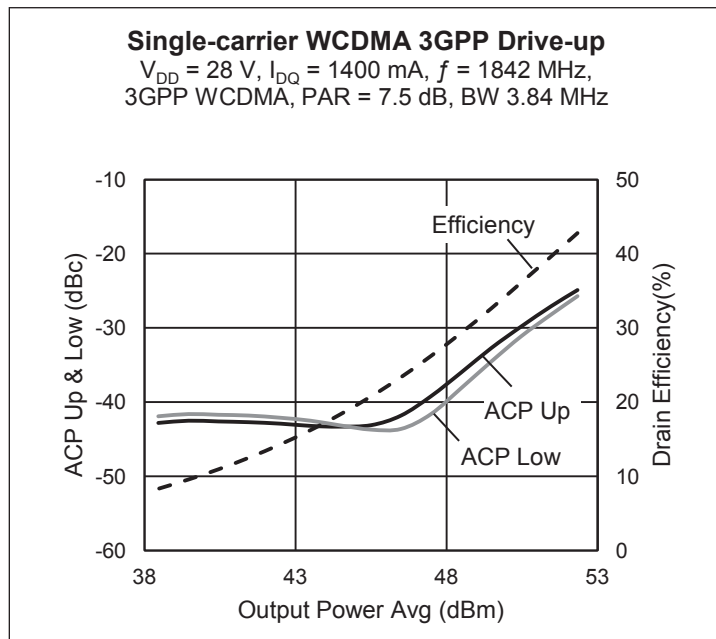
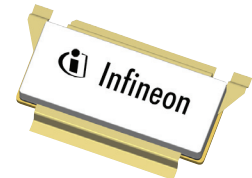


## Thermally-Enhanced High Power RF LDMOS FET 250 W, 28 V, 1805 – 1880 MHz

### 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	$\eta_D$	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	$\mu\text{A}$
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10	$\mu\text{A}$
On-State Resistance	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.05	—	$\Omega$
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	$\mu\text{A}$

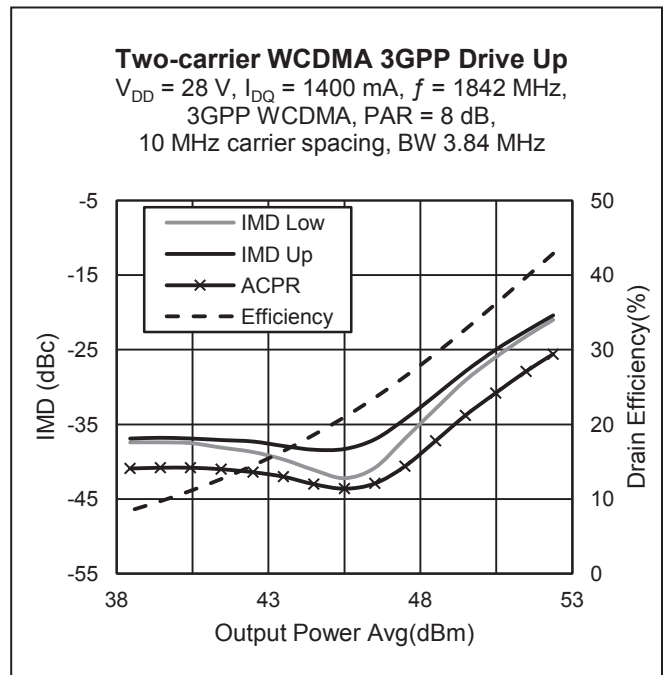
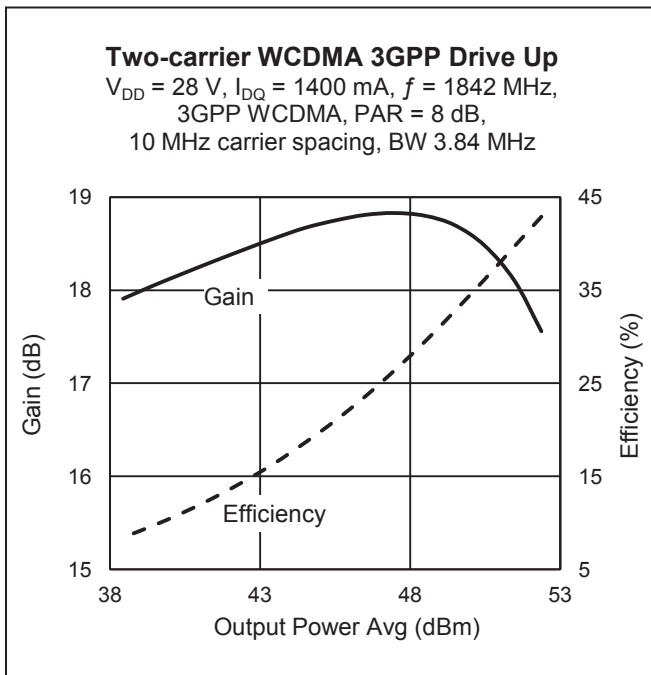
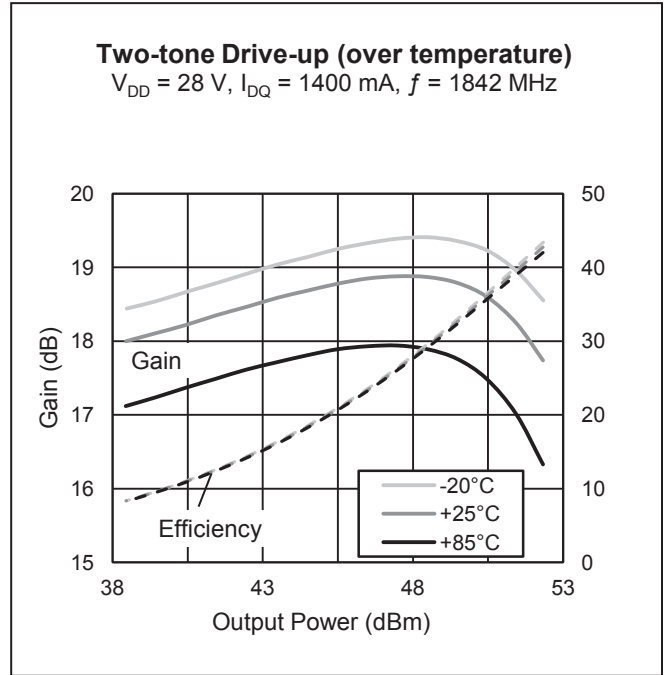
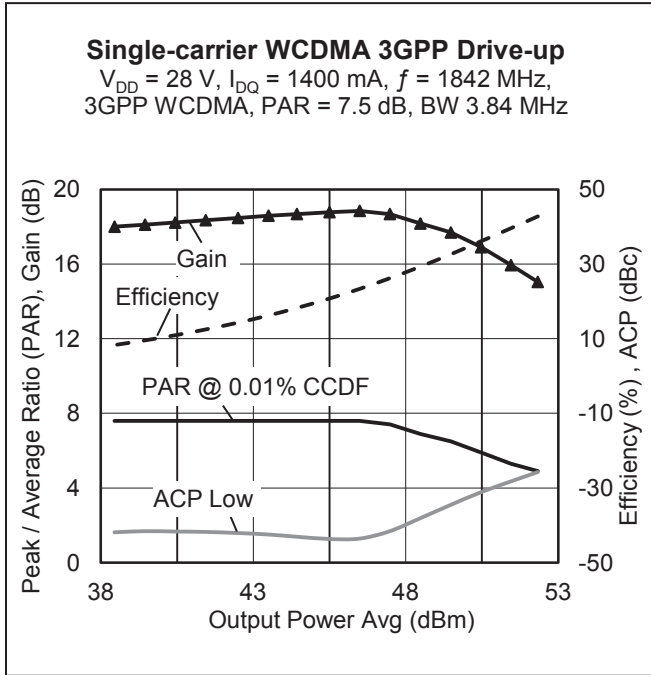
**Maximum Ratings**

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 ( $T_{CASE} = 70^{\circ}\text{C}, 200\text{ W CW}$ )	$R_{\theta JC}$	0.232	$^{\circ}\text{C/W}$

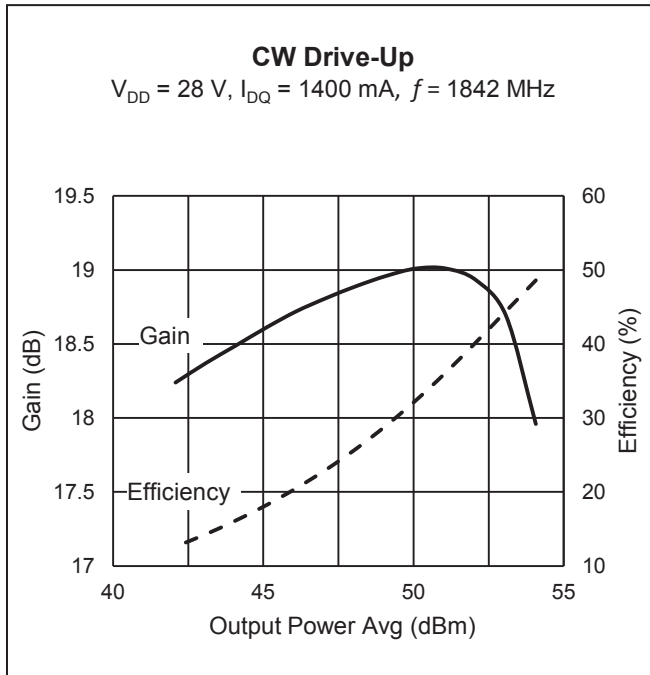
**Ordering Information**

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)

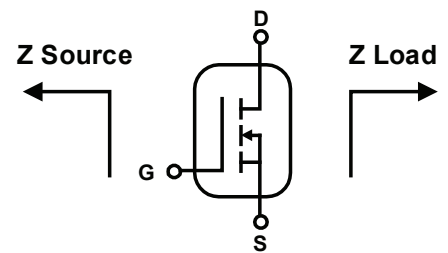


**Typical Performance** (cont.)

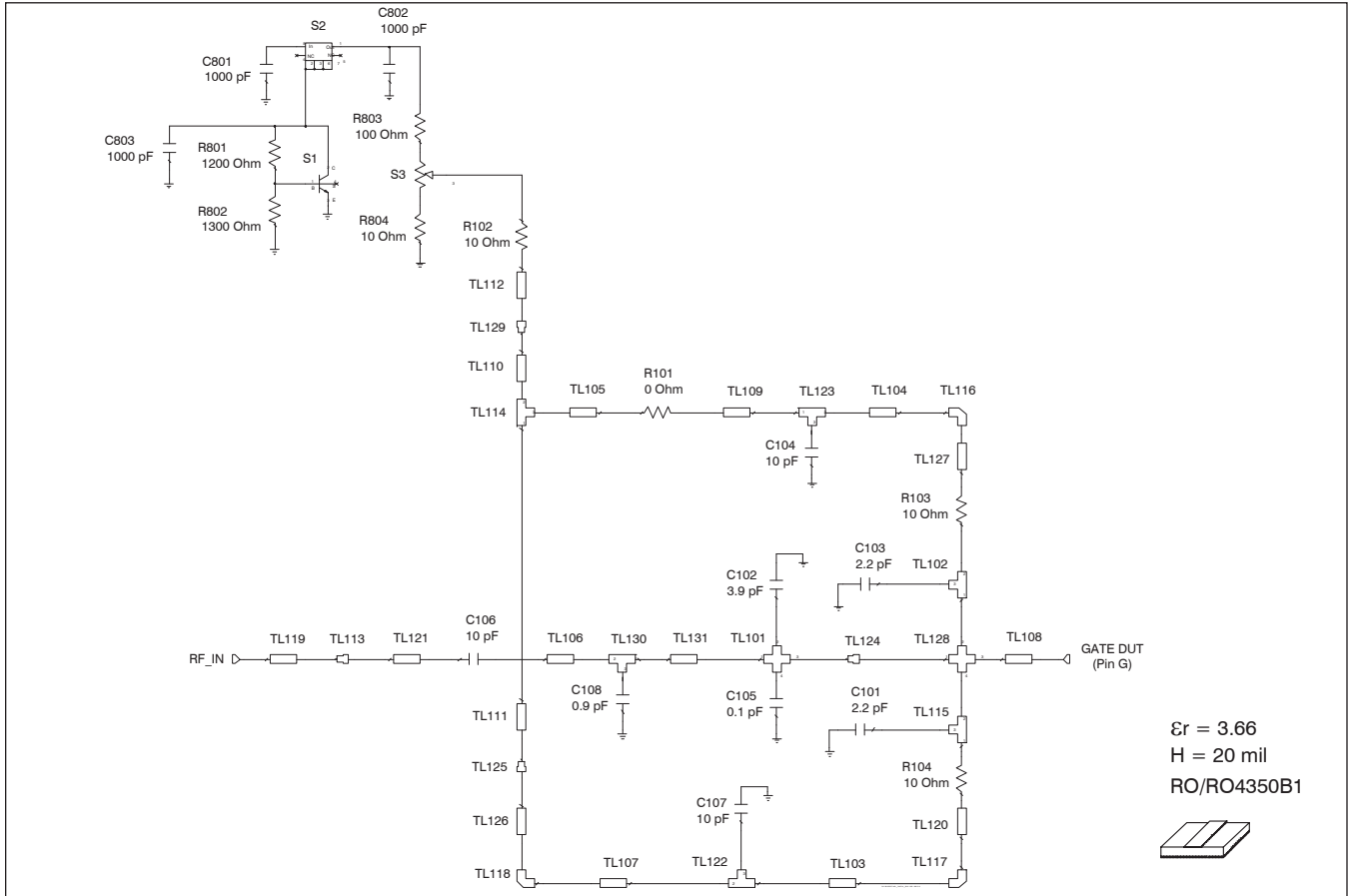


**Broadband Circuit Impedance**

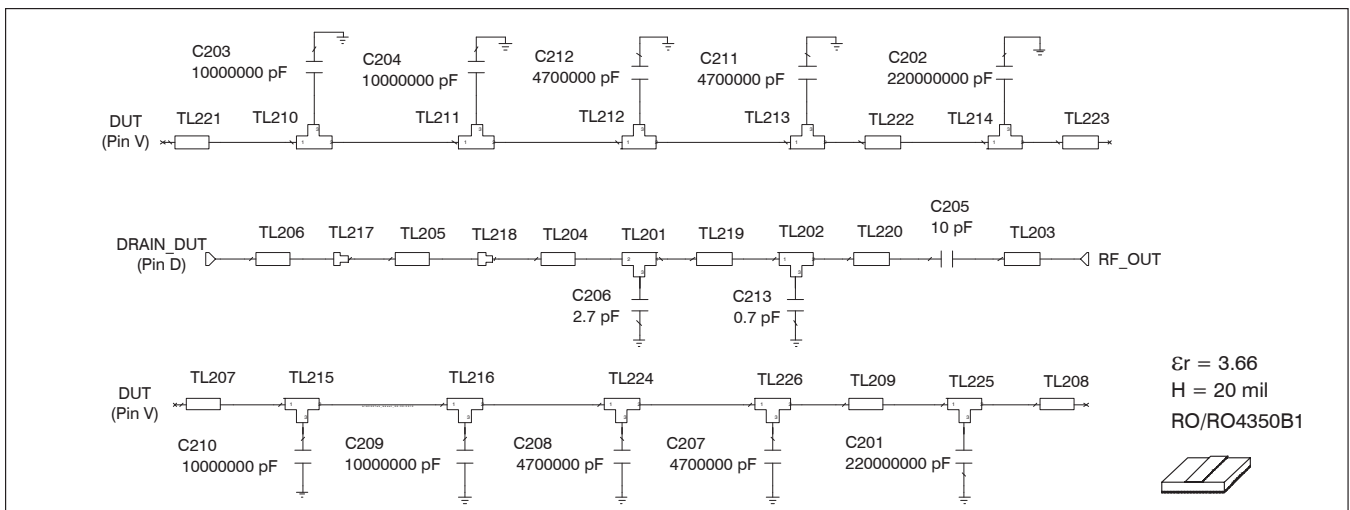
Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
1805	1.48	-3.43	2.33	-5.42
1842.5	2.05	-4.08	2.22	-5.07
1880	2.82	-4.70	1.89	-5.05



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
<b>Input</b>			
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 $\lambda$ , 54.17 $\Omega$	W1 = 1.016, W2 = 1.016, W3 = 2.032	W1 = 40, W2 = 40, W3 = 80
TL103, TL104	0.095 $\lambda$ , 54.17 $\Omega$	W = 1.016, L = 9.195	W = 40, L = 362
TL105	0.013 $\lambda$ , 54.17 $\Omega$	W = 1.016, L = 1.270	W = 40, L = 50
TL106	0.014 $\lambda$ , 47.12 $\Omega$	W = 1.270, L = 1.321	W = 50, L = 52
TL107	0.038 $\lambda$ , 54.17 $\Omega$	W = 1.016, L = 3.637	W = 40, L = 143
TL108	0.052 $\lambda$ , 4.99 $\Omega$	W = 19.050, L = 4.572	W = 750, L = 180
TL109	0.014 $\lambda$ , 54.17 $\Omega$	W = 1.016, L = 1.346	W = 40, L = 53
TL110	0.016 $\lambda$ , 54.17 $\Omega$	W = 1.016, L = 1.524	W = 40, L = 60
TL111	0.178 $\lambda$ , 63.89 $\Omega$	W = 0.762, L = 17.356	W = 30, L = 683
TL112	0.027 $\lambda$ , 34.72 $\Omega$	W = 1.981, L = 2.540	W = 78, L = 100
TL113		W1 = 1.270, W2 = 2.286	W1 = 50, W2 = 90
TL114	0.011 $\lambda$ , 54.17 $\Omega$	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 $\lambda$ , 47.12 $\Omega$	W = 1.270, L = 2.652	W = 50, L = 104
TL120, TL127	0.012 $\lambda$ , 54.17 $\Omega$	W = 1.016, L = 1.143	W = 40, L = 45
TL121	0.014 $\lambda$ , 31.24 $\Omega$	W = 2.286, L = 1.270	W = 90, L = 50
TL122, TL123	0.013 $\lambda$ , 54.17 $\Omega$	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 $\lambda$ , 54.17 $\Omega$	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 $\lambda$ , 47.12 $\Omega$	W1 = 1.270, W2 = 1.270, W3 = 2.032	W1 = 50, W2 = 50, W3 = 80
TL131	0.099 $\lambda$ , 47.12 $\Omega$	W = 1.270, L = 9.449	W = 50, L = 372

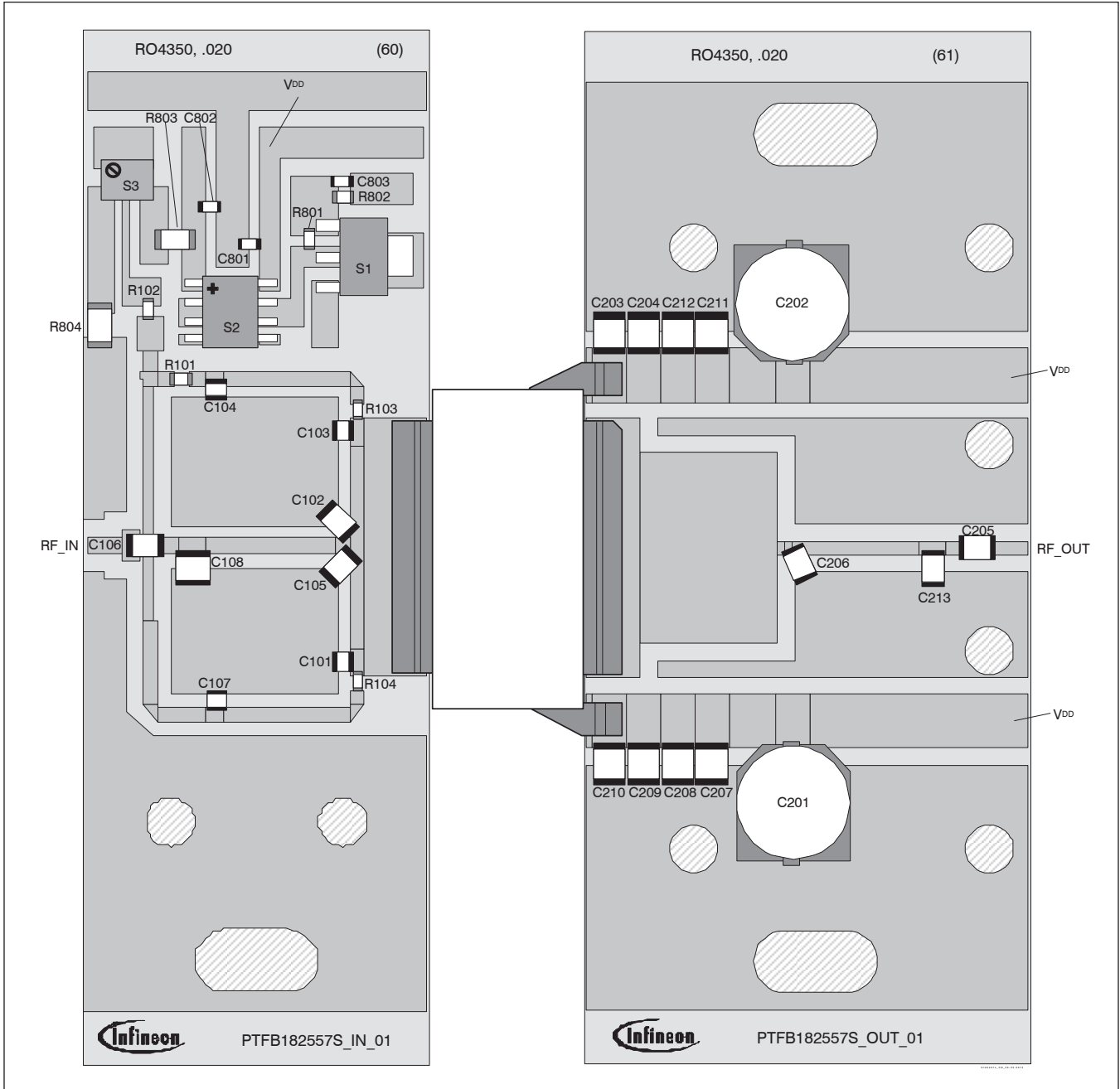
*table continued on page 7*

Reference Circuit (cont.)

Electrical Characteristics at 1880 MHz

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

Reference Circuit (cont.)



Reference circuit assembly diagram (not to scale)\*

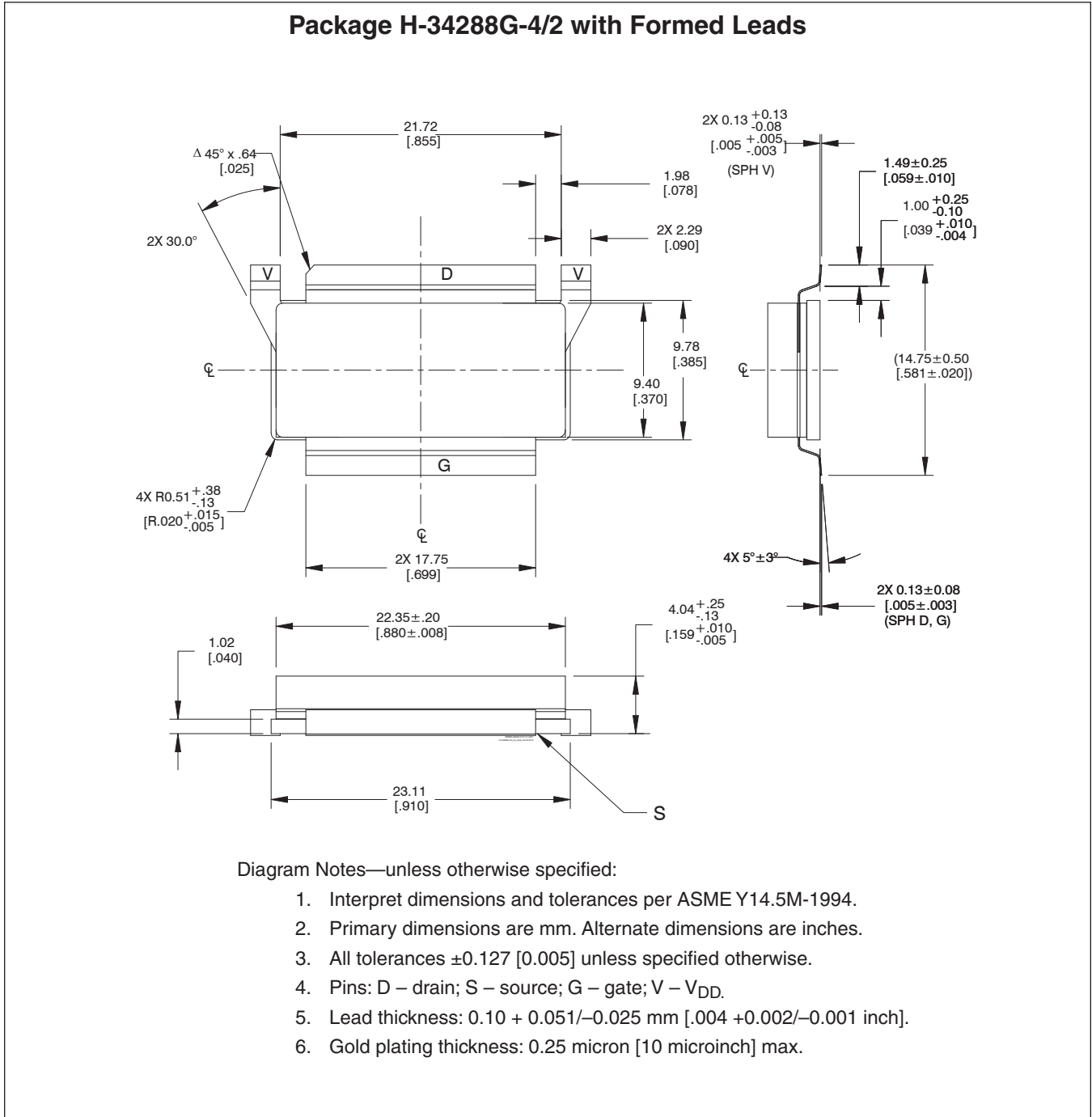


**Reference Circuit** (cont.)

**Components Information**

Component	Description	Suggested Manufacturer	P/N
<b>Input</b>			
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 $\Omega$	Digi-Key	P0.0GCT-ND
R102, R103, R104	Resistor, 10 $\Omega$	Digi-Key	P10GCT-ND
R801	Resistor, 1200 $\Omega$	Digi-Key	P1.2KGCT-ND
R802	Resistor, 1300 $\Omega$	Digi-Key	P1.3KGCT-ND
R803	Resistor, 100 $\Omega$	Digi-Key	P101ECT-ND
R804	Resistor, 10 $\Omega$	Digi-Key	P10ECT-ND
S1	Transistor	Digi-Key	BCP56
S2	Voltage Regulator	Digi-Key	LM78L05ACM-ND
S3	Potentiometer, 2k $\Omega$	Digi-Key	3224W-202ECT-ND
<b>Output</b>			
C201, C202	Capacitor, 220 $\mu$ F	Digi-Key	PCE4444TR-ND
C203, C204, C209, C210	Capacitor, 10 $\mu$ 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 $\mu$ F	Digi-Key	490-1864-2-ND
C213	Chip capacitor, 0.7 pF	ATC	ATC100B0R7CW500XB

Package Outline Specifications



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

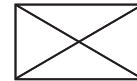
<b>Revision History:</b>	2012-06-25	Data Sheet
Previous Version:	2012-03-25, Advance Specification	
Page	Subjects (major changes since last revision)	
All	Data Sheet reflects released product specifications	

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