

Thermally-Enhanced High Power RF LDMOS FET 60 W, P_{3dB} @ 28 V, 2620 – 2690 MHz

Description

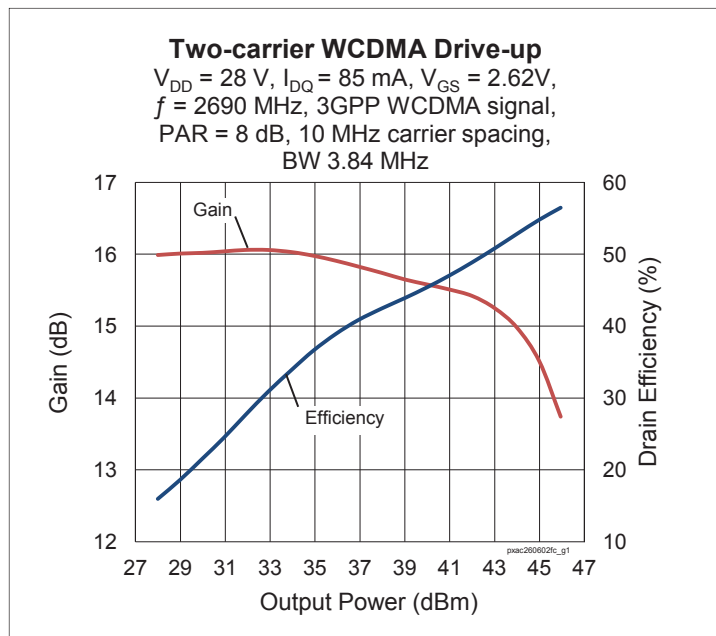
The PXAC260602FC is a 60-watt LDMOS FET with an asymmetrical design intended for use in multi-standard cellular power amplifier applications in the 2620 to 2690 MHz frequency band. Features include dual-path design, high gain and thermally-enhanced package with earless flanges. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXAC260602FC
Package H-37248-4



Features

- Main: Input matched
Peak: Input and output matching
- Asymmetric Doherty design
 - Main: P_{1dB} = 15 W Typ
 - Peak: P_{1dB} = 50 W Typ
- Typical Pulsed CW performance, 2690 MHz, 28 V, 10 μs pulse width, 10% duty cycle, class AB, Doherty Configuration
 - Output power at P_{1dB} = 50 W
 - Efficiency = 50%
 - Gain = 15 dB
- Typical two-carrier WCDMA performance, 2690 MHz, 28 V, 8 dB PAR @ 0.01% CCDF, Doherty Configuration
 - Output power = 5 W
 - Efficiency = 40%
 - Gain = 15.7 dB
 - IMD = -30 dBc
- Capable of handling 10:1 VSWR @ 28 V, 50 W (CW) output power
- Integrated ESD protection : Human Body Model, Class 1B (per JESD22-A114)
- Low thermal resistance
- Pb-free and RoHS compliant



RF Characteristics

Single-carrier WCDMA Specifications (tested in Infineon Doherty test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 85\text{ mA}$, $P_{OUT} = 5\text{ W avg}$, $V_{GS(PK)} = V_{GS}$ at 300 mA -1.0V, $f = 2620 - 2690\text{ MHz}$, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

| Characteristic | Symbol | Min | Typ | Max | Unit |
|------------------------------|----------|-----|------|-----|------|
| Linear Gain | G_{ps} | 14 | 15.7 | — | dB |
| Drain Efficiency | η_D | 35 | 39 | — | % |
| Adjacent Channel Power Ratio | ACPR | — | -31 | -28 | 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 |
| On-State Resistance (main) | $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$ | $R_{DS(on)}$ | — | 0.8 | — | Ω |
| | (peak) $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$ | $R_{DS(on)}$ | — | 0.22 | — | Ω |
| Operating Gate Voltage (main) | $V_{DS} = 28\text{ V}$, $I_{DQ} = 0.09\text{ A}$ | V_{GS} | 2 | 2.65 | 3.4 | V |
| | (peak) $V_{DS} = 28\text{ V}$, $I_{DQ} = 0\text{ mA}$ | V_{GS} | 1 | 1.65 | 2.4 | V |
| Gate Leakage Current | $V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$ | I_{GSS} | — | — | 1 | μA |

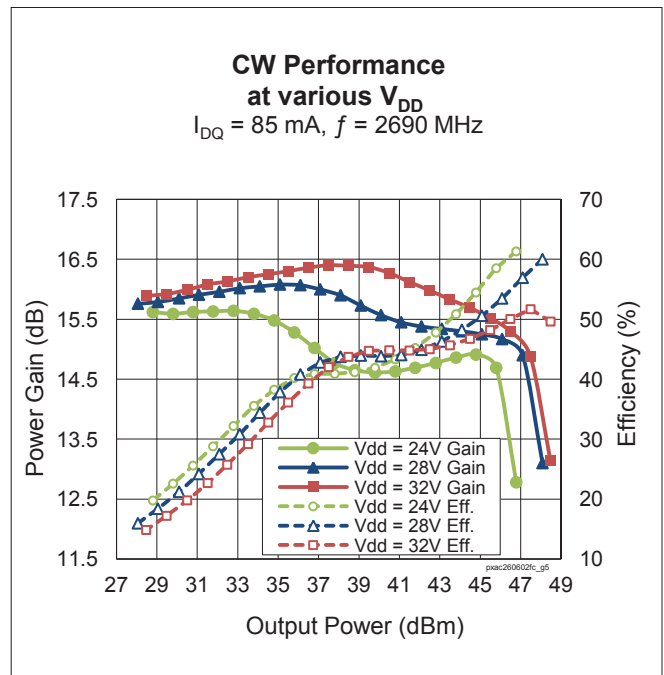
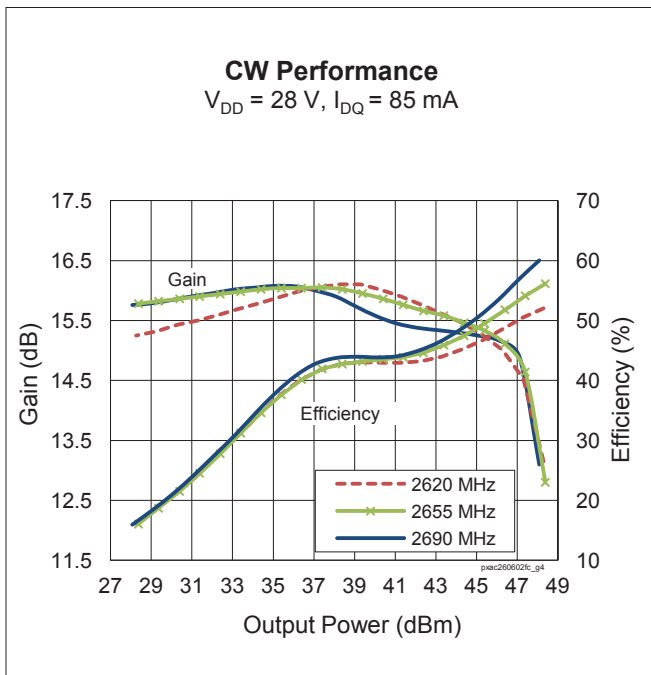
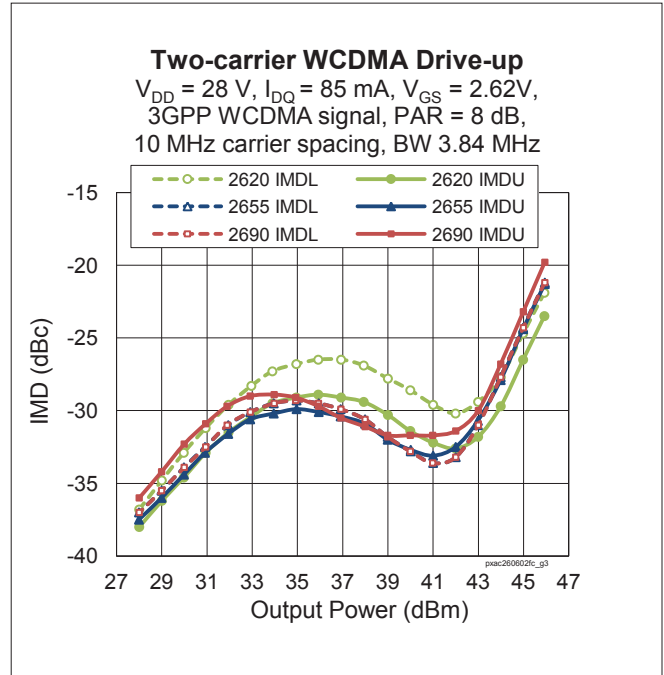
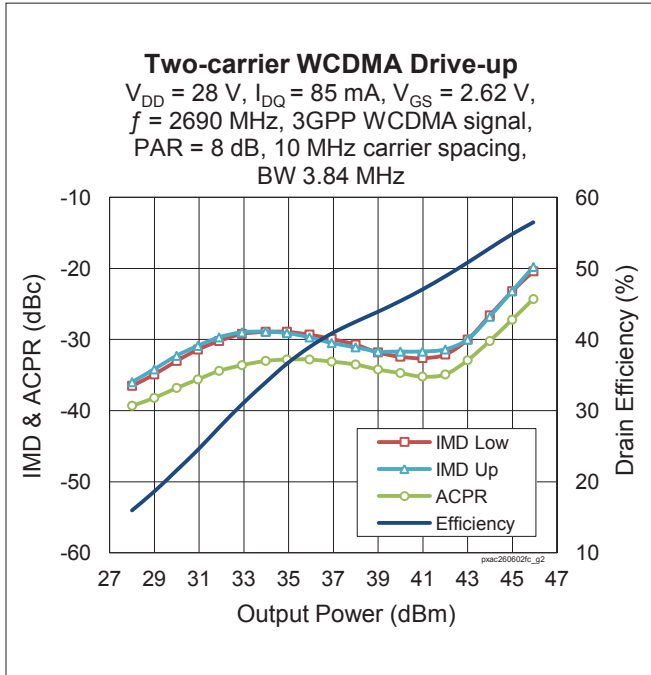
Maximum Ratings

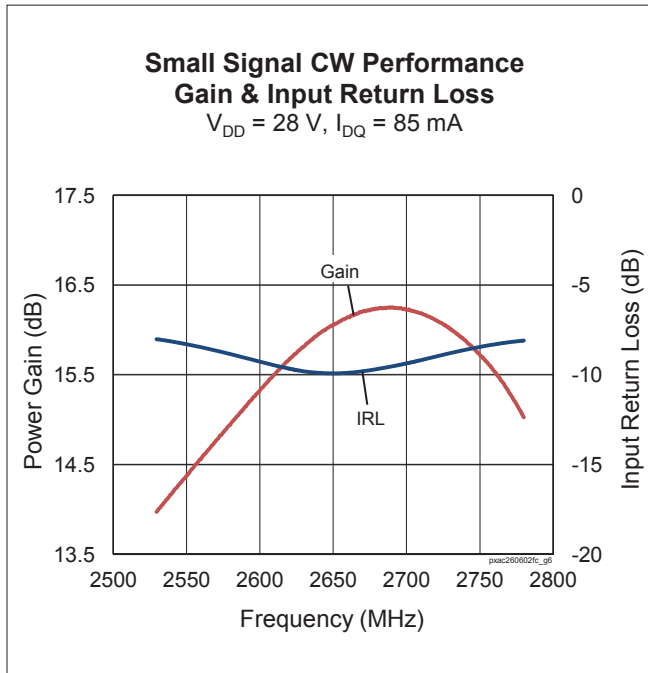
| Parameter | Symbol | Value | Unit |
|---|--|-----------------|----------------------|
| Drain-Source Voltage | V_{DSS} | 65 | V |
| Gate-Source Voltage | V_{GS} | -6 to +10 | V |
| Operating Voltage | V_{DD} | 0 to +32 | V |
| Junction Temperature | T_J | 200 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -65 to +150 | $^{\circ}\text{C}$ |
| Thermal Resistance (main, $T_{CASE} = 70^{\circ}\text{C}$, 5 W CW) | $R_{\theta JC}$ | 4.1 | $^{\circ}\text{C/W}$ |
| | (doherty, $T_{CASE} = 70^{\circ}\text{C}$, 20 W CW) | $R_{\theta JC}$ | 2.0 |

Ordering Information

| Type and Version | Order Code | Package Description | Shipping |
|----------------------|--------------------------|---------------------------|----------------------|
| PXAC260602FC V1 | PXAC260602FCV1XWSA1 | H-37248-4, earless flange | Tray |
| PXAC260602FC V1 R250 | PXAC260602FC V1R250XTMA1 | H-37248-4, earless flange | Tape & Reel, 250 pcs |

Typical Performance (data taken in a production test fixture)



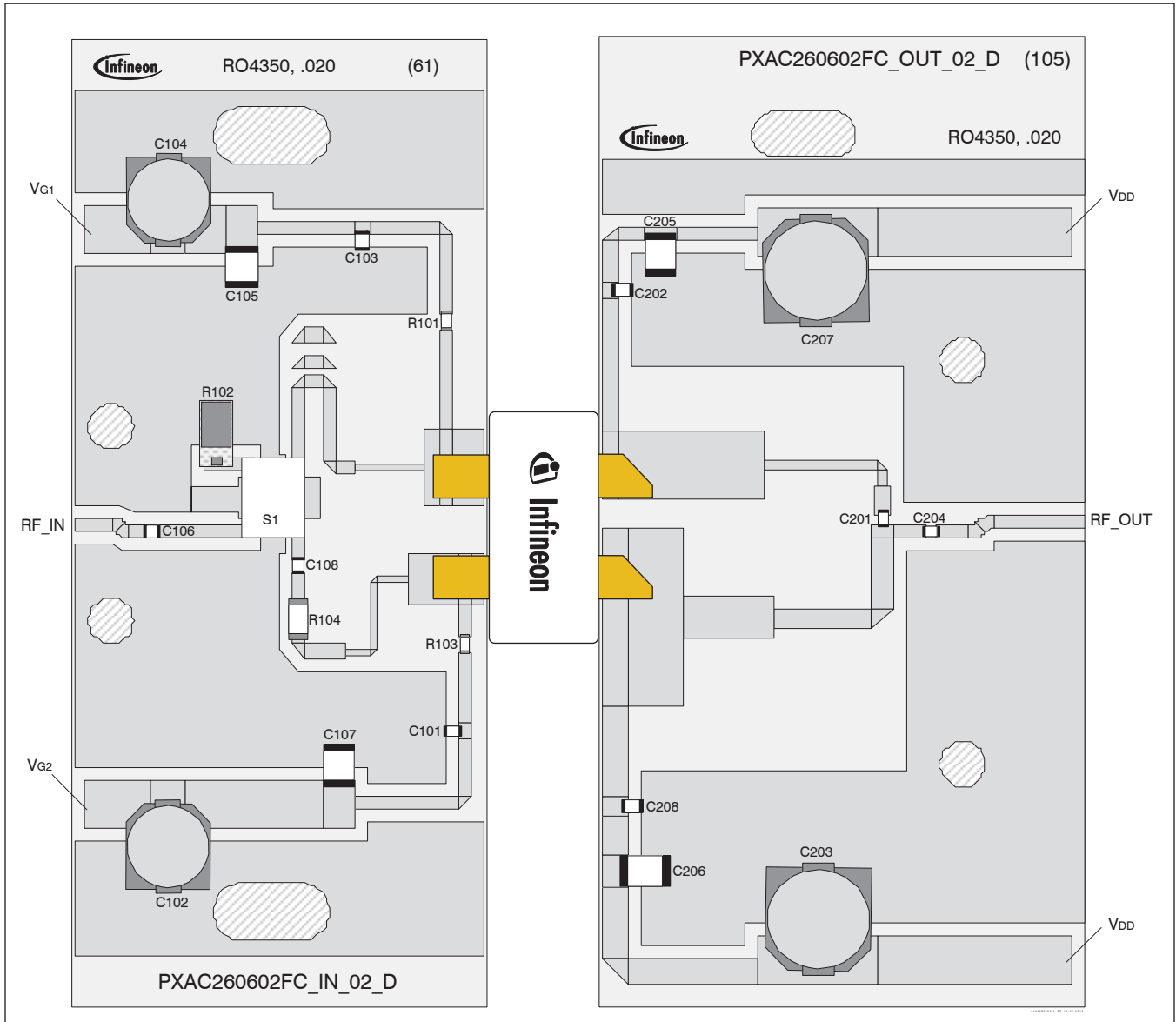
Typical Performance (cont.)

Load Pull Performance
Main Side Load Pull Performance – Pulsed CW signal: 10 μs , 10% duty cycle, 28 V, 80 mA

| | | P1dB | | | | | | | | | |
|------------|-----------------|------------------|-----------|------------|----------|---------|-----------------|-----------|------------|----------|---------|
| | | Max Output Power | | | | | Max PAE | | | | |
| Freq [MHz] | Zs [Ω] | ZI [Ω] | Gain [dB] | POUT [dBm] | POUT [W] | PAE [%] | ZI [Ω] | Gain [dB] | POUT [dBm] | POUT [W] | PAE [%] |
| 2490 | 9.0 – j33 | 12.8 – j9.5 | 19.2 | 42.84 | 19.2 | 54.2 | 5.8 – j4.4 | 21.9 | 41.49 | 14.1 | 68.7 |
| 2620 | 25 – j47 | 13.9 – j10.6 | 18.8 | 43.15 | 20.6 | 58.7 | 8.9 – j6.8 | 20.4 | 42.24 | 16.7 | 66.4 |
| 2690 | 35 – j52 | 12.7 – j13.0 | 18.6 | 42.76 | 18.9 | 55.4 | 6.8 – j9.2 | 20.6 | 41.73 | 14.9 | 65.6 |

Peak Side Load Pull Performance – Pulsed CW signal: 10 μs , 10% duty cycle, 28 V, 250 mA

| | | P1dB | | | | | | | | | |
|------------|-----------------|------------------|-----------|------------|----------|---------|-----------------|-----------|------------|----------|---------|
| | | Max Output Power | | | | | Max PAE | | | | |
| Freq [MHz] | Zs [Ω] | ZI [Ω] | Gain [dB] | POUT [dBm] | POUT [W] | PAE [%] | ZI [Ω] | Gain [dB] | POUT [dBm] | POUT [W] | PAE [%] |
| 2490 | 4.1 – j13.1 | 3.7 – j5.2 | 16.7 | 48.44 | 70 | 56.0 | 6.2 – j1.3 | 18.9 | 46.59 | 46 | 63.4 |
| 2620 | 6.5 – j14.8 | 3.7 – j6.5 | 17 | 48.28 | 67 | 55.4 | 5.9 – j3.7 | 19.1 | 46.96 | 50 | 63.1 |
| 2690 | 9.0 – j17.8 | 3.7 – j6.1 | 17.6 | 48.11 | 65 | 56.2 | 5.7 – j2.4 | 20.9 | 46.30 | 43 | 64.6 |

Reference Circuit , 2620 – 2690 MHz



Reference circuit assembly diagram (not to scale)

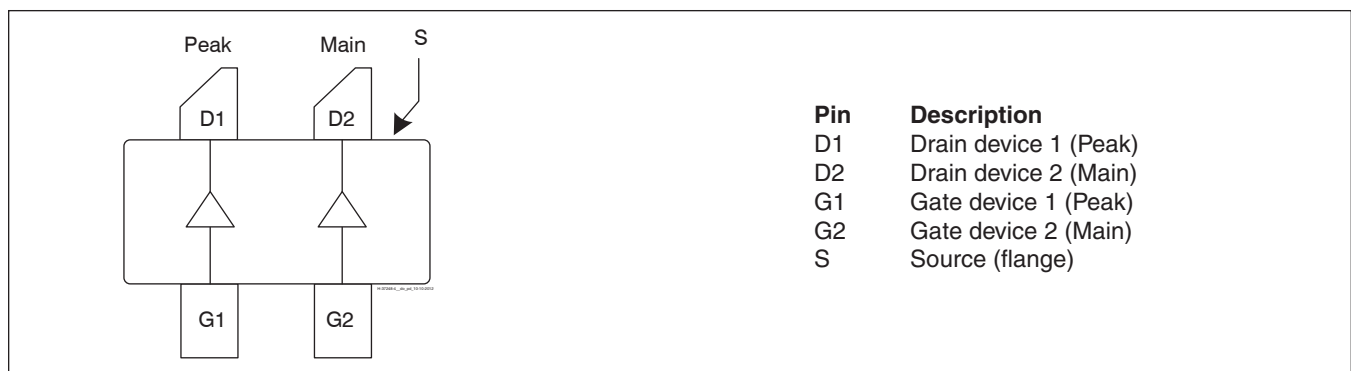
Reference Circuit (cont.)

Reference Circuit Assembly

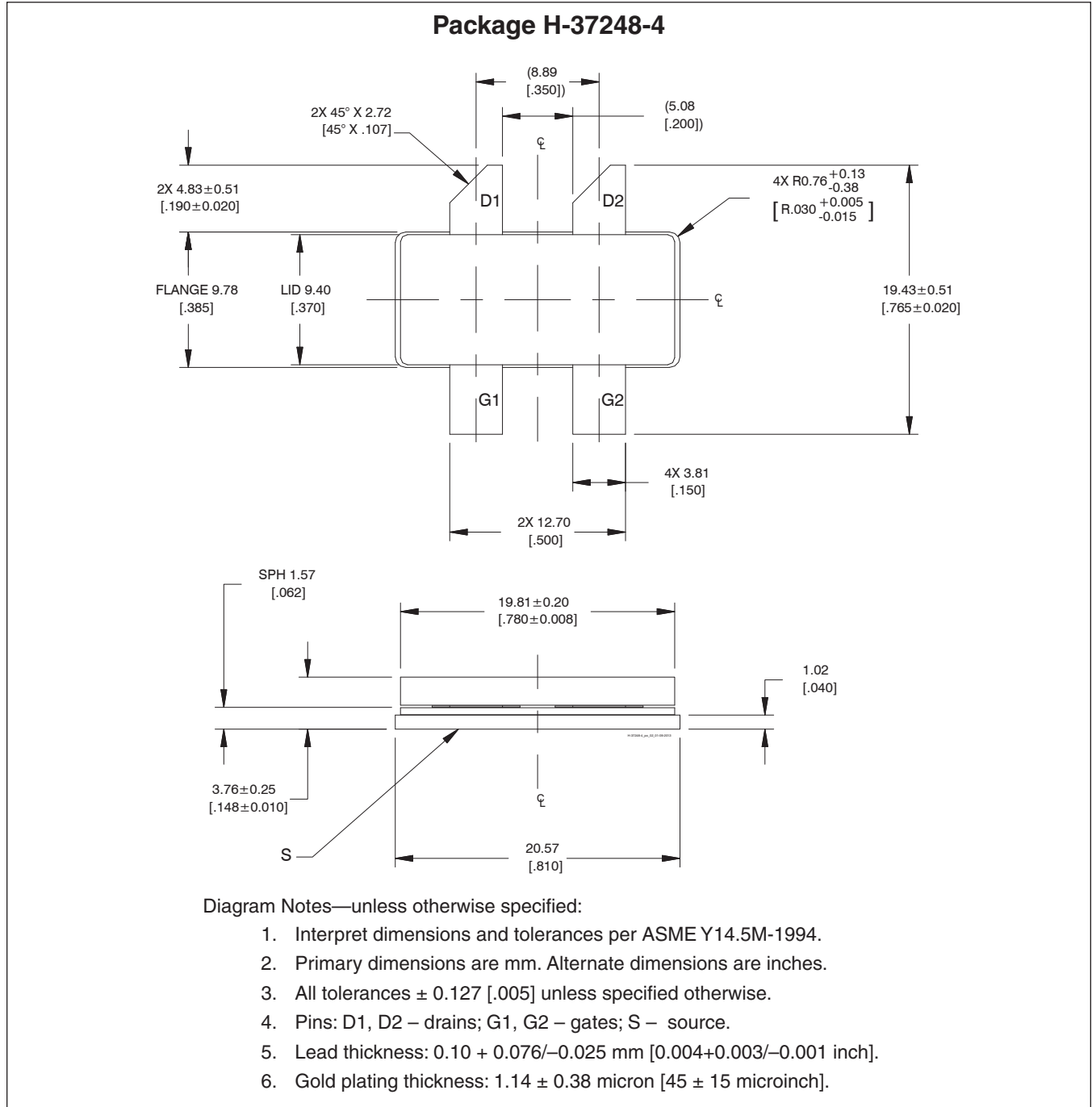
| | |
|---|---|
| DUT | PXAC260602FC V1 |
| Test Fixture Part No. | LTA/PXAC260602FC V1 |
| PCB | Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$, $f = 2620 - 2690$ MHz |
| Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower | |

Components Information

| Component | Description | Suggested Manufacturer | P/N |
|------------------------|--------------------------|---------------------------------|------------------|
| Input | | | |
| C101, C103, C106, C108 | Capacitor, 18 pF | ATC | ATC800A180JT250T |
| C102, C104 | Capacitor, 10 μ F | Panasonic Electronic Components | EEE-HB1H100AP |
| C105, C107 | Capacitor, 10 μ F | Taiyo Yuden | UMK325C7106MM-T |
| R101, R103 | Resistor, 10 Ω | Panasonic Electronic Components | ERJ-3GEYJ100V |
| R102 | Resistor, 50 Ω | Anaren | C16A5024 |
| R104 | Resistor, 20 Ω | Panasonic Electronic Components | ERJ-8GEYJ200V |
| S1 | Directional Coupler, 5dB | Anaren | X3C25P1-05S |
| Output | | | |
| C201, C202, C204, C208 | Capacitor, 18 pF | ATC | ATC800A180JT250T |
| C203, C207 | Capacitor, 100 μ F | Panasonic Electronic Components | EEE-FP1V101AP |
| C205, C206 | Capacitor, 10 μ F | Taiyo Yuden | UMK325C7106MM-T |

Pinout Diagram (top view)

Lead connections for PTAC260602FC

Package Outline Specifications



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

Previous Version: 2013-12-02, Data Sheet

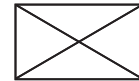
| Page | Subjects (major changes since last revision) |
|------|--|
| 1 | Revised ESD classification |
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highpowerRF@infineon.com

To request other information, contact us at:
+1 877 465 3667 (1-877-GO-LDMOS) USA
or +1 408 776 0600 International



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