

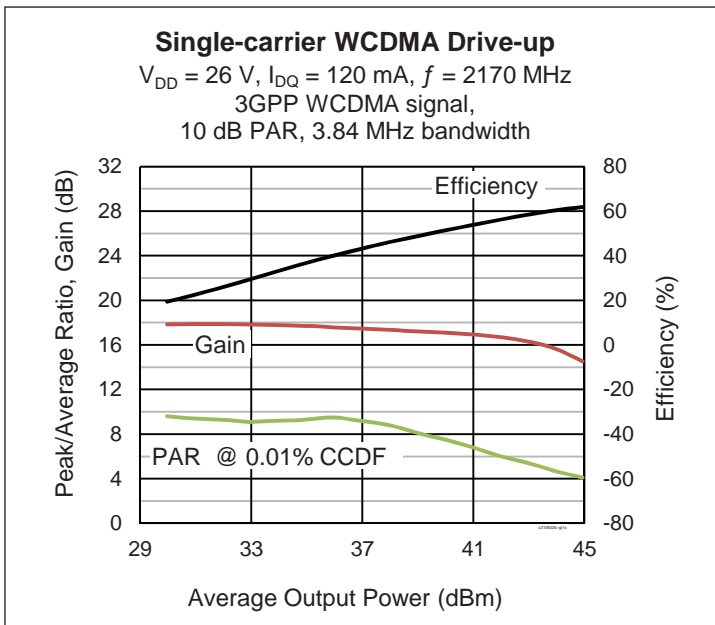
Thermally-Enhanced High Power RF LDMOS FET 55 W, 28 V, 1805 – 2170 MHz

Description

The PXAC210552FC is a 55-watt LDMOS FET with an asymmetric design for use in multi-standard cellular power amplifier applications in the 1805 to 2170 MHz frequency band. It features dual-path design, input and output matching, and a thermally-enhanced package with earless flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PXAC210552FC
Package H-37248-4



Features

- Broadband internal matching
- Asymmetric Doherty design
 - Main: P1dB = 20 W Typ
 - Peak: P1dB = 35 W Typ
- CW performance, 2170 MHz, 26 V
 - Output power at P1dB = 27 W
 - Gain = 17 dB
 - Efficiency = 59%
- Integrated ESD protection
- ESD: Human Body Model, Class 1B (per ANSI/ESDA/JEDEC JS-001)
- Capable of handling 10:1 VSWR @28 V, 55 W (CW) output power
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

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

$V_{DD} = 26\text{ V}$, $V_{GS(peak)} = 1.5\text{ V}$, $I_{DQ} = 120\text{ mA}$, $P_{OUT} = 39\text{ dBm}$ average, $f = 2170\text{ MHz}$. 3GPP WCDMA signal: 3.84 MHz bandwidth, 10 dB PAR @0.01% CCDF.

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	16	17.2	—	dB
Drain Efficiency	η_D	46	49	—	%
Adjacent Channel Power Ratio	ACPR	—	-29	-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

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 (main and peak)	$V_{DS} = 28\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	—	0.1	μA
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	—	—	0.1	μA
On-state Resistance	(main) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.38	—	Ω
	(peak) $V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.19	—	Ω
Operating Gate Voltage	(main) $V_{DS} = 26\text{ V}, I_{DQ} = 120\text{ mA}$	V_{GS}	2.16	2.65	3.15	V
	(peak) $V_{DS} = 26\text{ V}, I_{DQ} = 0\text{ mA}$	V_{GS}	1.00	1.50	2.00	V

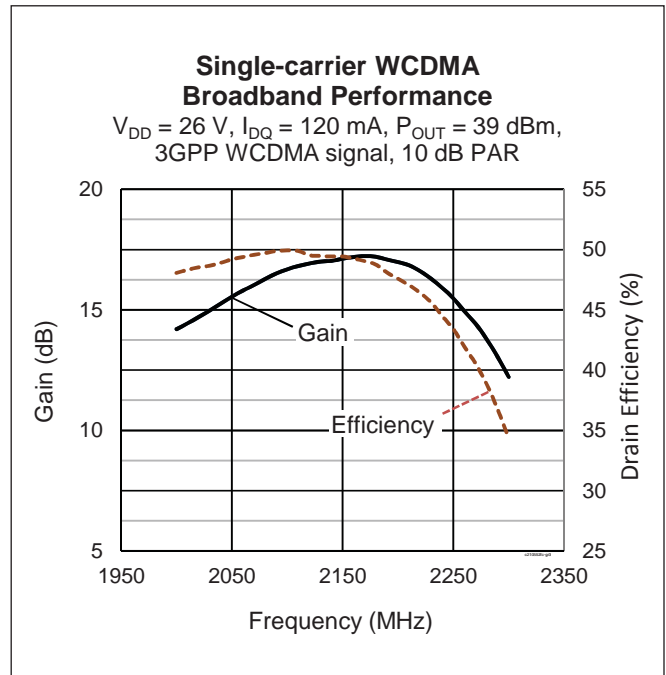
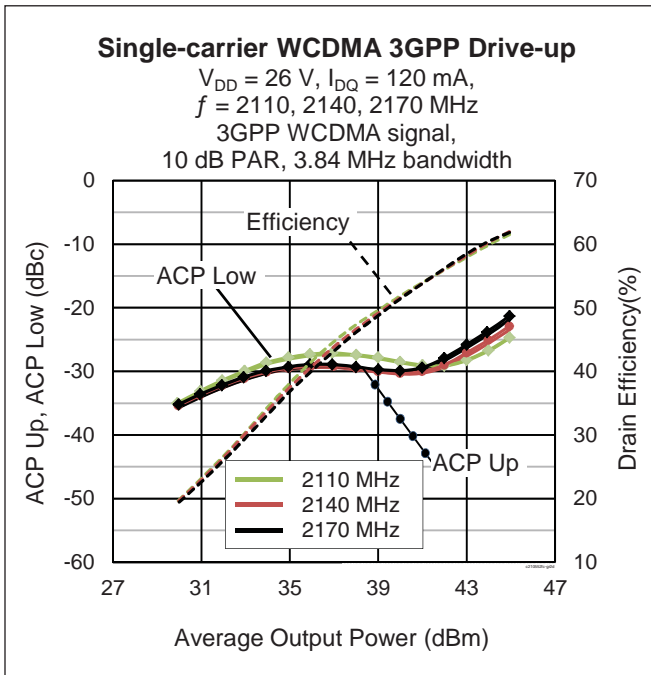
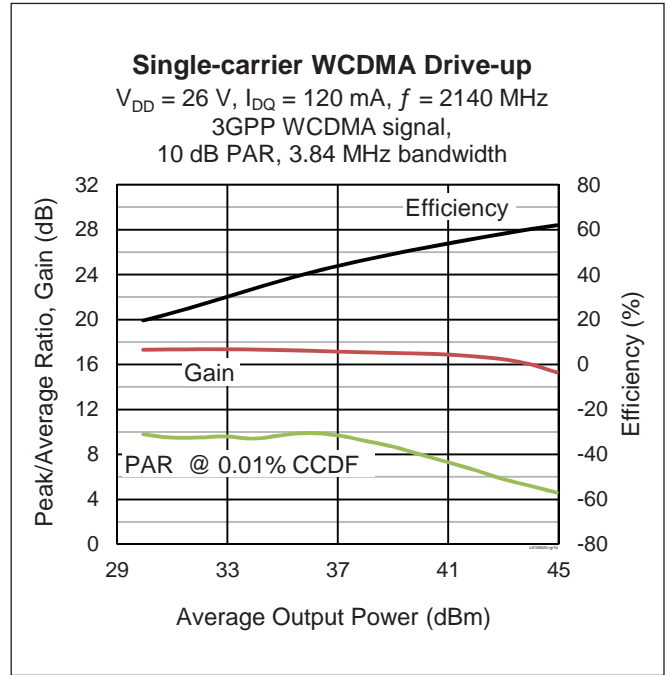
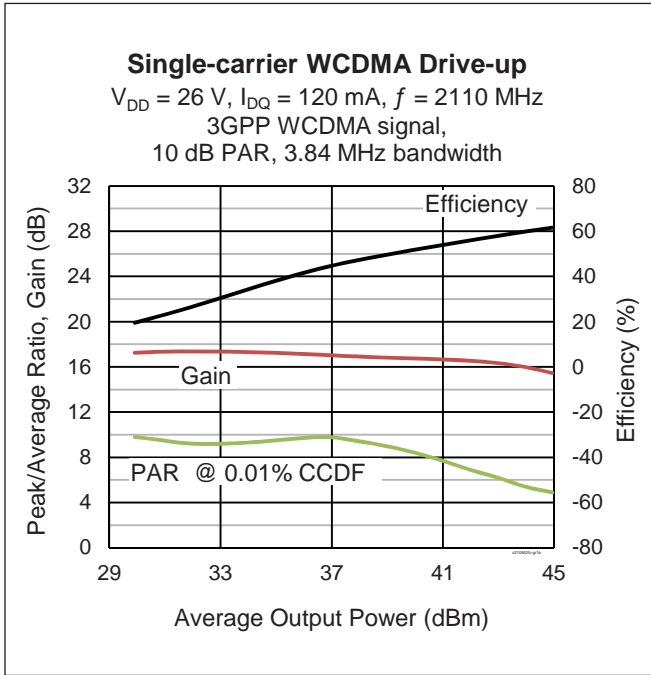
Maximum Ratings

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 ($T_{CASE} = 70^{\circ}\text{C}, 26\text{ V}, 8\text{ W CW}$)	$R_{\theta JC}$	1.44	$^{\circ}\text{C/W}$

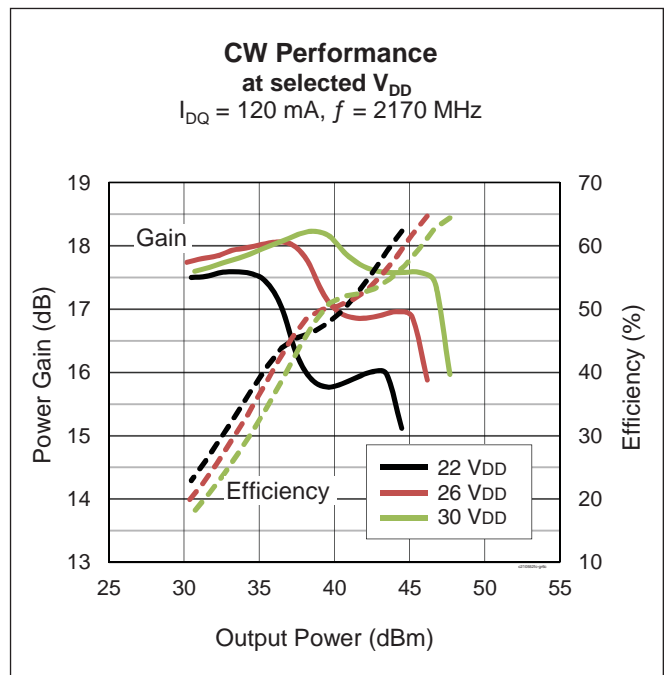
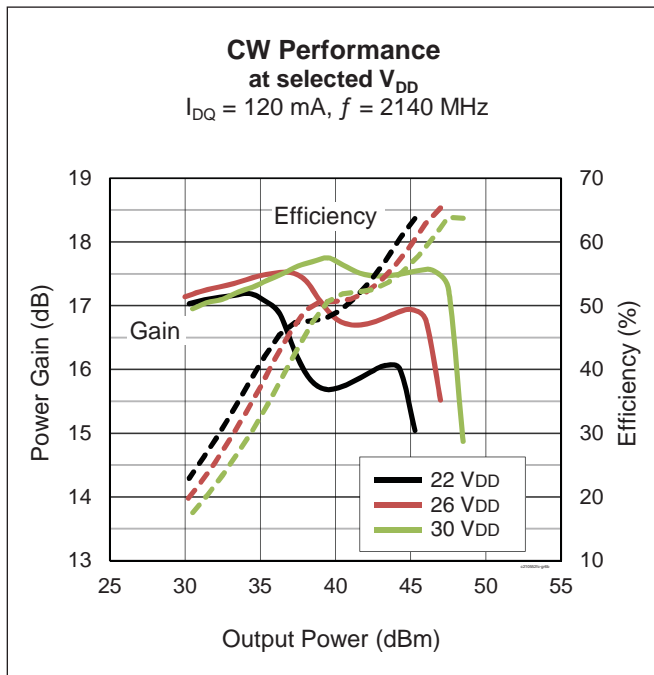
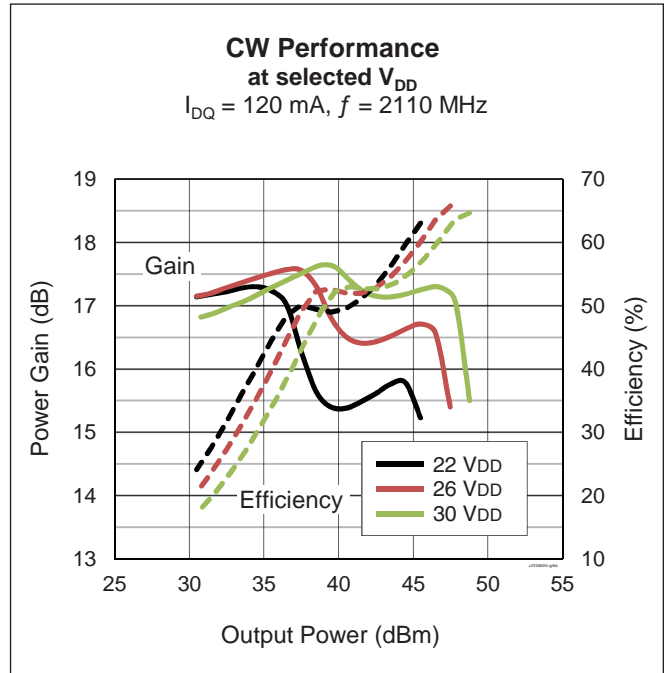
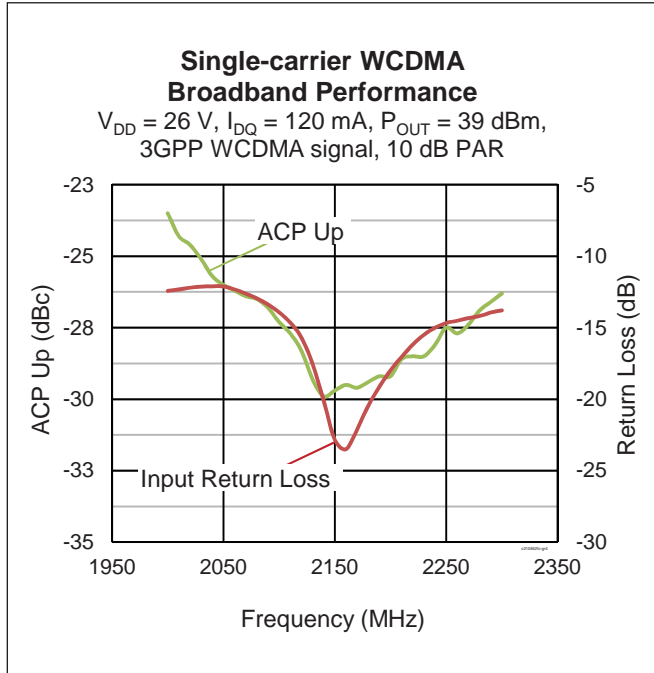
Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PXAC210552FC V1 R0	PXAC210552FCV1R0XTMA1	H-37248-4, ceramic open-cavity, earless	Tape & Reel, 50 pcs
PXAC210552FC V1 R2	PXAC210552FCV1R2XTMA1	H-37248-4, ceramic open-cavity, earless	Tape & Reel, 250 pcs

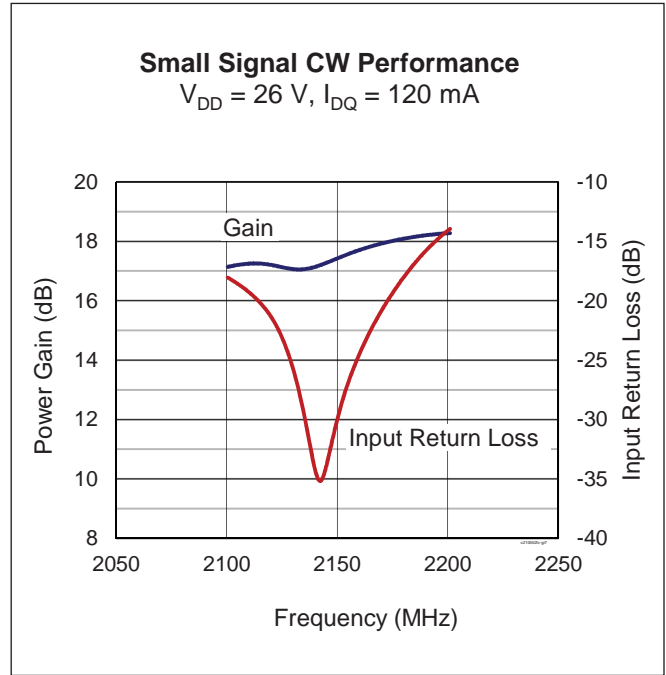
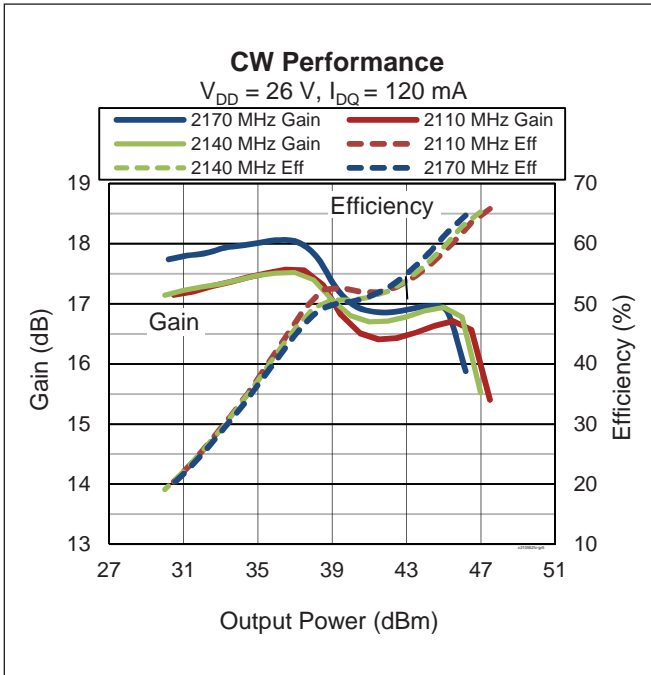
Typical Performance (data taken in Infineon Doherty reference test fixture)



Typical Performance (cont.)

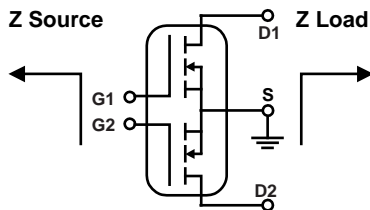


Typical Performance (cont.)



See next page for load pull information

Load Pull Performance



Main side pulsed CW signal: 160 μ sec, 10% duty cycle, $V_{DD} = 26$ V, $I_{DQ} = 120$ mA

Class AB		P _{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Z _s [Ω]	Z _l [Ω]	Gain [dB]	P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]	Z _l [Ω]	Gain [dB]	P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]
2110	19.70 – j30.49	11.34 – j3.06	20.9	43.74	23.7	59.4	11.02 – j3.49	22.3	42.70	18.6	66.0
2140	17.03 – j36.14	9.73 – j2.15	20.9	43.48	22.3	58.6	9.78 – j3.58	22.9	42.26	16.8	64.6
2170	34.36 – j32.08	10.27 – j2.68	20.8	43.71	23.5	58.4	9.47 – j3.32	22.5	42.53	17.9	64.6

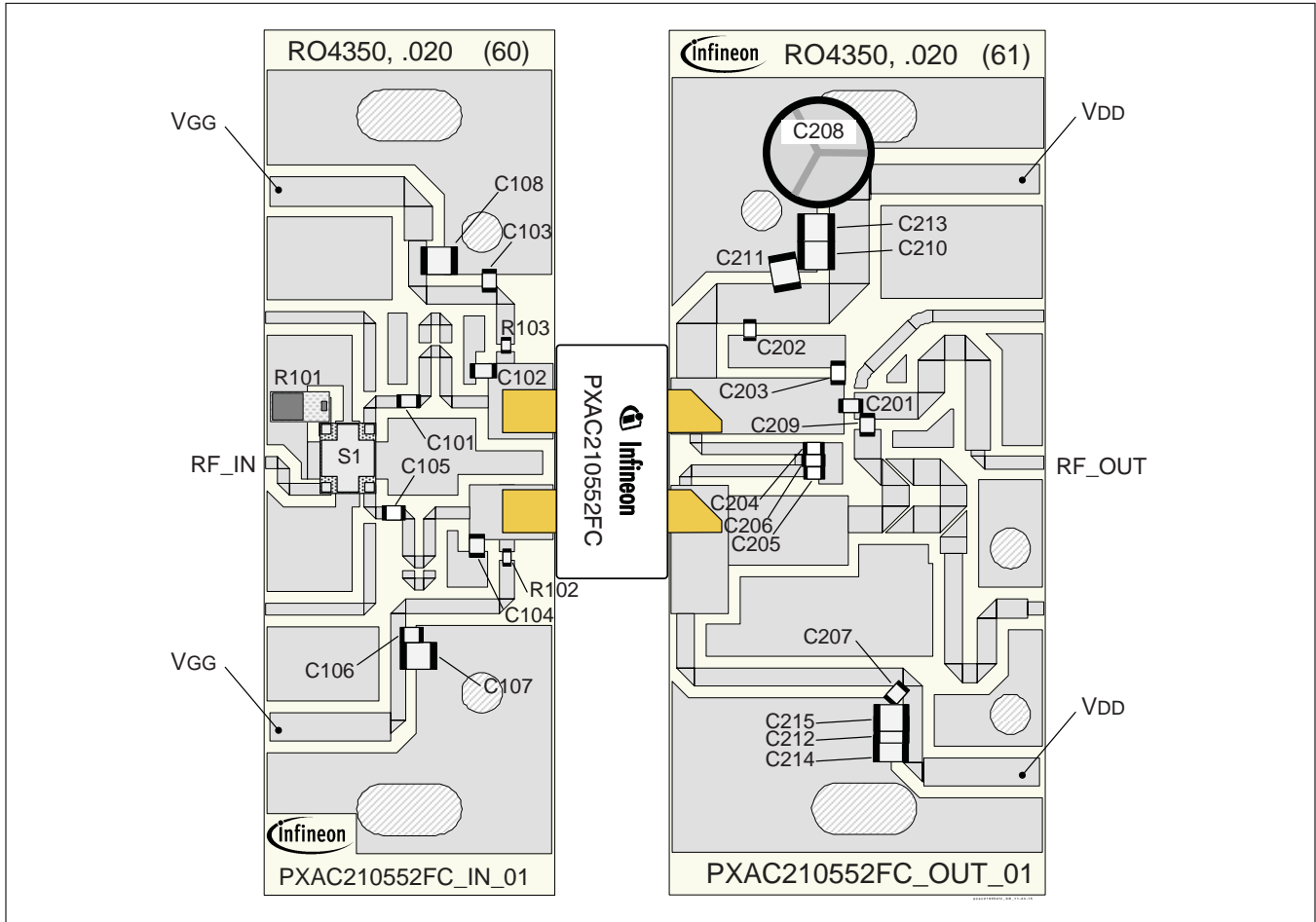
Peak side pulsed CW signal: 160 μ sec, 10% duty cycle, $V_{DD} = 26$ V, $V_{GS(peak)} = 1.5$ V

Class C		P _{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Z _s [Ω]	Z _l [Ω]	Gain [dB]	P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]	Z _l [Ω]	Gain [dB]	P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]
2110	9.80 – j12.90	3.28 – j4.71	15.5	47.56	57.0	60.7	4.00 – j1.52	16.5	45.6	36.3	71.8
2140	10.71 – j17.59	3.51 – j5.03	16.0	47.50	56.2	60.7	3.88 – j1.93	17.0	45.9	38.7	71.3
2170	15.51 – j13.51	3.58 – j5.14	15.6	47.53	56.6	60.0	3.69 – j1.47	16.6	45.4	34.9	70.9

Reference Circuit, tuned for 2110 – 2170 MHz

DUT	PXAC210552FC
Test Fixture Part No.	LTA/PXAC210552FC 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 Infineon Web site at www.infineon.com/rfpower	

Reference Circuit (cont.)



Reference circuit assembly diagram (not to scale)

Component Information

Component	Description	Manufacturer	P/N
Input			
C101, C103, C105, C106	Capacitor, 18 pF	ATC	ATC600F180GW250T
C102	Capacitor, 0.5 pF	ATC	ATC600F0R5CW250T
C104	Capacitor, 0.8 pF	ATC	ATC600F0R8CW250T
C107, C108	Capacitor, 10 μF	Taiyo Yuden	UMK325C7106MM-T
R101	Termination, 50 ohms	Anaren	C8A50Z4A
R102, R103	Resistor, 10 ohms	Panasonic	ERJ-3GEYJ100V
U1	Hybrid coupler	Anaren	X3C21P1-03S

table continued next page

Reference Circuit (cont.)

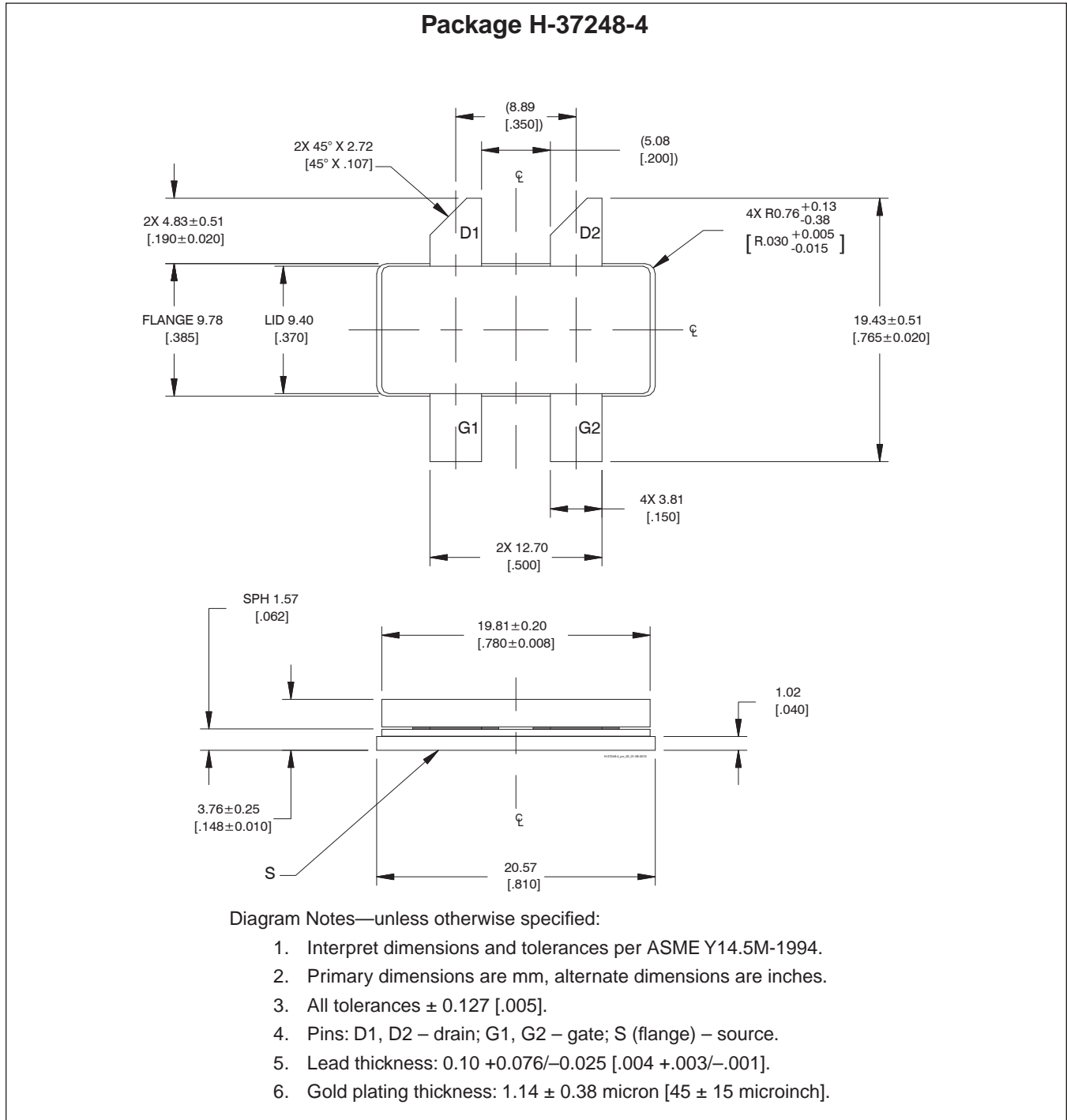
Component Information (cont.)

Component	Description	Manufacturer	P/N
Output			
C201	Capacitor, 5.1 pF	ATC	ATC600F5R1BW250T
C202, C204, C205, C207, C209	Capacitor, 18 pF	ATC	ATC600F180GW250T
C203	Capacitor, 0.8 pF	ATC	ATC600F0R8CW250T
C206	Capacitor, 0.1 μ F	Panasonic	ECJ-3VB1H104K
C208	Capacitor, 220 μ F	Cornell Dubilier Electronics (CDE)	SK221M050ST
C210, C211, C212, C213, C214, C215	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T

Pinout Diagram (top view)



Package Outline Specifications



Find the latest and most complete information about products and packaging at the Infineon Internet page (www.infineon.com/rfpower)

Revision History

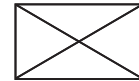
Revision	Date	Data Sheet	Page	Subjects (major changes at each revision)
01	2015-03-02	Advance	All	Proposed specification for new product development.
02	2015-12-04	Production	All	Information for production-released product, including firm specifications, operating performance, and reference circuit specifications.

We Listen to Your Comments

Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to:

highpowerRF@infineon.com

To request other information, contact us at:
+1 877 465 3667 (1-877-GO-LDMOS) USA
or +1 408 776 0600 International



Edition 2015-12-04

Published by
Infineon Technologies AG
85579 Neubiberg, Germany

© 2015 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (www.infineon.com/rfpower).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.