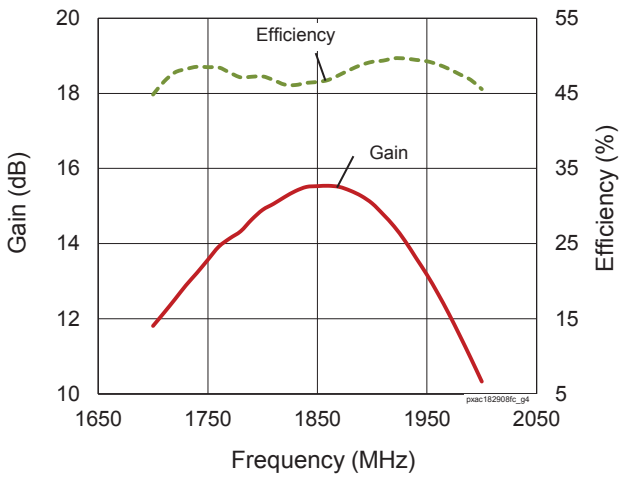
Type and Version	Order Code	Package Description	Shipping
PXAC182908FV V1 R0	PXAC182908FVV1R0XTMA1	H-37275G-6/2, earless flange	Tape & Reel, 50 pcs
PXAC182908FV V1 R250	PXAC182908FVV1R250XTMA1	H-37275G-6/2, earless flange	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

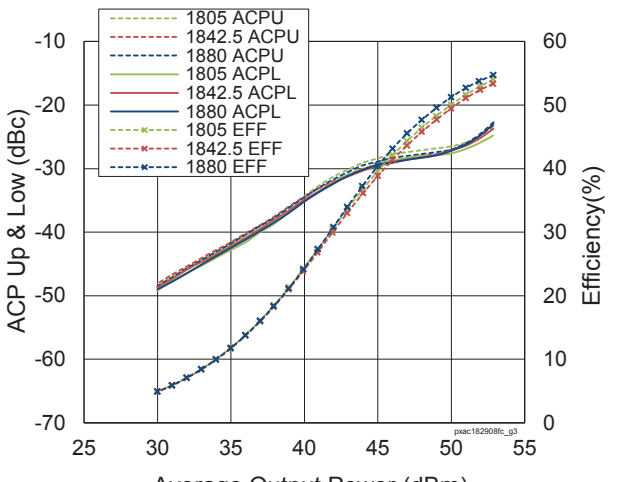
Single-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 600 mA, f = 1880 MHz,
3GPP WCDMA signal, PAR = 10 dB,
BW = 3.84 MHz



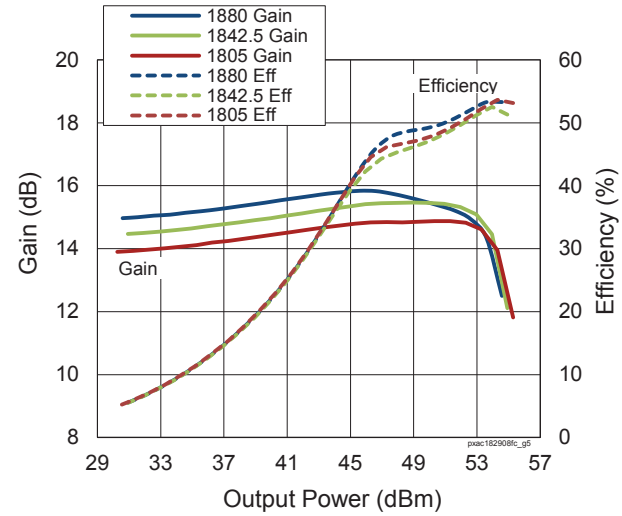
Single-carrier WCDMA Broadband Performance
V_{DD} = 28 V, I_{DQ} = 600 mA, P_{OUT} = 48.45 dBm,
3GPP WCDMA signal, PAR = 10 dB



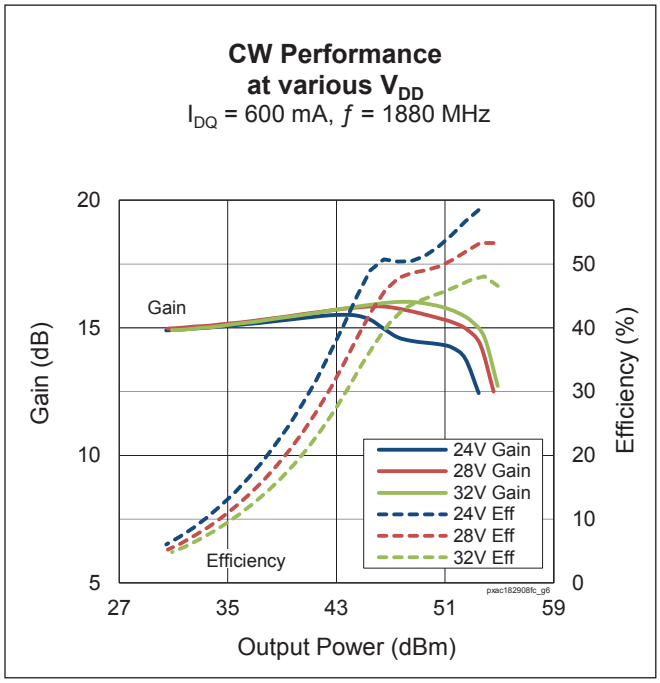
Single-carrier WCDMA 3GPP Drive-up
V_{DD} = 28 V, I_{DQ} = 600 mA, f = 1805-1880 MHz,
3GPP WCDMA signal, PAR = 10 dB,
BW = 3.84 MHz

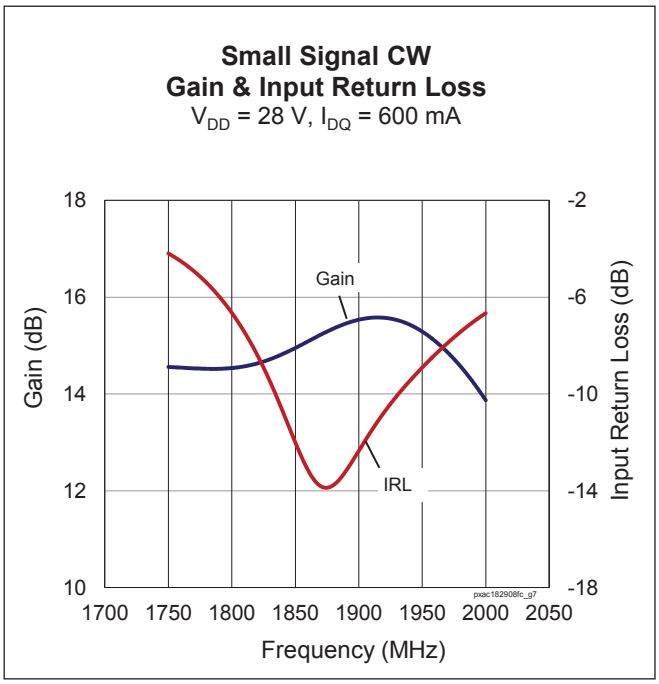


CW Performance
V_{DD} = 28 V, I_{DQ} = 600 mA



Typical Performance (cont.)





Load Pull Performance

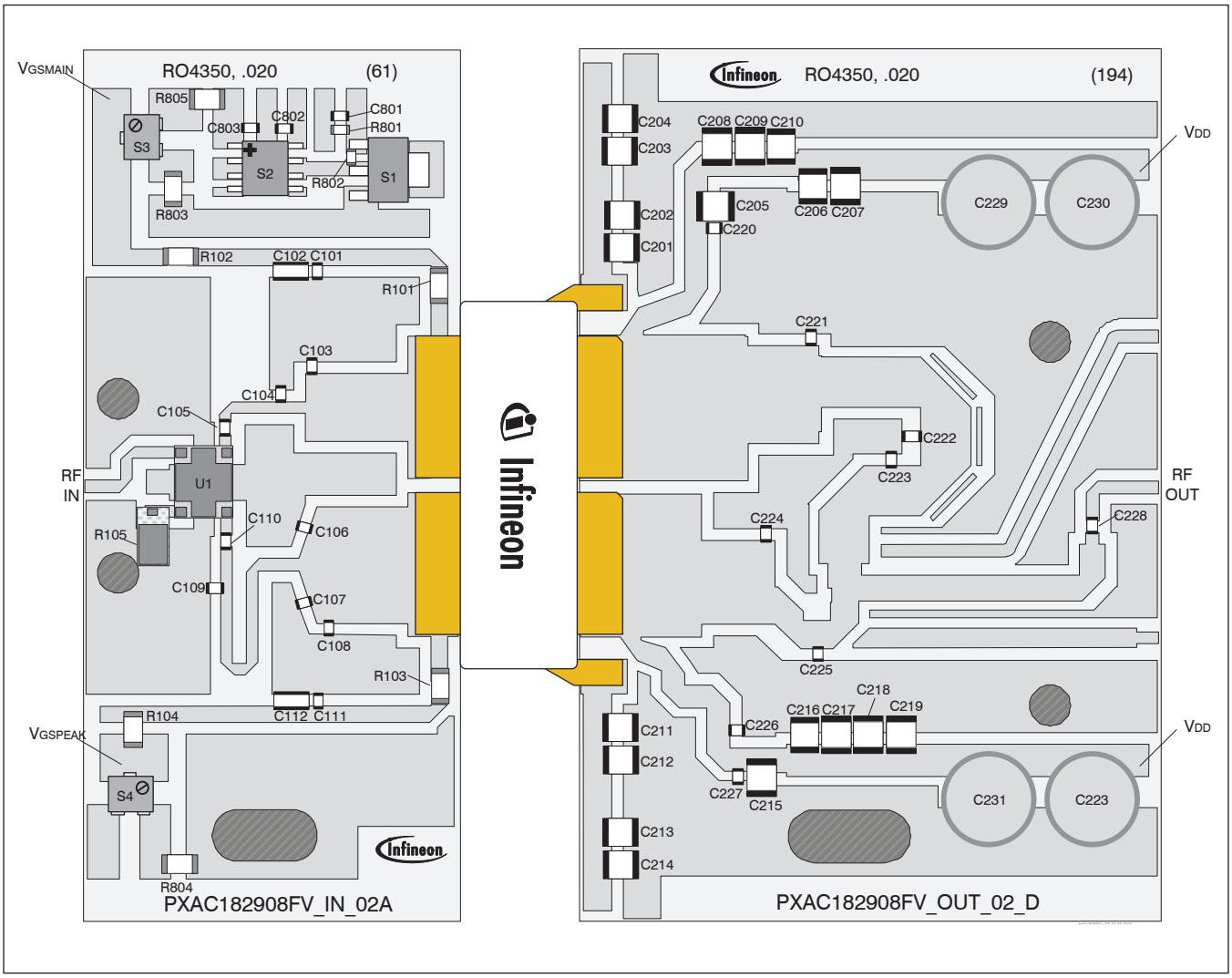
Main Side Load Pull Performance – Pulsed CW signal: 10 µs, 10% duty cycle, 28 V, I_{DQ} = 720 mA

		P_{1dB}									
		Max Output Power					Max PAE				
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 [%]
1805	4.98+j9.12	2.04–j3.48	19.6	51.3	133	55.3	3.50–j2.06	21.4	50.0	99	63.6
1842.5	2.98+j7.93	2.19–j3.56	19.0	51.3	136	55.9	3.48–j1.96	20.9	49.9	99	64.0
1880	1.98+j6.60	2.18–j3.52	20.0	51.2	132	55.7	3.36–j1.89	21.9	49.8	95	64.0

Peak Side Load Pull Performance – Pulsed CW signal: 10 µs, 10% duty cycle, 28 V, I_{DQ} = 100 mA

		P_{1dB}									
		Max Output Power					Max PAE				
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 [%]
1805	0.68–j3.85	4.06–j3.83	18.6	54.2	261	55.4	3.01–j0.87	20.4	52.5	176	64.1
1842.5	0.60–j4.14	4.50–j3.68	18.9	54.1	258	55.3	3.02–j1.36	20.6	52.8	192	64.3
1880	0.87–j4.71	5.12–j3.69	18.8	54.0	249	54.0	3.01–j1.52	20.5	52.8	192	64.6

Reference Circuit , 1805 – 1880 MHz



Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

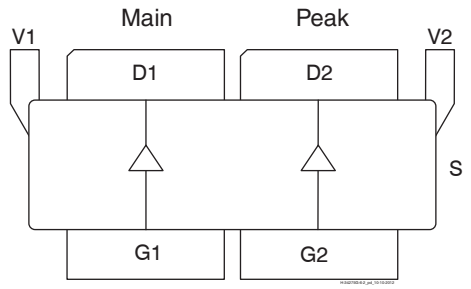
Reference Circuit Assembly

DUT	PXAC182908FV V1
Test Fixture Part No.	LTA/PXAC182908FV V1
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, ε_r = 3.66, f = 1805 – 1880 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, C105, C110, C111	Capacitor, 18 pF	ATC	ATC100A180JW150XB
C102, C112	Capacitor, 10 µF	Murata	LLL31BC70G106MA01L
C103	Capacitor, 1.5 pF	ATC	ATC100A1R5CW150XB
C104	Capacitor, 3.0 pF	ATC	ATC100A3R0CW150XB
C106	Capacitor, 0.4 pF	ATC	ATC100A0R4CW150XB
C107	Capacitor, 1.0 pF	ATC	ATC100A1R0CW150XB
C108	Capacitor, 0.7 pF	ATC	ATC100A0R7CW150XB
C109	Capacitor, 0.5 pF	ATC	ATC100A0R5CW150XB
C801, C802, C803	Capacitor, 1000 pF	Panasonic Electronic Components	ECJ-1VB1H102K
R101, R103	Resistor, 5.1 Ω	Panasonic Electronic Components	ERJ-8GEYJ5R1V
R102, R104	Resistor, 1K Ω	Panasonic Electronic Components	ERJ-8GEYJ102V
R105	Resistor, 50 Ω	Richardson	RICHARDSON
R801	Resistor, 1.3K Ω	Panasonic Electronic Components	ERJ-3GEYJ132V
R802	Resistor 1.2K Ω	Panasonic Electronic Components	ERJ-3GEYJ122V
R803, R804, R805	Resistor, 50 Ω	Panasonic Electronic Components	ERJ-8GEYJ510V
S1	Transistor	Infineon Technologies	BCP56
S2	Voltage regualtor	Texas Instruments	LM78L05ACM
S3, S4	Potentiometer, 2k Ω	Bourns Inc.	3224W-1-202E
U1	Hybrid coupler	Anaren	X3C19P1-05S
Output			
C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C220, C226, C227, C228	Capacitor, 18 pF	ATC	ATC100A180JW150XB
C221	Capacitor, 2.2 pF	ATC	ATC100A2R2CW150XB
C222	Capacitor, 0.3 pF	ATC	ATC100A0R3CW150XB
C223	Capacitor, 1.2 pF	ATC	ATC100A1R2CW150XB
C224	Capacitor, 0.4 pF	ATC	ATC100A0R4CW150XB
C225	Capacitor, 1.1 pF	ATC	ATC100A1R1CW150XB
C229, C230, C231, C232	Capacitor, 220 µF	Panasonic Electronic Components	EEE-FP1V221AP

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 PXAC182908FV

Package Outline Specifications

Package H-37275G-6/2

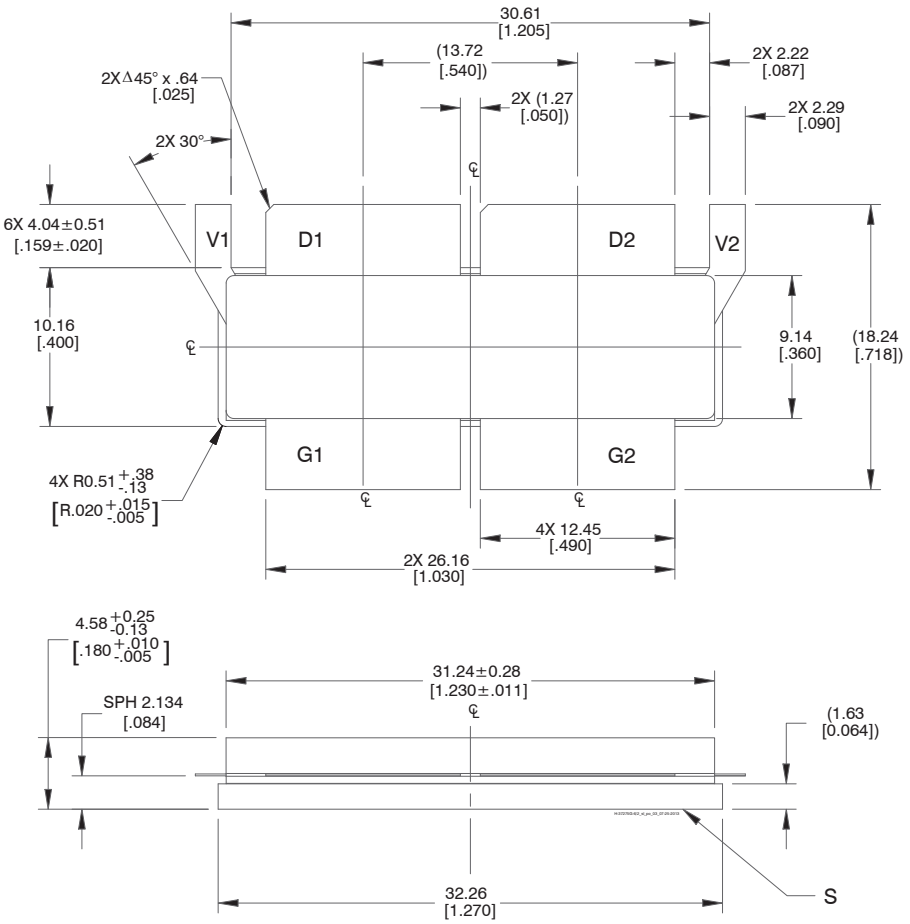


Diagram Notes—unless otherwise specified:

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; V1, V2 – V_{DD}.
5. Lead thickness: 0.13 + 0.051/–0.025 mm [0.005+0.002/–0.001 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 Type	Page	Subjects (major changes since last revision)
01	2015-01-08	Advance	All	Data Sheet reflects advance specification for product development
01.1	2015-01-29	Advance	2	Updated thermal resistance
02	2015-07-07	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	2015-07-29	Production	4	Corrected Drain Eff to PAE in Load Pull tablehead

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