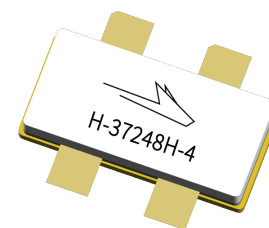


# PTAC260302FC

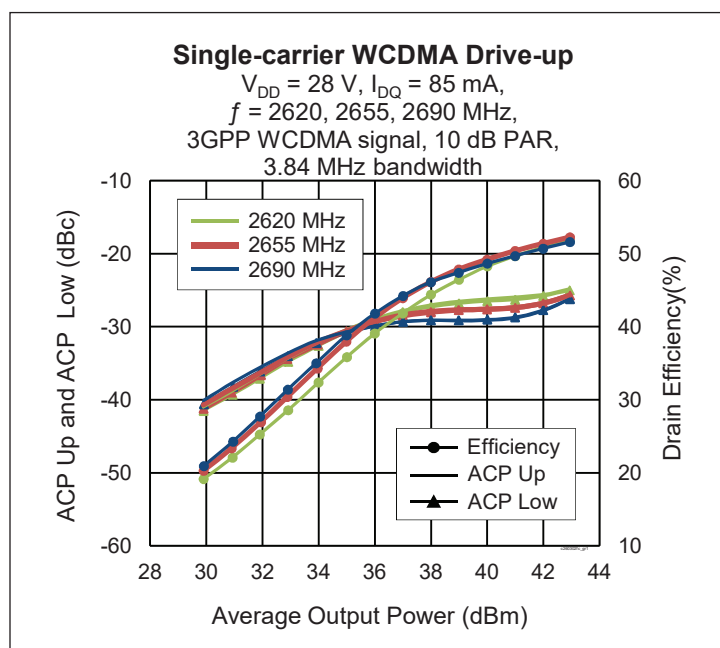
## Thermally-Enhanced High Power RF LDMOS FET 30 W, 28 V, 2620 – 2690 MHz

### Description

The PTAC260302FC is a 30-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 2620 to 2690 MHz frequency band. This device integrates a 10-W (main) and a 20-W (peak) transistor, making it ideal for asymmetric Doherty amplifier designs. Features include input matching, high gain and thermally-enhanced package with earless flange. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTAC260302FC  
Package H-37248H-4



### Features

- Asymmetric design
- Broadband internal matching
- Typical CW performance, 2690 MHz, 28 V (Doherty configuration, combined output)
  - Output power @  $P_{3dB} = 30\text{ W}$
  - Efficiency = 54%
  - Gain = 13 dB
- Typical single-carrier WCDMA performance, 2690 MHz, 28 V, 10 dB PAR
  - Output power = 37.5 dBm avg
  - Gain = 15.5 dB
  - Efficiency = 45%
- Capable of handling 10:1 VSWR @ 32 V, 30 W (CW) output power
- Integrated ESD protection
- Human Body Model Class 1B (per ANSI/ESDA/ JEDEC JS-001)
- Pb-free and RoHS compliant

### RF Characteristics

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

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 85\text{ mA}$ ,  $V_{GS1} = 1.1\text{ V}$ ,  $P_{OUT} = 5.6\text{ W avg}$ ,  $f = 2690\text{ MHz}$ ,  
 3GPP WCDMA signal, 3.84 MHz channel bandwidth, 10 dB peak/average @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	$G_{ps}$	14.5	15.5	—	dB
Drain Efficiency	$\eta_D$	42	45	—	%
Adjacent Channel Power Ratio	ACPR	—	-27	-25	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	$\mu\text{A}$
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	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) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.8	—	$\Omega$
	(peak) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.6	—	$\Omega$
Operating Gate Voltage	(main) $V_{DS} = 28\text{ V}, I_{DQ} = 0.085\text{ A}$	$V_{GS}$	2	2.7	3.5	V
	(peak) $V_{DS} = 28\text{ V}, I_{DQ} = 0\text{ A}$	$V_{GS}$	0.4	1.1	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	
Junction Temperature	$T_J$	225	$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	-65 to +150	$^{\circ}\text{C}$	
Thermal Resistance	(main) $(T_{CASE} 70^{\circ}\text{C}, 30\text{ W CW})$	$R_{qJC}$	1.5	$^{\circ}\text{C/W}$
	(peak) $(T_{CASE} 70^{\circ}\text{C}, 30\text{ W CW})$	$R_{qJC}$	1.7	$^{\circ}\text{C/W}$

**Ordering Information**

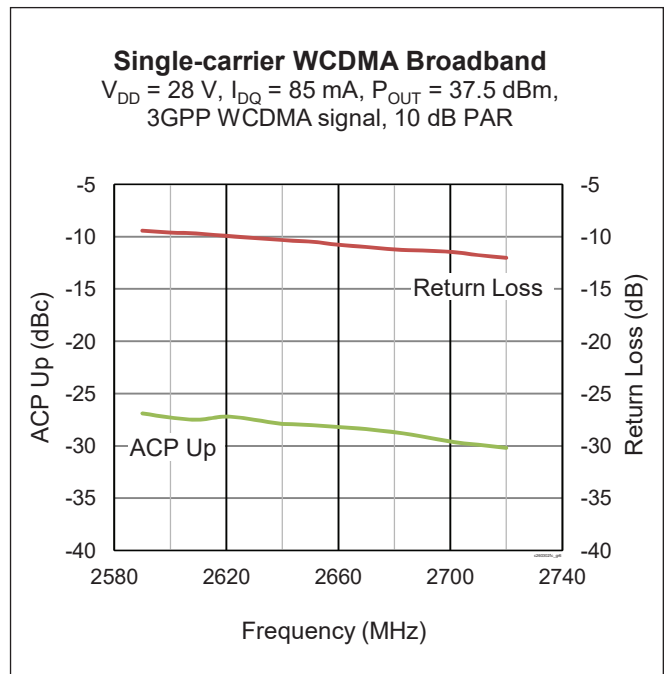
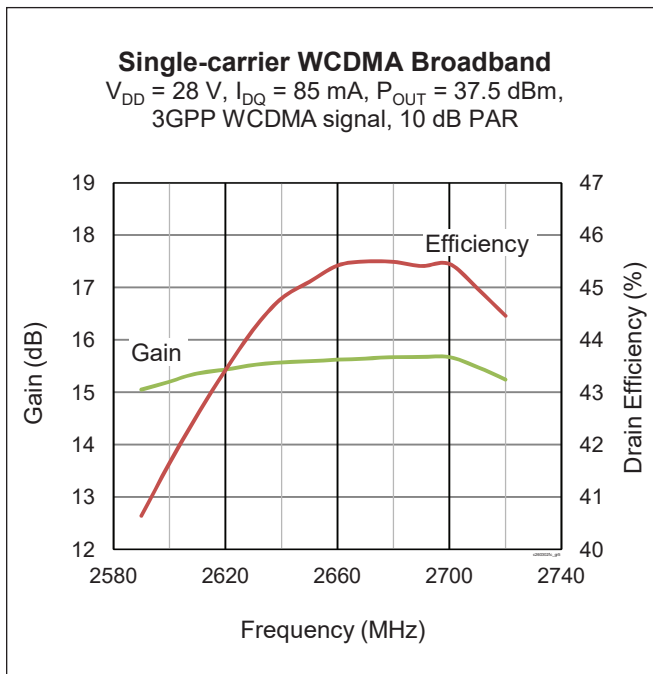
Type and Version	Order Code	Package and Description	Shipping
PTAC260302FC V1 R0	PTAC260302FC-V1-R0	H-37248H-4, Ceramic open-cavity, earless	Tape & Reel, 50 pcs
PTAC260302FC V1 R250	PTAC260302FC-V1-R250	H-37248H-4, Ceramic open-cavity, earless	Tape & Reel, 250 pcs

**Pinout Diagram** (top view)



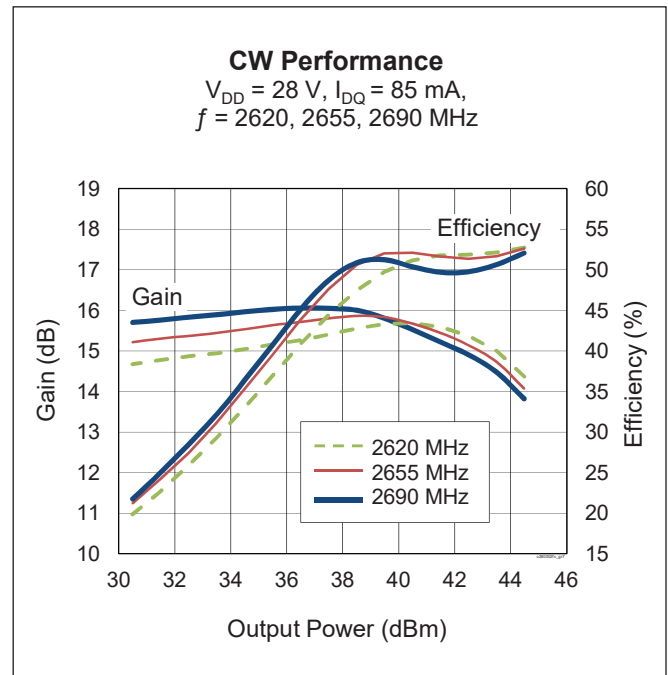
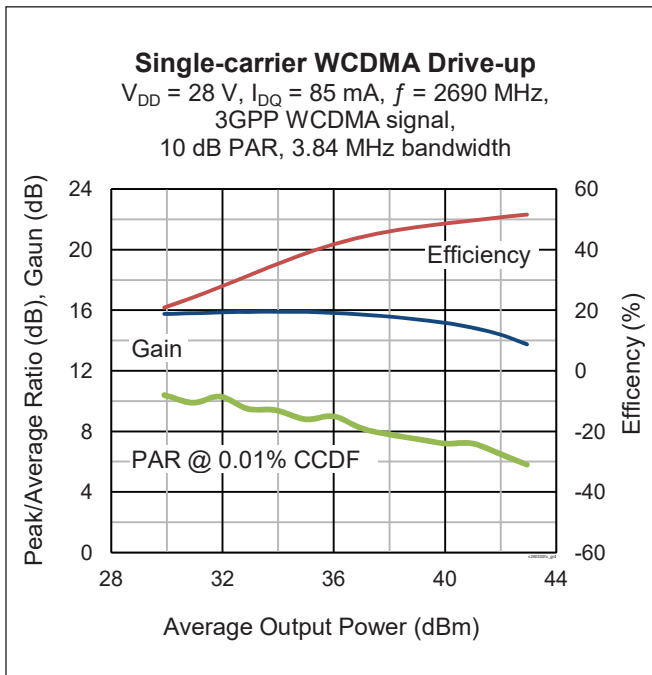
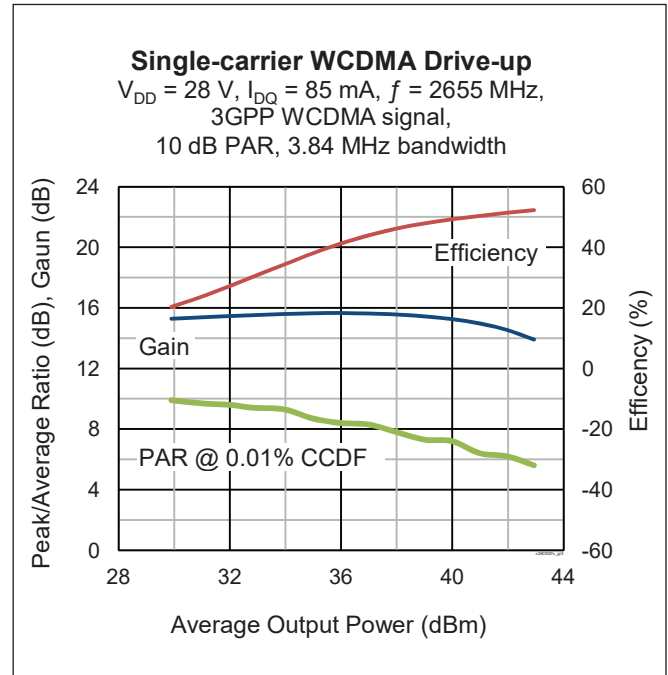
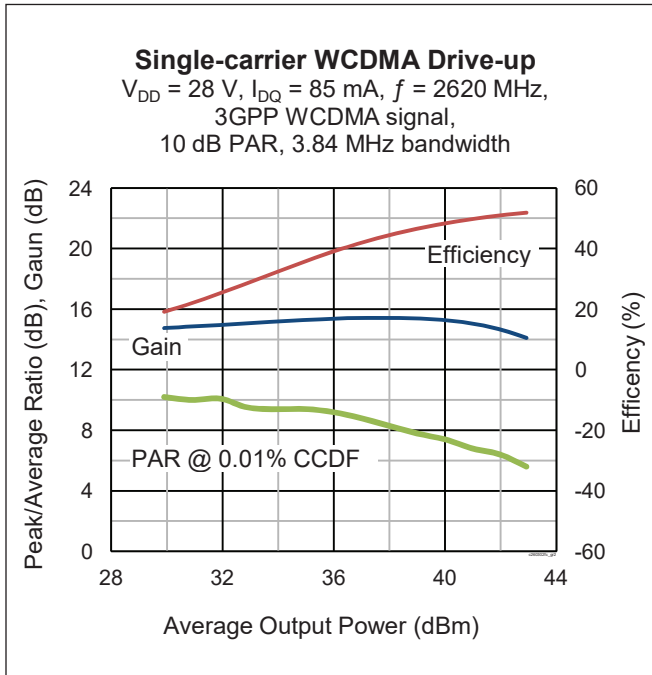
Lead connections for PTAC260302FC

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

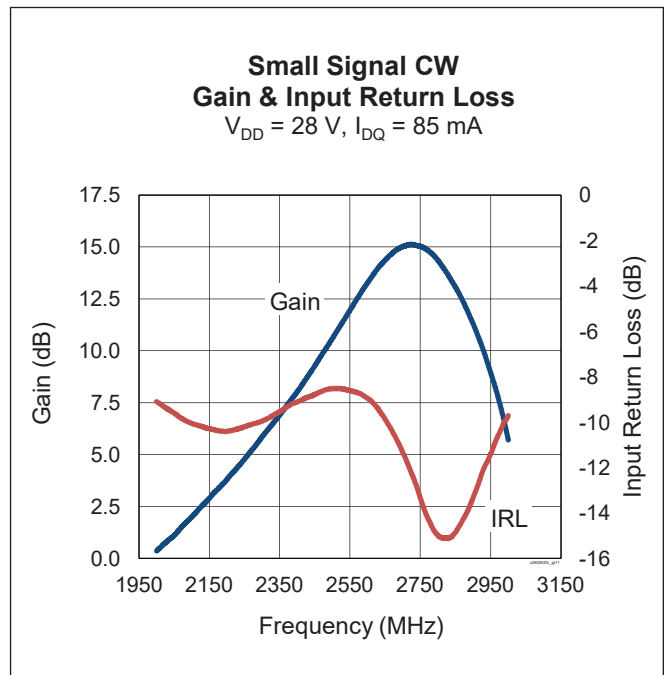
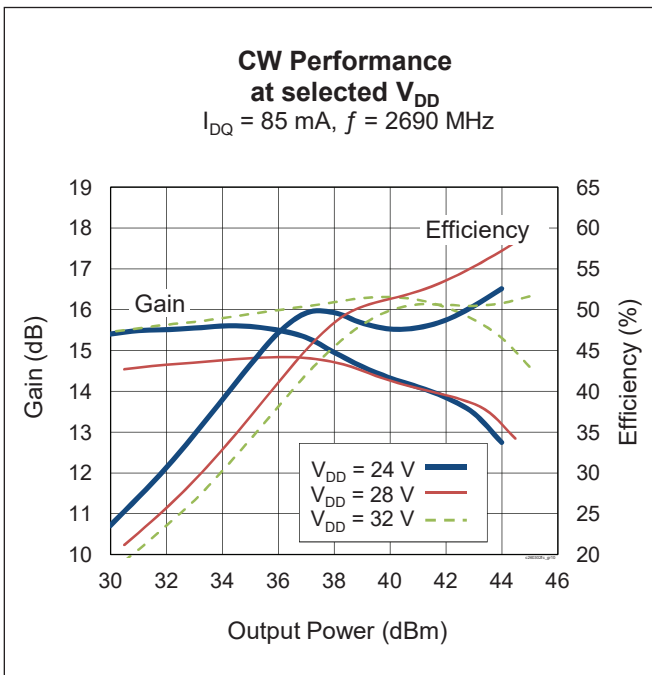
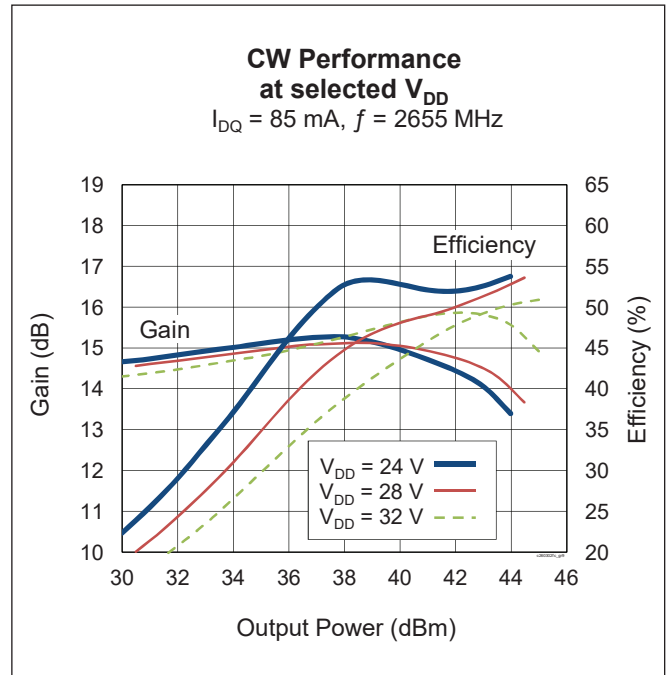
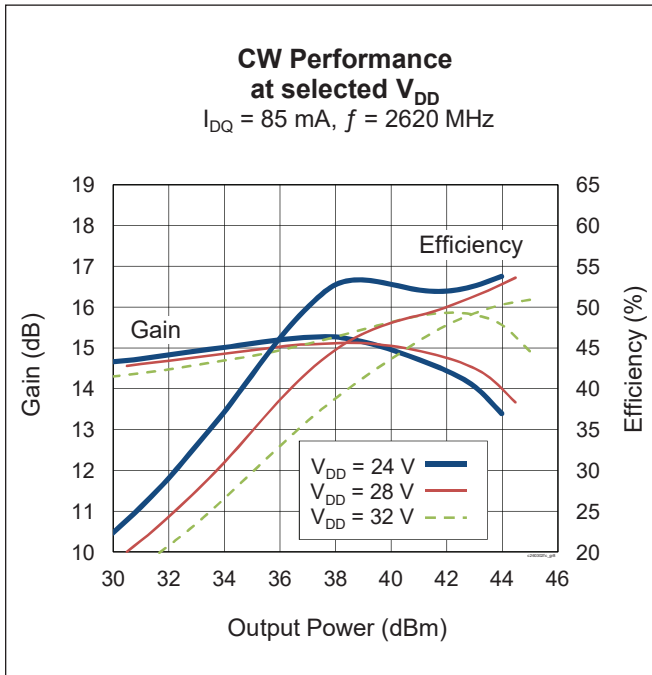




**Typical Performance** (cont.)

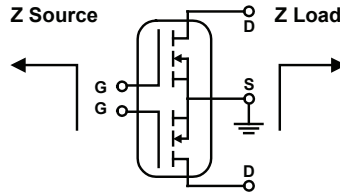


Typical Performance (cont.)





### Load Pull Performance



**Main Side** – Pulsed CW signal: 16  $\mu$ sec, 10% duty cycle; 28 V, 85 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 %	
2620	26 - j22	10.9 - j9.7	19.7	42.36	17.2	61.0	5.9 - j7.0	21.6	40.70	11.7	66.4	
2655	33 - j32	12.7 - j9.6	20.0	42.45	17.6	59.8	7.1 - j8.1	21.4	41.36	13.7	65.9	
2690	55 - j34	15.2 - j11.4	19.3	42.86	19.3	55.1	6.8 - j9.0	21.2	41.33	13.6	64.4	

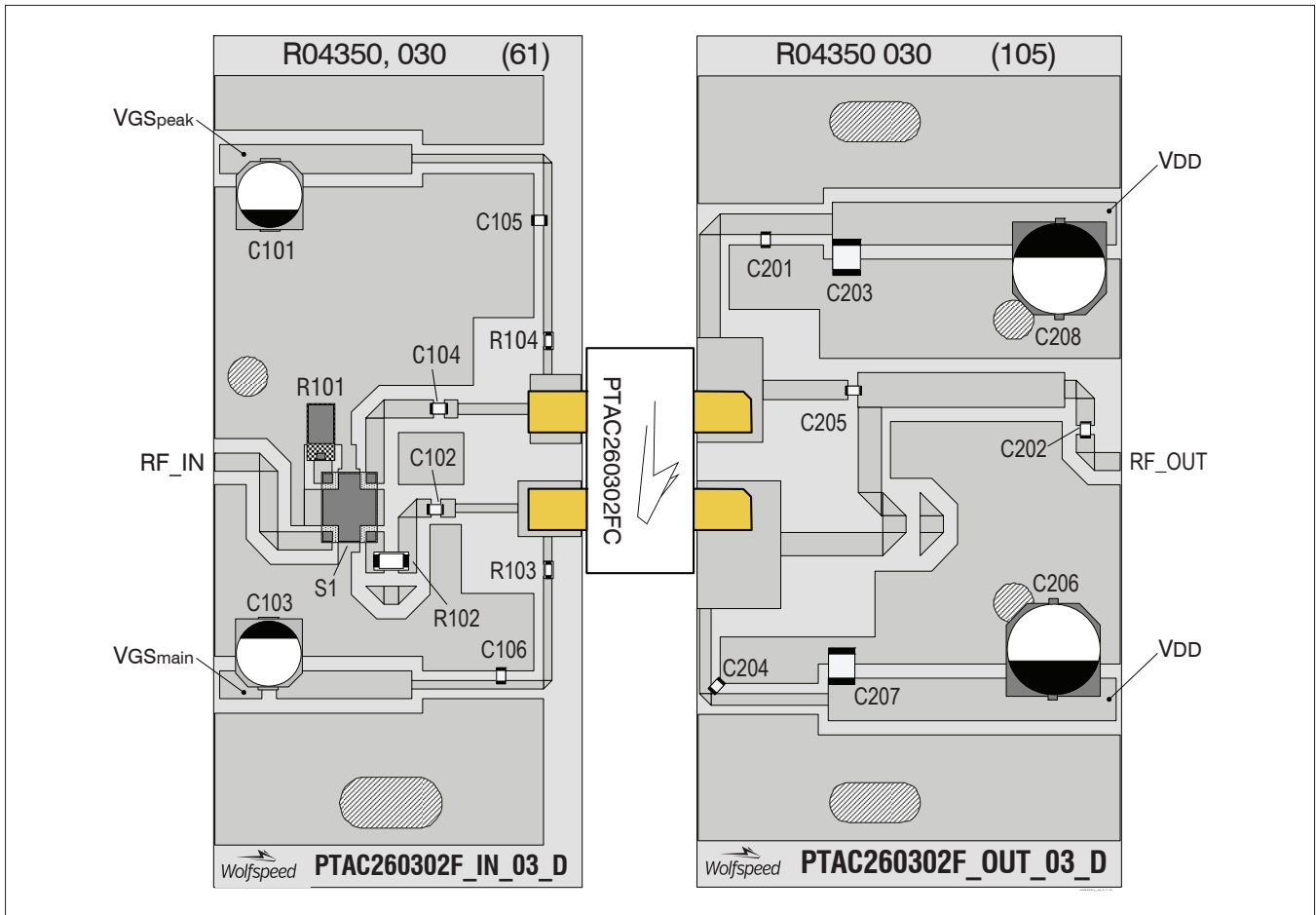
**Peak Side** – Pulsed CW signal: 16  $\mu$ sec, 10% duty cycle; 28 V, 115 mA

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 %	
2620	36 - j41	11.5 - j14.9	19.6	43.11	20.5	58.8	6.4 - j13.4	20.9	41.92	15.6	63.9	
2655	42 - j31	11.9 - j12.7	20	43.09	20.4	61.1	7.0 - j13.9	20.8	42.07	16.1	63.2	
2690	55 - j33	12.9 - j15.0	19.5	42.87	19.4	57.2	7.8 - j15.1	20.5	42.16	16.4	61.8	

### Reference Circuit

DUT	PTAC260302FC
Test Fixture Part No.	LTA/PTAC260302FC
PCB	Rogers 4350, 0.762 mm [.030"] 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">http://www.wolfspeed.com/RF</a> )	

**Reference Circuit** (cont.)

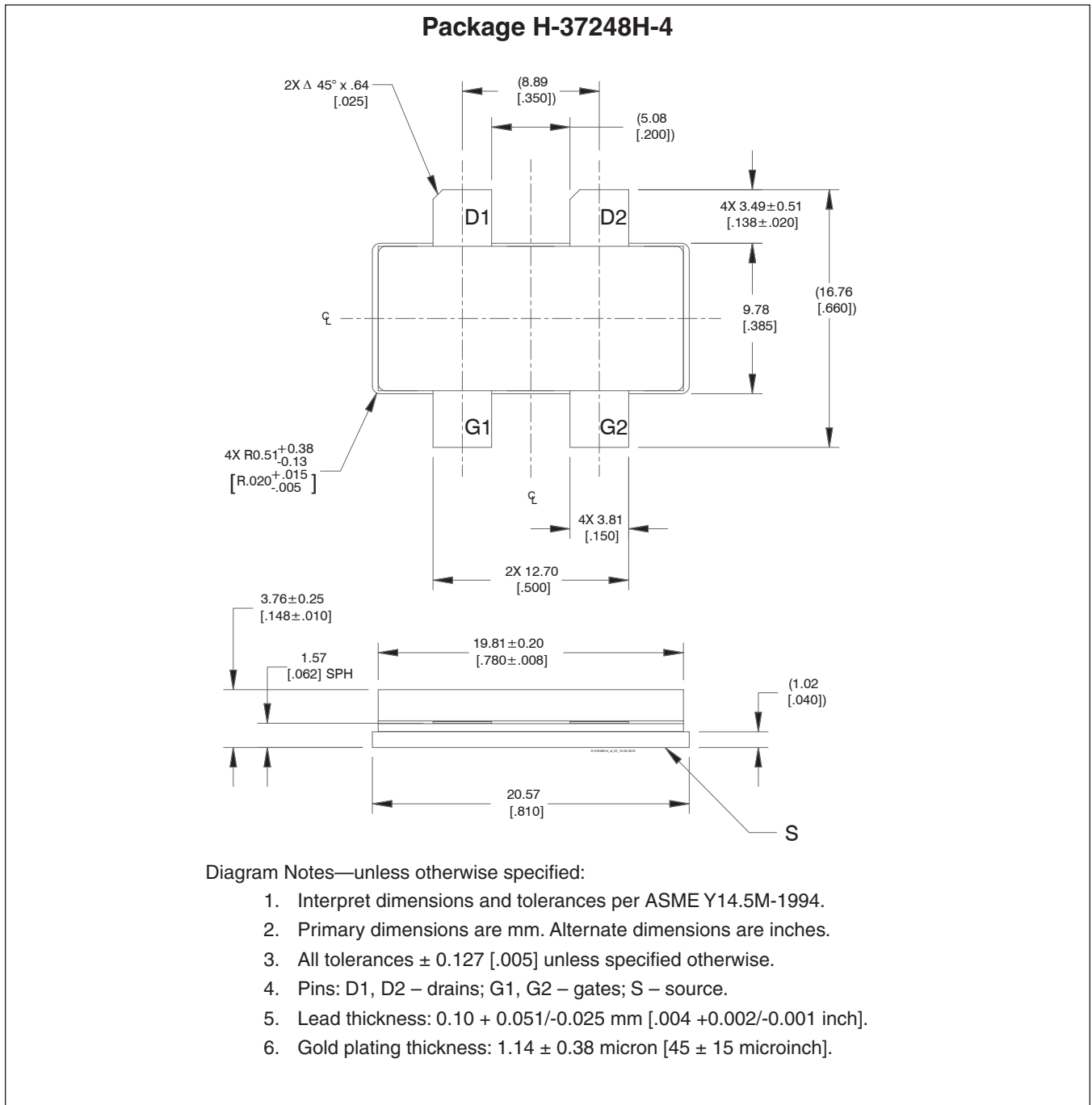


Reference circuit assembly diagram (not to scale)

**Component Information**

Component	Description	Suggested Manufacturer	P/N
<b>Input</b>			
C101, C103	Capacitor, 10 $\mu$ F, 50 V	Panasonic Electronic Components	EEV-HD1H100P
C102, C104, C105, C106	Chip capacitor, 18 pF	ATC	ATC100A180JW150XB
R101	Resistor, 50 Ohm	Anaren	C16A50Z4
R102	Resistor, 20 Ohm	Panasonic Electronic Components	ERJ-8GEYJ200V
R103, R104	Resistor, 10 Ohm	Panasonic Electronic Components	ERJ-3GEYJ100V
S1	Hybrid coupler	Anaren	X3C25P1_05S
<b>Output</b>			
C201, C202	Chip capacitor, 18 pF	ATC	ATC100A180JW150XB
C203, C207	Capacitor, 10 $\mu$ F	Taiyo Yuden	UMK325C7106MM-T
C204, C205	Chip capacitor, 18 pF	ATC	ATC100A180JW150XB
C206, C208	Capacitor, 220 $\mu$ F, 35 V	Panasonic Electronic Components	EEE-FP1V221AP

Package Outline Specifications





## Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2012-03-05	Advance	All	New product, proposed only.
02	2012-11-28	Advance	1,3 2	Updated package and Package Outline. Updated Pinout Diagram.
03	2014-02-12	Production	All 3 – 7	Product released to production. All information updated. Performance graphs, load pull and circuit information added.
04	2016-06-21	Production	1 2	Updated ESD rating Maximum junction temperature raised to 225°C, updated ordering info.
05	2018-07-02	Production	All	Converted to Wolfspeed Data Sheet.

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## Notes

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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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