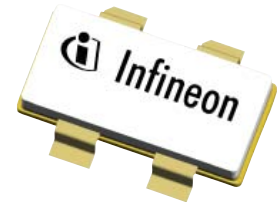


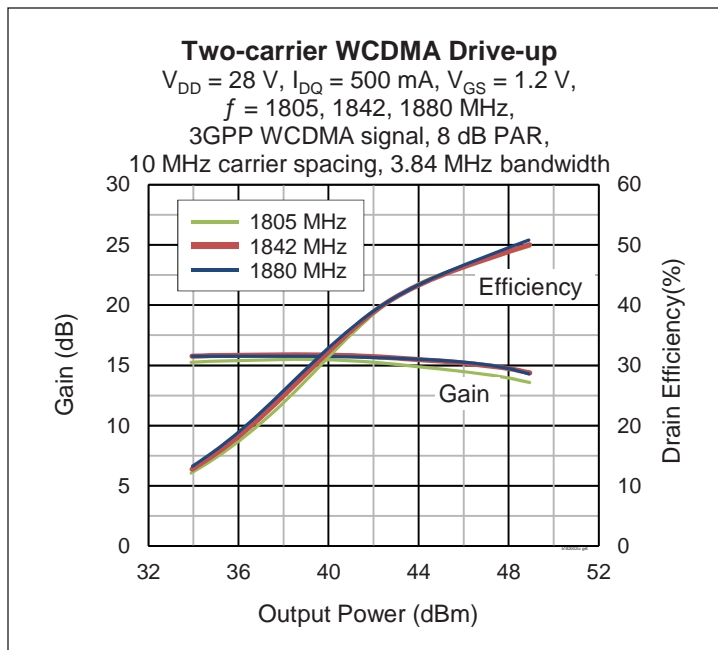
## Thermally-Enhanced High Power RF LDMOS FET 180 W, 28 V, 1805 – 1880 MHz

### Description

The PTAB182002TC is a 180-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 1805 to 1880 MHz frequency band. Features include input and output matching, high gain and a thermally-enhanced package with ear-less copper flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTAB182002TC  
Package H-49248H-4  
(formed leads)



### Features

- Asymmetric Doherty design
  - Main:  $P_{1dB} = 70\text{ W Typ}$
  - Peak:  $P_{1dB} = 120\text{ W Typ}$
- Broadband internal matching
- Integrated ESD protection
- Capable of handling 3:1 VSWR @ 30 V, 50 W (average) output power (one-carrier WCDMA signal, 10 dB PAR, Doherty test fixture)
- Copper flange for enhanced thermal performance
- Pb-free and RoHS-compliant

### RF Characteristics

**Two-carrier Specifications** (device with flat leads tested in an Infineon Doherty production test fixture)

$V_{DD} = 28\text{ V}$ ,  $V_{GSPK} = (V_{GS} \text{ at } I_{DQ} = 900\text{ mA}) - 1.90\text{ V}$ ,  $I_{DQ} = 520\text{ mA}$ ,  $P_{OUT} = 29\text{ W avg.}$ ,  $f_1 = 1870\text{ MHz}$ ,  $f_2 = 1880\text{ MHz}$ . 3GPP WCDMA signal: 3.84 MHz bandwidth, 7.5 dB PAR @ 0.01% CCDF.

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	$G_{ps}$	14.0	14.8	—	dB
Drain Efficiency	$\eta_D$	44	47	—	%
Intermodulation Distortion	IMD	—	-27.6	-24.0	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 (each side)	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	$V_{DS} = 28\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1.0	$\mu\text{A}$
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10.0	$\mu\text{A}$
Gate Leakage Current	$V_{GS} = 12\text{ V}, V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1.0	$\mu\text{A}$
On-state Resistance (main)	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.15	—	$\Omega$
On-state Resistance (peak)	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.09	—	$\Omega$
Operating Gate Voltage (main)	$V_{DS} = 28\text{ V}, I_{DQ} = 520\text{ mA}$	$V_{GS}$	2.5	3.0	3.5	V
Operating Gate Voltage (peak)	$V_{DS} = 28\text{ V}, I_{DQ} = 0\text{ mA}$	$V_{GS}$	0.7	1.1	1.5	V

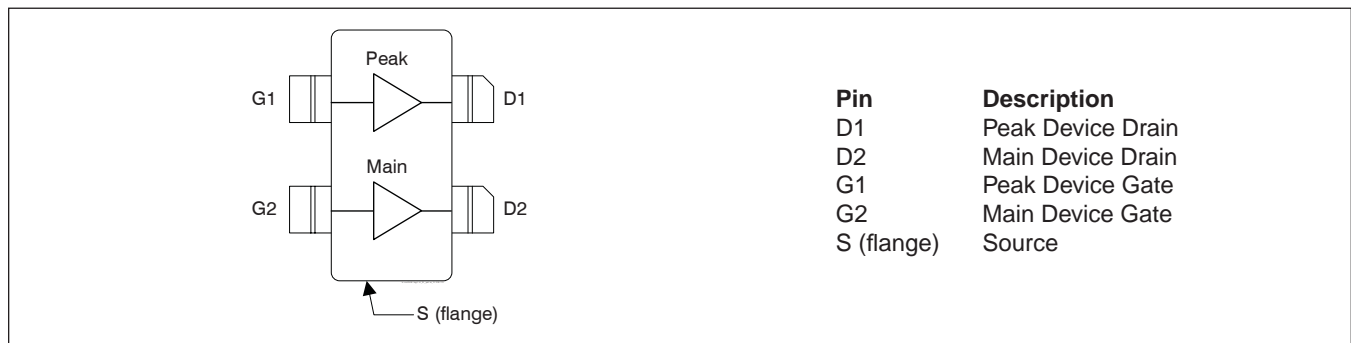
## Maximum Ratings

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 ( $T_{CASE} = 70^{\circ}\text{C}, 170\text{ W CW}$ )	$R_{qJC}$	0.34	$^{\circ}\text{C/W}$

## Ordering Information

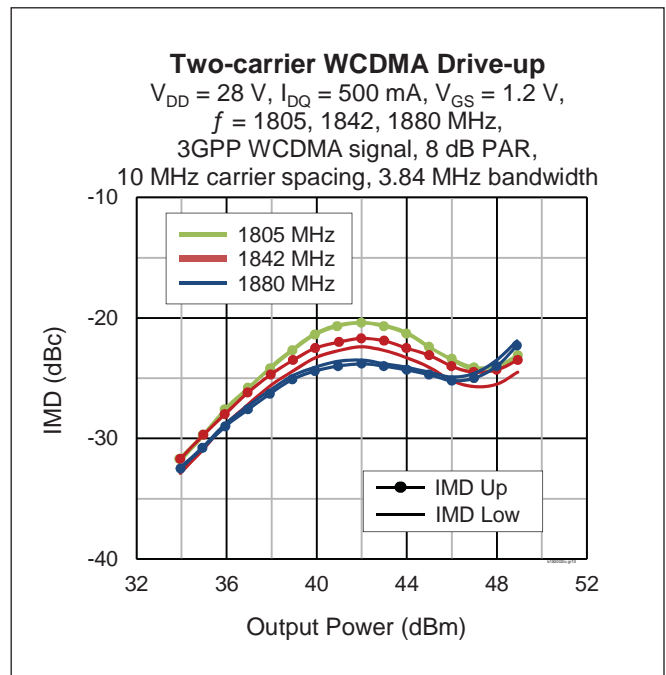
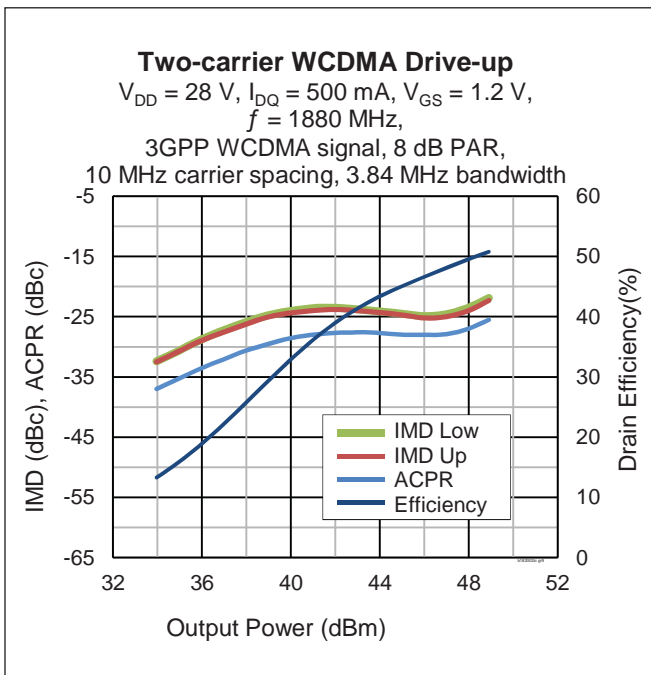
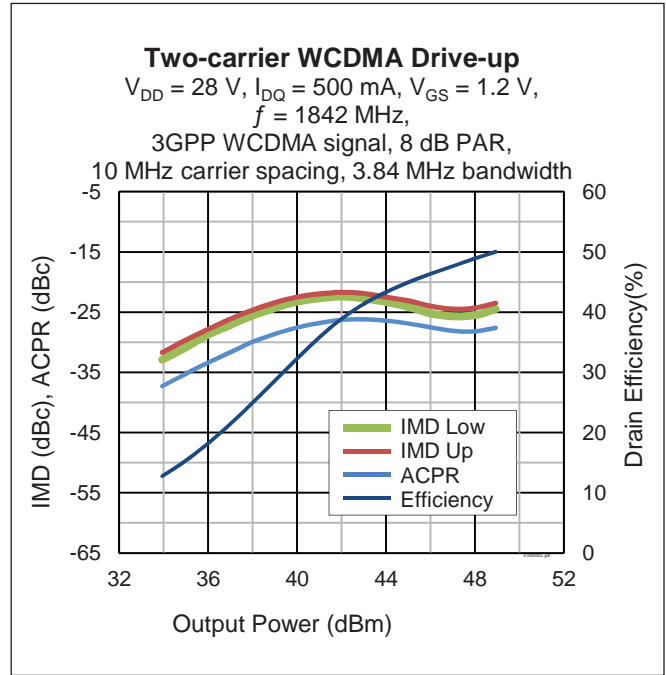
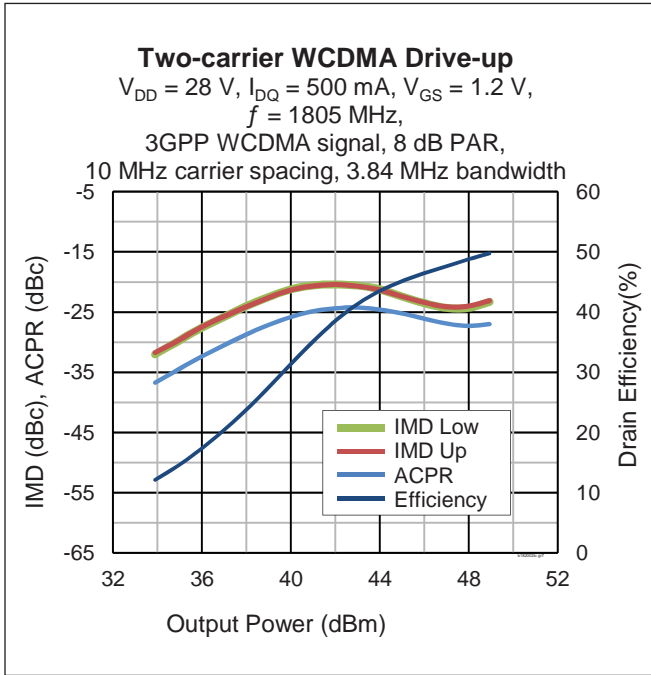
Type and Version	Order Code	Package and Description	Shipping
PTAB182002TC V2 R250	PTAB182002TCV2R250XTMA1	H-49248H-4, ceramic open-cavity, formed leads, earless	Tape & Reel, 250 pcs

## Pinout Diagram (top view)

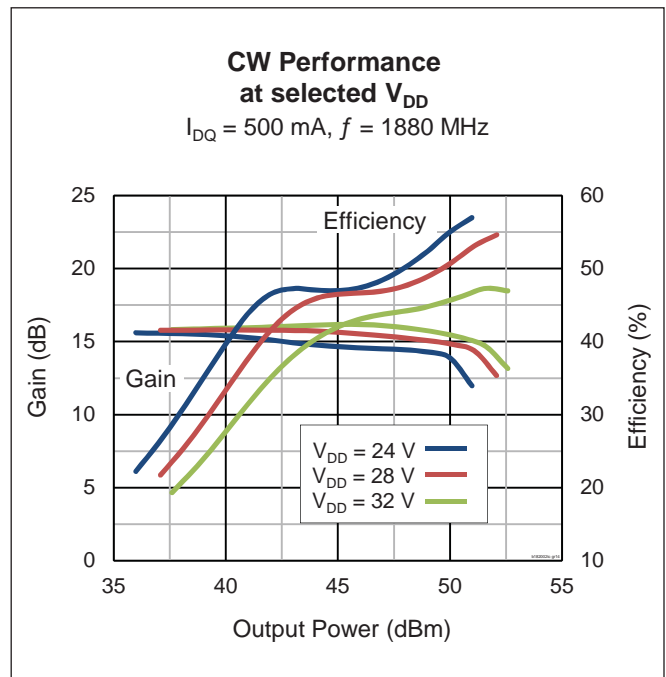
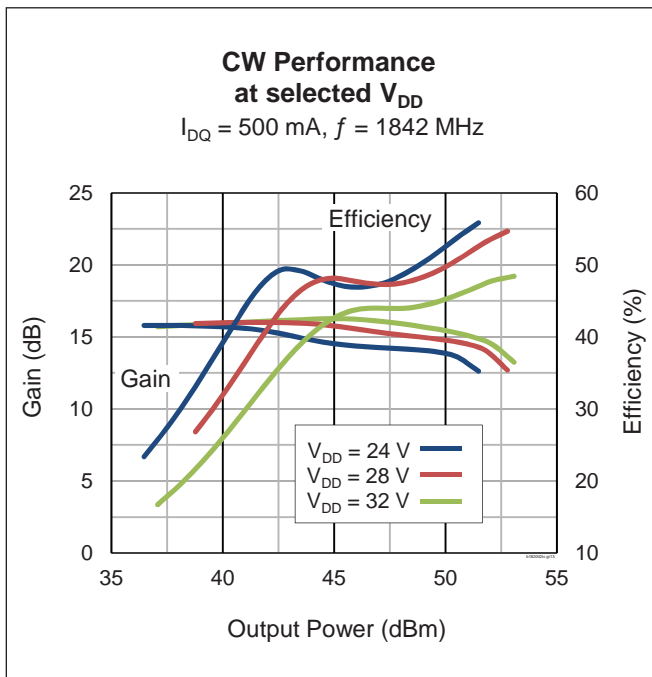
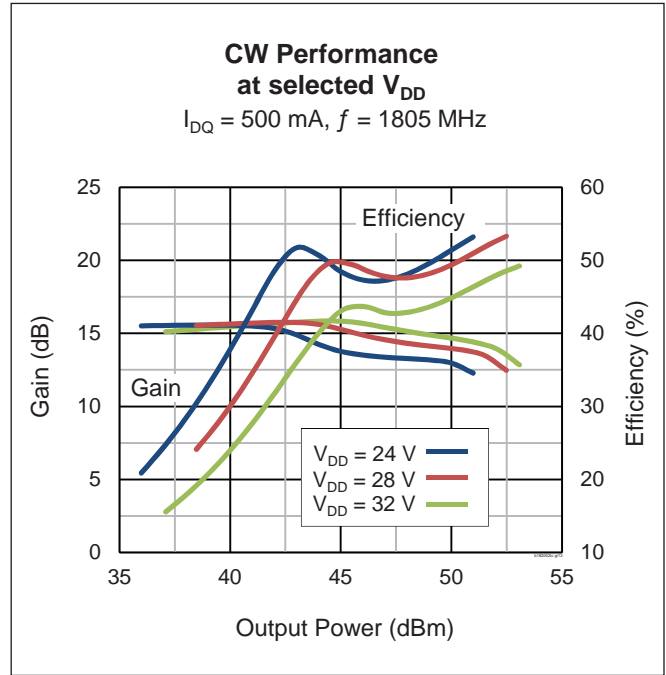
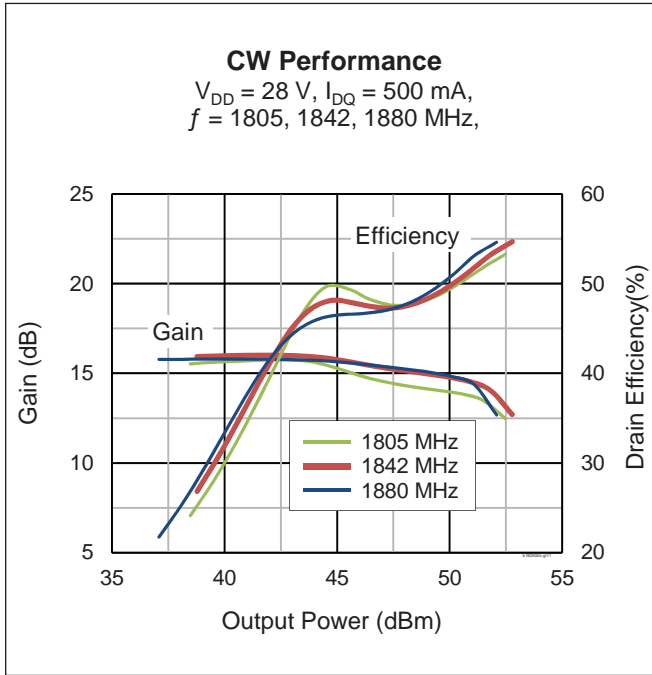


Lead connections for PTAB182002TC

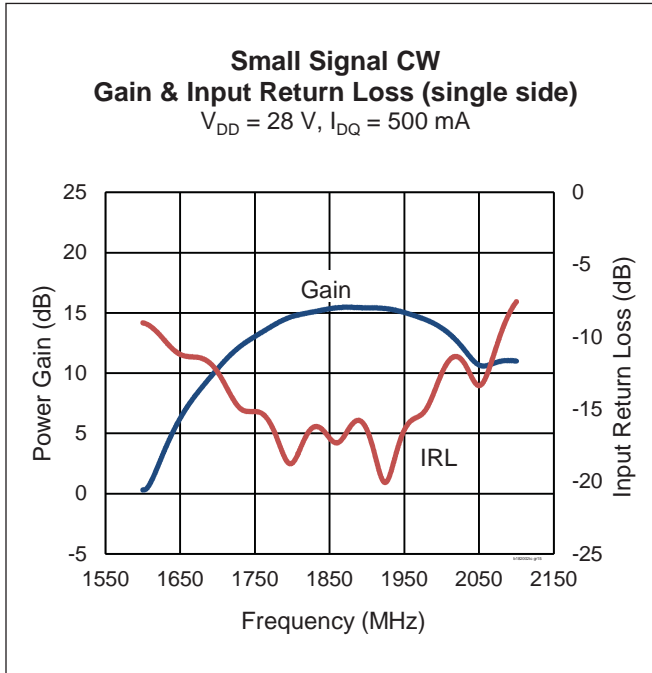
**Typical Performance** (data taken in a production Doherty test fixture)



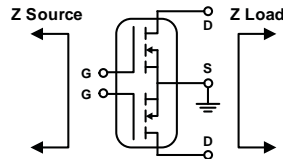
Typical Performance (cont.)



Typical Performance (cont.)



Load Pull Performance



Main Side Load Pull Performance – Pulsed CW signal: 16  $\mu$ sec, 10% duty cycle; 28 V, 530 mA

Freq [MHz]	Z Source [ $\Omega$ ]	Z Load [ $\Omega$ ]	Gain [dB]	P <sub>1dB</sub>			Z Load [ $\Omega$ ]	Gain [dB]	Max PAE		
				Max Output Power	Max PAE	Max PAE					
				P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]			P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]
1805	5.6 – j6.1	2.3 – j9.4	16.4	49.89	97	54.4	6.6 – j9.5	18.9	48.16	65	65.0
1842	12.4 – j12.7	2.1 – j9.4	15.9	50.03	101	53.6	5.4 – j8.6	18.7	48.21	66	66.0
1880	15.1 – j14.5	2.1 – j9.8	16.2	50.06	101	54.7	5.0 – j9.0	18.8	48.34	68	68.0

Peak Side Load Pull Performance – Pulsed CW signal: 16  $\mu$ sec, 10% duty cycle; 28 V, 850 mA

Freq [MHz]	Z Source [ $\Omega$ ]	Z Load [ $\Omega$ ]	Gain [dB]	P <sub>1dB</sub>			Z Load [ $\Omega$ ]	Gain [dB]	Max PAE		
				Max Output Power	Max PAE	Max PAE					
				P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]			P <sub>OUT</sub> [dBm]	P <sub>OUT</sub> [W]	PAE [%]
1805	7.5 – j8.9	1.5 – j9.3	18.2	51.47	140	52.8	2.4 – j8.3	20.1	50.17	104	62.5
1842	6.7 – j5.2	1.2 – j9.2	18.2	51.68	147	53.1	2.4 – j8.3	20.3	50.09	102	62.9
1880	5.5 – j6.8	1.4 – j9.7	18.7	51.35	136	54.0	2.4 – j8.3	20.5	49.95	99	62.2

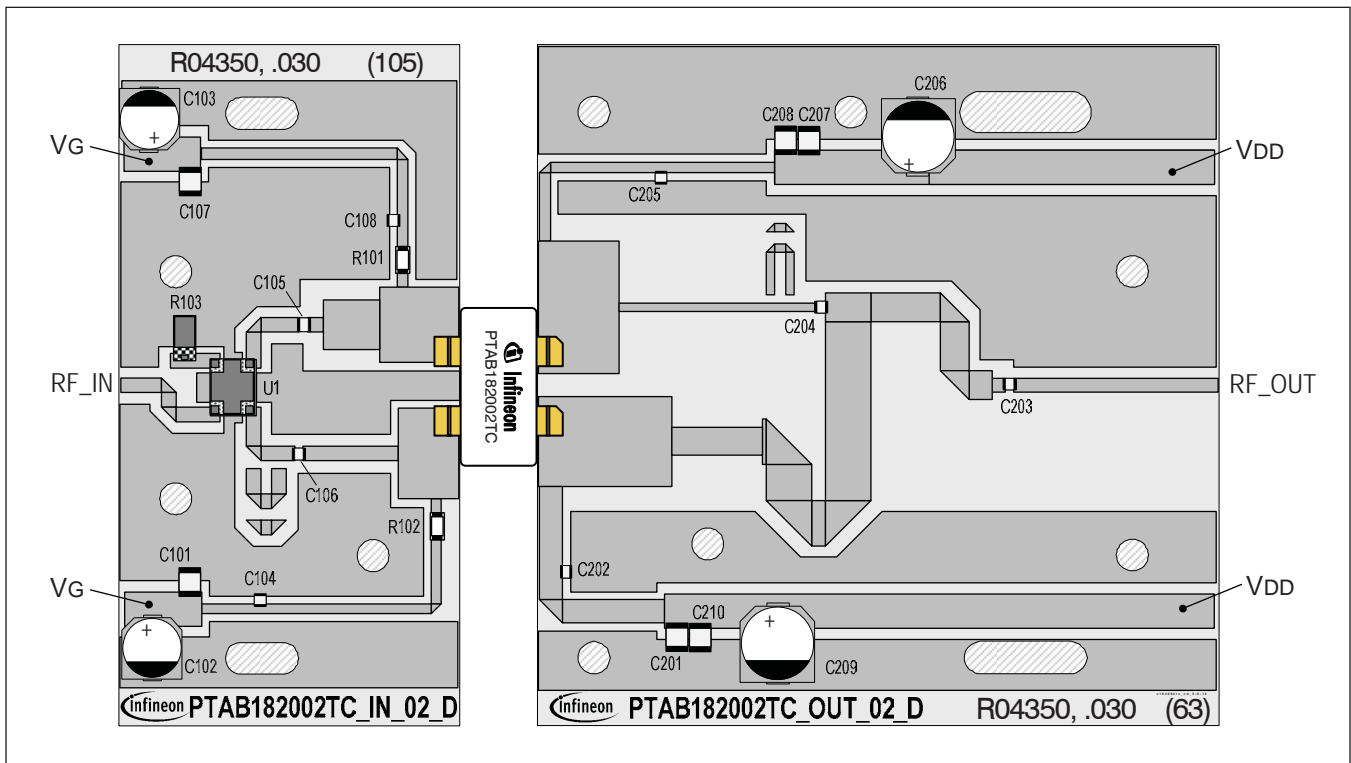
### Reference Circuit (1880 MHz)

DUT PTAB182002TC

Reference Circuit Part No. LTA/PTAB182002TC V2

PCB Rogers 4350, 0.762 mm [.030"] 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>)

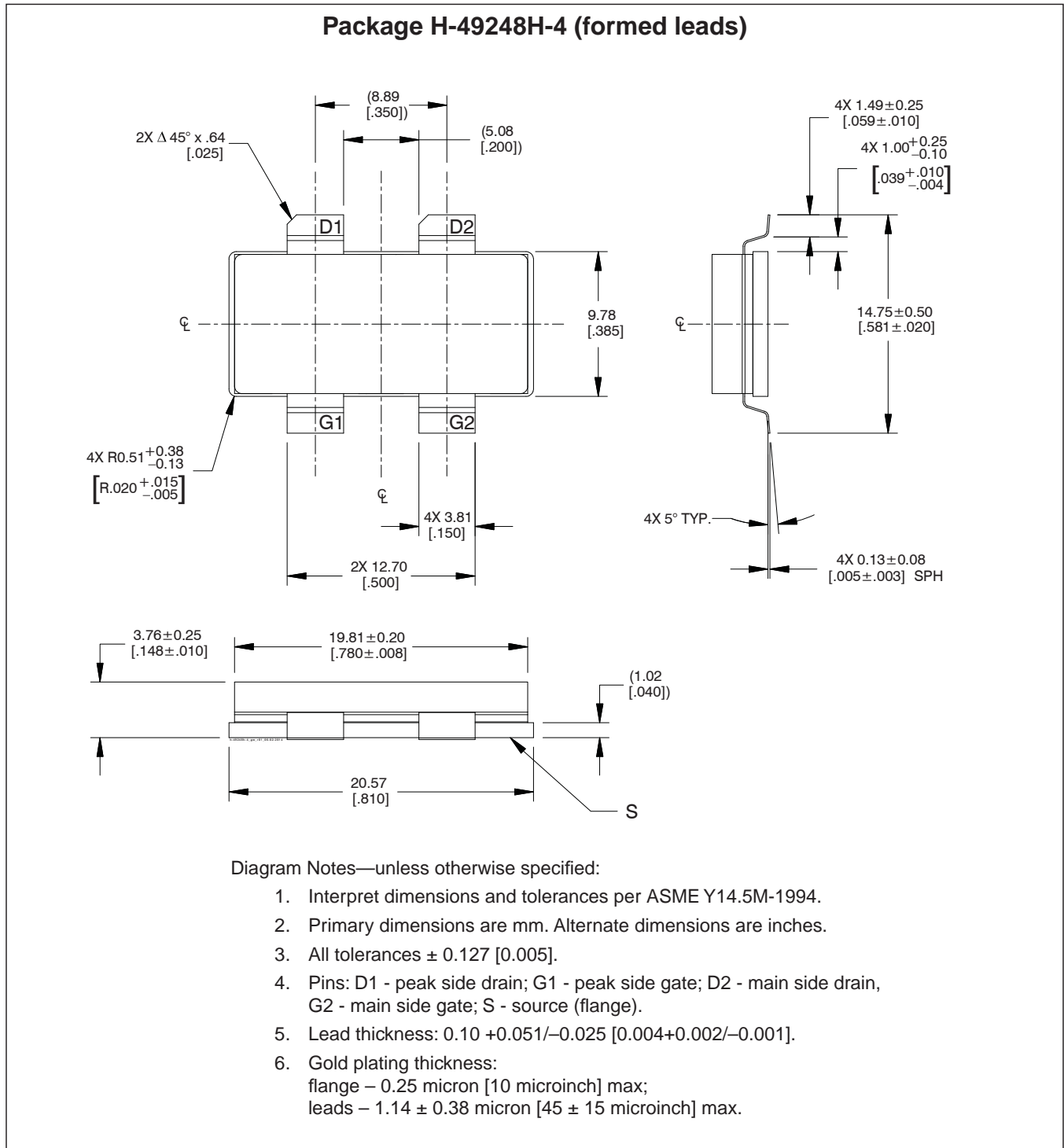


Reference circuit assembly diagram (not to scale)

### Components Information

Component	Description	Manufacturer	P/N
<b>Input</b>			
C101, C107	Capacitor, 10 $\mu$ F	Taiyo Yuden	UMK325C7106MM-T
C102, C103	Capacitor, 10 $\mu$ F	Panasonic Electronic Components – ECG	EEV-HD1H100P
C104, C105, C106, C108	Chip capacitor, 24 pF	ATC	ATC100A240JW150XB
R101, R102	Resistor, 10 $\Omega$	Panasonic Electronic Components – ECG	ERJ-8GEYJ100V
R103	Resistor, 50 $\Omega$	Anaren	C16A50Z4
U1	RF Directional Coupler	Anaren	X3C19P1-05S
<b>Output</b>			
C201, C207, C208, C210	Capacitor, 10 $\mu$ F	Taiyo Yuden	UMK325C7106MM-T
C202, C203, C204, C205	Chip capacitor, 24 pF	ATC	ATC100A240JW150XB
C206, C209	Capacitor, 220 $\mu$ F	Panasonic Electronic Components – ECG	EEE-FP1V221AP

### Package Outline Specifications



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

## Revision History

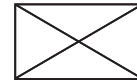
Revision	Date	Data Sheet	Page	Subjects (major changes in comparison with previous revisions)
01	2012-12-03	Advance	all	Preliminary specifications for this product
02	2012-12-21	Preliminary	all	Product further developed
03	2013-06-02	Production	all	Final characterization of production-released product
04	2014-07-01	Production	all	Product now Version 2 due to package change
			1, 2	Features and tables updated

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