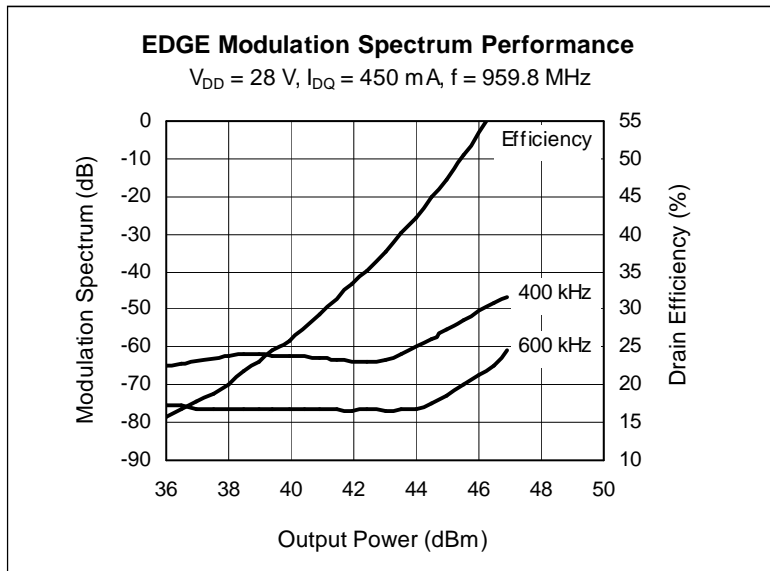


# LDMOS RF Power Field Effect Transistor 45 W, 869–960 MHz

## Description

The PTF080451 is a 45 W, internally matched *GOLDMOS* FET intended for EDGE and CDMA applications in the 860 to 960 MHz band. Full gold metallization ensures excellent device lifetime and reliability.



## Features

- Broadband internal matching
- Typical EDGE performance
  - Average output power = 22.5 W
  - Gain = 18 dB
  - Efficiency = 40%
- Typical CW performance
  - Output power at P-1dB = 60 W
  - Gain = 17 dB
  - Efficiency = 60%
- Integrated ESD protection: Human Body Model, Class 1 (minimum)
- Excellent thermal stability
- Low HCI drift
- Capable of handling 10:1 VSWR @ 28 V, 45 W (CW) output power



PTF080451E  
Package 30265

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

## RF Characteristics at $T_{CASE} = 25^{\circ}\text{C}$ unless otherwise indicated

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

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 450\text{ mA}$ ,  $P_{OUT} = 22.5\text{ W}$ ,  $f = 959.8\text{ MHz}$

Characteristic	Symbol	Min	Typ	Max	Units
Error Vector Magnitude	EVM (RMS)	—	2.0	—	%
Modulation Spectrum @ 400 kHz	ACPR	—	-62	—	dBc
Modulation Spectrum @ 600 kHz	ACPR	—	-76	—	dBc
Gain	$G_{ps}$	—	18	—	dB
Drain Efficiency	$\eta_D$	—	40	—	%

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

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 450\text{ mA}$ ,  $P_{OUT} = 45\text{ W PEP}$ ,  $f = 960\text{ MHz}$ , tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Units
Gain	$G_{ps}$	17	18	—	dB
Drain Efficiency	$\eta_D$	40	42	—	%
Intermodulation Distortion	IMD	—	-32	-30	dBc

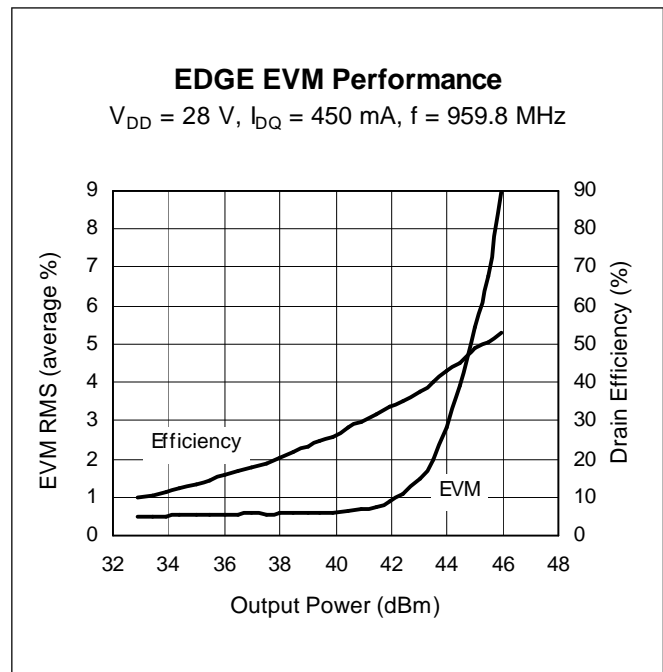
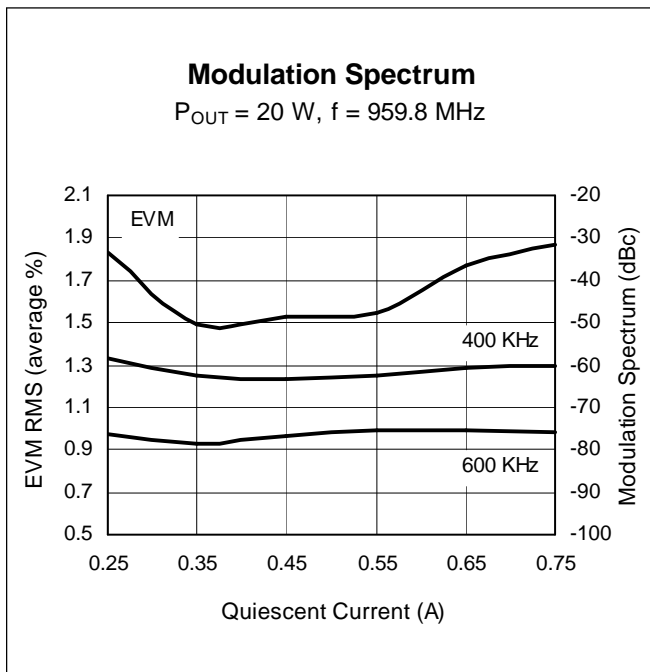
**DC Characteristics** at  $T_{CASE} = 25^{\circ}C$  unless otherwise indicated

Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain–Source Breakdown Voltage	$V_{GS} = 0 V, I_{DS} = 10 \mu A$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28 V, V_{GS} = 0 V$	$I_{DSS}$	—	—	1.0	$\mu A$
On–State Resistance	$V_{GS} = 10 V, V_{DS} = 0.1 V$	$R_{DS(on)}$	—	0.1	—	$\Omega$
Operating Gate Voltage	$V_{DS} = 28 V, I_{DQ} = 450 mA$	$V_{GS}$	2.5	3.2	4	V
Gate Leakage Current	$V_{GS} = 10 V, V_{DS} = 0 V$	$I_{GSS}$	—	—	1.0	$\mu A$

**Maximum Ratings**

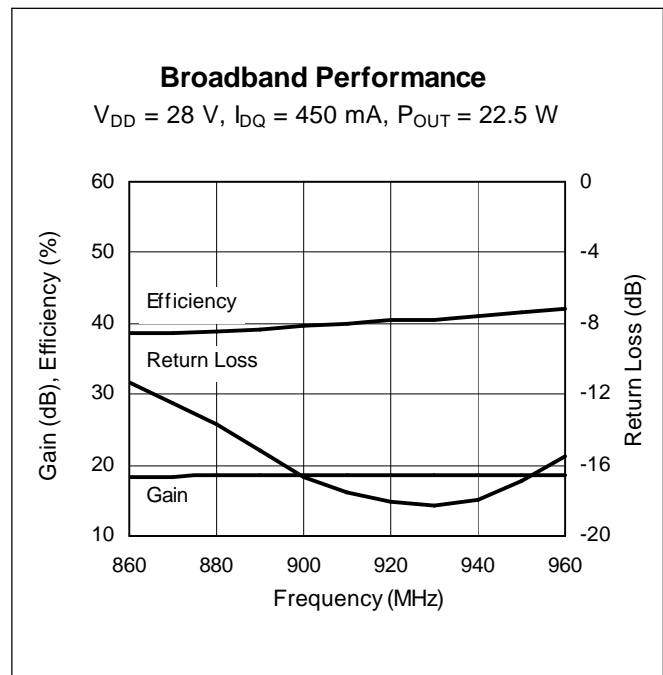
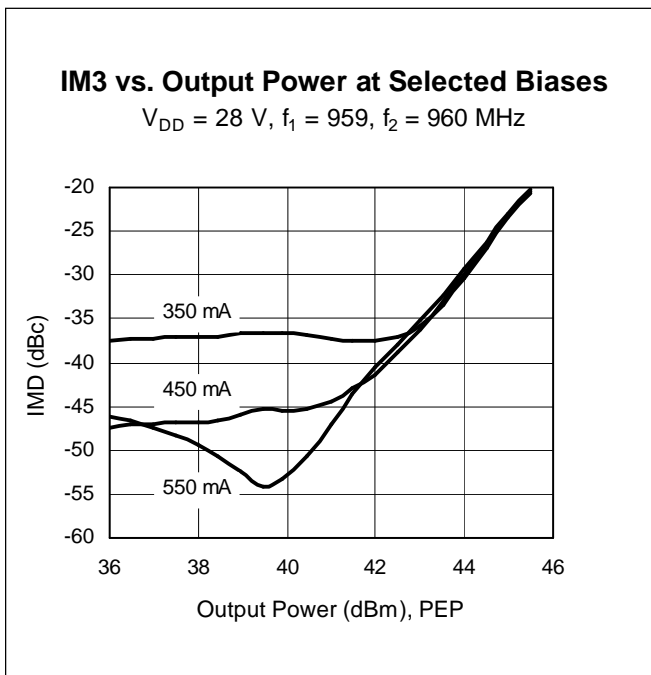
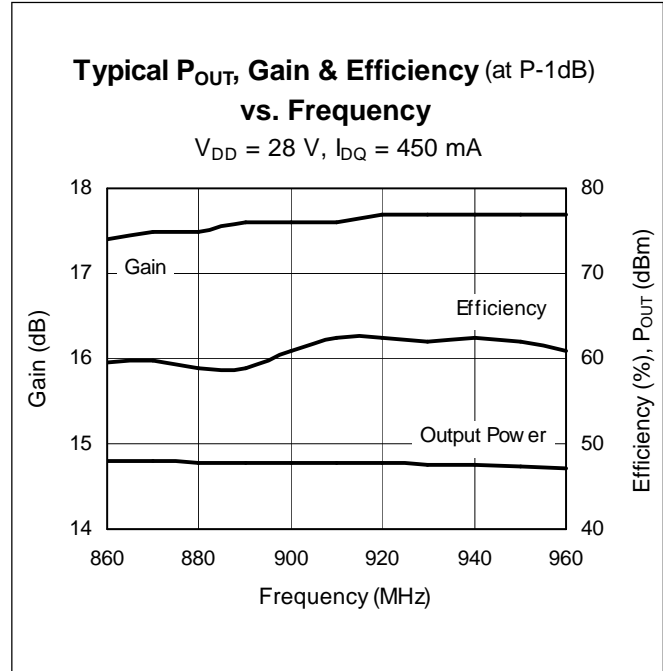
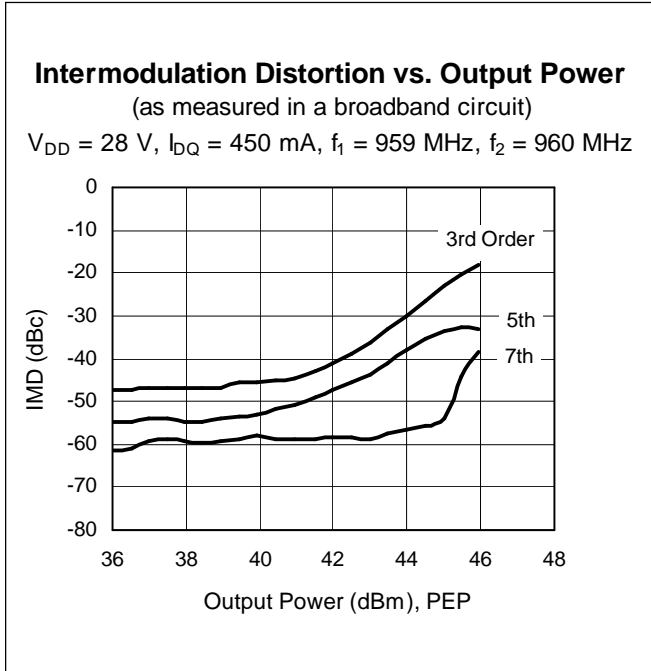
Parameter	Symbol	Value	Unit
Drain–Source Voltage	$V_{DSS}$	65	V
Gate–Source Voltage	$V_{GS}$	-0.5 to +12	V
Junction Temperature	$T_J$	200	$^{\circ}C$
Total Device Dissipation	$P_D$	184	W
Above 25 $^{\circ}C$ derate by		1.05	W/ $^{\circ}C$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^{\circ}C$
Thermal Resistance ( $T_{CASE} = 70^{\circ}C$ )	$R_{\theta JC}$	0.95	$^{\circ}C/W$

**Typical Performance** (measurements taken in production test fixture)



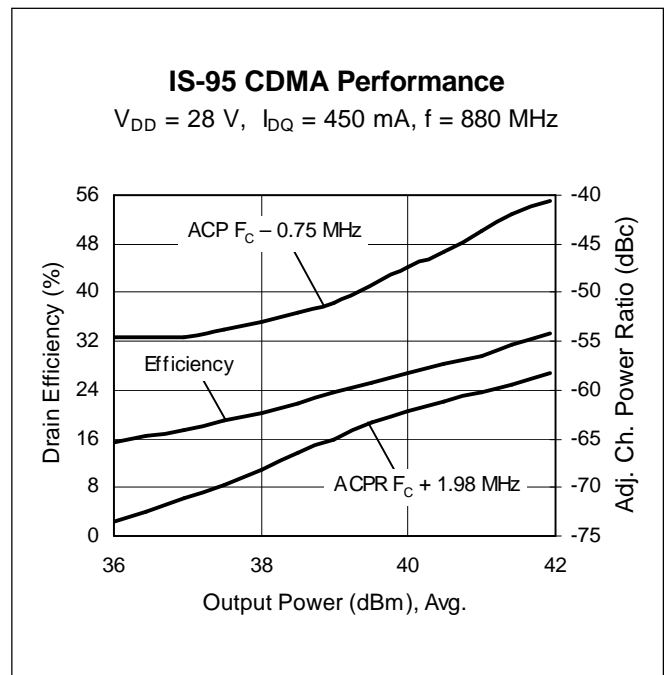
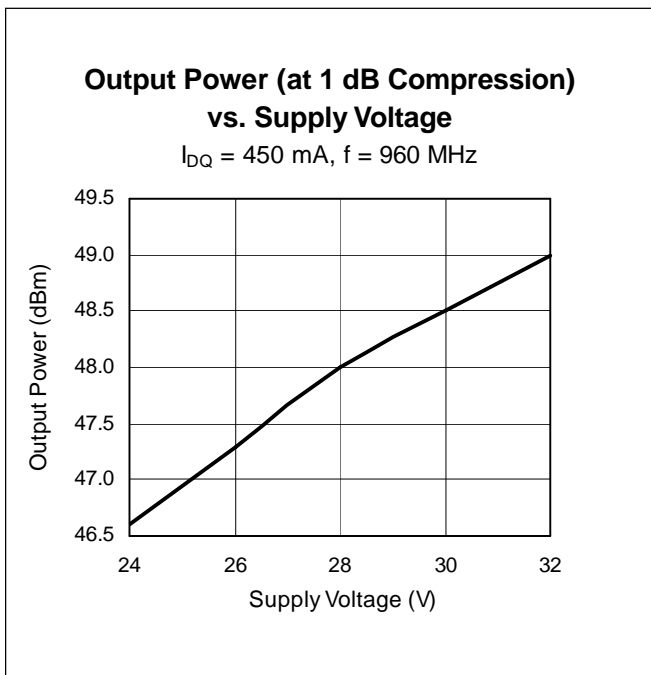
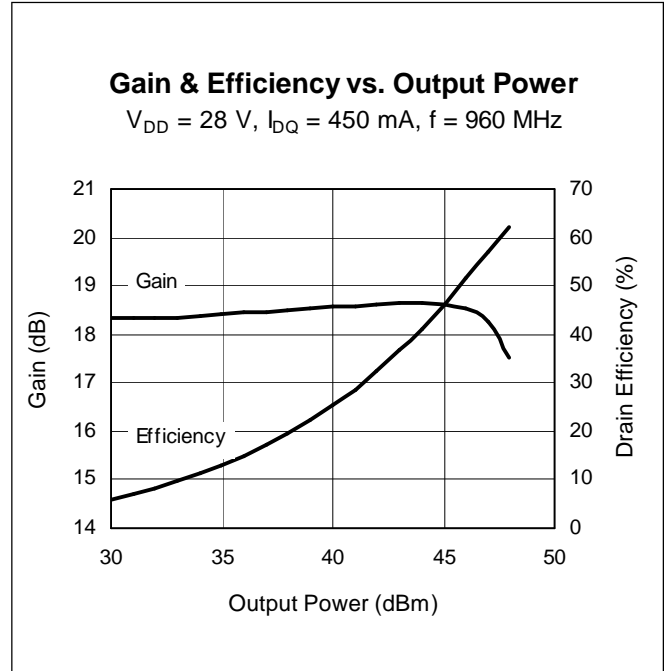
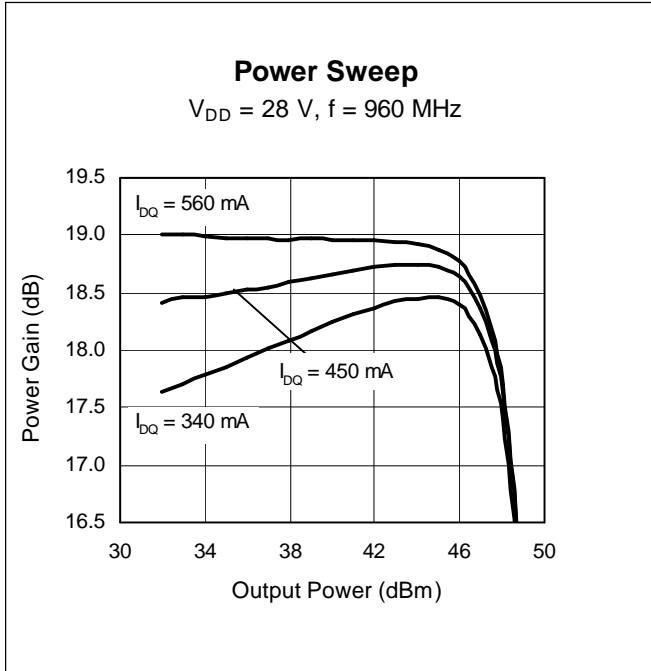
All published data at  $T_{CASE} = 25^{\circ}C$  unless otherwise indicated.

Typical Performance (cont.)



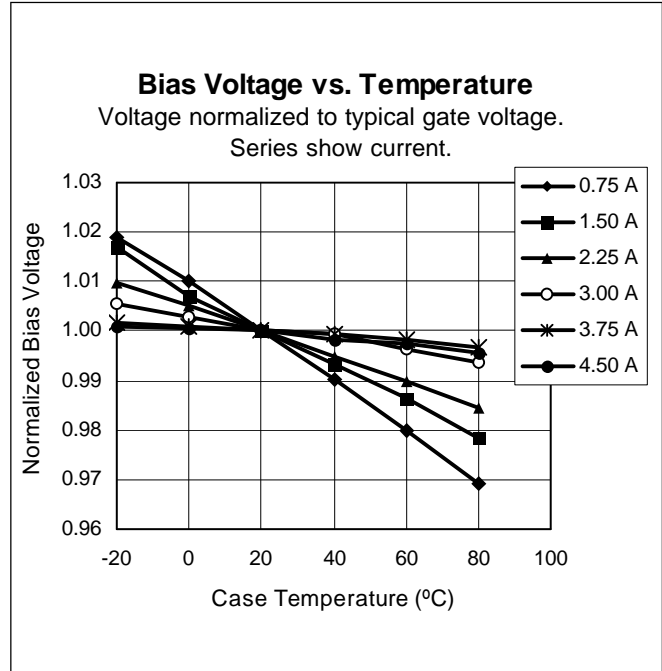
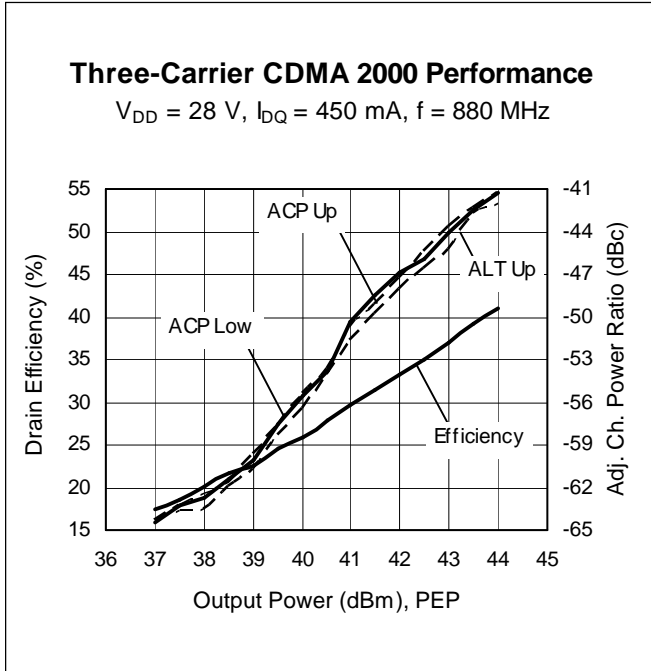
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Typical Performance (cont.)

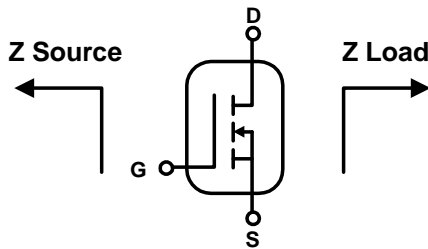


All published data at  $T_{CASE} = 25^{\circ}\text{C}$  unless otherwise indicated.

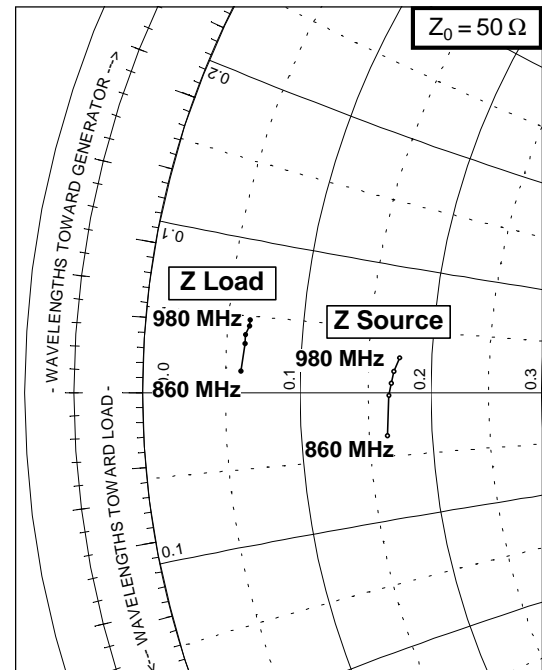
Typical Performance (cont.)



Broadband Circuit Impedance

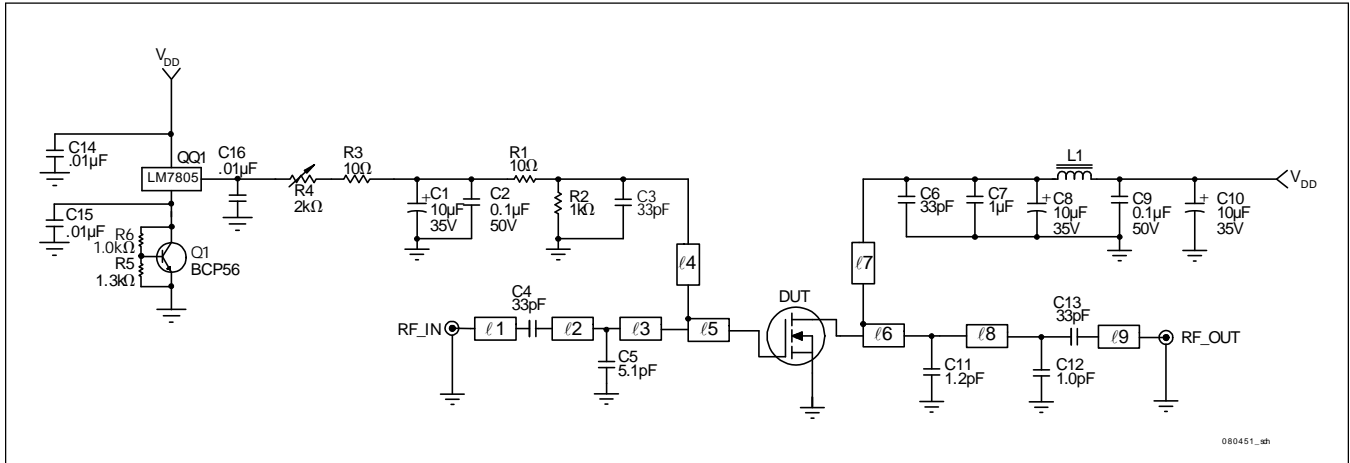


Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
860	8.20	-1.70	3.00	0.70
920	8.30	-0.12	3.10	1.60
940	8.40	0.38	3.10	1.90
960	8.50	0.85	3.20	2.20
980	8.70	1.40	3.20	2.40



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

### Test Circuit



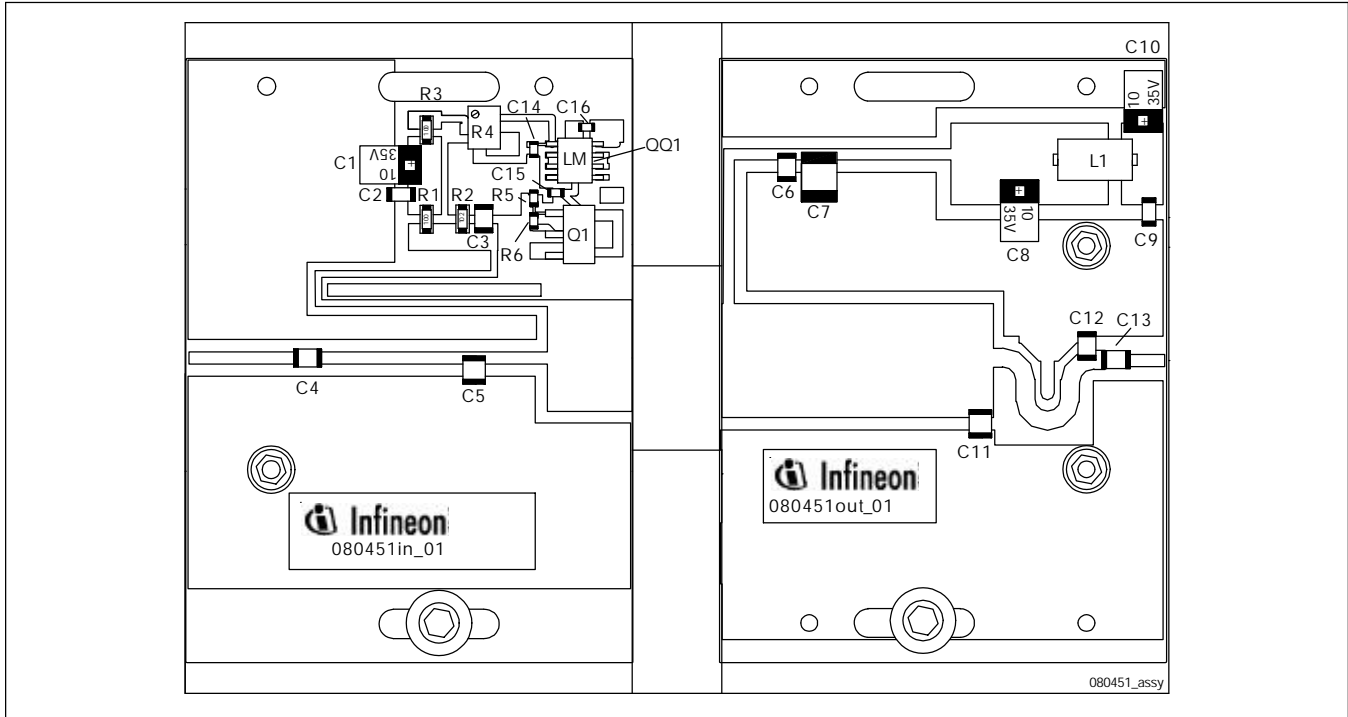
Test Circuit Schematic for 960 MHz

#### Circuit Assembly Information

DUT	PTF080451	LDMOS Transistor	
PCB	0.76 mm. [.030"] thick, $\epsilon_r = 4.5$	2 oz. copper	Rogers TMM4

Microstrip	Electrical Characteristics at 960 MHz	Dimensions: L x W (mm.)	Dimensions: L x W (in.)
ℓ1	0.075 $\lambda$ , 50.770 $\Omega$	0.505 x 0.053	12.83 x 1.35
ℓ2	0.114 $\lambda$ , 50.770 $\Omega$	0.765 x 0.053	19.43 x 1.35
ℓ3	0.050 $\lambda$ , 50.770 $\Omega$	0.335 x 0.053	8.51 x 1.35
ℓ4	0.289 $\lambda$ , 73.660 $\Omega$	2.000 x 0.025	50.80 x 0.64
ℓ5	0.060 $\lambda$ , 9.350 $\Omega$	0.360 x 0.506	9.14 x 12.85
ℓ6	0.199 $\lambda$ , 9.190 $\Omega$	1.200 x 0.510	30.48 x 12.95
ℓ7	0.132 $\lambda$ , 52.470 $\Omega$	0.890 x 0.050	22.61 x 1.27
ℓ8	0.134 $\lambda$ , 38.020 $\Omega$	0.880 x 0.085	22.35 x 2.16
ℓ9	0.029 $\lambda$ , 50.200 $\Omega$	0.195 x 0.054	4.95 x 1.37

**Test Circuit** (cont.)



Reference Circuit<sup>1</sup> (not to scale)

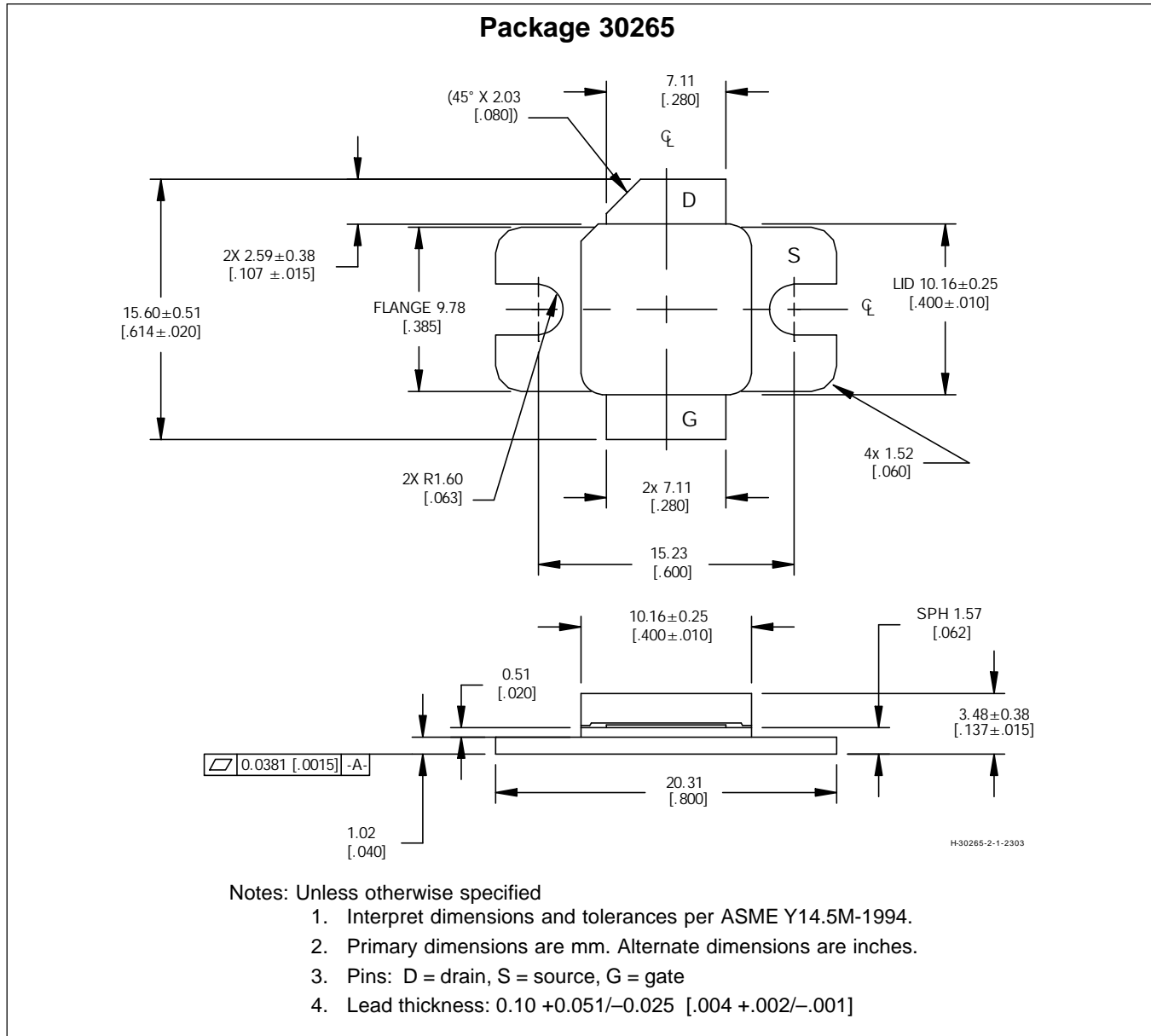
Component	Description	Manufacturer	P/N or Comment
C1, C8, C10	Capacitor, 10 $\mu$ F, 35 V, Tant TE Series SMD	Digi-Key	PCS6106TR-ND
C2, C9	Capacitor, 0.1 $\mu$ F, 50 V	Digi-Key	P4525-ND
C3, C4, C6, C13	Capacitor, 33 pF	ATC	100B 330
C5	Capacitor, 5.1 pF	ATC	100B 5R1
C7	Capacitor, 1 $\mu$ F, 50 V	Digi-Key	19528-ND
C11	Capacitor, 1.2 pF	ATC	100B 1R2
C12	Capacitor, 1.0 pF	ATC	100B 1R0
C14, C15, C16	Capacitor, .01 $\mu$ F	Digi-Key	PCC1772CT-ND
L1	Ferrite, 6 mm	Philips	53/3/4.6-452
Q1	Transistor	Infineon	BCP56
QQ1	Voltage Regulator	Digi-Key	LM7805
R1, R3	Resistor, 10 ohm	Digi-Key	100ECT-ND
R2	Resistor, 1.0 k-ohm	Digi-Key	1KQBK
R4	Resistor, Variable 2 k-ohm, 4 W	Digi-Key	3224 W-202ETR-ND
R5	Resistor, 1.3 k-ohm 1/10 W, 0603	Digi-Key	P1.3KGCT-ND
R6	Resistor, 1.0 k-ohm 1/10 W, 0603	Digi-Key	P1.0KGCT-ND

<sup>1</sup>Gerber files for this circuit are available on request.

### Ordering Information

Type	Package Outline	Package Description	Marking
PTF080451E	30265	Thermally enhanced, flange mount	PTF080451E

### Package Outline Specifications



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



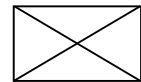
Page	Subjects (major changes since last revision)
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**Edition 2004-06-24**

**Published by Infineon Technologies AG,  
 St.-Martin-Strasse 53,  
 81669 München, Germany**

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