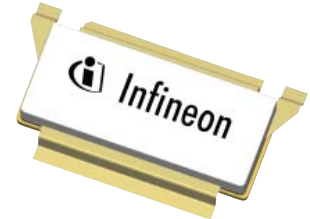


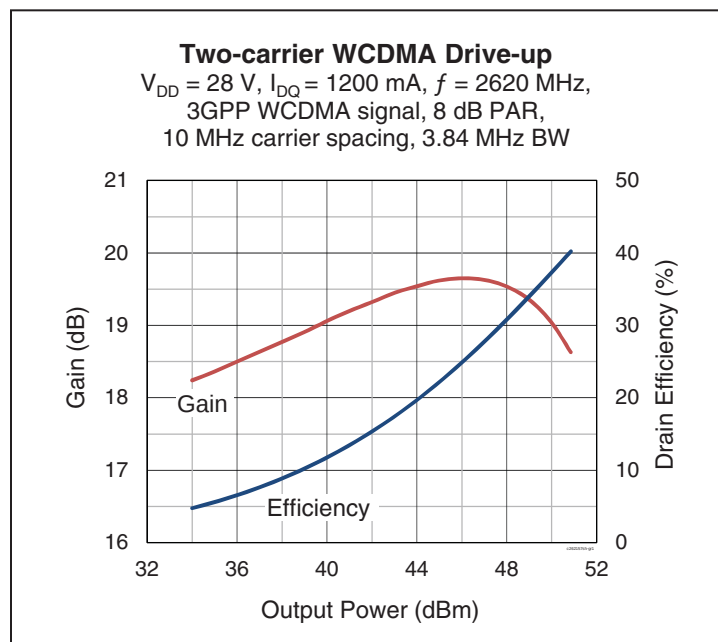
Thermally-Enhanced High Power RF LDMOS FET 200 W, 28 V, 2620 – 2690 MHz

Description

The PTFC262157SH 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 surface-mount flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTFC262157SH
Package H-34288G-4/2
(formed leads)



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% CCDF
 - Output power at $P_{1dB} = 50\text{ W}$
 - 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 (device with flat leads tested in Infineon production test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1150\text{ mA}$, $P_{OUT} = 50\text{ W}$ average, $f = 2690\text{ MHz}$, 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 $T_{CASE} = 25^\circ\text{C}$ 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}	—	—	1.0	μA
	$V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10.0	μA
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1.0	μA
On-state Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	$V_{DS} = 28\text{ V}$, $I_{DQ} = 1.1\text{ A}$	V_{GS}	—	2.65	—	V

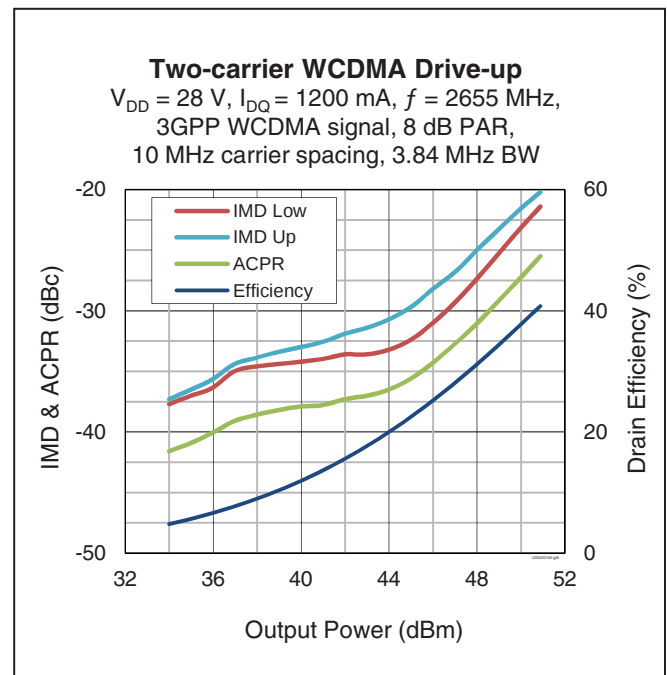
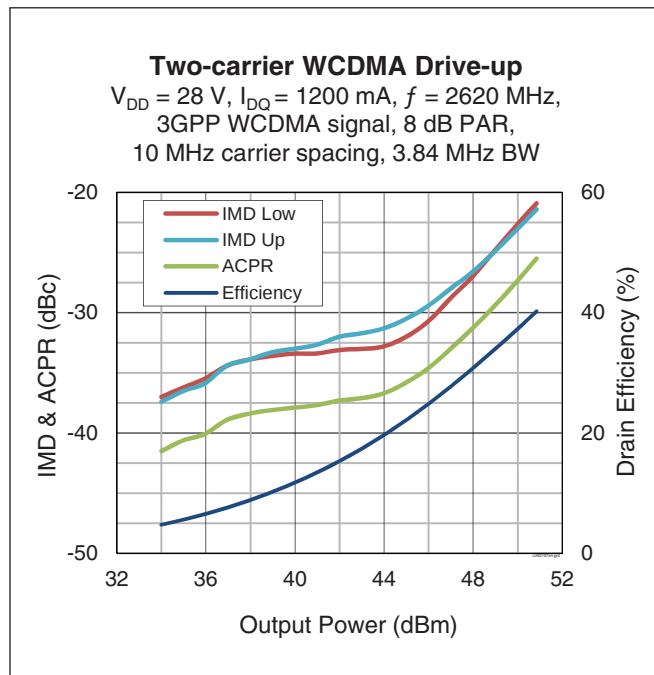
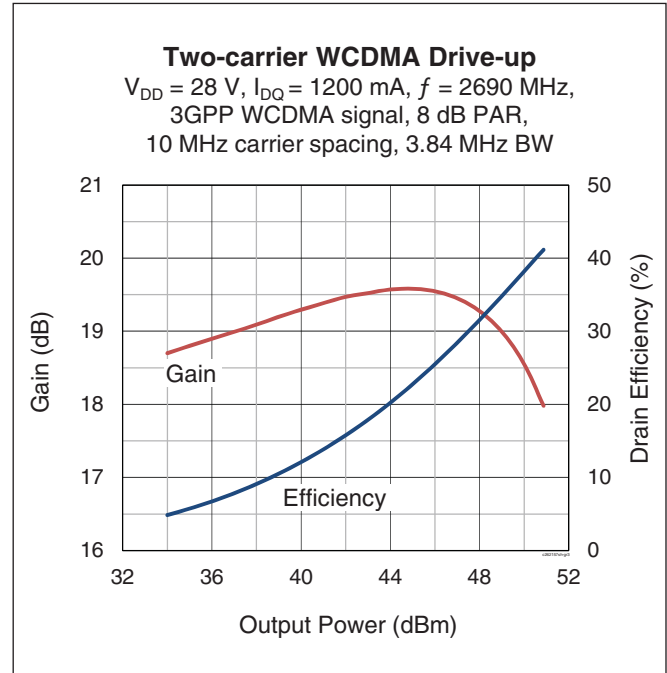
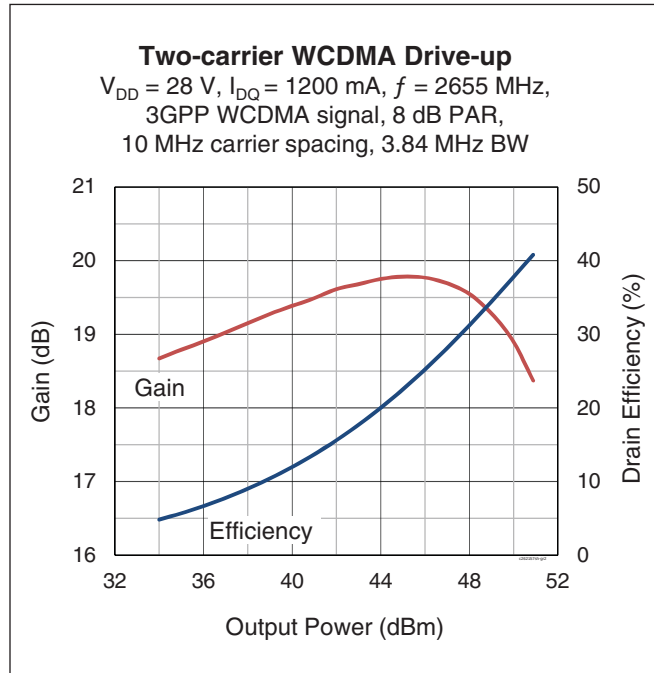
Maximum Ratings

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	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	−65 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$, 150 W CW)	$R_{\theta JC}$	0.34	$^{\circ}\text{C/W}$

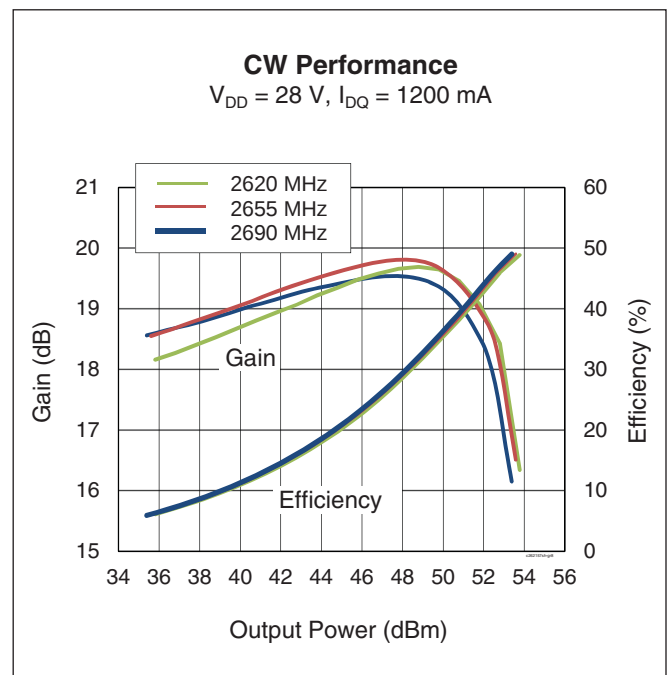
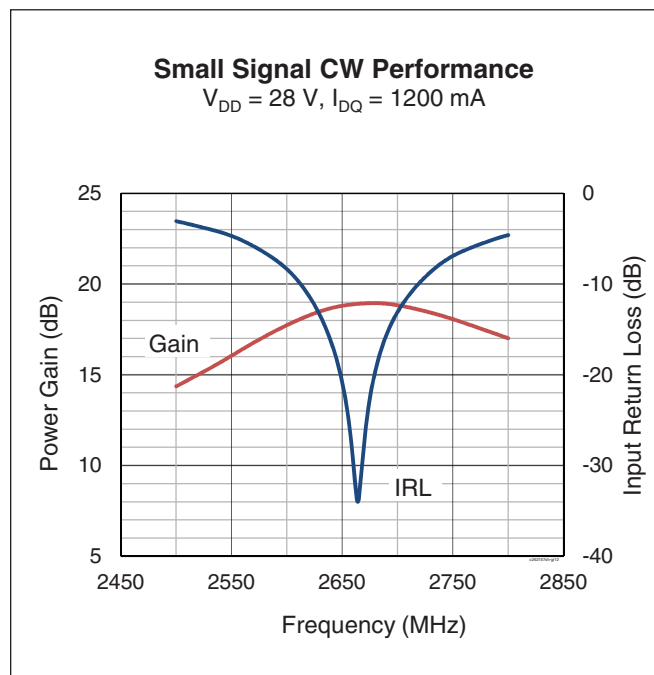
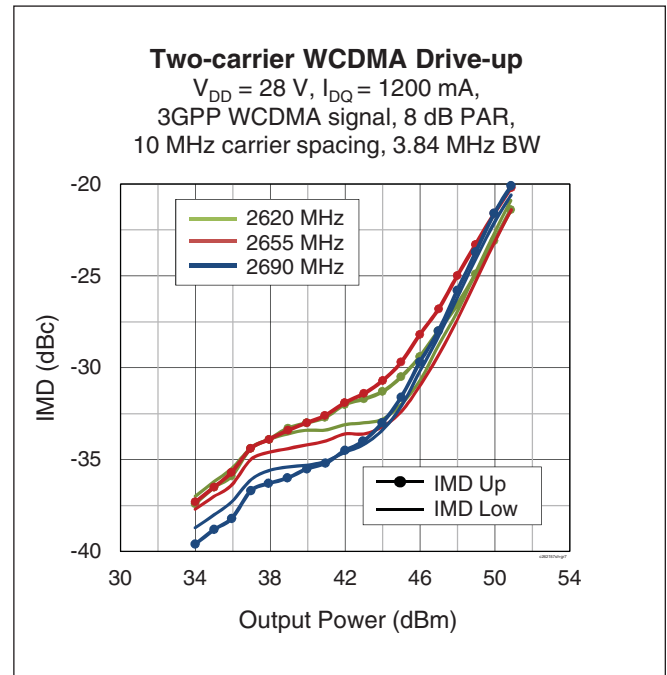
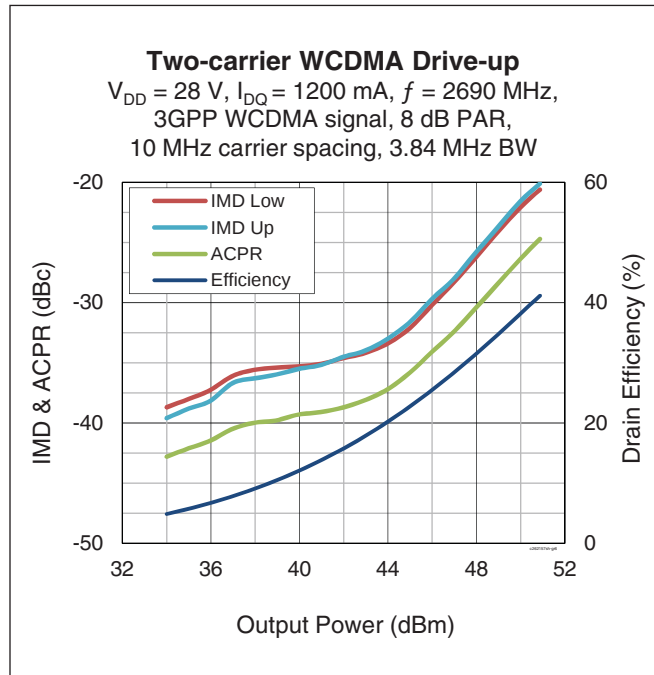
Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PTFC 262157SH V1 R250	PTFC262157SHV1R250XTMA1	H-34288G-4/2, ceramic open-cavity, earless surface mount	Tape & Reel, 250 pcs

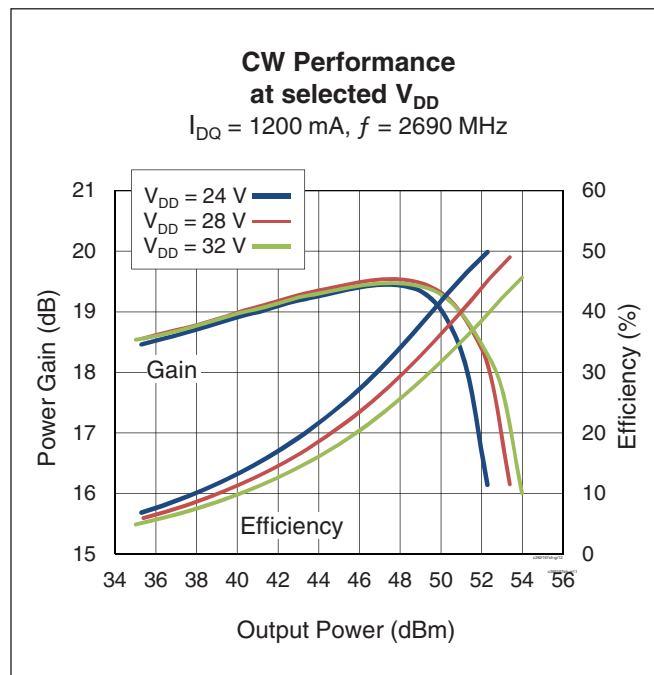
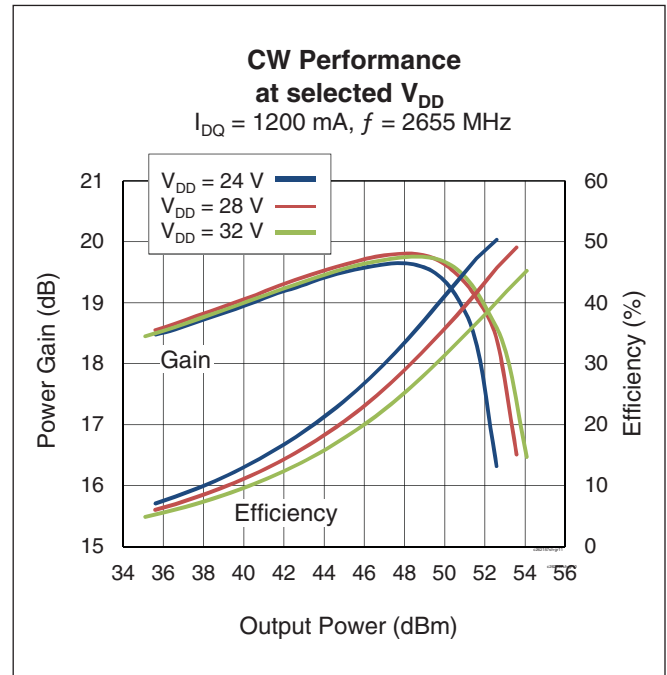
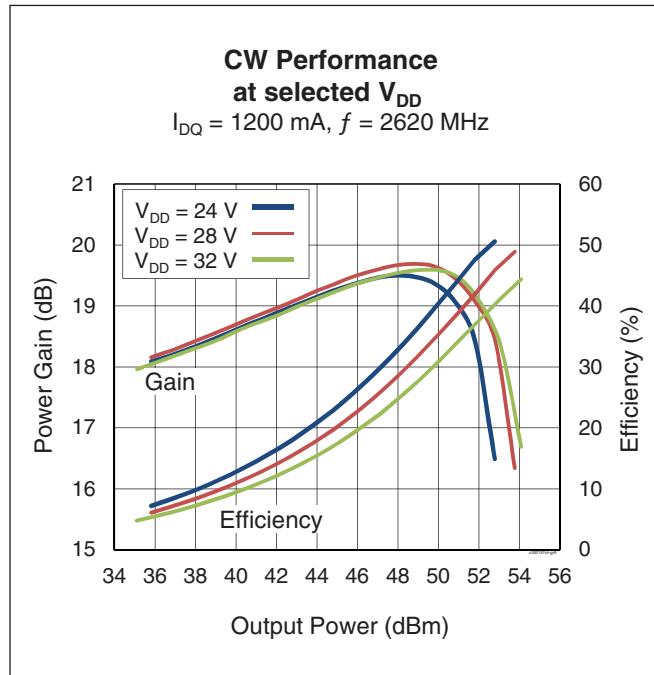
Typical Performance (data taken in an Infineon gull-wing applications circuit)



Typical Performance (cont.)

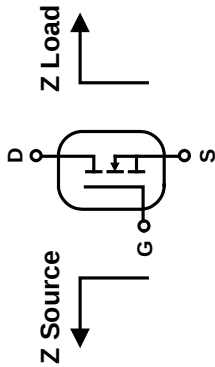


Typical Performance (cont.)



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 μ sec, 10% duty cycle; 28 V, 1100 mA

Class AB		P _{1dB}															
		Max Output Power						Max PAE						Z Optimum			
Freq [MHz]	Z _s [Ω]	Z _i [Ω]	Gain [dB]	PAE [%]	P _{OUT} [dBm]	P _{OUT} [W]	Z _i [Ω]	Gain [dB]	PAE [%]	P _{OUT} [dBm]	P _{OUT} [W]	Z _i [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 μ sec, 10% duty cycle; 28 V, 50 mA

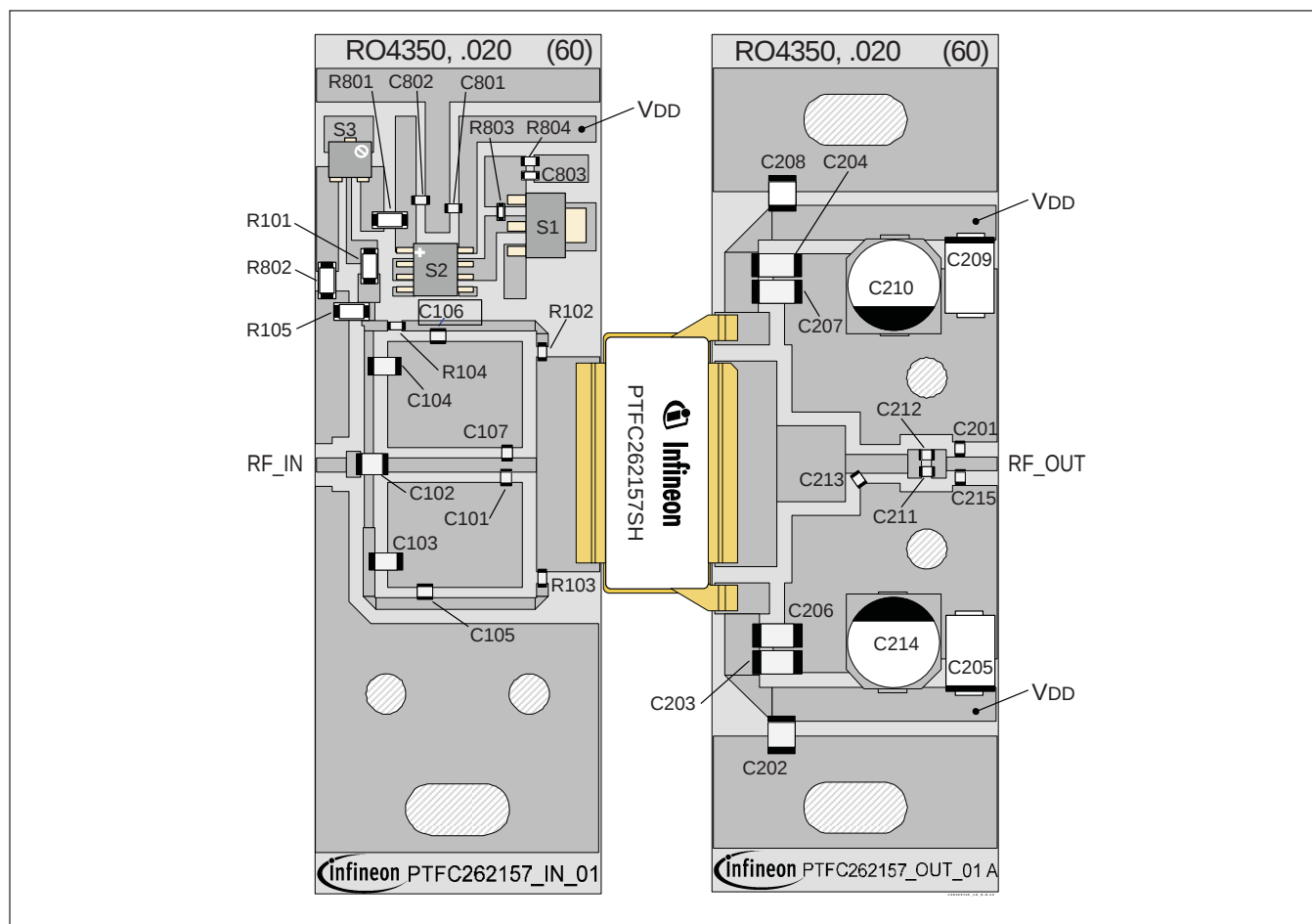
Class B		P _{1dB}															
		Max Output Power						Max PAE						Z Optimum			
Freq [MHz]	Z _s [Ω]	Z _i [Ω]	Gain [dB]	PAE [%]	P _{OUT} [dBm]	P _{OUT} [W]	Z _i [Ω]	Gain [dB]	PAE [%]	P _{OUT} [dBm]	P _{OUT} [W]	Z _i [Ω]	Gain [dB]	PAE [%]	P _{OUT} [dBm]	P _{OUT} [W]	
2620	3.82 – j6.78	5.9 – j2.3	17.5	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 PTFC262157SH

Reference Fixture Part No. LTN/PTFC262157SH 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 (<http://www.infineon.com/rfpower>)


Reference circuit assembly diagram (not to scale)

Component Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101	Chip capacitor, 1.3 pF	ATC100A1R3CW150XB	ATC
C102	Chip capacitor, 10 pF	ATC100B100JW500XB	ATC
C103, C104	Chip capacitor, 4.7 μ F	Nichicon	F931C475MAA
C105, C106	Chip capacitor, 10 pF	ATC	ATC100A100JW500XB
C107	Chip capacitor, 0.1 pF	ATC	ATC100A0R1AW150XB
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, 1.3k 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, C215	Chip capacitor, 0.3 pF	ATC	ATC100A0R3CW150XB
C202, C208	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
C203, C204	Chip capacitor, 1 μ F	TDK Corporation	C4532X7R2A105M230KA
C205, C209	Capacitor, 10 μ F	Garrett	281M5002106K
C206, C207	Chip capacitor, 2.2 μ F, 50 V	TDK Corporation	C4532X7R1H225M160KA
C210, C214	Capacitor, 220 μ F, 35 V	Panasonic Electronic Components	EEE-FP1V221AP
C211, C212	Chip capacitor, 12 pF	ATC	ATC100A120JW150XB
C213	Chip capacitor, 1.2 pF	ATC	ATC100A1R2CW150XB

Package Outline Specifications

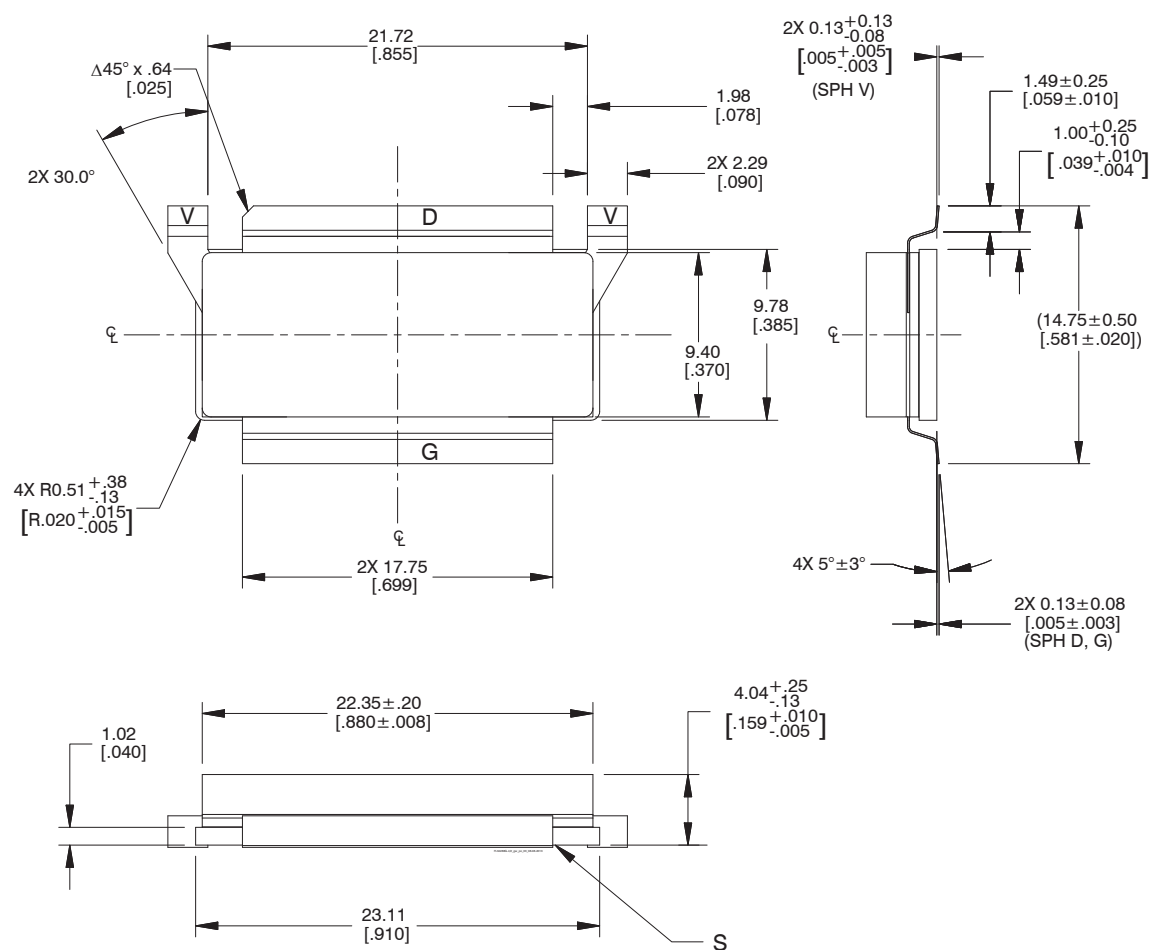
Package H-34288G-4/2 (formed leads)

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 about 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	Product released to production, information complete and current.
03	2014-04-14	Production	2	Maximum junction temperature raised to 225 °C.

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Edition 2014-04-14

Published by
Infineon Technologies AG
85579 Neubiberg, Germany

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