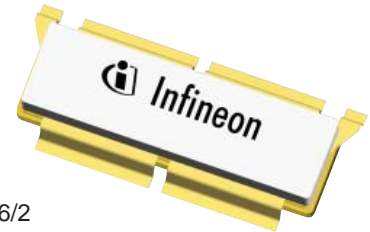


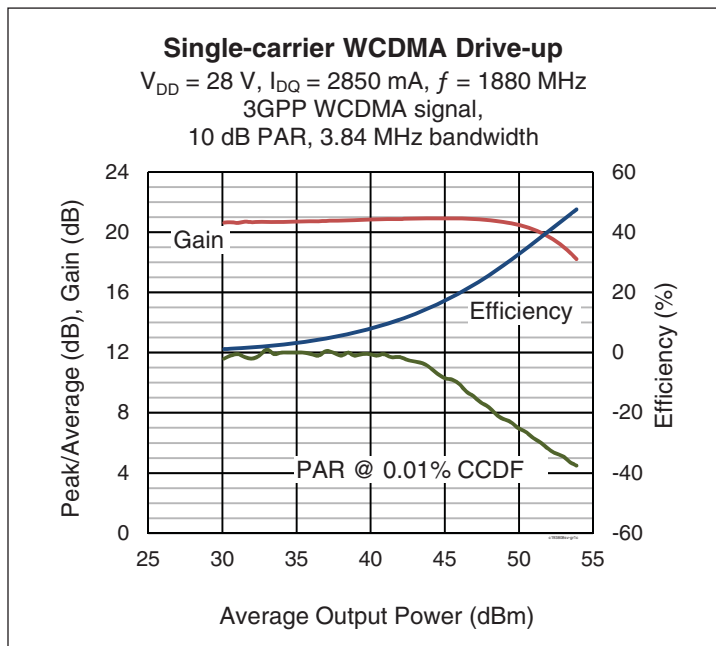
Thermally-Enhanced High Power RF LDMOS FET 380 W, 28 V, 1805 – 1880 MHz

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 $P_{1dB} = 380\text{ W}$
 - 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)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 2880\text{ mA}$, $P_{OUT} = 80\text{ W avg}$, $f = 1880\text{ MHz}$.

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 $T_{CASE} = 25^\circ\text{C}$ 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 | $V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ mA}$ | $V_{(BR)DSS}$ | 65 | — | — | V |
| Drain Leakage Current | $V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$ | I_{DSS} | — | — | 1 | μA |
| | $V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$ | I_{DSS} | — | — | 10 | μA |
| Gate Leakage Current | $V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$ | I_{GSS} | — | — | 1 | μA |
| On-State Resistance | $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$ | $R_{DS(on)}$ | — | 0.19 | — | Ω |
| Operating Gate Voltage | $V_{DS} = 28\text{ V}$, $I_{DQ} = 2.88\text{ A}$ | V_{GS} | 2.3 | 2.6 | 2.9 | V |

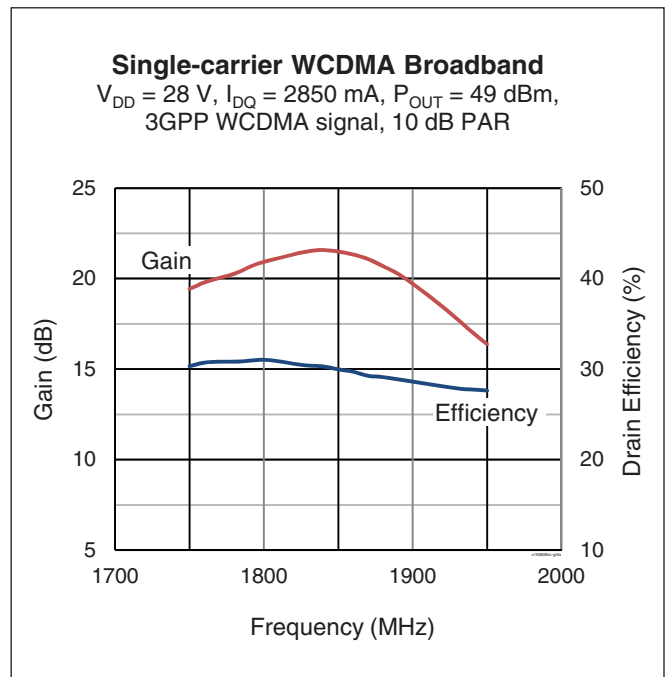
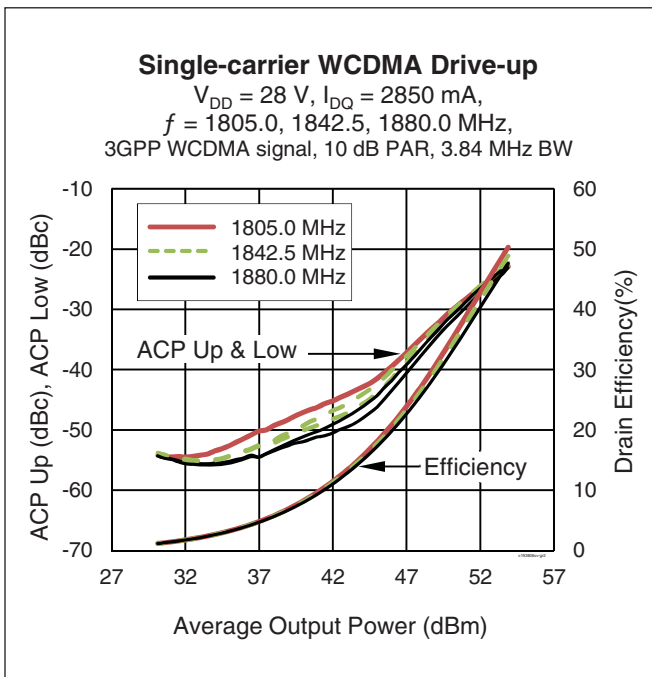
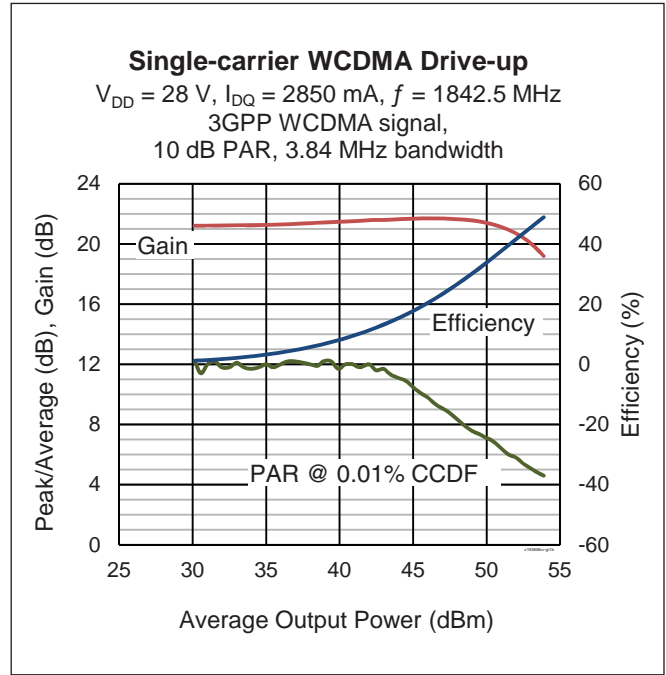
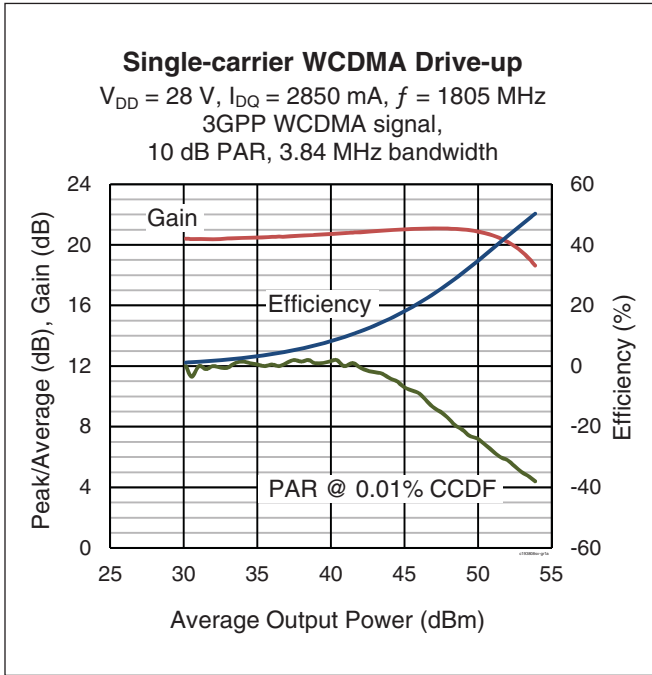
Maximum Ratings

| 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 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -65 to +150 | $^{\circ}\text{C}$ |
| Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$, 280 W CW) | $R_{\theta JC}$ | 0.18 | $^{\circ}\text{C/W}$ |

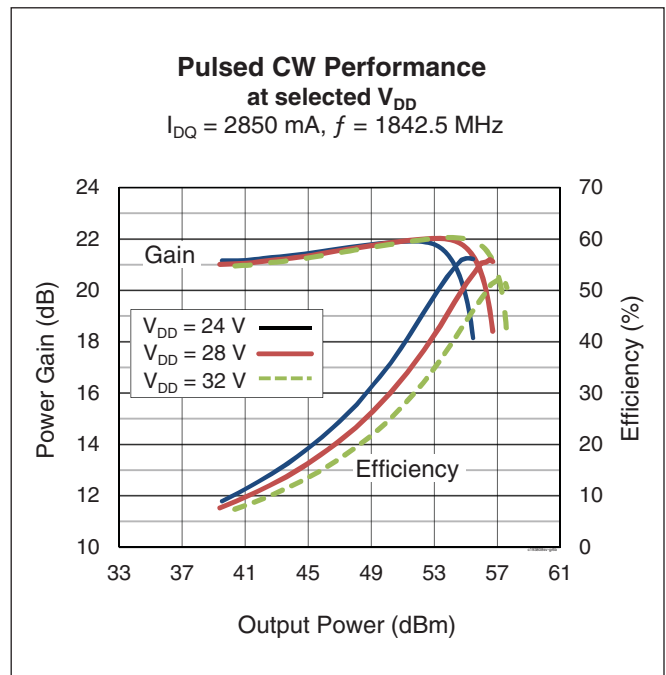
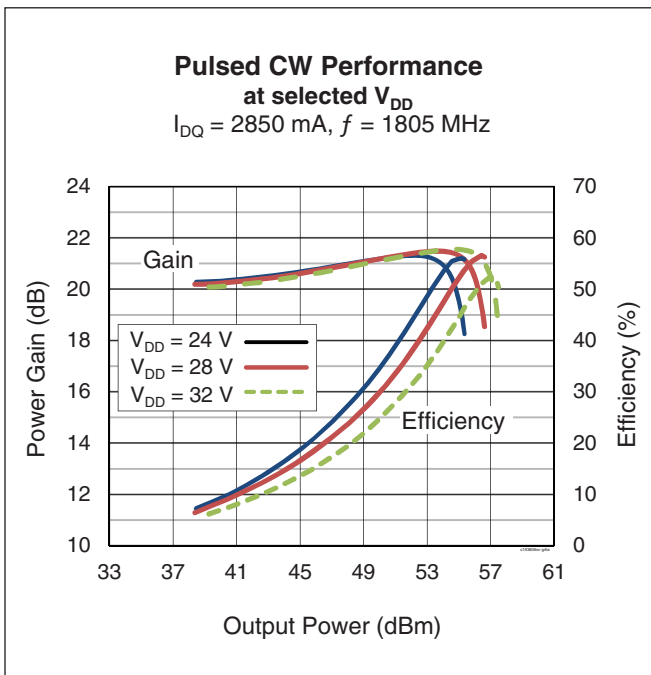
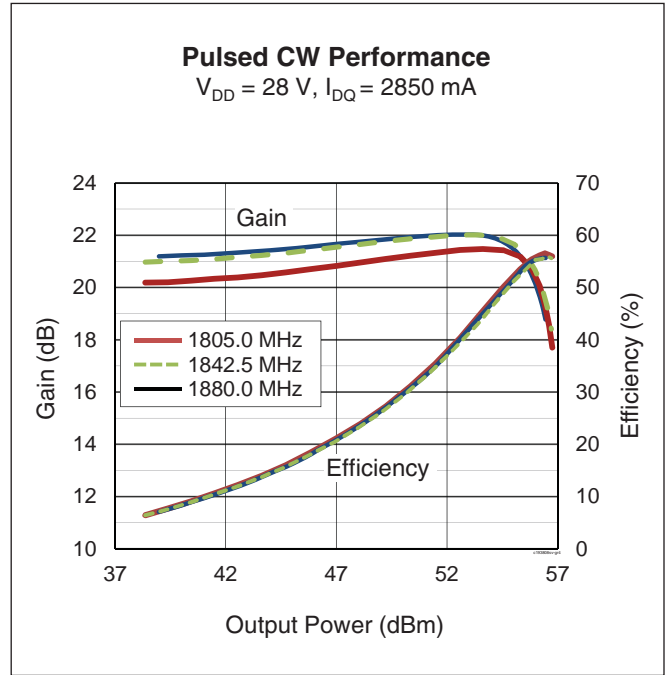
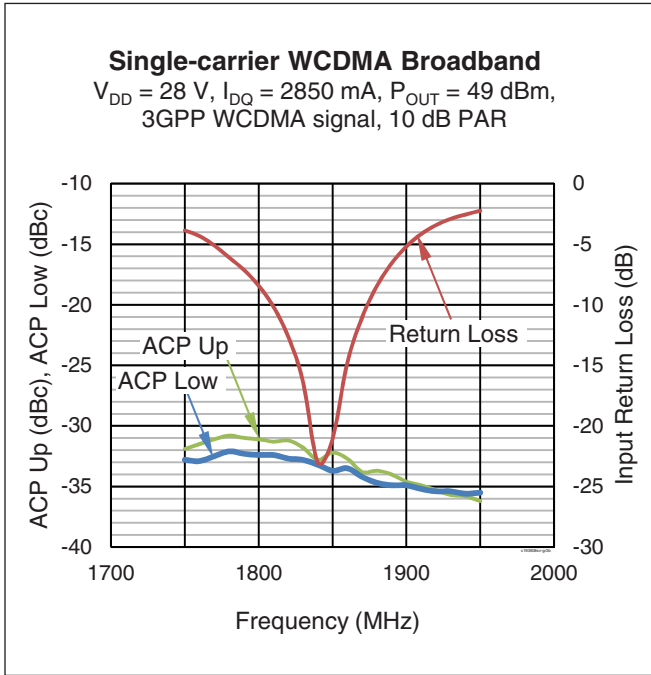
Ordering Information

| 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 |

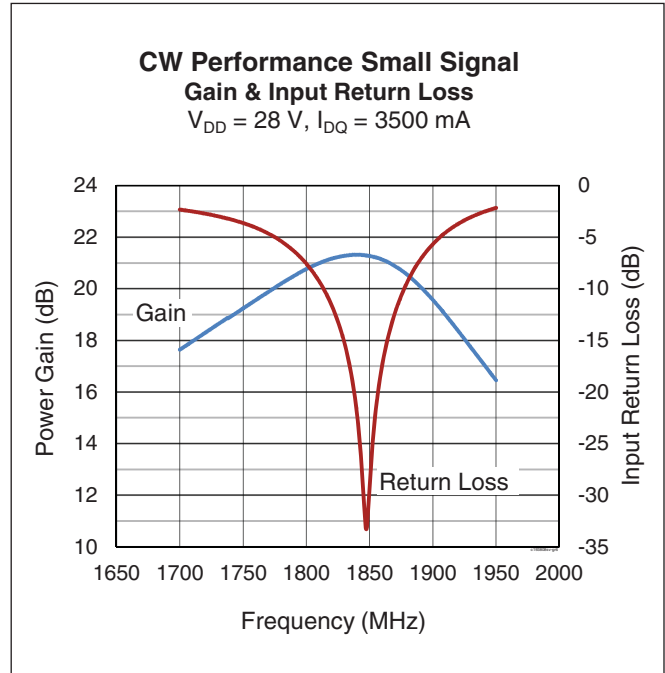
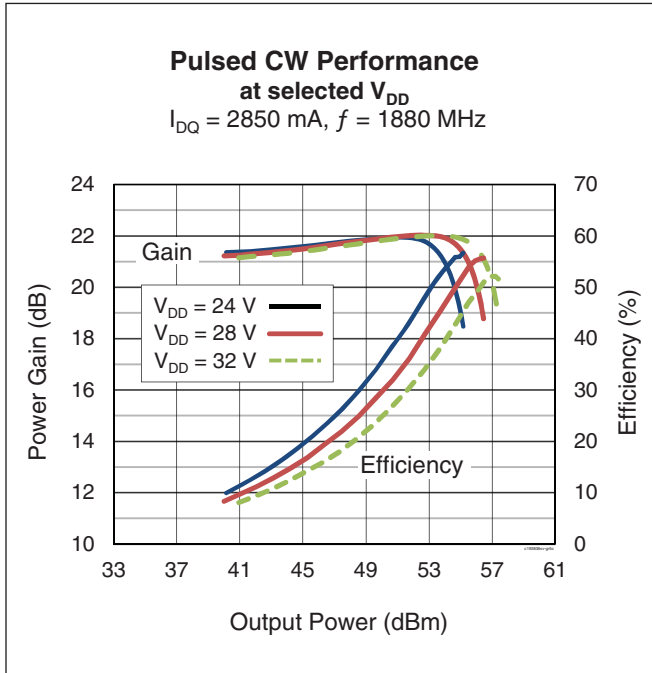
Typical Performance (data taken in an Infineon production test fixture)



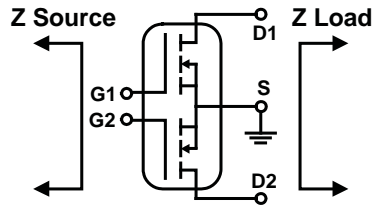
Typical Performance (cont.)



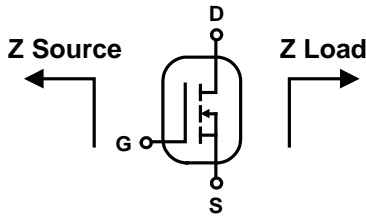
Typical Performance (cont.)



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 μ sec, 10% duty cycle; 28 V, 1440 mA

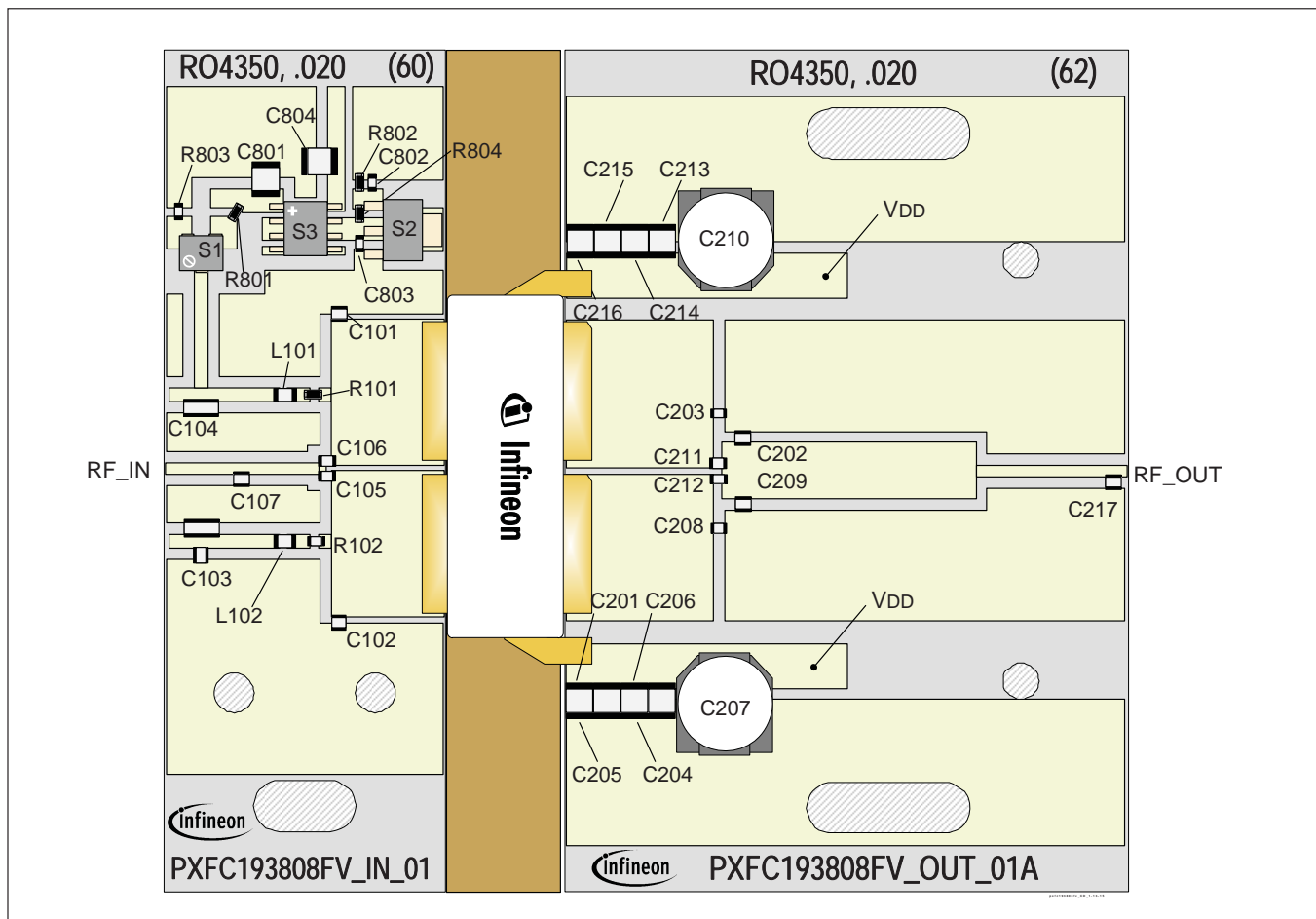
| Class AB | | P_{3dB} | | | | | | | | | |
|------------|------------------------------|-----------------------------|-----------|------------------------|----------------------|---------|-----------------------------|-----------|------------------------|----------------------|----------------|
| | | Max Output Power | | | | | Max Efficiency | | | | |
| Freq [MHz] | Z _{in} [Ω] | Z _o [Ω] | Gain [dB] | P _{OUT} [dBm] | P _{OUT} [W] | PAE [%] | Z _o [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 μ sec, 10% duty cycle; 28 V, 1440 mA

| Class AB | | P_{1dB} | | | | | | | | | |
|------------|------------------------------|-----------------------------|-----------|------------------------|----------------------|---------|-----------------------------|-----------|------------------------|----------------------|----------------|
| | | Max Output Power | | | | | Max Efficiency | | | | |
| Freq [MHz] | Z _{in} [Ω] | Z _o [Ω] | Gain [dB] | P _{OUT} [dBm] | P _{OUT} [W] | PAE [%] | Z _o [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, $\epsilon_r = 3.66$ |
| Find Gerber files for this reference circuit on the Infineon Web site at www.infineon.com/rfpower | |

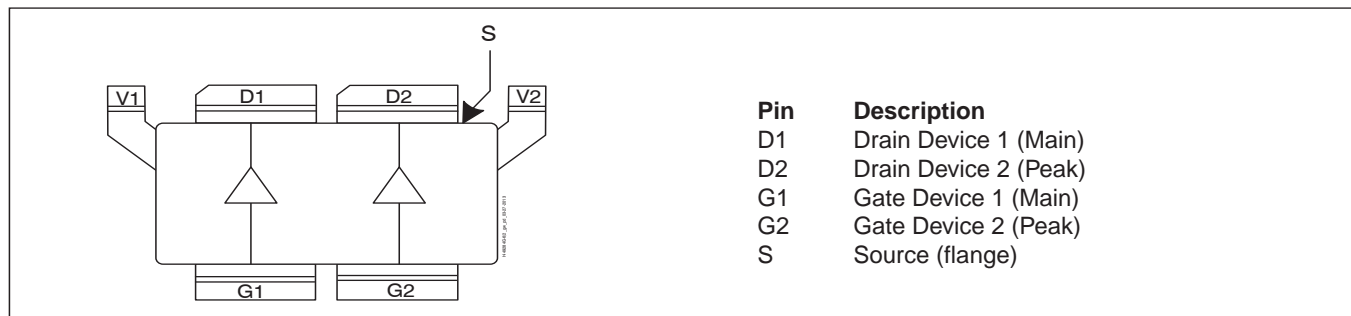


Reference circuit assembly diagram (not to scale)

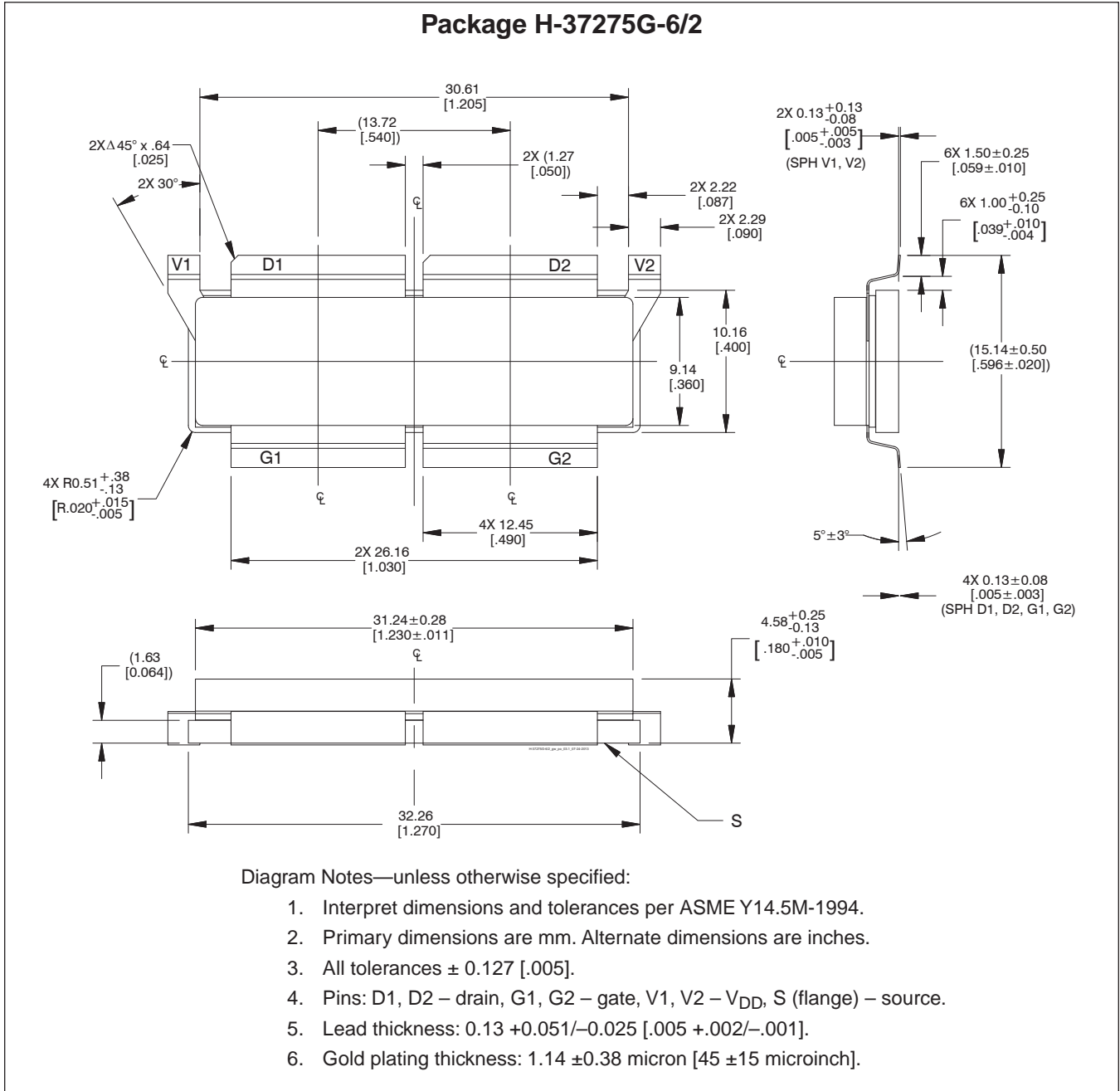
Reference Circuit (cont.)

Reference circuit bill of Materials

| Component | Description | Manufacturer | Part Number |
|------------------------|--------------------------|----------------------------------|--------------------|
| Input | | | |
| C101, C102 | Capacitor, 0.7 pF | ATC | ATC100A0R7JT250XT |
| C104, C103 | Capacitor, 10 μ F | Murata Electronics North America | LLL31BC70G106MA01L |
| C106, C105 | Capacitor, 18 pF | ATC | ATC800A180GT250XT |
| C107 | Capacitor, 1.0 pF | ATC | ATC100A1R0CW150XB |
| C801, C804 | Capacitor, 10 μ F | Taiyo Yuden | UMK325C7106MM-T |
| C802 | Capacitor, 0.001 μ F | Panasonic | ECJ-1VB1H102K |
| C803 | Capacitor, 1 μ F | 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 μ F | 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 μ F | Murata Electronics North America | GRM32ER71H475KA88L |
| C207, C210 | Capacitor, 220 μ F | Panasonic – ECG | EEE-FP1V221AP |
| C211, C212 | Capacitor, 18 pF | ATC | ATC600F0R8BT250XT |
| C217 | Capacitor, 0.3 pF | ATC | ATC100A0R3CW150XB |

Pinout Diagram (top view)

Lead connections for PXFC193808SV

Package Outline Specifications



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

Revision History

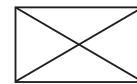
| Revision | Date | Data Sheet | Page | Subjects (major changes at each revision) |
|----------|------------|------------|------|---|
| 01 | 2014-07-24 | Advance | All | Data Sheet reflects advance specification for product development |
| 02 | 2015-01-09 | Production | All | Data Sheet represents released 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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