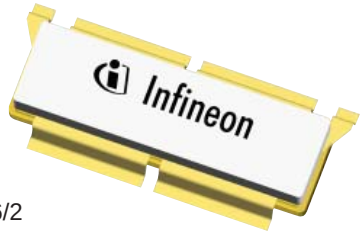
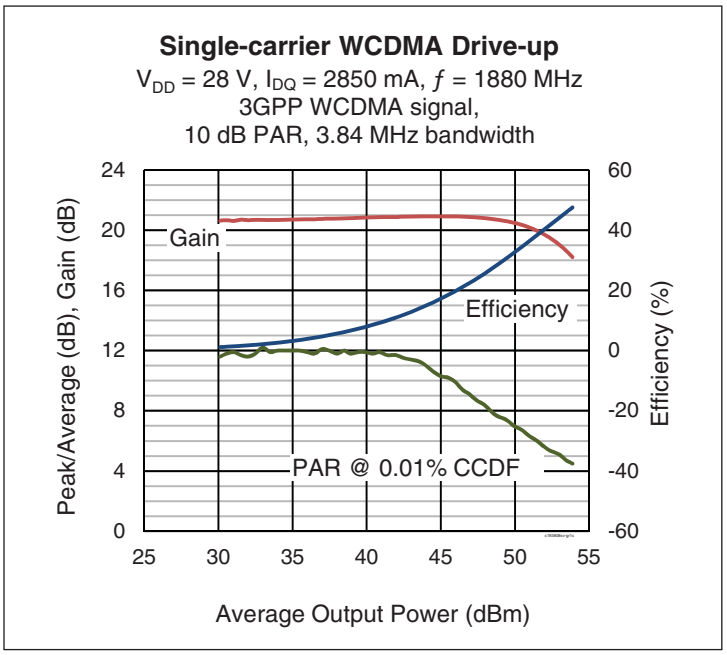
Thermally-Enhanced High Power RF LDMOS FET
380 W, 28 V, 1805 – 1880 MHz

Description

The PXFC193808SV is a 380-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 1805 to 1880 MHz frequency band. Features include input and output matching, high gain and a thermally-enhanced package with earless flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PXFC193808SV
Package H-37275G-6/2



Features

- Broadband internal input and output matching
- Typical pulsed CW performance, 1842.5 MHz, 28 V,
  - Output power at P_{1dB} = 380 W
  - Efficiency = 54.9%
  - Gain = 21 dB
- Integrated ESD protection
- ESD: Human Body Model, Class 2 (per ANSI/ESDA/JEDEC JS-001)
- Capable of handling 10:1 VSWR @28 V, 200 W (1-C WCDMA) output power
- 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} = 2880 mA, P_{OUT} = 80 W avg, f = 1880 MHz.
3GPP signal, 3.84 MHz channel bandwidth, 10 dB peak/average @ 0.01% probability on CCDF.

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	19.5	21	—	dB
Drain Efficiency	η_D	28.5	30.3	—	%
Adjacent Channel Power Ratio	ACPR	—	–33.5	–32	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
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1	µA
On-State Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.19	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ} = 2.88 A	V_{GS}	2.3	2.6	2.9	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, 280 W CW)	$R_{\theta JC}$	0.18	°C/W

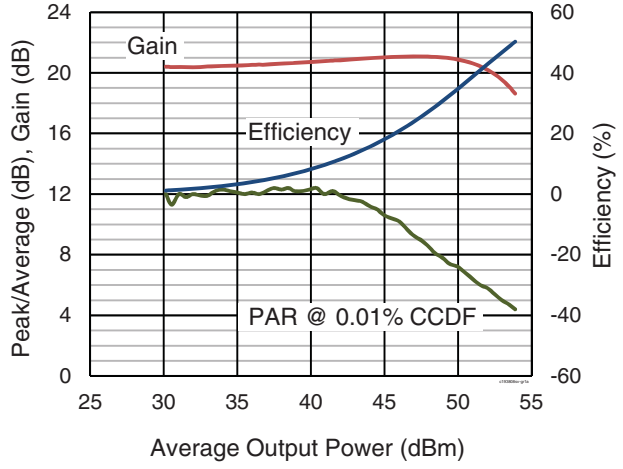
Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PXFC193808SV V1 R250	PXFC193808SVV1R250XTMA1	H-37275G-6/2, ceramic open-cavity, push-pull, earless	Tape & Reel, 250 pcs

Typical Performance (data taken in an Infineon production test fixture)

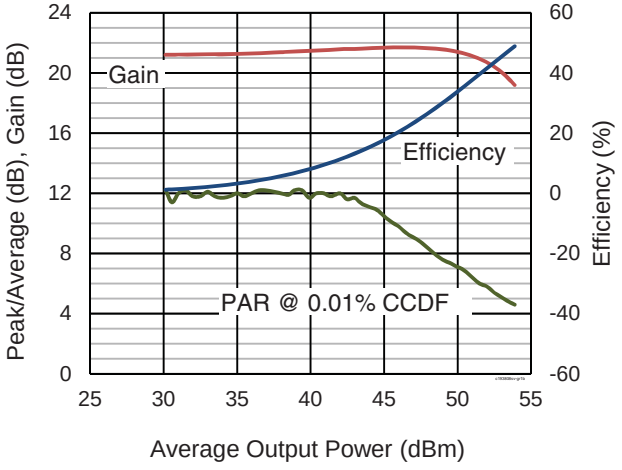
Single-carrier WCDMA Drive-up

V_{DD} = 28 V, I_{DQ} = 2850 mA, f = 1805 MHz
3GPP WCDMA signal,
10 dB PAR, 3.84 MHz bandwidth



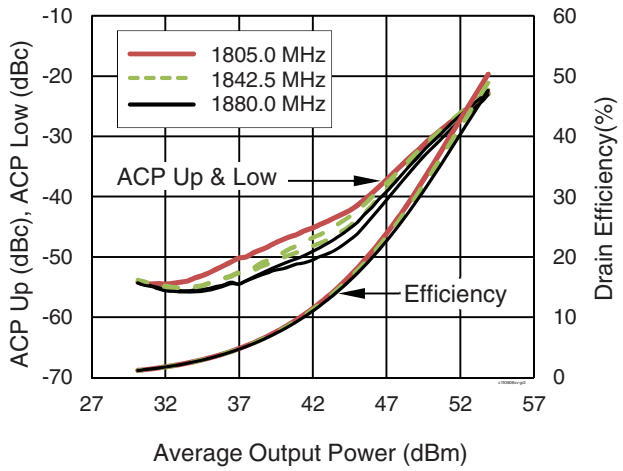
Single-carrier WCDMA Drive-up

V_{DD} = 28 V, I_{DQ} = 2850 mA, f = 1842.5 MHz
3GPP WCDMA signal,
10 dB PAR, 3.84 MHz bandwidth



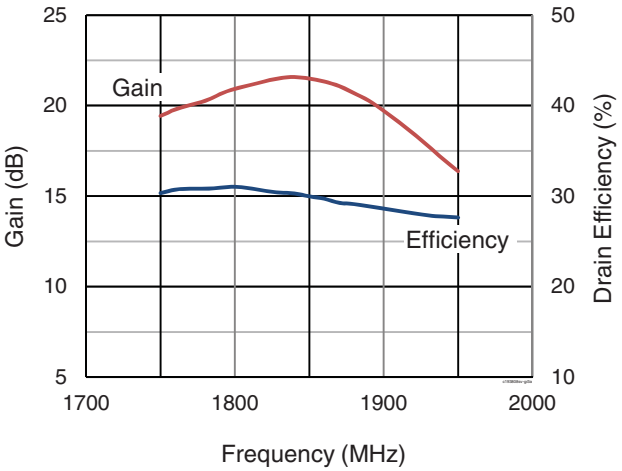
Single-carrier WCDMA Drive-up

V_{DD} = 28 V, I_{DQ} = 2850 mA,
f = 1805.0, 1842.5, 1880.0 MHz,
3GPP WCDMA signal, 10 dB PAR, 3.84 MHz BW



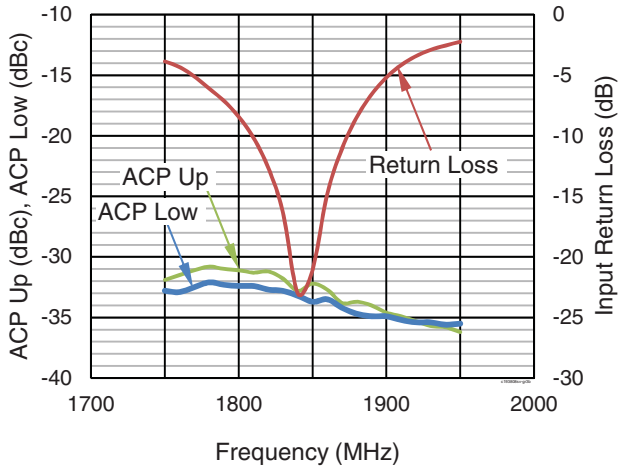
Single-carrier WCDMA Broadband

V_{DD} = 28 V, I_{DQ} = 2850 mA, P_{OUT} = 49 dBm,
3GPP WCDMA signal, 10 dB PAR

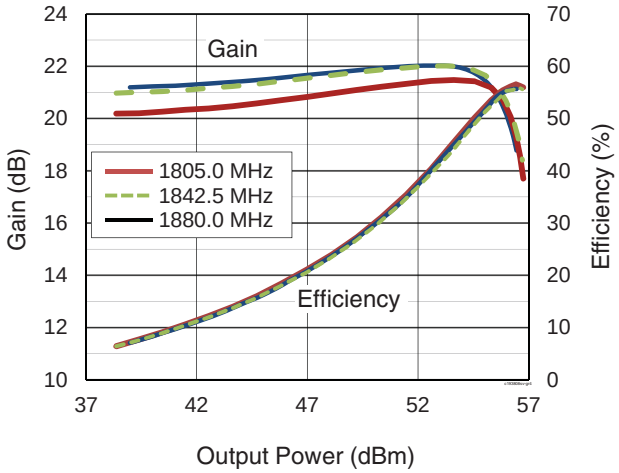


Typical Performance (cont.)

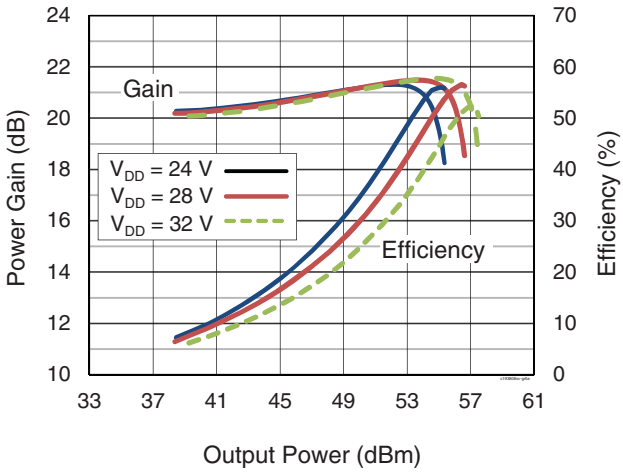
Single-carrier WCDMA Broadband
V_{DD} = 28 V, I_{DQ} = 2850 mA, P_{OUT} = 49 dBm,
3GPP WCDMA signal, 10 dB PAR



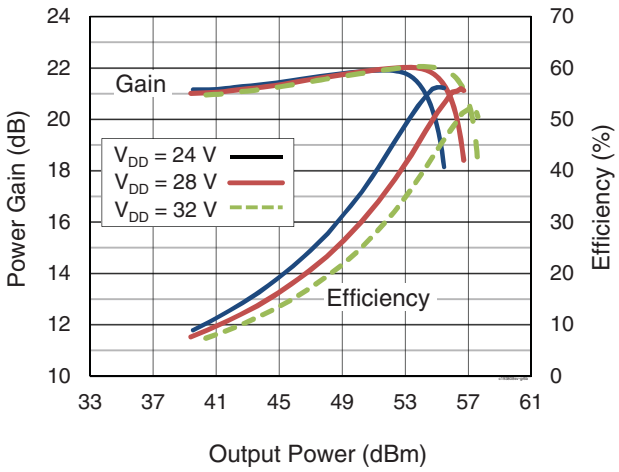
Pulsed CW Performance
V_{DD} = 28 V, I_{DQ} = 2850 mA



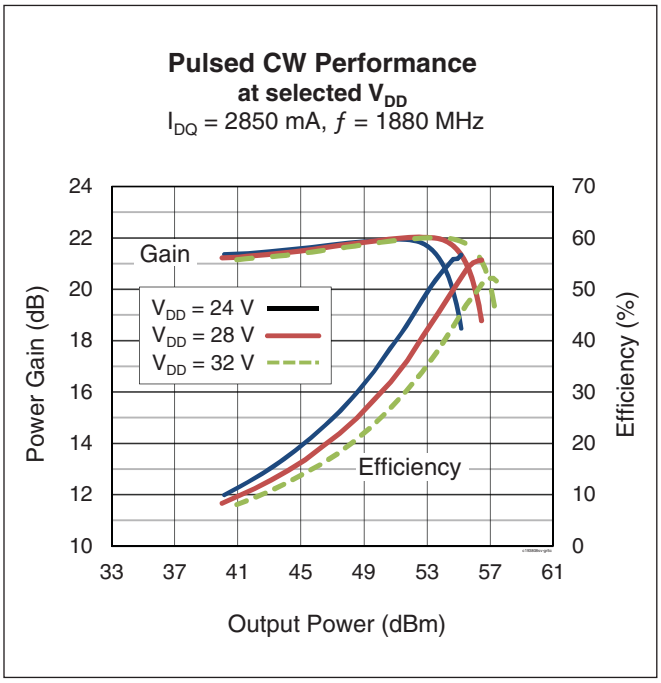
Pulsed CW Performance
at selected V_{DD}
I_{DQ} = 2850 mA, f = 1805 MHz

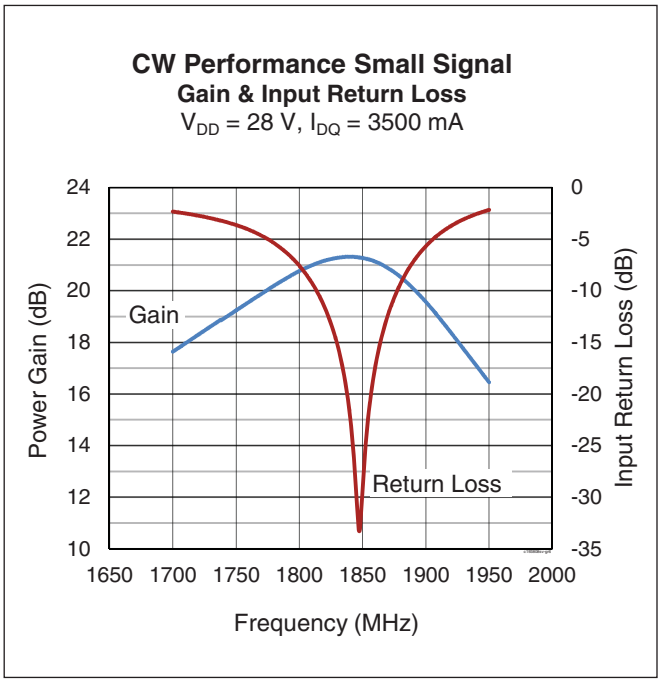


Pulsed CW Performance
at selected V_{DD}
I_{DQ} = 2850 mA, f = 1842.5 MHz



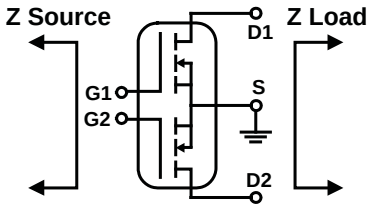
Typical Performance (cont.)





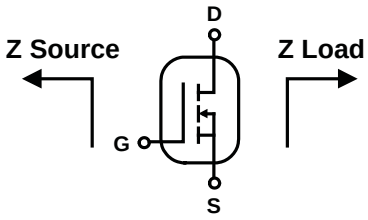
See next page for circuit impedance and device load pull performance

Broadband Circuit Impedance



Frequency [MHz]	Z Source [Ω]	Z Load [Ω]
1805.0	0.59 –j5.21	1.87 –j2.27
1842.5	0.55 –j5.14	1.92 –j2.38
1880.0	0.55 –j5.07	1.94 –j2.54

Load Pull Performance



Single side pulsed CW signal: 10 µsec, 10% duty cycle; 28 V, 1440 mA

Class AB		P_{3dB}									
		Max Output Power					Max Efficiency				
Freq [MHz]	Zin [Ω]	Zo [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]	Zo [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	Efficiency [%]
1805.0	0.90 – j6.31	5.32 – j5.58	17.6	54.64	291	55.8	3.61 – j3.45	19.3	53.81	240	64.0
1842.5	1.26 – j7.08	5.67 – j5.06	17.5	54.57	286	55.8	3.60 – j3.43	19.2	53.77	238	63.7
1880.0	1.86 – j8.27	6.17 – j4.71	18.0	54.52	283	54.8	3.52 – j3.70	19.6	53.73	236	63.2

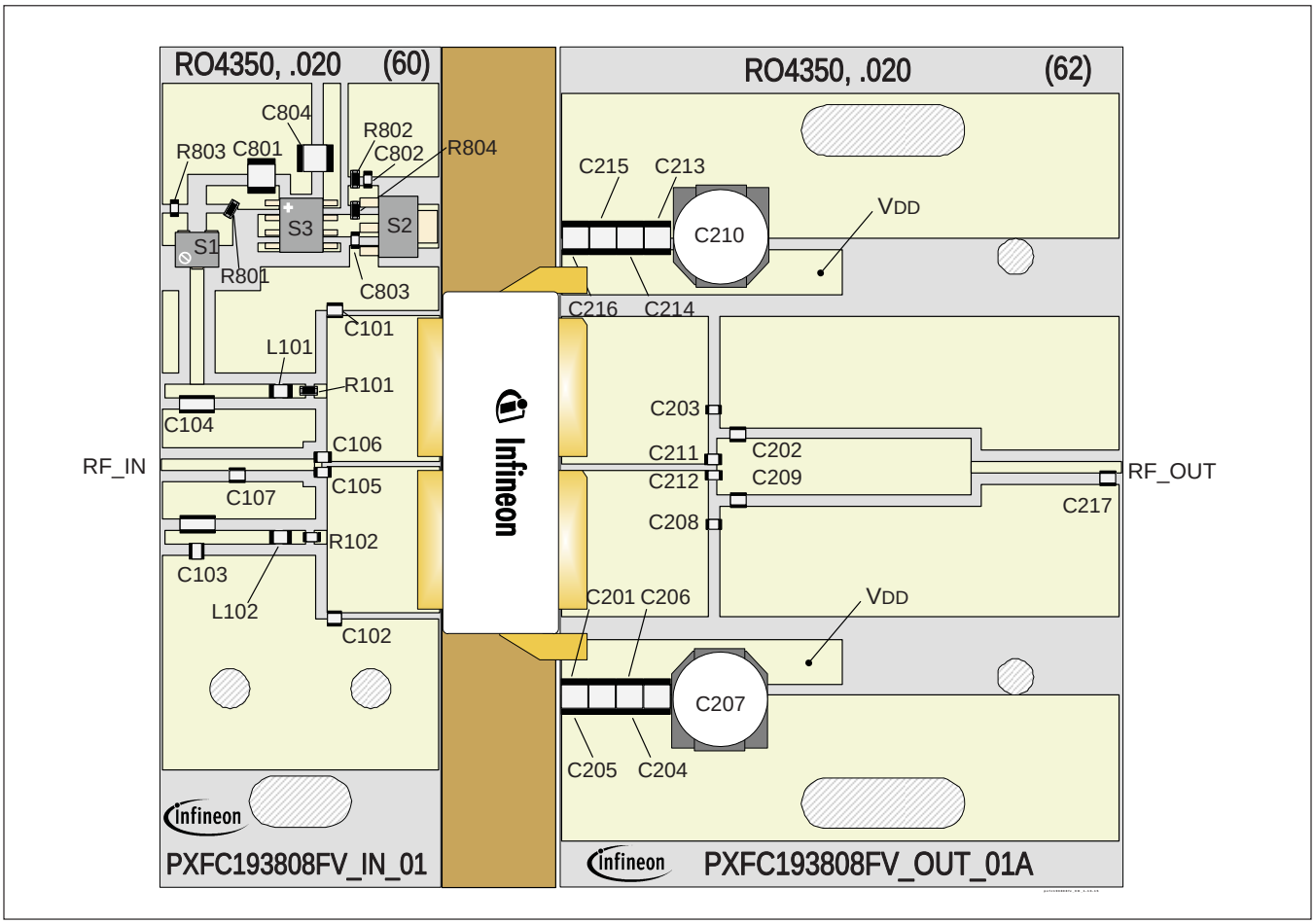
Single side pulsed CW signal: 10 µsec, 10% duty cycle; 28 V, 1440 mA

Class AB		P_{1dB}									
		Max Output Power					Max Efficiency				
Freq [MHz]	Zin [Ω]	Zo [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]	Zo [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	Efficiency [%]
1805.0	0.90 – j6.31	4.22 – j5.43	19.8	53.90	245	54.4	2.89 – j2.95	21.9	52.44	175	63.1
1842.5	1.26 – j7.08	4.30 – j5.28	19.7	53.86	243	55.0	2.80 – j3.08	21.8	52.36	172	62.8
1880.0	1.86 – j8.27	5.04 – j5.46	20.0	53.83	241	53.0	2.79 – j3.85	21.8	52.67	185	62.1

Reference Circuit, 1805 MHz to 1880 MHz

DUT	PXFC193808SV V1
Reference Circuit Part No.	LTN/PXFC193808SV V1
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, ε_r = 3.66

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



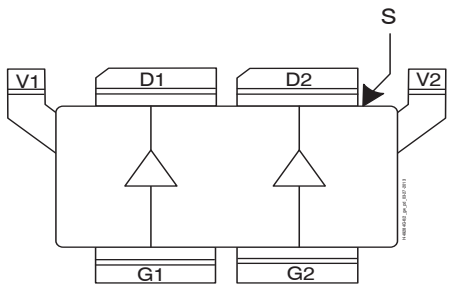
Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

Reference circuit bill of Materials

Component	Description	Manufacturer	Part Number
Input			
C101, C102	Capacitor, 0.7 pF	ATC	ATC100A0R7JT250XT
C104, C103	Capacitor, 10 µF	Murata Electronics North America	LLL31BC70G106MA01L
C106, C105	Capacitor, 18 pF	ATC	ATC800A180GT250XT
C107	Capacitor, 1.0 pF	ATC	ATC100A1R0CW150XB
C801, C804	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C802	Capacitor, 0.001 µF	Panasonic	ECJ-1VB1H102K
C803	Capacitor, 1 µF	Murata Electronics North America	GRM21BR71H105KA12L
L101, L102	RF chip inductor, 22 nH	ATC	0805WL220JT
R101, R102	Chip resistor, 10 ohms	Panasonic – ECG	ERJ-3GEYJ100V
R801	Chip resistor, 100 ohms	Panasonic – ECG	ERJ-3GEYJ101V
R802	Chip resistor, 1.3K ohms	Panasonic – ECG	ERJ-3GEYJ132V
R803	Chip resistor, 10 ohms	Panasonic – ECG	ERJ-3GEYJ100V
R804	Chip resistor, 1.2K ohms	Panasonic – ECG	ERJ-3GEYJ122V
S1	Potentiometer, 2K ohms	Bourns Inc.	3224W-1-202E
S2	Transistor	Fairchild Semiconductor	BCP56
S3	Voltage regulator	Texas Instruments	LM78L05ACM
Output			
C201, C205, C215, C216	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C202, C209	Capacitor, 0.5 pF	ATC	ATC100A0R5CW150XB
C203, C208	Capacitor, 2.1 pF	ATC	ATC800A2R1BT250XT
C204, C206, C213, C214	Capacitor, 4.7 µF	Murata Electronics North America	GRM32ER71H475KA88L
C207, C210	Capacitor, 220 µF	Panasonic – ECG	EEE-FP1V221AP
C211, C212	Capacitor, 18 pF	ATC	ATC600F0R8BT250XT
C217	Capacitor, 0.3 pF	ATC	ATC100A0R3CW150XB

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 PXFC193808SV

Package Outline Specifications

Package H-37275G-6/2

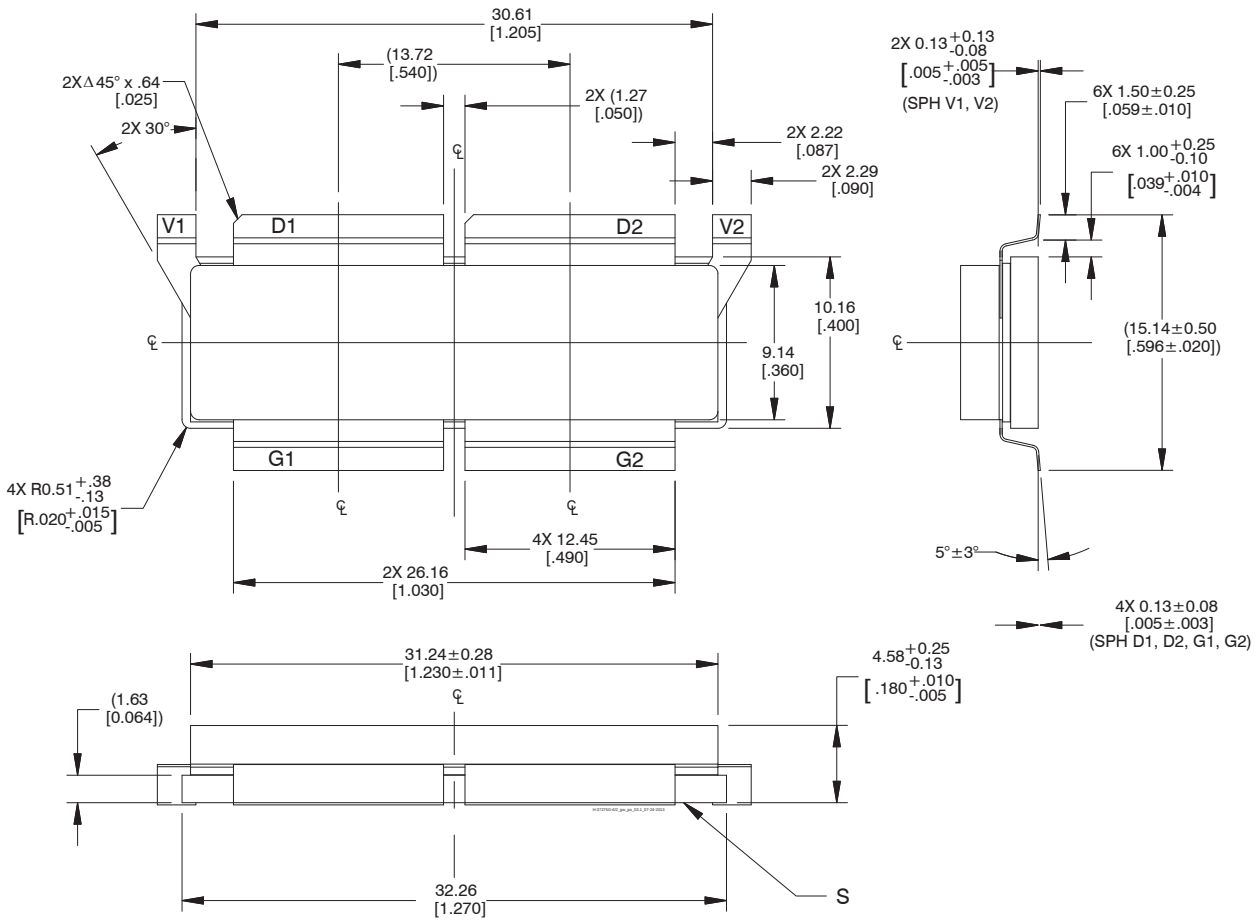


Diagram Notes—unless otherwise specified:

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].
4. Pins: D1, D2 – drain, G1, G2 – gate, V1, V2 – V_{DD}, S (flange) – source.
5. Lead thickness: 0.13 +0.051/–0.025 [.005 +.002/–.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 at each revision)
01	2014-07-24	Advance	All	Data Sheet reflects advance specification for product development
02	2015-01-09	Production	All	Data Sheet represents released product specifications, including reference circuit and updated performance information.
02.1	2015-01-13	Production	8	BOM updated with correct part numbers and manufacturers.

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Edition 2015-01-13

Published by
Infineon Technologies AG
85579 Neubiberg, Germany

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