

Thermally-Enhanced High Power RF LDMOS FET 60 W, P_{3dB} @ 28 V, 2620 – 2690 MHz

Description

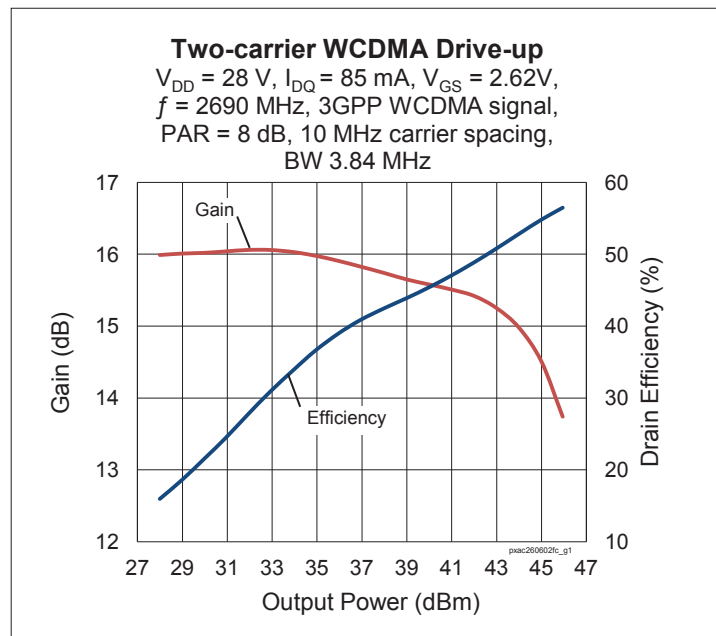
The PXAC260602FC is a 60-watt LDMOS FET with an asymmetrical design intended for use in multi-standard cellular power amplifier applications in the 2620 to 2690 MHz frequency band. Features include dual-path design, high gain and thermally-enhanced package with earless flanges. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXAC260602FC
Package H-37248-4



Features

- Main: Input matched
Peak: Input and output matching
- Asymmetric Doherty design
 - Main: P_{1dB} = 15 W Typ
 - Peak: P_{1dB} = 50 W Typ
- Typical Pulsed CW performance, 2690 MHz, 28 V, 10 µs pulse width, 10% duty cycle, class AB, Doherty Configuration
 - Output power at P_{1dB} = 50 W
 - Efficiency = 50%
 - Gain = 15 dB
- Typical two-carrier WCDMA performance, 2690 MHz, 28 V, 8 dB PAR @ 0.01% CCDF, Doherty Configuration
 - Output power = 5 W
 - Efficiency = 40%
 - Gain = 15.7 dB
 - IMD = -30 dBc
- Capable of handling 10:1 VSWR @ 28 V, 50 W (CW) output power
- Integrated ESD protection : Human Body Model, Class 1B (per JESD22-A114)
- Low thermal resistance
- Pb-free and RoHS compliant



RF Characteristics

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

$V_{DD} = 28\text{ V}$, $I_{DQ} = 85\text{ mA}$, $P_{OUT} = 5\text{ W avg}$, $V_{GS(PK)} = V_{GS}$ at 300 mA -1.0V, $f = 2620 - 2690\text{ MHz}$, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	14	15.7	—	dB
Drain Efficiency	η_D	35	39	—	%
Adjacent Channel Power Ratio	ACPR	—	-31	-28	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)

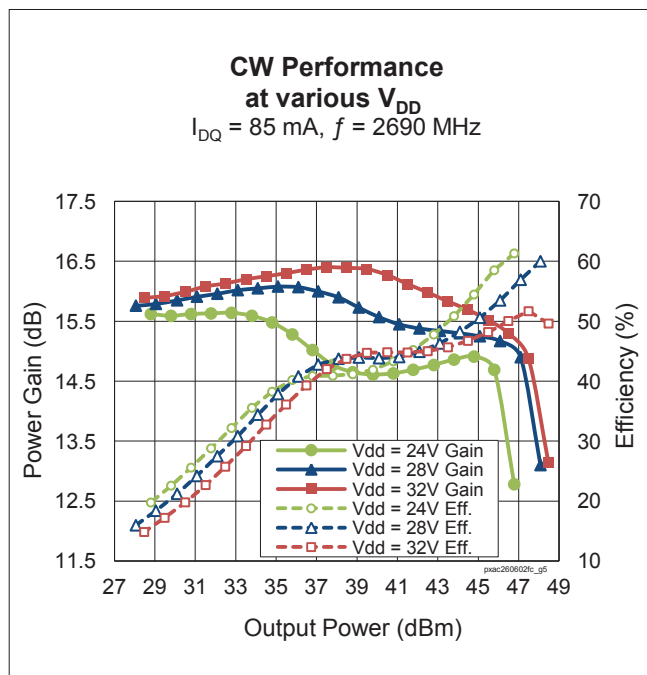
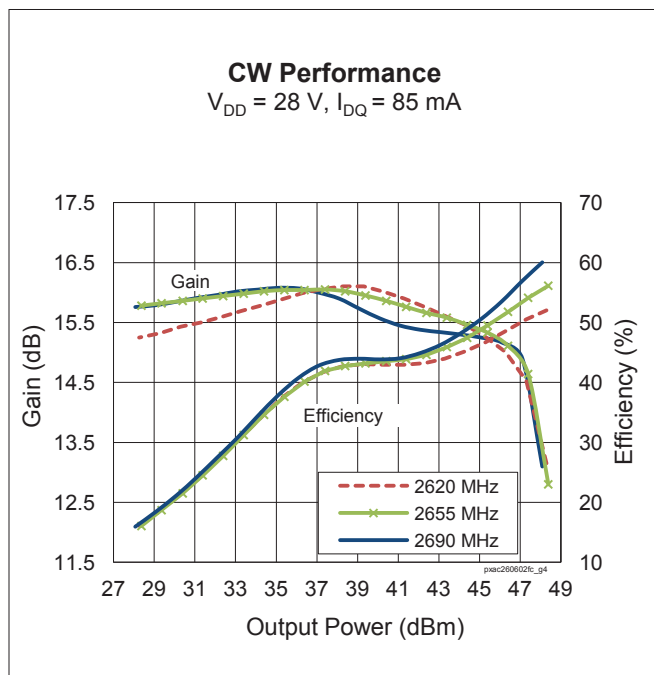
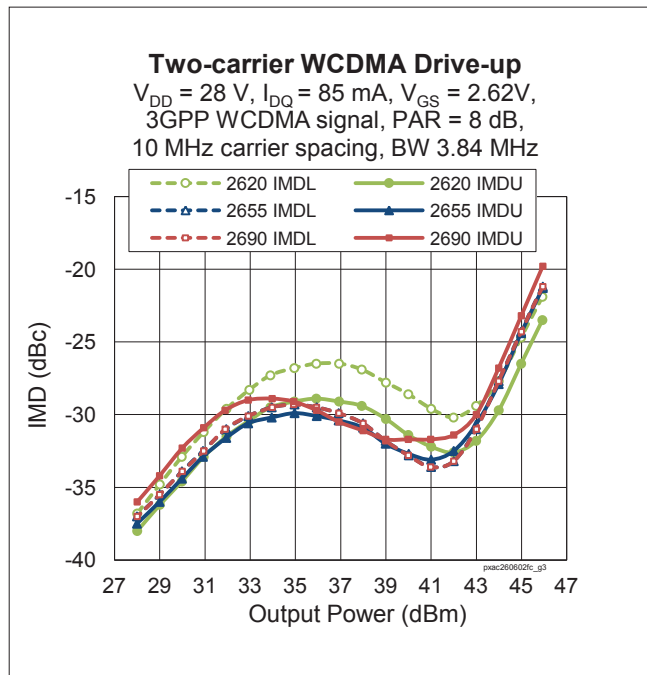
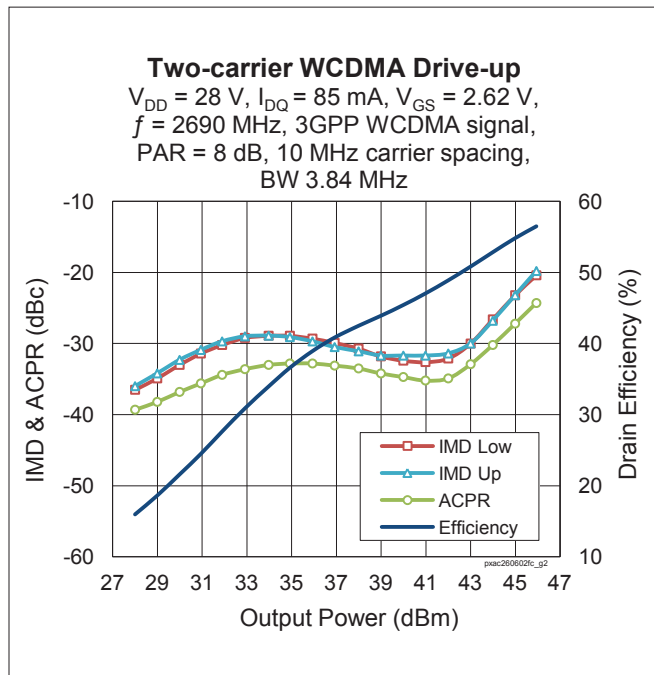
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	0.1	μA
	$V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $I_{DS} = 0\text{ V}$	I_{GSS}	—	—	—	μA
On-State Resistance (main)	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.8	—	Ω
	(peak) $V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.22	—	Ω
Operating Gate Voltage (main)	$V_{DS} = 28\text{ V}$, $I_{DQ} = 85\text{ mA}$	V_{GS}	2.5	2.75	3.0	V
	(peak) $V_{DS} = 28\text{ V}$, $I_{DQ} = 300\text{ mA}$	V_{GS}	2.3	2.7	3.1	V

Maximum Ratings

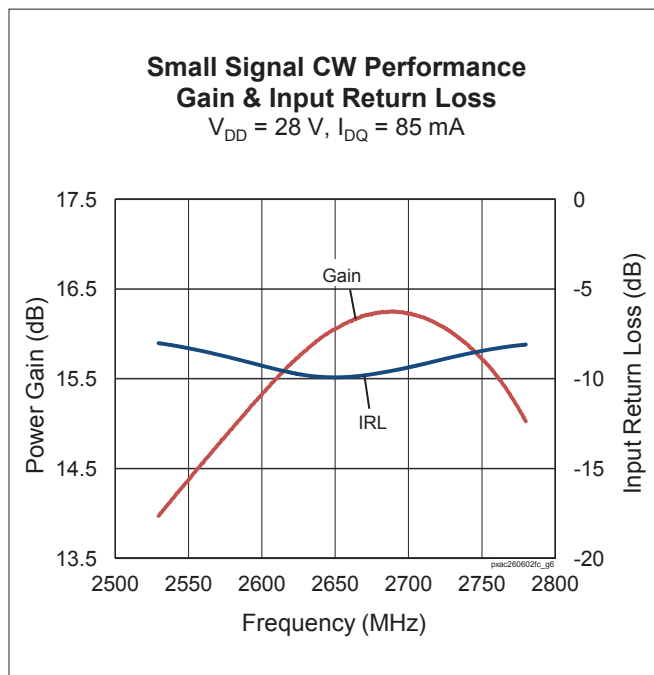
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	65	V
Gate-Source Voltage	V _{GS}	−6 to +10	V
Operating Voltage	V _{DD}	0 to +32	V
Junction Temperature	T _J	225	°C
Storage Temperature Range	T _{STG}	−65 to +150	°C
Thermal Resistance (main, T _{CASE} = 70°C, 5 W CW)	R _{θJC}	4.1	°C/W
(doherty, T _{CASE} = 70°C, 20 W CW)	R _{θJC}	2.0	°C/W

Ordering Information

Type and Version	Order Code	Package Description	Shipping
PXAC260602FC V1 R0	PXAC260602FCV1R0XTMA1	H-37248-4, earless flange	Tape & Reel, 50 pcs
PXAC260602FC V1 R250	PXAC260602FC V1R250XTMA1	H-37248-4, earless flange	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)


Typical Performance (cont.)



Load Pull Performance

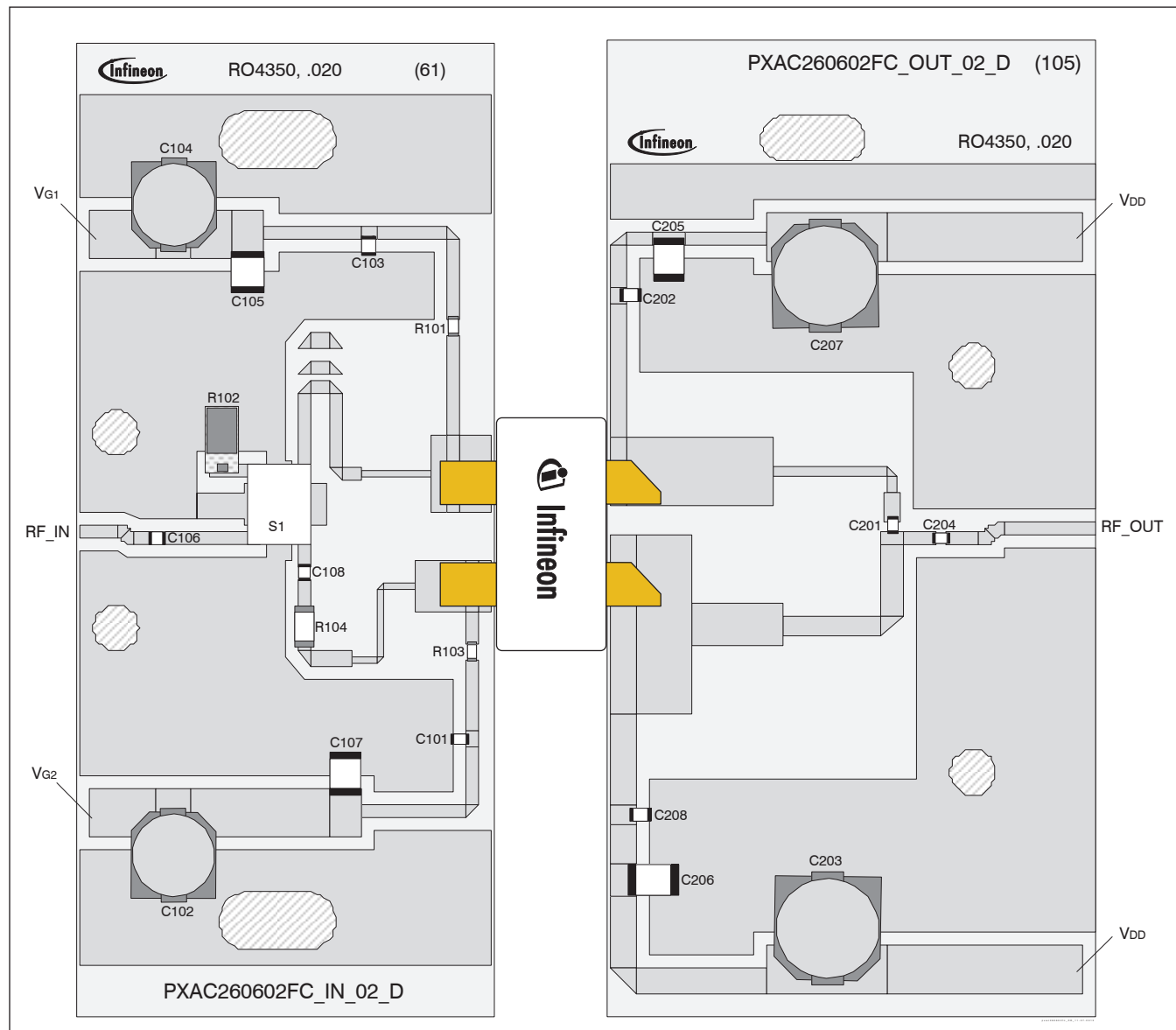
Main Side Load Pull Performance – Pulsed CW signal: 10 μs , 10% duty cycle, 28 V, 80 mA

		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 [%]
2490	9.0 – j33	12.8 – j9.5	19.2	42.84	19.2	54.2	5.8 – j4.4	21.9	41.49	14.1	68.7
2620	25 – j47	13.9 – j10.6	18.8	43.15	20.6	58.7	8.9 – j6.8	20.4	42.24	16.7	66.4
2690	35 – j52	12.7 – j13.0	18.6	42.76	18.9	55.4	6.8 – j9.2	20.6	41.73	14.9	65.6

Peak Side Load Pull Performance – Pulsed CW signal: 10 μs , 10% duty cycle, 28 V, 250 mA

		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 [%]
2490	4.1 – j13.1	3.7 – j5.2	16.7	48.44	70	56.0	6.2 – j1.3	18.9	46.59	46	63.4
2620	6.5 – j14.8	3.7 – j6.5	17	48.28	67	55.4	5.9 – j3.7	19.1	46.96	50	63.1
2690	9.0 – j17.8	3.7 – j6.1	17.6	48.11	65	56.2	5.7 – j2.4	20.9	46.30	43	64.6

Reference Circuit , 2620 – 2690 MHz



Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

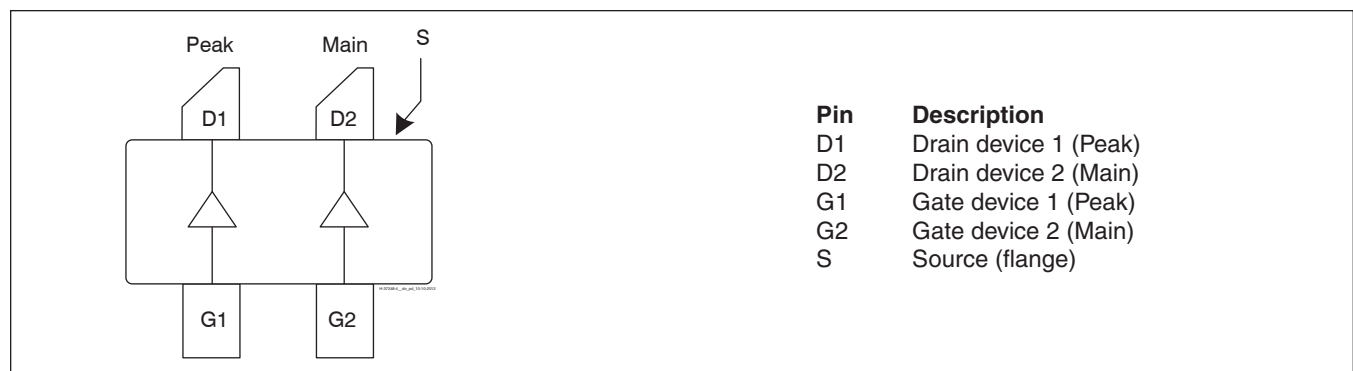
Reference Circuit Assembly

DUT	PXAC260602FC V1
Test Fixture Part No.	LTA/PXAC260602FC V1
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$, $f = 2620 - 2690$ MHz
Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower	

Components Information

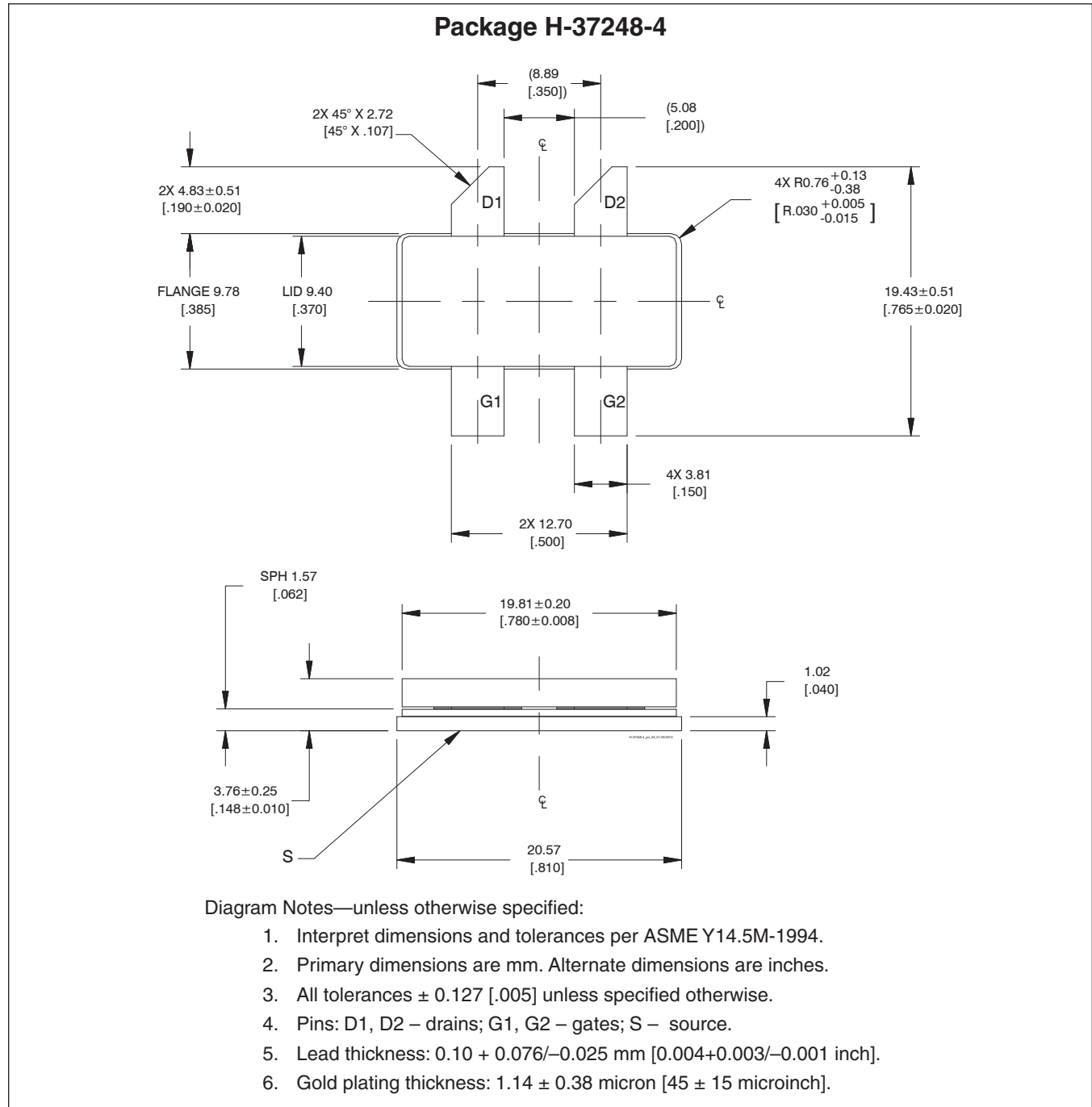
Component	Description	Suggested Manufacturer	P/N
Input			
C101, C103, C106, C108	Capacitor, 18 pF	ATC	ATC800A180JT250T
C102, C104	Capacitor, 10 μ F	Panasonic Electronic Components	EEE-HB1H100AP
C105, C107	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
R101, R103	Resistor, 10 Ω	Panasonic Electronic Components	ERJ-3GEYJ100V
R102	Resistor, 50 Ω	Anaren	C16A5024
R104	Resistor, 20 Ω	Panasonic Electronic Components	ERJ-8GEYJ200V
S1	Directional Coupler, 5dB	Anaren	X3C25P1-05S
Output			
C201, C202, C204, C208	Capacitor, 18 pF	ATC	ATC800A180JT250T
C203, C207	Capacitor, 100 μ F	Panasonic Electronic Components	EEE-FP1V101AP
C205, C206	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T

Pinout Diagram (top view)



Lead connections for PXAC260602FC

Package Outline Specifications



Find the latest and most complete information about products and packaging at the Infineon Internet page
<http://www.infineon.com/rfpower>

Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2013-10-14	Advance	All	Data Sheet reflects advance specification for product development
02	2013-12-02	Production	All	Data Sheet reflects released product specification
02.1	2013-12-12	Production	1	Revised ESD classification
02.2	2014-05-14	Production	2 6	Revised junction temperature in Maximum Ratings table Corrected naming typo in Pinout Diagram
02.3	2015-12-23	Production	2	DC Characteristic table
02.4	2016-06-22	Production	2	Updated ordering information

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