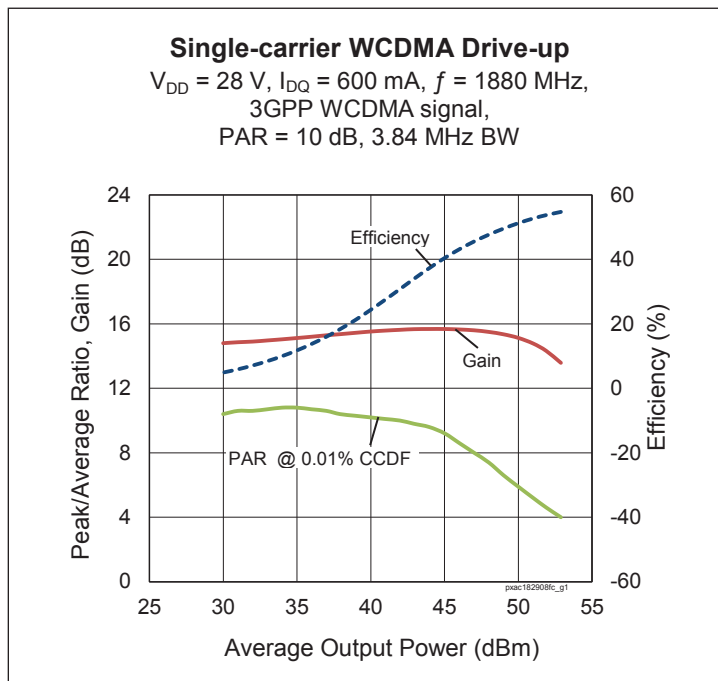


Thermally-Enhanced High Power RF LDMOS FET 240 W, 28 V, 1805 – 1880 MHz

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 : $P_{1dB} = 120\text{ W Typ}$
 - Peak : $P_{1dB} = 220\text{ W Typ}$
- Typical Pulsed CW performance, 1842.5 MHz, 28 V, combined outputs
 - Output power at $P_{1dB} = 240\text{ W}$
 - 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)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 600\text{ mA}$, $V_{GSPEAK} = 0.70\text{ V}$, $P_{OUT} = 70\text{ W avg}$, $f_1 = 1880\text{ MHz}$, 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 | — | % |
| Adjacent Channel Power Ratio | ACPR | — | -27.5 | -25 | 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 |
| | $V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$ | I_{DSS} | — | — | 10 | μA |
| On-State Resistance (main) | $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$ | $R_{DS(on)}$ | — | 0.11 | — | Ω |
| | (peak) $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$ | $R_{DS(on)}$ | — | 0.06 | — | Ω |
| Operating Gate Voltage (main) | $V_{DS} = 28\text{ V}$, $I_{DQ} = 600\text{ mA}$ | V_{GS} | 2.45 | 2.70 | 2.95 | V |
| | (peak) $V_{DS} = 28\text{ V}$, $I_{DQ} = 0\text{ A}$ | V_{GS} | 0.45 | 0.60 | 0.80 | V |
| Gate Leakage Current | $V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$ | I_{GSS} | — | — | 1 | μA |

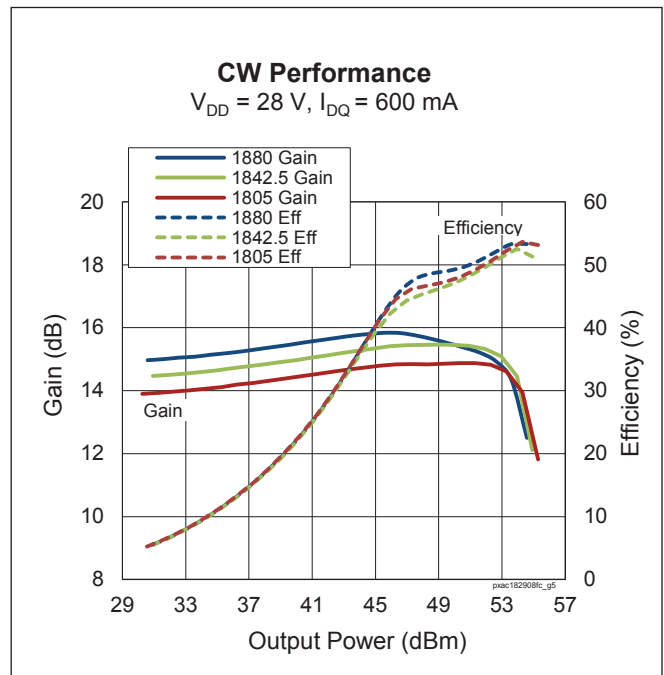
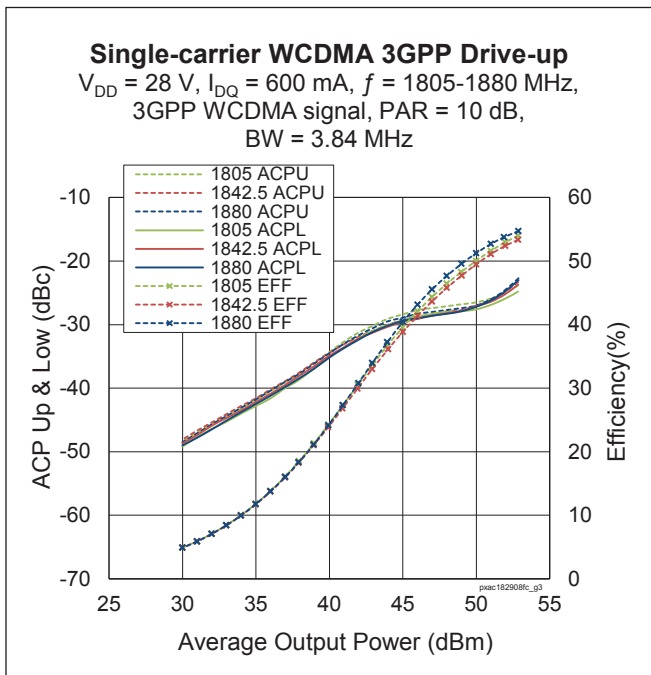
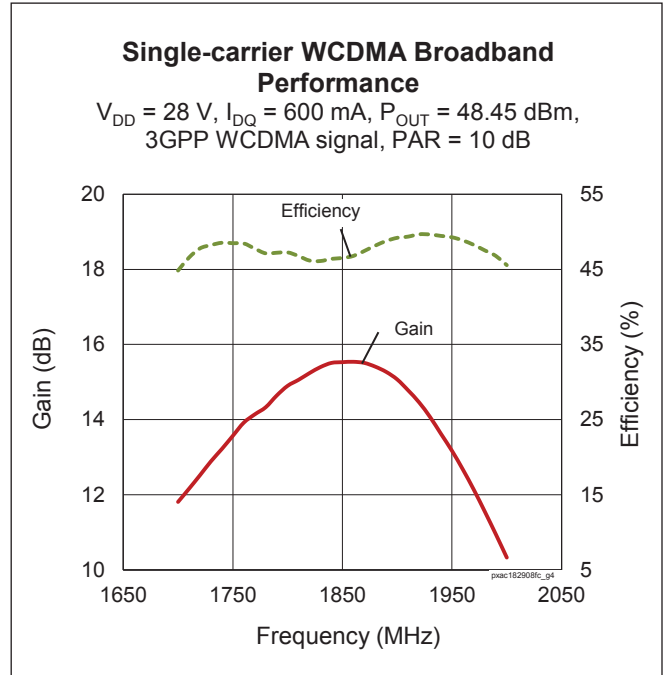
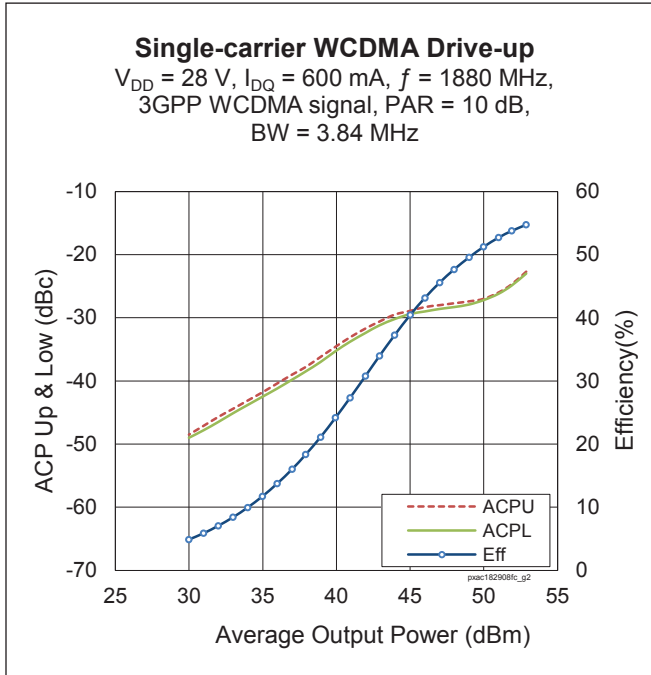
Maximum Ratings

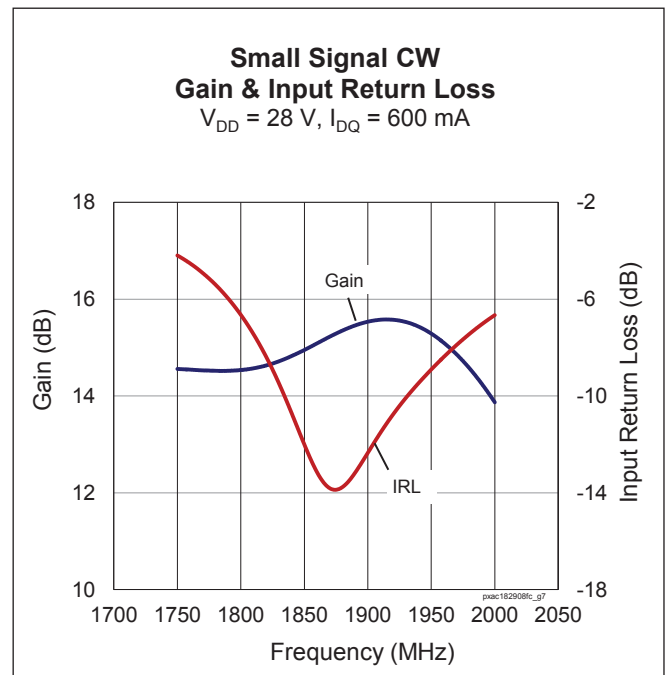
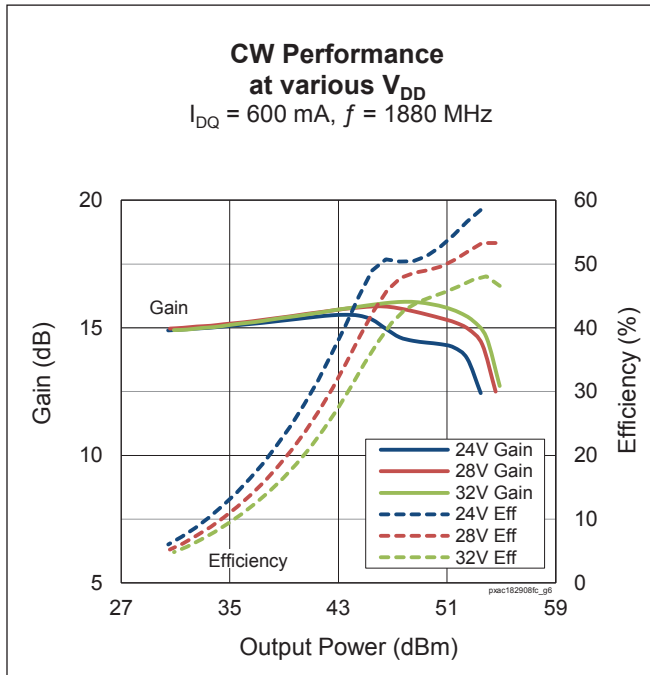
| Parameter | Symbol | Value | Unit |
|--|--|-----------------|----------------------|
| Drain-Source Voltage | V_{DSS} | 65 | V |
| Gate-Source Voltage | V_{GS} | -6 to +10 | V |
| Operating Voltage | V_{DD} | 0 to +32 | V |
| Junction Temperature | T_J | 225 | $^{\circ}\text{C}$ |
| Storage Temperature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

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)



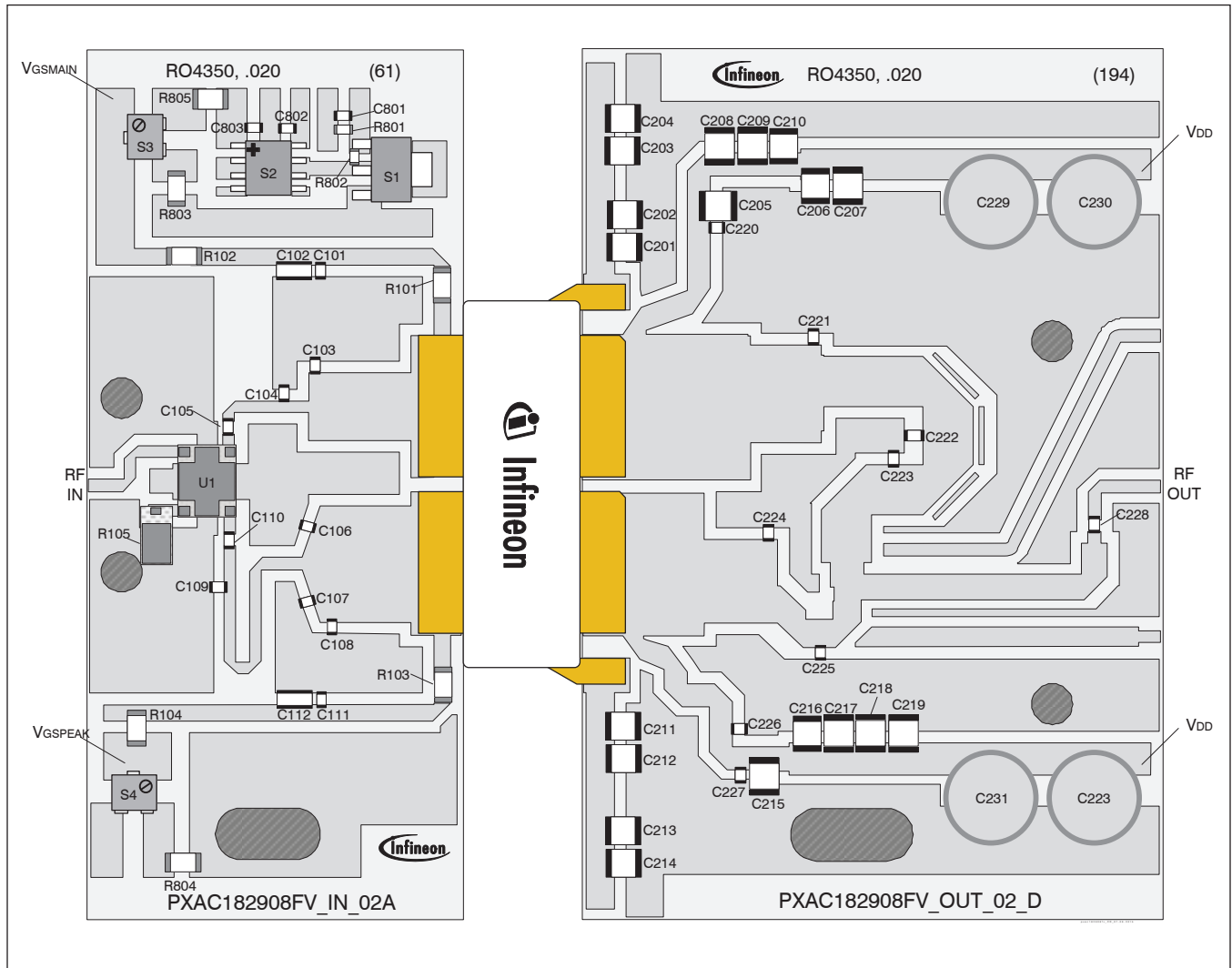
Typical Performance (cont.)

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

| Freq [MHz] | Z_s [Ω] | P_{1dB} | | | | | | | | | |
|------------|--------------------|--------------------|-----------|-----------------|---------------|--------------|--------------------|-----------|-----------------|---------------|--------------|
| | | Max Output Power | | | | | Max PAE | | | | |
| | | Z_L [Ω] | Gain [dB] | P_{OUT} [dBm] | P_{OUT} [W] | η_D [%] | Z_L [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, $I_{DQ} = 100 \text{ mA}$

| Freq [MHz] | Z_s [Ω] | P_{1dB} | | | | | | | | | |
|------------|--------------------|--------------------|-----------|-----------------|---------------|--------------|--------------------|-----------|-----------------|---------------|--------------|
| | | Max Output Power | | | | | Max PAE | | | | |
| | | Z_L [Ω] | Gain [dB] | P_{OUT} [dBm] | P_{OUT} [W] | η_D [%] | Z_L [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.)

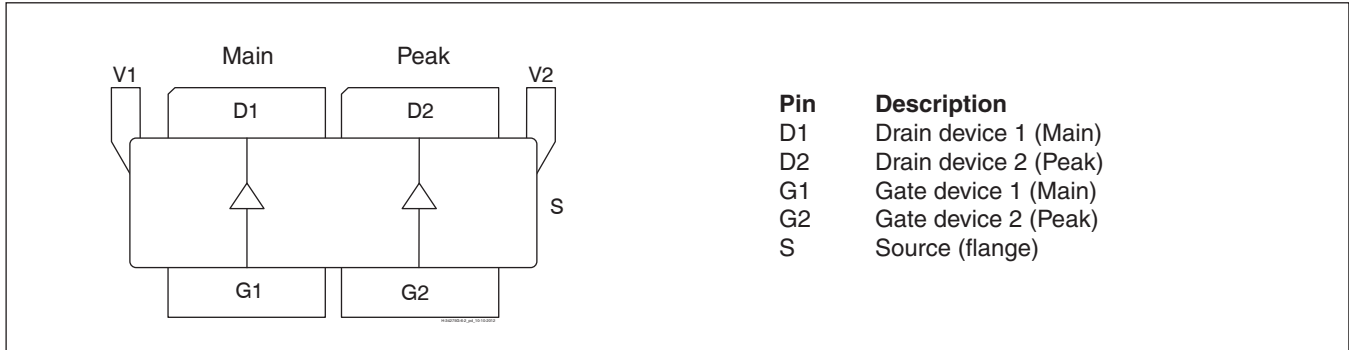
Reference Circuit Assembly

| | |
|---|---|
| DUT | PXAC182908FV V1 |
| Test Fixture Part No. | LTA/PXAC182908FV V1 |
| PCB | Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$, $f = 1805 - 1880$ MHz |
| Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower | |

Components Information

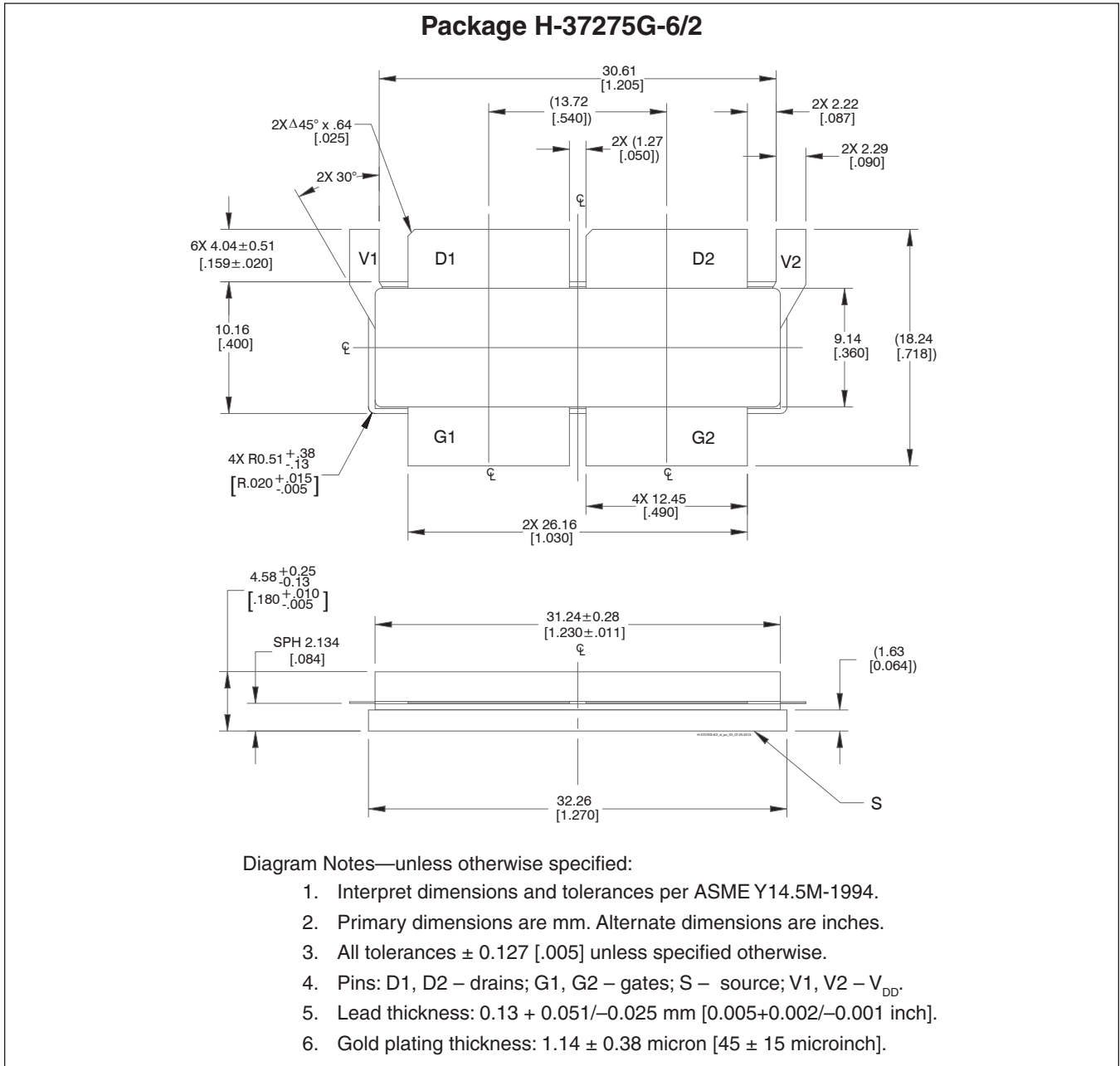
| Component | Description | Manufacturer | P/N |
|--|----------------------------|---------------------------------|--------------------|
| Input | | | |
| C101, C105, C110, C111 | Capacitor, 18 pF | ATC | ATC100A180JW150XB |
| C102, C112 | Capacitor, 10 μ F | Murata | LLL31BC70G106MA01L |
| C103 | Capacitor, 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 regulator | 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 μ F | 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 μ F | Panasonic Electronic Components | EEE-FP1V221AP |

Pinout Diagram (top view)



Lead connections for PXAC182908FV

Package Outline Specifications



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