PTFA260851E
PTFA260851F

green Product

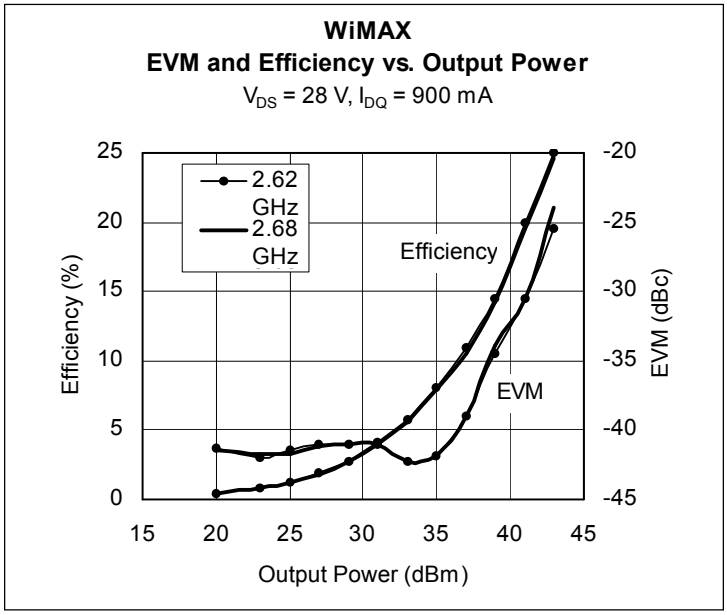
Thermally-Enhanced High Power RF LDMOS FET
85 W, 2500 – 2700 MHz

Description

The PTFA260851E and PTFA260851F are 85-watt LDMOS FETs designed for WiMAX power amplifier applications in the 2500 to 2700 MHz band. Features include input and output matching, and thermally-enhanced packages with slotted or earless flanges. Manufactured with Infineon's advanced LDMOS process, these devices provide excellent thermal performance and superior reliability.

PTFA260851E
Package H-30248-2

PTFA260851F
Package H-31248-2



Features

- Thermally-enhanced, Pb-free and RoHS-compliant packages
- Broadband internal matching
- Typical WiMAX performance at 2680 MHz, 28 V
  - Average output power = 16 W
  - Linear Gain = 14 dB
  - Efficiency = 22%
  - Error Vector Magnitude = –29 dB
- Typical CW performance, 2680 MHz, 28 V
  - Output power at P–1dB = 100 W
  - Efficiency = 47%
- Integrated ESD protection: Human Body Model, Class 2 (minimum)
- Excellent thermal stability, low HCI drift
- Capable of handling 10:1 VSWR @ 28 V, 85 W (CW) output power

RF Characteristics

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

V_{DD} = 28 V, I_{DQ} = 900 mA, P_{OUT} = 16 W average, f = 2680 MHz, modulation = 64 QAM 2/3, channel bandwidth = 3.5 MHz, sample rate = 4 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	—	14	—	dB
Drain Efficiency	η_D	—	22	—	%
Error Vector Magnitude	EVM	—	–29	—	dB

All published data at T_{CASE} = 25°C unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

RF Characteristics (cont.)

Two-tone Measurements (tested in Infineon test fixture)

V_{DD} = 28 V, I_{DQ} = 900 mA, P_{OUT} = 85 W PEP, f = 2680 MHz, tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	13	14	—	dB
Drain Efficiency	η_D	33	36	—	%
Intermodulation Distortion	IMD	—	–30	–28	dBc

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 10 mA	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	µA
	V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	µA
On-State Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.095	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ} = 900 mA	V_{GS}	2.0	2.5	3.0	V
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	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	°C
Total Device Dissipation	P_D	437.5	W
Above 25°C derate by		2.5	W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 85 W CW)	$R_{\theta JC}$	0.4	°C/W

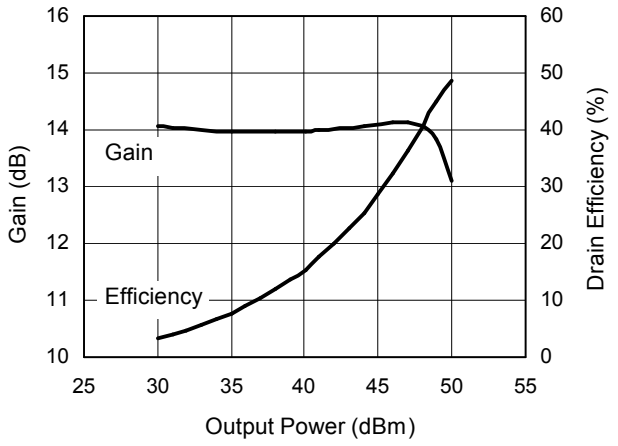
Ordering Information

Type and Version	Package Type	Package Description	Marking
PTFA260851E V1	H-30248-2	Thermally-enhanced slotted flange, single-ended	PTFA260851E
PTFA260851F V1	H-31248-2	Thermally-enhanced earless flange, single-ended	PTFA260851F

Typical Performance (data taken in a production test fixture)

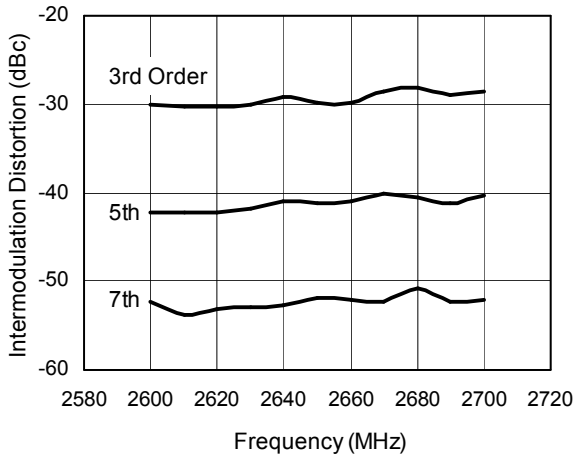
Gain & Efficiency vs. Output Power

V_{DD} = 28 V, I_{DQ} = 900 mA, f = 2.68 GHz



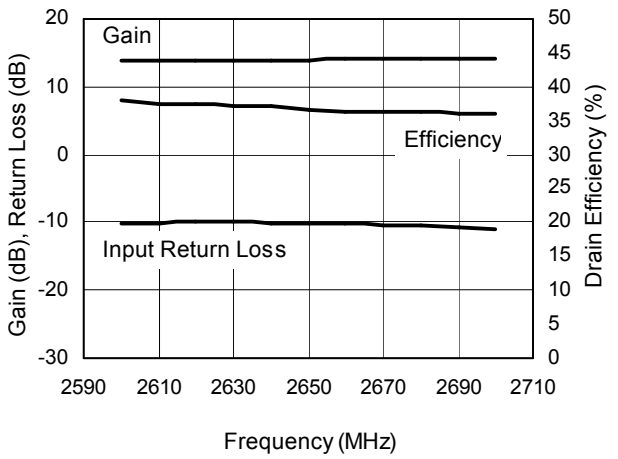
Two–tone Broadband Performance

V_{DD} = 28 V, I_{DQ} = 900 mA, P_{OUT} = 42.5 W



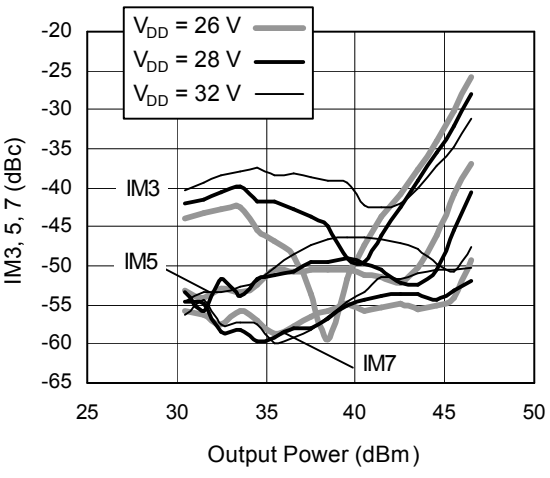
Two–tone Broadband Performance

V_{DD} = 28 V, I_{DQ} = 900 mA, P_{OUT} = 42.5 W



Two–tone Performance, various voltages

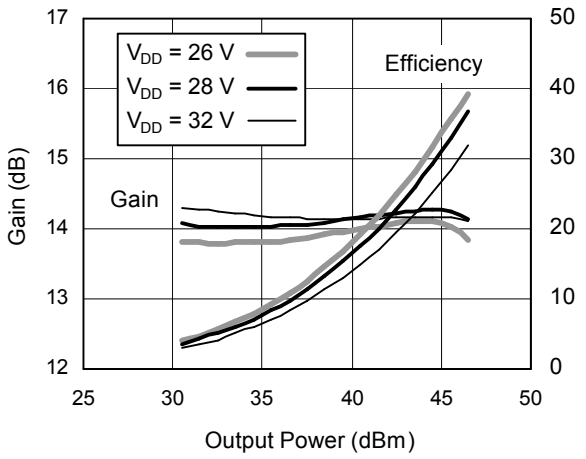
I_{DQ} = 900 mA, f = 2.68 GHz, tone spacing = 1 MHz



Typical Performance (cont.)

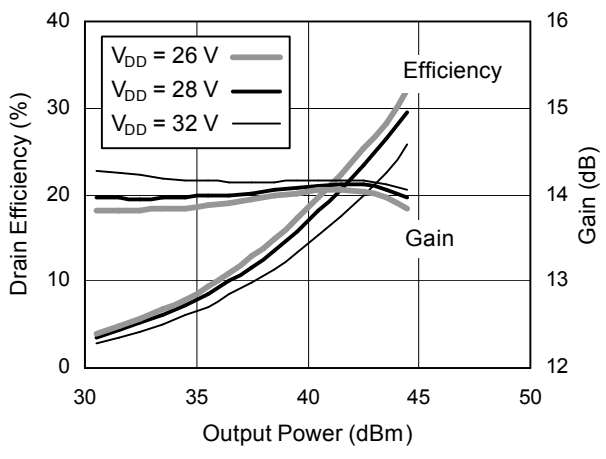
Two–tone Performance, various voltages

I_{DQ} = 900 mA, f = 2.68 GHz, tone spacing = 1 MHz



3-Carrier CDMA2000 Performance, various voltages

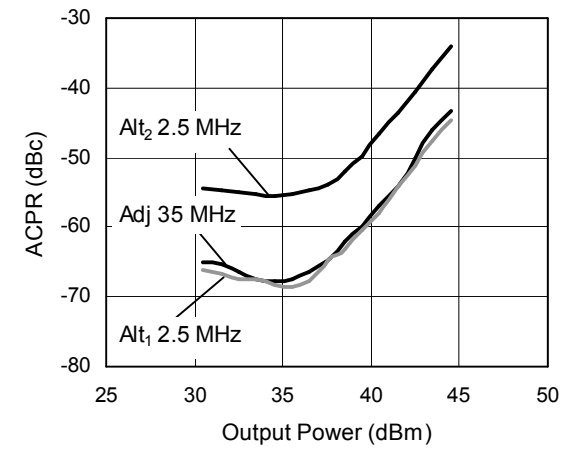
I_{DQ} = 900 mA, f = 2.68 GHz, PAR = 7 dB



3-Carrier CDMA2000 Performance

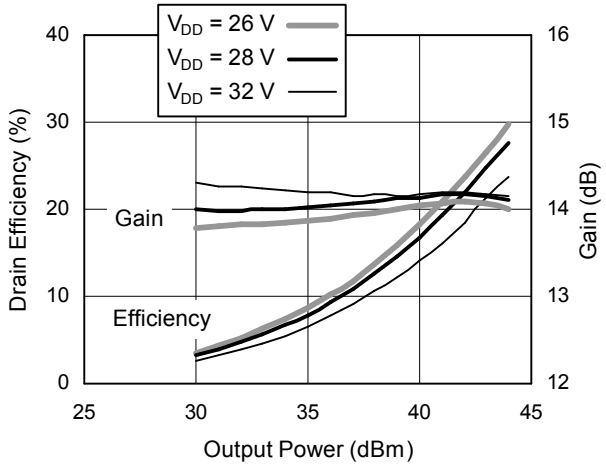
Adjacent Channel Power Ratio

V_{DD} = 28 V, I_{DQ} = 900 mA, f = 2.68 GHz, PAR = 7 dB



WCDMA 3GPP Single-carrier Performance, various voltages

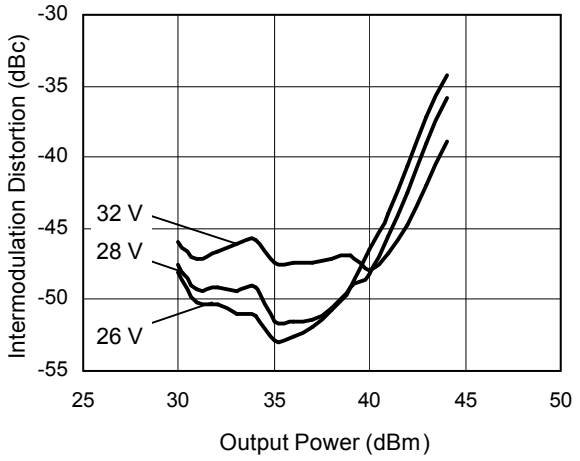
I_{DQ} = 900 mA, f = 2.68 GHz, PAR = 8 dB



Typical Performance (cont.)

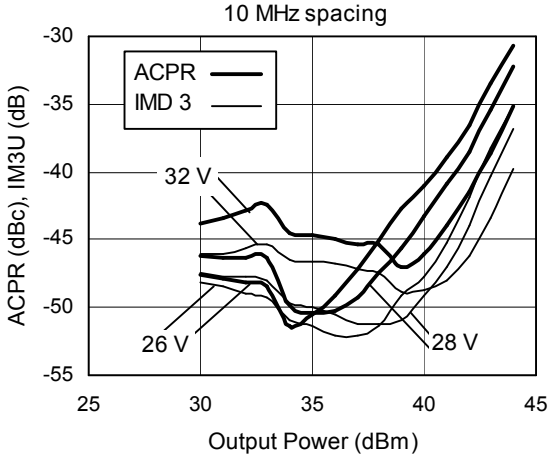
WCDMA 3GPP Single-carrier Performance

I_{DQ} = 900 mA, f = 2.68 GHz, PAR = 8 dB



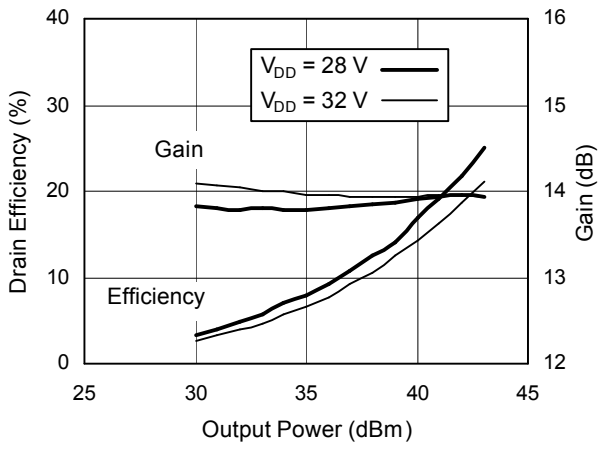
WCDMA 3GPP 2-carrier Performance, various voltages

I_{DQ} = 900 mA, f = 2.68 GHz, PAR = 8 dB, 10 MHz spacing



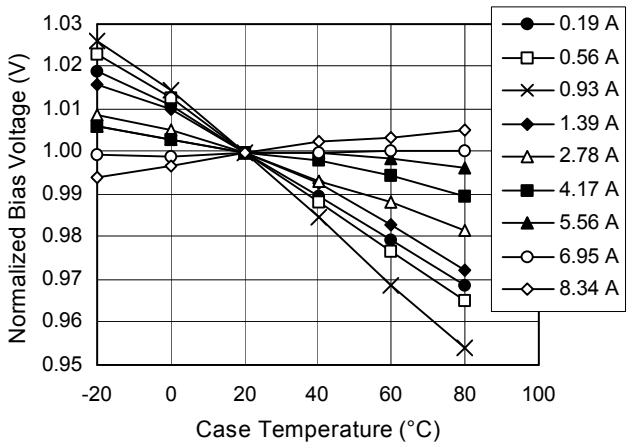
WCDMA 3GPP 2-carrier Performance

V_{DD} = 28 V & 32 V, I_{DQ} = 900 mA, f = 2.68 GHz, PAR = 8 dB, 10 MHz spacing

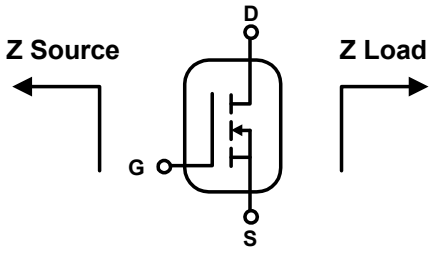


Bias Voltage vs. Temperature

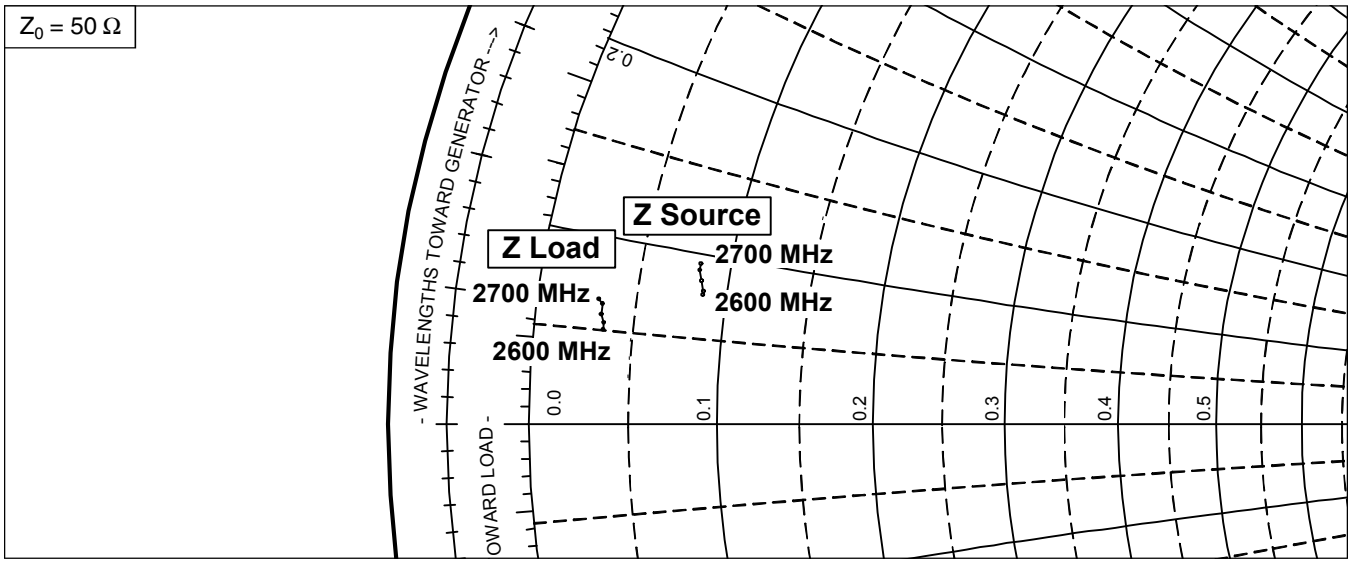
Voltage normalized to typical gate voltage, series show current



Broadband Circuit Impedance

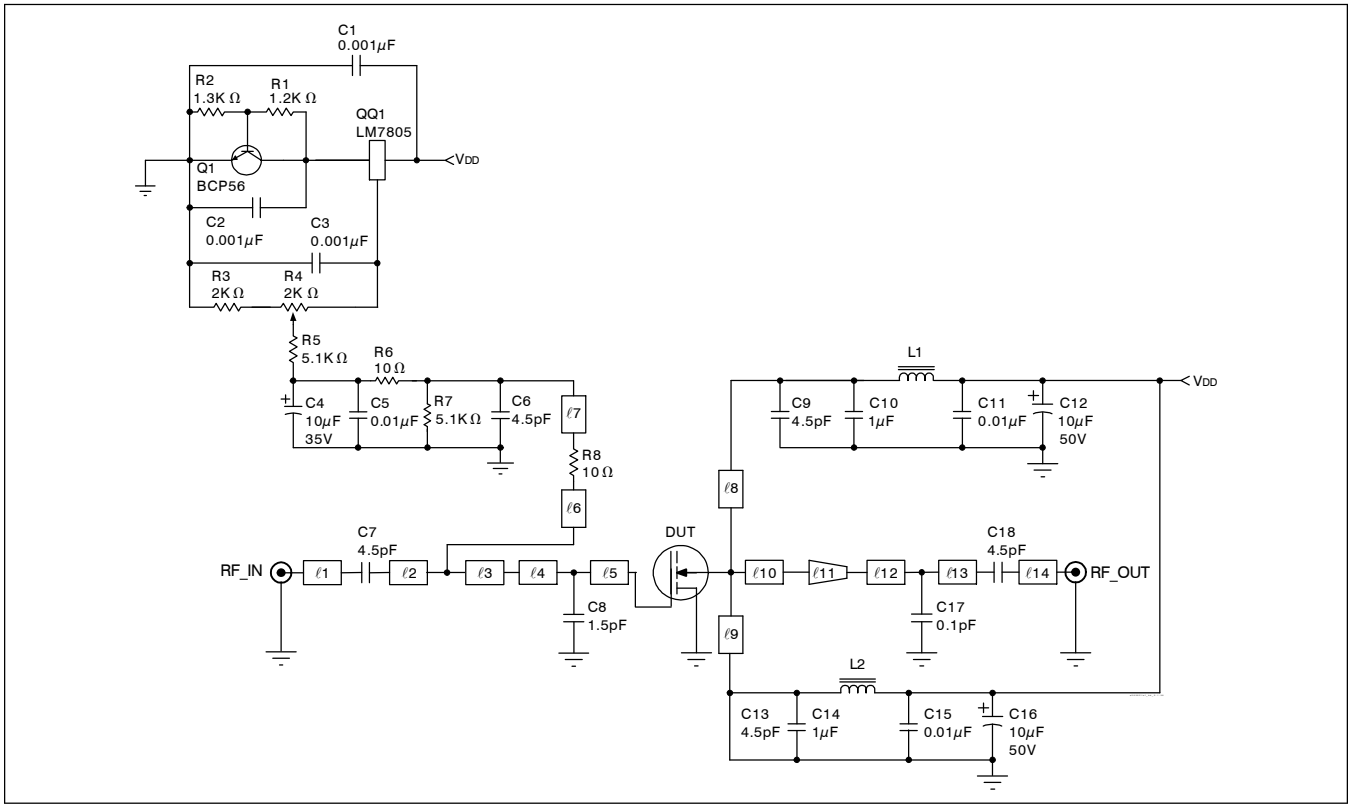


Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
2600	4.4	3.8	1.8	2.5
2620	4.4	3.9	1.8	2.7
2650	4.3	4.2	1.7	2.9
2680	4.2	4.5	1.7	3.2
2700	4.2	4.7	1.6	3.3



See next page for circuit information

Reference Circuit

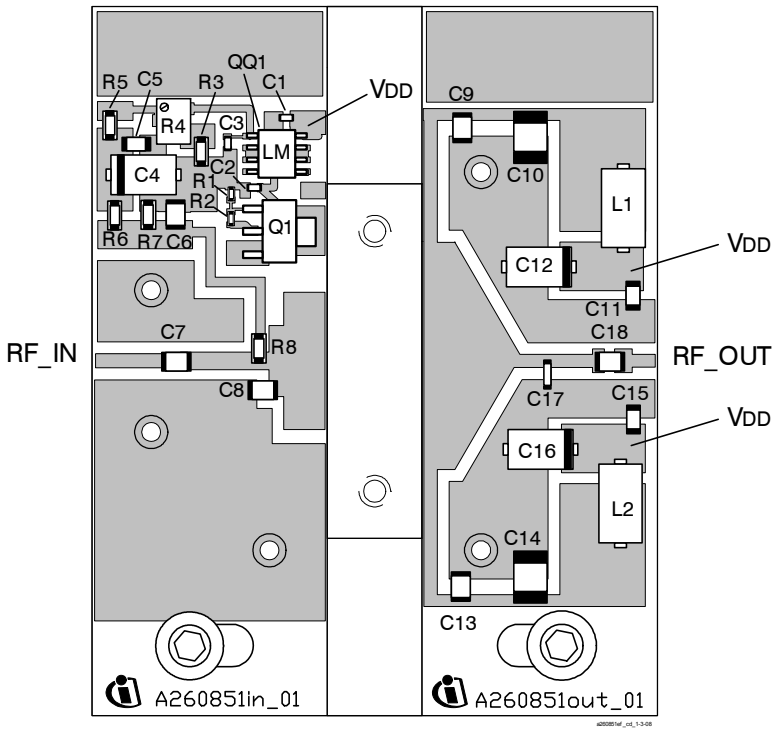


Reference circuit schematic for ƒ = 2650 MHz

Circuit Assembly Information			
DUT	PTFA260851E or PTFA260851F	LDMOS Transistor	
PCB	0.76 mm [.030"] thick, ε_r = 4.5	TMM4	2 oz. copper

Microstrip	Electrical Characteristics at 2650 MHz	Dimensions: L x W (mm)	Dimensions: L x W (in.)
ℓ1	0.121 λ, 46.9 Ω	7.42 x 1.52	0.292 x 0.060
ℓ2	0.135 λ, 40.5 Ω	8.20 x 1.93	0.323 x 0.076
ℓ3	0.021 λ, 40.5 Ω	1.27 x 1.93	0.050 x 0.076
ℓ4	0.028 λ, 14.7 Ω	1.60 x 7.54	0.063 x 0.297
ℓ5	0.079 λ, 8.3 Ω	4.37 x 14.66	0.172 x 0.577
ℓ6	0.008 λ, 57.9 Ω	0.51 x 1.04	0.020 x 0.041
ℓ7	0.272 λ, 57.9 Ω	16.79 x 1.04	0.661 x 0.041
ℓ8	0.278 λ, 49.3 Ω	16.89 x 1.40	0.665 x 0.055
ℓ9	0.278 λ, 49.3 Ω	16.89 x 1.40	0.665 x 0.055
ℓ10	0.060 λ, 5.2 Ω	3.28 x 24.36	0.129 x 0.959
ℓ11 (taper)	0.113 λ, 5.2 Ω / 49.3 Ω	6.73 x 24.36 / 1.40	0.265 x 0.959 / 0.055
ℓ12	0.048 λ, 49.3 Ω	2.97 x 1.40	0.117 x 0.055
ℓ13	0.095 λ, 49.3 Ω	5.84 x 1.40	0.230 x 0.055
ℓ14	0.070 λ, 49.3 Ω	4.29 x 1.40	0.169 x 0.055

Reference Circuit (cont.)



*Reference circuit assembly diagram (not to scale)**

Component	Description	Suggested Manufacturer	P/N or Comment
C1, C2, C3	Capacitor, 0.001 µF	Digi-Key	PCC1772CT-ND
C4	Tantalum capacitor, 10 µF, 35 V	Digi-Key	399-1655-2-ND
C5, C11, C15	Capacitor, 0.01 µF	ATC	200B 103
C6, C7, C9, C13, C18	Ceramic capacitor, 4.5 pF	ATC	100B 4R5
C8	Ceramic capacitor, 1.5 pF	ATC	100B 1R5
C10, C14	Capacitor, 1 µF	ATC	920C105
C12, C16	Tantalum capacitor, 10 µF, 50 V	Garrett Electronics	TPSE106K050R0400
C17	Ceramic capacitor, 0.1 pF	ATC	100A 0R1
L1, L2	Ferrite, 8.9 mm	Elna Magnetics	BDS 4.6/3/8.9-4S2
Q1	Transistor	Infineon 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	Chip resistor 2 k-ohms	Digi-Key	P2KECT-ND
R4	Potentiometer 2 k-ohms	Digi-Key	3224W-202ETR-ND
R5, R7	Chip resistor 5.1 k-ohms	Digi-Key	P5.1KECT-ND
R6, R8	Chip resistor 10 ohms	Digi-Key	P10ECT-ND

**Gerber Files for this circuit available on request*

Package Outline Specifications

Package H-30248-2

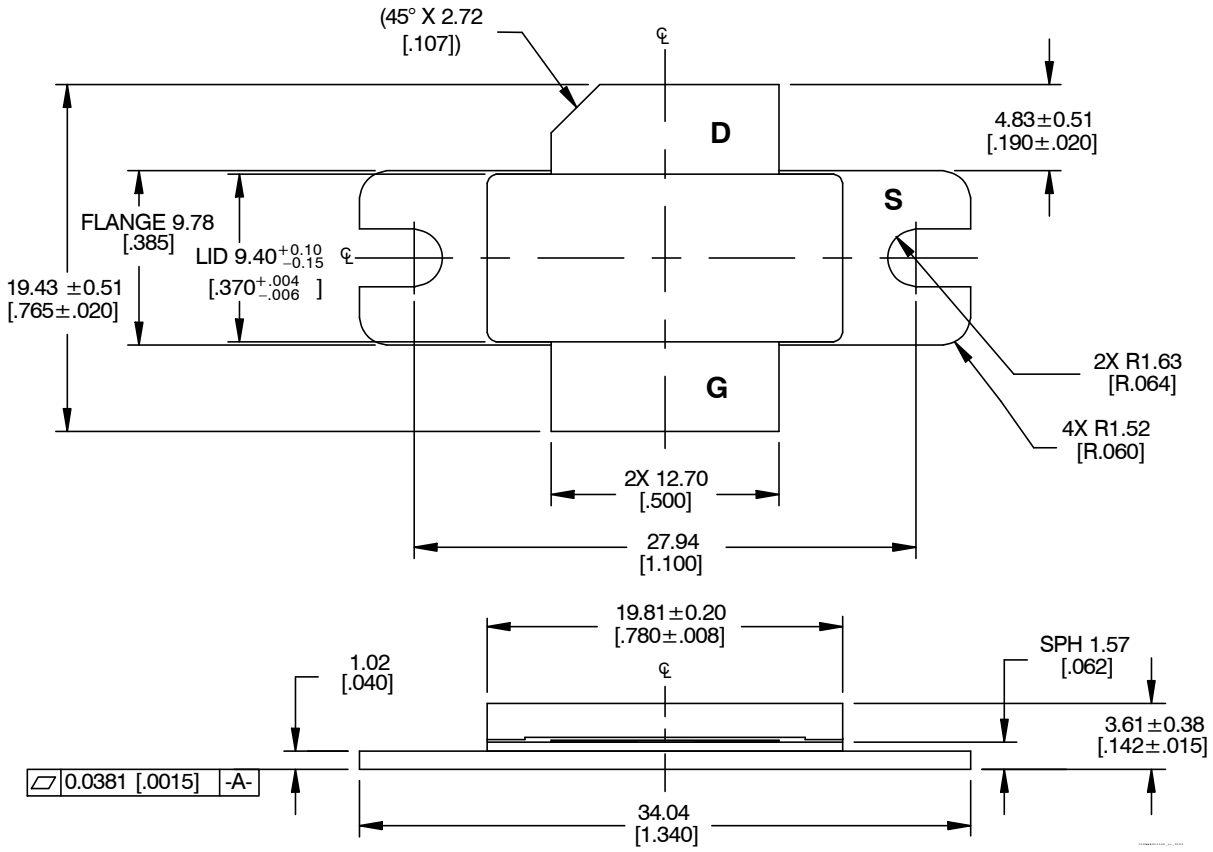


Diagram Notes—unless otherwise specified:

1. Lead thickness: 0.10 +0.051/–0.025 [.004 +.002/–.001].
2. All tolerances ± 0.127 [.005] unless specified otherwise.
3. Pins: D = drain, S = source, G = gate.
4. Interpret dimensions and tolerances per ASME Y14.5M-1994.
5. Primary dimensions are mm. Alternate dimensions are inches.
6. Gold plating thickness:
   S - flange: 2.54 micron [100 microinch] (min)
   D, G - leads: 1.14 micron ± 0.38 micron [45 microinch ± 15 microinch]

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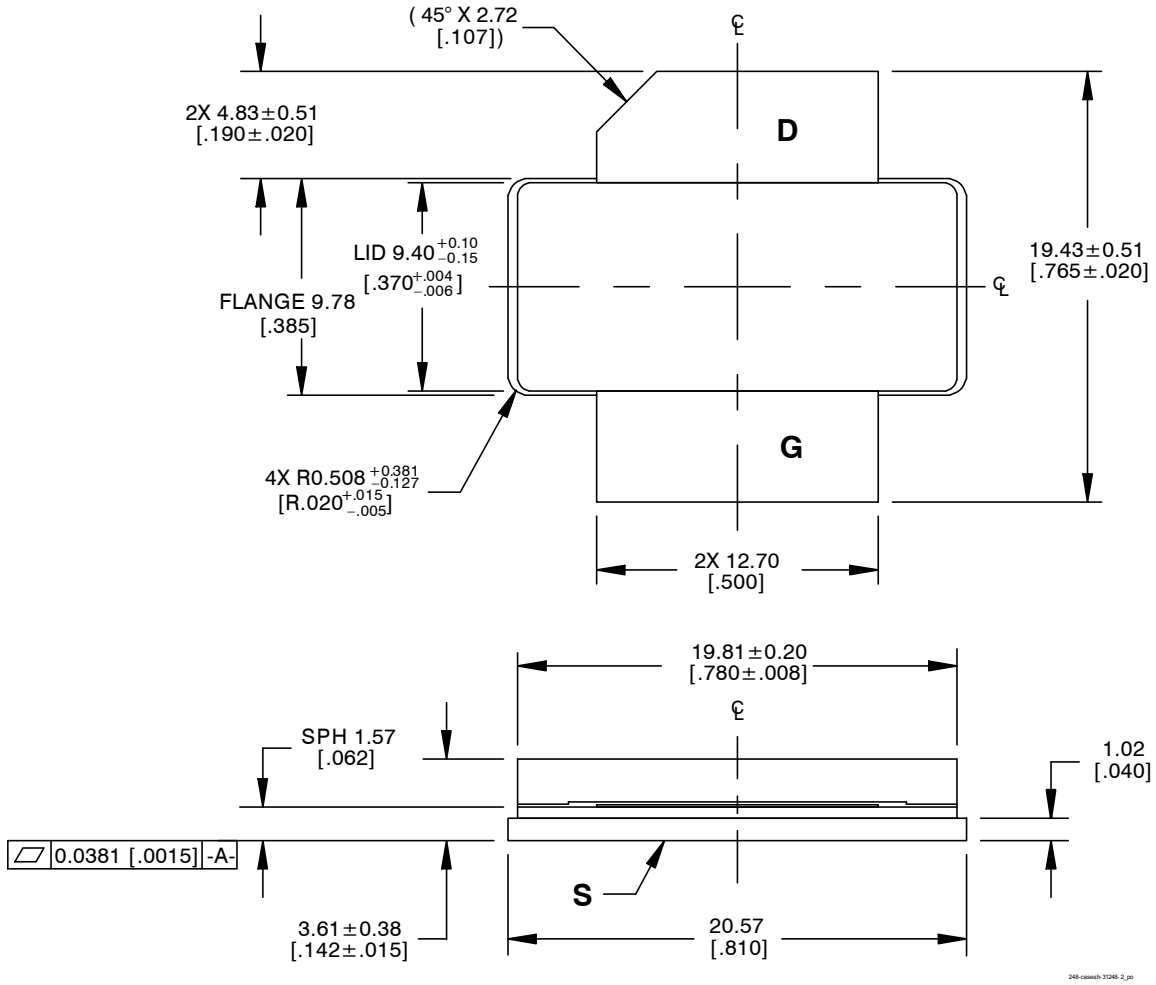
Package Outline Specifications

Package H-31248-2



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Revision History:	2009-02-20	Data Sheet
Previous Version:	2006-07-21, Preliminary Data Sheet	

Page	Subjects (major changes since last revision)
6, 7	Add impedance and circuit information.
1	Increase bandwidth from 2620 – 2680 to 2500 – 2700.
8	Fixed typing error

We Listen to Your Comments

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To request other information, contact us at:
+1 877 465 3667 (1-877-GO-LDMOS) USA
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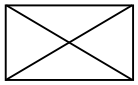

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