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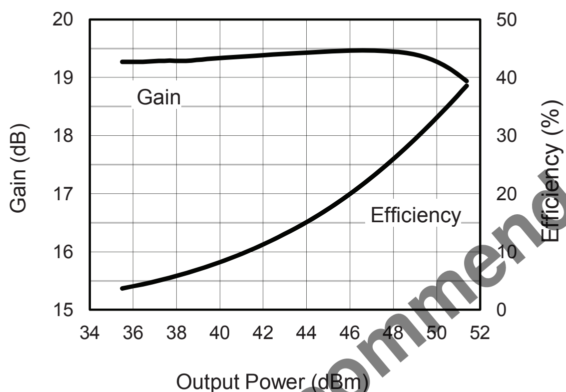
Thermally-Enhanced High Power RF LDMOS FET
340 W, 30 V, 1930 – 1990 MHz

Description

The PTFB193408SV is a 340-watt symetrical 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

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



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) ouput power
- Integrated ESD protection
- Excellent thermal stability
- RoHS-compliant

RF Characteristics

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

V_{DD} = 30 V, I_{DQ} = 2.65 A, P_{OUT} = 80 W average, f = 1990 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°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 V, I_{DQ} = 2.6 A, P_{OUT} = 80 W average, f_1 = 1980 MHz, f_2 = 1990 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 V, I_{DQ} = 2.6 A, P_{OUT} = 265 W PEP, f = 1990 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 V, I_{DS} = 10 mA	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	V_{DS} = 30 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	μA
	V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	μA
On-State Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	V_{DS} = 30 V, I_{DQ} = 2.6 A	V_{GS}	2.3	2.8	3.3	V
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1.0	μA

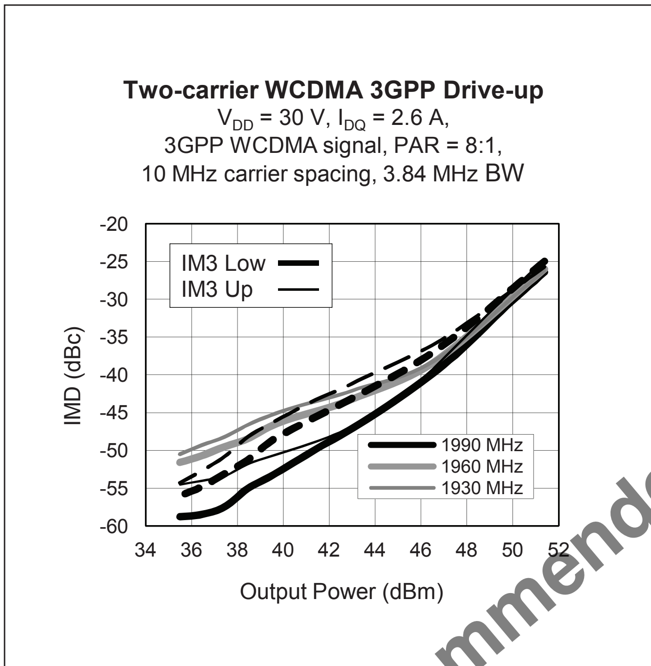
Maximum Ratings

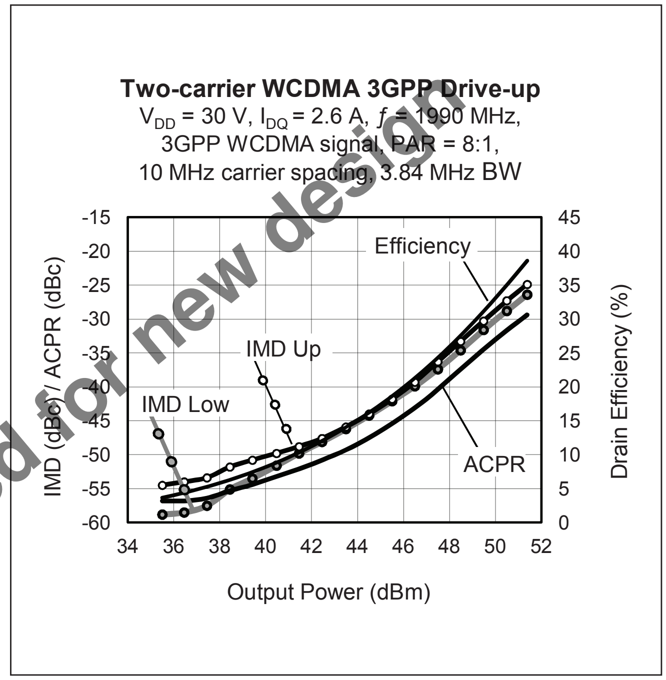
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	–6 to +10	V
Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 300 W CW)	$R_{\theta JC}$	0.2	°C/W

Ordering Information

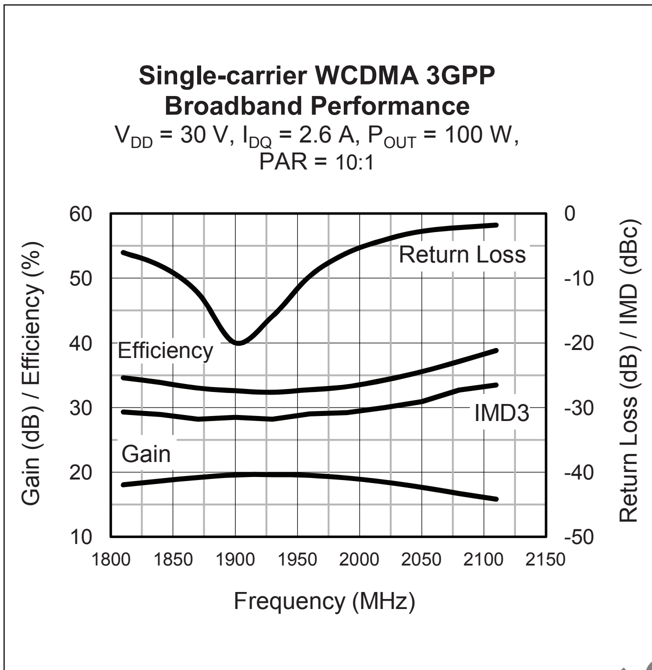
Type and Version	Order Code	Package and Description	Shipping
PTFB 193408SV V1 R250	PTFB193408SVV1R250XTMA1	H-34275G-6/2, ceramic open-cavity, formed leads, earless	Tape & Reel, 250 pcs

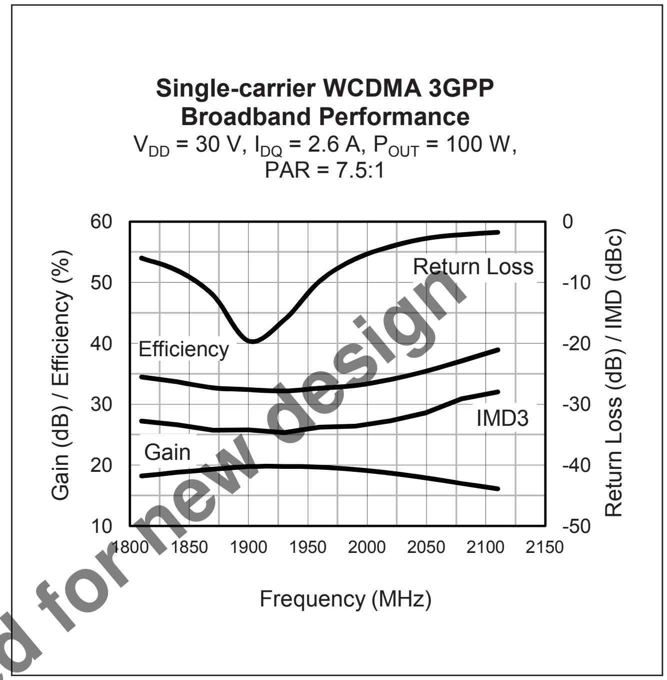
Typical Performance (data taken in a production test fixture)

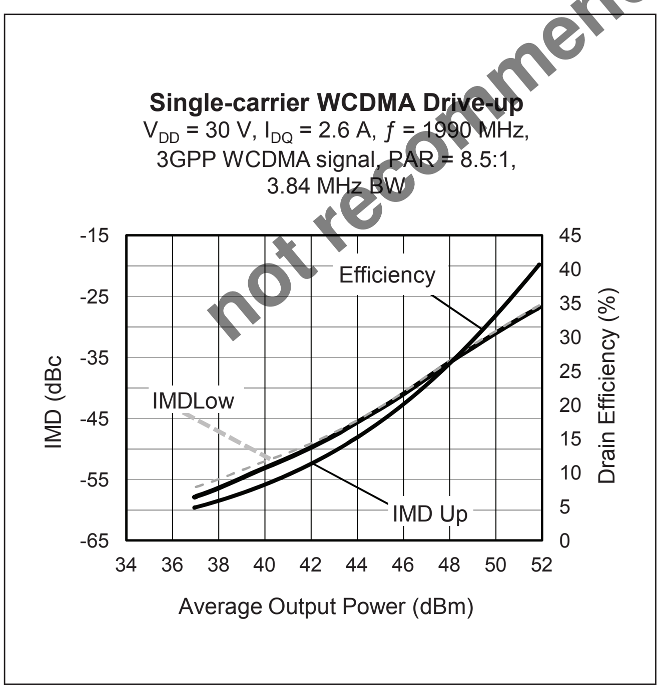


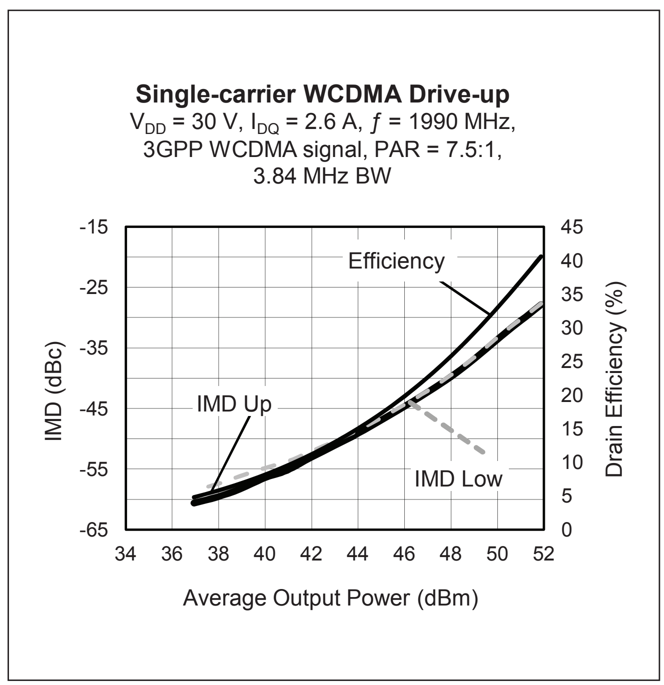


Typical Performance (cont.)

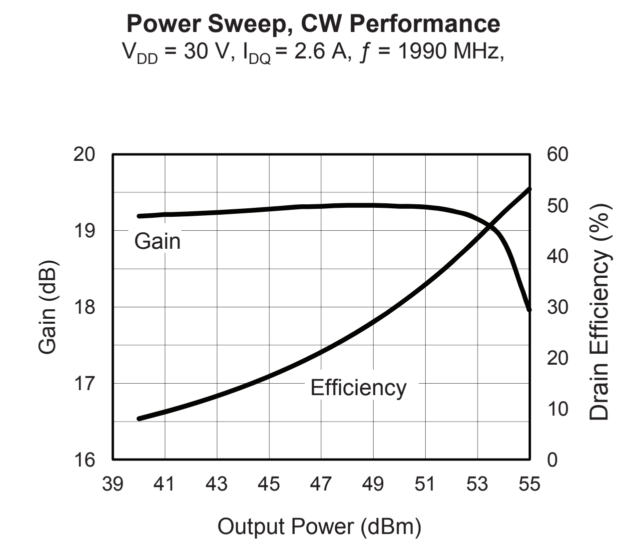


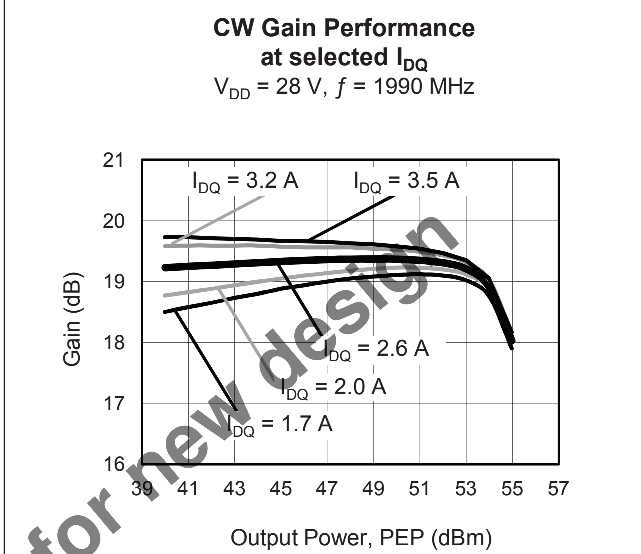


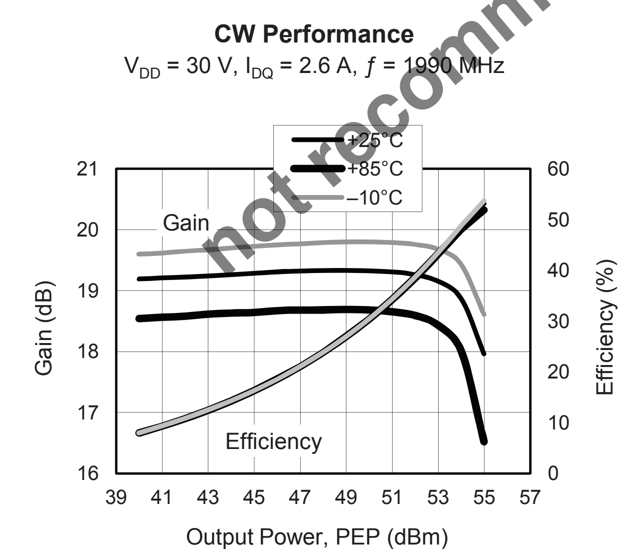


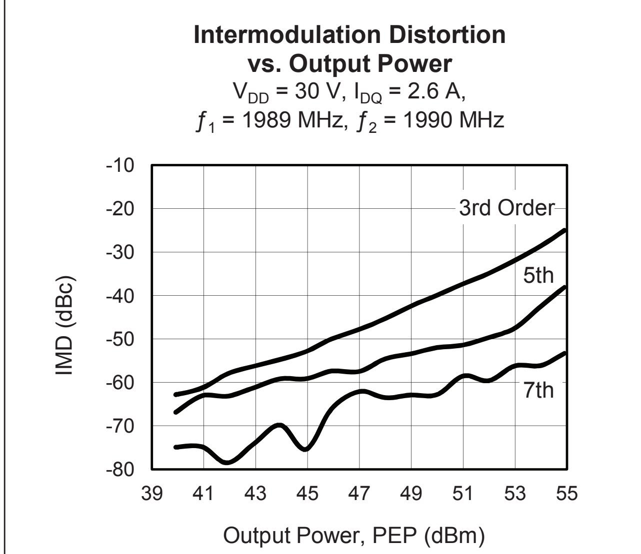


Typical Performance (cont.)



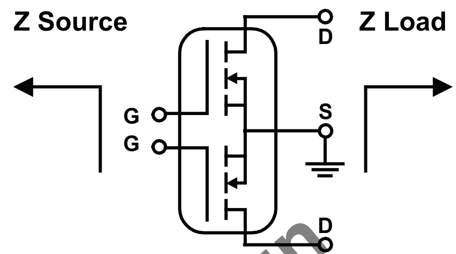




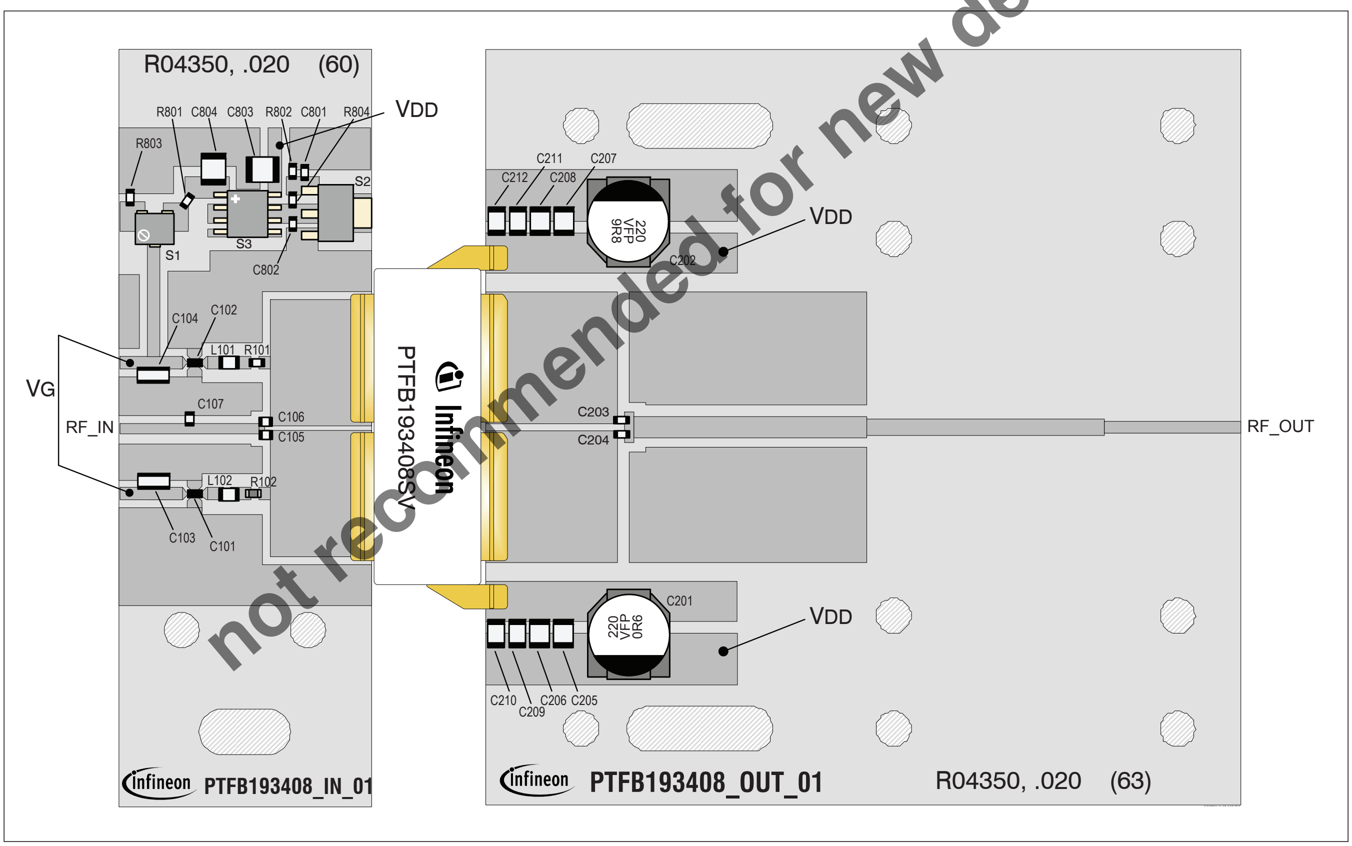


Broadband Circuit Impedance (combined leads)

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)

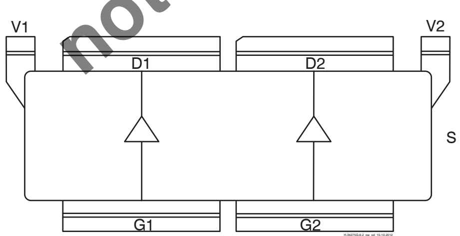
Reference Circuit Assembly	
DUT	PTFB193408SV V1
Test Fixture Part No.	LTN/PTFB193408SV
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, ε_r = 3.66
Find Gerber files for this test fixture on the Infineon Web site at **http://www.infineon.com/rfpower**	

Reference Circuit (cont.)

Component Information

Component	Description	Suggested Supplier	P/N
Input			
C101, C102	Chip capacitor, 1 µF	Digi-Key	NFM18PS105R0J3D-ND
C103, C104	Capacitor, 10 µF	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 µF	Digi-Key	490-4736-2-ND
C803, C804	Capacitor, 10 µF	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-202ECT-ND
S2	Transistor	Infineon Technologies	BCP56-ND
S3	Voltage Regulator	Digi-Key	LM780L05ACM-ND
Output			
C201, C202	Capacitor, 220 µF	Digi-Key	PCE4444TR-ND
C203, C204	Capacitor, 18 pF	ATC	800A180JT
C205, C206, C207, C208	Capacitor, 4.7 µF	Digi-Key	490-1864-2-ND
C209, C210, C211, C212	Capacitor, 10 µF	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)

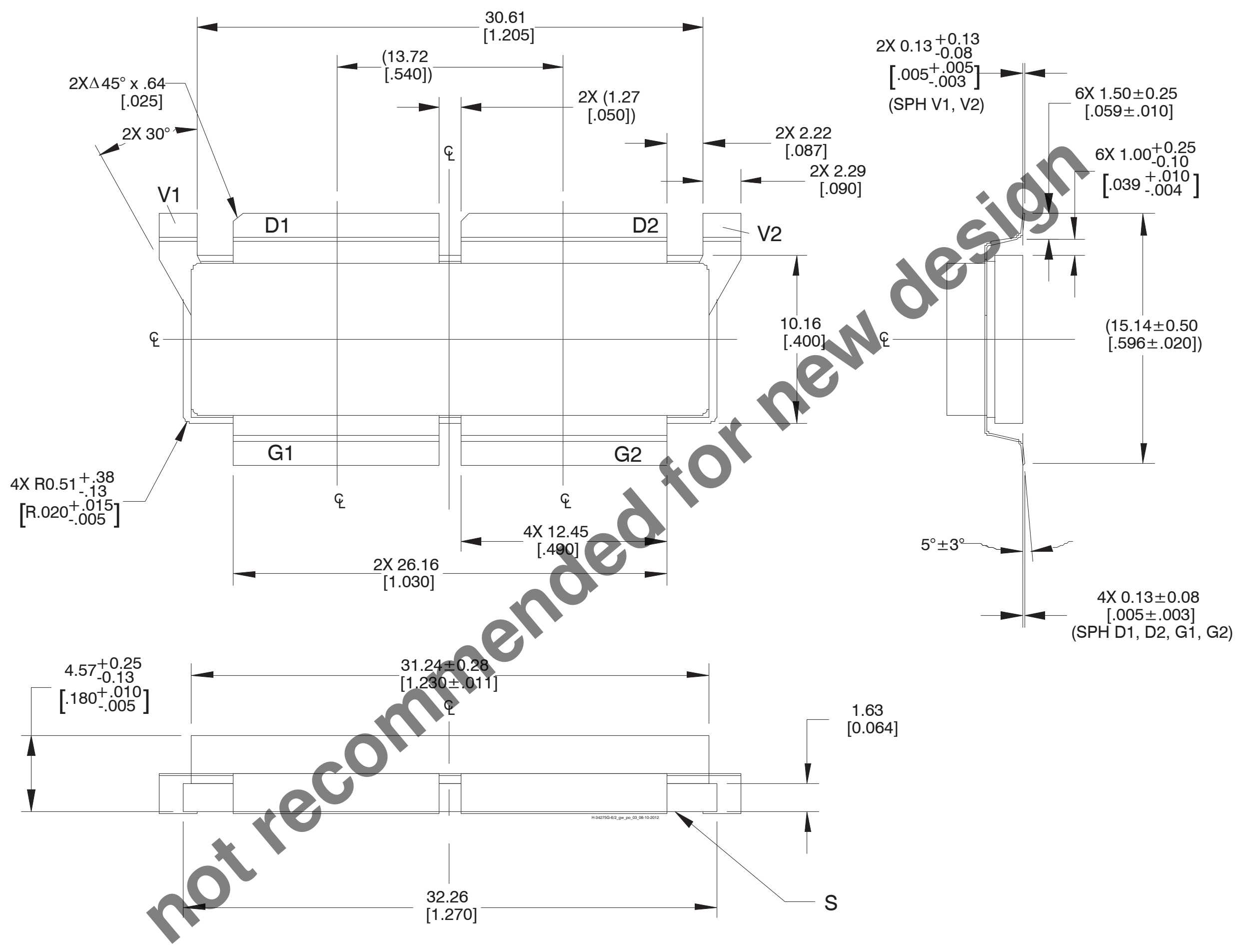


Diagram Notes—unless otherwise specified:

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:	2015-10-01	Data Sheet
Previous Version:	2012-11-30, Data Sheet, Rev. 02.1	
Page	Subjects (major changes since last revision)	
All	Not recommended for new design	

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