

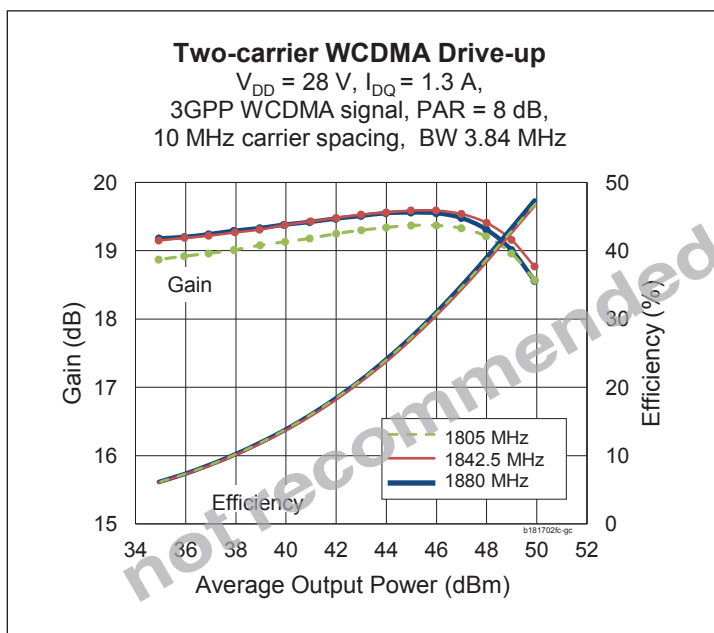
PTFB181702FC

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 Wolfspeed'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 Wolfspeed 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	η_D	24	26	—	%
Intermodulation Distortion	IMD	—	-35	-33	dBc

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	μA
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10	μA
On-State Resistance	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.11	—	Ω
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	μA

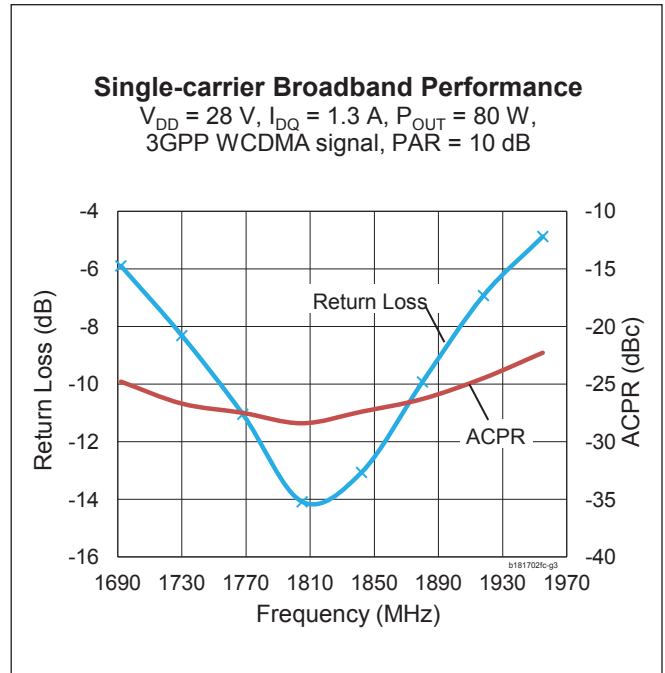
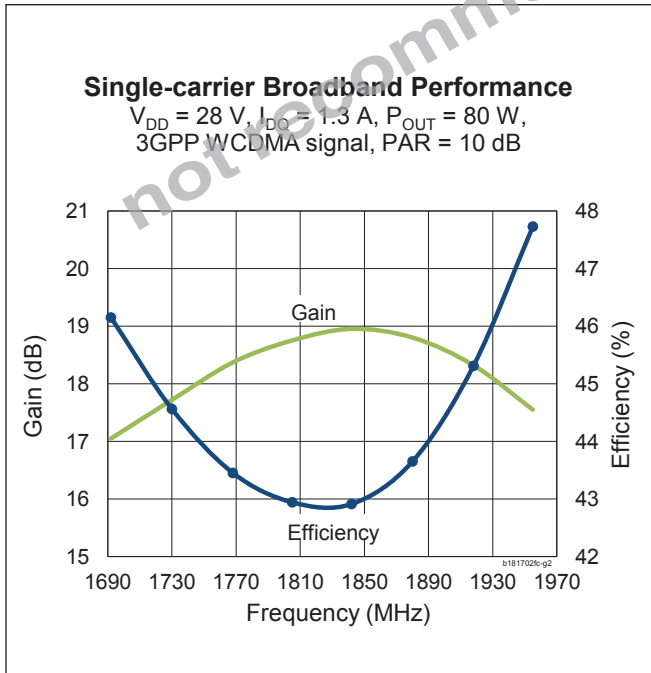
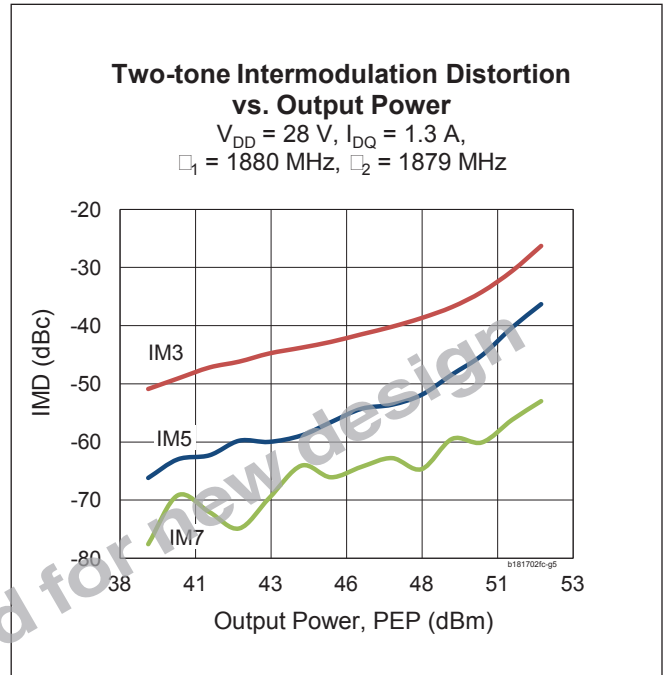
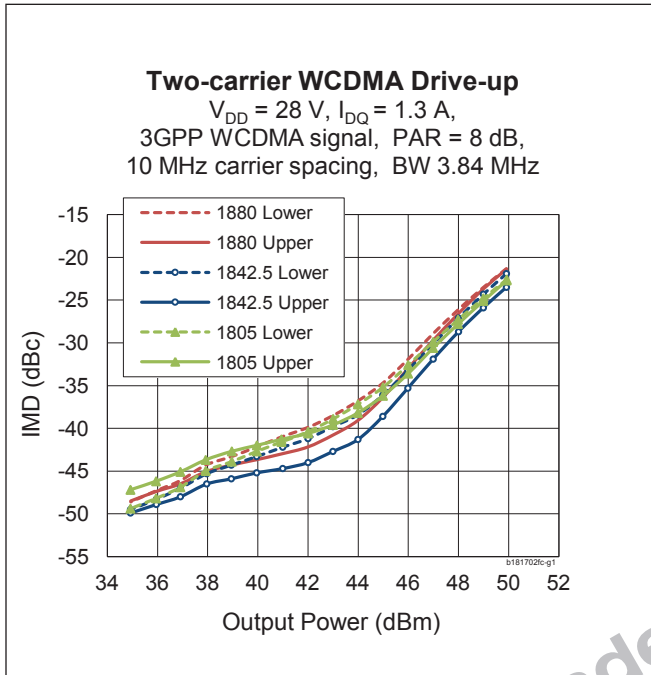
Maximum Ratings

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

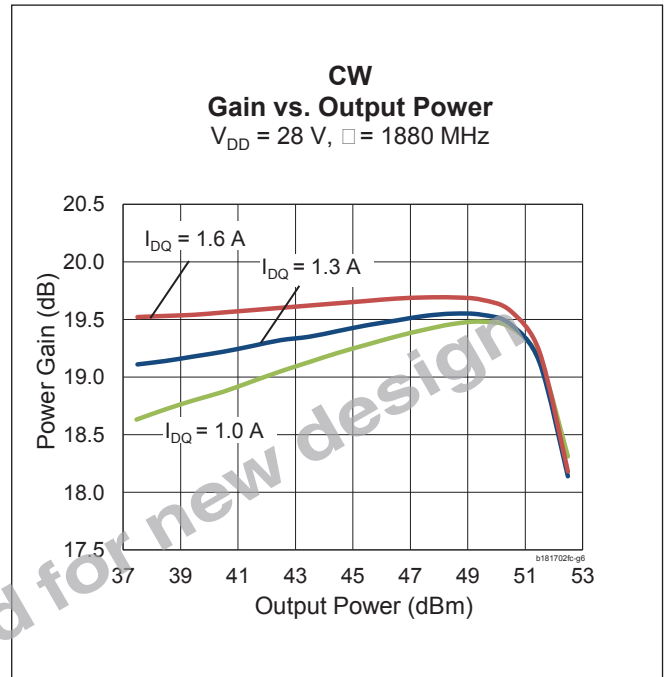
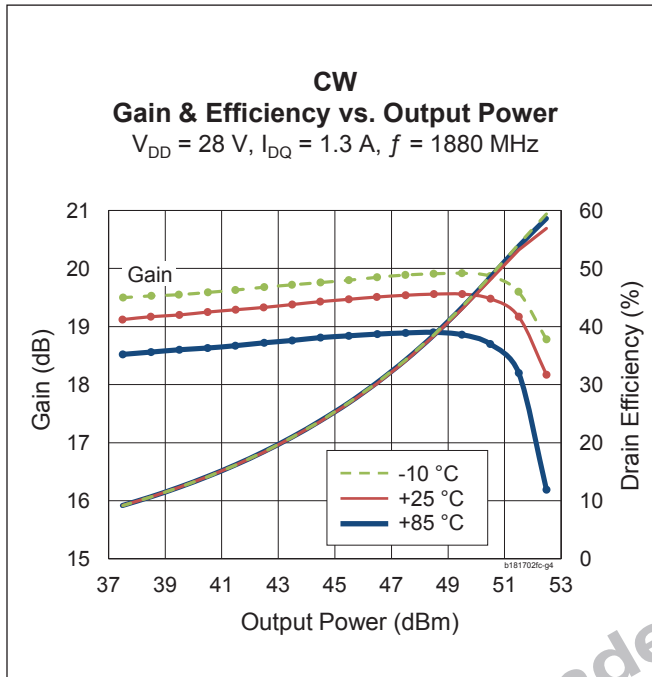
Ordering Information

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

Typical Performance (data taken in a production test fixture)

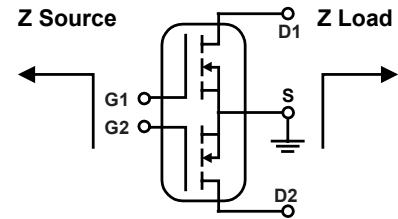


Typical Performance (cont.)



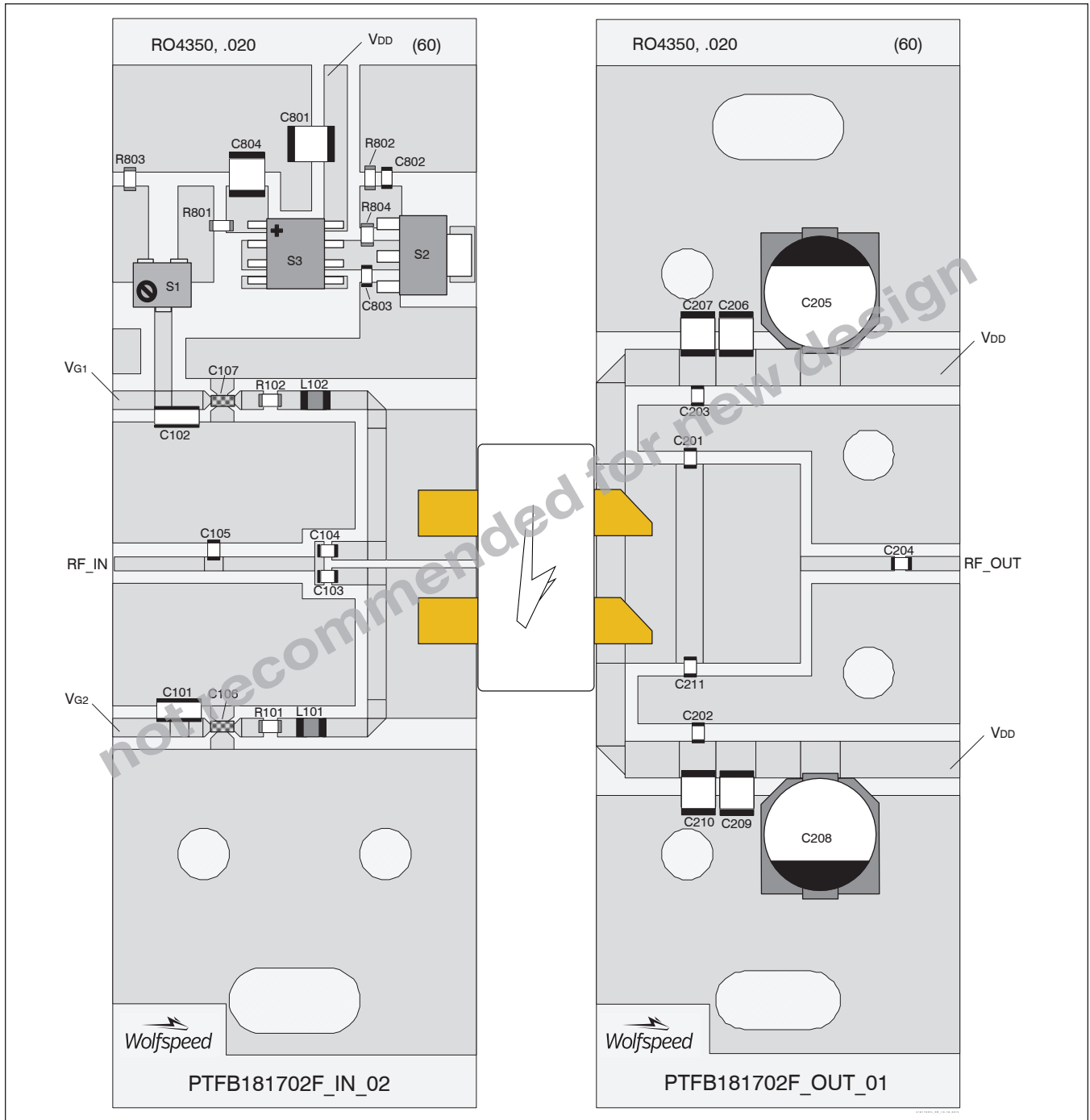
Broadband Circuit Impedance

Frequency MHz	Z Source Ω		Z Load Ω	
	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



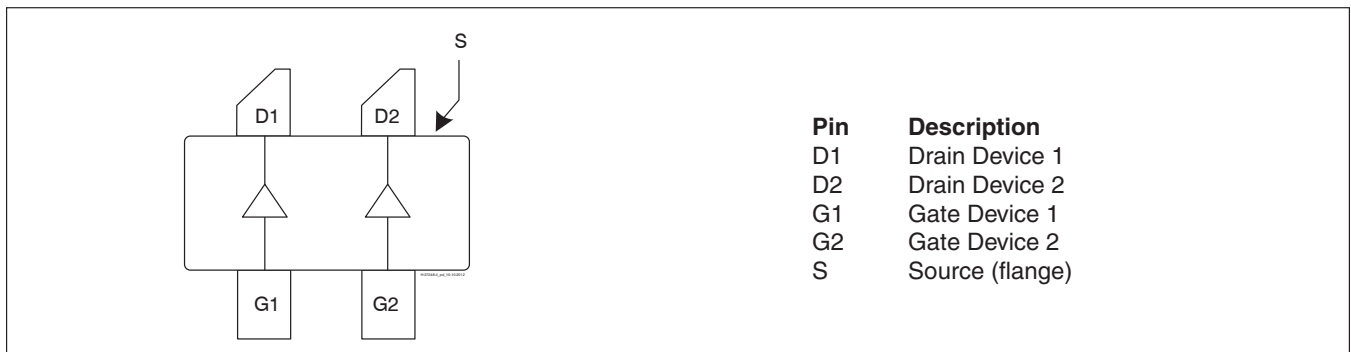
Reference circuit assembly diagram (not to scale)*

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 Wolfspeed Web site at http://www.wolfspeed.com/RF	

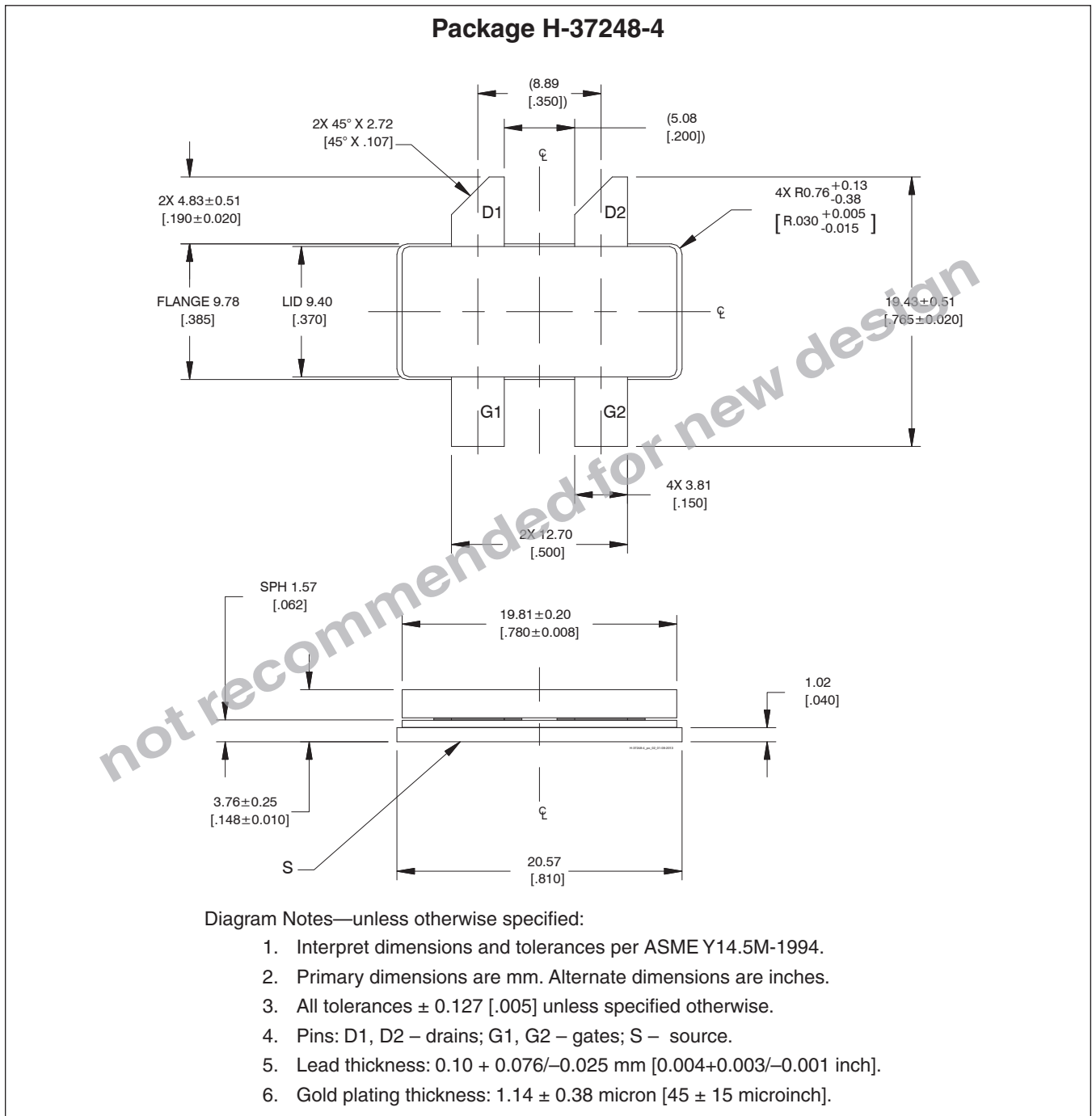
Components Information

Component	Description	Suggested Supplier	P/N
Input			
C101, C102	Capacitor, 10 μ 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 μ F	Digi-Key	587-1818-2-ND
C802	Chip capacitor, 1000 pF	Digi-Key	PCC1772CT-ND
C803	Capacitor, 1 μ 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 Ω	Digi-Key	3224W-202ECT-ND
S2	Transistor	Digi-Key	BCP56-ND
S3	Voltage Regulator	Digi-Key	LM7805
Output			
C201, C211	Chip capacitor, 1.2 pF	ATC	ATC800A1R2BT250XT
C202, C203, C204	Chip capacitor, 18 pF	ATC	ATC800A180JT250XT
C205, C208	Capacitor, 220 μ F	Digi-Key	PCE4444TR-ND
C206, C207, C209, C210	Capacitor, 10 μ F	Digi-Key	587-1818-2-ND

Pinout Diagram (top view)

Lead connections for PTFB181702FC

Package Outline Specifications



Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2012-05-29	Advance	All	Data Sheet reflects advance specification for product development
02	2012-10-15	Advance	All	Data sheet reflects released product specifications
02.1	2016-06-10	Production	2, 7	Updated ordering code to R0, revised package outline-minor changes
03	2018-02-21	Production	All	Not recommended for new design
04	2018-08-20	Production	All	Converted to Wolfspeed data sheet

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Notes

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