



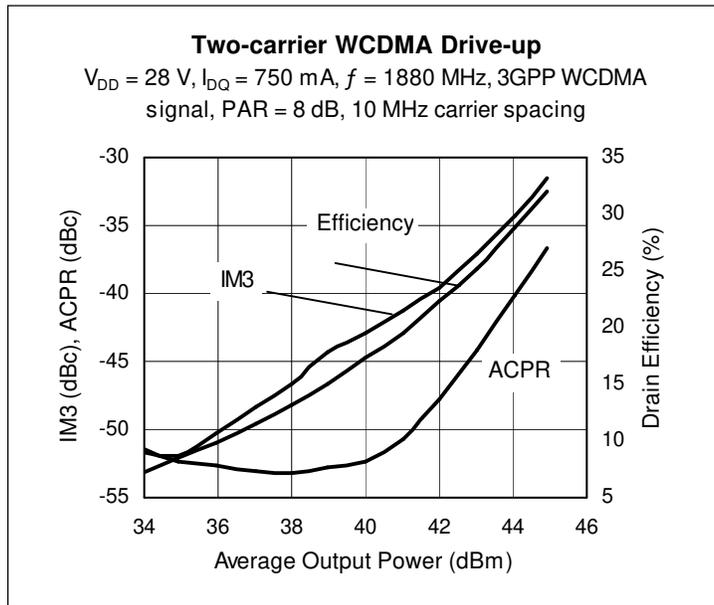
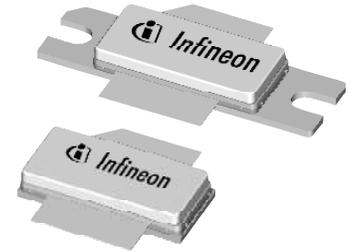
## Thermally-Enhanced High Power RF LDMOS FETs 100 W, 1805 – 1880 MHz

### Description

The PTFA181001GL and PTFA181001HL are 100-watt LDMOS FETs designed for EDGE and WCDMA power amplifier applications in the 1805 to 1880 MHz band. Features include input and output matching, and thermally-enhanced open-cavity packages with copper flanges. Manufactured with Infineon's advanced LDMOS process, these devices provide excellent thermal performance and superior reliability.

PTFA181001GL\*  
Package PG-63248-2

PTFA181001HL\*  
Package PG-64248-2



### Features

- Thermally-enhanced, plastic open-cavity (EPOC™) packages with copper flanges, Pb-free and RoHS compliant
- Broadband internal matching
- Typical EDGE performance at 1879.8 MHz, 28 V
  - Average output power = 45 W
  - Linear Gain = 16.5 dB
  - Efficiency = 36%
  - EVM RMS = 1.8%
- Typical CW performance, 1880 MHz, 28 V
  - Output power at P-1dB = 120 W
  - Gain 15.5 dB
  - Efficiency = 52%
- Integrated ESD protection: Human Body Model, Class 2 (minimum)
- Excellent thermal stability
- Capable of handling 10:1 VSWR @ 28 V, 100 W (CW) output power

### RF Characteristics

#### EDGE Measurements (not subject to production test—verified by design/characterization in Infineon test fixture)

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 750\text{ mA}$ ,  $P_{OUT} = 45\text{ W (AVG)}$ ,  $f = 1879.8\text{ MHz}$

Characteristic	Symbol	Min	Typ	Max	Unit
Error Vector Magnitude	RMS EVM	—	1.8	—	%
Modulation Spectrum @ 400 KHz	ACPR	—	-61	—	dBc
Modulation Spectrum @ 600 KHz	ACPR	—	-73	—	dBc
Gain	$G_{ps}$	—	16.5	—	dB
Drain Efficiency	$\eta_D$	—	36	—	%

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

\*See Infineon distributor for future availability.

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

## RF Characteristics (cont.)

### Two-tone Measurements (tested in Infineon test fixture)

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 750\text{ mA}$ ,  $P_{OUT} = 100\text{ W PEP}$ ,  $f = 1850\text{ MHz}$ , tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	$G_{ps}$	—	16.5	—	dB
Drain Efficiency	$\eta_D$	—	41	—	%
Intermodulation Distortion	IMD	—	-30	—	dBc

## 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	$V_{DS} = 28\text{ V}$ , $V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1.0	$\mu\text{A}$
	$V_{DS} = 63\text{ V}$ , $V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	10.0	$\mu\text{A}$
On-State Resistance	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.085	—	$\Omega$
Operating Gate Voltage	$V_{DS} = 28\text{ V}$ , $I_D = 750\text{ mA}$	$V_{GS}$	2.0	2.5	3.0	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1.0	$\mu\text{A}$

## Maximum Ratings

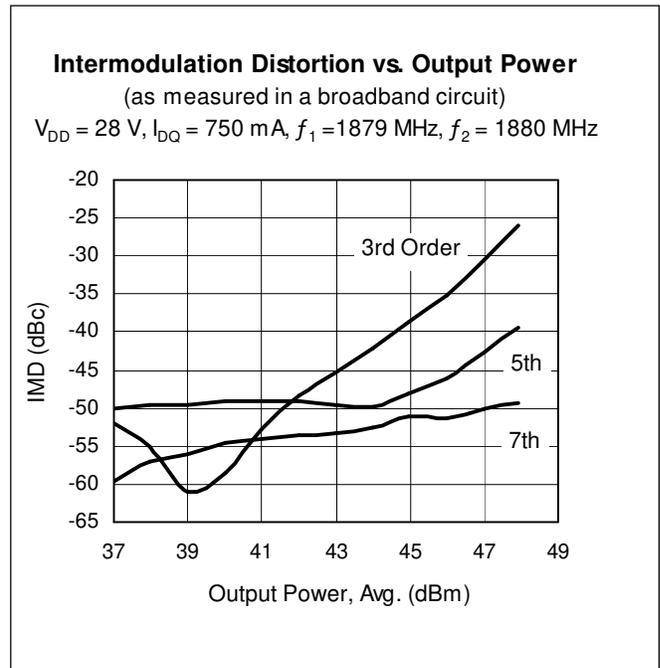
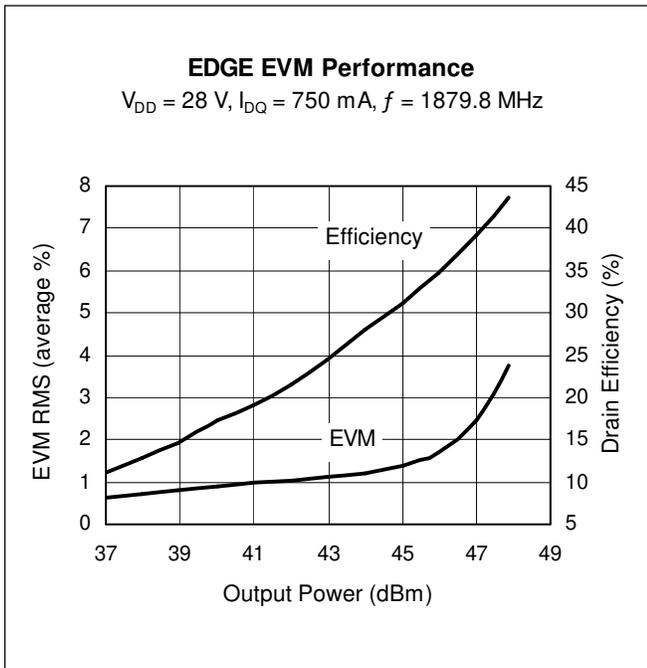
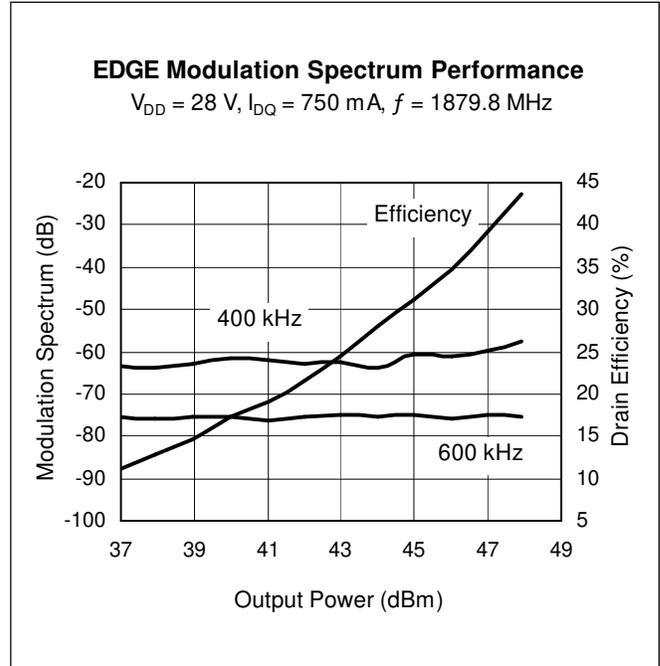
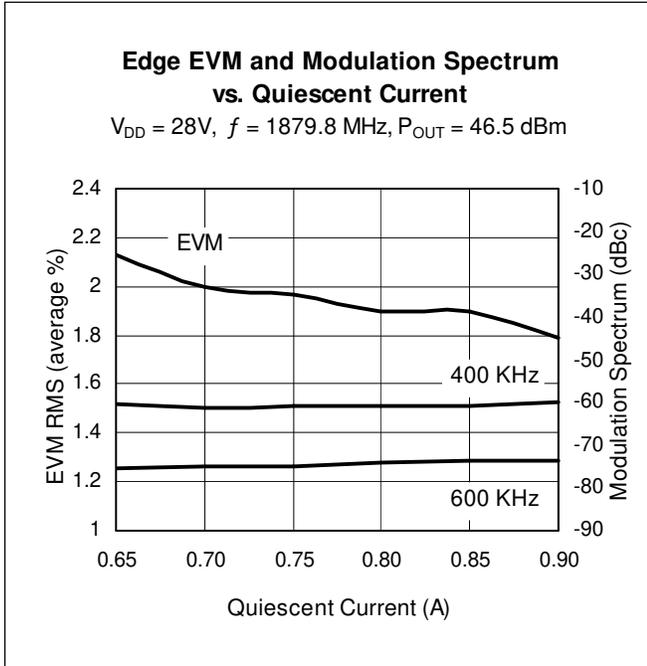
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	65	V
Gate-Source Voltage	$V_{GS}$	-0.5 to +12	V
Junction Temperature	$T_J$	200	$^{\circ}\text{C}$
Total Device Dissipation Above 25 $^{\circ}\text{C}$ derate by	$P_D$	TBD	W
		TBD	W/ $^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^{\circ}\text{C}$
Thermal Resistance ( $T_{CASE} = 70^{\circ}\text{C}$ , 100 W CW)	$R_{\theta JC}$	TBD	$^{\circ}\text{C/W}$

## Ordering Information

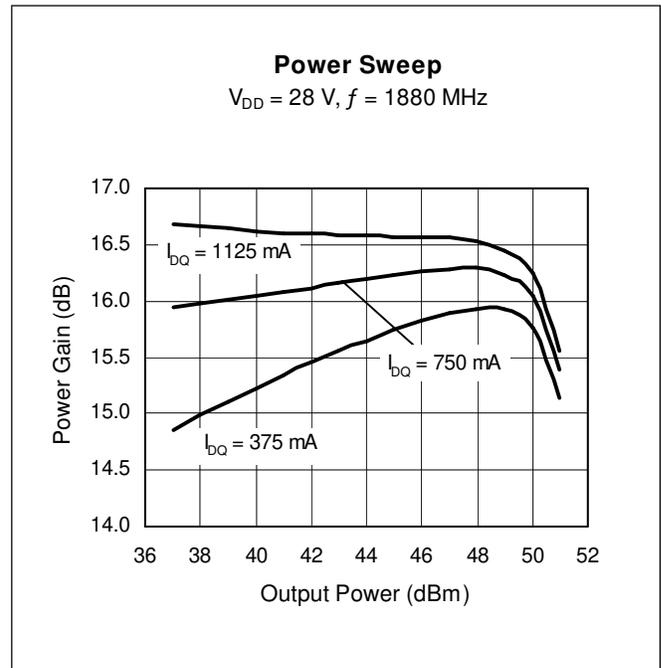
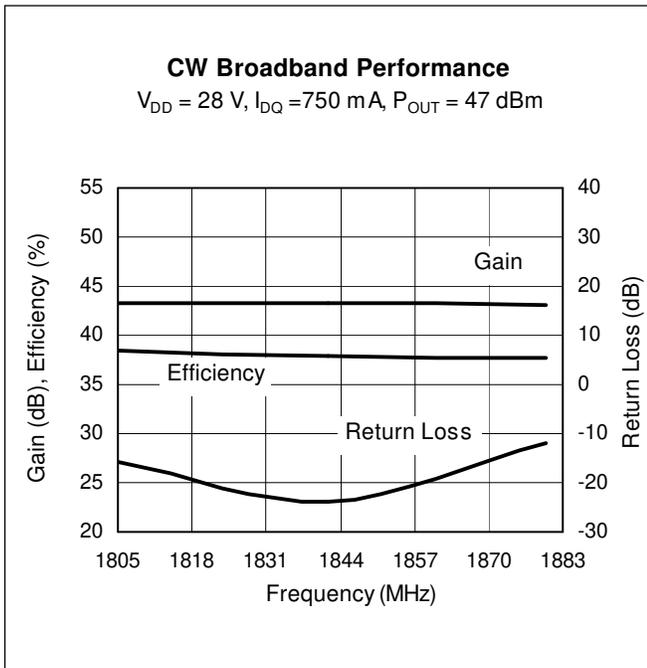
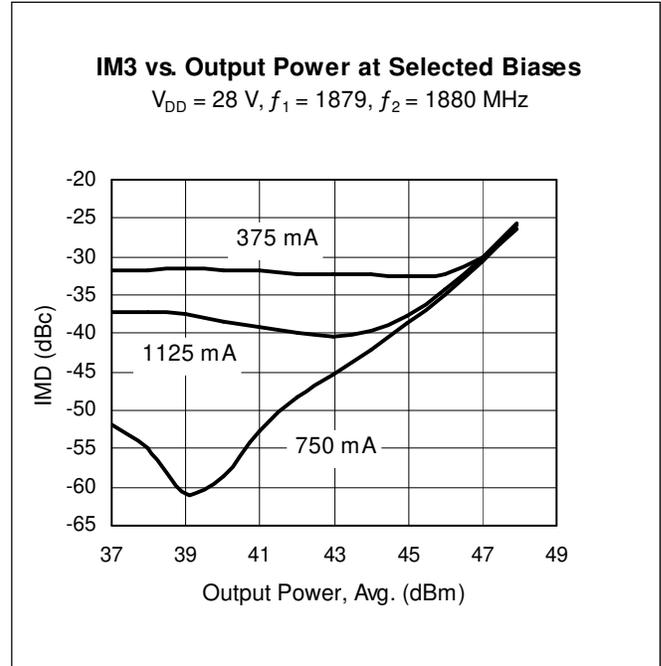
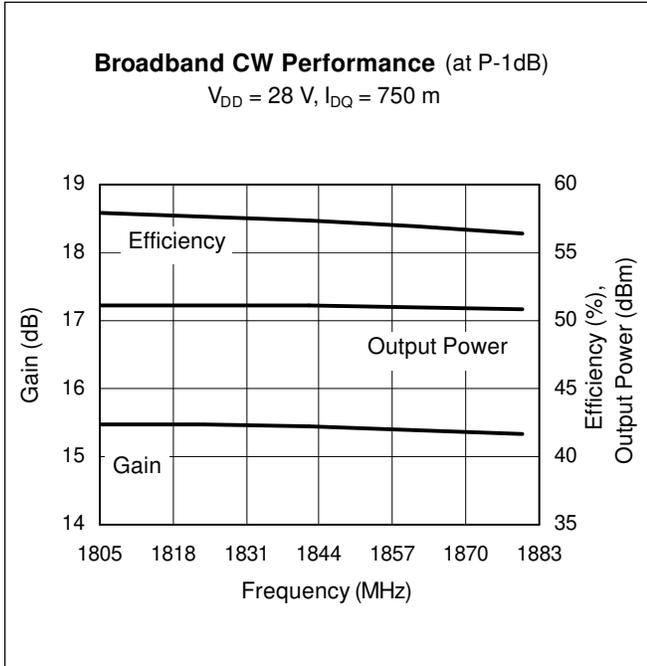
Type and Version	Package Type	Package Description	Shipping	Marking
PTFA181001GL* V1	PG-63248-2	Thermally-enhanced, plastic open-cavity, slotted flange, single-ended	Tray	PTFA181001GL
PTFA181001HL* V1	PG-64248-2	Thermally-enhanced, plastic open-cavity, earless flange, single-ended	Tray	PTFA181001HL

\*See Infineon distributor for future availability.

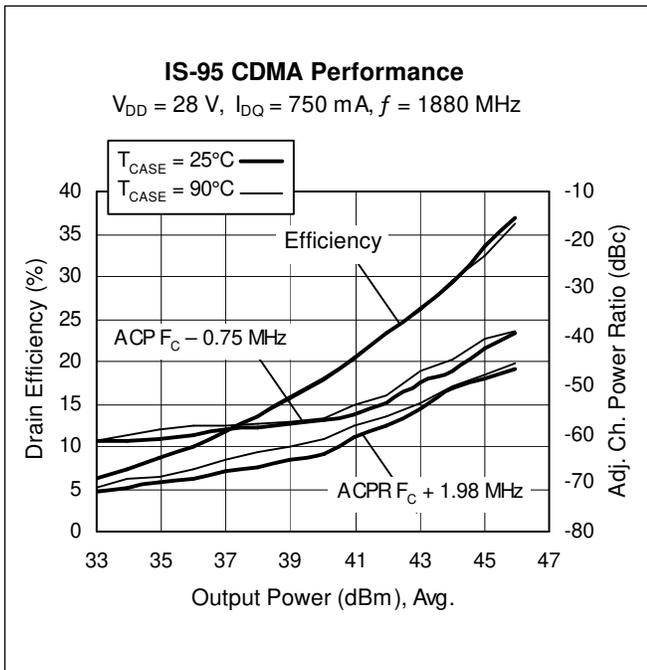
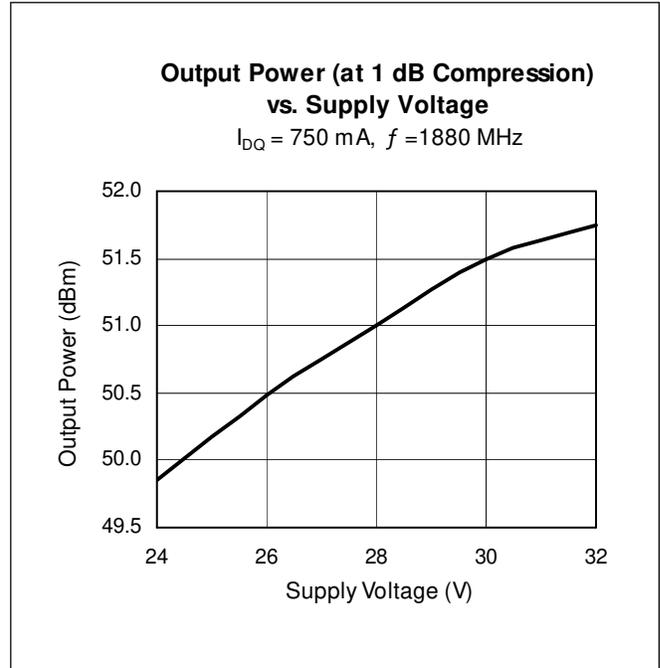
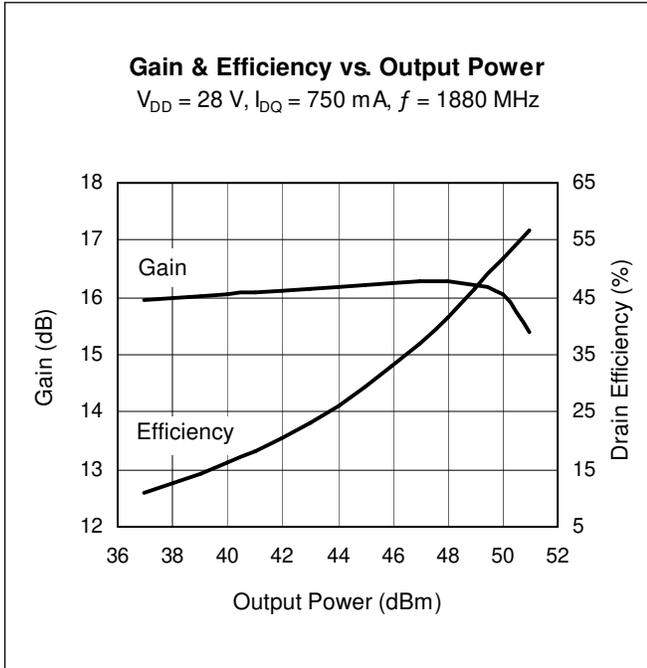
**Typical Performance** (data taken in a production test fixture)



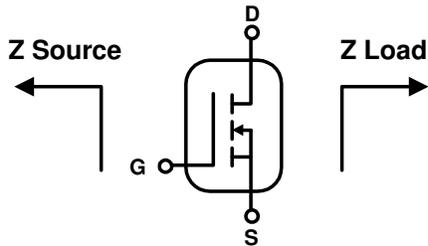
Typical Performance (cont.)



Typical Performance (cont.)



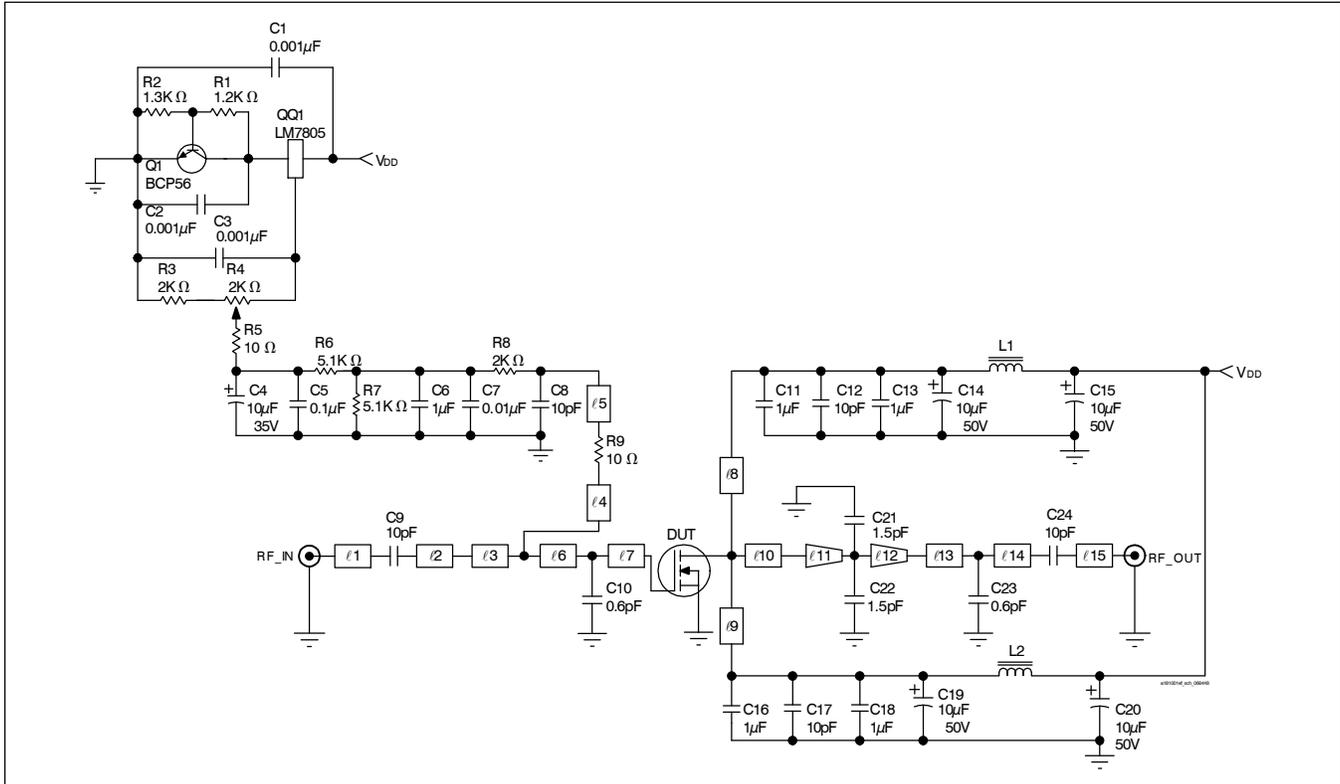
### Broadband Circuit Impedance



Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
1805	4.62	-6.23	1.50	-3.87
1830	4.18	-6.10	1.51	-3.46
1850	4.20	-6.13	1.50	-3.16
1860	4.58	-6.20	1.49	-3.00
1880	4.42	-6.36	1.48	-2.62

See next page for reference circuit

### Reference Circuit



Reference circuit schematic for  $f = 1880 \text{ MHz}$

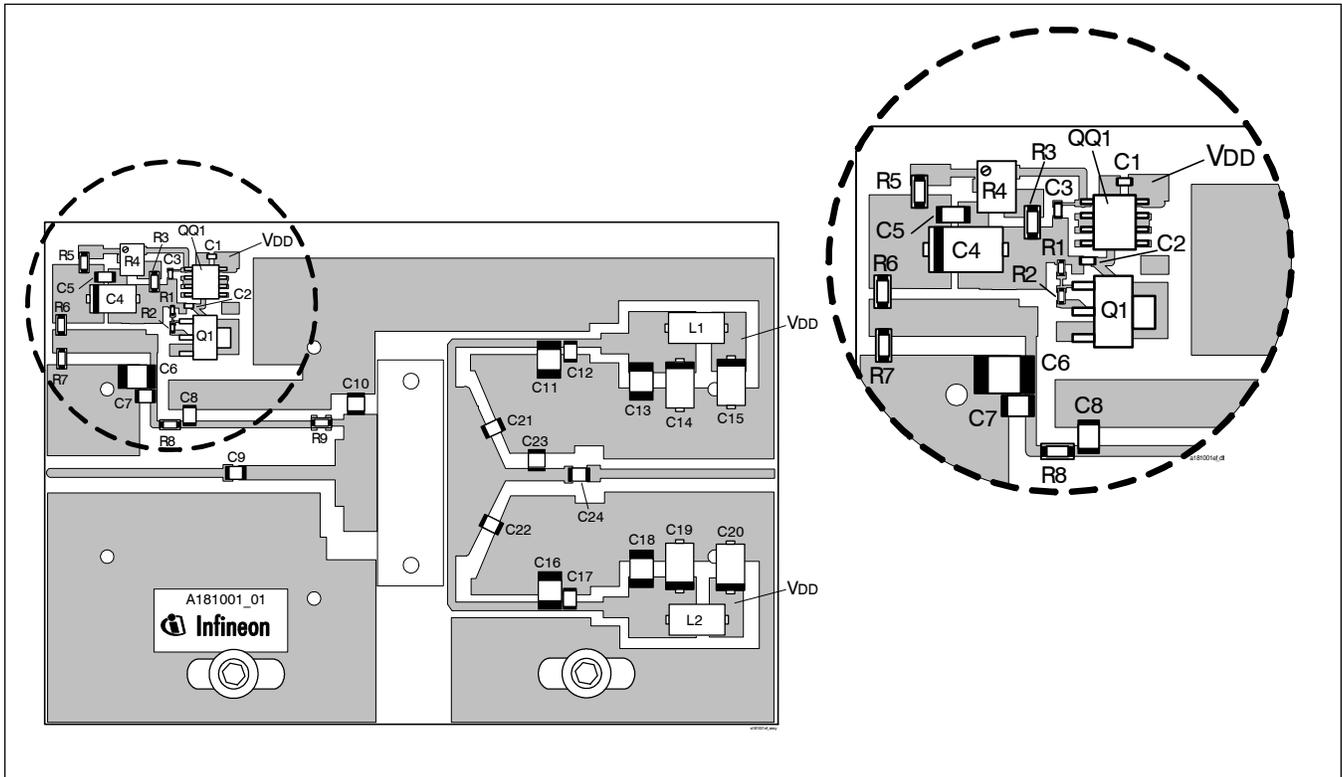
### Circuit Assembly Information

DUT	PTFA181001GL or PTFA181001HL	LDMOS Transistor	
PCB	0.76 mm [.030"] thick, $\epsilon_r = 4.5$	Rogers TMM4	2 oz. copper

Microstrip	Electrical Characteristics at 1880 MHz <sup>1</sup>	Dimensions: L x W (mm)	Dimensions: L x W (in.)
l1	0.314 $\lambda$ , 50.0 $\Omega$	27.43 x 1.37	1.080 x 0.054
l2	0.172 $\lambda$ , 38.0 $\Omega$	14.73 x 2.16	0.580 x 0.085
l3	0.016 $\lambda$ , 11.4 $\Omega$	1.27 x 10.16	0.050 x 0.400
l4	0.024 $\lambda$ , 60.0 $\Omega$	2.24 x 0.99	0.088 x 0.039
l5	0.218 $\lambda$ , 60.0 $\Omega$	19.33 x 0.99	0.761 x 0.039
l6	0.019 $\lambda$ , 6.9 $\Omega$	1.52 x 17.78	0.060 x 0.700
l7	0.044 $\lambda$ , 6.9 $\Omega$	3.43 x 17.78	0.135 x 0.700
l8, l9	0.233 $\lambda$ , 53.0 $\Omega$	20.45 x 1.24	0.805 x 0.049
l10	0.039 $\lambda$ , 4.9 $\Omega$	3.10 x 25.65	0.122 x 1.010
l11 (taper)	0.037 $\lambda$ , 4.9 $\Omega$ / 10.3 $\Omega$	2.92 x 25.65 / 11.43	0.115 x 1.010 / 0.450
l12 (taper)	0.033 $\lambda$ , 10.3 $\Omega$ / 41.0 $\Omega$	2.79 x 11.43 / 1.91	0.110 x 0.450 / 0.075
l13	0.069 $\lambda$ , 41.0 $\Omega$	6.35 x 1.91	0.250 x 0.075
l14	0.038 $\lambda$ , 41.0 $\Omega$	3.25 x 1.91	0.128 x 0.075
l15	0.331 $\lambda$ , 50.0 $\Omega$	28.98 x 1.37	1.141 x 0.054

<sup>1</sup>Electrical characteristics are rounded.

Reference Circuit (cont.)

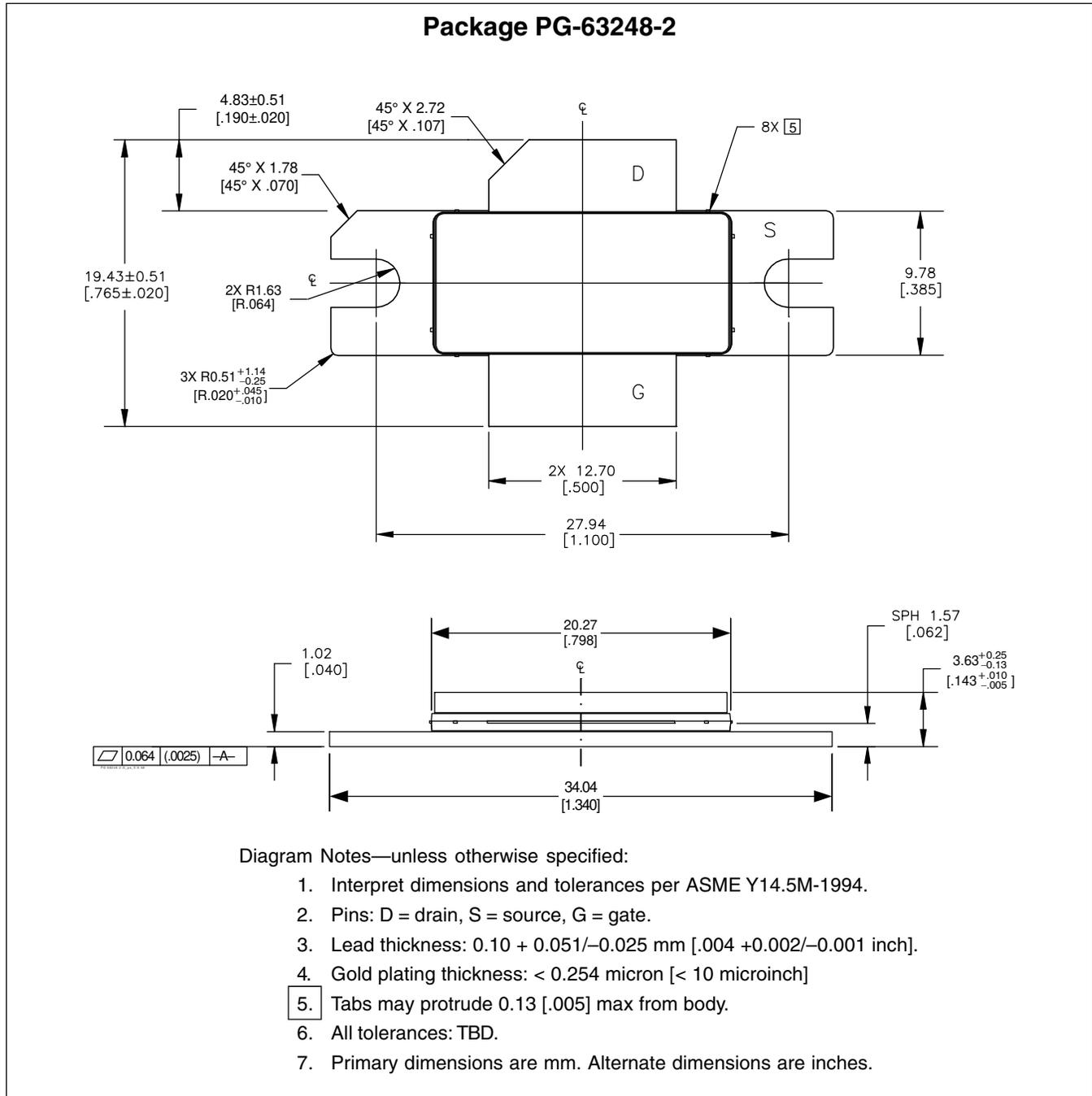


Reference circuit assembly diagram\* (not to scale)

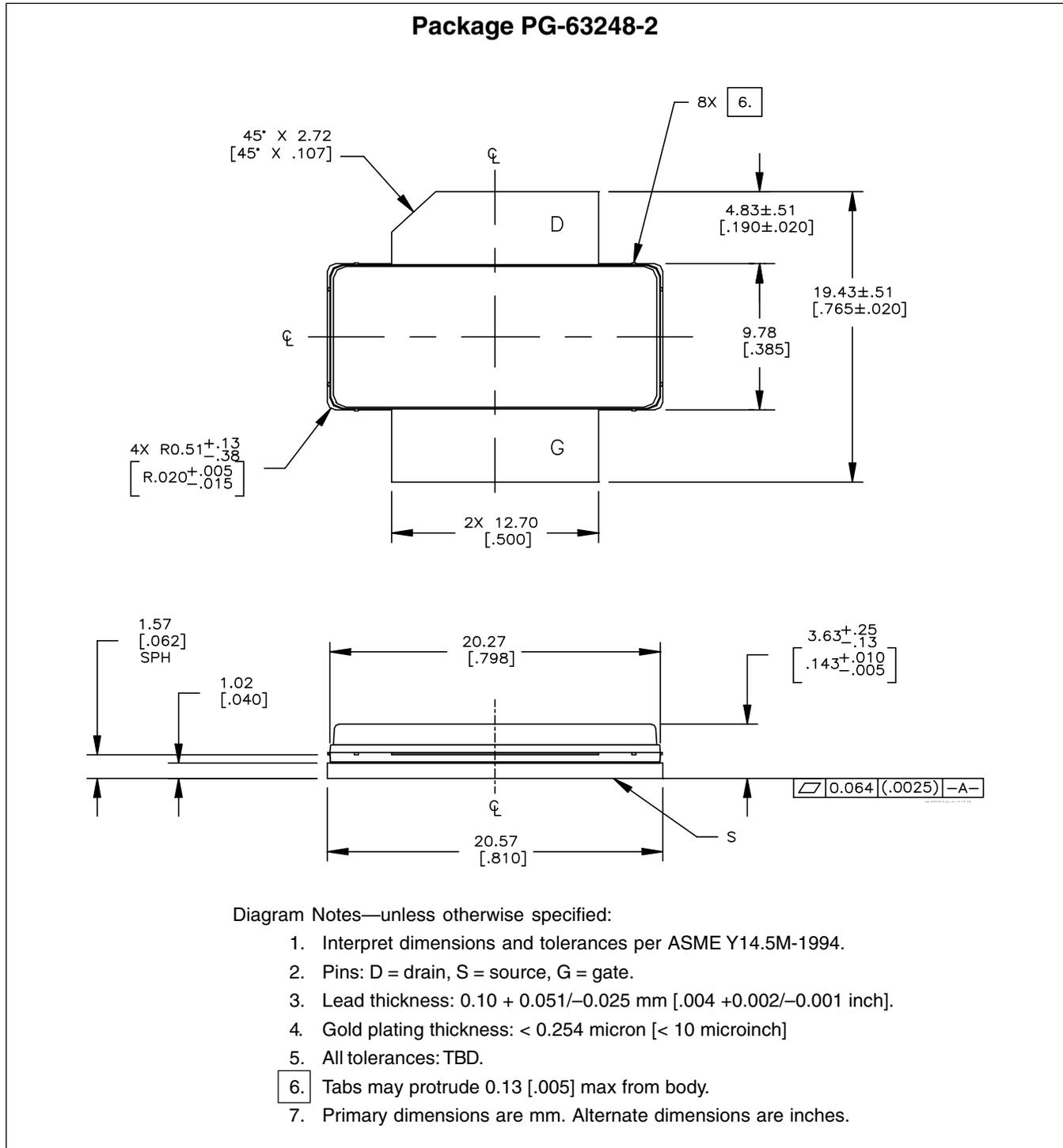
Component	Description	Suggested Manufacturer	P/N or Comment
C1, C2, C3	Capacitor, 0.001 $\mu$ F	Digi-Key	PCC1772CT-ND
C4	Tantalum capacitor, 10 $\mu$ F, 35 V	Digi-Key	399-1655-2-ND
C5	Capacitor, 0.1 $\mu$ F	Digi-Key	PCC104BCT-ND
C6, C11, C13, C16, C18	Capacitor, 1.0 $\mu$ F	ATC	920C105
C7	Capacitor, 0.01 $\mu$ F	ATC	200B 103
C8, C9, C12, C17, C24	Ceramic capacitor, 10 pF	ATC	100B 100
C10, C23	Ceramic capacitor, 0.6 pF	ATC	100B 0R6
C14, C15, C19, C20	Tantalum capacitor, 10 $\mu$ F, 50 V	Garrett Electronics	TPSE106K050R0400
C21, C22	Ceramic capacitor, 1.5 pF	ATC	100B 1R5
L1, L2	Ferrite, 8.9 mm	Elna Magnetics	BDS 4.6/3/8.9-4S2
Q1	Transistor	Infinion Technologies	BCP56
QQ1	Voltage regulator	National Semiconductor	LM7805
R1	Chip Resistor 1.2 k-ohms	Digi-Key	P1.2KGCT-ND
R2	Chip Resistor 1.3 k-ohms	Digi-Key	P1.3KGCT-ND
R3, R8	Chip Resistor 2 k-ohms	Digi-Key	P2KECT-ND
R4	Potentiometer 2 k-ohms	Digi-Key	3224W-202ETR-ND
R5, R9	Chip Resistor 10 ohms	Digi-Key	P10ECT-ND
R6, R7	Chip Resistor 5.1 k-ohms	Digi-Key	P5.1KECT-ND

\*Gerber files for this circuit available on request

### Package Outline Specifications



Package Outline Specifications (cont.)



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

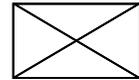
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