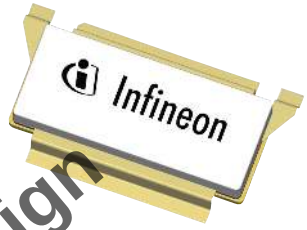
green Product

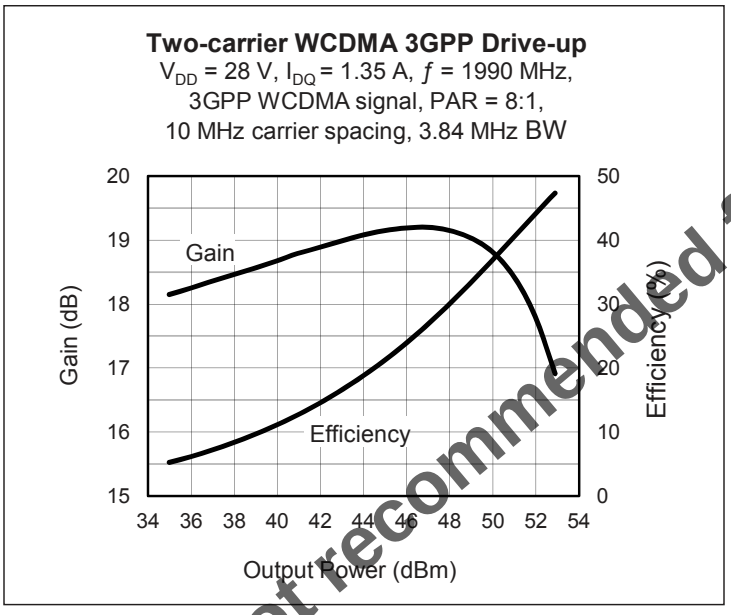
Thermally-Enhanced High Power RF LDMOS FET
255 W, 28 V, 1930 – 1990 MHz

Description

The PTFB192557SH is a 250-watt LDMOS FET designed specifically for use in Doherty cellular power amplifier applications in the 1930 to 1990 MHz frequency band. Input and output matching has been optimized for maximum performance as the peak side transistor in Doherty amplifiers. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTFB192557SH
Package H-34288G-4/2
(formed leads)



Features

- Optimized for use as peak side in Doherty amplifiers
- Input and output internal matching
- Typical CW pulsed performance, 1990 MHz, 28 V
  - Output power at P_{1dB} = 250 W
  - Efficiency = 55%
  - Gain = 18.6 dB
- Integrated ESD protection
- Low thermal resistance
- Pb-free and RoHS-compliant
- Capable of handling 10:1 VSWR at 28 V, 250 W (CW) ouput power

RF Characteristics

Single-carrier WCDMA Performance (tested in standard Infineon test fixture)

(WCDMA signal: 3GPP, 3.84 MHz channel bandwidth, with 10 dB peak/average @ 0.01% CCDF)
V_{DD} = 28 V, I_{DQ} = 1.35 A, P_{OUT} = 60 W average, f = 1990 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	18	19	—	dB
Drain Efficiency	η_D	29	31	—	%
Adjacent Channel Power Ratio	ACPR	—	–33.5	–32	dBc

All published data at T_{CASE} = 25°C unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

Target RF Characteristics (cont.)

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
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} = 1.35 A	V_{GS}	2.3	2.8	3.3	V
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1	µA

Maximum Ratings

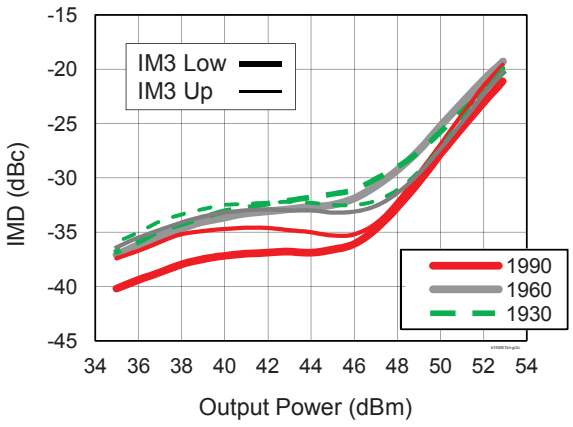
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	–6 to +10	V
Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 200 W CW)	$R_{\theta JC}$	0.232	°C/W

Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PTFB 192557SH V1 R250	PTFB192557SHV1R250XTMA1	H-34275G-6/2, ceramic open-cavity, formed leads, earless	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

Two-carrier WCDMA 3GPP Drive-up
V_{DD} = 28 V, I_{DQ} = 1.35 A,
3GPP WCDMA signal, PAR = 8:1,
10 MHz carrier spacing, BW = 3.84 MHz



Two-carrier WCDMA 3GPP Drive-up
V_{DD} = 28 V, I_{DQ} = 1.35 A, f = 1990 MHz,
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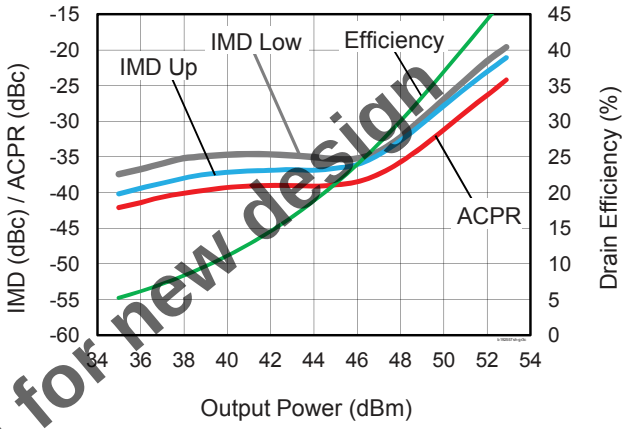
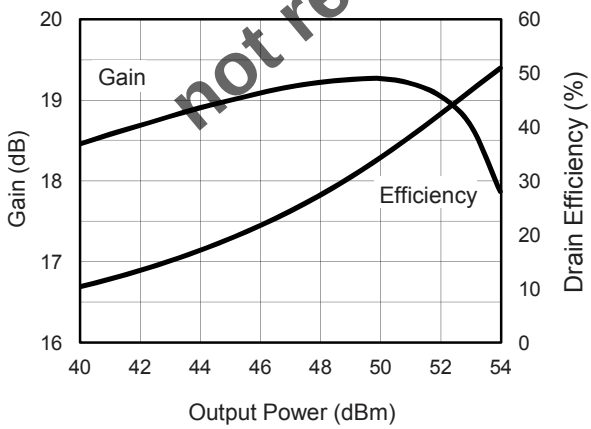
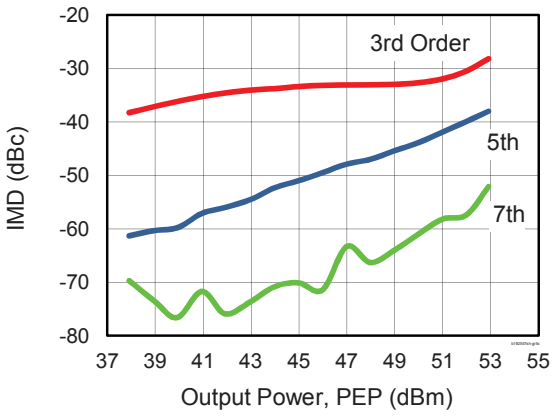
10 MHz carrier spacing, 3.84 MHz BW



Power Sweep, CW Performance
V_{DD} = 28 V, I_{DQ} = 1.35 A, f = 1990 MHz,



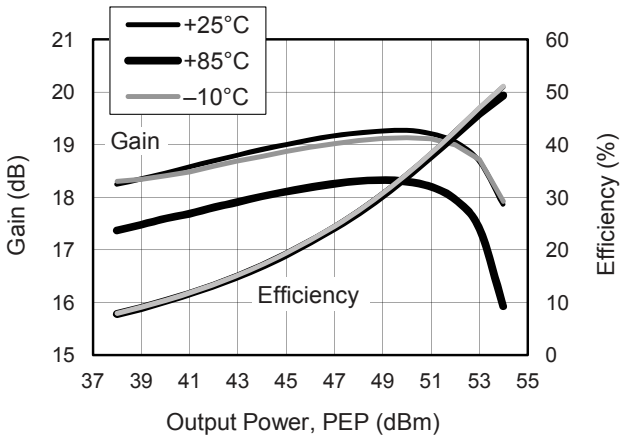
Intermodulation Distortion vs. Output Power
V_{DD} = 28 V, I_{DQ} = 1.35 A,
f_1 = 1989 MHz, f_2 = 1990 MHz



Typical Performance (cont.)

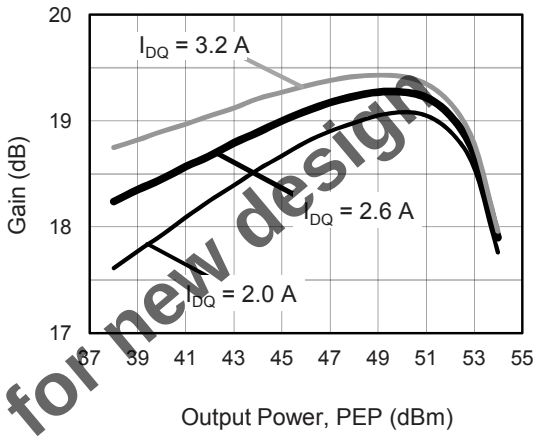
CW Performance

V_{DD} = 28 V, I_{DQ} = 1.35 A, f = 1990 MHz



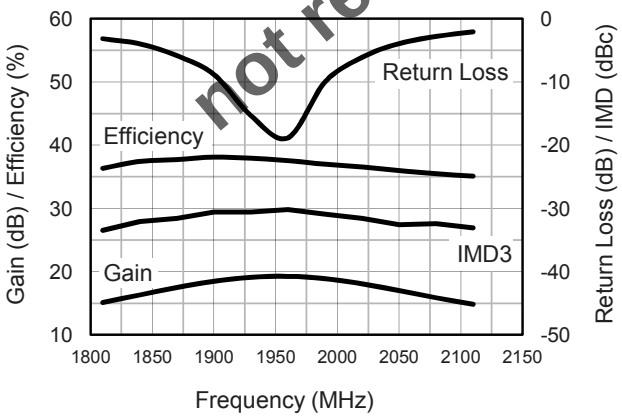
CW Gain Performance at I_{DQ}

V_{DD} = 28 V, f = 1990 MHz



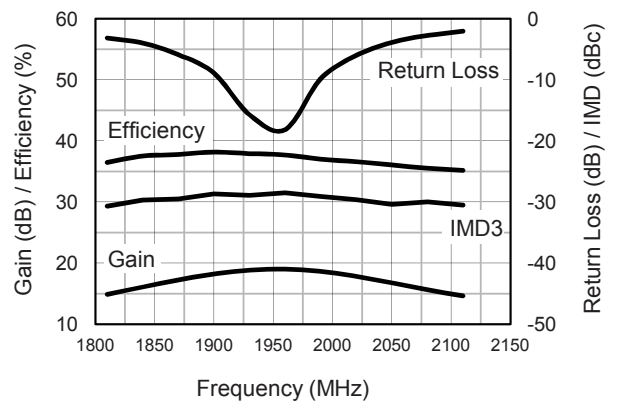
Single-carrier WCDMA Broadband Performance

V_{DD} = 28 V, I_{DQ} = 1.35 A, P_{OUT} = 100 W,
3GPP WCDMA signal, TM1 w/ 64 DPCH,
43% clipping, 7.5:1 PAR, 3.84 MHz BW



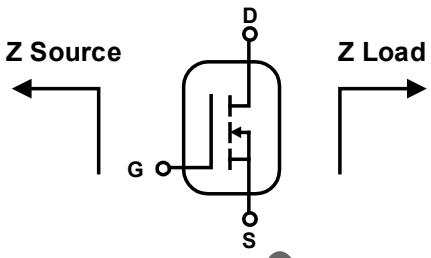
Single-carrier WCDMA Broadband Performance

V_{DD} = 28 V, I_{DQ} = 1.35 A, P_{OUT} = 100 W,
3GPP WCDMA signal, TM1 w/ 64 DPCH,
100% clipping, 10:1 PAR, 3.84 MHz BW

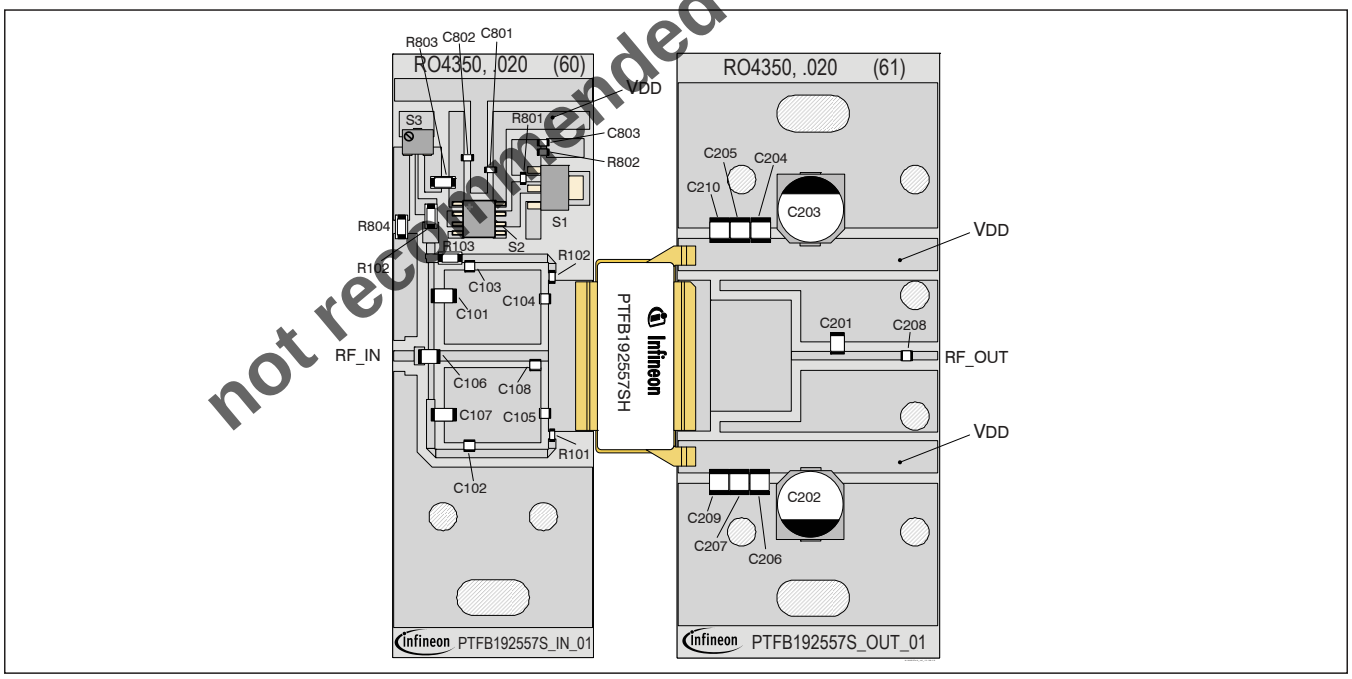


Broadband Circuit Impedance

Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
1900	2.36	–5.38	2.18	–1.47
1910	2.32	–5.32	2.20	–1.42
1920	2.28	–5.26	2.23	–1.37
1930	2.24	–5.19	2.26	–1.32
1940	2.21	–5.13	2.29	–1.27
1950	2.17	–5.07	2.32	–1.22
1960	2.13	–5.01	2.35	–1.17
1970	2.10	–4.95	2.38	–1.12
1980	2.07	–4.89	2.42	–1.07
1990	2.03	–4.83	2.46	–1.03
2000	2.00	–4.77	2.49	–0.98



Reference Circuit



Reference circuit assembly diagram (not to scale)

Reference Circuit Assembly

DUT	PTFB192557SH V1
Test Fixture Part No.	LTN/PTFB192557SH
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, ε_r = 3.66

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

Reference Circuit (cont.)

Component Information

Component	Description	Suggested Supplier	P/N
Input			
C101, C107	Chip capacitor, 5 µF	Digi-Key	PCS3475CT-ND
C102, C103	Chip capacitor, 10 pF	ATC	ATC100A100JW500XB
C104, C105	Chip capacitor, 2 pF	ATC	ATC100A2R2CW500XB
C106	Chip capacitor, 10 pF	ATC	ATC100B100JW500XB
C108	Chip capacitor, 2 pF	ATC	ATC100A2R0CW150XB
R101, R102	Resistor, 10 Ω	Digi-Key	P10GCT-ND
R103, C104	Resistor, 10 Ω	Digi-Key	P10ECT-ND
S1	Potentiometer, 2k Ω	Digi-Key	3224W-202ECT-ND
S2	Transistor	Infineon Technologies	BCP56-ND
S3	Voltage Regulator	Digi-Key	LM780L05ACM-ND
Output			
C201, C202, C203, C204, C205, C206, C210, C211	Capacitor, 10 µF	Digi-Key	587-1818-2-ND
C207	Chip capacitor, 2 pF	ATC	ATC100A1R7CW150XB
C208	Chip capacitor, 18 pF	ATC	ATC100B180JW500XB
C209	Chip capacitor, 1 pF	ATC	ATC100B0R9CW500XB

Package Outline Specifications

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

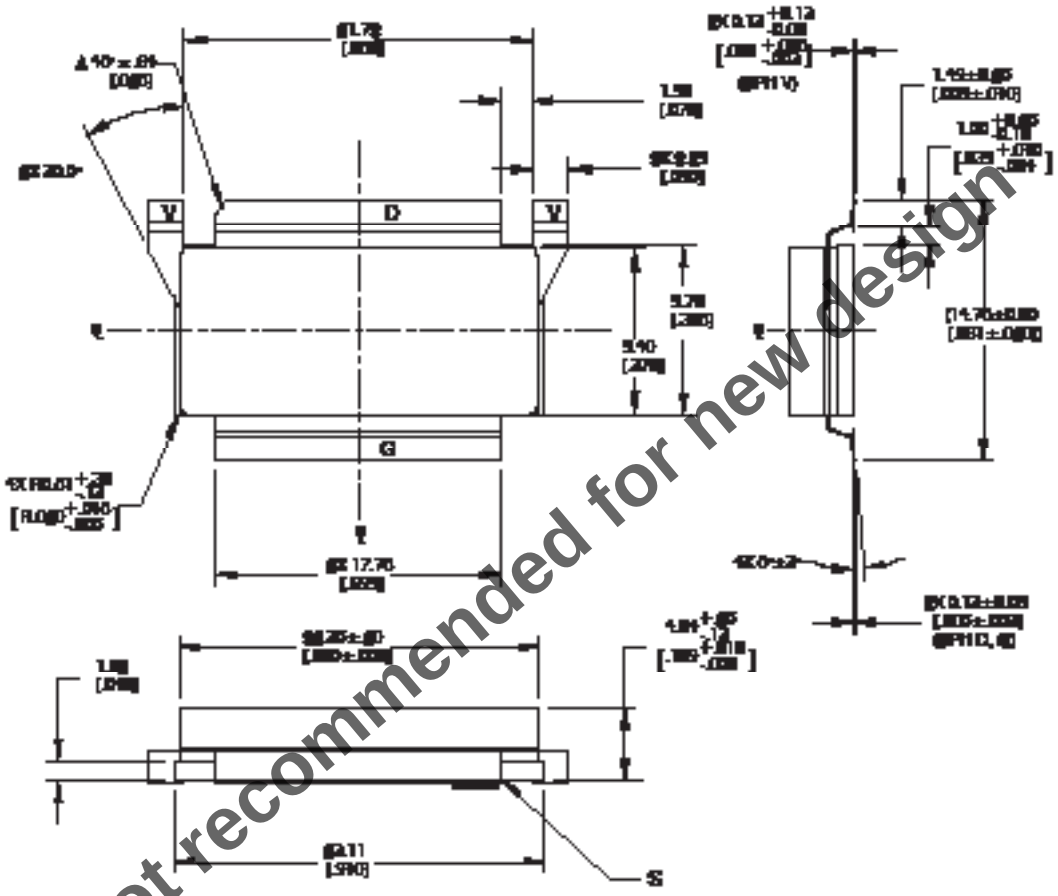


Diagram Notes—unless otherwise specified:

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] unless specified otherwise.
4. Pins: G – gate, D – drain, S – source, V – 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 (**http://www.infineon.com/rfpower**)

Revision History:	2015-10-01	Data Sheet
Previous Version:	2012-11-28 , Data Sheet	
Page	Subjects (major changes since last revision)	
all	Not recommended for new design	

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