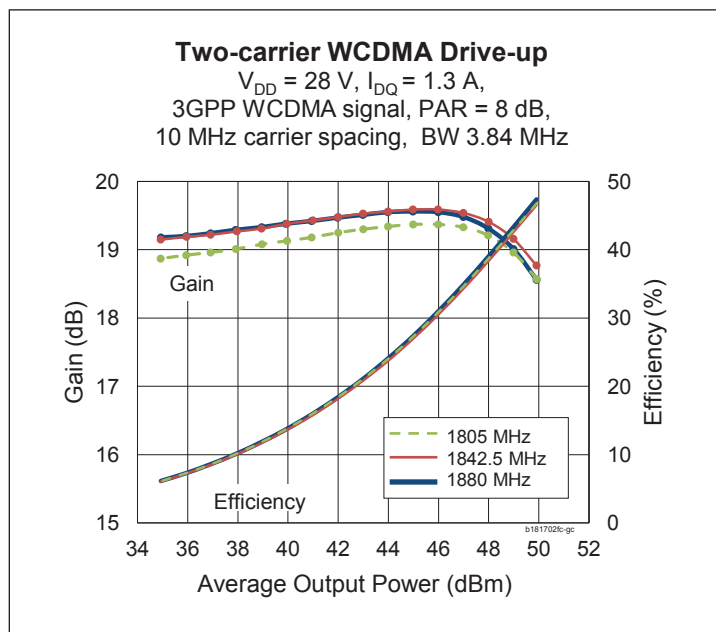


## Thermally-Enhanced High Power RF LDMOS FET 170 W, 28 V, 1805 – 1880 MHz

### Description

The PTFB181702FC is a 170-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications. Features include input and output matching, high gain and thermally-enhanced package with earless flanges. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PTFB181702FC  
Package H-37248-4



### Features

- Broadband internal matching
- Typical CW performance, 1842 MHz, 28 V
  - Output power at  $P_{1dB} = 180\text{ W}$
  - Efficiency = 58%
  - Gain = 18.5 dB
- Capable of handling 10:1 VSWR @28 V, 170 W (CW) output power
- Integrated ESD protection
- Low thermal resistance
- Pb-free and RoHS compliant

### RF Characteristics

#### Two-carrier WCDMA Specifications (tested in Infineon test fixture)

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 1300\text{ mA}$ ,  $P_{OUT} = 30\text{ W avg}$ ,  $f_1 = 1870\text{ MHz}$ ,  $f_2 = 1880\text{ MHz}$ , 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 8 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	$G_{ps}$	18	19	—	dB
Drain Efficiency	$\eta_D$	24	26	—	%
Intermodulation Distortion	IMD	—	-35	-33	dBc

All published data at  $T_{CASE} = 25^\circ\text{C}$  unless otherwise indicated

**ESD:** Electrostatic discharge sensitive device—observe handling precautions!

**DC Characteristics** (each side)

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	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.11	—	$\Omega$
Operating Gate Voltage	$V_{DS} = 28\text{ V}, I_{DQ} = 650\text{ mA}$	$V_{GS}$	2.5	3.0	3.5	V
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1	$\mu\text{A}$

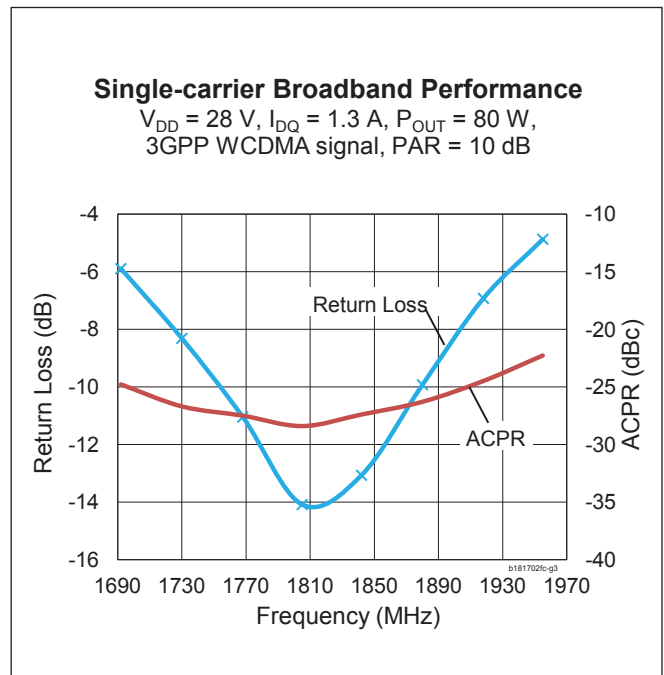
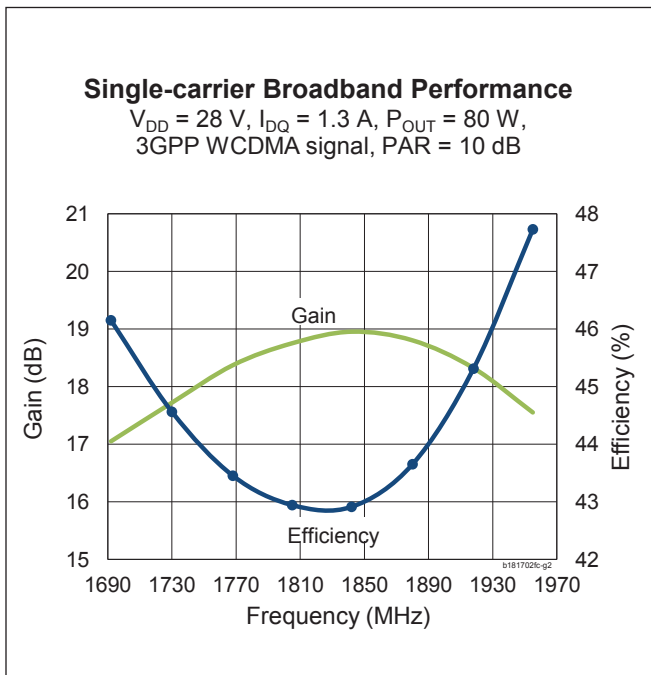
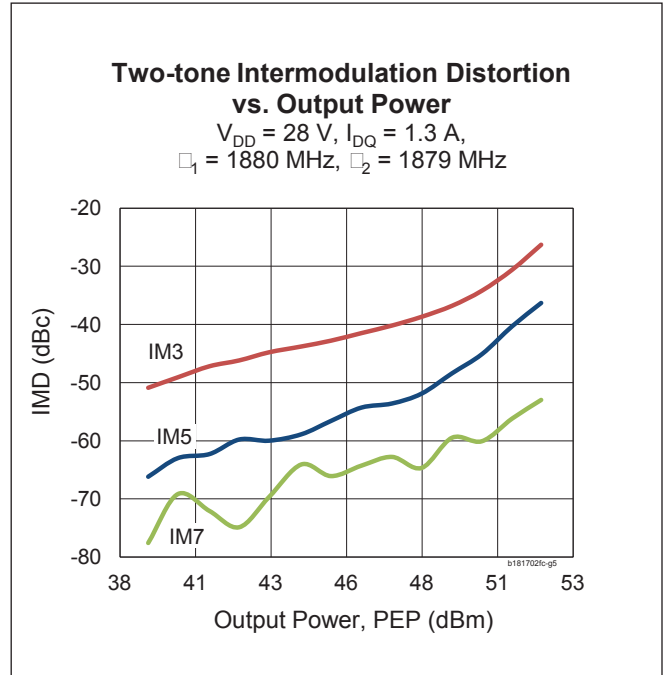
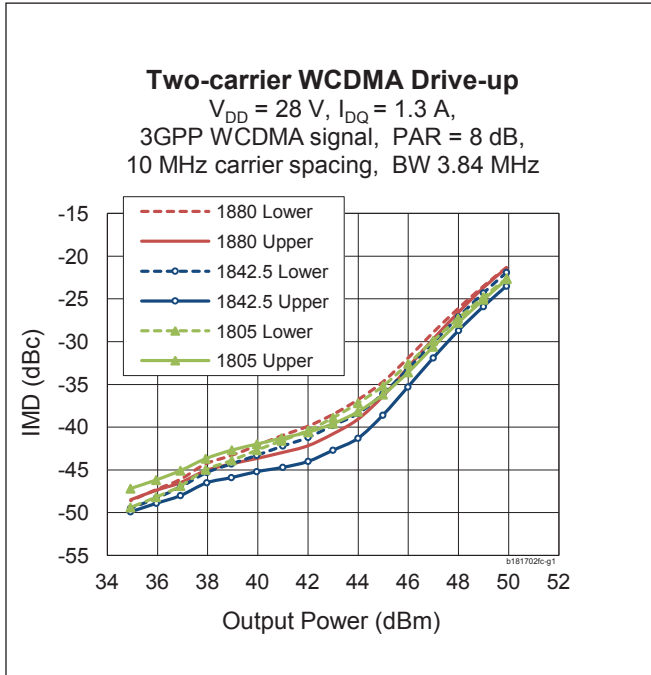
**Maximum Ratings**

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 ( $T_{CASE} = 70^{\circ}\text{C}, 170\text{ W CW}$ )	$R_{\theta JC}$	0.27	$^{\circ}\text{C/W}$

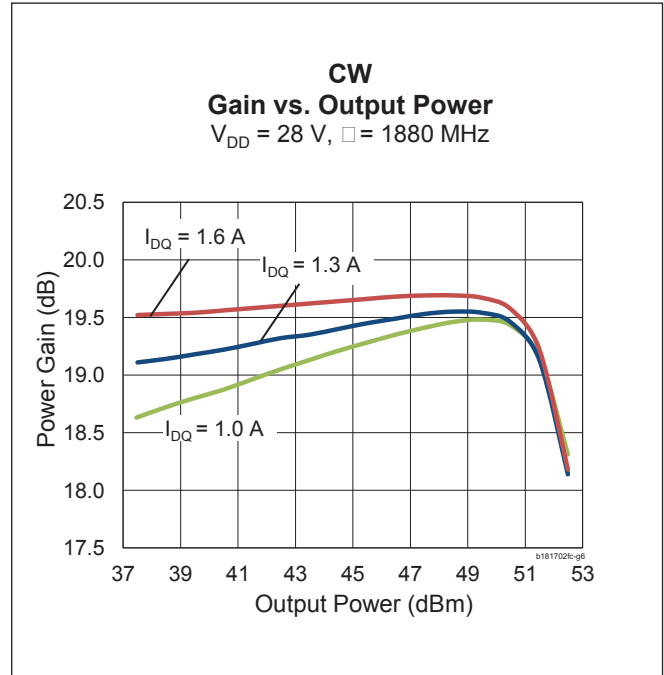
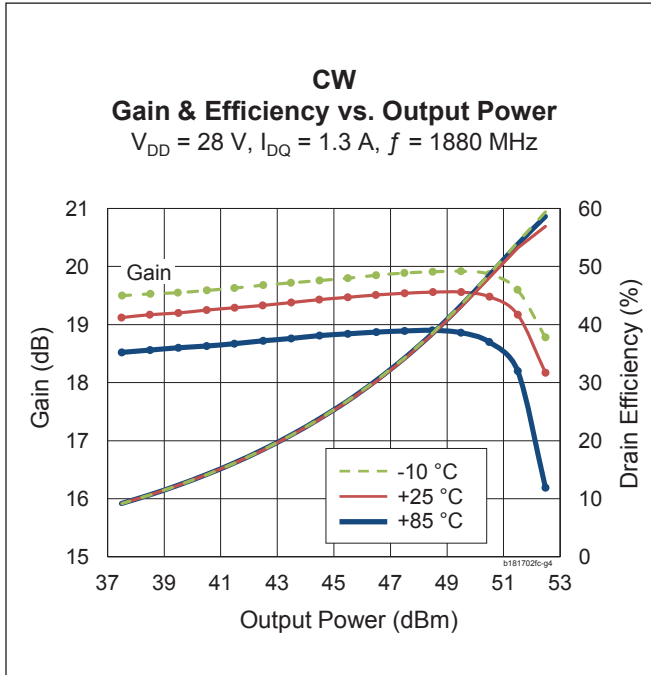
**Ordering Information**

Type and Version	Order Code	Package Description	Shipping
PTFB181702FC V1 R0	PTFB181702FCV1R0XTMA1	H-37248-4, earless flange	Tape & Reel, 50 pcs
PTFB181702FC V1 R250	PTFB181702FCV1R250XTMA1	H-37248-4, earless flange	Tape & Reel, 250 pcs

**Typical Performance** (data taken in a production test fixture)

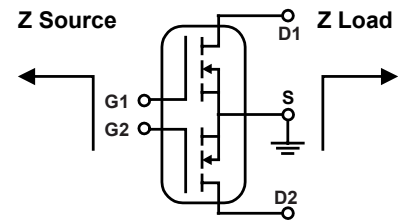


Typical Performance (cont.)

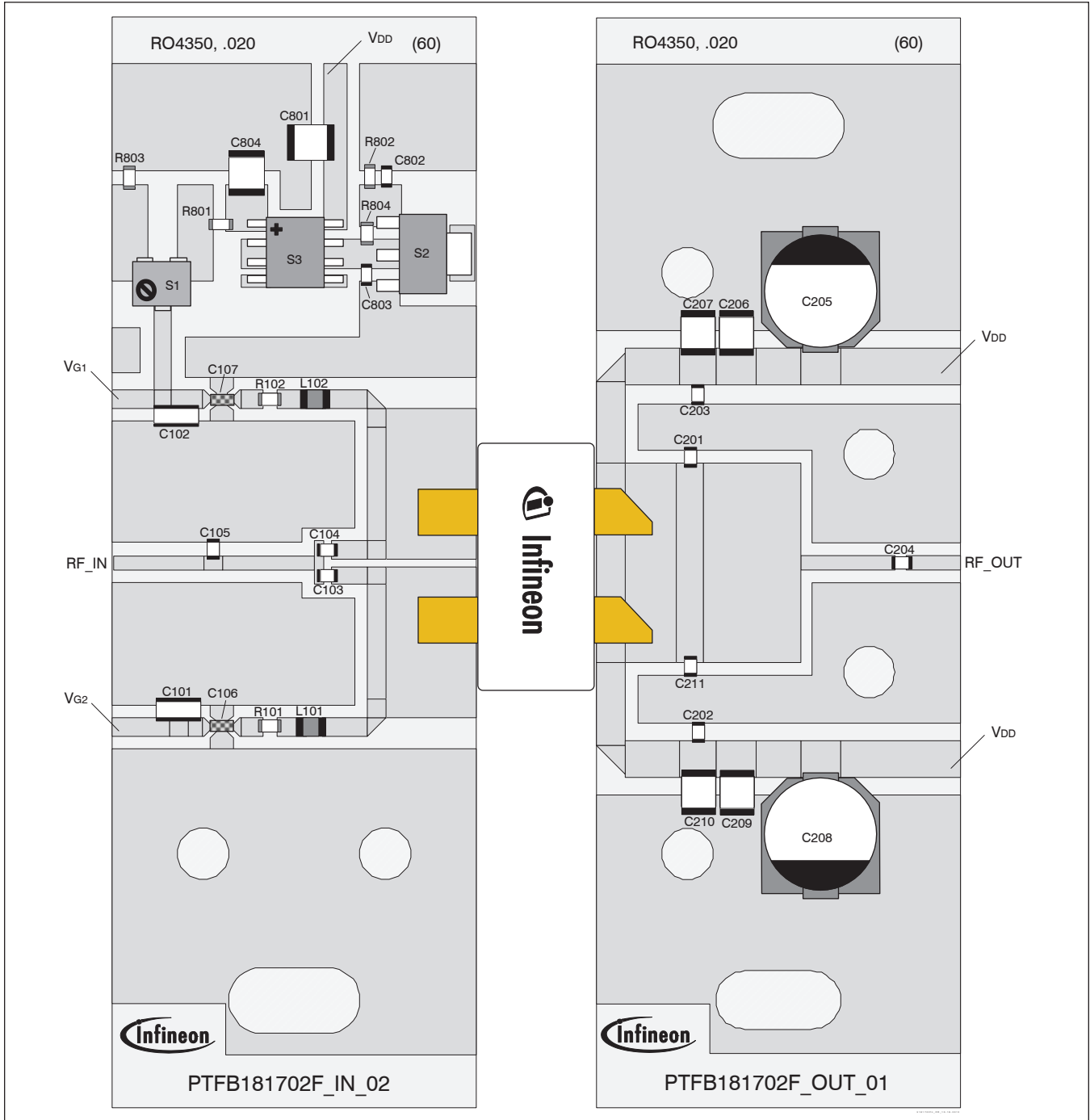


Broadband Circuit Impedance

Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
1805	2.99	-6.14	1.87	-4.46
1825	2.99	-6.08	1.52	-4.50
1845	3.00	-6.03	1.35	-4.34
1865	3.00	-5.97	1.25	-4.19
1880	3.00	-5.94	1.20	-4.08



Reference Circuit



Reference circuit assembly diagram (not to scale)\*

**Reference Circuit** (cont.)

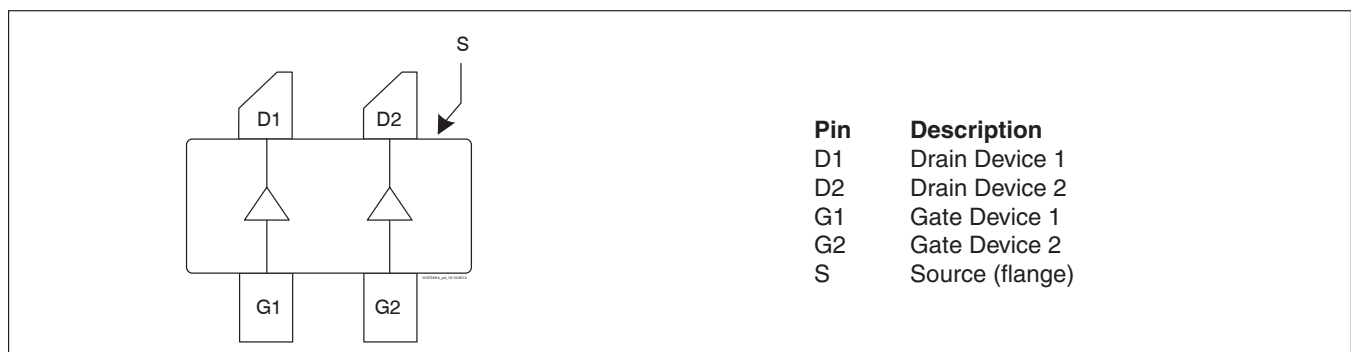
**Reference Circuit Assembly**

DUT	PTFB181702FC
Test Fixture Part No.	LTN/PTFB181702FC
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 <a href="http://www.infineon.com/rfpower">http://www.infineon.com/rfpower</a>	

**Components Information**

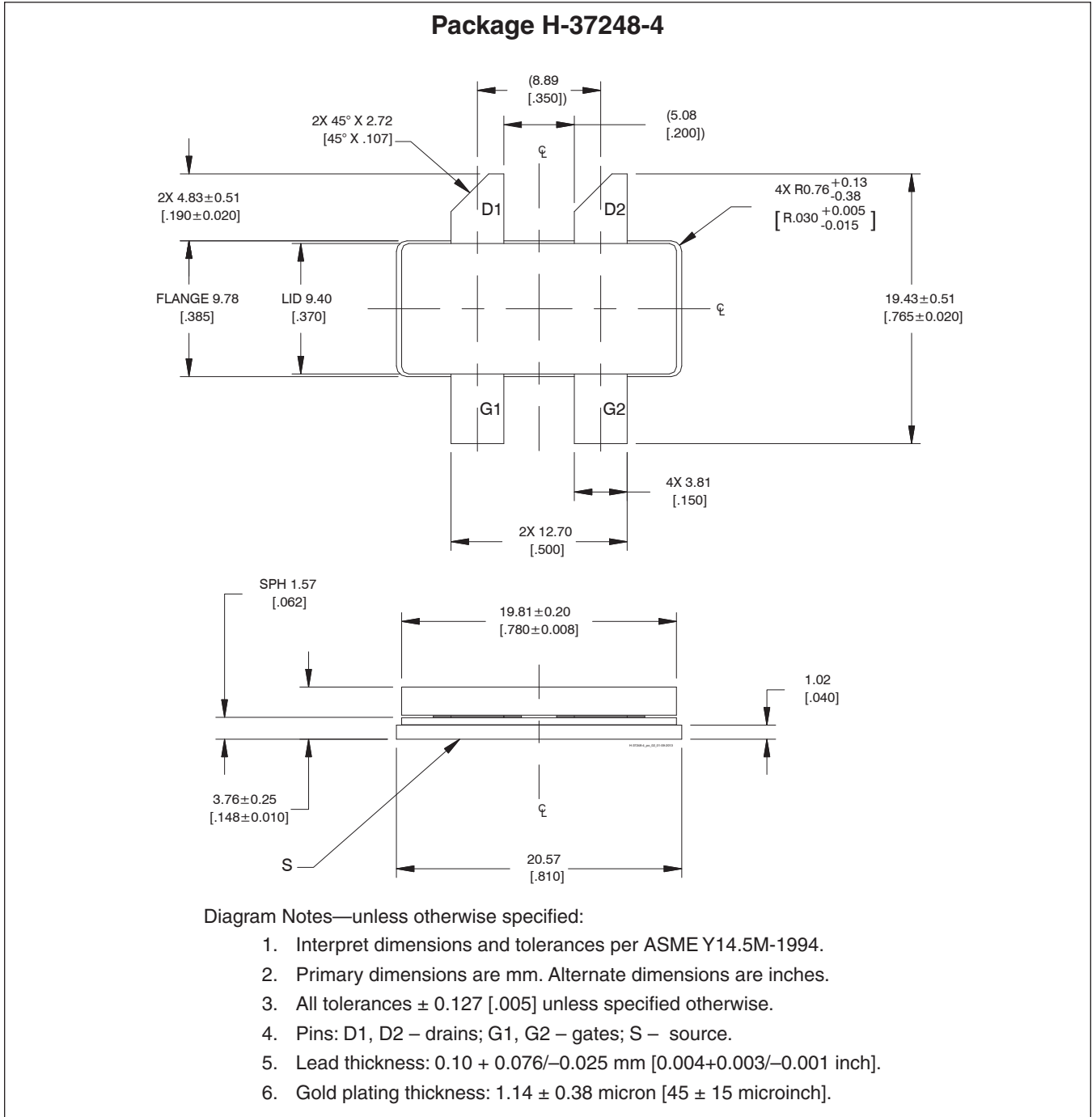
Component	Description	Suggested Supplier	P/N
<b>Input</b>			
C101, C102	Capacitor, 10 $\mu$ F	Digi-Key	490-4393-2-ND
C103, C104	Capacitor, 18 pF	ATC	ATC800A180JT250XT
C105	Capacitor, 1.5 pF	ATC	ATC800A1R5BT250XT
C106, C107	EMI Suppression Capacitor	Digi-Key	NFM18PS105R0J3D-ND
C801, C804	Capacitor, 10 $\mu$ F	Digi-Key	587-1818-2-ND
C802	Chip capacitor, 1000 pF	Digi-Key	PCC1772CT-ND
C803	Capacitor, 1 $\mu$ F	Digi-Key	490-4736-2-ND
L101, L102	Inductor, 27.3 nH	Coilcraft	0908SQ-27NGLB
R101, R102, R803	Resistor, 10 ohm	Digi-Key	P10GTR-ND
R801	Resistor, 100 ohm	Digi-Key	P100GTR-ND
R802	Resistor, 1300 ohm	Digi-Key	P1.3KGTR-ND
R804	Resistor, 1200 ohm	Digi-Key	P1.2KGTR-ND
S1	Potentiometer, 2k $\Omega$	Digi-Key	3224W-202ECT-ND
S2	Transistor	Digi-Key	BCP56-ND
S3	Voltage Regulator	Digi-Key	LM7805
<b>Output</b>			
C201, C211	Chip capacitor, 1.2 pF	ATC	ATC800A1R2BT250XT
C202, C203, C204	Chip capacitor, 18 pF	ATC	ATC800A180JT250XT
C205, C208	Capacitor, 220 $\mu$ F	Digi-Key	PCE4444TR-ND
C206, C207, C209, C210	Capacitor, 10 $\mu$ F	Digi-Key	587-1818-2-ND

**Pinout Diagram** (top view)



Lead connections for PTFB181702FC

Package Outline Specifications



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