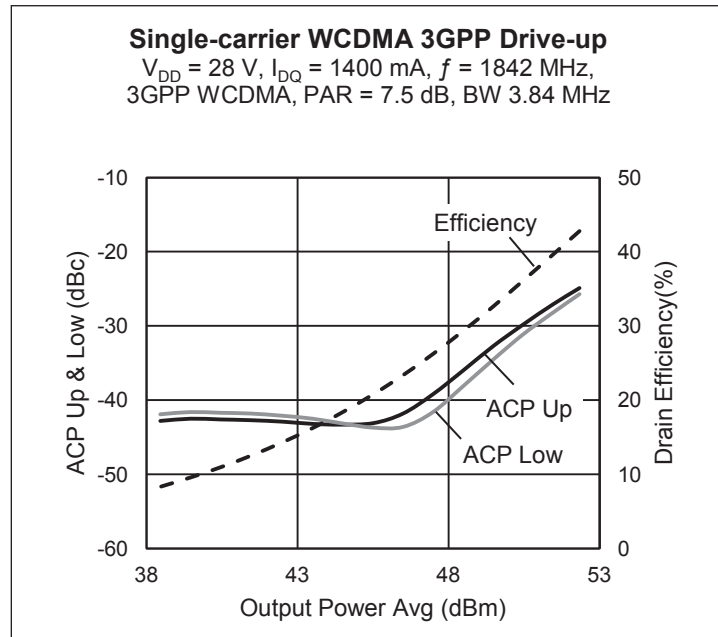
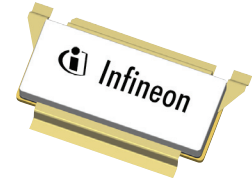


Thermally-Enhanced High Power RF LDMOS FET 250 W, 28 V, 1805 – 1880 MHz

Description

The PTFB182557SH is a 250-watt LDMOS FET specifically designed for use in Doherty cellular power amplifier applications in the 1805 to 1880 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.

PTFB182557SH
Package H-34288G-4/2



Features

- Broadband internal matching
- Optimized for use as peak side in Doherty amplifiers
- Typical two-carrier WCDMA performance, 1842 MHz, 28 V, 3GPP signal, PAR = 8 dB, 10 MHz carrier spacing
 - Average output power = 75 W
 - Linear gain = 18.5 dB
 - Efficiency = 31%
 - Intermodulation distortion = -31 dBc
 - Adjacent channel power = -36 dBc
- Typical CW performance, 1842 MHz, 28 V
 - Output power at P_{1dB} = 250 W
 - Efficiency = 49%
 - Gain = 18 dB
- Capable of handling 10:1 VSWR @ 28 V, 240 W (CW) output power
- Integrated ESD protection
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

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

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1350\text{ mA}$, $P_{OUT} = 60\text{ W}$ avg, $f = 1842.5\text{ MHz}$, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	18	19	—	dB
Drain Efficiency	η_D	31	32.5	—	%
Adjacent Channel Power Ratio	ACPR	—	-33	-31	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	μA
	$V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	$V_{DS} = 28\text{ V}$, $I_{DQ} = 1.4\text{ A}$	V_{GS}	2.3	2.8	3.3	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	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	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	−40 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$, 200 W CW)	$R_{\theta JC}$	0.232	$^{\circ}\text{C/W}$

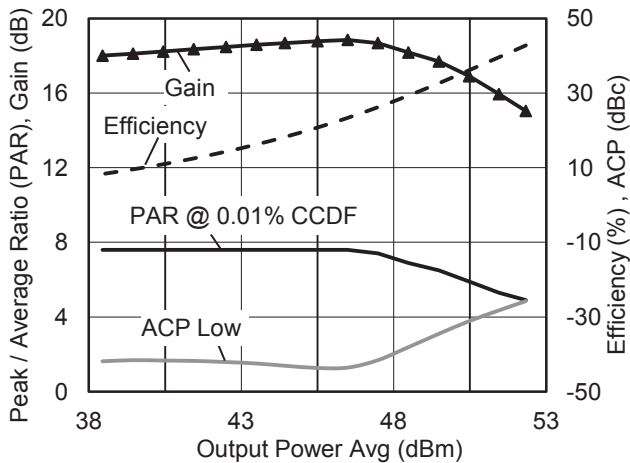
Ordering Information

Type and Version	Order Code	Package and Description	Shipping
PTFB182557SH V1 R250	PTFB182557SHV1R250XTMA1	H-34288G-4/2, earless flange	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

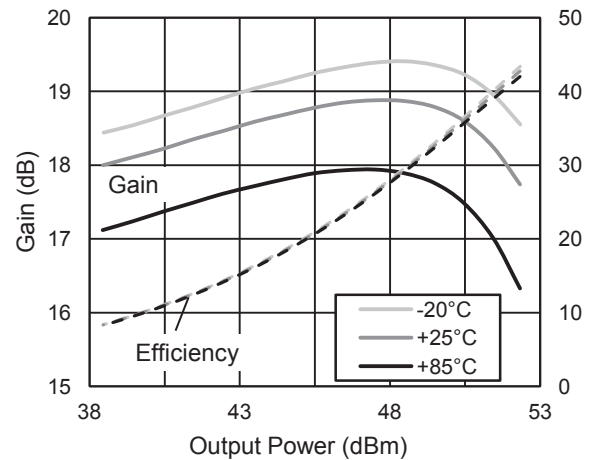
Single-carrier WCDMA 3GPP Drive-up

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1400\text{ mA}$, $f = 1842\text{ MHz}$,
3GPP WCDMA, PAR = 7.5 dB, BW 3.84 MHz



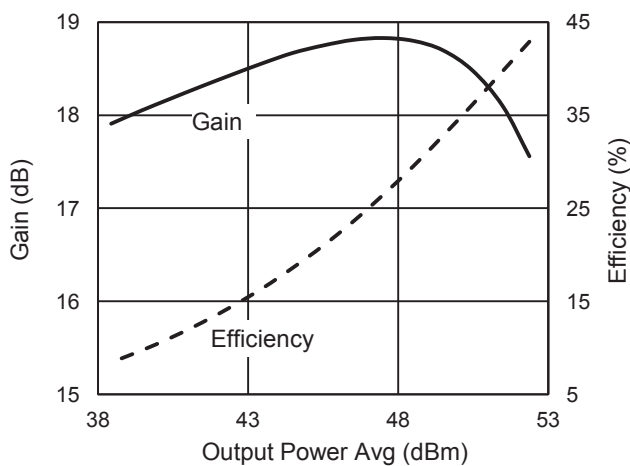
Two-tone Drive-up (over temperature)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1400\text{ mA}$, $f = 1842\text{ MHz}$



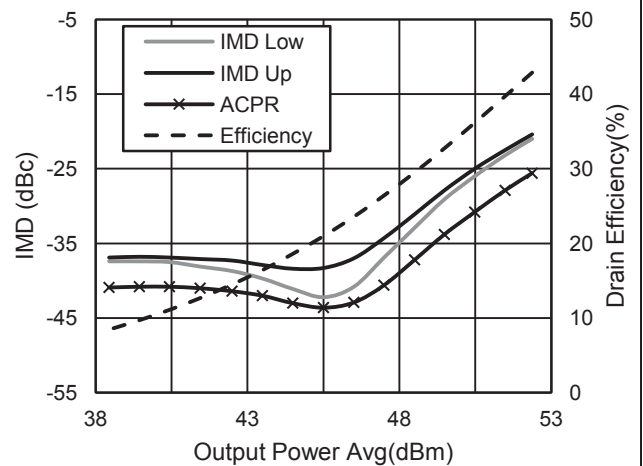
Two-carrier WCDMA 3GPP Drive Up

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1400\text{ mA}$, $f = 1842\text{ MHz}$,
3GPP WCDMA, PAR = 8 dB,
10 MHz carrier spacing, BW 3.84 MHz

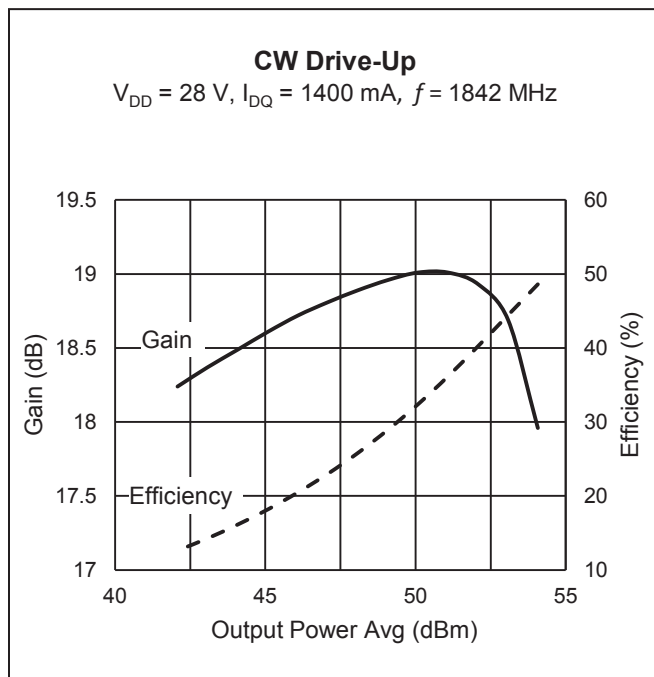


Two-carrier WCDMA 3GPP Drive Up

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1400\text{ mA}$, $f = 1842\text{ MHz}$,
3GPP WCDMA, PAR = 8 dB,
10 MHz carrier spacing, BW 3.84 MHz

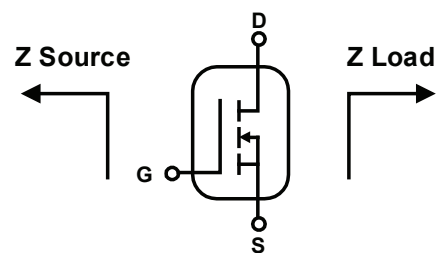


Typical Performance (cont.)

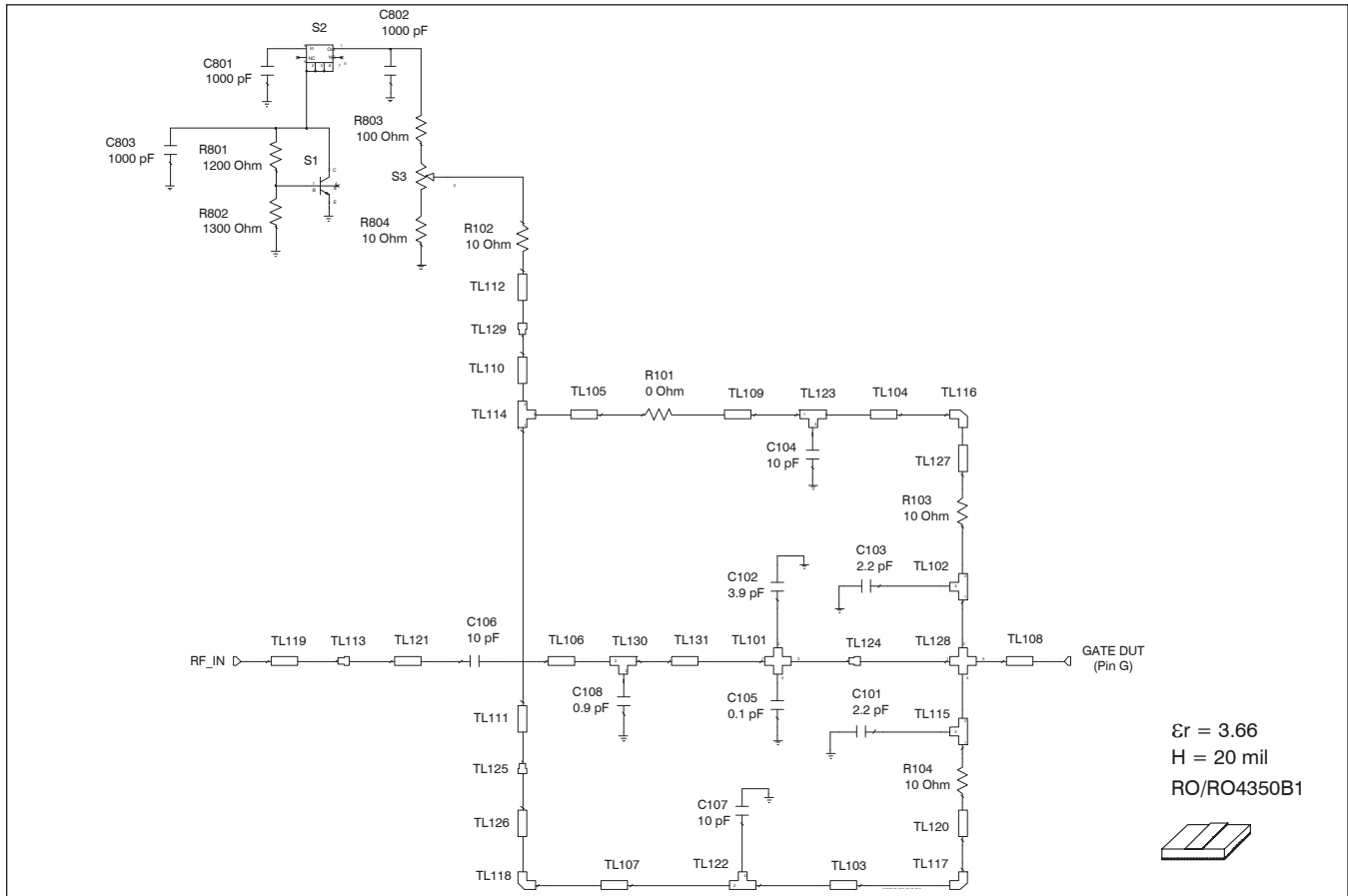


Broadband Circuit Impedance

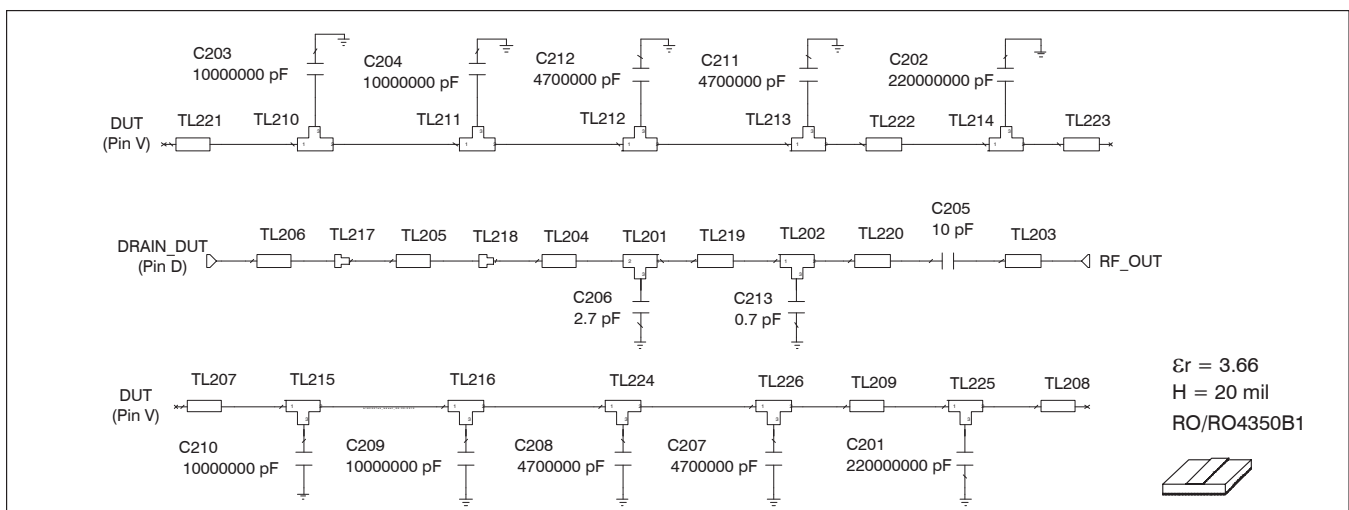
Frequency MHz	Z Source Ω		Z Load Ω	
	R	jX	R	jX
1805	1.48	-3.43	2.33	-5.42
1842.5	2.05	-4.08	2.22	-5.07
1880	2.82	-4.70	1.89	-5.05



Reference Circuit



Reference circuit input schematic for $f = 1880 \text{ MHz}$



Reference circuit output schematic for $f = 1880 \text{ MHz}$

Reference Circuit (cont.)

Reference Circuit Assembly

DUT PTFB182557SH

Test Fixture Part No. LTN/PTFB182557SH

PCB Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$

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

Electrical Characteristics at 1880 MHz

Transmission Line	Electrical Characteristics	Dimensions: mm	Dimensions: mils
Input			
TL101		W1 = 1.270, W2 = 1.270, W3 = 1.270, W4 = 1.270	W1 = 50, W2 = 50, W3 = 50, W4 = 50
TL102, TL115	0.021 λ , 54.17 Ω	W1 = 1.016, W2 = 1.016, W3 = 2.032	W1 = 40, W2 = 40, W3 = 80
TL103, TL104	0.095 λ , 54.17 Ω	W = 1.016, L = 9.195	W = 40, L = 362
TL105	0.013 λ , 54.17 Ω	W = 1.016, L = 1.270	W = 40, L = 50
TL106	0.014 λ , 47.12 Ω	W = 1.270, L = 1.321	W = 50, L = 52
TL107	0.038 λ , 54.17 Ω	W = 1.016, L = 3.637	W = 40, L = 143
TL108	0.052 λ , 4.99 Ω	W = 19.050, L = 4.572	W = 750, L = 180
TL109	0.014 λ , 54.17 Ω	W = 1.016, L = 1.346	W = 40, L = 53
TL110	0.016 λ , 54.17 Ω	W = 1.016, L = 1.524	W = 40, L = 60
TL111	0.178 λ , 63.89 Ω	W = 0.762, L = 17.356	W = 30, L = 683
TL112	0.027 λ , 34.72 Ω	W = 1.981, L = 2.540	W = 78, L = 100
TL113		W1 = 1.270, W2 = 2.286	W1 = 50, W2 = 90
TL114	0.011 λ , 54.17 Ω	W1 = 1.016, W2 = 1.270, W3 = 1.016	W1 = 40, W2 = 50, W3 = 40
TL116, TL117, TL118		W = 1.016	W = 40
TL119	0.028 λ , 47.12 Ω	W = 1.270, L = 2.652	W = 50, L = 104
TL120, TL127	0.012 λ , 54.17 Ω	W = 1.016, L = 1.143	W = 40, L = 45
TL121	0.014 λ , 31.24 Ω	W = 2.286, L = 1.270	W = 90, L = 50
TL122, TL123	0.013 λ , 54.17 Ω	W1 = 1.016, W2 = 1.016, W3 = 1.270	W1 = 40, W2 = 40, W3 = 50
TL124		W1 = 19.050, W2 = 1.270	W1 = 750, W2 = 50
TL125		W1 = 0.762, W2 = 1.016	W1 = 30, W2 = 40
TL126	0.063 λ , 54.17 Ω	W = 1.016, L = 6.134	W = 40, L = 242
TL128		W1 = 14.986, W2 = 1.016, W3 = 14.986, W4 = 1.016	W1 = 590, W2 = 40, W3 = 590, W4 = 40
TL129		W1 = 1.016, W2 = 1.981	W1 = 40, W2 = 78
TL130	0.021 λ , 47.12 Ω	W1 = 1.270, W2 = 1.270, W3 = 2.032	W1 = 50, W2 = 50, W3 = 80
TL131	0.099 λ , 47.12 Ω	W = 1.270, L = 9.449	W = 50, L = 372

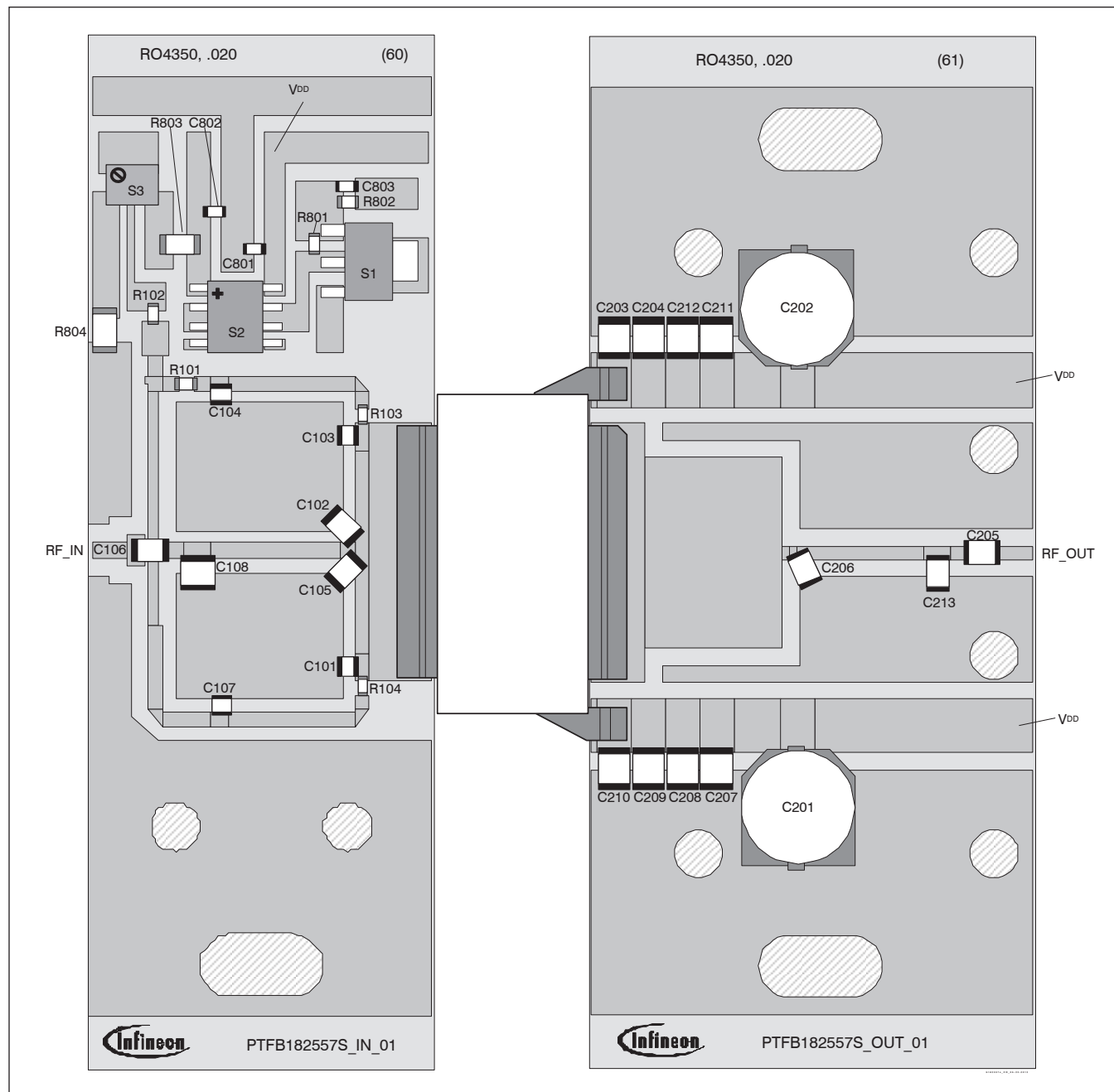
table continued on page 7

Reference Circuit (cont.)

Electrical Characteristics at 1880 MHz

Transmission Line	Electrical Characteristics	Dimensions: mm	Dimensions: mils
Output			
TL201	0.005λ , 53.60Ω	$W1 = 1.034$, $W2 = 1.034$, $W3 = 0.508$	$W1 = 41$, $W2 = 41$, $W3 = 20$
TL202	0.021λ , 53.60Ω	$W1 = 1.034$, $W2 = 1.034$, $W3 = 2.032$	$W1 = 41$, $W2 = 41$, $W3 = 80$
TL203	0.037λ , 52.90Ω	$W = 1.057$, $L = 3.556$	$W = 42$, $L = 140$
TL204	0.005λ , 53.60Ω	$W = 1.034$, $L = 0.508$	$W = 41$, $L = 20$
TL205	0.116λ , 6.67Ω	$W = 13.970$, $L = 10.160$	$W = 550$, $L = 400$
TL206	0.047λ , 4.99Ω	$W = 19.050$, $L = 4.064$	$W = 750$, $L = 160$
TL207, TL221	0.006λ , 19.85Ω	$W = 4.064$, $L = 0.508$	$W = 160$, $L = 20$
TL208, TL223	0.176λ , 19.85Ω	$W = 4.064$, $L = 16.104$	$W = 160$, $L = 634$
TL209, TL222	0.038λ , 19.85Ω	$W = 4.064$, $L = 3.454$	$W = 160$, $L = 136$
TL210, TL211, TL212, TL213, TL214, TL215, TL216, TL224, TL225, TL226	0.028λ , 19.85Ω	$W1 = 4.064$, $W2 = 4.064$, $W3 = 2.540$	$W1 = 160$, $W2 = 160$, $W3 = 100$
TL217		$W1 = 13.970$, $W2 = 19.050$	$W1 = 550$, $W2 = 750$
TL218		$W1 = 1.034$, $W2 = 13.970$	$W1 = 41$, $W2 = 550$
TL219	0.097λ , 53.52Ω	$W = 1.036$, $L = 9.388$	$W = 41$, $L = 370$
TL220	0.019λ , 53.52Ω	$W = 1.036$, $L = 1.788$	$W = 41$, $L = 70$

Reference Circuit (cont.)



Reference Circuit (cont.)

Components Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101, C103	Chip capacitor, 2.2 pF	ATC	ATC100A2R2CW500XB
C102	Chip capacitor, 3.9 pF	ATC	ATC100B3R9CW500XB
C104, C107	Chip capacitor, 10 pF	ATC	ATC100A100JW500XB
C105	Chip capacitor, 0.1 pF	ATC	ATC100B0R1CW500XB
C106	Chip capacitor, 10 pF	ATC	ATC100B100JW500XB
C108	Chip capacitor, 0.9 pF	ATC	ATC100B0R9CW500XB
C801, C802, C803	Capacitor, 1000 pF	Digi-Key	PCC1772CT-ND
R101	Resistor, 0 Ω	Digi-Key	P0.0GCT-ND
R102, R103, R104	Resistor, 10 Ω	Digi-Key	P10GCT-ND
R801	Resistor, 1200 Ω	Digi-Key	P1.2KGCT-ND
R802	Resistor, 1300 Ω	Digi-Key	P1.3KGCT-ND
R803	Resistor, 100 Ω	Digi-Key	P101ECT-ND
R804	Resistor, 10 Ω	Digi-Key	P10ECT-ND
S1	Transistor	Digi-Key	BCP56
S2	Voltage Regulator	Digi-Key	LM78L05ACM-ND
S3	Potentiometer, 2k Ω	Digi-Key	3224W-202ECT-ND
Output			
C201, C202	Capacitor, 220 μ F	Digi-Key	PCE4444TR-ND
C203, C204, C209, C210	Capacitor, 10 μ F	Digi-Key	587-1818-2-ND
C205	Chip capacitor, 10 pF	ATC	ATC100B100JW500XB
C206	Chip capacitor, 2.7 pF	ATC	ATC100B2R7CW500XB
C207, C208, C211, C212	Chip capacitor, 4.7 μ F	Digi-Key	490-1864-2-ND
C213	Chip capacitor, 0.7 pF	ATC	ATC100B0R7CW500XB

Package Outline Specifications

Package H-34288G-4/2 with Formed Leads

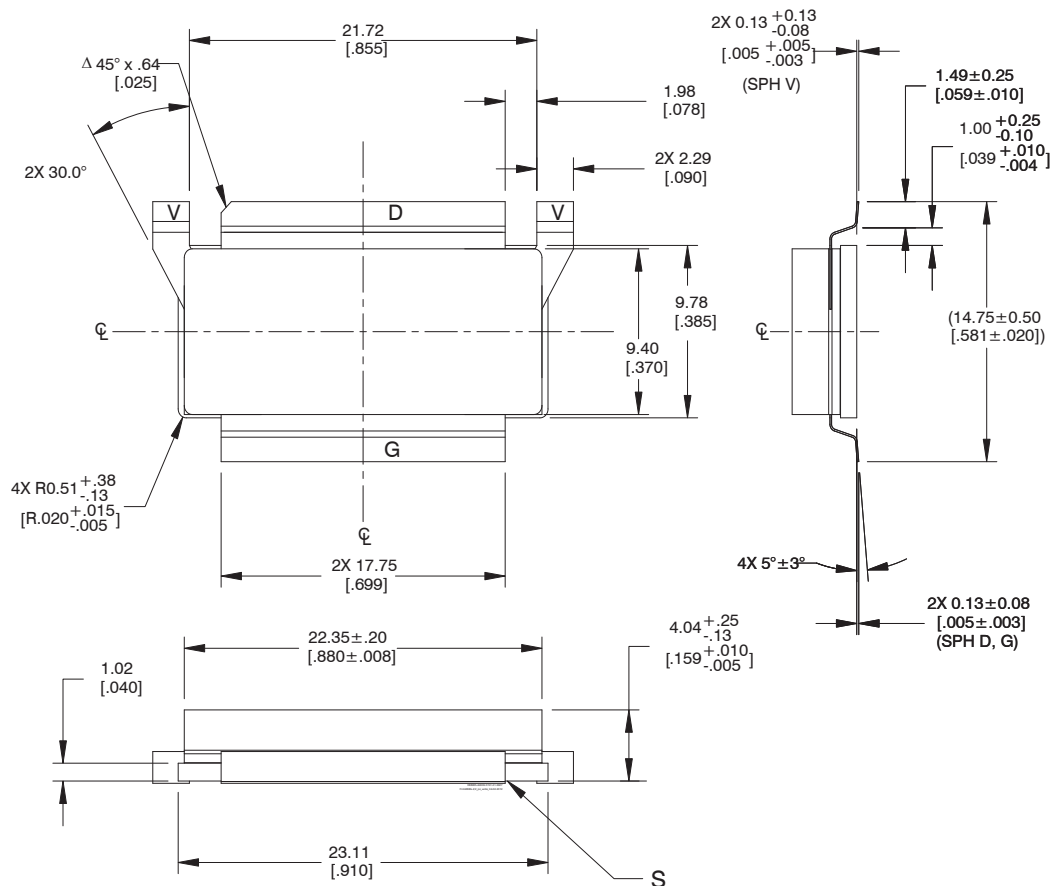


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances ± 0.127 [0.005] unless specified otherwise.
4. Pins: D – drain; S – source; G – gate; V – V_{DD} .
5. Lead thickness: 0.10 + 0.051/–0.025 mm [0.004 + 0.002/–0.001 inch].
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:	2012-06-25	Data Sheet
Previous Version:	2012-03-25, Advance Specification	
Page	Subjects (major changes since last revision)	
All	Data Sheet reflects released product 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 2012-06-25

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2012 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.