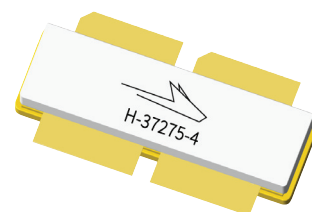


# PXAC243502FV

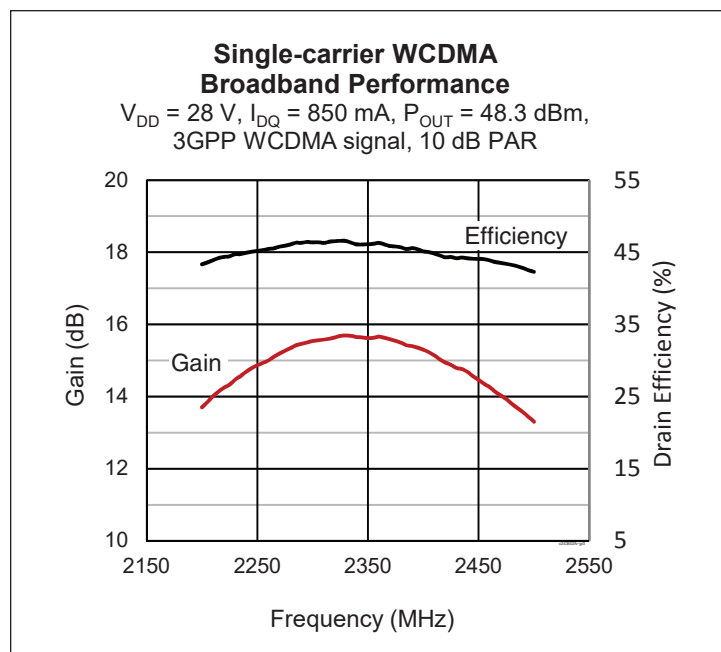
## High Power RF LDMOS Field Effect Transistor 350 W, 28 V, 2300 – 2400 MHz

### Description

The PXAC243502FV LDMOS FET is a 350-watt LDMOS FET designed for use in power amplifier applications in the 2300 MHz to 2400 MHz frequency band. Features include an asymmetric design with high gain and a thermally-enhanced package with earless flange. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PXAC243502FV  
Package H-37275-4



### Features

- Asymmetric design
  - Main: 150 W P<sub>1dB</sub>
  - Peak: 200 W P<sub>1dB</sub>
- Broadband internal matching
- CW performance at 2350 MHz, 28 V
  - Output power = 250 W P<sub>1dB</sub>
  - Efficiency = 46%
  - Gain = 16 dB
- Integrated ESD protection
- Human Body Model Class 2 (per ANSI/ESDA/ JEDEC JS-001)
- Low thermal resistance
- Pb-free and RoHS-compliant

### RF Characteristics

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

$V_{DD} = 28\text{ V}$ ,  $V_{GS(peak)} = 1.0\text{ V}$ ,  $I_{DQ} = 850\text{ mA}$ ,  $P_{OUT} = 68\text{ W avg}$ ,  $f = 2400\text{ MHz}$   
3GPP WCDMA signal, 3.84 MHz channel bandwidth, 10 dB peak/average @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	$G_{ps}$	14.0	15.0	—	dB
Drain Efficiency	$\eta_D$	42	45	—	%
Adjacent Channel Power Ratio	ACPR	—	-32	-26	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	$\mu\text{A}$
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1	$\mu\text{A}$
On-State Resistance	main $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.088	—	$\Omega$
	peak $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.088	—	$\Omega$
Operating Gate Voltage	main $V_{DS} = 28\text{ V}, I_{DQ} = 850\text{ mA}$	$V_{GS}$	2.3	2.6	3.0	V
	peak $V_{DS} = 28\text{ V}, I_{DQ} = 0\text{ mA}$	$V_{GS}$	0.8	1.2	1.6	V

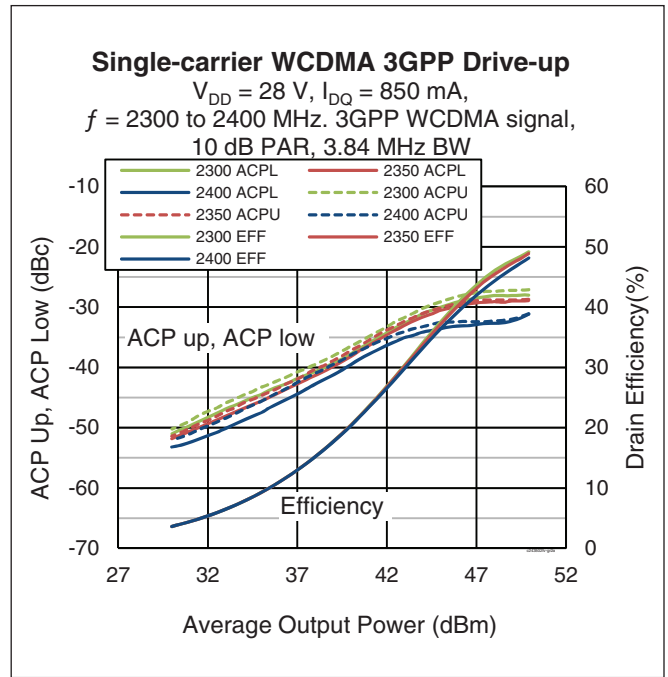
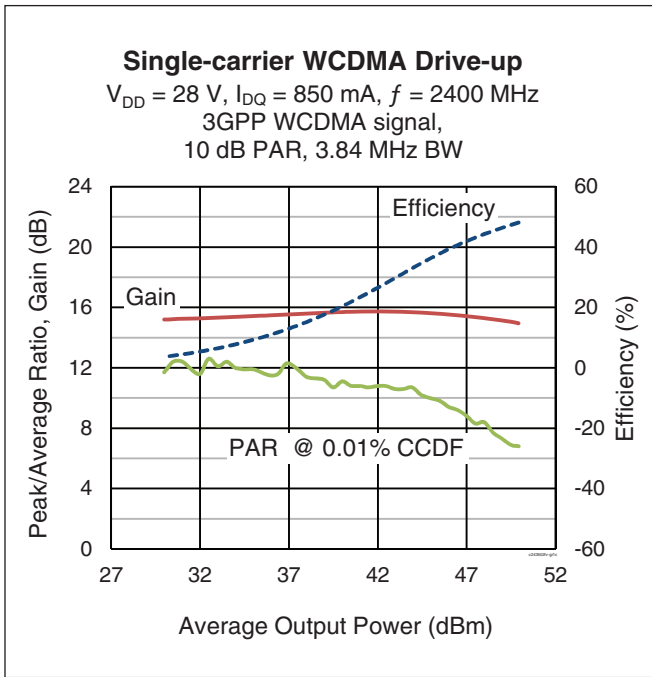
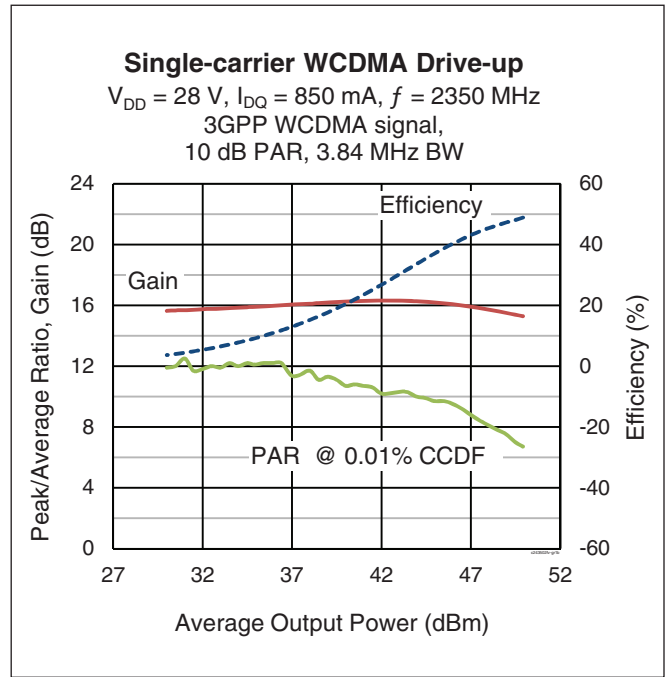
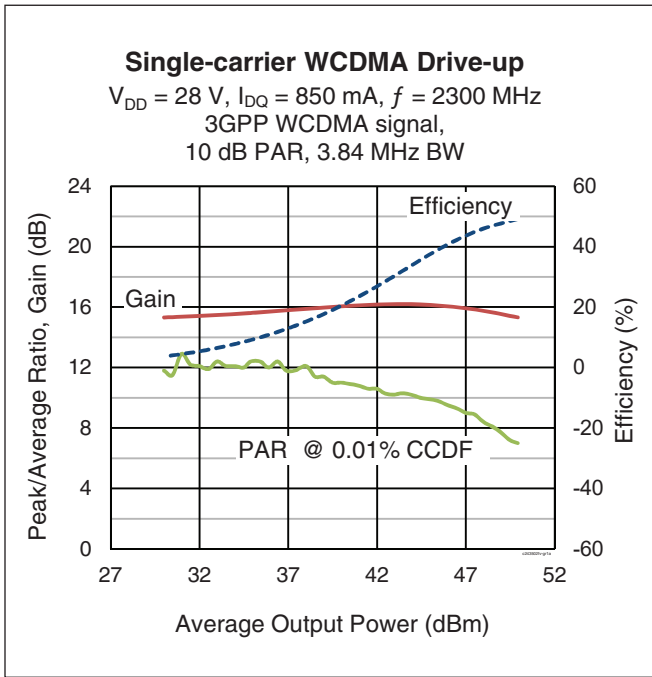
## Maximum Ratings

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 ( $T_{CASE} = 70^{\circ}\text{C}, 250\text{ W CW}$ )	$R_{\theta JC}$	0.22	$^{\circ}\text{C/W}$

## Ordering Information

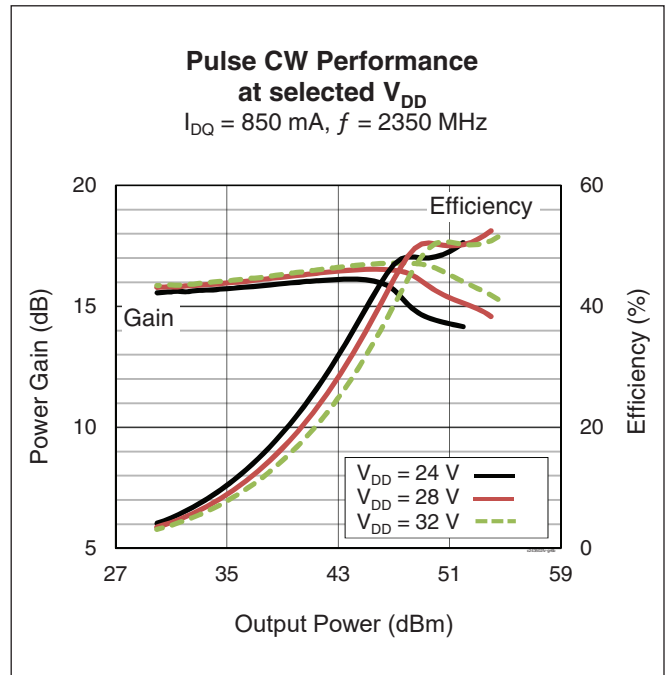
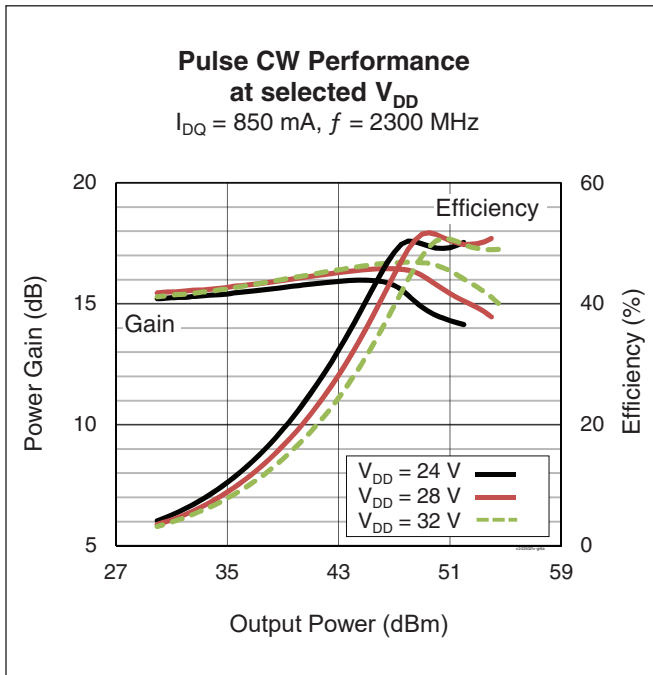
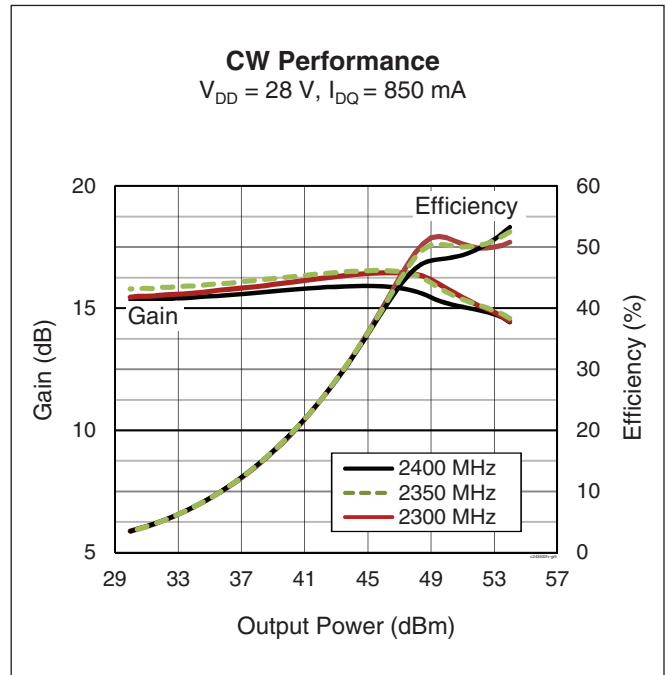
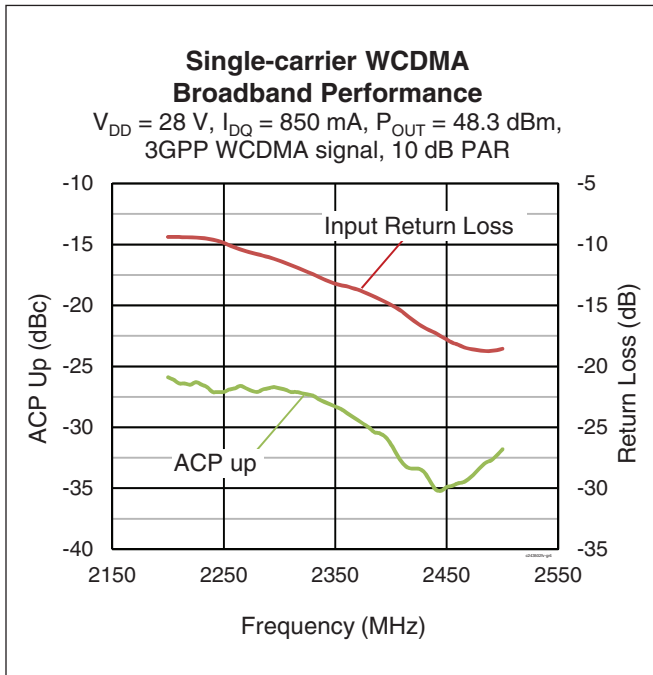
Type and Version	Order Code	Package and Description	Shipping
PXAC243502FV V1 R0	PXAC243502FV-V1-R0	H-37275-4	Tape & Reel, 50 pcs
PXAC243502FV V1 R250	PXAC243502FV-V1-R250	H-37275-4	Tape & Reel, 250 pcs

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

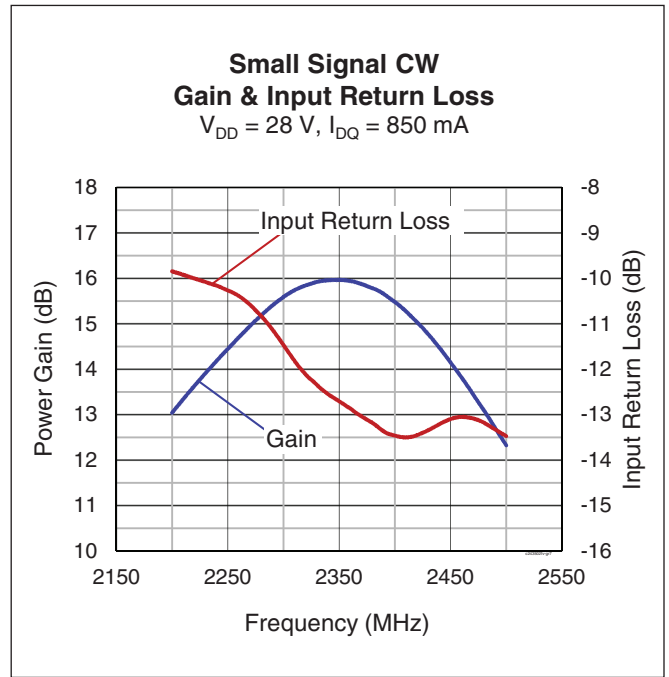
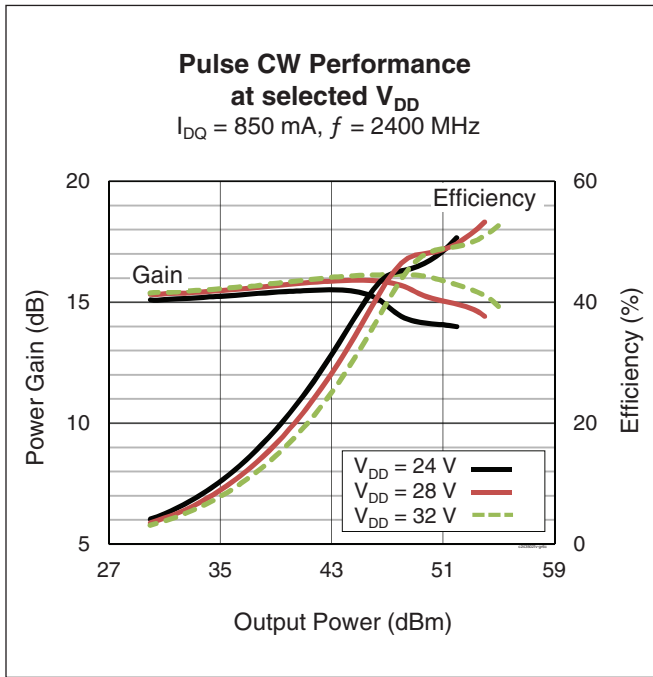




**Typical RF Performance (cont.)**



**Typical RF Performance (cont.)**



See next page for Load Pull Performance

## Load Pull Performance

**Main Side** – Pulsed CW signal: 160  $\mu$ sec, 10% duty cycle;  $V_{DD} = 28$  V,  $I_{DQ} = 850$  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 [%]
2300	6.82 – j9.56	1.28 – j3.64	16.16	52.39	173.38	49.67	2.37 – j2.28	18.79	50.39	109.47	59.01
2350	8.29 – j9.42	1.25 – j3.62	16.44	52.20	165.96	49.05	1.97 – j2.50	18.63	50.66	116.49	57.37
2400	10.06 – j7.29	1.30 – j3.61	16.46	51.82	152.05	45.61	1.99 – j2.24	18.90	50.15	103.49	54.87

**Peak Side** – Pulsed CW signal: 160  $\mu$ sec, 10% duty cycle;  $V_{DD} = 28$  V,  $I_{DQ} = 1350$  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 [%]
2300	3.27 – j6.01	2.09 – j3.76	17.42	53.03	200.91	48.19	1.43 – j2.25	19.79	51.17	130.98	55.51
2350	4.08 – j6.00	2.03 – j3.86	17.54	52.77	189.23	45.76	1.33 – j2.63	19.82	51.31	135.33	53.60
2400	5.14 – j6.25	1.90 – j3.64	18.08	52.61	182.39	45.91	1.49 – j2.71	20.01	51.45	139.57	51.41

**Peak Side** – Pulsed CW signal: 160  $\mu$ sec, 10% duty cycle;  $V_{DD} = 28$  V,  $V_{GS(peak)} = 1.5$  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 [%]
2300	3.27 – j6.01	1.67 – j4.02	12.90	53.71	234.96	50.13	1.42 – j2.66	14.27	52.51	178.28	59.99
2350	4.08 – j6.00	1.62 – j4.07	13.16	53.57	227.51	50.21	1.37 – j2.69	14.53	51.75	149.62	58.18
2400	5.14 – j6.25	1.96 – j4.15	13.39	53.43	220.29	48.66	1.47 – j2.71	14.74	51.79	150.83	56.64

## Reference Circuit, 2300 to 2400 MHz

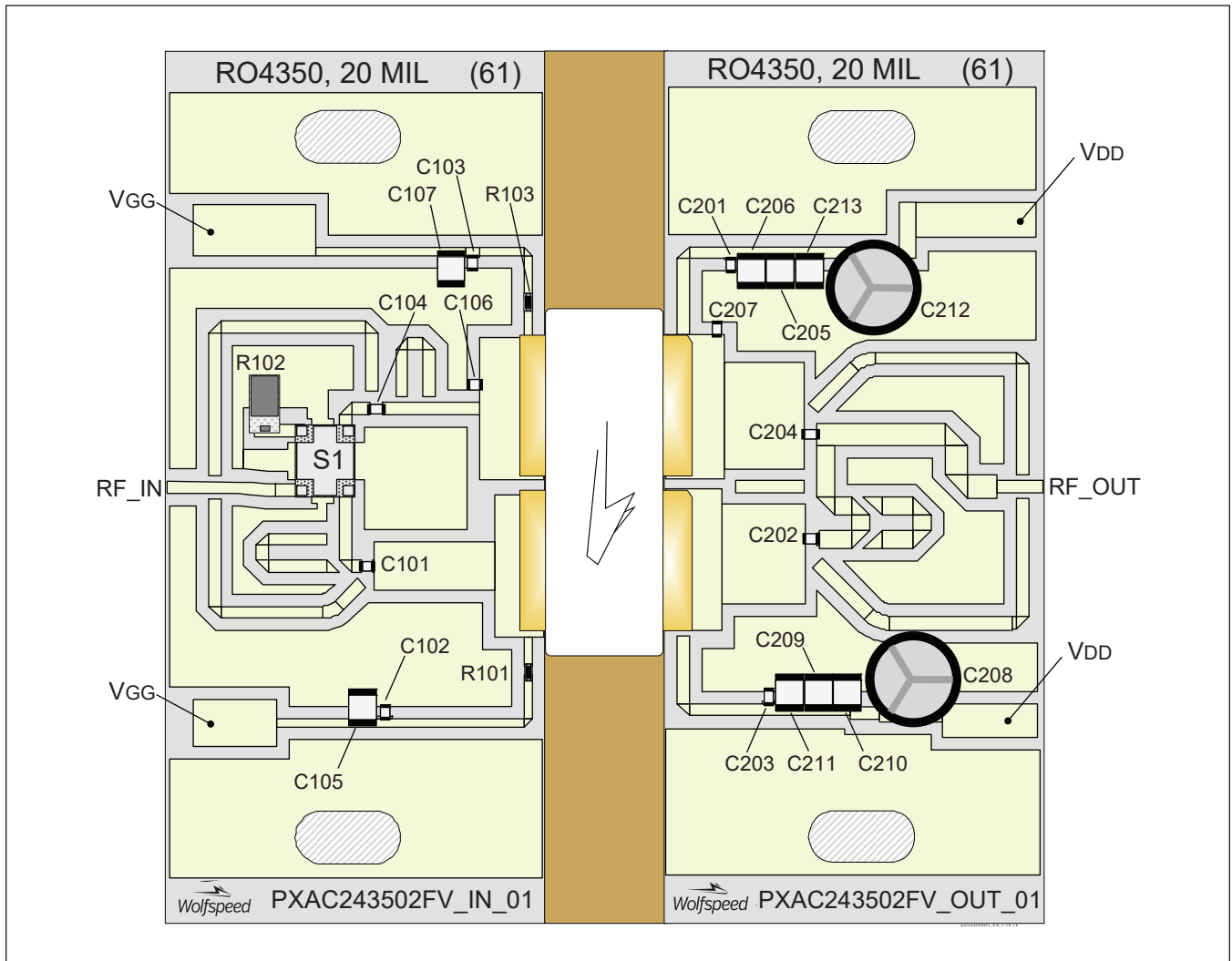
DUT PXAC243502FV V1

Test Fixture Part No. LTA/PXAC243502FV 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 (<http://www.wolfspeed.com/RF>)

**Reference Circuit** (cont.)



Reference circuit assembly diagram (not to scale)

**Component Information**

Component	Description	Manufacturer	Part Number
<b>Input</b>			
C101, C102, C103, C104	Capacitor, 15 pF	ATC	ATC600F150JT250XT
C105, C107	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C106	Capacitor, 0.5 pF	ATC	ATC600F0R5BT250XT
R101, R103	Chip resistor, 10 ohms	Panasonic Electronic Components	ERJ-3GEYJ100V
R102	Chip resistor, 50 ohms	Anaren	C16A50Z4
S1	Hybrid coupler	Anaren	X3C25P1-02S

(table cont. next page)

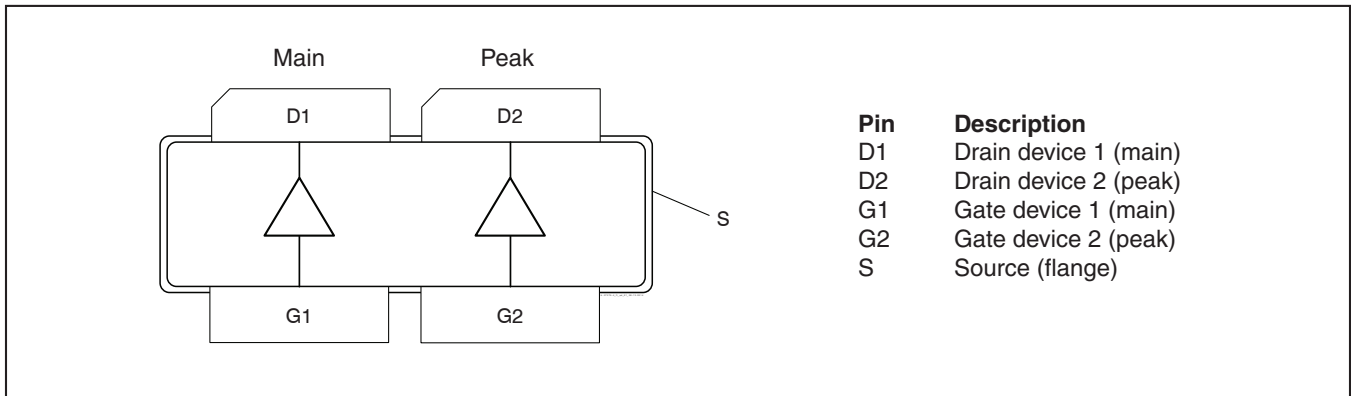


**Reference Circuit** (cont.)

**Component Information** (cont.)

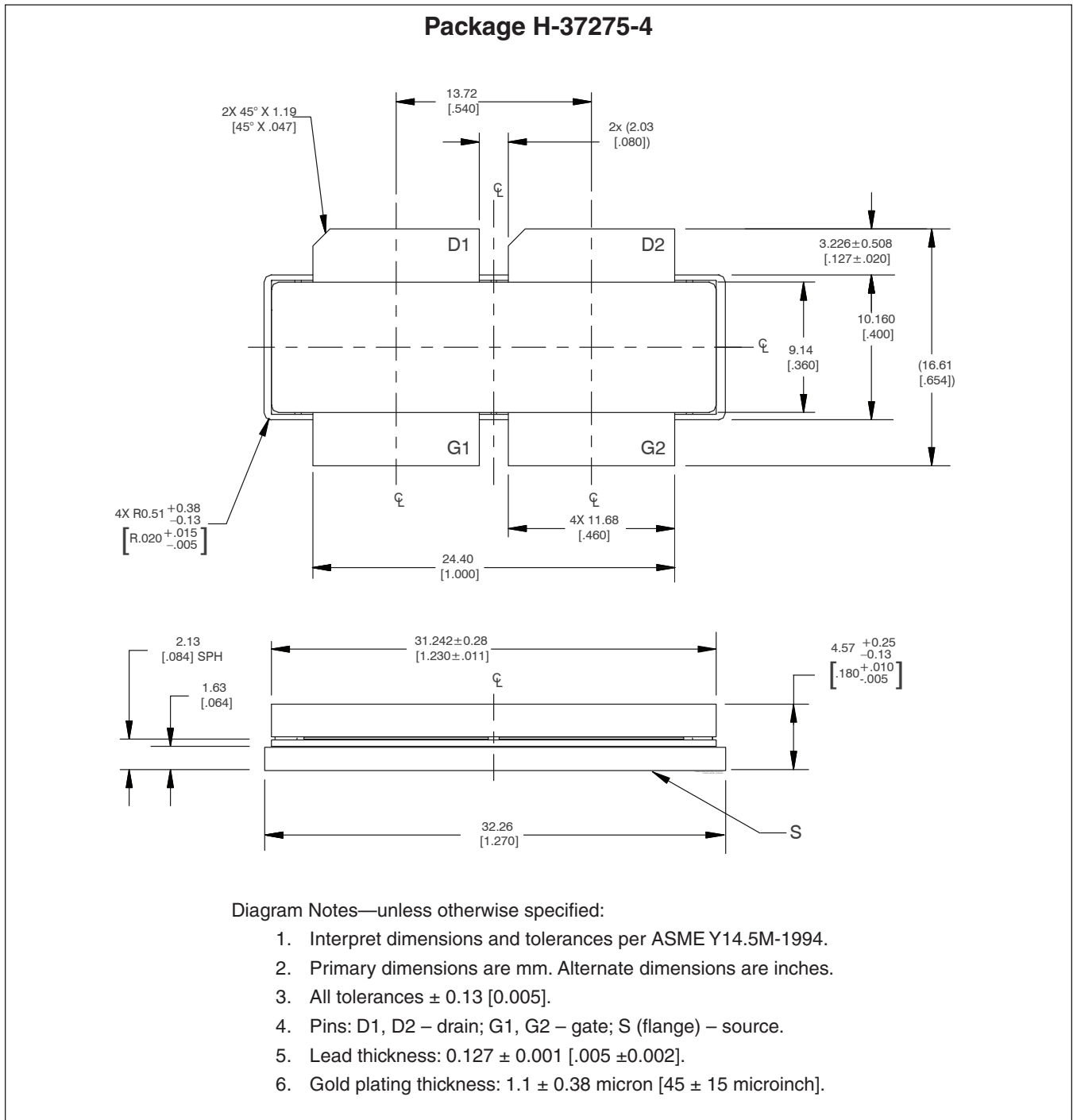
Component	Description	Manufacturer	Part Number
<b>Output</b>			
C201, C203	Capacitor, 15 pF	ATC	ATC600F150JT250XT
C207	Capacitor, 0.8 pF	ATC	ATC600F0R8BT250XT
C204	Capacitor, 3 pF	ATC	ATC600F3R0BT250XT
C202	Capacitor, 3.9 pF	ATC	ATC600F3R9BT250XT
C205, C206, C209, C210, C211, C213	Capacitor, 10 $\mu$ F	Taiyo Yuden	UMK325C7106MM-T
C212, C208	Capacitor, 220 $\mu$ F	Panasonic Electronic Components	EEE-FP1V221AP

**Pinout Diagram** (top view)





Package Outline Specifications



## Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2013-03-05	Advance	All	Proposed specification for new product development.
02	2014-12-24	Producton	All	Includes released-product specifications, including performance graphs and load pull data.
03	2015-01-16	Production	6 – 8	Include reference circuit information.
03.1	2015-04-13	Production	1, 2	Update RF and DC tables. Removed 1C WCDMA performance from Features, added HBM rating. Updated ordering table.
03.2	2016-06-22	Production	2	Updated ordering information.
04	2018-07-03	Production	All	Converted to Wolfspeed Data Sheet.

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## Notes

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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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