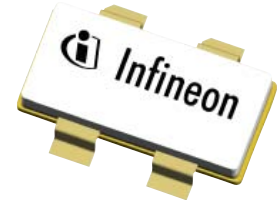


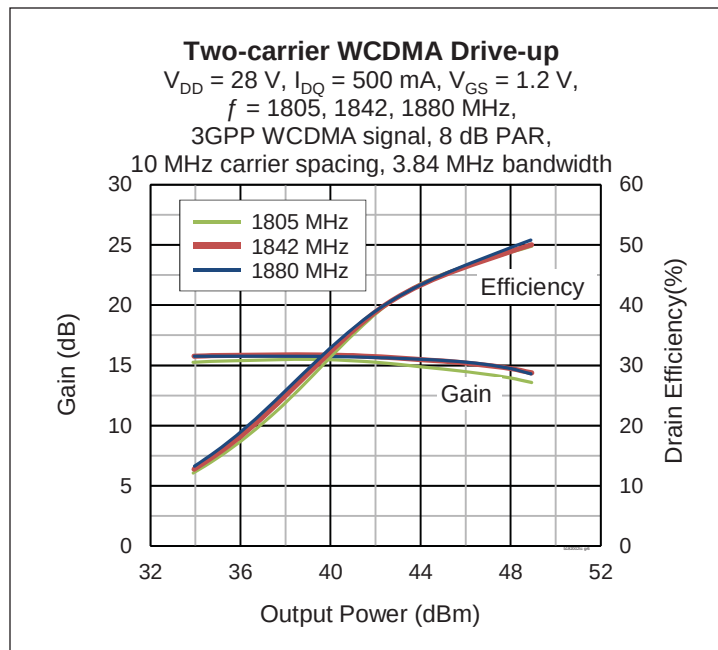
Thermally-Enhanced High Power RF LDMOS FET 180 W, 28 V, 1805 – 1880 MHz

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	η_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	μA
	$V_{DS} = 63\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10.0	μA
Gate Leakage Current	$V_{GS} = 12\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1.0	μA
On-state Resistance (main)	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.15	—	Ω
On-state Resistance (peak)	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.09	—	Ω
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

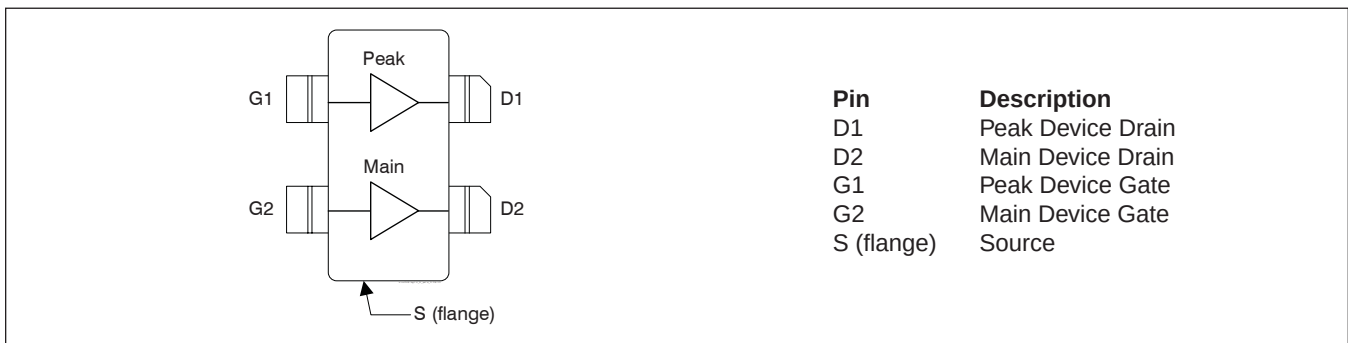
Maximum Ratings

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 W CW)	R_{qJC}	0.34	$^{\circ}\text{C/W}$

Ordering Information

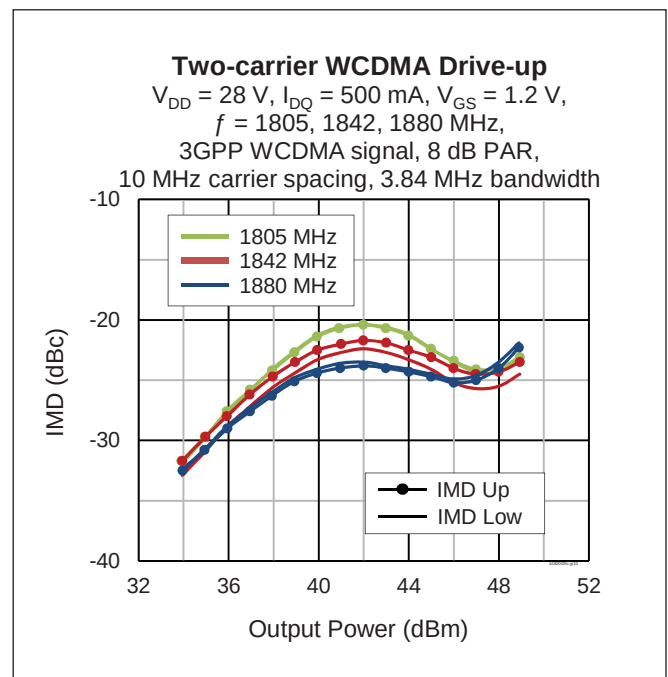
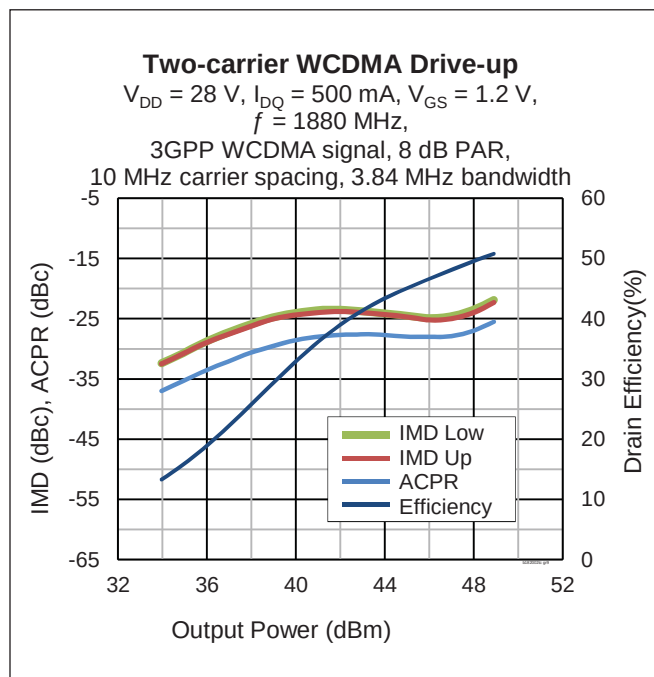
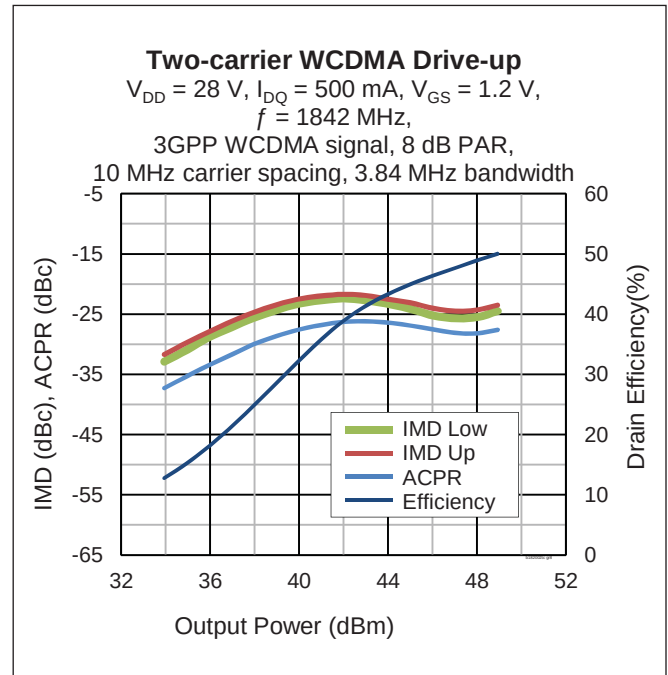
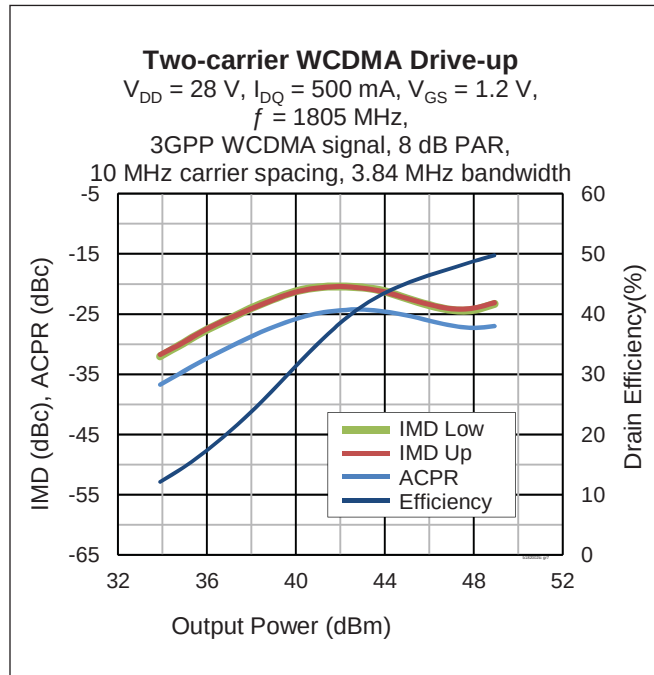
Type and Version	Order Code	Package and Description	Shipping
PTAB182002TC V2 R250	PTAB182002TCV2R250XTMA1	H-49248H-4, ceramic open-cavity, formed leads, earless	Tape & Reel, 250 pcs

Pinout Diagram (top view)

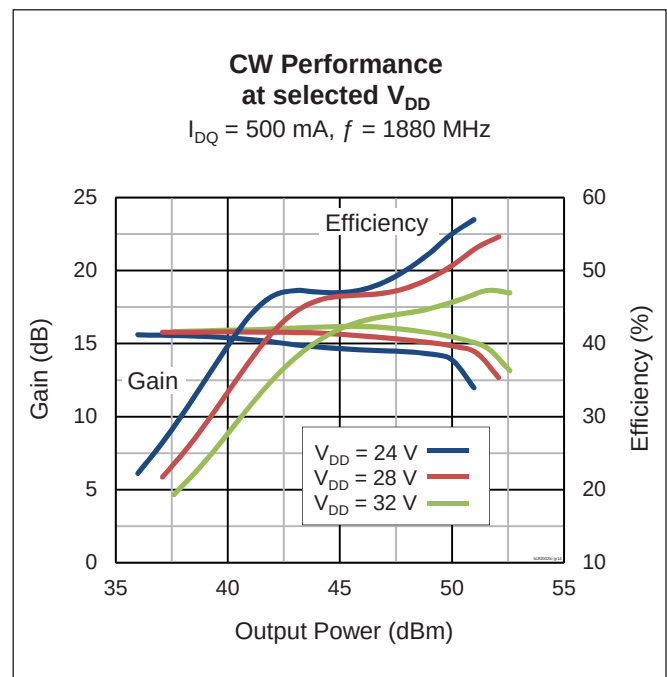
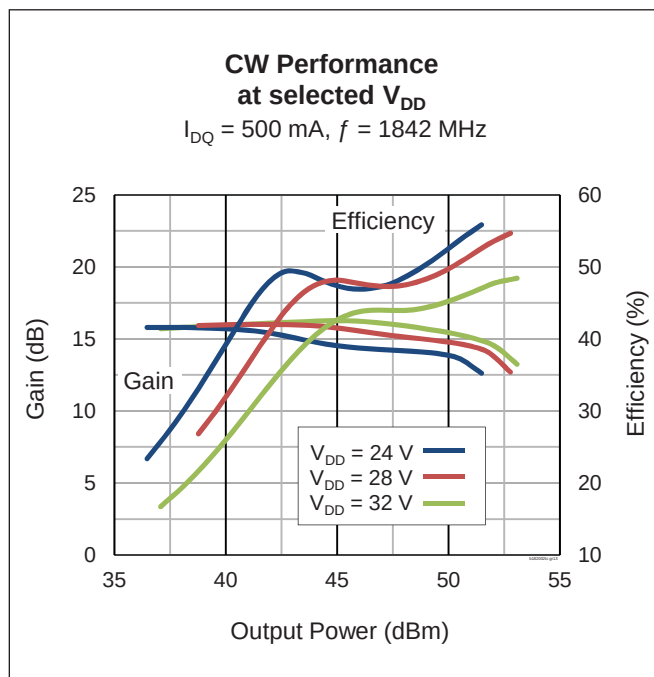
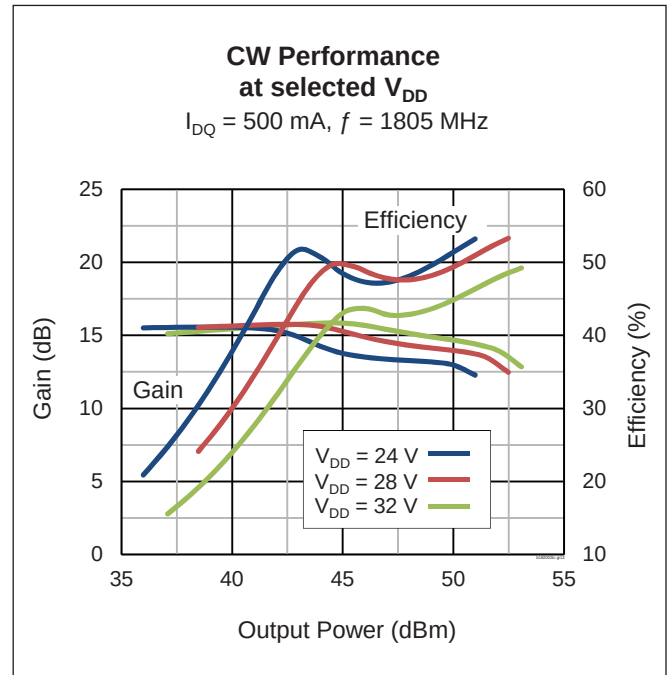
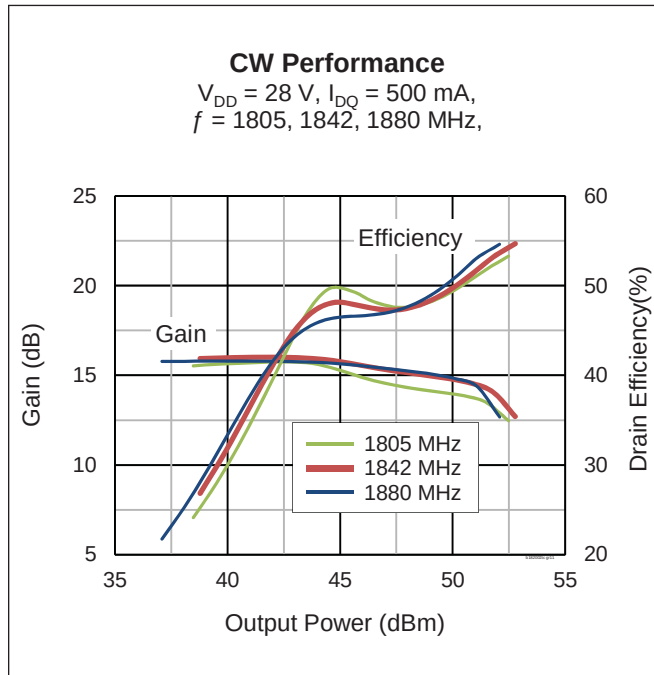


Lead connections for PTAB182002TC

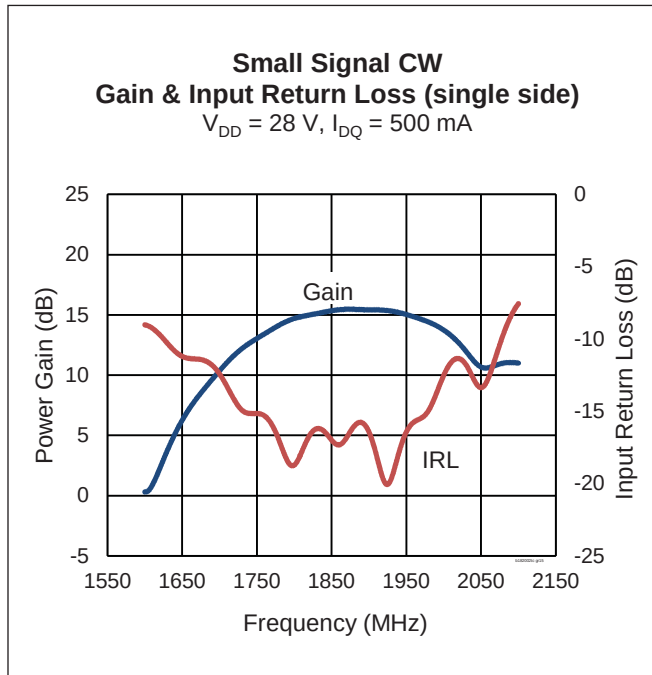
Typical Performance (data taken in a production Doherty test fixture)



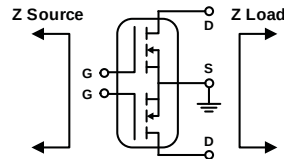
Typical Performance (cont.)



Typical Performance (cont.)



Load Pull Performance



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

Freq [MHz]	Z Source [Ω]	Z Load [Ω]	Gain [dB]	P _{1dB}			Z Load [Ω]	Gain [dB]	Max PAE		
				Max Output Power	P _{OUT} [W]	PAE [%]			P _{OUT} [dBm]	P _{OUT} [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 μsec , 10% duty cycle; 28 V, 850 mA

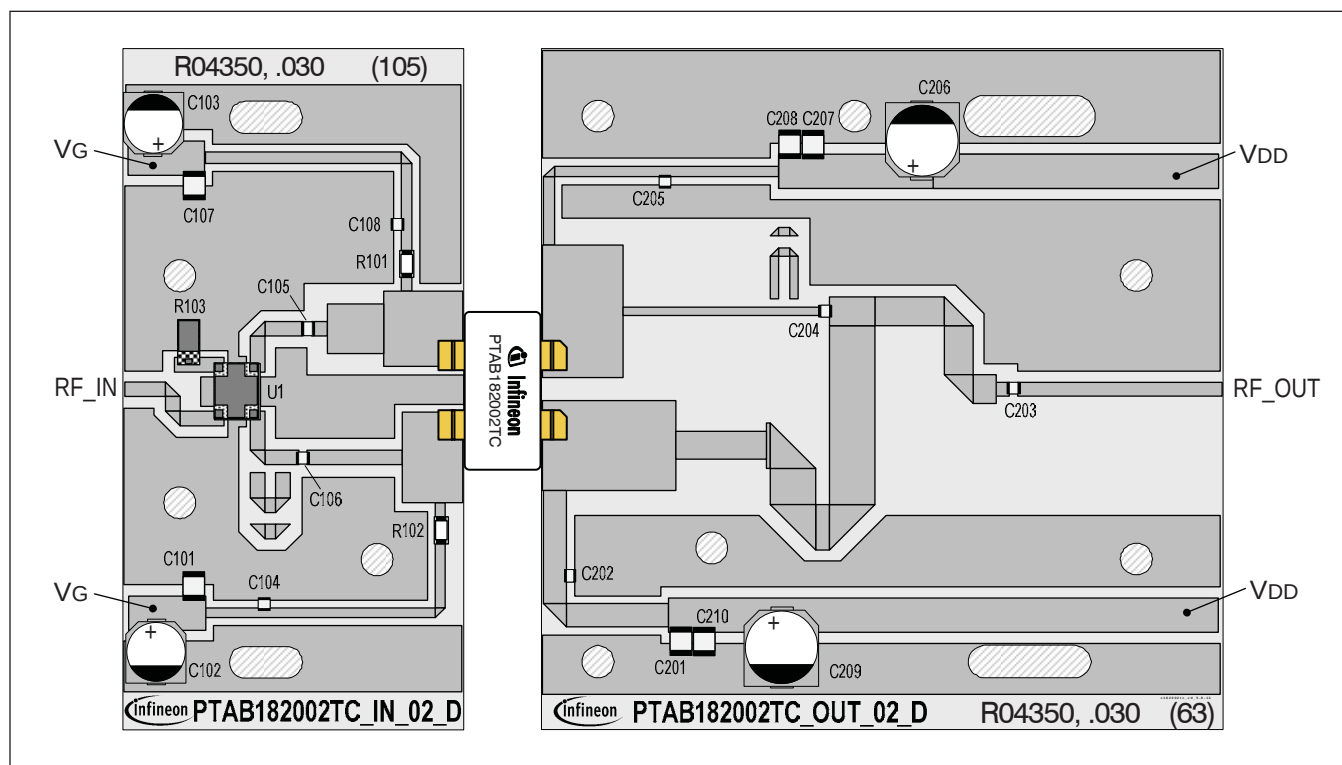
Freq [MHz]	Z Source [Ω]	Z Load [Ω]	Gain [dB]	P _{1dB}			Z Load [Ω]	Gain [dB]	Max PAE		
				Max Output Power	P _{OUT} [W]	PAE [%]			P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]
1805	7.5 – j8.9	1.5 – j9.3	18.2	51.47	140	52.8	2.4 – j8.3	20.1	50.17	104	62.5
1842	6.7 – j5.2	1.2 – j9.2	18.2	51.68	147	53.1	2.4 – j8.3	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
Input			
C101, C107	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
C102, C103	Capacitor, 10 μ F	Panasonic Electronic Components – ECG	EEV-HD1H100P
C104, C105, C106, C108	Chip capacitor, 24 pF	ATC	ATC100A240JW150XB
R101, R102	Resistor, 10 Ω	Panasonic Electronic Components – ECG	ERJ-8GEYJ100V
R103	Resistor, 50 Ω	Anaren	C16A50Z4
U1	RF Directional Coupler	Anaren	X3C19P1-05S
Output			
C201, C207, C208, C210	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
C202, C203, C204, C205	Chip capacitor, 24 pF	ATC	ATC100A240JW150XB
C206, C209	Capacitor, 220 μ F	Panasonic Electronic Components – ECG	EEE-FP1V221AP

Package Outline Specifications

Package H-49248H-4 (formed leads)

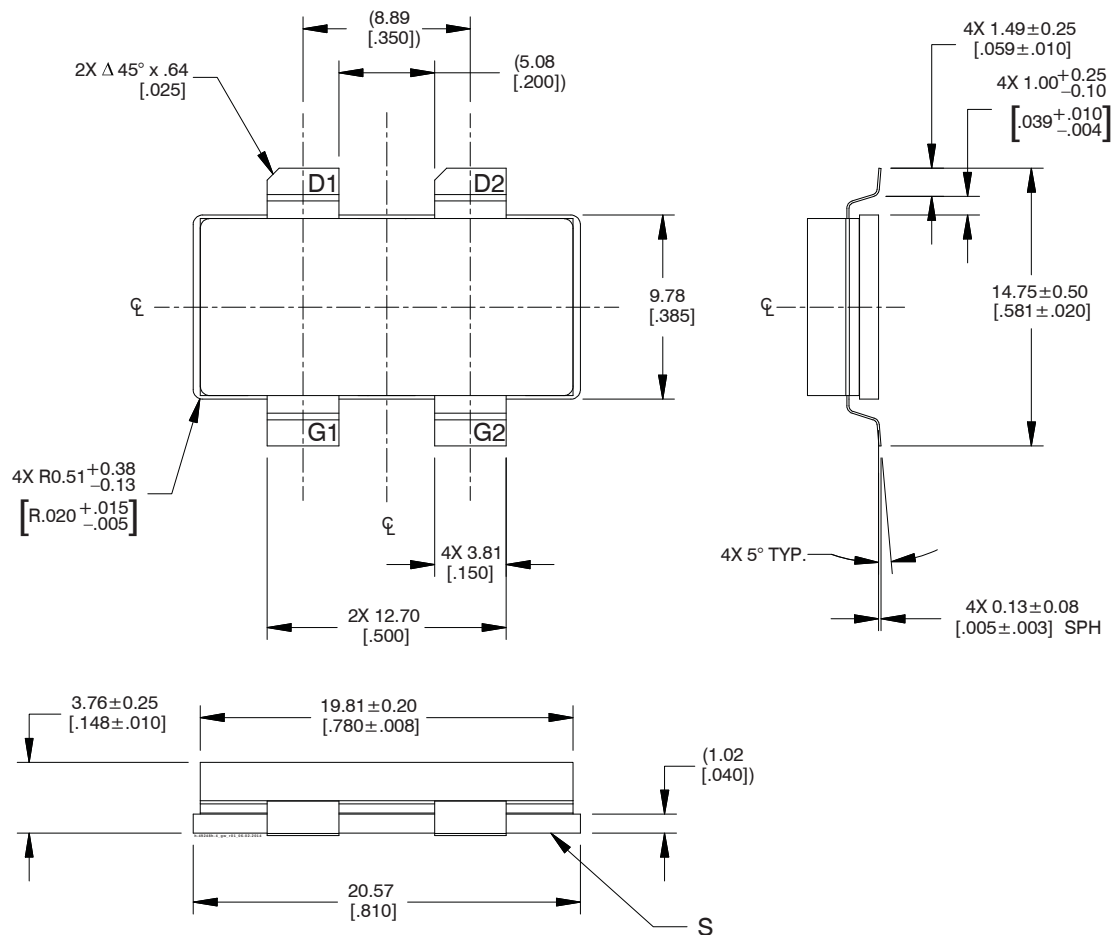


Diagram Notes—unless otherwise specified:

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].
4. Pins: D1 - peak side drain; G1 - peak side gate; D2 - main side drain, G2 - main side gate; S - source (flange).
5. Lead thickness: $0.10 + 0.051/-0.025$ [0.004+0.002/-0.001].
6. Gold plating thickness:
flange – 0.25 micron [10 microinch] max;
leads – 1.14 ± 0.38 micron [45 ± 15 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

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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