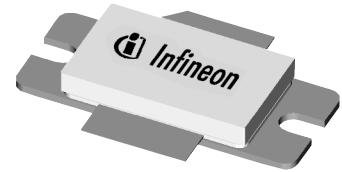


Thermally-Enhanced High Power RF LDMOS FETs 200 W, 860 – 900 MHz

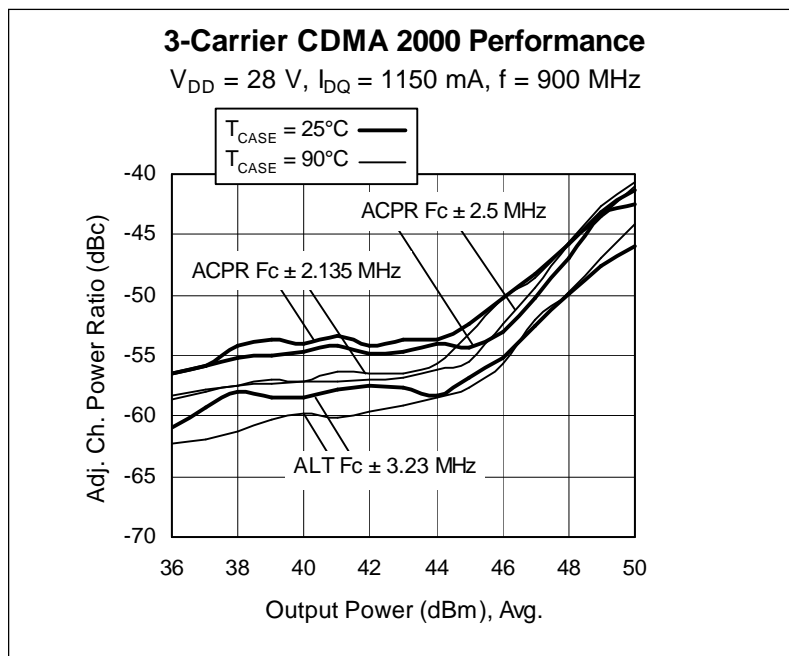
Description

The PTF082001E and PTF082001F are 200-watt, internally-matched GOLDMOS FETs intended for CDMA and CDMA 2000 applications in the 860 to 900 MHz band. Thermally-enhanced packaging provides the coolest operation available. Full gold metallization ensures excellent device lifetime and reliability.

PTF082001E
Package 30260



PTF082001F*
Package 31260



Features

- Thermally-enhanced packaging
- Broadband internal matching
- Typical CDMA IS-95 performance
 - Average output power = 40 W
 - Gain = 18 dB
 - Efficiency = 27%
- Typical CW performance
 - Output power at P-1dB = 215 W
 - Gain = 17 dB
 - Efficiency = 55%
- Integrated ESD protection: Human Body Model, Class 1 (minimum)
- Excellent thermal stability
- Low HCI Drift
- Capable of handling 10:1 VSWR @ 28 V, 200 W output power

ESD: Electrostatic discharge sensitive device—observe handling precautions!

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

CDMA IS-95 Measurements (not subject to production test—verified by design/characterization in Infineon test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1150\text{ mA}$, $P_{OUT} = 40\text{ W}$, $f = 860\text{ MHz}$

Characteristic	Symbol	Min	Typ	Max	Unit
ACPR@ 750 KHz	ACPR	—	-45	—	dBc
ACPR@ 1.98 MHz	ACPR	—	-62	—	dBc
Gain	G_{ps}	—	18	—	dB
Drain Efficiency	η_D	—	27	—	%

*See Infineon distributor for future availability.

RF Characteristics (cont.)

Two-Tone Measurements (in Infineon test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 1150\text{ mA}$, $P_{OUT} = 190\text{ W PEP}$, $f_C = 900\text{ MHz}$, tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	17	18	—	dB
Drain Efficiency	η_D	40	43	—	%
Intermodulation Distortion	IMD	—	—	-28	dBc

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ }\mu\text{A}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.1	—	Ω
Operating Gate Voltage	$V_{DS} = 28\text{ V}$, $I_{DQ} = 1150\text{ mA}$	V_{GS}	2.5	2.9	4	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	0.01	1.0	μA

Maximum Ratings

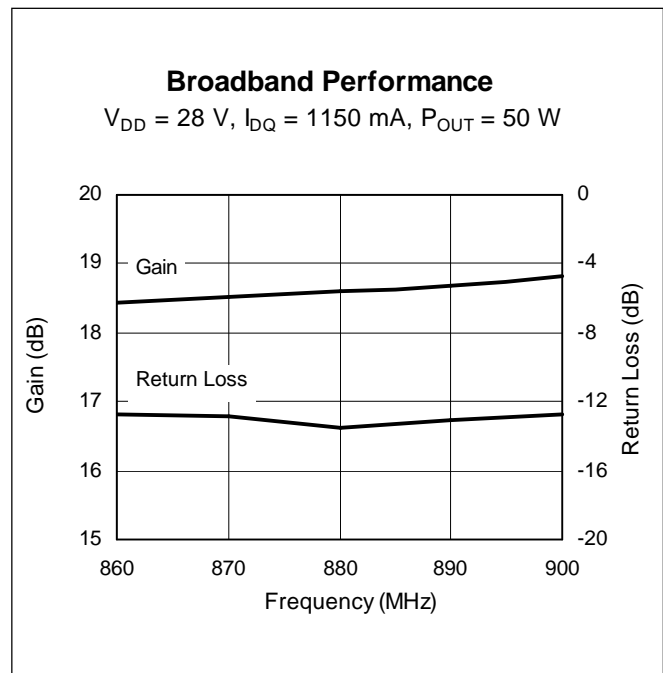
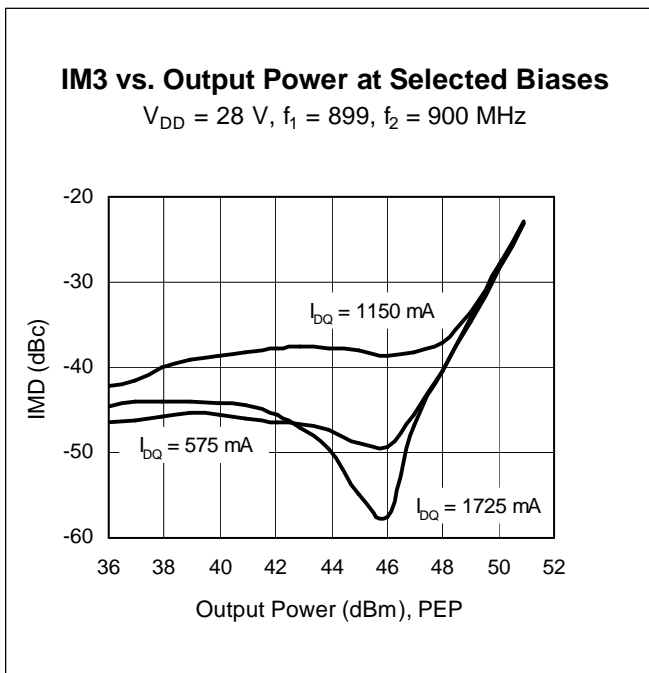
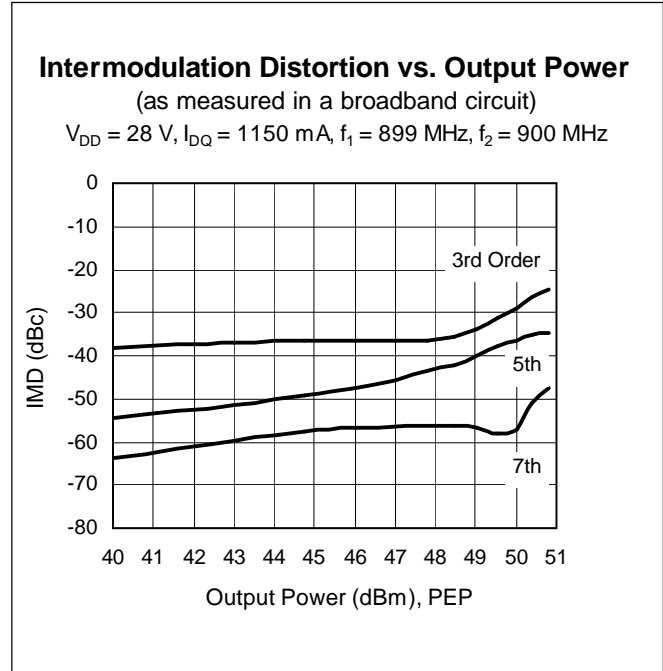
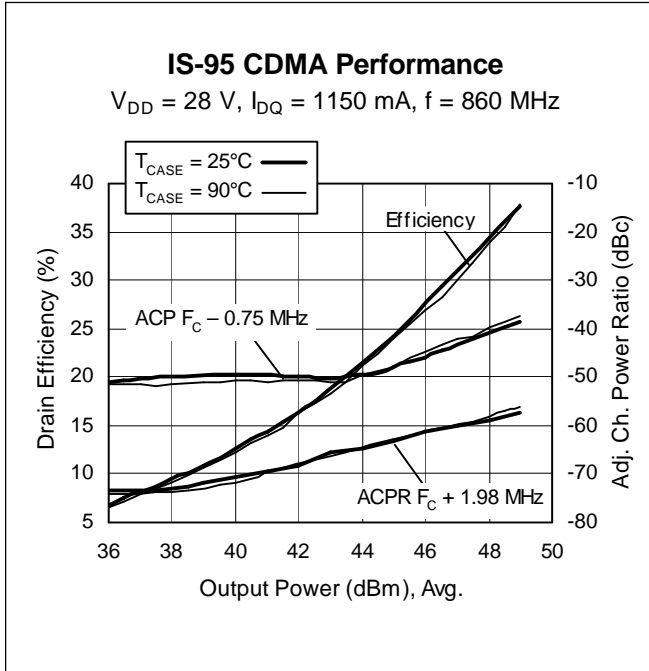
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	-0.5 to +12	V
Junction Temperature	T_J	200	$^\circ\text{C}$
Total Device Dissipation	P_D	603	W
Above 25°C derate by		3.45	W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^\circ\text{C}$
Thermal Resistance ($T_{CASE} = 70^\circ\text{C}$, 200 W CW)	$R_{\theta JC}$	0.29	$^\circ\text{C/W}$

Ordering Information

Type	Package Outline	Package Description	Marking
PTF082001E	30260	Thermally-enhanced slotted flange, single-ended	PTF082001E
PTF082001F*	31260	Thermally-enhanced earless flange, single-ended	PTF082001F

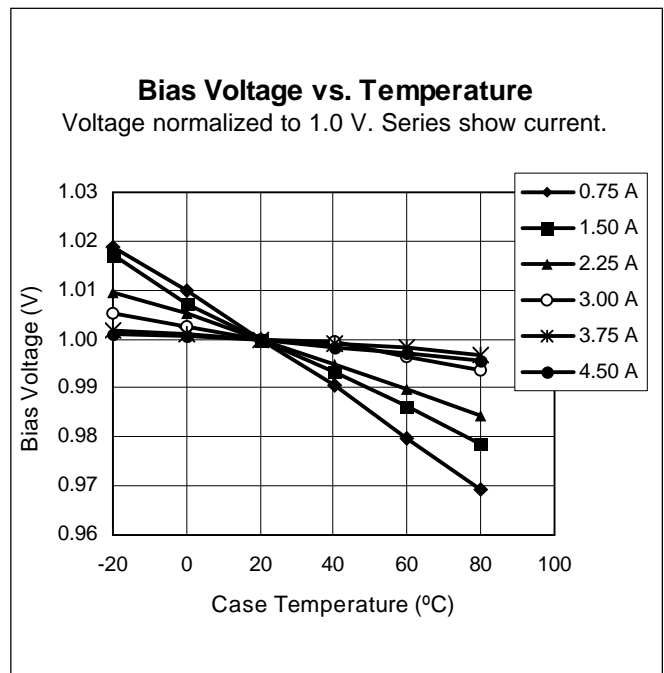
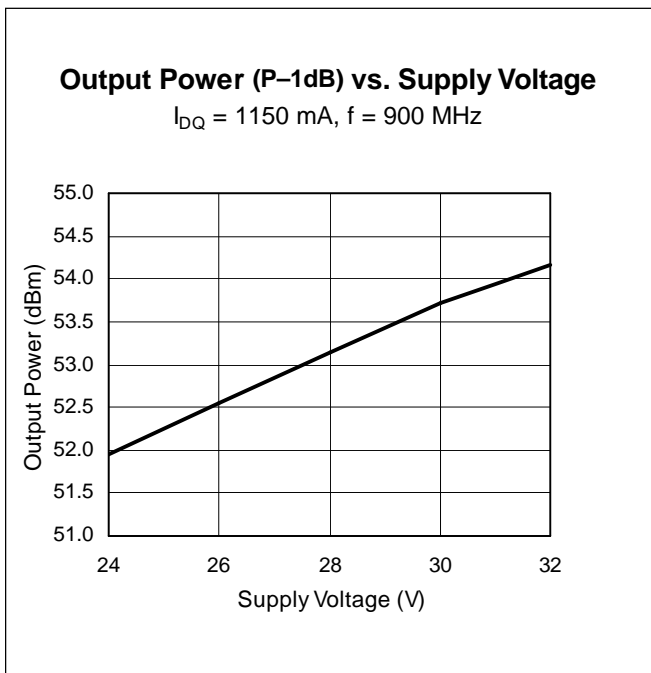
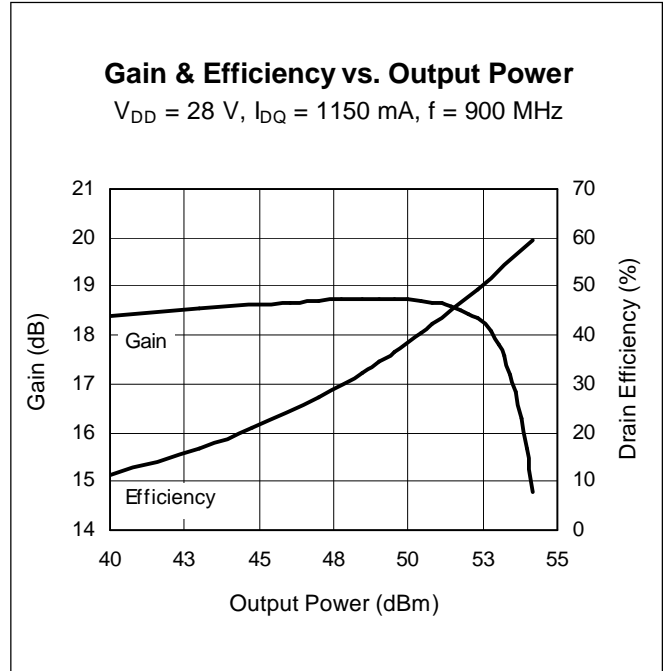
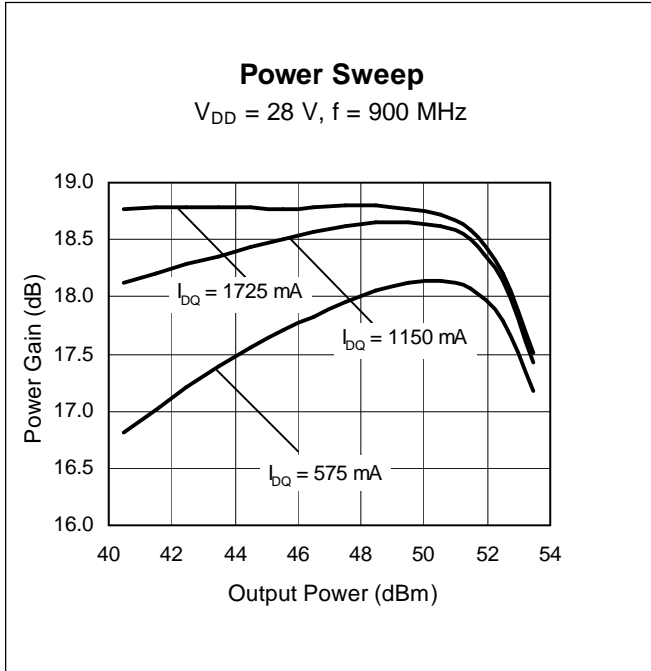
*See Infineon distributor for future availability.

Typical Performance (measured in Infineon test fixture)

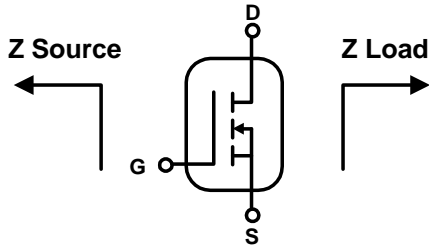


All published data at $T_{CASE} = 25^{\circ}\text{C}$ unless otherwise indicated.

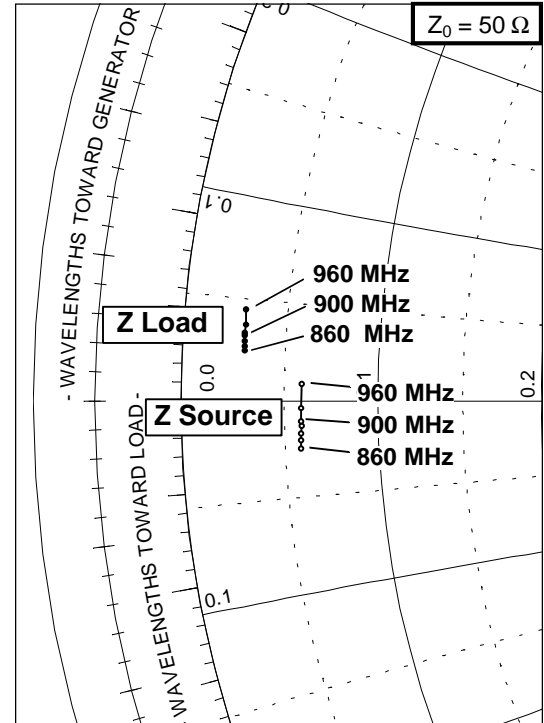
Typical Performance (cont.)



Broadband Circuit Impedance

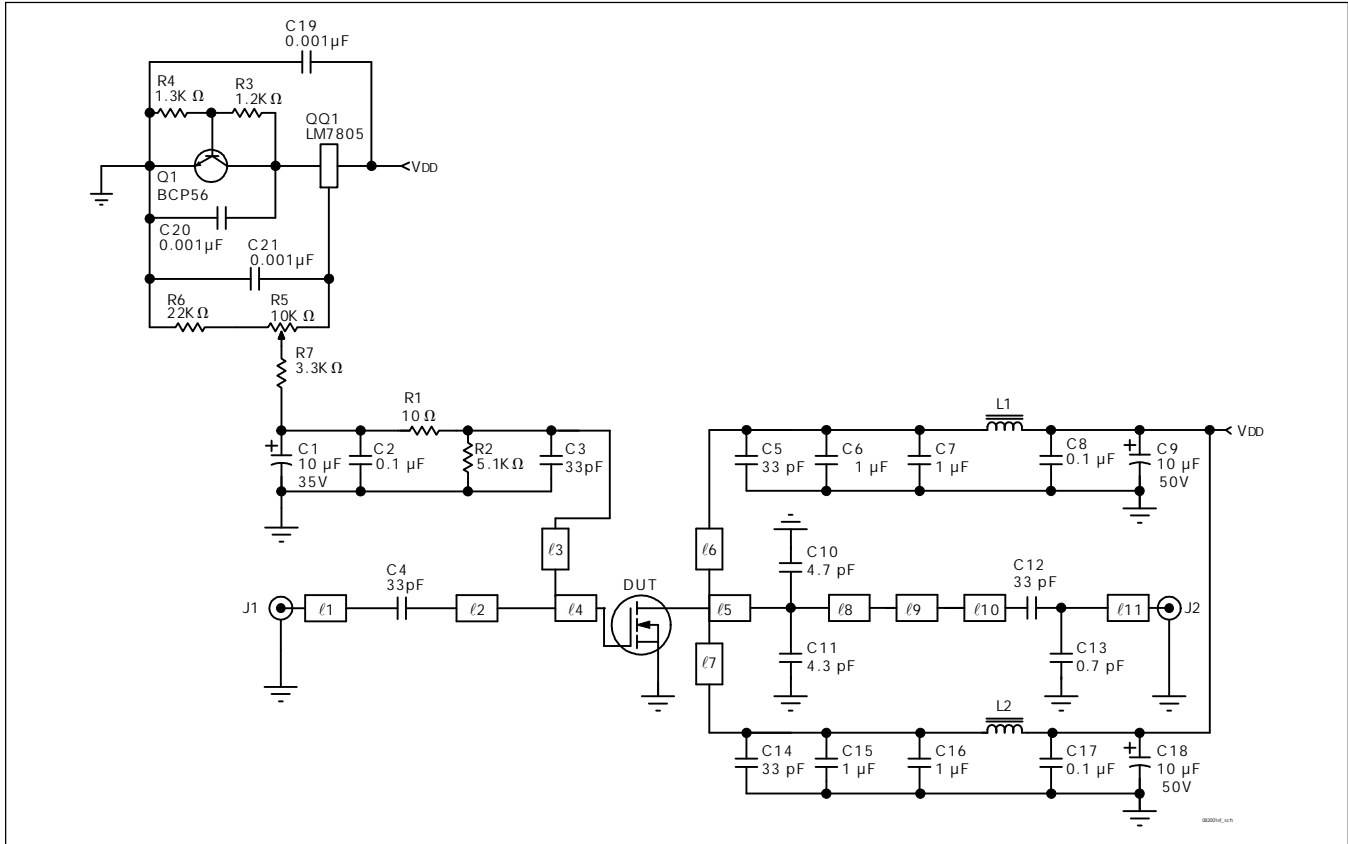


Frequency MHz	Z Source Ω		Z Load Ω	
	R	jX	R	jX
860	2.92	-1.25	1.49	1.25
870	2.93	-1.04	1.49	1.36
880	2.93	-0.86	1.49	1.48
890	2.96	-0.65	1.47	1.61
900	2.94	-0.54	1.47	1.68
920	2.95	-0.20	1.49	1.88
960	2.96	0.44	1.46	2.25



See next page for Reference Circuit information.

Reference Circuit



Reference Circuit Schematic for 900 MHz

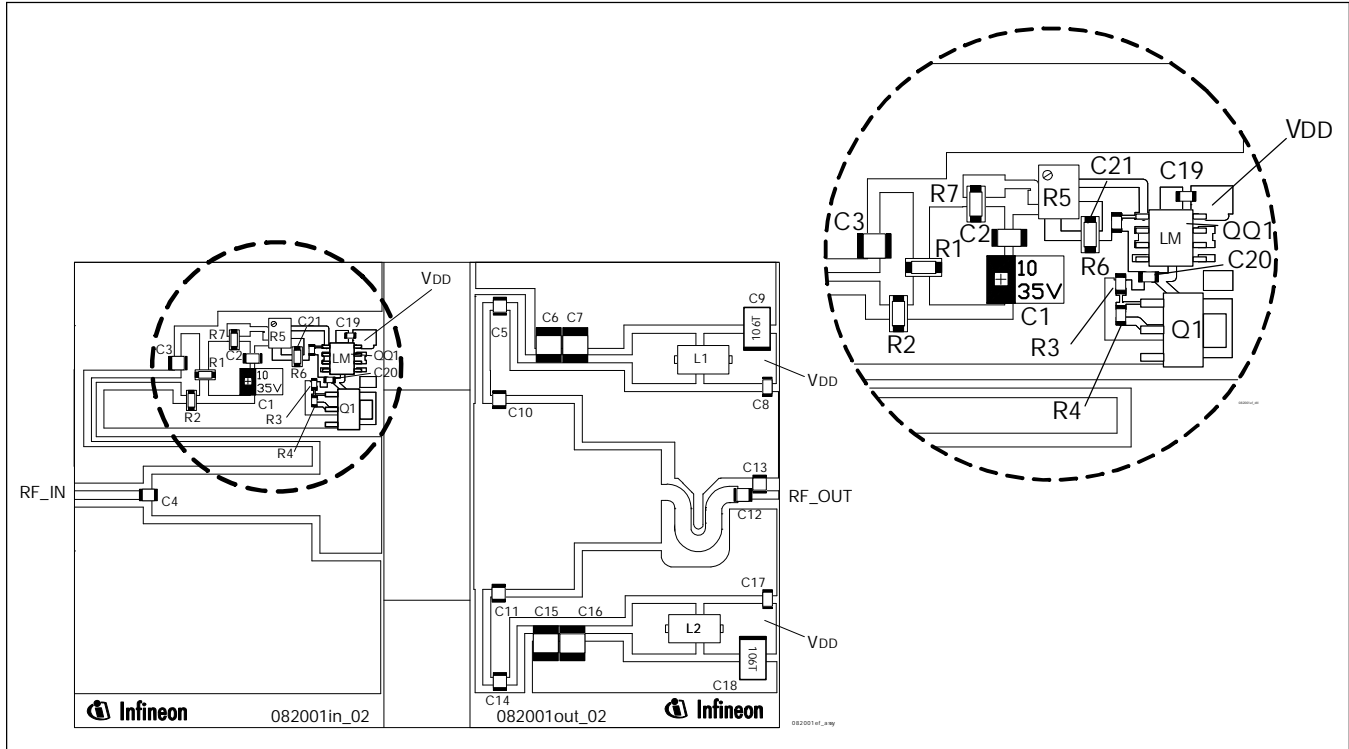
Circuit Assembly Information

DUT	PTF082001E	LDMOS Transistor
PCB	0.76 mm [.030"] thick, $\epsilon_r = 4.5$	2 oz. copper Rogers TMM4

Microstrip	Electrical Characteristics at 900 MHz*	Dimensions: L x W (mm)	Dimensions: L x W (in.)
$\ell 1$	0.063 λ , 50.0 Ω	11.43 x 1.40	0.450 x 0.055
$\ell 2$	0.165 λ , 15.9 Ω	27.69 x 6.86	1.090 x 0.270
$\ell 3$	0.330 λ , 68.0 Ω	61.60 x 0.76	2.425 x 0.030
$\ell 4$	0.061 λ , 6.5 Ω	9.91 x 19.05	0.390 x 0.750
$\ell 5$	0.026 λ , 4.2 Ω	4.19 x 30.48	0.165 x 1.200
$\ell 6$	0.111 λ , 50.0 Ω	20.32 x 1.27	0.800 x 0.050
$\ell 7$	0.111 λ , 50.0 Ω	20.32 x 1.27	0.800 x 0.050
$\ell 8$	0.077 λ , 4.2 Ω	12.32 x 30.48	0.485 x 1.200
$\ell 9$	0.087 λ , 7.9 Ω	14.22 x 15.24	0.560 x 0.600
$\ell 10$	0.164 λ , 34.0 Ω	28.96 x 2.54	1.140 x 0.100
$\ell 11$	0.063 λ , 50.0 Ω	5.08 x 1.40	0.200 x 0.055

*Electrical characteristics are rounded.

Reference Circuit (cont.)

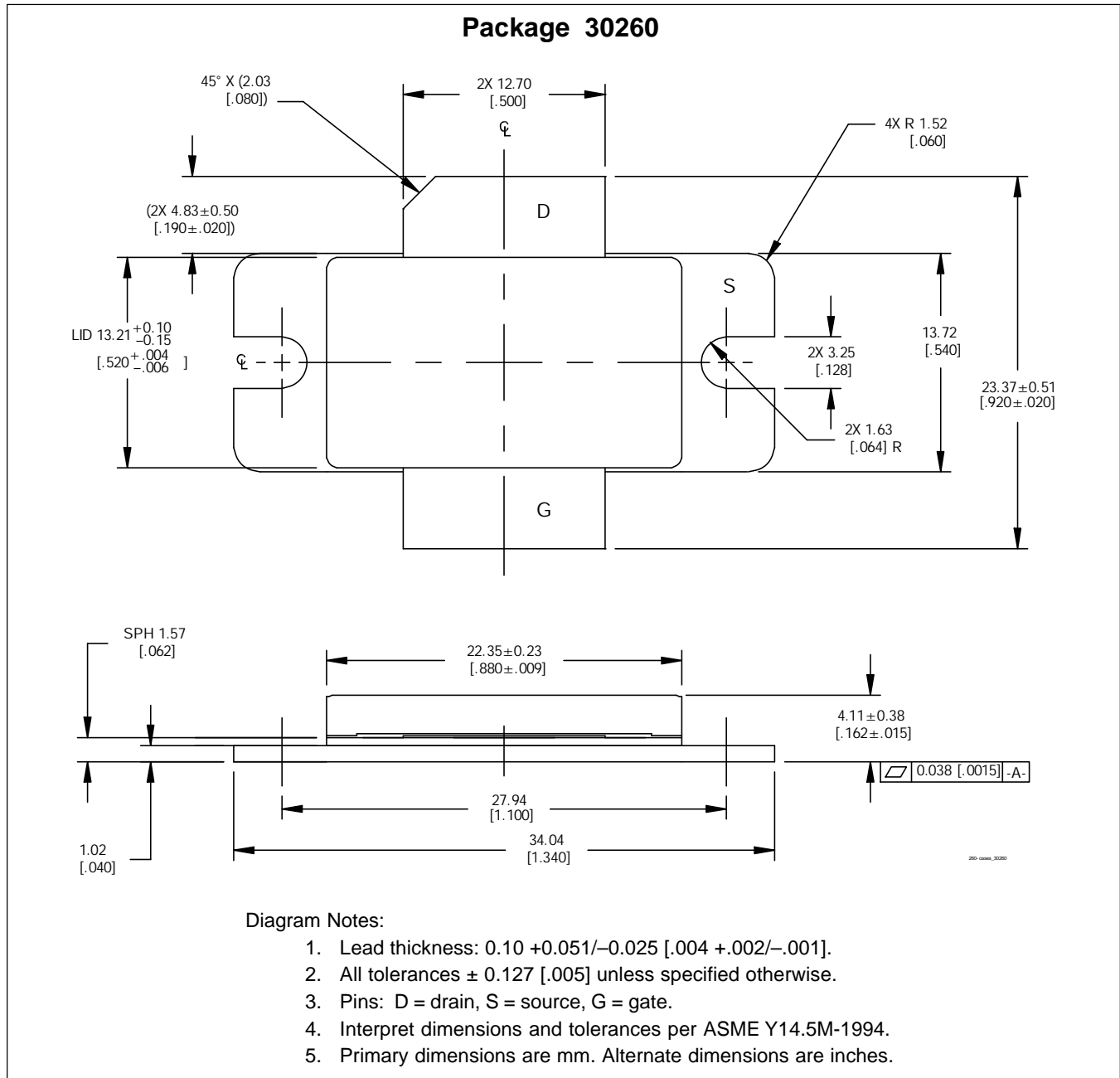


Reference Circuit¹ (not to scale)

Component	Description	Manufacturer	P/N or Comment
C1	Capacitor, 10 μ F, 35V, Tant. TE Series	Digi-Key	PC56106-ND, SMD
C2, C8, C17	Capacitor, 0.1 μ F, 50 V, 1206	Digi-Key	PCC104BCT-ND
C3, C4, C5, C12, C14	Capacitor, 33 pF	ATC	100B 330
C13	Capacitor, 0.7 pF	ATC	100B0R7
C6, C7, C15, C16	Capacitor, 1 μ F, 50 V	Digi-Key	19528-ND
C9, C18	Capacitor, 10 μ F, 50 V, Tant. TE Series	Garrett Electronics	TPSE106K050R0400, SMD
C11	Capacitor, 4.3 pF	ATC	100B4R3
C10	Capacitor, 4.7 pF	ATC	100B4R7
C19, C20, C21	Capacitor, 0.001 μ F, 50V, 0603	Digi-Key	PCC1772CT-ND
L1, L2	Ferrite, 6 mm	Ferroxcube	53/3/4.6-452
Q1	Transistor	Infineon	BCP56
QQ1	Voltage regulator	National Semiconductor	LM7805
R1	Resistor, 10 ohms, 1/4 W, 1206	Digi-Key	P10ECT-ND
R2	Resistor, 5.1 k-ohms, 1/4 W, 1206	Digi-Key	P5.1KECT-ND
R3	Resistor, 1.2 k-ohms, 1/10 W, 0603	Digi-Key	P1.2KGCT-ND
R4	Resistor, 1.3 k-ohms, 1/10 W, 0603	Digi-Key	P1.3KGCT-ND
R5	Potentiometer 10 k-ohms, 0.25 W	Digi-Key	3224W-103ETR-ND
R6	Resistor, 22 k-ohms, 1/4 W, 1206	Digi-Key	P22KECT-ND
R7	Resistor, 3.3 k-ohms, 1/4 W, 1206	Digi-Key	P3.3KECT-ND

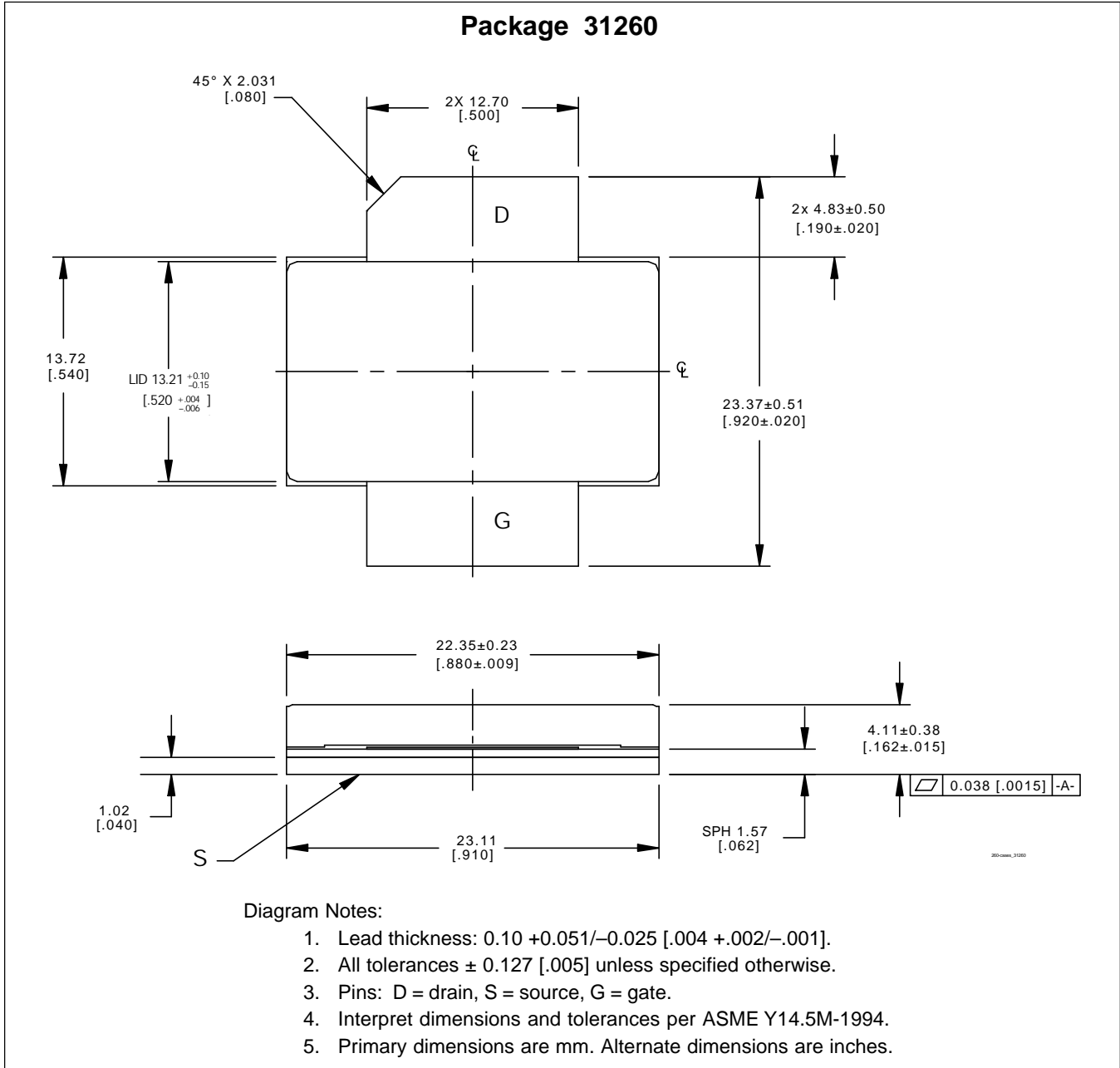
¹Gerber files for this circuit are available on request.

Package Outline Specifications



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

Package Outline Specifications (cont.)



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Revision History: 2004-10-15

Data Sheet

Previous Version: 2004-08-19, Preliminary Data Sheet

Page	Subjects (major changes since last revision)
	Add test data and circuit information.

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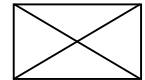
Please send your proposal (including a reference to this document) to:

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