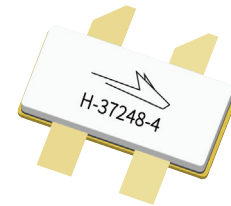


# PXAC261212FC

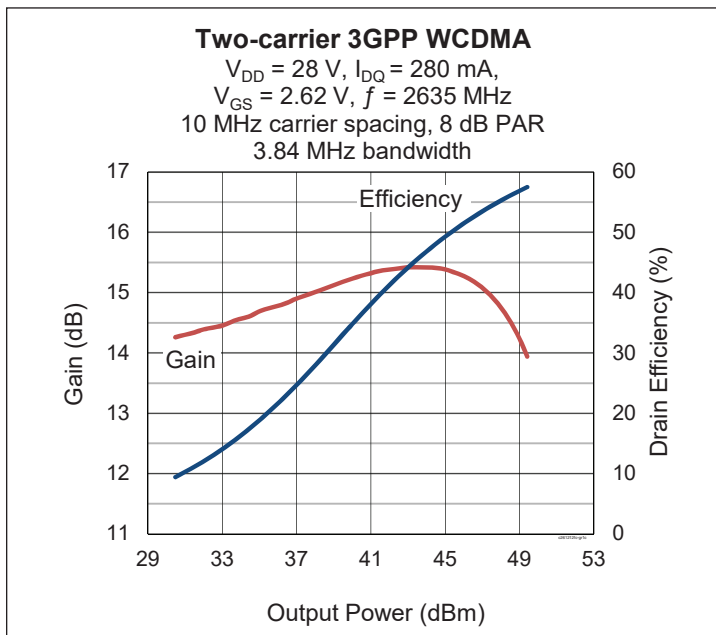
## Thermally-Enhanced High Power RF LDMOS FET 120 W, 28 V, 2496 – 2690 MHz

### Description

The PXAC261212FC is a 120-watt LDMOS FET with an asymmetric design designed for use in multi-standard cellular power amplifier applications in the 2496 to 2690 MHz frequency band. It features dual-path design, input and output matching, and a thermally-enhanced package with earless flange. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PXAC261212FC  
Package H-37248-4



### Features

- Broadband internal matching
- Asymmetric design
  - Main  $P_{1dB} = 50\text{ W}$
  - Peak  $P_{1dB} = 75\text{ W}$
- CW performance in Doherty configuration, 2635 MHz, 28 V
  - Output power at  $P_{1dB} = 107\text{ W}$
  - Gain = 14.4 dB
  - Efficiency = 57%
- Integrated ESD protection: Human Body Model, class 1C (per JESD22-A114)
- Capable of handling 10:1 VSWR @28 V, 120 W (CW) output power
- Low thermal resistance
- Pb-free and RoHS-compliant

### RF Characteristics

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

$V_{DD} = 28\text{ V}$ ,  $V_{GS(peak)} = 1.3\text{ V}$ ,  $I_{DQ} = 280\text{ mA}$ ,  $P_{OUT} = 28\text{ W}$  average,  $f_1 = 2630\text{ MHz}$ ,  $f_2 = 2640\text{ MHz}$ . 3GPP WCDMA signal: 3.84 MHz bandwidth, 8 dB PAR @0.01% CCDF.

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	$G_{ps}$	14.2	15.0	—	dB
Drain Efficiency	$\eta_D$	45	48	—	%
Intermodulation Distortion	IMD	—	-25	-22	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	$V_{DS} = 28\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1.0	$\mu\text{A}$
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10.0	$\mu\text{A}$
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1.0	$\mu\text{A}$
On-state Resistance	(main) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.19	—	$\Omega$
	(peak) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.16	—	$\Omega$
Operating Gate Voltage	(main) $V_{DS} = 28\text{ V}, I_{DQ} = 280\text{ mA}$	$V_{GS}$	2.1	2.6	3.1	V
	(peak) $V_{DS} = 28\text{ V}, I_{DQ} = 0\text{ A}$	$V_{GS}$	0.80	1.3	1.8	V

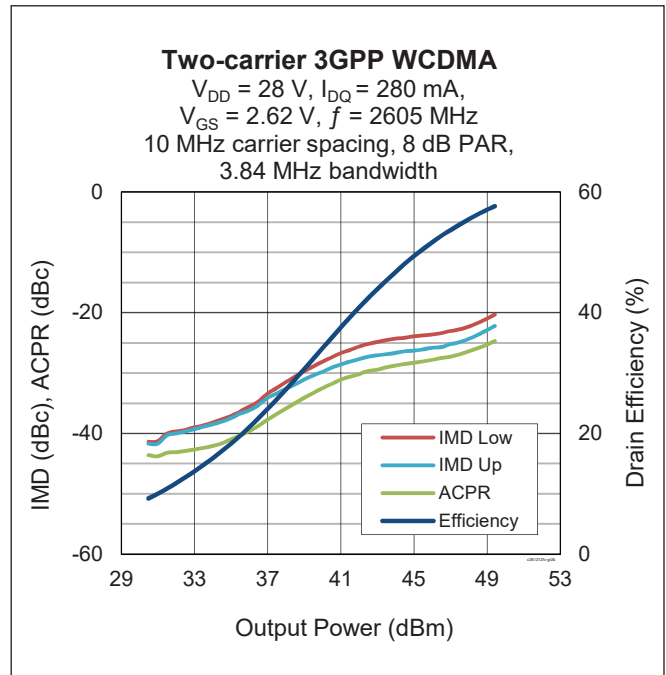
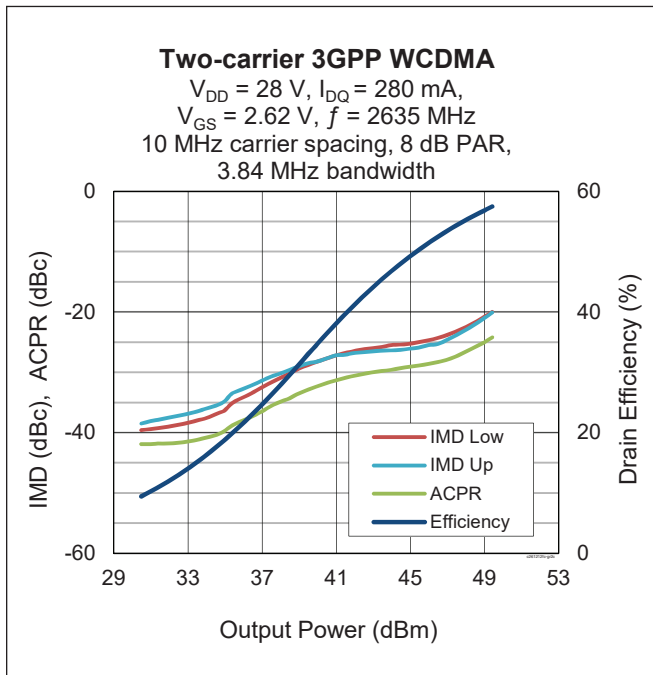
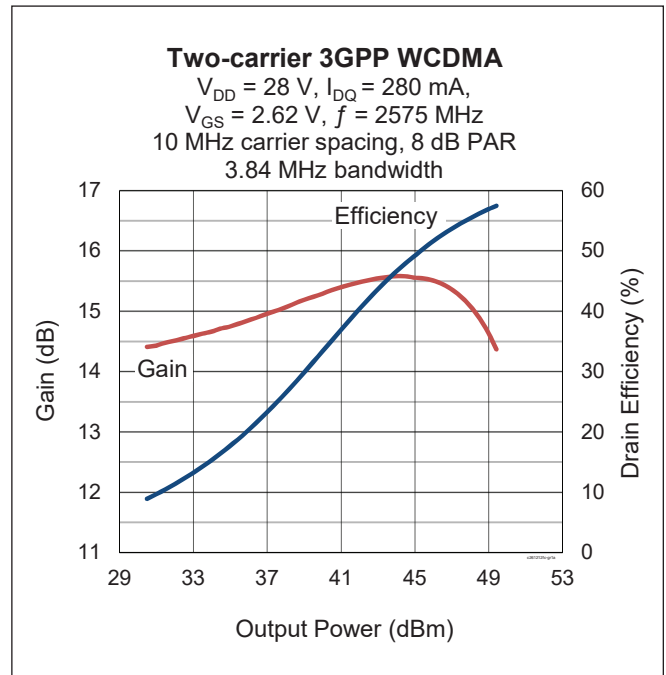
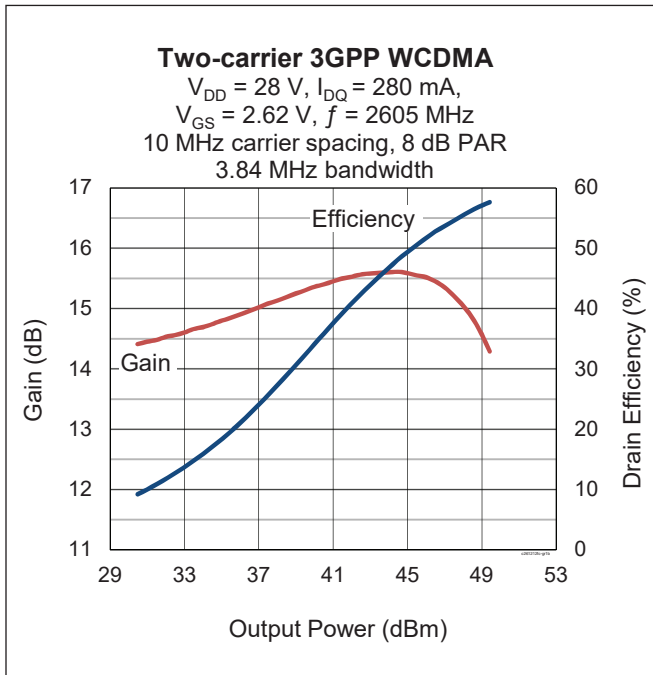
## Maximum Ratings

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 ( $T_{CASE} = 70^{\circ}\text{C}, 100\text{ W CW}$ )	$R_{\theta JC}$	0.61	$^{\circ}\text{C/W}$

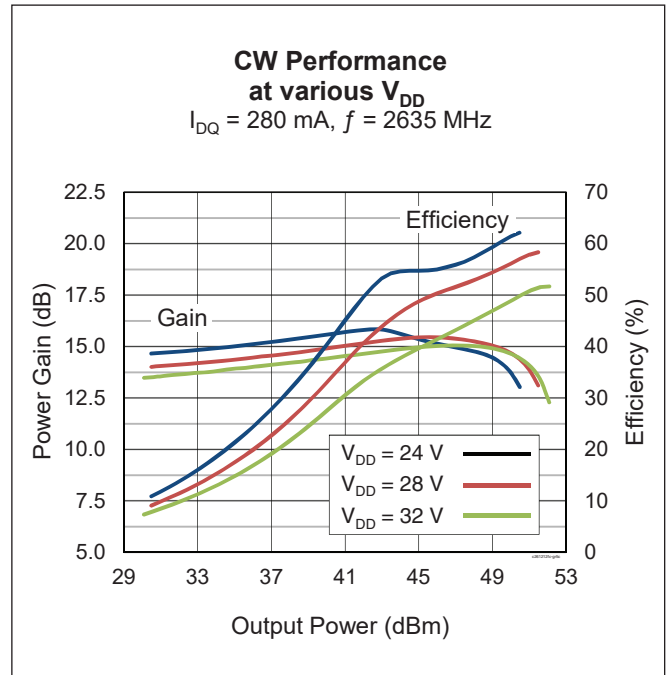
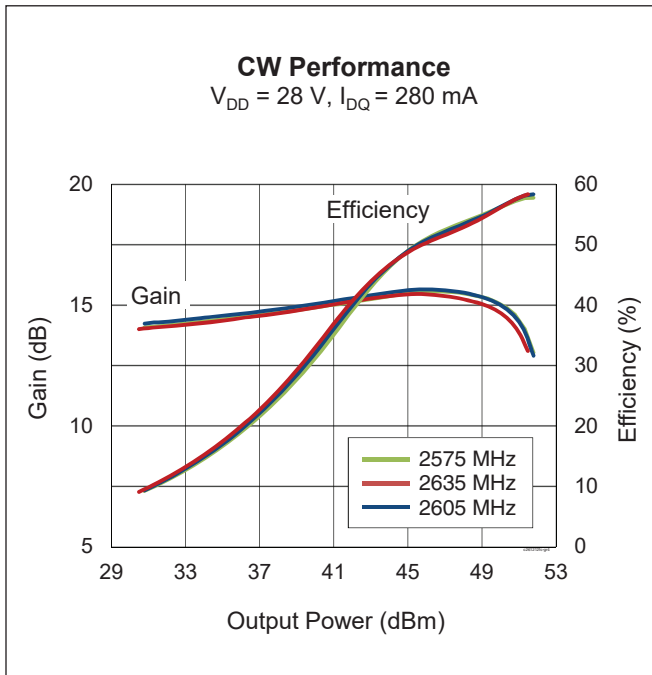
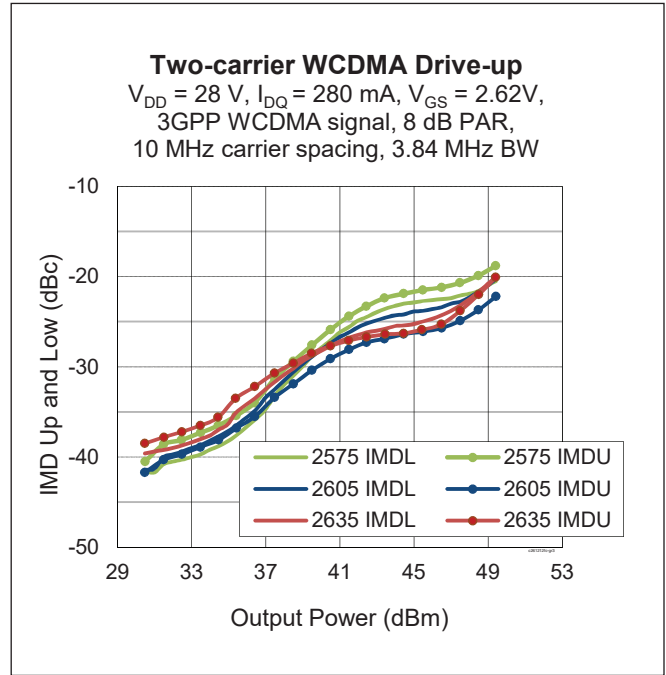
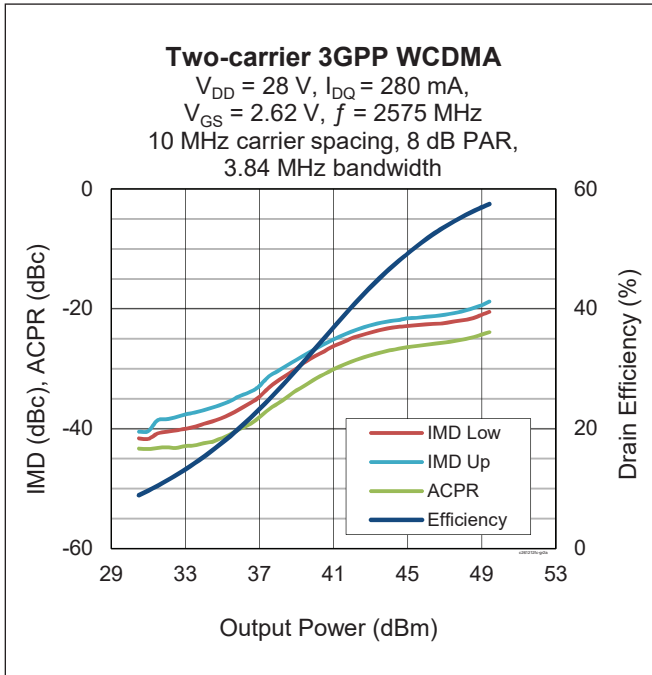
## Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PXAC261212FC V1 R0	PXAC261212FC-V1-R0	H-37248-4, ceramic open-cavity, earless	Tape & Reel, 50 pcs
PXAC261212FC V1 R250	PXAC261212FC-V1-R250	H-37248-4, ceramic open-cavity, earless	Tape & Reel, 250 pcs

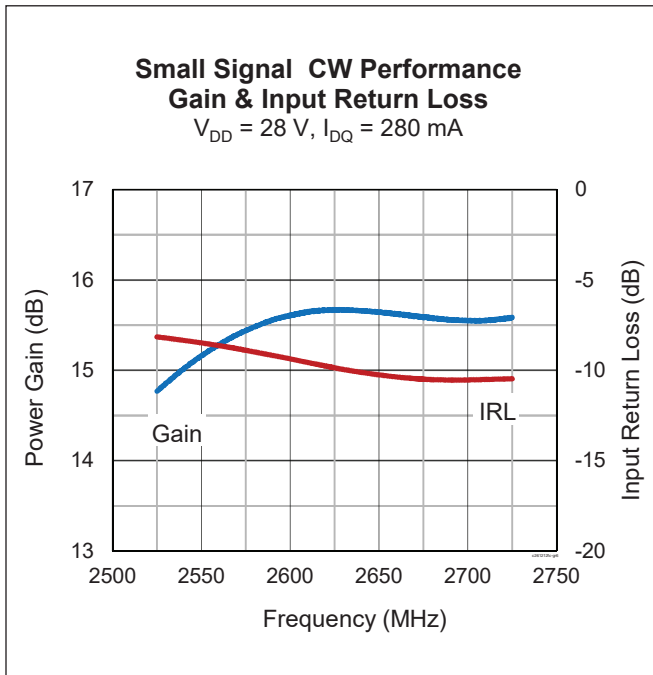
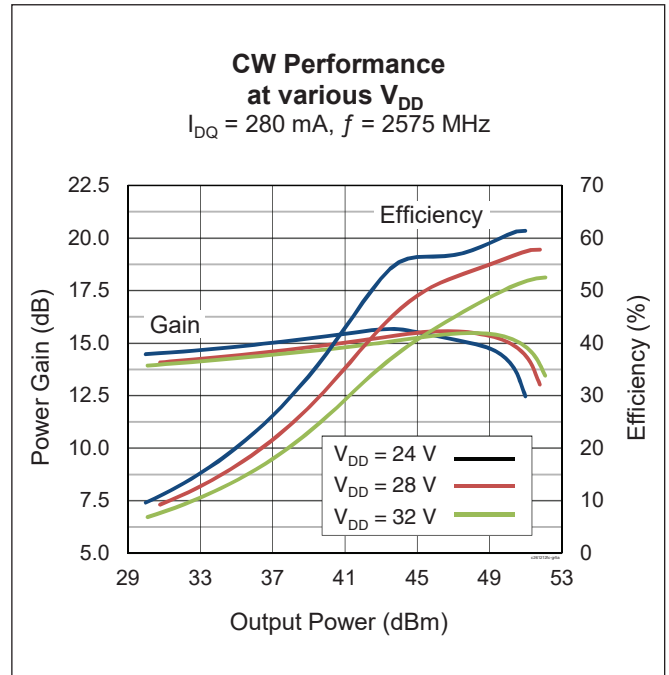
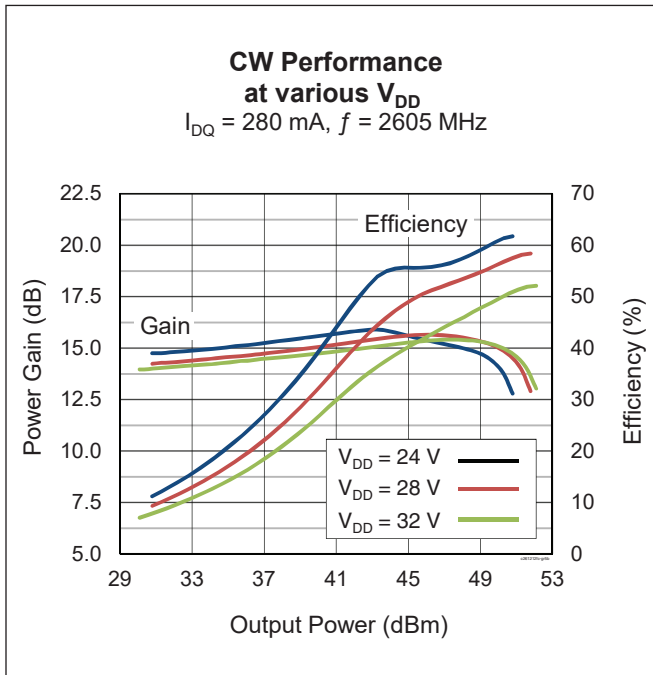
**Typical Performance** (data taken in Wolfspeed Doherty reference test fixture)



Typical Performance (cont.)

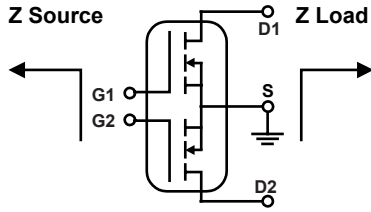


**Typical Performance** (cont.)





**Load Pull Performance**



Main side pulsed CW signal: 160  $\mu$ sec, 10% duty cycle; 28 V,  $V_{GS} = 1.4$  V,  $I_{DQ} = 250$  mA

Class AB		P <sub>1dB</sub>									
		Max Output Power					Max PAE				
Freq [MHz]	Z <sub>s</sub> [ $\Omega$ ]	Z <sub>l</sub> [ $\Omega$ ]	Gain [dB]	P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]	Z <sub>l</sub> [ $\Omega$ ]	Gain [dB]	P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]
2490	5.1 – j14.5	2.8 – j5.8	16.9	48.53	71.3	52.8	6.0 – j4.2	19.1	46.90	49.0	62.4
2590	6.8 – j16.6	2.8 – j6.2	17.0	48.30	67.6	50.4	5.5 – j3.6	19.4	46.68	46.6	61.1
2690	12.9 – j17.8	2.9 – j6.0	17.2	48.30	67.6	50.4	4.5 – j3.3	19.5	46.76	47.4	60.4

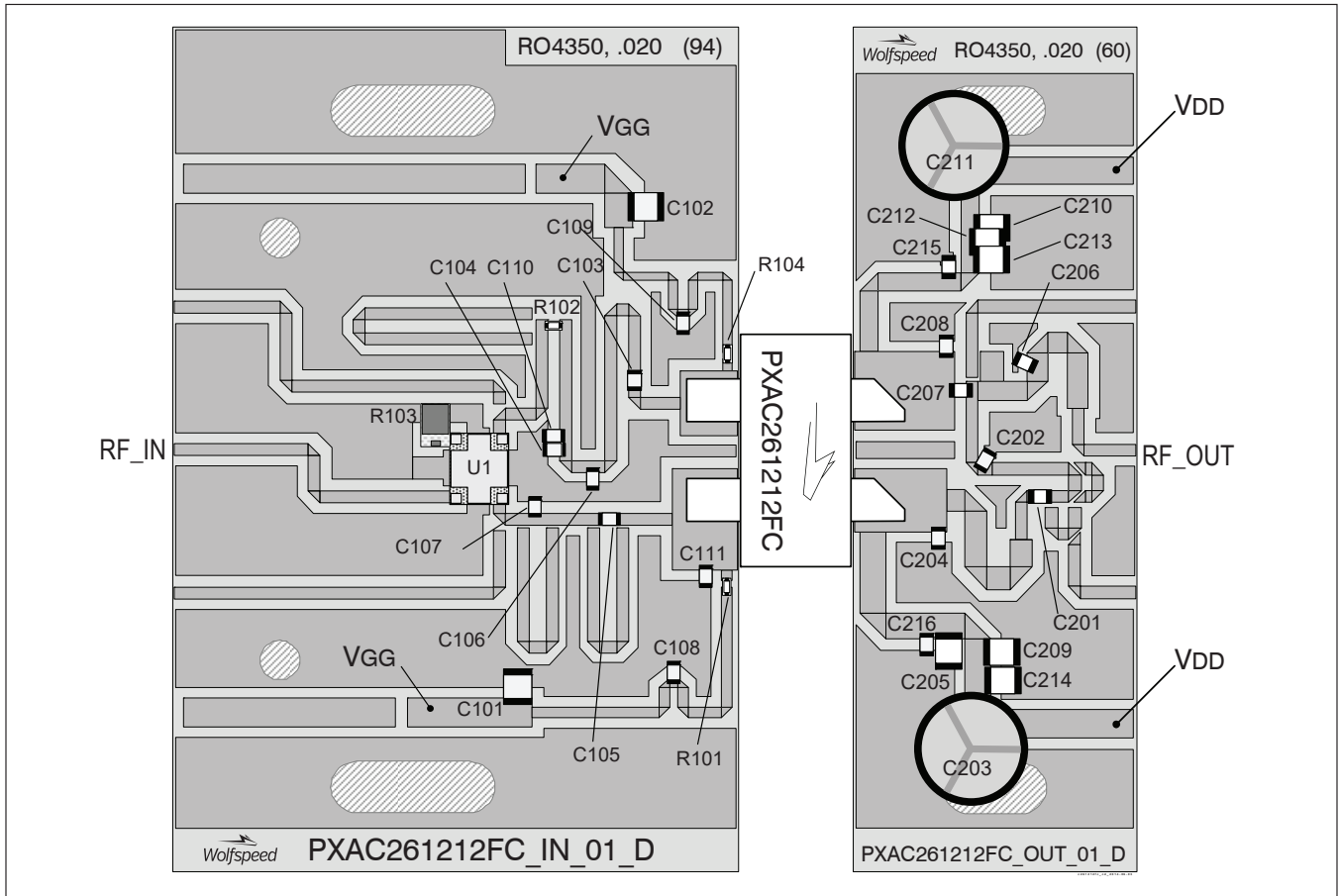
Peak side pulsed CW signal: 160  $\mu$ sec, 10% duty cycle; 28 V,  $V_{GS} = 1.4$  V

Class C		P <sub>1dB</sub>									
		Max Output Power					Max PAE				
Freq [MHz]	Z <sub>s</sub> [ $\Omega$ ]	Z <sub>l</sub> [ $\Omega$ ]	Gain [dB]	P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]	Z <sub>l</sub> [ $\Omega$ ]	Gain [dB]	P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]
2490	4.5 – j11.4	11.2 – j7.5	13.0	50.27	106.4	55.6	4.3 – j5.4	14.1	48.40	69.2	65.3
2590	4.7 – j12.9	13.1 – j6.3	13.4	50.08	101.9	54.1	6.0 – j6.3	14.6	48.60	72.4	63.2
2690	9.2 – j14.5	14.1 – j3.4	13.7	50.03	100.7	55.5	8.0 – j7.0	14.7	48.70	74.1	62.0

**Reference Circuit, tuned for 2575 – 2675 MHz**

DUT	PXAC261212FC
Test Fixture Part No.	LTA/PXAC261212FC V1
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$
Find Gerber files for this reference fixture on the Wolfspeed Web site at ( <a href="http://www.wolfspeed.com/RF">www.wolfspeed.com/RF</a> )	

Reference Circuit (cont.)



Reference circuit assembly diagram (not to scale)

Assembly Information

Component	Description	Manufacturer	P/N
<b>Input</b>			
C101, C102	Chip capacitor, 4.7 $\mu$ F	Murata Electronics North America	GRM32ER71H475KA88L
C103, C105, C108, C109	Chip capacitor, 10 pF	ATC	ATC600F100JW250T
C104	Chip capacitor, 0.4 pF	ATC	ATC600F0R4CW250T
C106, C107	Chip capacitor, 0.8 pF	ATC	ATC600F0R8AW250T
C110	Chip capacitor, 0.2 pF	ATC	ATC600F0R2AW250T
C111	Chip capacitor, 0.3 pF	ATC	ATC600F0R3CW250T
R101, R104	Resistor, 10 Ohm	Panasonic – ECG	ERJ-3GEYJ100V
R102	Resistor, 5.1k Ohm	Panasonic – ECG	ERJ-3GEYJ512V
R103	Resistor, 50 Ohm	Anaren	RFP-060120A15Z50
U1	90° RF hybrid coupler	Anaren	XC2650P-03S

(table continued next page)

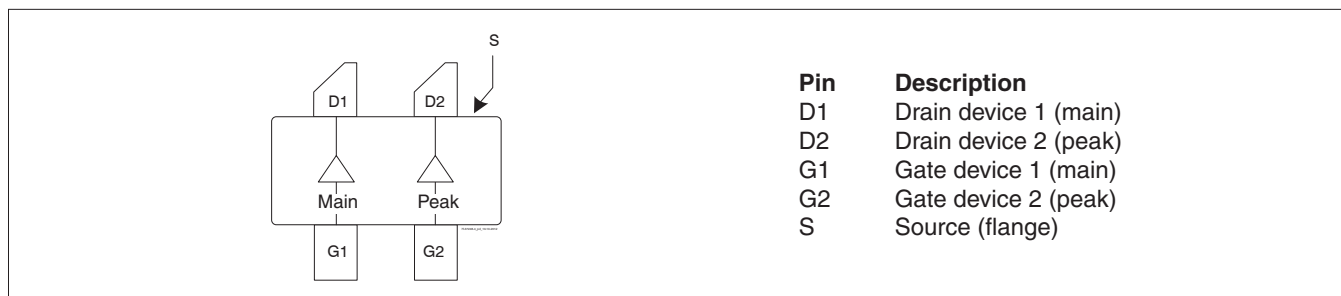


**Reference Circuit** (cont.)

**Assembly Information** (cont.)

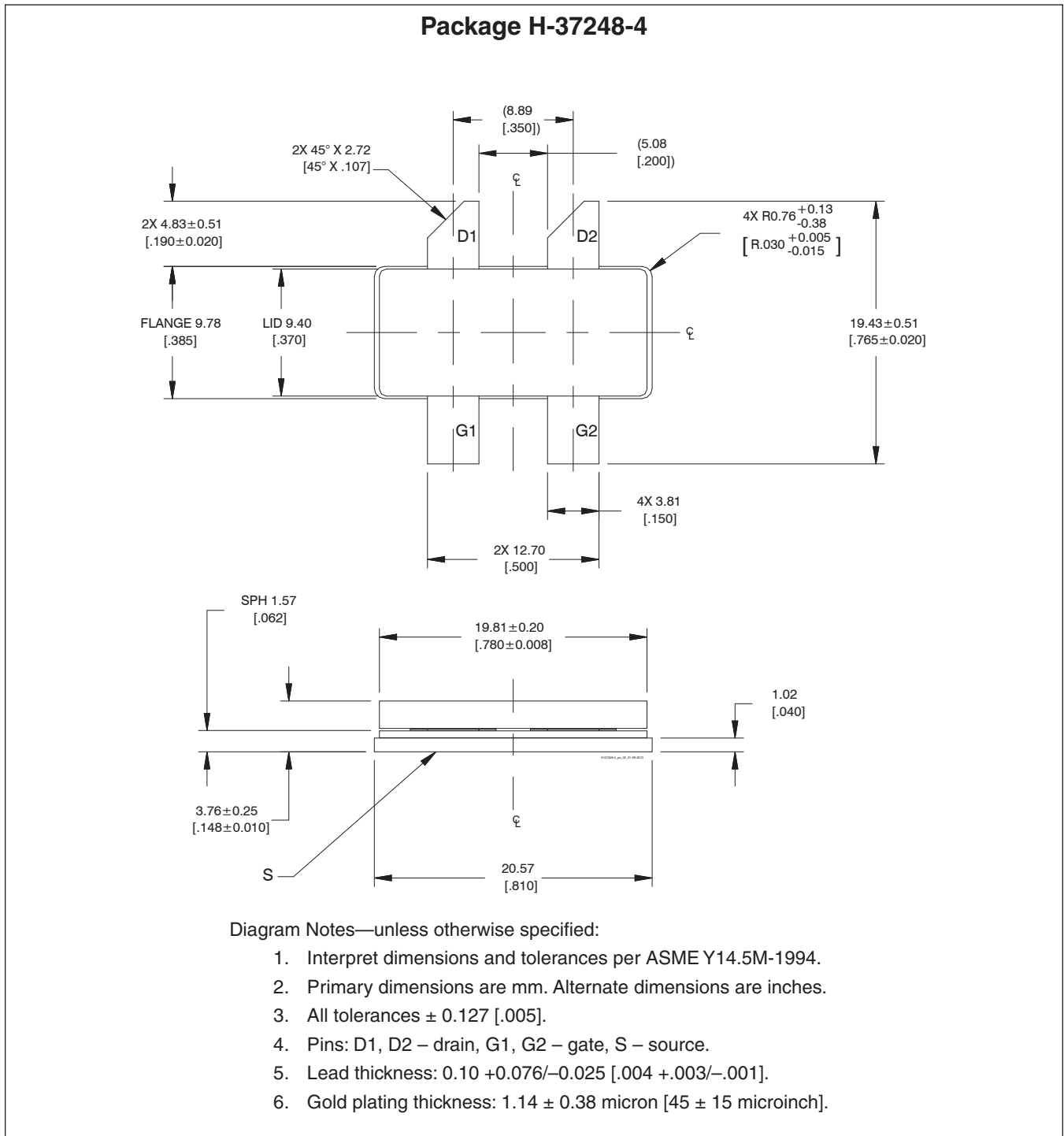
Component	Description	Manufacturer	P/N
<b>Output</b>			
C201, C215, C216	Chip capacitor, 10 pF	ATC	ATC600F100JW250T
C202, C204, C211, C208	Chip capacitor, 0.5 pF	ATC	ATC600F0R5CW250T
C203	Capacitor, 220 μF	Cornell Dubilier Electronics (CDE)	SK221M050ST
C205, C209, C210, C212, C213, C214	Chip capacitor, 4.7 μF	Murata Electronics North America	GRM32ER71H475KA88L
C206	Chip capacitor, 0.3 pF	ATC	ATC600F0R3CW250T
C207	Chip capacitor, 3.9 pF	ATC	ATC600F3R9CW250T

**Pinout Diagram** (top view)





Package Outline Specifications





## Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2014-03-03	Advance	all	Proposed specification for new product development.
02	2014-06-12	Production	all	Specification for production-released device.
02.1	2014-06-30	Production	1	Corrected typo in features.
02.2	2016-06-22	Production	2	Updated ordering information
03	2018-07-03	Production	All	Converted to Wolfspeed Data Sheet

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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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А