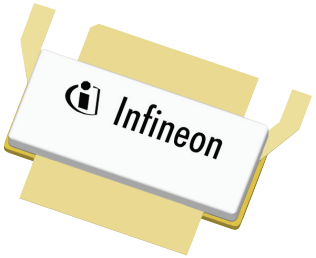
green Product

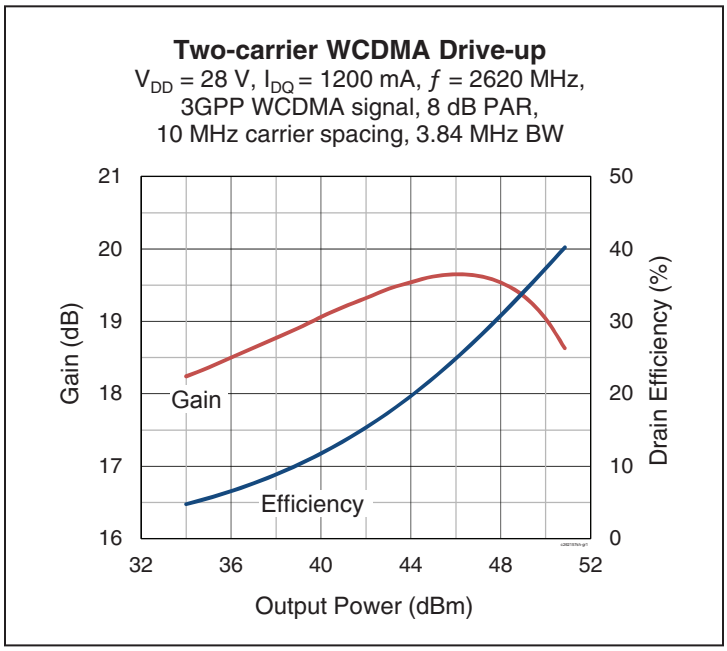
Thermally-Enhanced High Power RF LDMOS FET
200 W, 28 V, 2620 – 2690 MHz

Description

The PTFC262157FH LDMOS FET is designed for use in Doherty cellular power applications in the 2620 MHz to 2690 MHz frequency band. Input and output matching have been optimized for maximum performance as the peak side transistor in a Doherty amplifier. Other features include a thermally-enhanced package with earless flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTFC262157FH
Package H-34288G-4/2



Features

- Broadband internal matching, optimized for Doherty peak side
- Wide video bandwidth
- Typical single-carrier WCDMA performance, 2690 MHz, 28 V, 10 dB PAR @ 0.01% CCDR
  - Output power at P_{1dB} = 50 W
  - Efficiency = 29%
  - Gain = 19.5 dB
  - ACPR = –31.5 dBc at 2690 MHz
- Capable of handling 10:1 VSWR @ 28 V, 180 W (CW) output power
- Integrated ESD protection: Human Body Model, Class 1C (per JESD22-A114)
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

Single-carrier WCDMA Specifications (tested in Infineon test fixture)
V_{DD} = 28 V, I_{DQ} = 1150 mA, P_{OUT} = 50 W average, f = 2690 MHz, 3GPP WCDMA signal, 3.84 MHz bandwidth,10 dB PAR @0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	Gps	18.0	19.5	—	dB
Drain Efficiency	η_D	27	29	—	%
Adjacent Channel Power Ratio	ACPR	—	–31.5	–30	dBc

All published data at T_{CASE} = 25°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 V, I_{DS} = 10 mA	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	µA
	V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	µA
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1.0	µA
On-state Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ} = 1.1 A	V_{GS}	—	2.65	—	V

Maximum Ratings

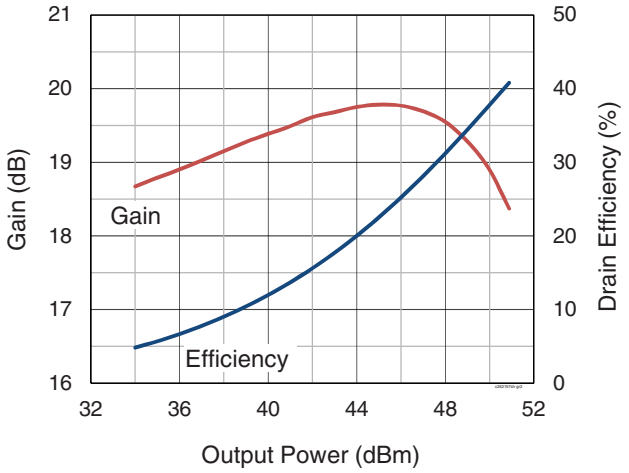
Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DSS}	65	V
Gate-source Voltage	V_{GS}	–6 to +10	V
Operating Voltage	V_{DD}	0 to +32	V
Junction Temperature	T_J	225	°C
Storage Temperature Range	T_{STG}	–65 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 150 W CW)	$R_{\theta JC}$	0.34	°C/W

Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PTFC262157FH V1 R0	PTFC262157FHV1R0XTMA1	H-34288G-4/2, ceramic open-cavity, earless	Tape & Reel, 50 pcs
PTFC262157FH V1 R250	PTFC262157FHV1R250XTMA1	H-34288G-4/2, ceramic open-cavity, earless	Tape & Reel, 250 pcs

Typical Performance (data taken in a reference test fixture)

Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 1200 mA, f = 2655 MHz,
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW



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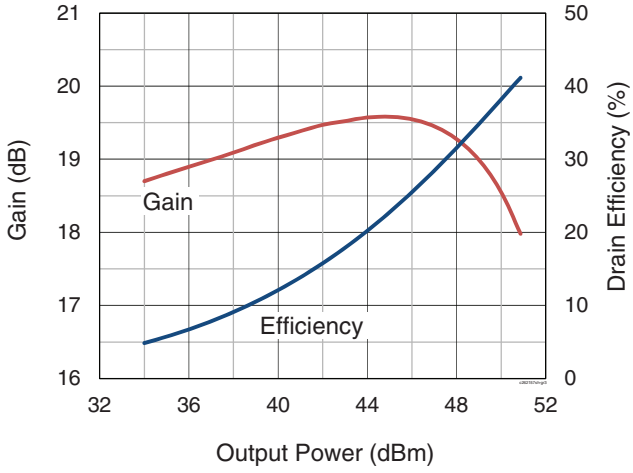
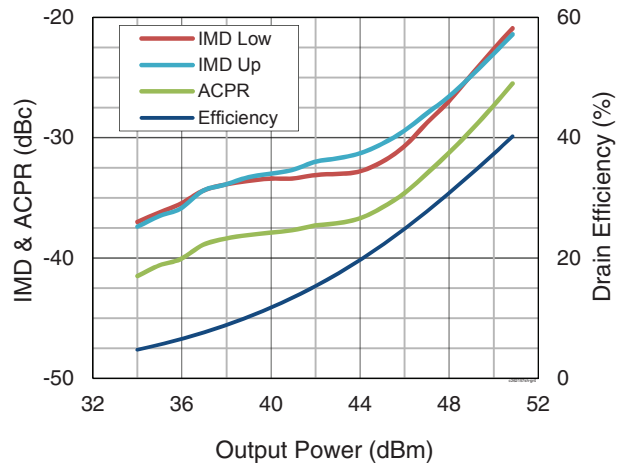


Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 1200 mA, f = 2620 MHz,
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW



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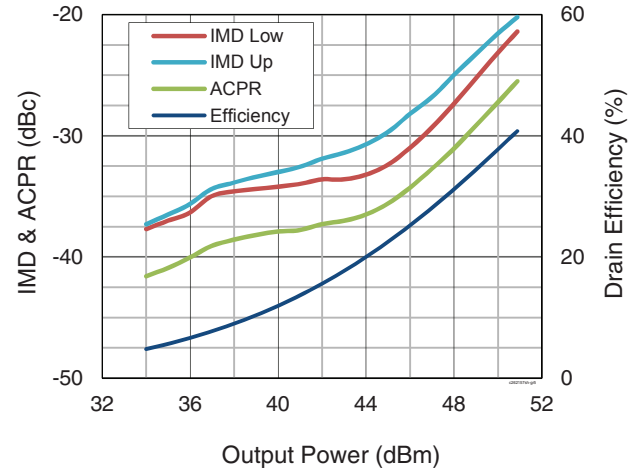
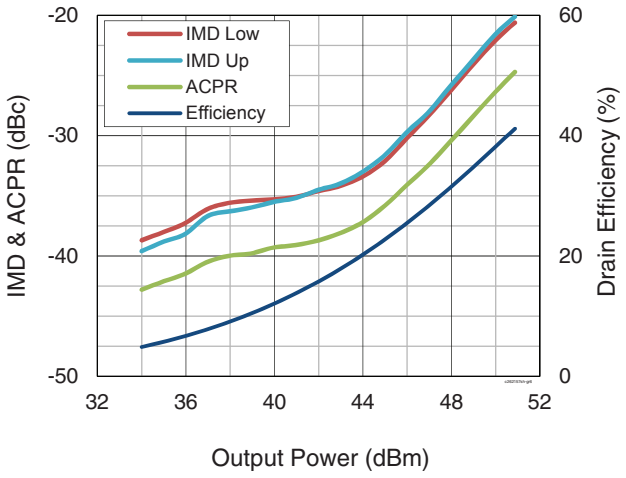


Typical Performance (cont.)

Two-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 1200 mA, f = 2690 MHz,
3GPP WCDMA signal, 8 dB PAR,
10 MHz carrier spacing, 3.84 MHz BW



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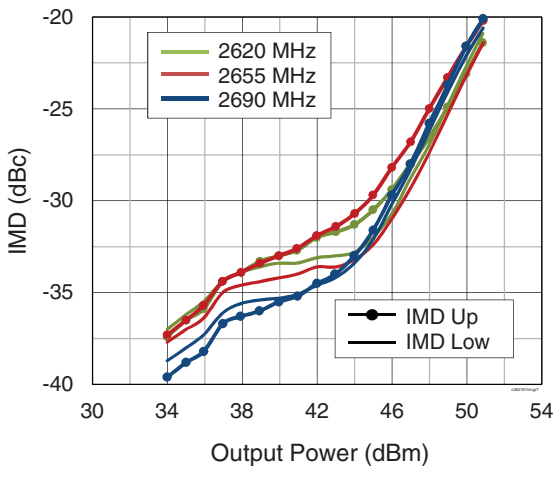
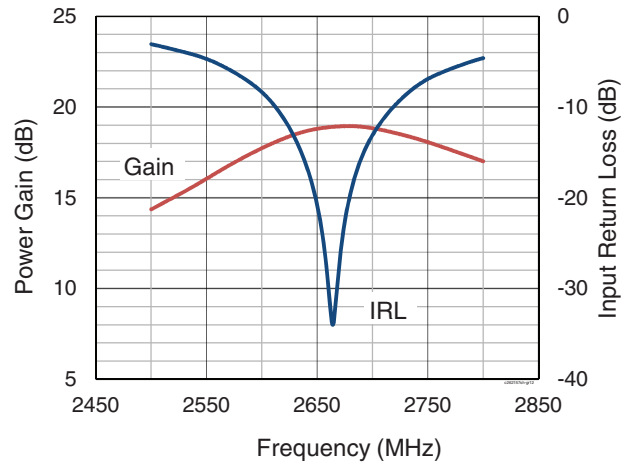
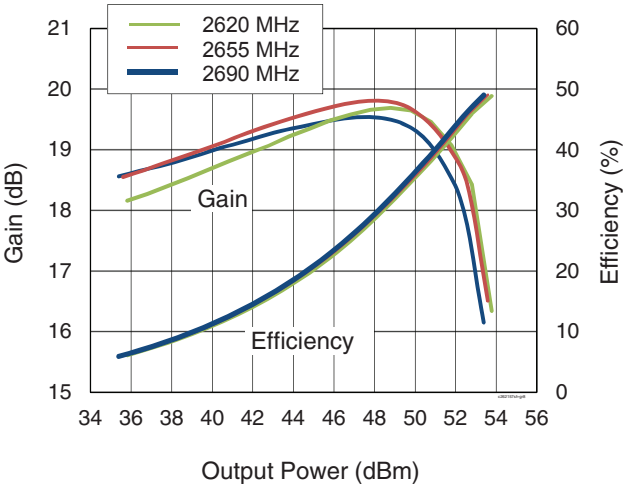


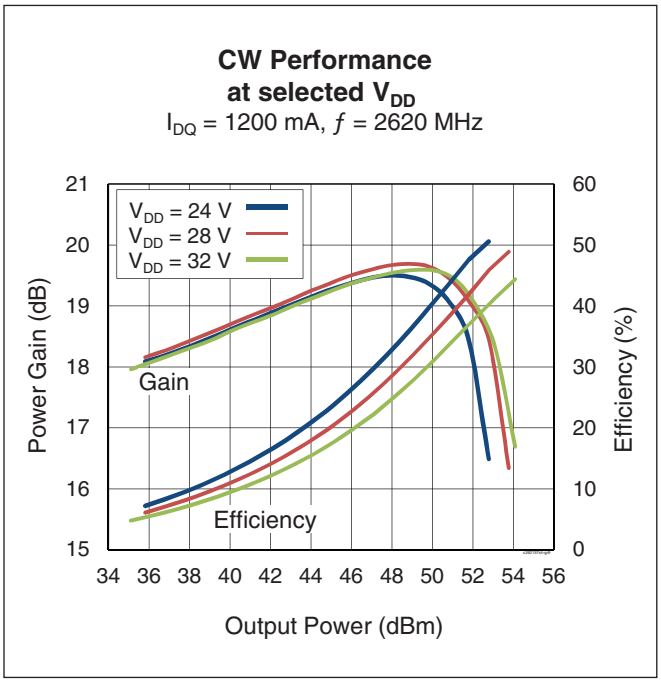
Small Signal CW Performance
V_{DD} = 28 V, I_{DQ} = 1200 mA

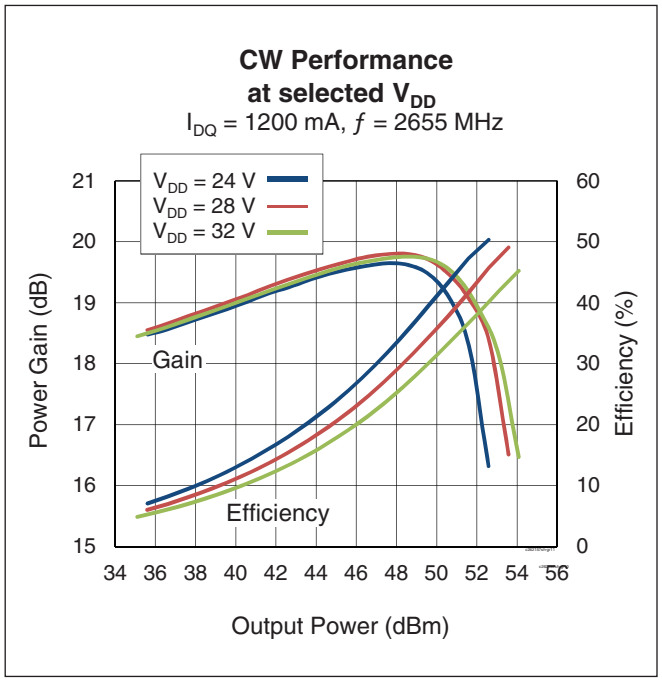


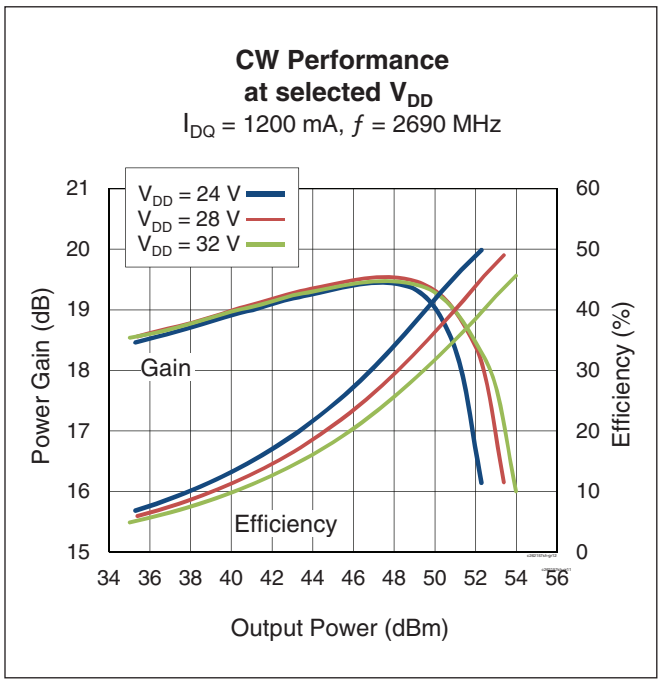
CW Performance
V_{DD} = 28 V, I_{DQ} = 1200 mA



Typical Performance (cont.)

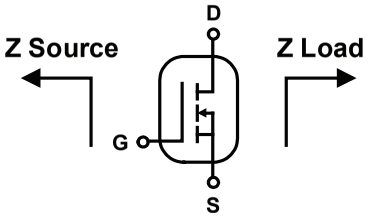






Broadband Circuit Impedance

Frequency [MHz]	Z Source [Ω]	Z Load [Ω]
2585	2.23 – 4.85	4.41 – 3.07
2620	2.18 – 4.70	4.43 – 3.13
2655	2.13 – 4.56	4.44 – 3.18
2690	2.08 – 4.42	4.43 – 3.25
2725	2.04 – 4.28	4.41 – 3.31



Load Pull Performance

Pulsed CW signal: 16 µsec, 10% duty cycle; 28 V, 1100 mA

Class AB		P_{1dB}														
		Max Output Power					Max PAE					Z Optimum				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	PAE [%]	P_{OUT} [dBm]	P_{OUT} [W]	Zl [Ω]	Gain [dB]	PAE [%]	P_{OUT} [dBm]	P_{OUT} [W]	Zl [Ω]	Gain [dB]	PAE [%]	P_{OUT} [dBm]	P_{OUT} [W]
2620	4.52 – j5.08	5.5 – j2	18.4	48.1	54.30	269	3.6 – j4.9	19.8	55.8	53.30	214	4.2 – j4.2	19.5	55.3	53.90	245
2655	7.5 – j6.07	5.5 – j1.8	18.5	48.5	54.30	269	4.2 – j4.9	19.9	56.6	53.50	224	4.4 – j4.3	19.7	56.2	53.80	240
2690	7.6 – j6.5	5.7 – j2	19.2	48.2	53.90	245	4.4 – j4.9	20.3	54.5	53.00	200	4.7 – j4	20.0	53.8	53.50	224

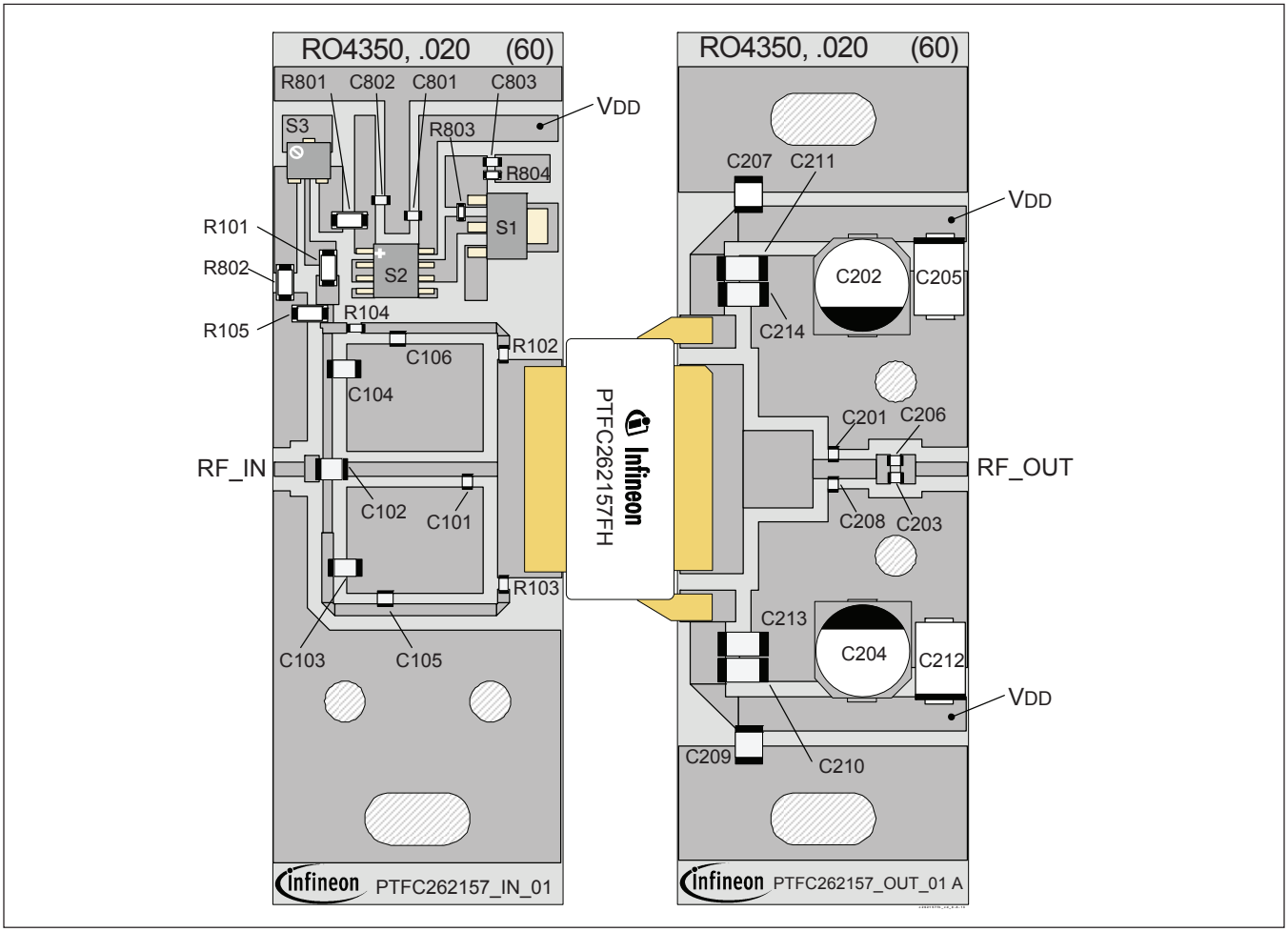
Pulsed CW signal: 16 µsec, 10% duty cycle; 28 V, 50 mA

Class B		P_{1dB}														
		Max Output Power					Max PAE					Z Optimum				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	PAE [%]	P_{OUT} [dBm]	P_{OUT} [W]	Zl [Ω]	Gain [dB]	PAE [%]	P_{OUT} [dBm]	P_{OUT} [W]	Zl [Ω]	Gain [dB]	PAE [%]	P_{OUT} [dBm]	P_{OUT} [W]
2620	3.82 – j6.78	5.9 – j2.3	17.5	54.0	54.70	295	4 – j4.7	18.4	61.2	53.90	245	4.1 – j4.4	18.3	61.1	54.10	257
2655	4.79 – j6.8	5.7 – j2.1	17.6	54.2	54.60	288	4 – j4.6	18.6	61.1	53.70	234	4.3 – j4.1	18.5	60.8	54.10	257
2690	6.28 – j6.24	5.6 – j1.8	17.7	54.2	54.50	282	4.4 – j4.6	18.6	60.5	53.60	229	4.6 – j4	18.4	60.2	54.00	251

Reference Circuit, tuned for 2620 – 2690 MHz

DUT	PTFC262157FH
Test Fixture Part No.	LTN/PTFC262157FH V1
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, ε_r = 3.66

Find Gerber files for this reference fixture on the Infineon Web site at (**http://www.infineon.com/rfpower**)



Reference circuit assembly diagram (not to scale)

Component Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101	Chip capacitor, 1.7 pF	ATC	ATC100A1R7CW150XB
C102	Chip capacitor, 10 pF	ATC	ATC100B100JW500XB
C103, C104	Chip capacitor, 4.7 µF	Nichicon	F931C475MAA
C105, C106	Chip capacitor, 10 pF	ATC	ATC100A100JW500XB
C801, C802, C803	Capacitor, 1k pF	Panasonic Electronic Components	ECJ-1VB1H102K

(table cont. next page)

Reference Circuit (cont.)

Component Information (cont.)

Component	Description	Suggested Manufacturer	P/N
Input (cont.)			
R101, R802	Resistor, 10 Ω	Panasonic Electronic Components	ERJ-8GEYJ100V
R102, R103, R104	Resistor, 10 Ω	Panasonic Electronic Components	ERJ-3GEYJ100V
R105	Resistor, 5.1k Ω	Panasonic Electronic Components	ERJ-8GEYJ512V
R801	Resistor, 100 Ω	Panasonic Electronic Components	ERJ-8GEYJ101V
R803	Resistor, 1.2k Ω	Panasonic Electronic Components	ERJ-3GEYJ122V
R804	Resistor, 1.2k Ω	Panasonic Electronic Components	ERJ-3GEYJ132V
S1	Transistor	Infineon Technologies	BCP56-10
S2	Voltage regulator	Fairchild Semiconductor	LM7805
S3	Potentiometer, 2k Ω	Bourns Inc.	3224W-1-202E
Output			
C201	Chip capacitor, 0.6	ATC	ATC100A0R6CW150XB
C202, C204	Capacitor, 2.2 µF, 50 V	Panasonic Electronic Components	EEE-FP1V221AP
C203, C206	Chip capacitor, 12 pF	ATC	ATC100A120JW150XB
C205, C212	Capacitor, 10 µF	Garrett Electronics	281M5002106K
C207, C209	Capacitor, 10 µF	Taiyo Yuden	UMK325C7106MM-T
C208	Chip capacitor, 0.5 pF	ATC	ATC100A0R5CW150XB
C210, C211	Chip capacitor, 1 µF	TDK Corporation	C4532X7R2A105M230KA
C213, C214	Chip capacitor, 2.2 µF	TDK Corporation	C4532X7R1H225M160KA

Package Outline Specifications

Package H-34288G-4/2

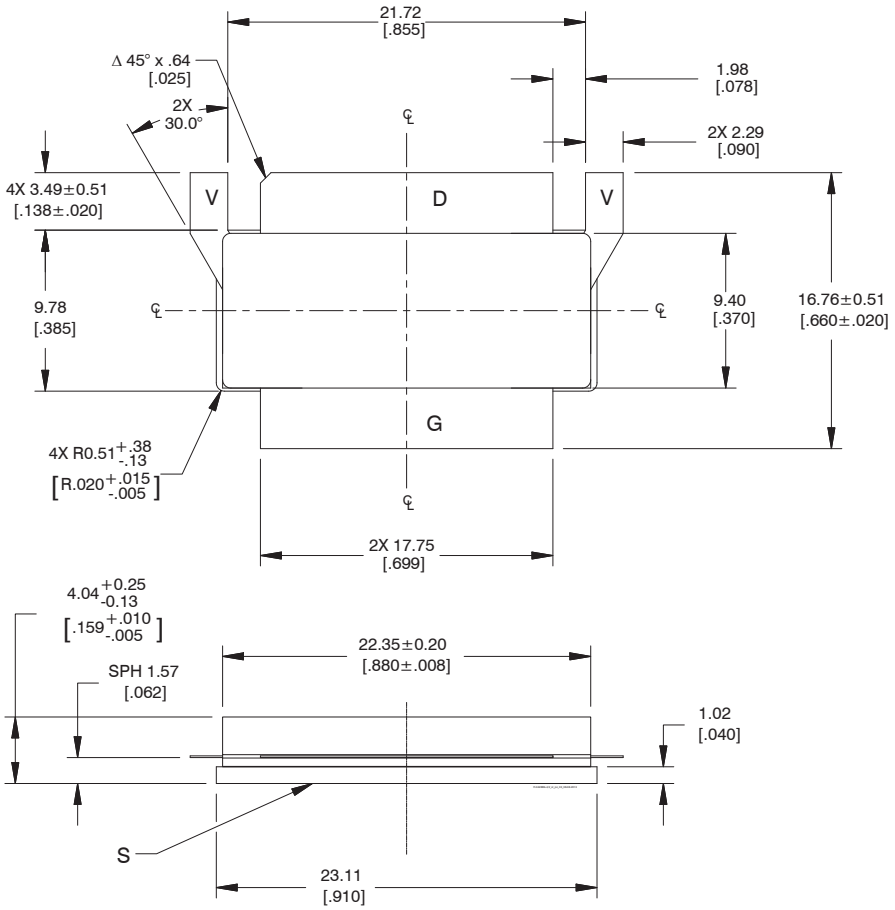


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances ± 0.127 [.005].
4. Pins: D – drain, S – source, G – gate, V – drain voltage (V_{DD}).
5. Lead thickness: 0.10 +0.051/–0.025 [.004 +.002/–.001].
6. Gold plating thickness: 0.25 micron [10 microinch] max.

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

Revision History

Revision	Date	Data Sheet	Page	Subjects (major changes since last revision)
01	2012-08-07	Advance	all	Proposed specification for new product development.
02	2013-08-08	Production	all	Data Sheet reflects released product specifications
03	2014-04-14	Production	2	Maximum junction temperature raised to 225 °C.
03.1	2016-06-21	Production	2	Updated ordering information

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Please send your proposal (including a reference to this document) to:

(**highpowerRF@infineon.com**)

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Edition 2016-06-21

Published by
Infineon Technologies AG
85579 Neubiberg, Germany

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Information

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