

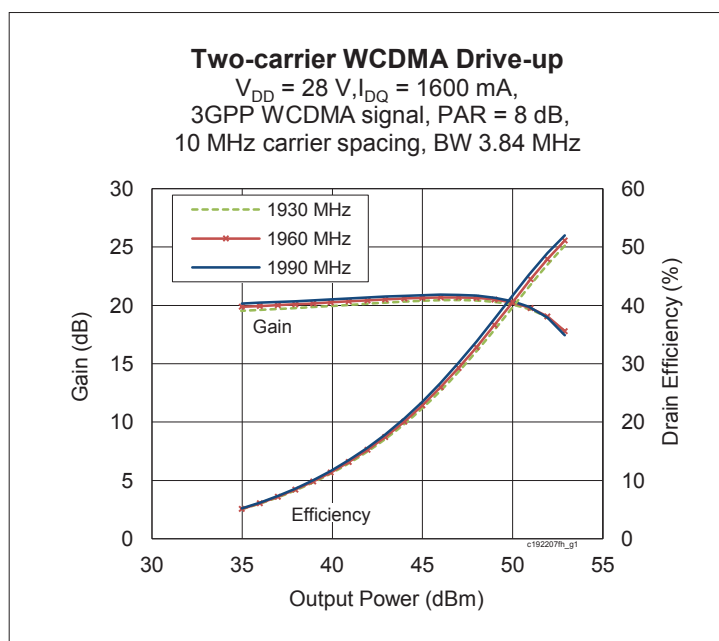
# PXFC192207FH

## Thermally-Enhanced High Power RF LDMOS FET 220 W, 28 V, 1805 – 1990 MHz

### Description

The PXFC192207FH is a 220-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 1805 to 1990 MHz frequency band. Features include input and output matching, high gain and thermally-enhanced package with earless flanges. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXFC192207FH  
Package H-37288G-4/2



### Features

- Broadband input and output matching
- Typical Pulsed CW performance, 1990 MHz, 28 V, 16  $\mu\text{s}$  pulse width, 10 % duty cycle, class AB
  - Output power at  $P_{1dB} = 220\text{ W}$
  - Efficiency = 55%
  - Gain = 20 dB
- Typical single-carrier WCDMA performance, 1990 MHz, 28 V, 9.9 dB PAR @ 0.01% CCDF
  - Output power = 50 W
  - Efficiency = 29%
  - Gain = 20 dB
  - ACPR = -34 dBc @ 5 MHz
- Capable of handling 10:1 VSWR @28 V, 220 W (CW) output power
- Integrated ESD protection : Human Body Model, Class 1C (per JESD22-A114)
- Low thermal resistance
- Pb-free and RoHS compliant

### RF Characteristics

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

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 1600\text{ mA}$ ,  $P_{OUT} = 50\text{ W avg}$ ,  $f_1 = 1980\text{ MHz}$ ,  $f_2 = 1990\text{ MHz}$ , 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 8 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	$G_{ps}$	19	20.5	—	dB
Drain Efficiency	$\eta_D$	29	32	—	%
Intermodulation Distortion	IMD	—	-32.5	-29	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

## DC Characteristics

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	$\mu\text{A}$
	$V_{DS} = 63\text{ V}$ , $V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10	$\mu\text{A}$
On-State Resistance	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.03	—	$\Omega$
Operating Gate Voltage	$V_{DS} = 28\text{ V}$ , $I_{DQ} = 1.6\text{ A}$	$V_{GS}$	2.3	2.6	2.9	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1	$\mu\text{A}$

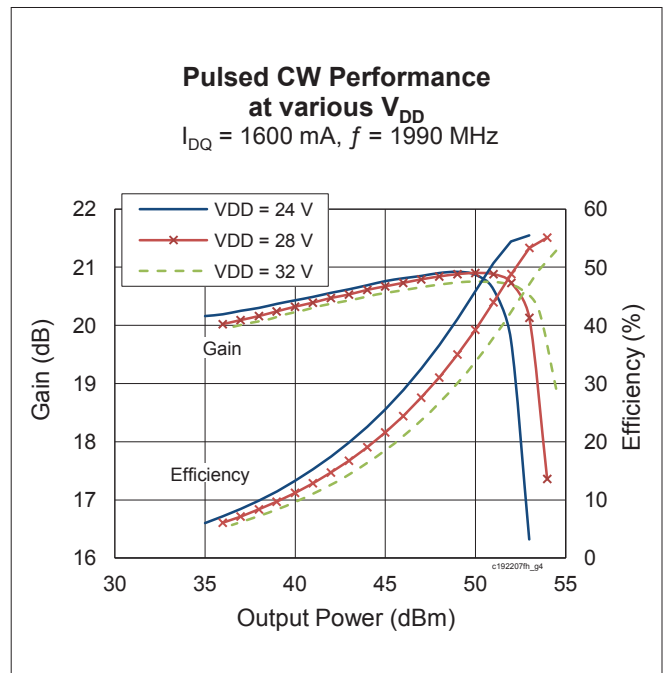
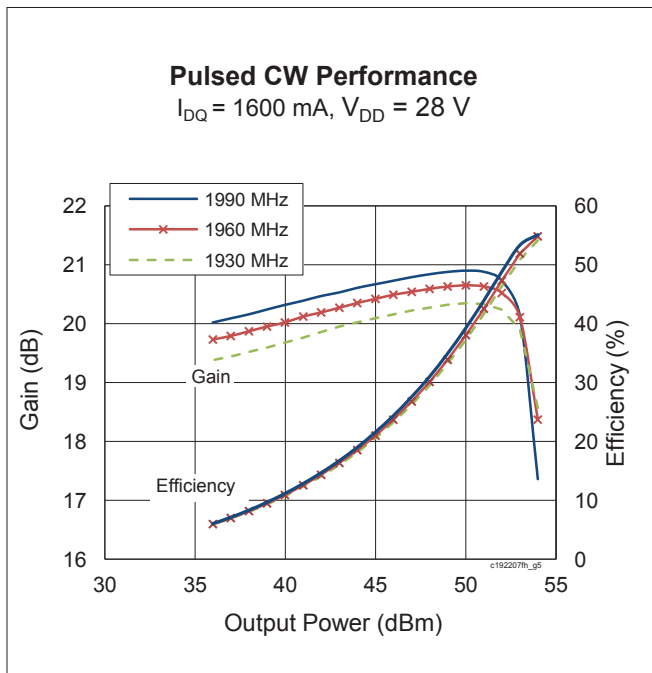
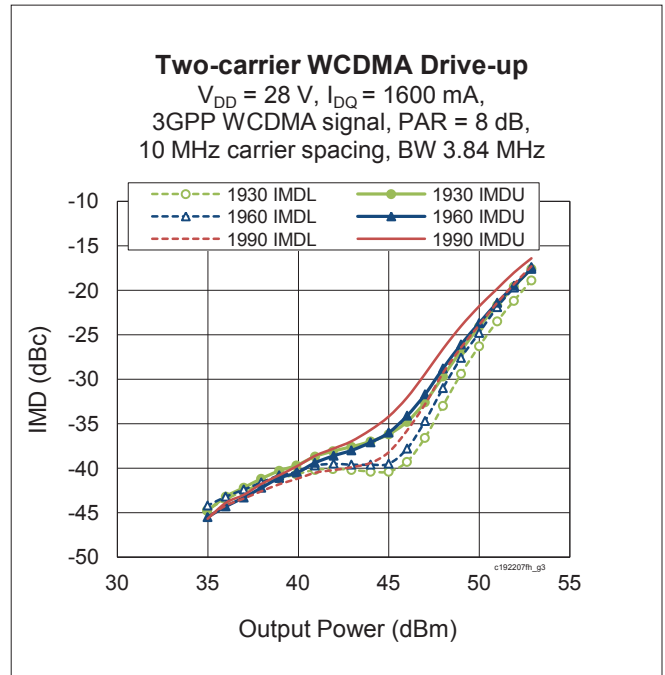
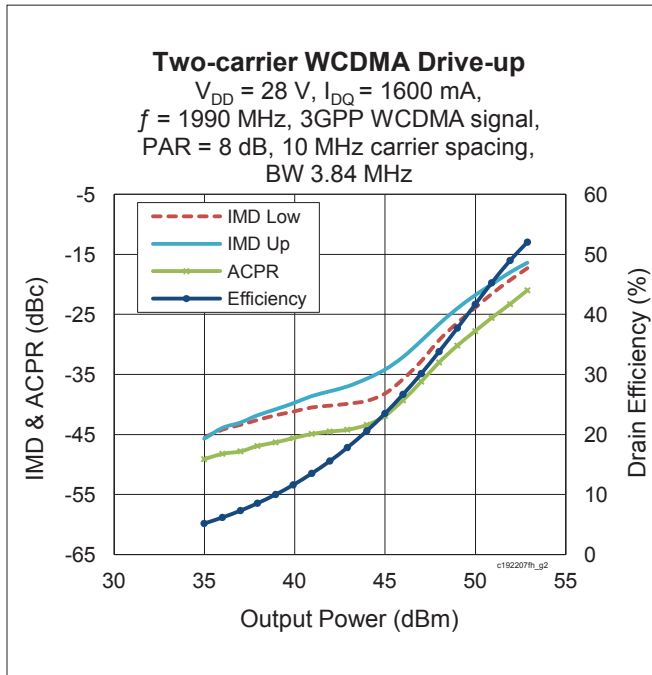
## Maximum Ratings

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)	$R_{\theta JC}$	0.28	$^{\circ}\text{C/W}$

## Ordering Information

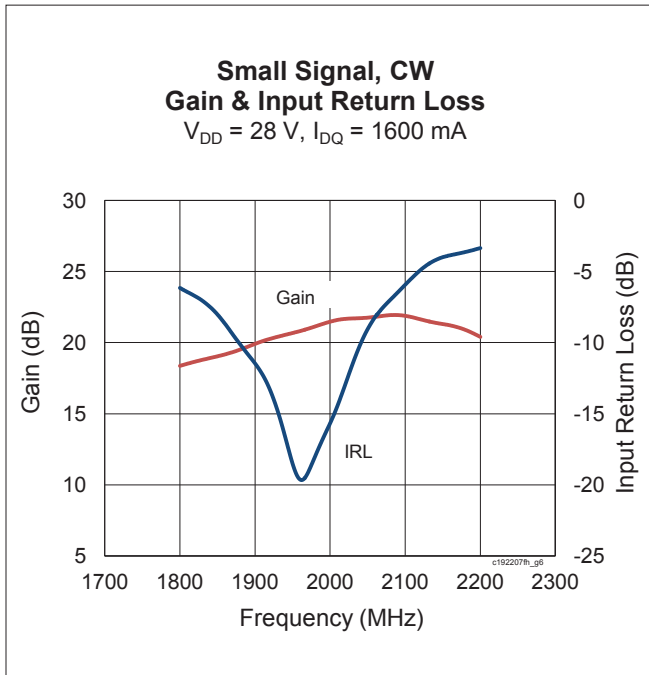
Type and Version	Order Code	Package Description	Shipping
PXFC192207FH V3 R0	PXFC192207FH-V3-R0	H-37288G-4/2, earless flange	Tape & Reel, 50 pcs
PXFC192207FH V3 R250	PXFC192207FH-V3-R250	H-37288G-4/2, earless flange	Tape & Reel, 250 pcs

**Typical Performance** (data taken in a production test fixture)



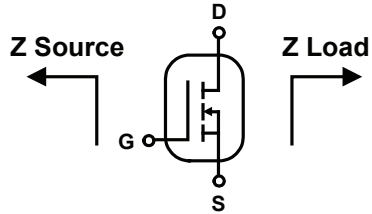


**Typical Performance** (cont.)



See next page for broadband circuit impedance

### Broadband Circuit Impedance



Freq [MHz]	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
1930	3.12	-4.70	1.15	-2.80
1960	3.11	-4.62	1.14	-2.69
1990	3.10	-4.55	1.13	-2.58

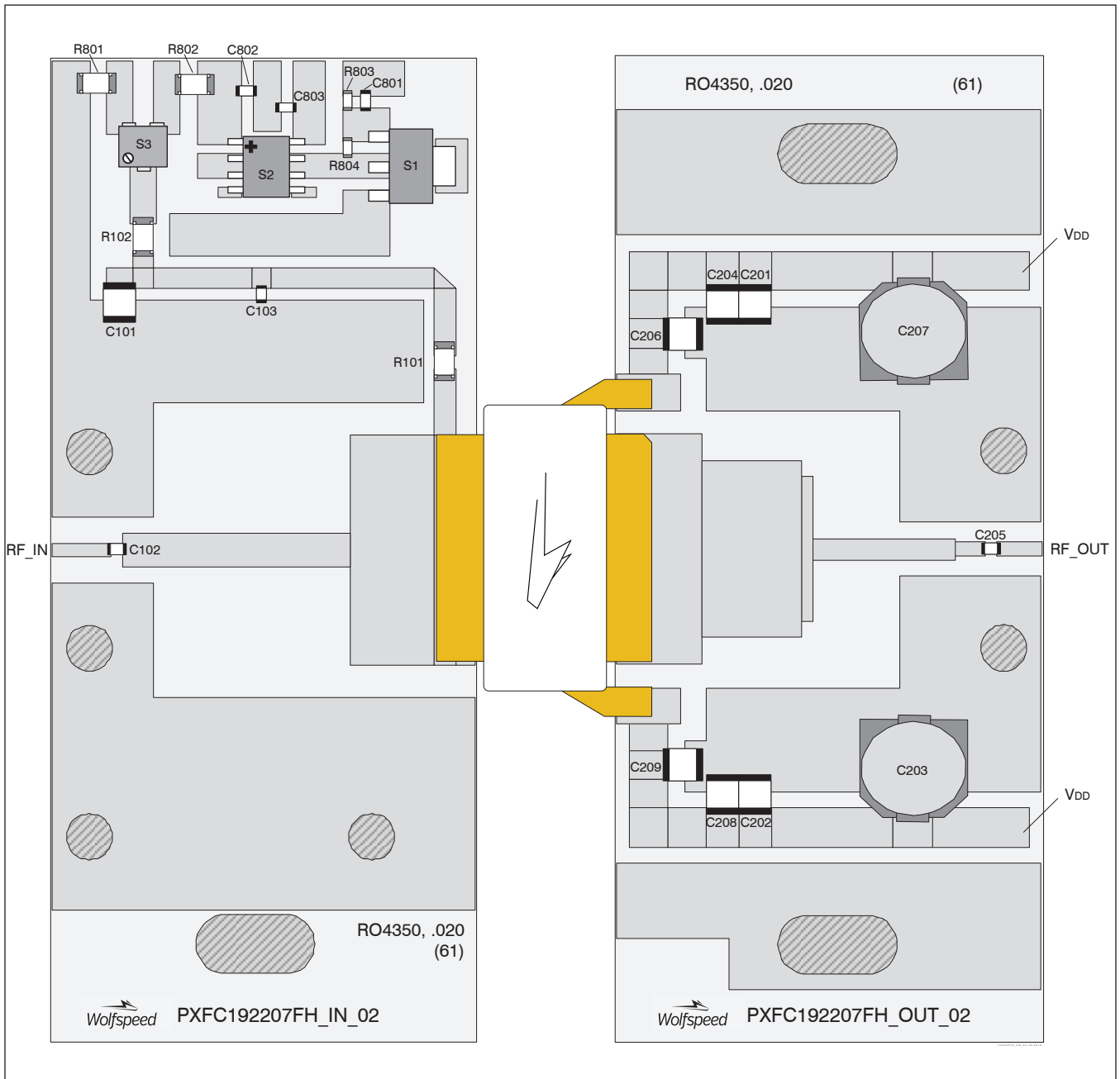
### Load Pull Performance

Each Side Load Pull Performance – Pulsed CW signal: 16  $\mu$ s, 10% duty cycle, 28 V, 1100 mA

Freq [MHz]	Zs [ $\Omega$ ]	P <sub>1dB</sub>									
		Max Output Power					Max PAE				
		ZI [ $\Omega$ ]	Gain [dB]	P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]	ZI [ $\Omega$ ]	Gain [dB]	P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]
1805	2.1-j3.4	0.7-j2.4	16.8	55.1	324	54.1	1.6-j1.9	19.3	53.4	219	65.7
1880	2.1-j3.3	0.7-j2.5	17.6	55.0	316	54.4	1.6-j1.9	20.3	53.0	200	65.0
1930	1.9-j3.7	0.8-j2.6	17.8	54.7	295	50.0	1.4-j2.0	20.6	53.0	200	62.8
1990	3.8-j4.1	0.7-j2.8	18.4	54.6	288	50.8	1.4-j2.1	21	52.8	191	61.7



Reference Circuit , 1930 – 1990 MHz



Reference circuit assembly diagram (not to scale)\*

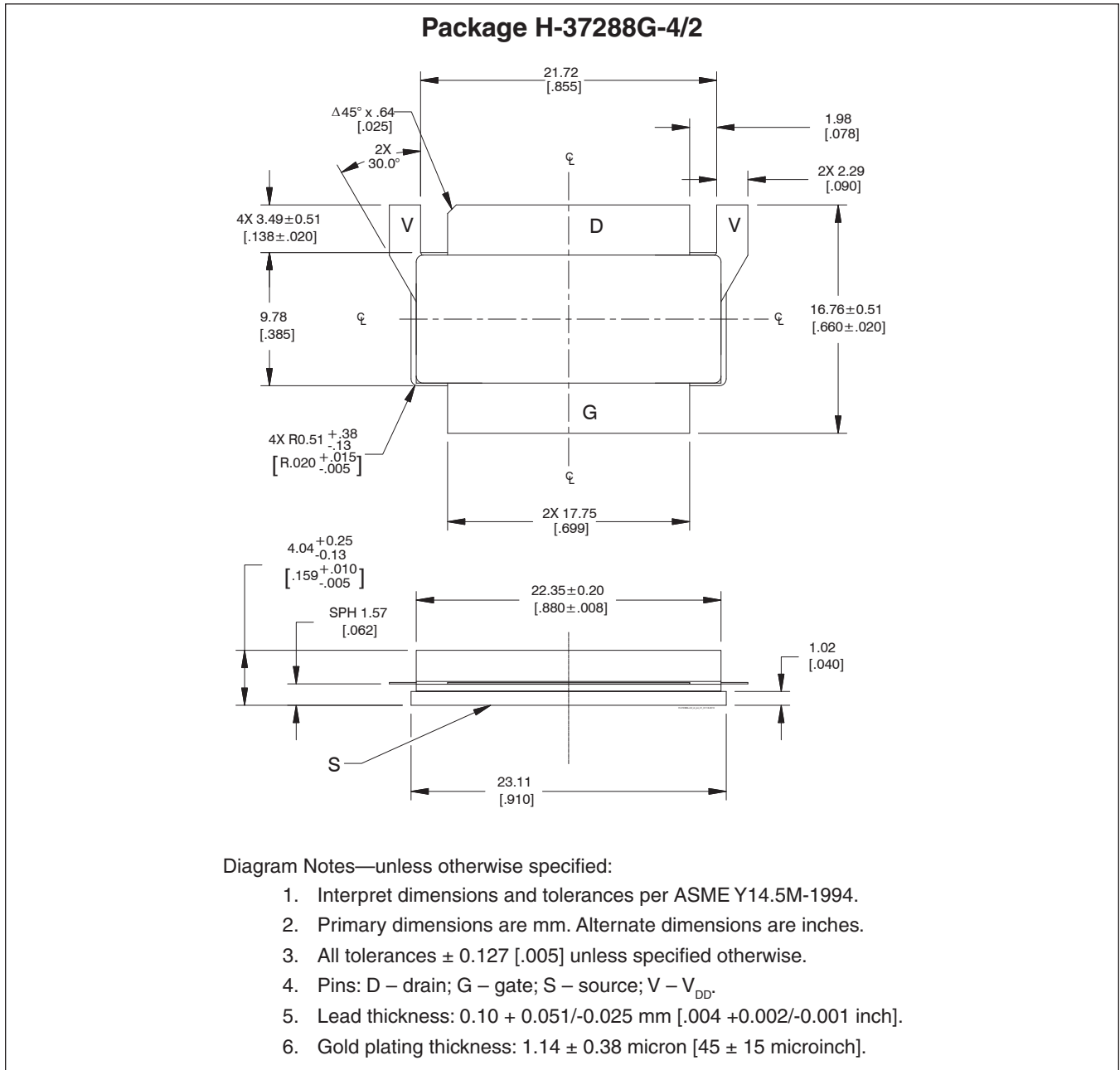
**Reference Circuit** (cont.)**Reference Circuit Assembly**

DUT	PXFC192207FH
Test Fixture Part No.	LTN/PXFC192207FH V3
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$ , $f = 1930 - 1990$ MHz
Find Gerber files for this test fixture on the Wolfspeed Web site at <a href="http://www.wolfspeed.com/RF">http://www.wolfspeed.com/RF</a>	

**Components Information**

Component	Description	Suggested Manufacturer	P/N
<b>Input</b>			
C101	Capacitor, 10 $\mu$ F	Taiyo Yuden	UMK325C7106MM-T
C102, C103	Capacitor, 33 pF	ATC	ATC100A330JW150XB
C801, C802, C803	Capacitor, 1000 pF	Panasonic Electronic Components	ECJ-1VB1H102K
R101, R102, R801	Resistor, 10 $\Omega$	Panasonic Electronic Components	ERJ-8GEYJ100V
R802	Resistor, 100 $\Omega$	Panasonic Electronic Components	ERJ-8GEYJ101V
R803	Resistor, 1300 $\Omega$	Panasonic Electronic Components	ERJ-3GEYJ132V
R804	Resistor, 1200 $\Omega$	Panasonic Electronic Components	ERJ-3GEYJ122V
S1	Transistor	Infineon Technologies	BCP56
S2	Voltage Regulator	Texas Instruments	LM78L05ACM
S3	Potentiometer, 2k $\Omega$	Bourns Inc.	3224W-1-202E
<b>Output</b>			
C201, C202, C204, C206, C208, C209	Capacitor, 10 $\mu$ F	Taiyo Yuden	UMK325C7106MM-T
C203, C207	Capacitor, 220 $\mu$ F	Panasonic Electronic Components	EEE-FP1V221AP
C205	Capacitor, 33 pF	ATC	ATC100A330JW150XB

Package Outline Specifications







## Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2013-02-04	Advance	All	Data Sheet reflects advance specification for product development
02	2013-04-29	Production	All	Data Sheet reflects released product specifications
03	2013-07-18	Production	All 1 2 7 8	Updated package from V1 to V2 for general release Updated package and revised efficiency in Two-carrier WCDMA specifications table Updated ordering information table Updated LTN version Updated package outline
04	2014-07-15	Production	All 1 2	Updated package from V2 to V3 for general release Updated Two-carrier WCDMA specifications table Revised junction temperature in Maximum Ratings table
04.1	2016-06-22	Production	2	Updated ordering information
05	2018-06-25	Production	All	Converted to Wolfspeed Data Sheet

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## Notes

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