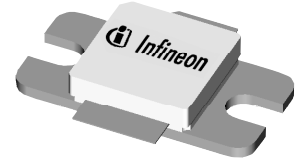


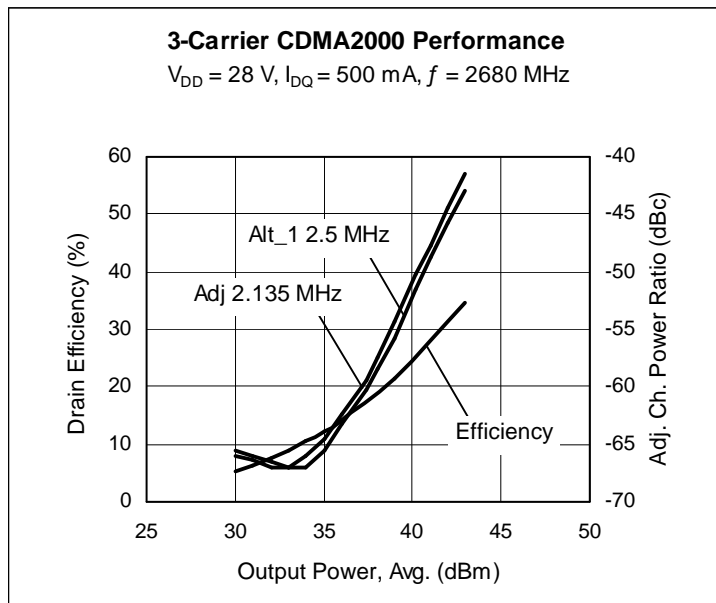
## Thermally-Enhanced High Power RF LDMOS FET 45 W, 2.62 – 2.68 GHz

### Description

The PTFA260451E is a thermally-enhanced 45-watt, internally-matched *GOLDMOS*® FET intended for CDMA2000, Super3G (3GPP TSG RAN), and WiMAX applications from 2.62 to 2.68 GHz. Thermally-enhanced packaging provide the coolest operation available. Full gold metallization ensures excellent device lifetime and reliability.



PTFA260451E  
Package H-30265-2



### Features

- Lead-free, RoHS-compliant and thermally-enhanced packaging
- Internal matching for wideband performance
- Typical three-carrier CDMA2000 performance
  - Average output power = 10 W
  - Gain = 14 dB
  - Efficiency = 24%
  - ACPR = -52 dBc
- Typical CW performance
  - Output power at P-1dB = 50 W
  - Efficiency = 46%
- Integrated ESD protection: Human Body Model, Class 2 (minimum)
- Excellent thermal stability
- Low HCI Drift
- Capable of handling 10:1 VSWR @ 28 V, 45 W (CW) output power

### RF Performance

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

$V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 500\text{ mA}$ ,  $P_{OUT} = 10\text{ W AVG}$ ,  $f = 2680\text{ MHz}$

Characteristic	Symbol	Min	Typ	Max	Unit
Adjacent Channel Power Ratio	ACPR	—	-45	—	dBc
Gain	$G_{ps}$	—	14	—	dB
Drain Efficiency	$\eta_D$	—	24	—	%

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

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

**RF Performance** (cont.)

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

 $V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 500\text{ mA}$ ,  $P_{OUT} = 45\text{ W PEP}$ ,  $f = 2680\text{ MHz}$ , tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	$G_{ps}$	14.0	15	—	dB
Drain Efficiency	$\eta_D$	36	37	—	%
Intermodulation Distortion	IMD	—	-30	-28	dBc

**DC Characteristics**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$ , $I_D = 10\text{ mA}$	$V_{(BR)DSS}$	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	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.16	—	$\Omega$
Operating Gate Voltage	$V_{DS} = 28\text{ V}$ , $I_{DQ} = 500\text{ mA}$	$V_{GS}$	2.0	2.5	3	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$ , $V_{DS} = 0\text{ V}$	$I_{GSS}$	—	—	1.0	$\mu\text{A}$

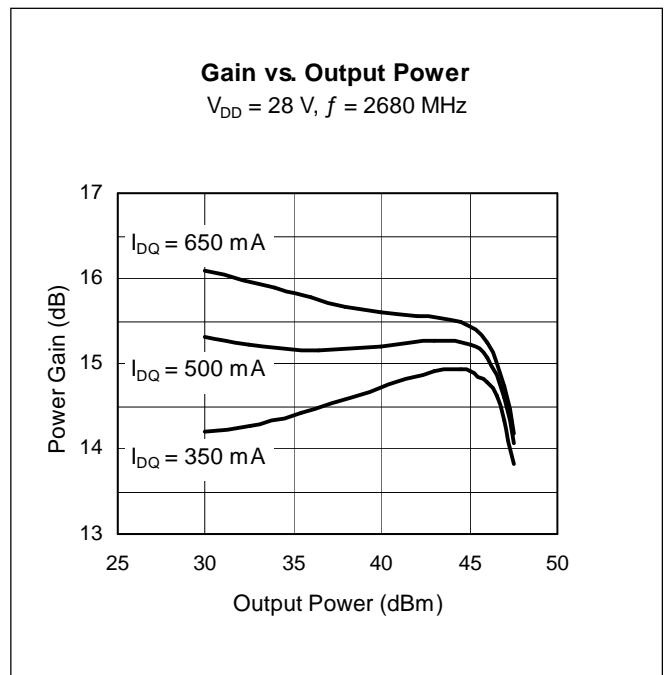
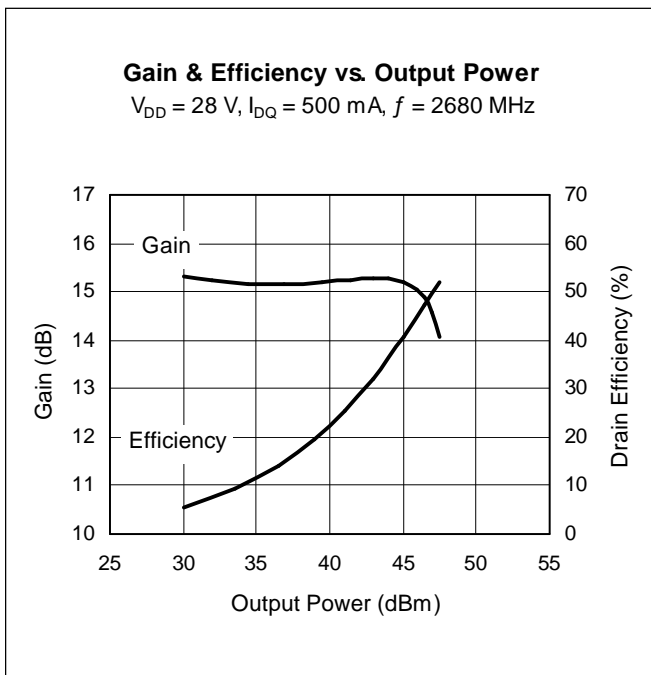
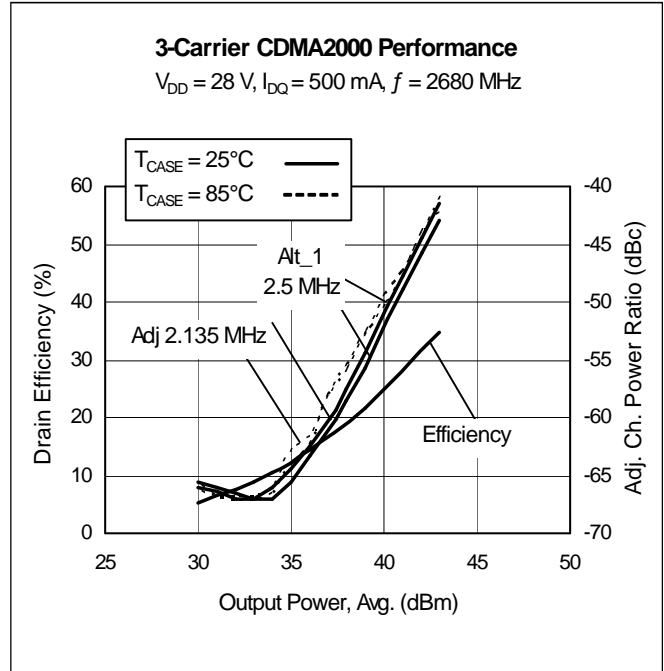
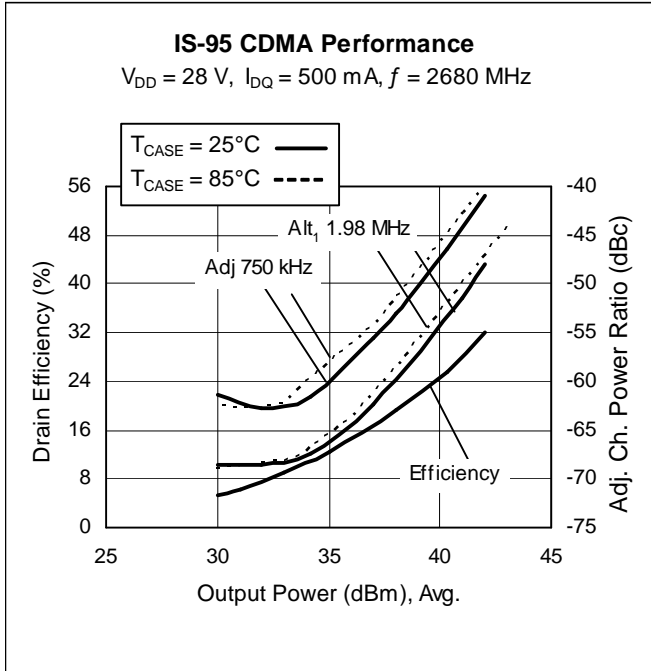
**Maximum Ratings**

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	$P_D$	199	W
		Above 25 $^{\circ}\text{C}$ derate by	1.14
Storage Temperature Range	$T_{STG}$	-40 to +150	$^{\circ}\text{C}$
Thermal Resistance ( $T_{CASE} = 70^{\circ}\text{C}$ , 45 W CW)	$R_{\theta JC}$	0.88	$^{\circ}\text{C/W}$

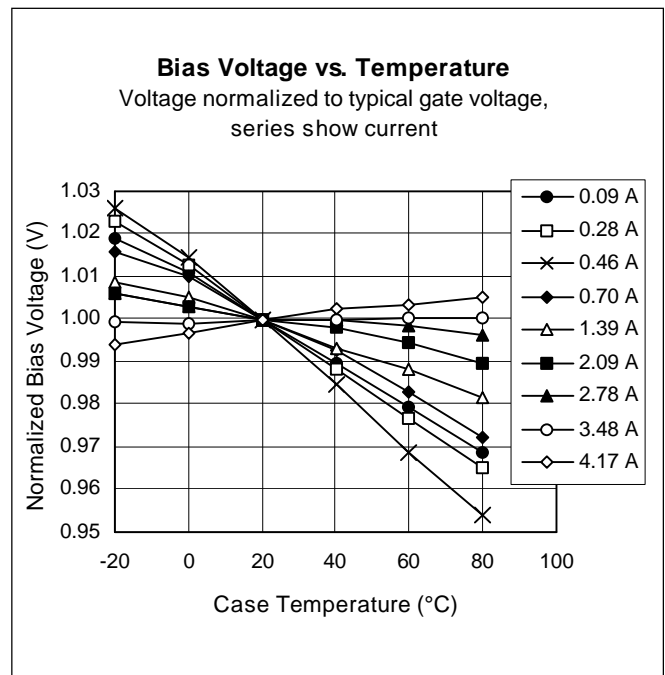
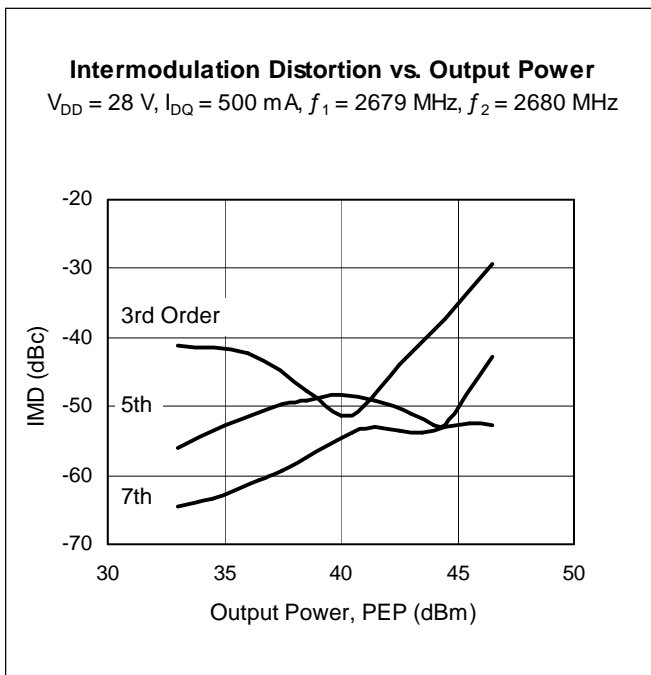
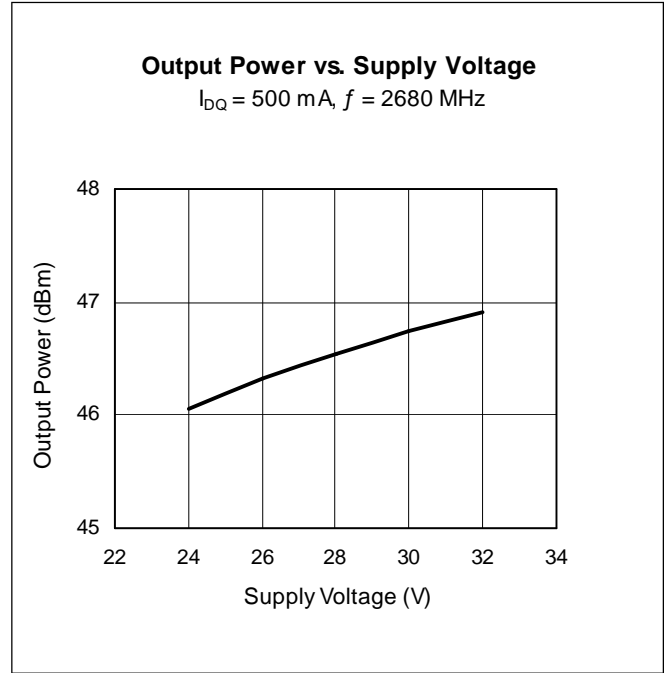
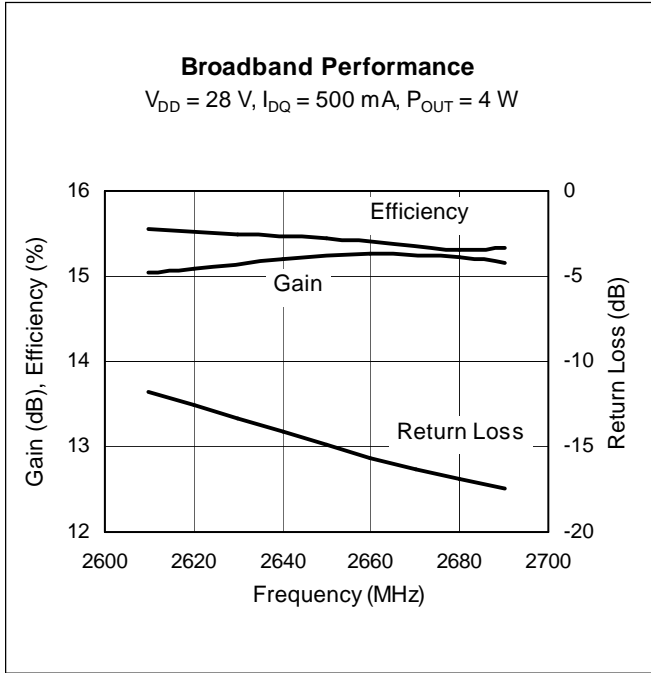
**Ordering Information**

Type and Version	Package Outline	Package Description	Marking
PTFA260451E V1	H-30265-2	Thermally-enhanced slotted flange, single-ended	PTFA260451E

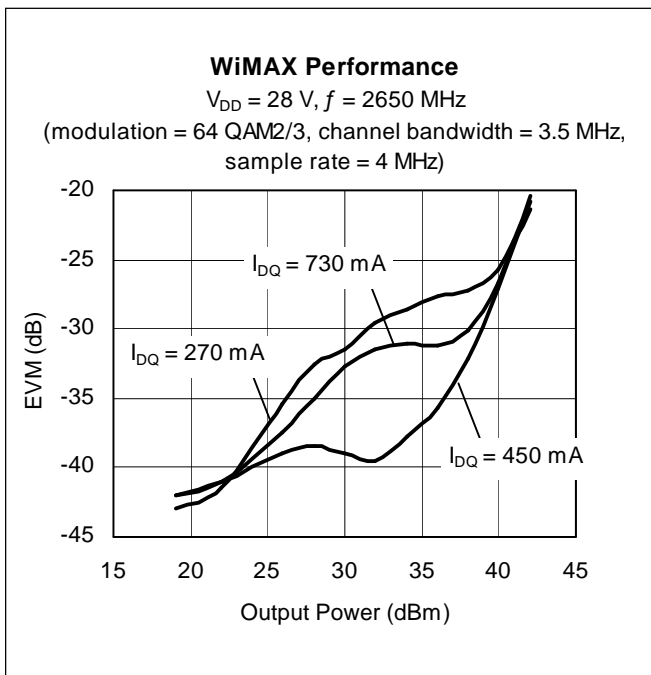
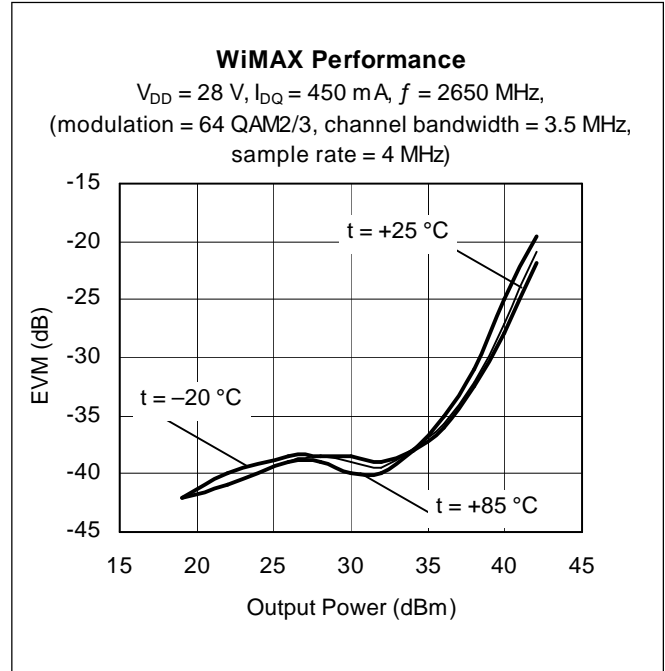
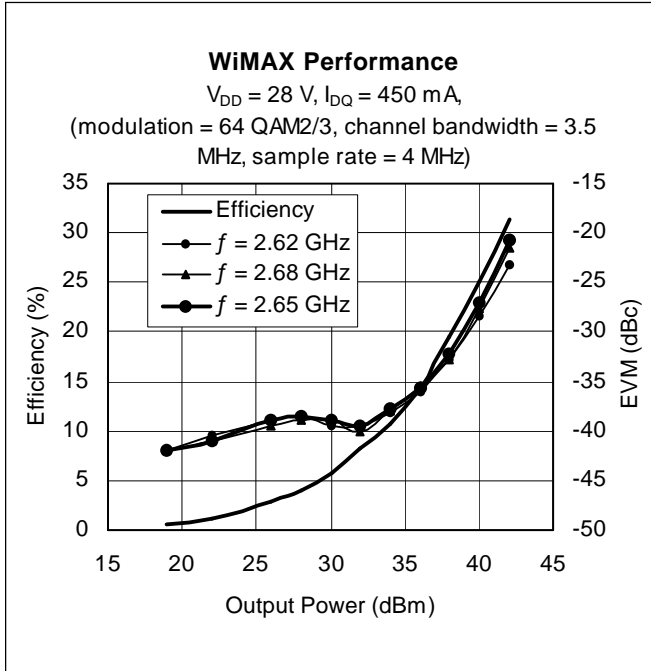
**Typical Performance** (data taken in production test fixture)



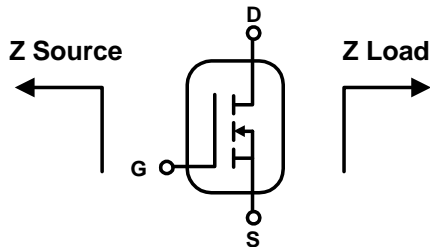
Typical Performance (cont.)



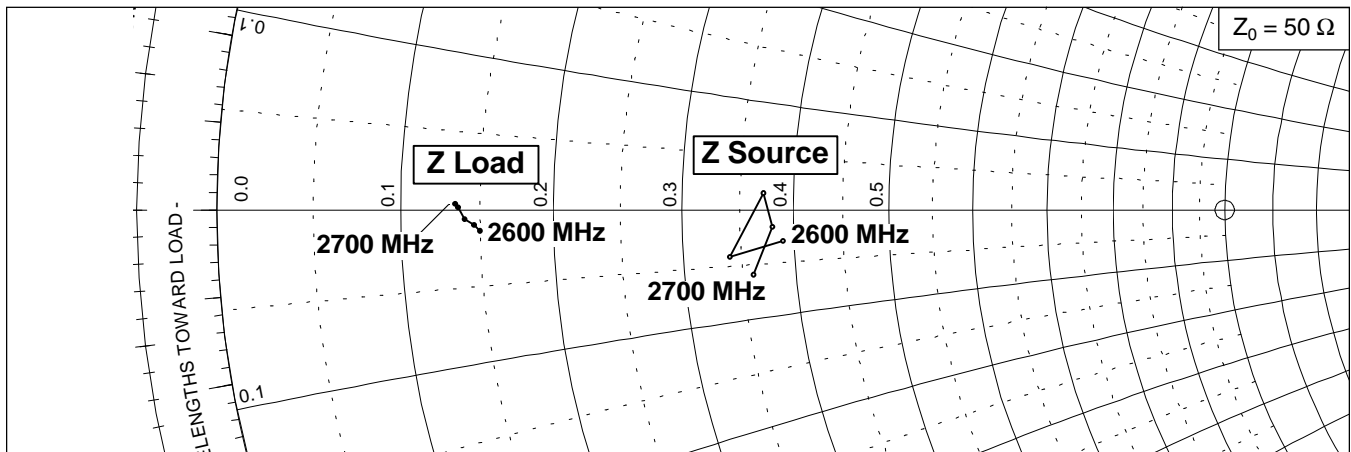
Typical WiMAX Performance



**Broadband Circuit Impedance**

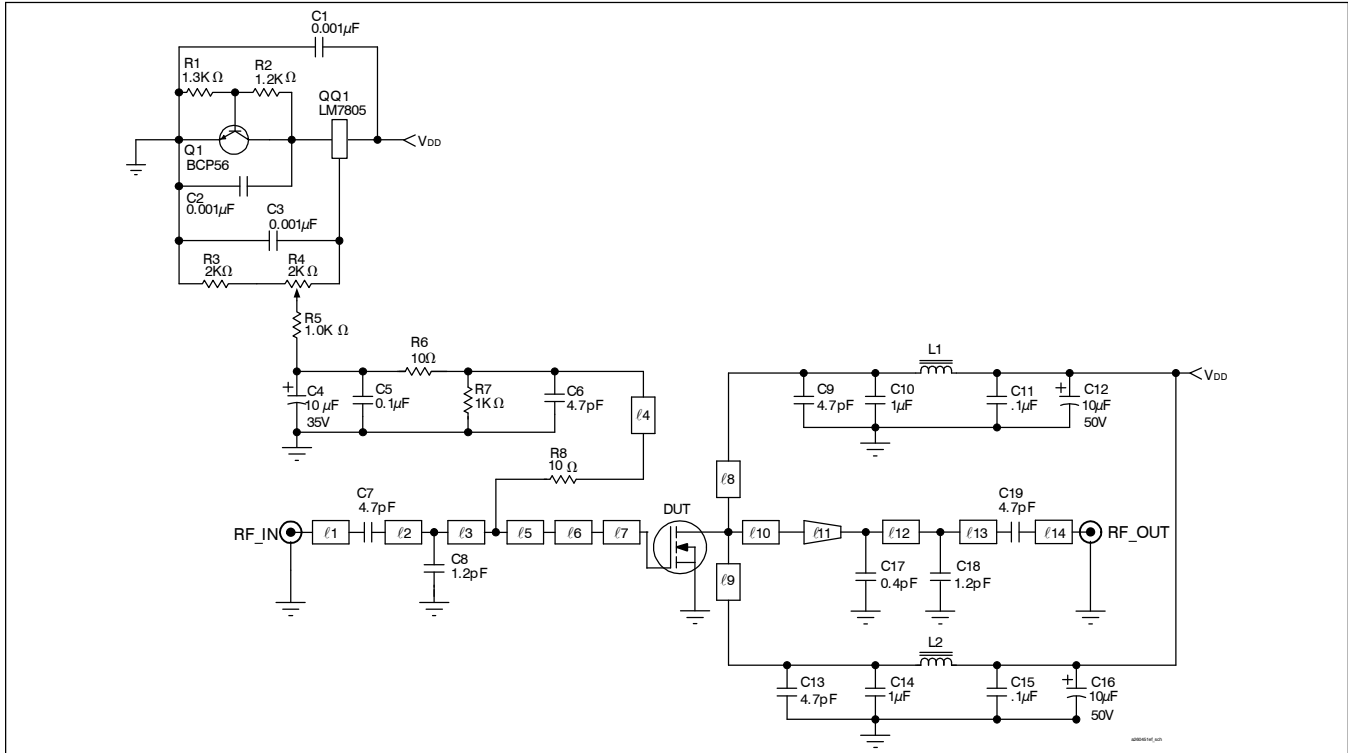


Frequency MHz	Z Source W		Z Load W	
	R	jX	R	jX
2600	19.5	-1.5	7.5	-0.7
2620	17.0	-2.1	7.3	-0.5
2650	18.6	0.8	7.0	-0.3
2680	19.0	-0.8	6.8	0.1
2700	18.0	-3.0	6.7	0.2



See next page for reference circuit information

Reference Circuit



Reference circuit schematic for  $f = 2680$  MHz

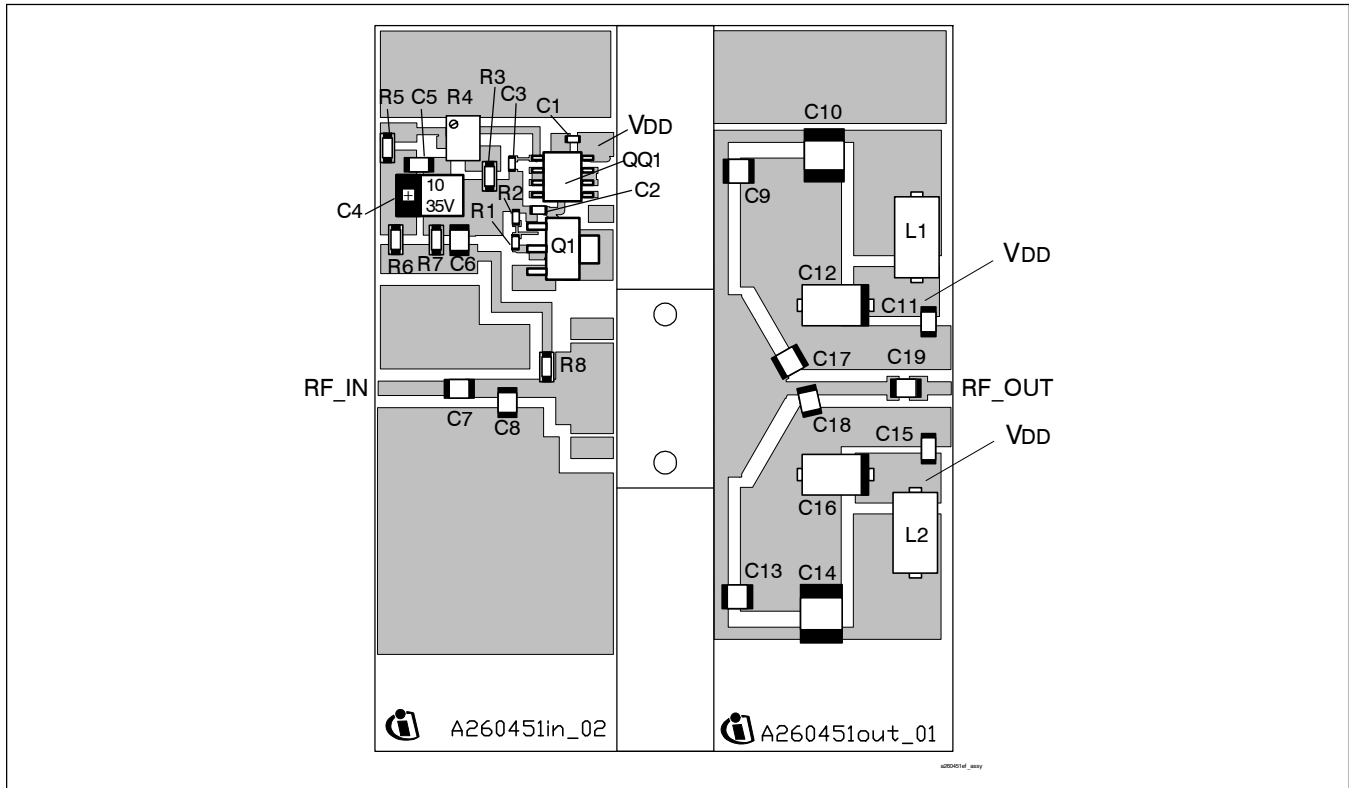
Circuit Assembly Information

DUT	PTFA260451E	LDMOS Transistor	
PCB	0.76 mm [.030"] thick, $\epsilon_r = 4.5$	Rogers TMM4	2 oz. copper

Microstrip	Electrical Characteristics at 2680 MHz <sup>1</sup>	Dimensions: L x W (mm)	Dimensions: L x W (in.)
$l_1$	0.130 $\lambda$ , 50.0 $\Omega$	7.87 x 1.47	0.310 x 0.058
$l_2$	0.061 $\lambda$ , 44.0 $\Omega$	3.68 x 1.83	0.145 x 0.072
$l_3$	0.065 $\lambda$ , 44.0 $\Omega$	3.91 x 1.83	0.154 x 0.072
$l_4$	0.299 $\lambda$ , 62.0 $\Omega$	18.44 x 1.02	0.726 x 0.040
$l_5$	0.018 $\lambda$ , 44.0 $\Omega$	1.09 x 1.83	0.043 x 0.072
$l_6$	0.029 $\lambda$ , 15.0 $\Omega$	1.65 x 7.62	0.065 x 0.300
$l_7$	0.077 $\lambda$ , 12.5 $\Omega$	4.32 x 9.45	0.170 x 0.372
$l_8$	0.234 $\lambda$ , 55.0 $\Omega$	14.33 x 1.27	0.564 x 0.050
$l_9$	0.218 $\lambda$ , 55.0 $\Omega$	13.36 x 1.27	0.526 x 0.050
$l_{10}$	0.050 $\lambda$ , 6.6 $\Omega$	2.74 x 19.10	0.108 x 0.752
$l_{11}$ (taper)	0.080 $\lambda$ , 6.6 $\Omega$ / 50.0 $\Omega$	4.90 x 19.10 / 1.32	0.193 x 0.752 / 0.052
$l_{12}$	0.053 $\lambda$ , 50.0 $\Omega$	3.25 x 1.32	0.128 x 0.052
$l_{13}$	0.133 $\lambda$ , 50.0 $\Omega$	8.13 x 1.32	0.320 x 0.052
$l_{14}$	0.070 $\lambda$ , 50.0 $\Omega$	4.27 x 1.32	0.168 x 0.052

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

Reference Circuit (cont.)



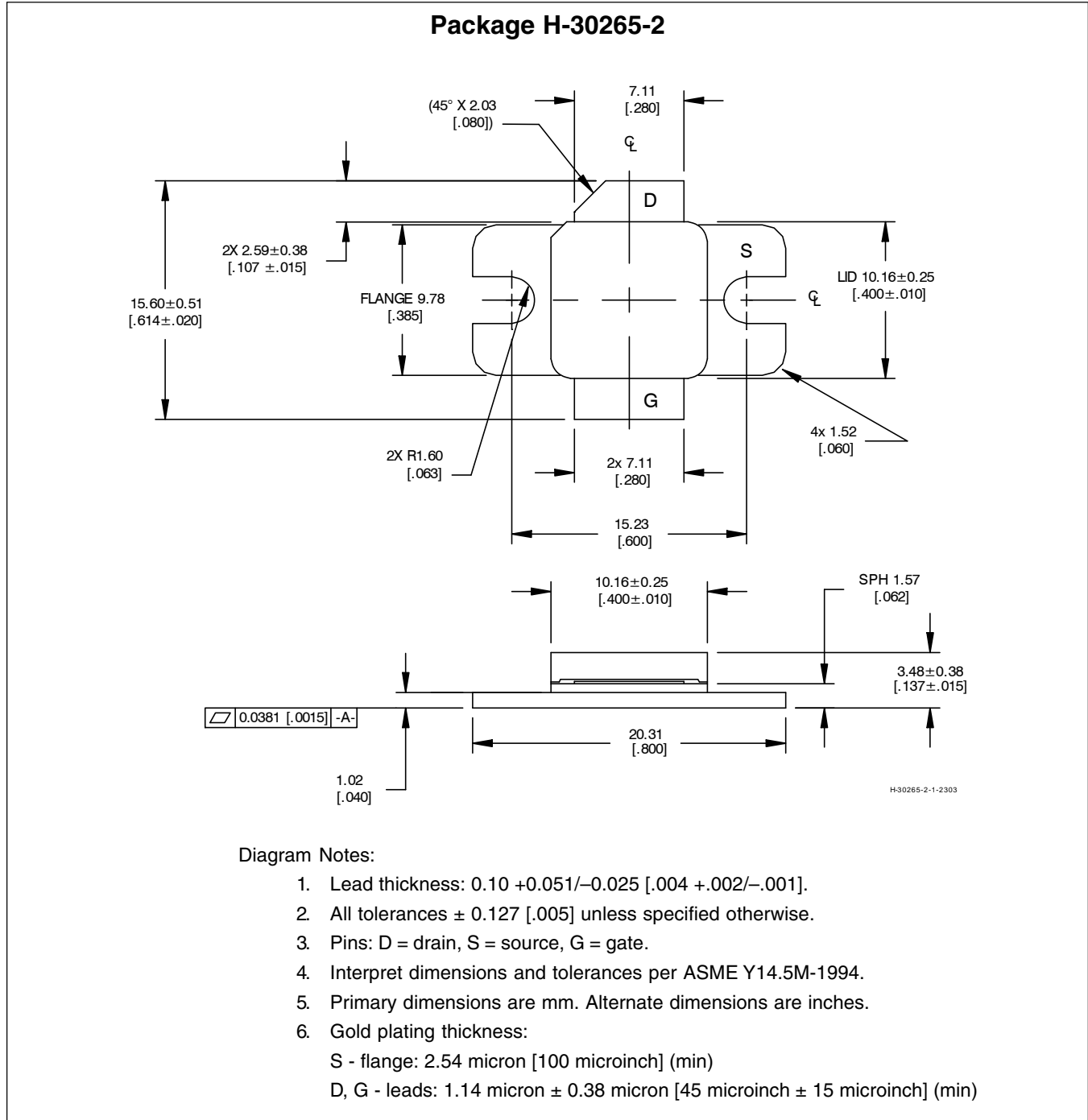
Reference circuit assembly diagram\* (not to scale)

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	PCS6106TR-ND
C5, C11, C15	Capacitor, 0.1 $\mu$ F	Digi-Key	PCC104BCT-ND
C6, C7, C9, C13, C19	Ceramic capacitor, 4.7 pF	ATC	100B 4R7
C8, C18	Ceramic capacitor, 1.2 pF	ATC	100B 1R2
C10, C14	Capacitor, 1 $\mu$ F	ATC	920C105KW
C12, C16	Tantalum capacitor, 10 $\mu$ F, 50 V	Garrett Electronics	TPSE106K050R0400
C17	Ceramic capacitor, 0.4 pF	ATC	100B 0R4
Q1	Transistor	Infineon Technologies	BCP56
QQ1	Voltage regulator	National Semiconductor	LM7805
R1	Chip resistor, 1.3 k-ohms	Digi-Key	P1.3KGCT-ND
R2	Chip resistor, 1.2 k-ohms	Digi-Key	P1.2KGCT-ND
R3	Chip resistor, 2 k-ohms	Digi-Key	P2.0KECT-ND
R4	Potentiometer, 2 k-ohms	Digi-Key	3224W-202ETR-ND
R5, R7	Chip resistor, 1 k-ohms	Digi-Key	P1.0KECT-ND
R6, R8	Chip resistor, 10 ohms	Digi-Key	P10ECT-ND
L1, L2	Ferrite	Philips	BDS46/3.8.8-452

\*Gerber Files for this circuit available on request



Package Outline Specifications



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

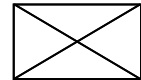
Page	Subjects (major changes since last revision)
All	Remove references to alternate products.

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**Edition 2008-03-04**

**Published by**  
**Infineon Technologies AG**  
**81726 Munich, Germany**

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