

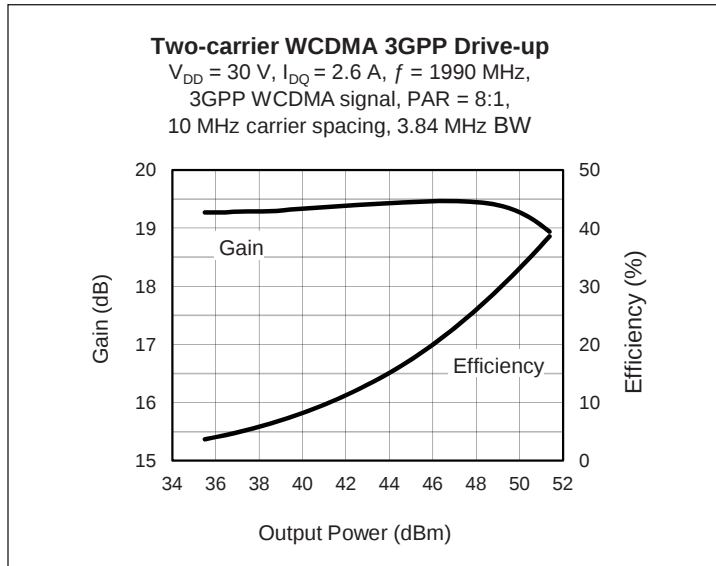
Thermally-Enhanced High Power RF LDMOS FET 340 W, 30 V, 1930 – 1990 MHz

Description

The PTFB193408SV is a 340-watt symmetrical push-pull LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 1930 to 1990 MHz frequency band. Features include input and output matching, high gain and thermally-enhanced packages. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTFB193408SV
Package H-34275G-6/2



Features

- Broadband internal matching, input and output
- Wide video bandwidth
- Typical single-carrier WCDMA performance, 1990 MHz, 30 V
 - Output power = 100 W
 - Efficiency = 33%
 - Gain = 19.0 dB
 - PAR = 7.5 dB @ 0.01% CCDF
 - ACPR @ 5 MHz = -35 dBc
- Increased negative gate-source voltage range for improved performance in Doherty amplifiers
- Capable of handling 10:1 VSWR at 30 V, 340 W (CW) output power
- Integrated ESD protection
- Excellent thermal stability
- RoHS-compliant

RF Characteristics

Single-carrier WCDMA Measurements (tested in Infineon test fixture)

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.65\text{ A}$, $P_{OUT} = 80\text{ W}$ average, $f = 1990\text{ MHz}$

WCDMA signal: 3GPP, 3.84 MHz channel bandwidth, with 10 dB peak/average @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	18	19	—	dB
Drain Efficiency	η_D	29	31	—	%
Adjacent Channel Power Ratio	ACPR	—	-32	-30	dBc

(table continued next page)

All published data at $T_{CASE} = 25^\circ\text{C}$ unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

RF Characteristics (cont.)

Two-carrier WCDMA Characteristics (not subject to production test—verified by design/characterization in Infineon test fixture)

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $P_{OUT} = 80\text{ W}$ average, $f_1 = 1980\text{ MHz}$, $f_2 = 1990\text{ MHz}$,
WCDMA signal: 3GPP, 3.84 MHz channel bandwidth, 8.0 dB peak/average @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	—	19.5	—	dB
Drain Efficiency	η_D	—	29	—	%
Intermodulation Distortion	IMD	—	−33	—	dBc

Two-tone Characteristics (not subject to production test—verified by design/characterization in Infineon test fixture)

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $P_{OUT} = 265\text{ W PEP}$, $f = 1990\text{ MHz}$, tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	—	19.5	—	dB
Drain Efficiency	η_D	—	36	—	%
Intermodulation Distortion	IMD	—	−30	—	dBc

DC Characteristics (both sides)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
	$V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10.0	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	$V_{DS} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$	V_{GS}	2.3	2.8	3.3	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1.0	μA

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	−6 to +10	V
Junction Temperature	T_J	200	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	−40 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$, 300 W CW)	$R_{\theta JC}$	0.2	$^{\circ}\text{C/W}$

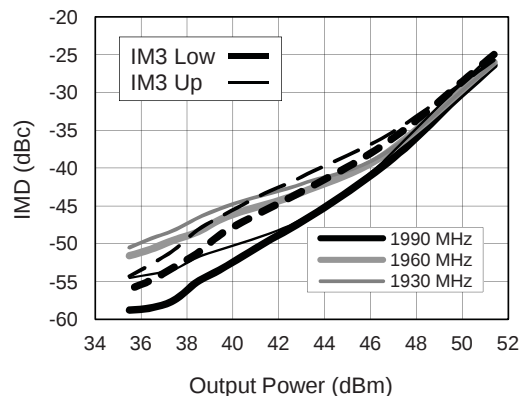
Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PTFB 193408SV V1 R250	PTFB193408SVV1R250XTMA1	H-34275G-6/2, ceramic open-cavity, formed leads, earless	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

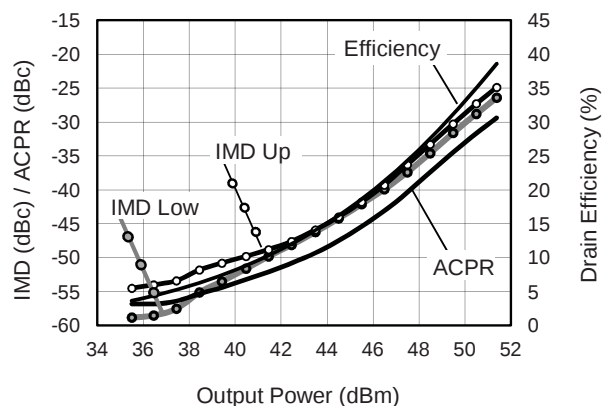
Two-carrier WCDMA 3GPP Drive-up

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$,
3GPP WCDMA signal, PAR = 8:1,
10 MHz carrier spacing, 3.84 MHz BW



Two-carrier WCDMA 3GPP Drive-up

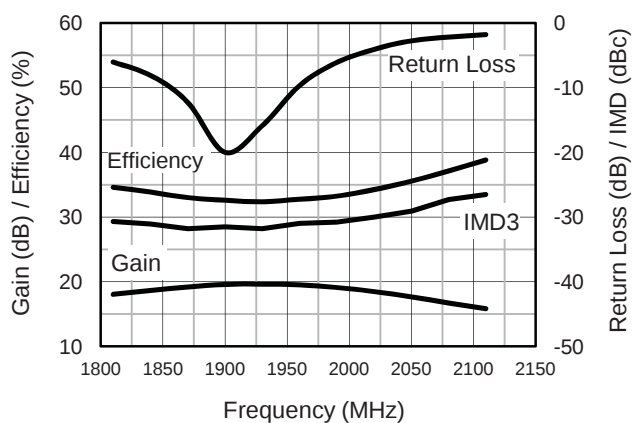
$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $f = 1990\text{ MHz}$,
3GPP WCDMA signal, PAR = 8:1,
10 MHz carrier spacing, 3.84 MHz BW



Typical Performance (cont.)

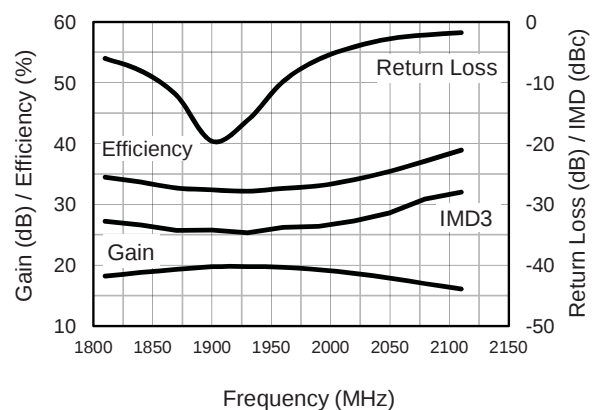
Single-carrier WCDMA 3GPP Broadband Performance

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $P_{OUT} = 100\text{ W}$,
PAR = 10:1



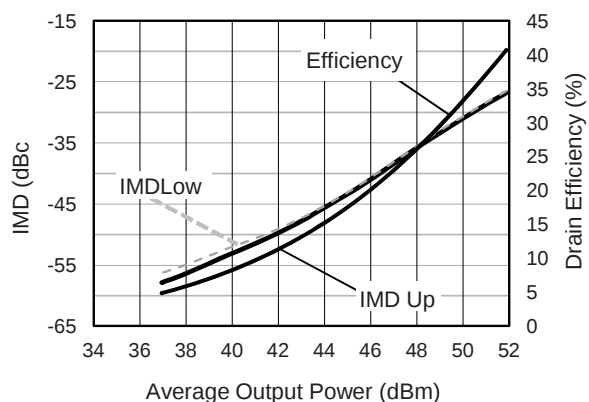
Single-carrier WCDMA 3GPP Broadband Performance

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $P_{OUT} = 100\text{ W}$,
PAR = 7.5:1



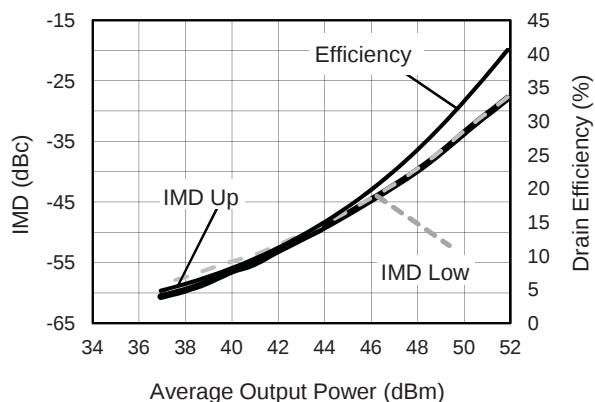
Single-carrier WCDMA Drive-up

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $f = 1990\text{ MHz}$,
3GPP WCDMA signal, PAR = 8.5:1,
3.84 MHz BW



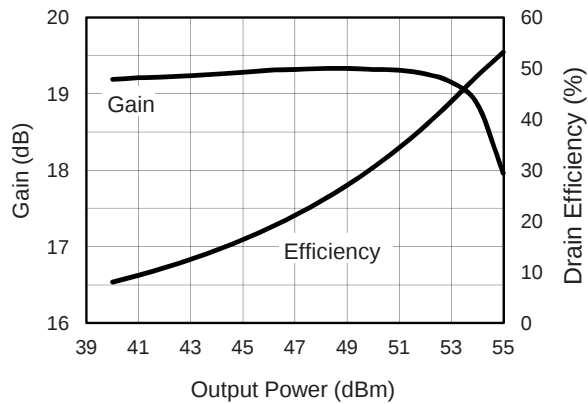
Single-carrier WCDMA Drive-up

$V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $f = 1990\text{ MHz}$,
3GPP WCDMA signal, PAR = 7.5:1,
3.84 MHz BW

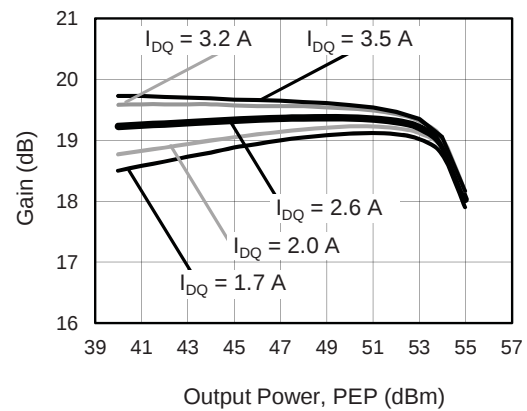


Typical Performance (cont.)

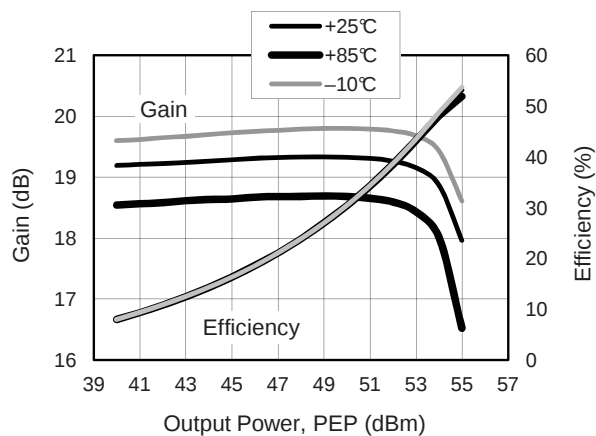
Power Sweep, CW Performance
 $V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $f = 1990\text{ MHz}$,



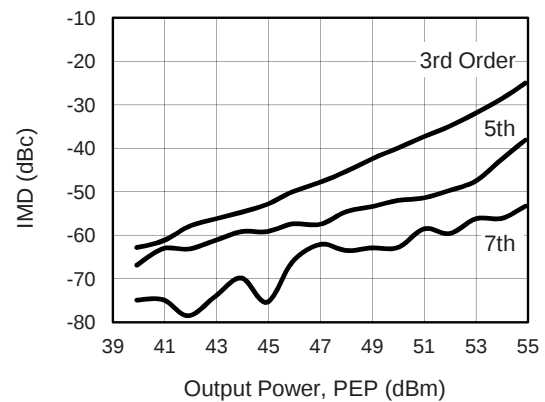
CW Gain Performance at selected I_{DQ}
 $V_{DD} = 28\text{ V}$, $f = 1990\text{ MHz}$



CW Performance
 $V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$, $f = 1990\text{ MHz}$

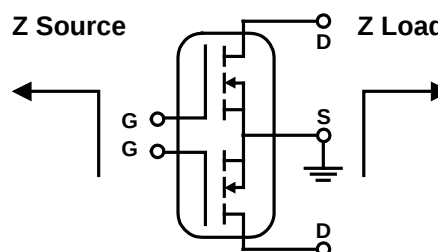


Intermodulation Distortion vs. Output Power
 $V_{DD} = 30\text{ V}$, $I_{DQ} = 2.6\text{ A}$,
 $f_1 = 1989\text{ MHz}$, $f_2 = 1990\text{ MHz}$

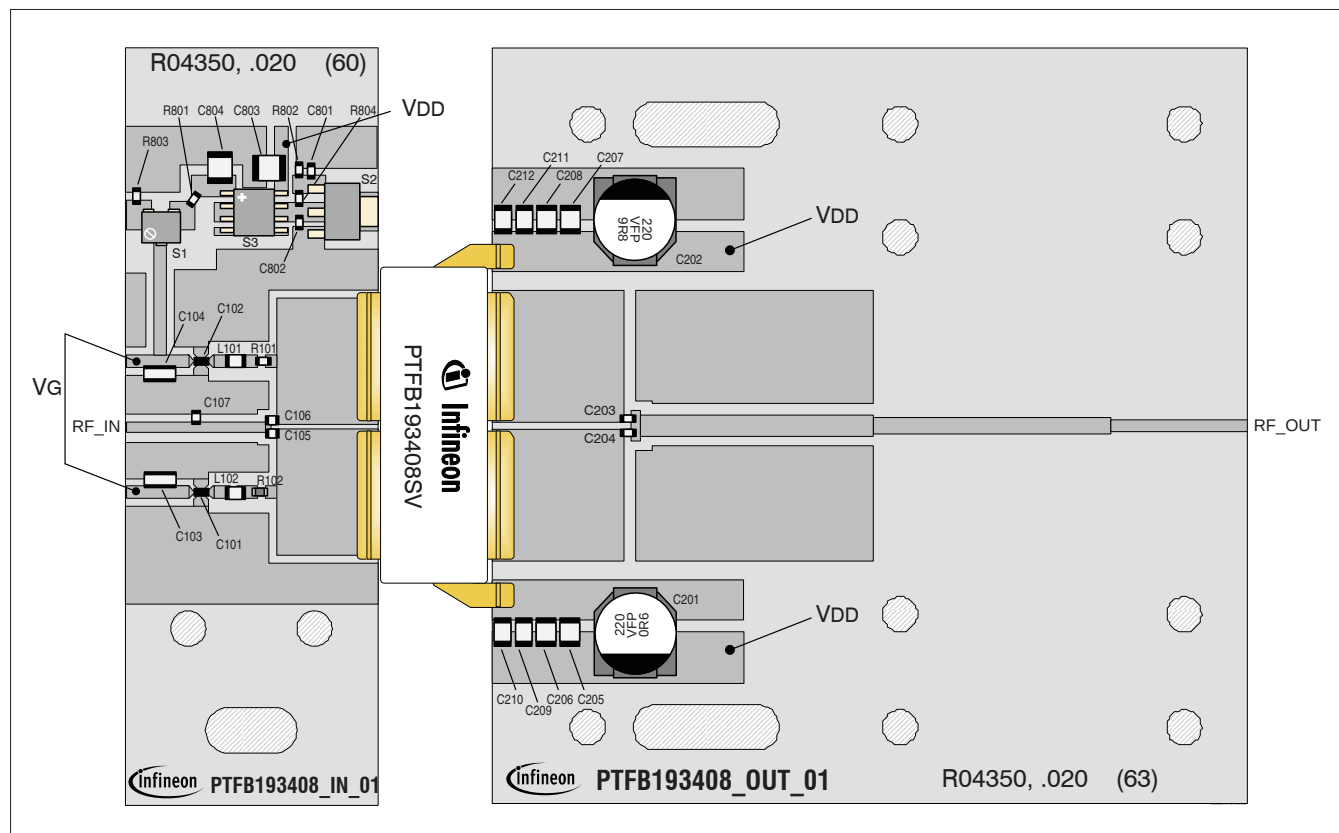


Broadband Circuit Impedance (combined leads)

Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
1900	1.10	-3.23	0.55	-2.09
1930	1.11	-3.16	0.54	-2.01
1960	1.11	-3.09	0.53	-1.93
1990	1.12	-3.03	0.53	-1.86
2020	1.12	-2.97	0.52	-1.78



Reference Circuit



Reference circuit assembly diagram (not to scale)

Reference Circuit Assembly

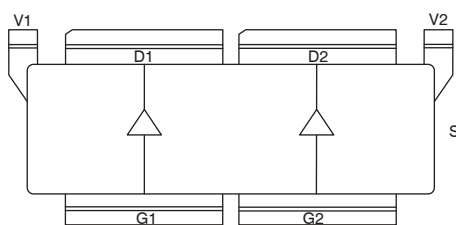
DUT	PTFB193408SV V1
Test Fixture Part No.	LTN/PTFB193408SV
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$
Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower	

Reference Circuit (cont.)

Component Information

Component	Description	Suggested Supplier	P/N
Input			
C101, C102	Chip capacitor, 1 μ F	Digi-Key	NFM18PS105R0J3D-ND
C103, C104	Capacitor, 10 μ F	Digi-Key	490-4393-2-ND
C105, C106	Capacitor, 18 pF	ATC	800A180JT
C107	Chip capacitor, 1.5 pF	ATC	ATC100A1R5BW150XB
C801	Chip capacitor, 1,000 pF	Digi-Key	PCC1772CT-ND
C802	Capacitor, 1 μ F	Digi-Key	490-4736-2-ND
C803, C804	Capacitor, 10 μ F	Digi-Key	587-1818-2-ND
L101, L102	Inductor, 22 nH	ATC	0805WL220JT
R101, R102, R803	Resistor, 10 Ω	Digi-Key	P10GTR-ND
R801	Resistor, 100 Ω	Digi-Key	P100GTR-ND
R802	Resistor, 1,300 Ω	Digi-Key	P1.3KGTR-ND
R804	Resistor, 1,200 Ω	Digi-Key	P1.2KGTR-ND
S1	Potentiometer, 2k Ω	Digi-Key	3224W-20ECT-ND
S2	Transistor	Infineon Technologies	BCP56-ND
S3	Voltage Regulator	Digi-Key	LM780L05ACM-ND
Output			
C201, C202	Capacitor, 220 μ F	Digi-Key	PCE4444TR-ND
C203, C204	Capacitor, 18 pF	ATC	800A180JT
C205, C206, C207, C208	Capacitor, 4.7 μ F	Digi-Key	490-1864-2-ND
C209, C210, C211, C212	Capacitor, 10 μ F	Digi-Key	587-1818-2-ND

Pinout Diagram



Pin	Description
V1, V2	V_{DD}
G1, G2	Gate
D1, D2	Drain
S	Source (flange)

Package Outline Specifications

Package H-34275G-6/2 (formed leads)

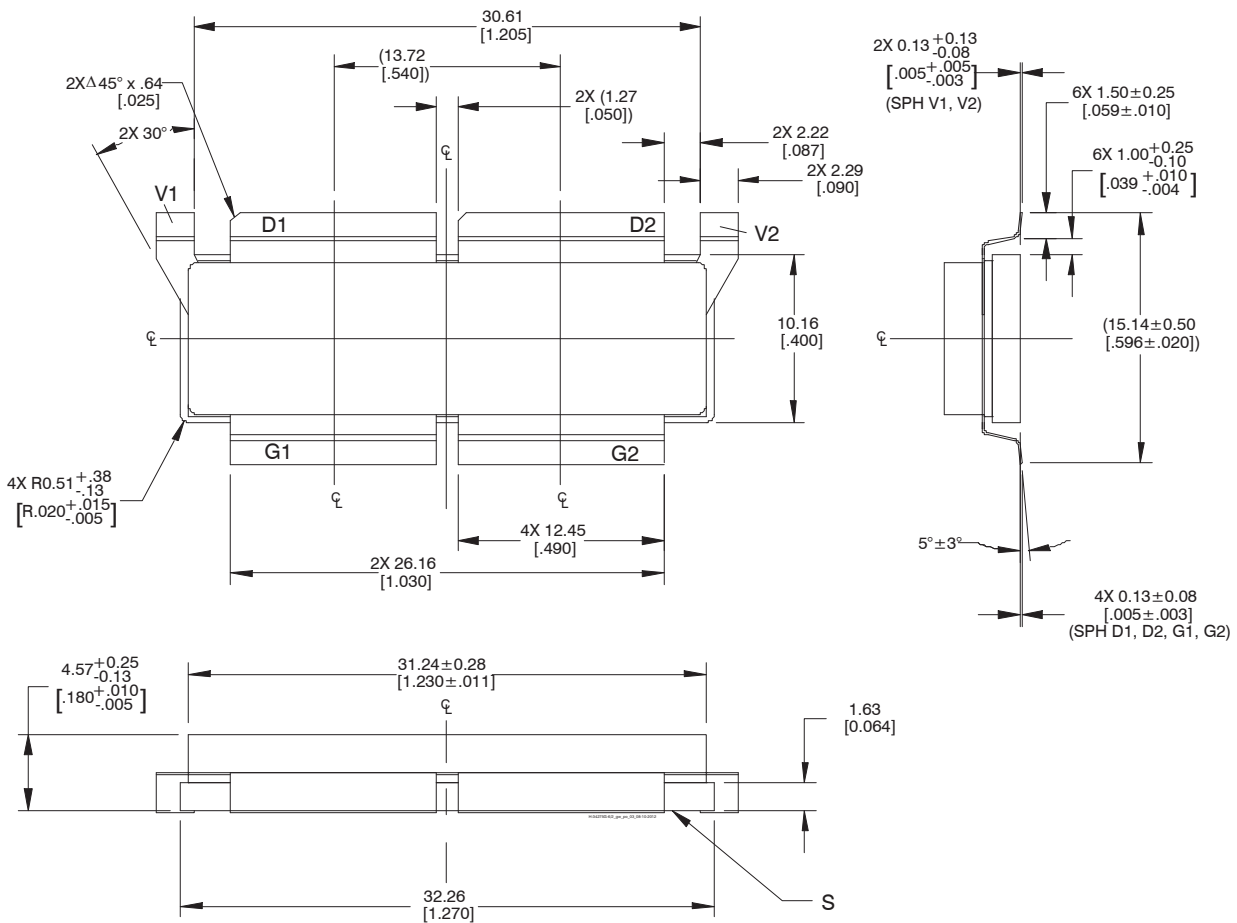


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances ± 0.127 [.005] unless specified otherwise.
4. Pins: D1, D2 – drain, G1, G2 – gate, S – source, V1, V2 – V_{DD} .
5. Lead thickness: $0.13 + 0.051/-0.025$ [.005 +.002/-.001].
6. Gold plating thickness: 0.25 micron [10 microinch] max.

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

Revision History: 2012-11-30

Data Sheet

Previous Version: 2012-11-09, Data Sheet, Rev. 02

Page	Subjects (major changes since last revision)
all	Product now released to production.
3	Tray shipping not available.
7	Update reference circuit assembly table.

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Any information within this document that you feel is wrong, unclear or missing at all?

Your feedback will help us to continuously improve the quality of this document.

Please send your proposal (including a reference to this document) to:

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