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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: [info@chipsmall.com](mailto:info@chipsmall.com) Web: [www.chipsmall.com](http://www.chipsmall.com)

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

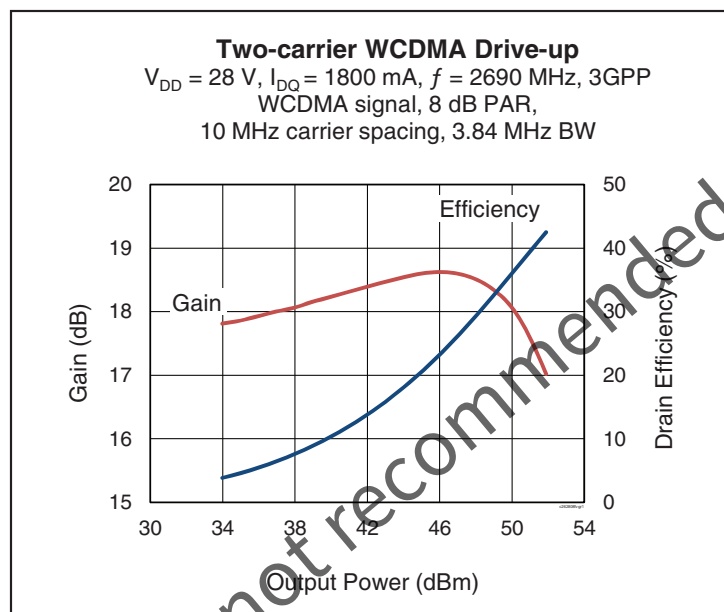


# PTFC262808FV

## Thermally-Enhanced High Power RF LDMOS FET 280 W, 28 V, 2620 – 2690 MHz

### Description

The PTFC262808FV is a 280-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 2620 to 2690 MHz frequency band. Features include input and output matching, high gain and thermally-enhanced package. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTFC262808FV

Package H-37275G-6/2

### Features

- Broadband internal matching
- Typical 1-carrier WCDMA performance, 2655 MHz, 28 V, 10 dB PAR
  - Output power at  $P_{1dB} = 56\text{ W}$  avg.
  - Efficiency = 24%
  - Gain = 18 dB
  - ACPR = -33 dBc @ 3.84 MHz
- Integrated ESD protection: Human Body Model, Class 1C (per JESD22-A114)
- Low thermal resistance
- RoHS-compliant
- Capable of handling 10:1 VSWR at 28 V, 280 W (CW) output power

### RF Characteristics

#### Single-carrier WCDMA Specifications (tested in Wolfspeed production test fixture)

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 1800\text{ mA}$ ,  $P_{OUT} = 56\text{ W}$  average,  $f = 2655\text{ MHz}$ , 3GPP WCDMA signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

| Characteristic               | Symbol   | Min  | Typ  | Max | Unit |
|------------------------------|----------|------|------|-----|------|
| Gain                         | $G_{ps}$ | 16.5 | 18.0 | —   | dB   |
| Drain Efficiency             | $\eta_D$ | 22   | 24   | —   | %    |
| Adjacent Channel Power Ratio | ACPR     | —    | -33  | -30 | dBc  |

All published data at  $T_{CASE} = 25^\circ\text{C}$  unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

**DC Characteristics** (single 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          | $V_{DS} = 28\text{ V}$ , $V_{GS} = 0\text{ V}$     | $I_{DSS}$     | —   | —    | 1.0  | $\mu\text{A}$ |
|                                | $V_{DS} = 63\text{ V}$ , $V_{GS} = 0\text{ V}$     | $I_{DSS}$     | —   | —    | 10.0 | $\mu\text{A}$ |
| Gate Leakage Current           | $V_{GS} = 10\text{ V}$ , $V_{DS} = 0\text{ V}$     | $I_{GSS}$     | —   | —    | 1    | $\mu\text{A}$ |
| On-State Resistance            | $V_{GS} = 10\text{ V}$ , $V_{DS} = 0.1\text{ V}$   | $R_{DS(on)}$  | —   | 0.05 | —    | $\Omega$      |
| Operating Gate Voltage         | $V_{DS} = 28\text{ V}$ , $I_{DQ} = 1800\text{ mA}$ | $V_{GS}$      | —   | 2.6  | —    | V             |

**Maximum Ratings**

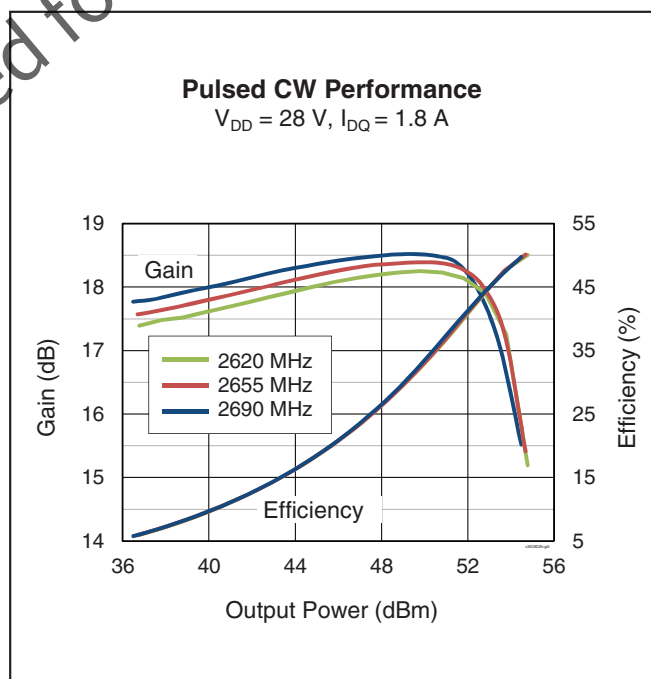
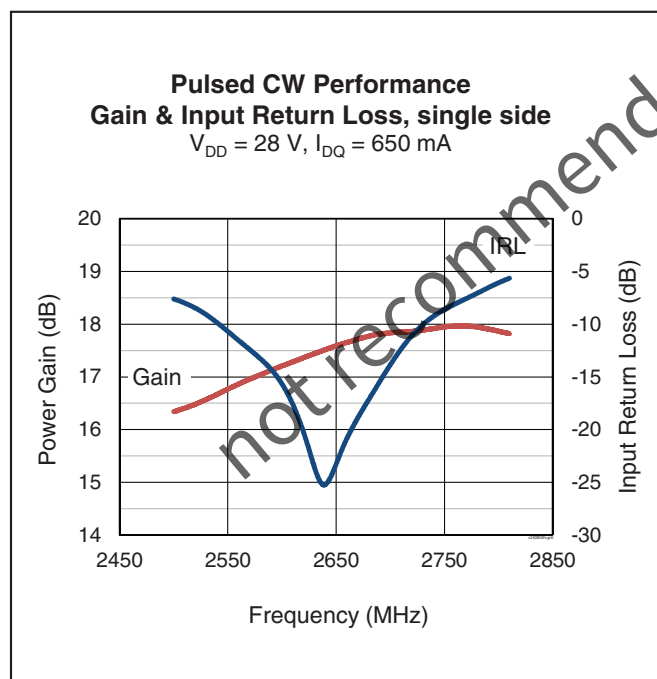
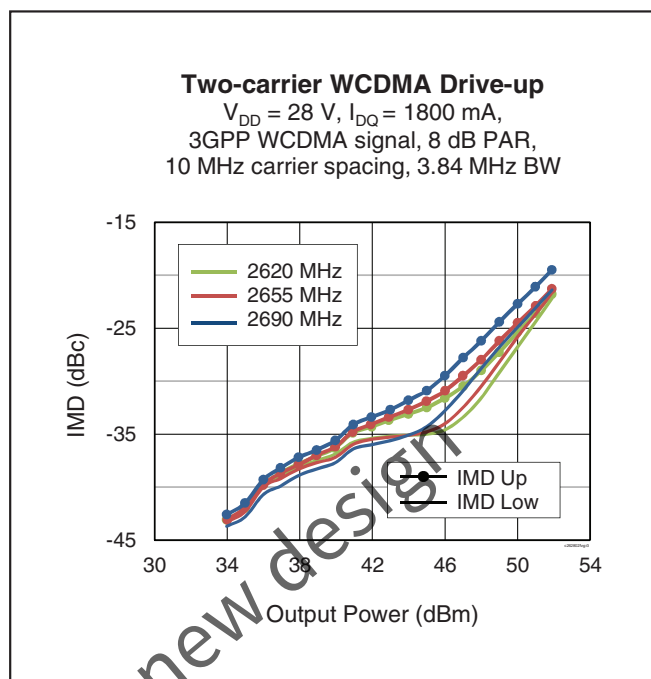
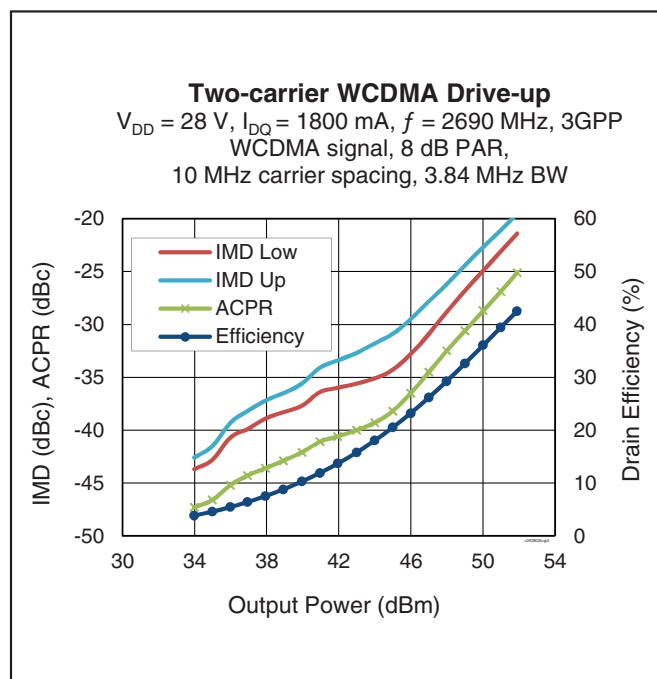
| Parameter  | Symbol          | Value       | Unit                 |
|--|-----------------|-------------|----------------------|
| Drain-Source Voltage   | $V_{DSS}$       | 65          | V                    |
| Gate-Source Voltage  | $V_{GS}$        | -6 to +10   | V                    |
| Operating 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 ( $T_{CASE} = 70^{\circ}\text{C}$ , 200 W CW) | $R_{\theta JC}$ | 0.20        | $^{\circ}\text{C/W}$ |

**Ordering Information**

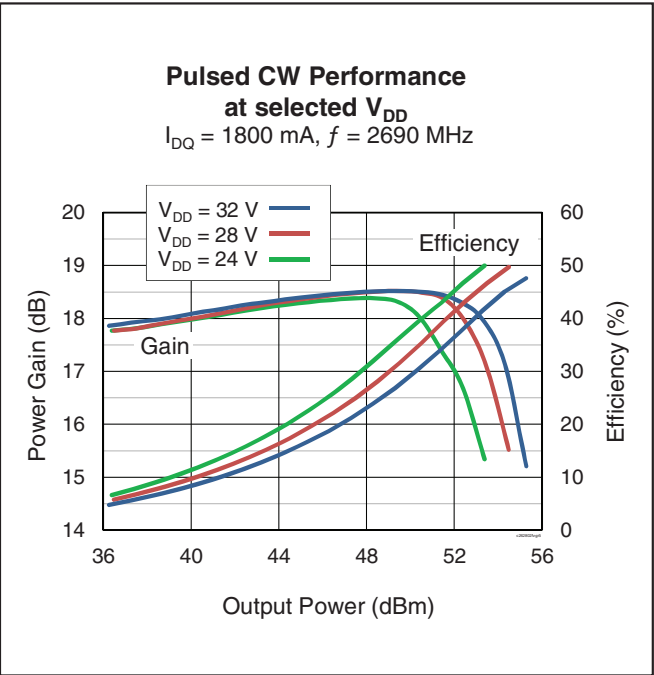
| Type and Version     | Order Code           | Package and Description                    | Shipping             |
|----------------------|----------------------|--|----------------------|
| PTFC262808FV V1 R0   | PTFC262808FV-V1-R0   | H-37275G-6/2, ceramic open-cavity, earless | Tape & Reel, 50 pcs  |
| PTFC262808FV V1 R250 | PTFC262808FV-V1-R250 | H-37275G-6/2, ceramic open-cavity, earless | Tape & Reel, 250 pcs |



# Typical Performance (data taken in Wolfspeed production test fixture)

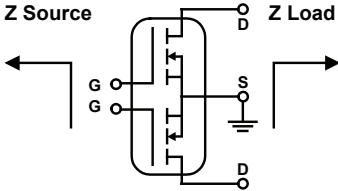


Typical Performance (cont.)



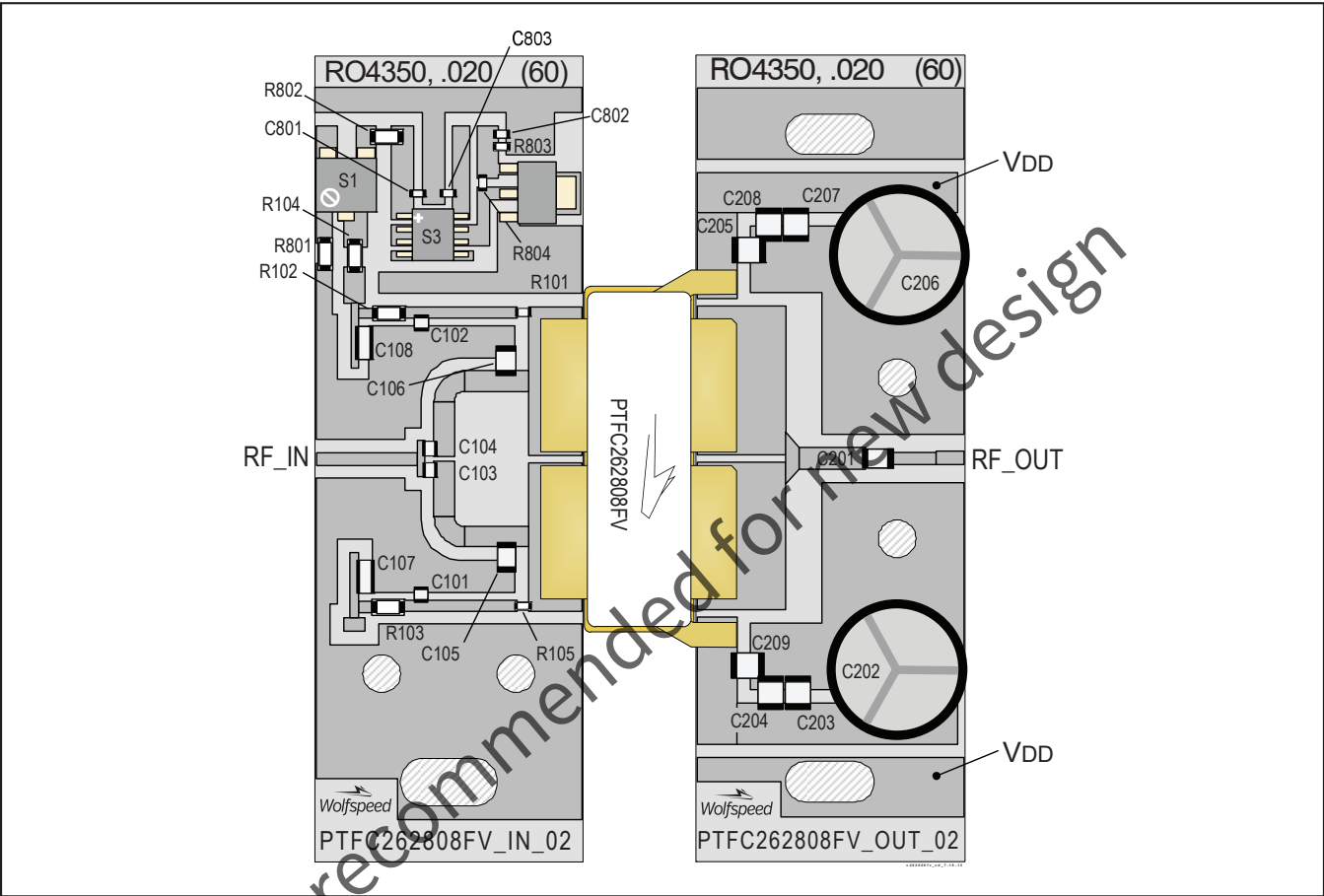
Broadband Circuit Impedance

| Frequency<br>MHz | Z Source $\Omega$ |       | Z Load $\Omega$ |       |
|------------------|-------------------|-------|-----------------|-------|
|                  | R                 | jX    | R               | jX    |
| 2620             | 2.88              | -1.58 | 0.55            | -2.45 |
| 2655             | 2.99              | -1.55 | 0.53            | -2.39 |
| 2690             | 3.10              | -1.52 | 0.52            | -2.33 |



Reference Circuit, tuned for 2620 – 2690 MHz

|   |  |
|---|--|
| DUT   | PTFC262808FV   |
| Test Fixture Part No.   | LTN/PTFC262808FV V1  |
| PCB   | Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$ |
| Find Gerber files for this test fixture on the Wolfspeed Web site at ( <a href="http://www.wolfspeed.com/RF">www.wolfspeed.com/RF</a> ) |  |



Reference circuit assembly diagram (not to scale)

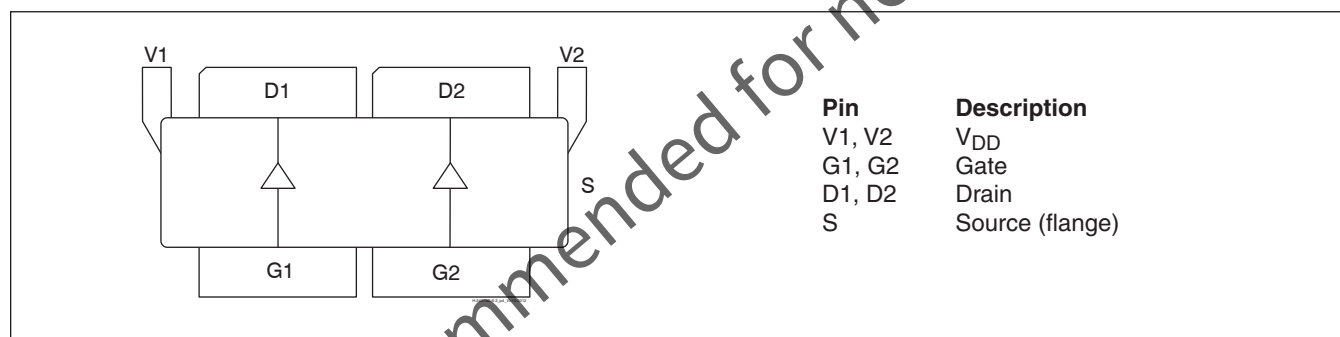
Component Information

| Component        | Description              | Suggested Manufacturer           | P/N                |
|------------------|--------------------------|----------------------------------|--------------------|
| <b>Input</b>     |                          |                                  |                    |
| C101, C102       | Chip capacitor, 10 pF    | ATC                              | ATC100A100JW500XB  |
| C103, C104       | Chip capacitor, 18 pF    | ATC                              | ATC100A180JW150XB  |
| C105, C106       | Chip capacitor, 0.4 pF   | ATC                              | ATC100B0R4CW500XB  |
| C107, C108       | Capacitor, 10 $\mu$ F    | Murata Electronics North America | LLL31BC70G106MA01L |
| C801, C802, C803 | Chip capacitor, 1,000 pF | Panasonic                        | ECJ-1VB1H102K      |
| R101, R102       | Resistor, 10 $\Omega$    | Panasonic Electronic Components  | ERJ-3GEYJ100V      |

(table cont. next page)

**Reference Circuit** (cont.)**Component Information** (cont.)

| Component                          | Description                  | Suggested Manufacturer             | P/N               |
|------------------------------------|------------------------------|------------------------------------|-------------------|
| <b>Input</b> (cont.)               |                              |                                    |                   |
| R102, R103, R104, R801, R802       | Resistor, 10 $\Omega$        | Panasonic Electronic Components    | ERJ-8GEYJ100V     |
| R803                               | Resistor, 1.3k $\Omega$      | Panasonic Electronic Components    | ERJ-3GEYJ132V     |
| R804                               | Resistor, 1.2k $\Omega$      | Panasonic Electronic Components    | ERJ-3GEYJ122V     |
| S1                                 | Potentiometer, 2k $\Omega$   | Bourns Inc.                        | 3224W-1-202E      |
| S2                                 | Transistor                   | Infineon Technologies              | BCP56-10          |
| S3                                 | Voltage regulator            | Fairchild Semiconductor            | LM7805            |
| <b>Output</b>                      |                              |                                    |                   |
| C201                               | Chip capacitor, 18 pF        | ATC                                | ATC100B180KW500XB |
| C202, C206                         | Capacitor, 470 $\mu$ F, 50 V | Cornell Dubilier Electronics (CDE) | SEK471M050ST      |
| C203, C204, C205, C207, C208, C209 | Capacitor, 10 $\mu$ F        | Taiyo Yuden                        | UMK925C7106MM-T   |

**Pinout Diagram** (top view)

Lead connections for PTFC262808FV

## Package Outline Specifications

## Package H-37275G-6/2

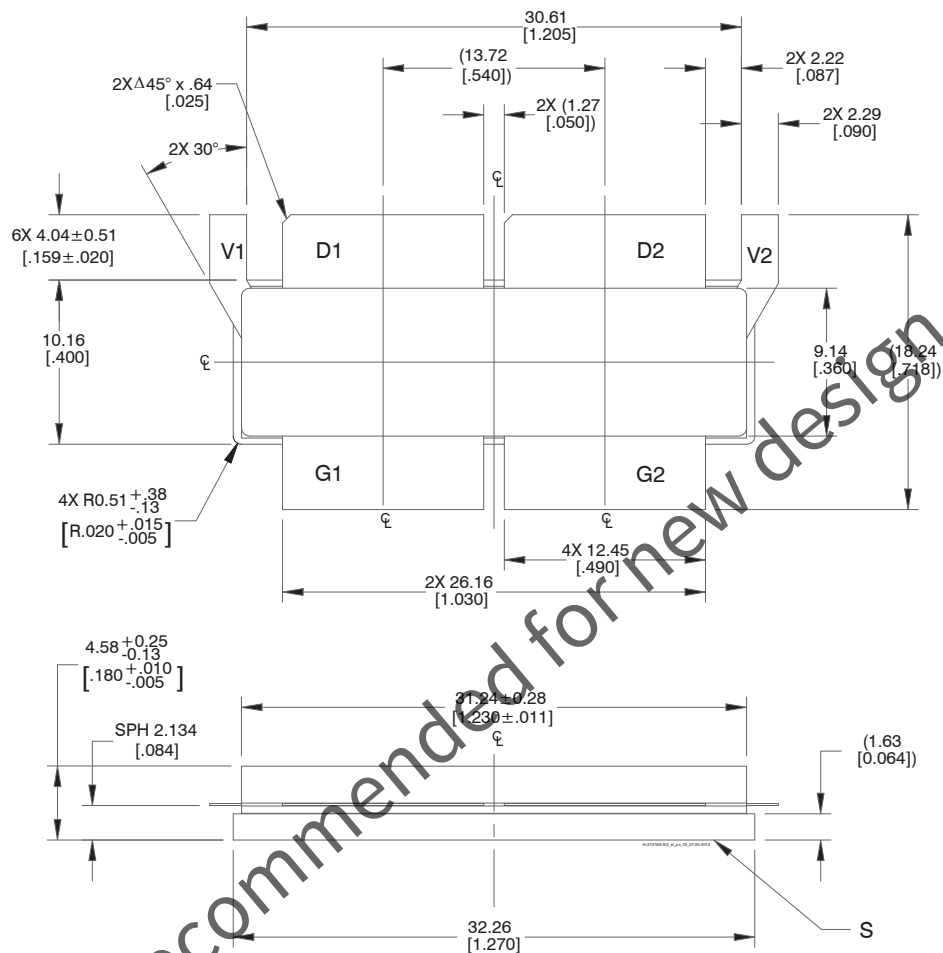


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances  $\pm 0.127$  [0.005].
4. Pins: D1, D2 – drain; G1, G2 – gate; S – source; V1, V2 –  $V_{DD}$ .
5. Lead thickness:  $0.13 + 0.051 / - 0.025$  [0.005 + 0.002 / - 0.001].
6. Gold plating thickness:  $1.14 \pm 0.38$  micron [45  $\pm$  15 microinch] max.



## Revision History

| Revision | Date       | Data Sheet Type | Page | Subjects (major changes since last revision)  |
|----------|------------|-----------------|------|---|
| 01       | 2012-09-14 | Advance         | All  | New product, proposed only.   |
| 02       | 2013-07-24 | Data Sheet      | All  | Product released to production. All information updated.  |
| 02.1     | 2013-08-02 | Data Sheet      | 2    | Order Code for Tape and Reel corrected.   |
| 02.2     | 2013-08-06 | Data Sheet      | 2    | Order Code for Tray corrected.  |
| 03       | 2016-06-22 | Data Sheet      | 2    | Operating Gate Voltage conditions corrected, maximum junction temperature raised to 225 °C, update ordering information |
| 04       | 2018-07-03 | Production      | All  | Converted to Wolfspeed Data Sheet. Not recommended for new design   |

For more information, please contact:

4600 Silicon Drive  
Durham, North Carolina, USA 27703  
[www.wolfspeed.com/RF](http://www.wolfspeed.com/RF)

Sales Contact  
[RFSales@wolfspeed.com](mailto:RFSales@wolfspeed.com)

RF Product Marketing Contact  
[RFMarketing@wolfspeed.com](mailto:RFMarketing@wolfspeed.com)  
919.407.7816

## Notes

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