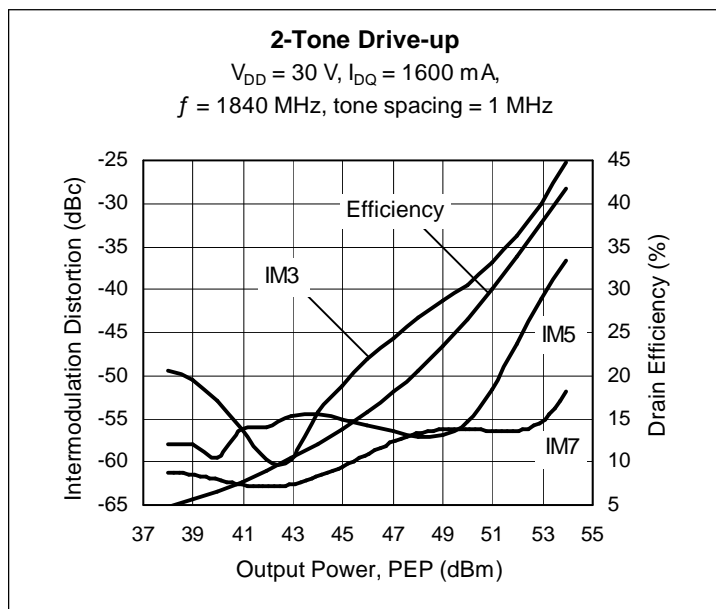
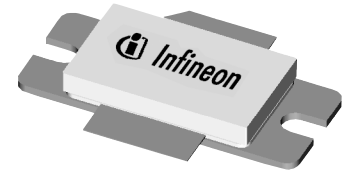


Thermally-Enhanced High Power RF LDMOS FET 200 W, 1805 – 1880 MHz

Description

The PTFA182001E is a 200-watt LDMOS FET intended for EDGE applications from 1805 to 1880 MHz. Features include input and output matching, and thermally-enhanced single-ended package with a slotted flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PTFA182001E
Package H-30260-2



Features

- Pb-free, RoHS-compliant and thermally-enhanced package
- Broadband internal matching
- Typical EDGE performance at 1836.6 MHz, 30 V
 - Average output power = 50 dBm
 - Linear gain = 16.3 dB
 - Efficiency = 37%
 - EVM = 3.1%
 - 400 kHz modulation = -61 dBc
 - 600 kHz modulation = -76 dBc
- Typical CW performance, 1880 MHz, 30 V
 - Output power at P-1dB = 220 W
 - Efficiency = 49%
- Integrated ESD protection: Human Body Model, Class 2 (minimum)
- Excellent thermal stability, low HCI drift
- Capable of handling 5:1 VSWR @ 30 V, 200 W (CW) output power

RF Characteristics

Two-tone Measurements (tested in Infineon test fixture)

$V_{DD} = 30\text{ V}$, $I_{DQ} = 1.6\text{ A}$, $P_{OUT} = 200\text{ W PEP}$, $f = 1840\text{ MHz}$, tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	15.7	16.6	—	dB
Drain Efficiency	η_D	37	38	—	%
Intermodulation Distortion	IMD	—	-31.5	-30	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

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	μA
Drain Leakage Current	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10.0	μA
On-State Resistance	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	$V_{DS} = 30\text{ V}, I_{DQ} = 1.8\text{ A}$	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	μA

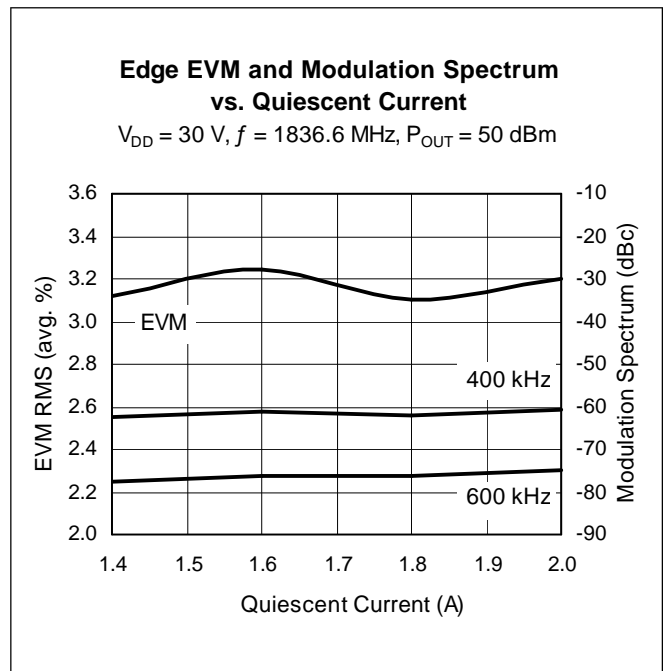
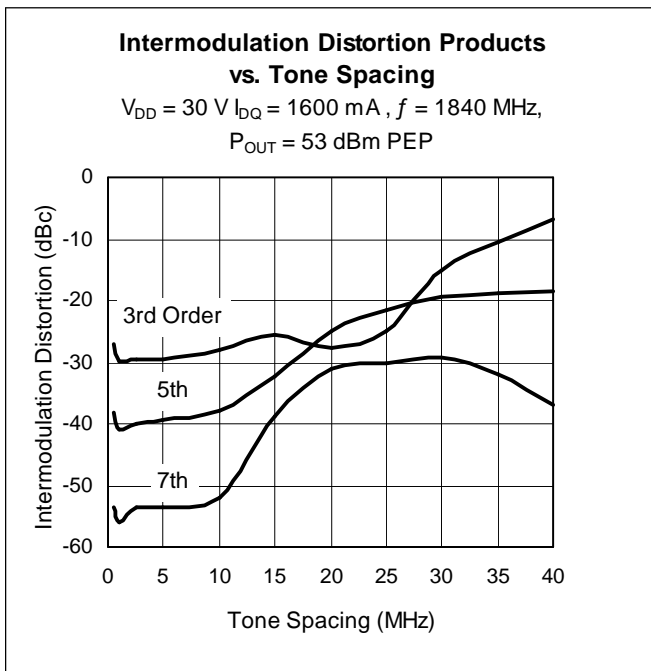
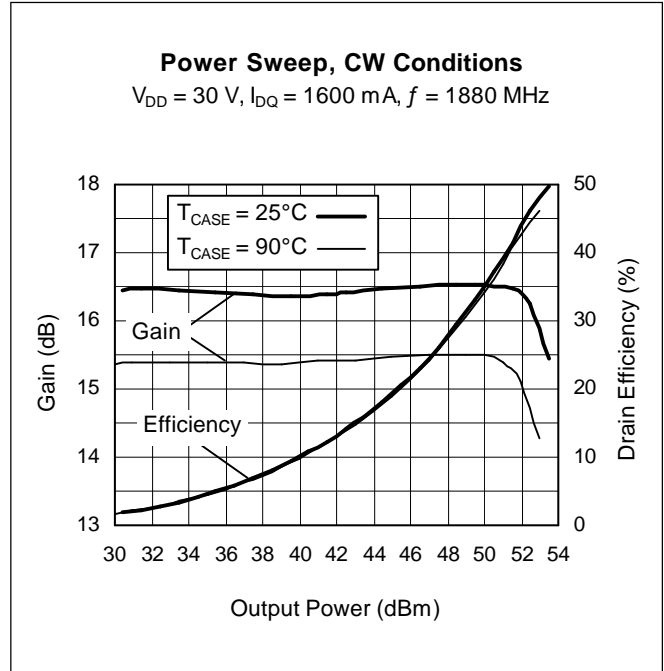
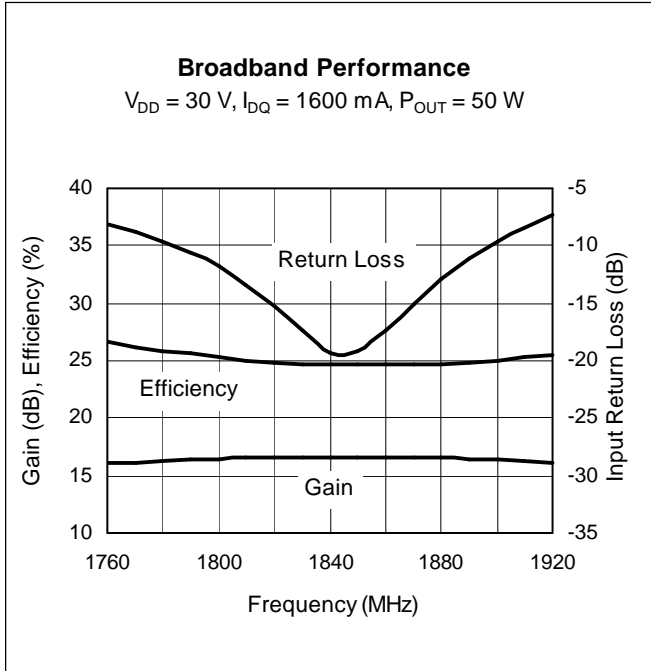
Maximum Ratings

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	625	W
Above 25 $^{\circ}\text{C}$ derate by		3.57	W/ $^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}, 200\text{ W CW}$)	$R_{\theta JC}$	0.28	$^{\circ}\text{C/W}$

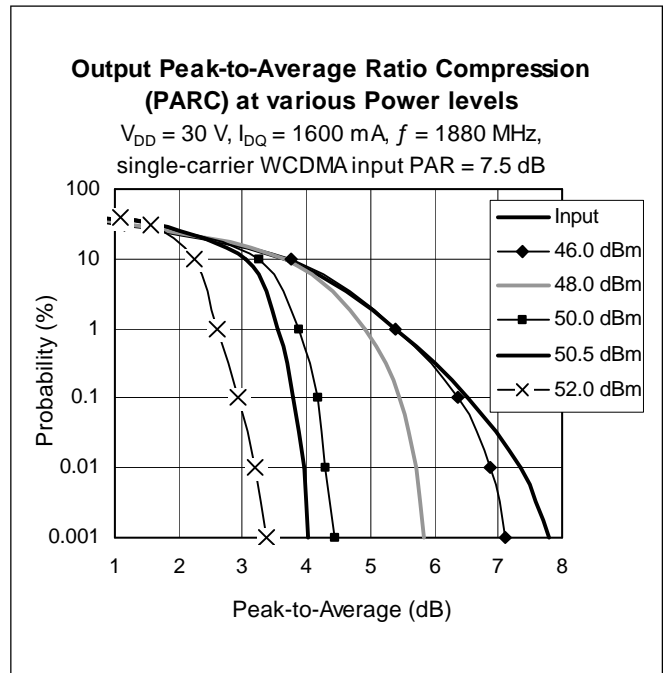
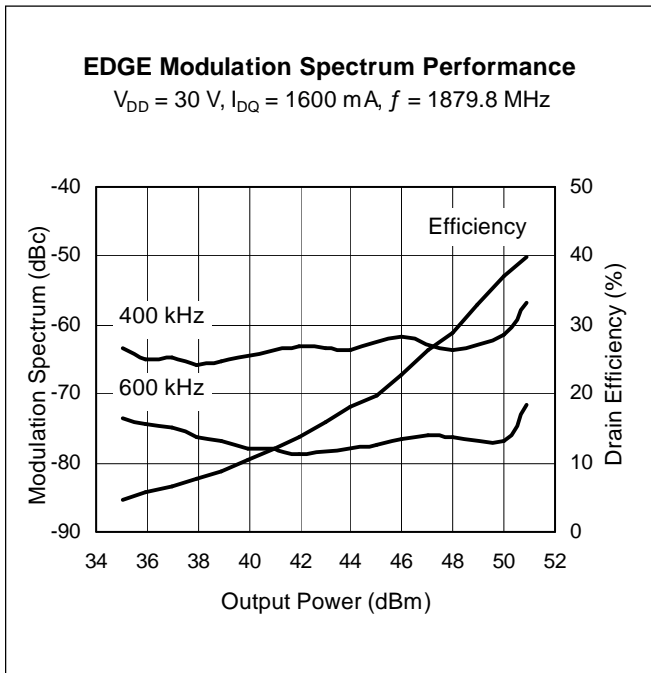
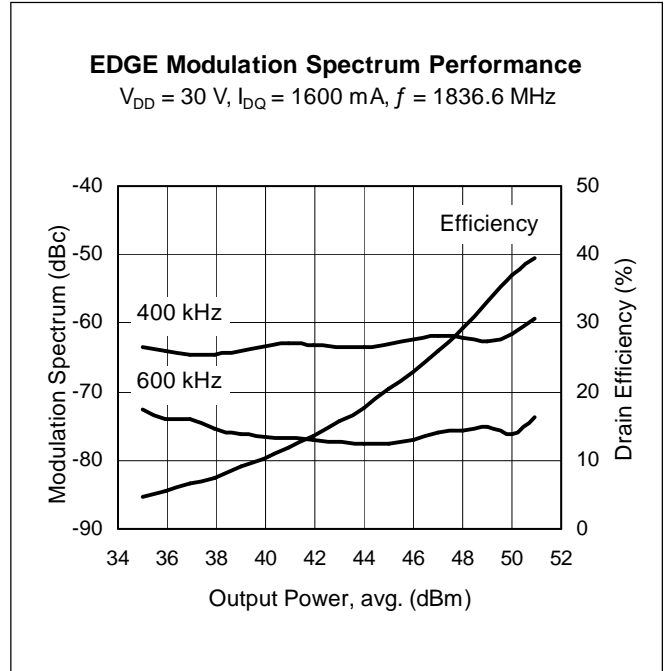
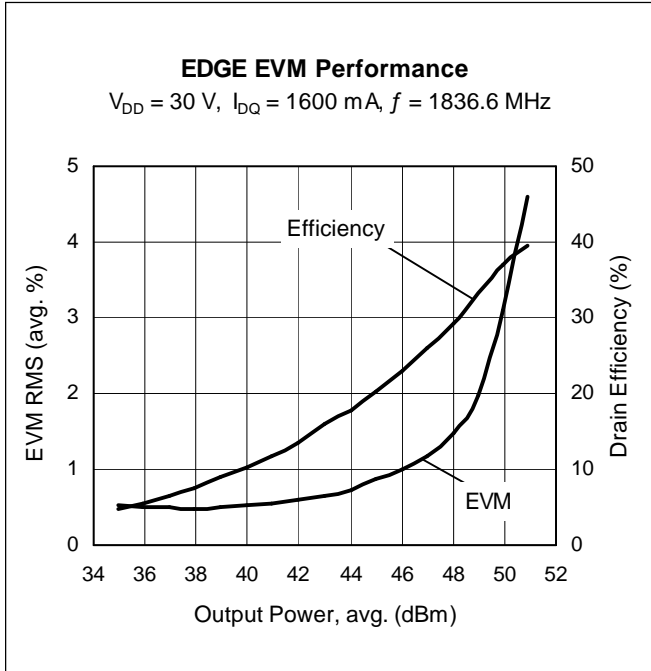
Ordering Information

Type and Version	Package Type	Package Description	Marking
PTFA182001E V1	H-30260-2	Thermally-enhanced slotted flange, single-ended	PTFA182001E

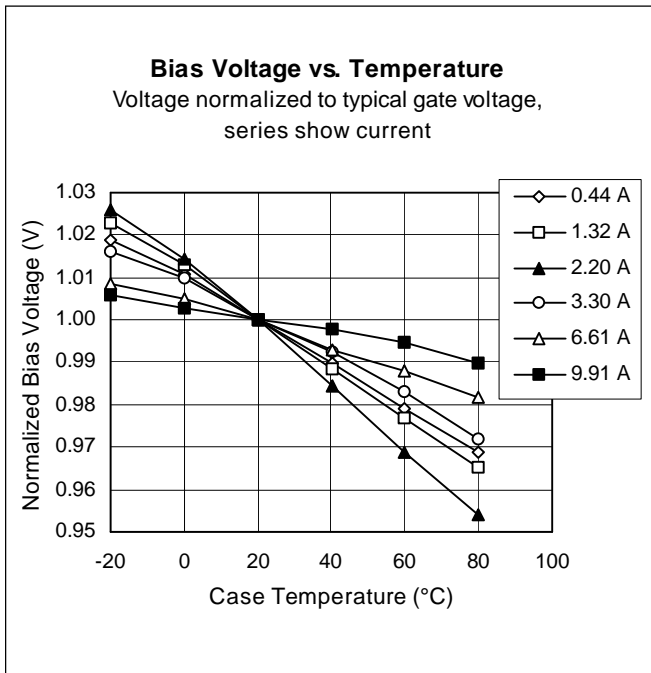
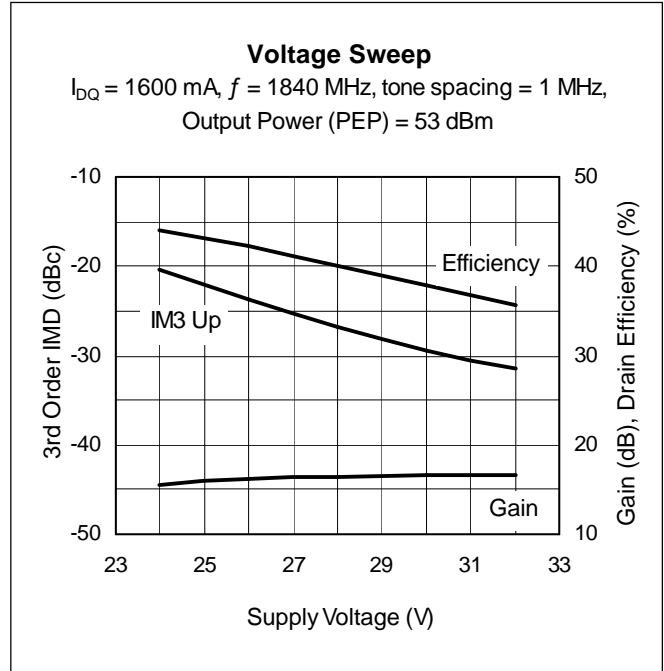
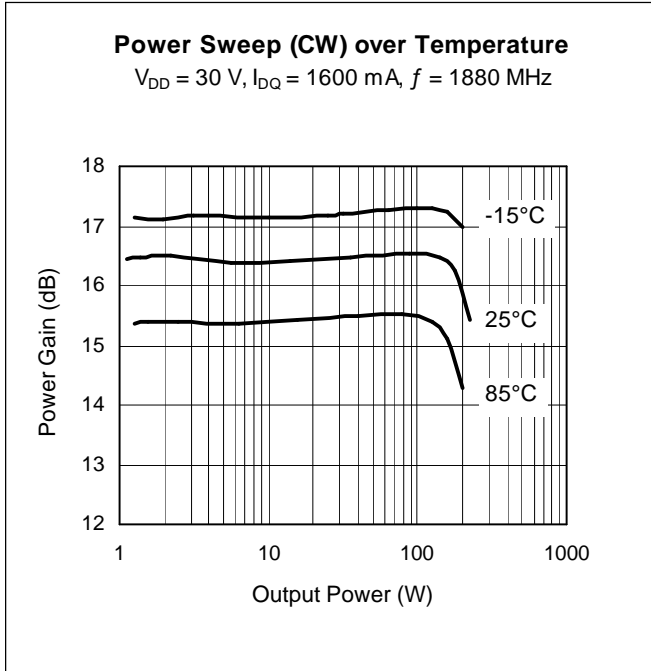
Typical Performance (data taken in a production test fixture)



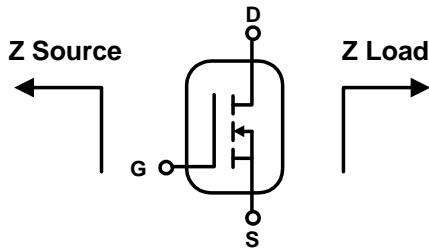
Typical Performance (cont.)



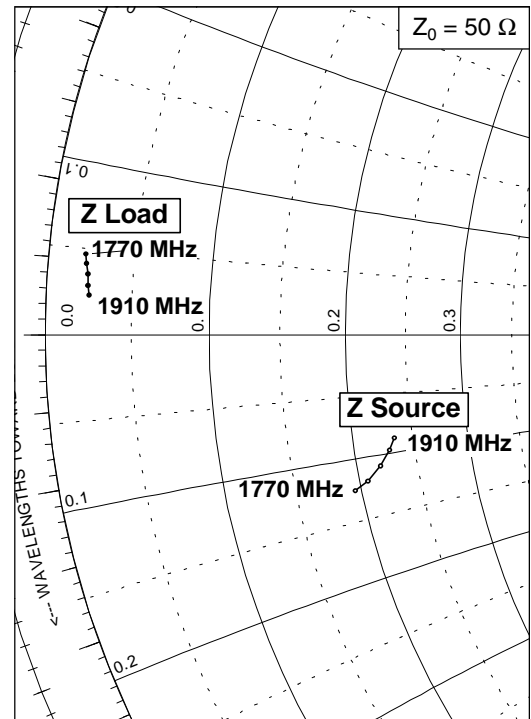
Typical Performance (cont.)



Broadband Circuit Impedance

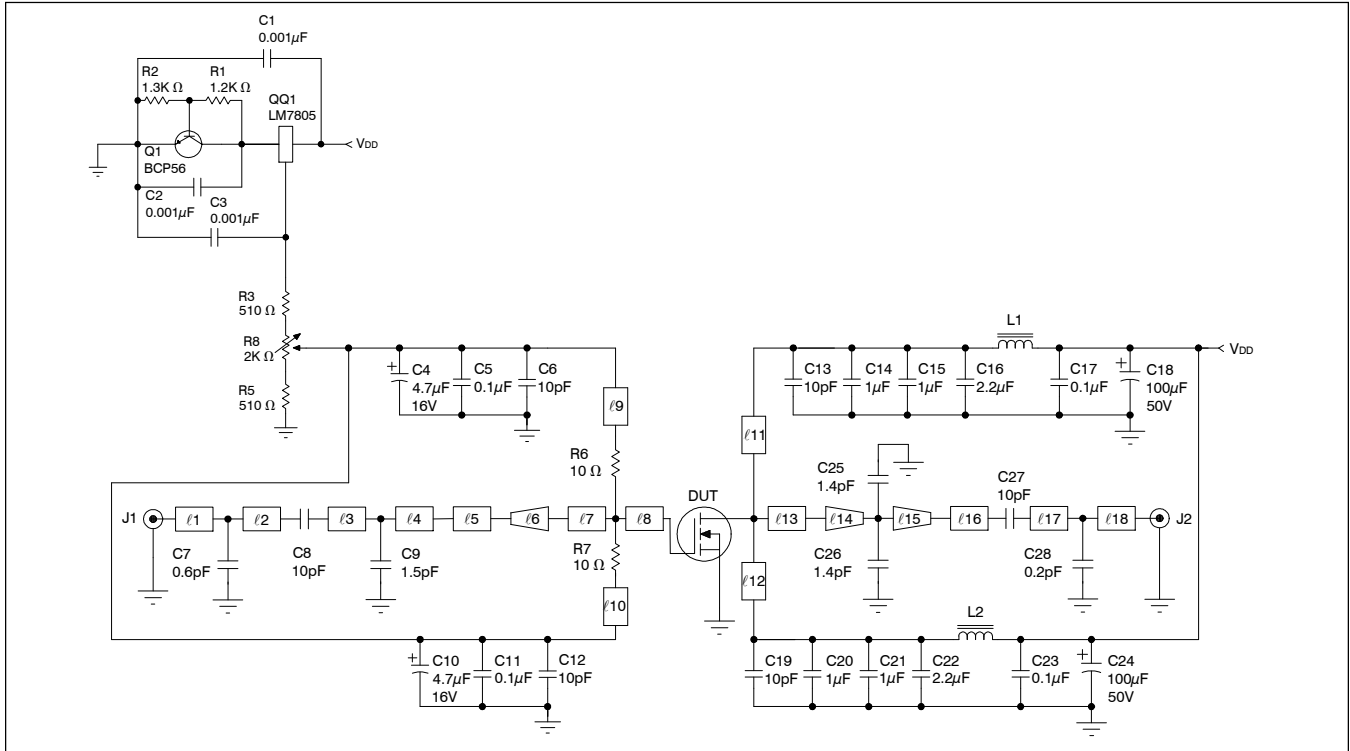


Frequency MHz	Z Source W		Z Load W	
	R	jX	R	jX
1770	11.72	-4.39	1.22	1.17
1800	11.45	-4.87	1.17	1.44
1840	10.97	-5.48	1.15	1.78
1880	10.33	-5.99	1.08	2.08
1910	9.76	-6.27	1.04	2.35



See next page for circuit information

Reference Circuit (cont.)



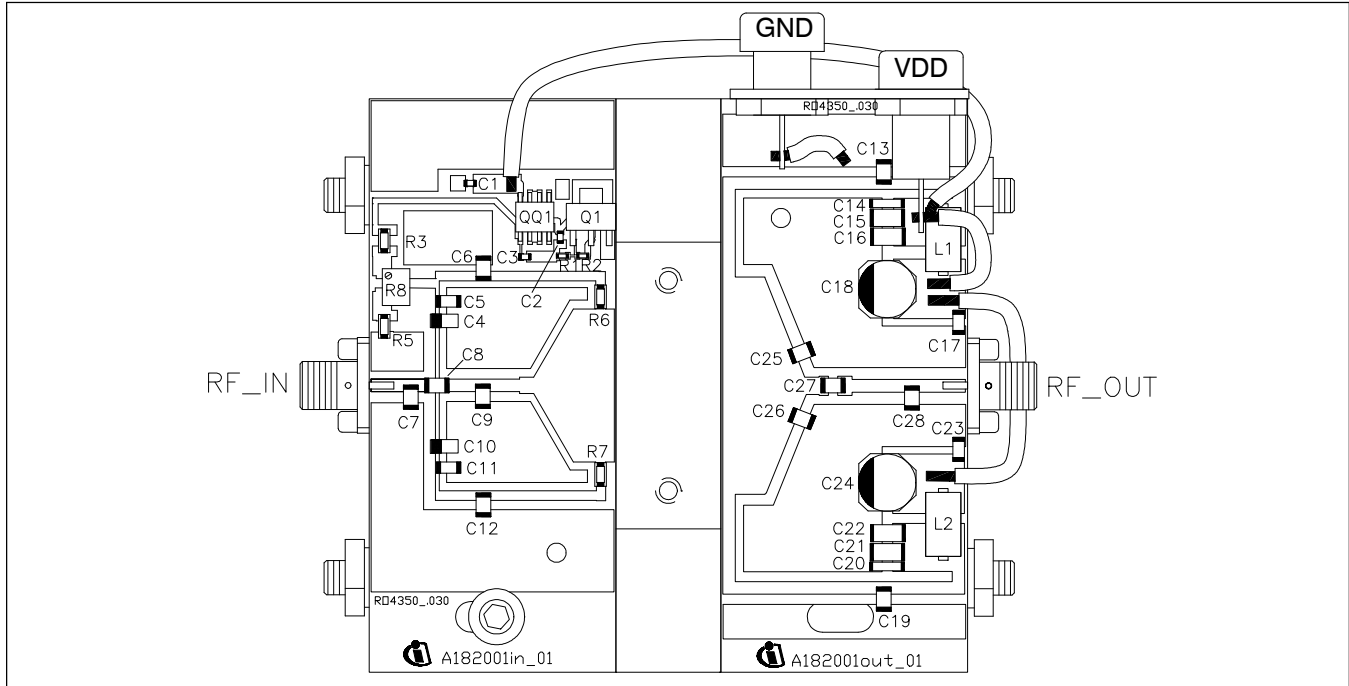
Reference circuit schematic for $f = 1840 \text{ MHz}$

Circuit Assembly Information

DUT	PTFA182001E	LDMOS Transistor	
PCB	0.76 mm [.030"] thick, $\epsilon_r = 3.48$	Rogers RO4350	1 oz. copper

Microstrip	Electrical Characteristics at 1840 MHz	Dimensions: L x W (mm)	Dimensions: L x W (in.)
l1	0.056 λ , 50.2 Ω	5.54 x 1.68	0.218 x 0.066
l2	0.024 λ , 50.2 Ω	2.39 x 1.68	0.094 x 0.066
l3	0.051 λ , 50.2 Ω	5.00 x 1.68	0.197 x 0.066
l4	0.050 λ , 50.2 Ω	4.93 x 1.68	0.194 x 0.066
l5	0.019 λ , 42.8 Ω	1.88 x 2.16	0.074 x 0.085
l6 (taper)	0.054 λ , 42.8 Ω / 6.9 Ω	5.23 x 2.16 / 20.32	0.206 x 0.085 / 0.800
l7	0.040 λ , 6.9 Ω	3.63 x 20.32	0.143 x 0.800
l8	0.021 λ , 6.9 Ω	1.85 x 20.32	0.073 x 0.800
l9, l10	0.186 λ , 59.1 Ω	18.59 x 1.27	0.732 x 0.050
l11, l12	0.328 λ , 50.7 Ω	32.39 x 1.65	1.275 x 0.065
l13	0.062 λ , 5.0 Ω	5.51 x 28.83	0.217 x 1.135
l14 (taper)	0.043 λ , 5.0 Ω / 15.1 Ω	3.84 x 28.83 / 8.43	0.151 x 1.135 / 0.332
l15 (taper)	0.021 λ , 15.1 Ω / 41.2 Ω	1.96 x 8.43 / 2.29	0.077 x 0.332 / 0.090
l16	0.026 λ , 41.2 Ω	2.49 x 2.29	0.098 x 0.090
l17	0.095 λ , 50.2 Ω	9.42 x 1.68	0.371 x 0.066
l18	0.072 λ , 50.2 Ω	7.11 x 1.68	0.280 x 0.066

Reference Circuit (cont.)

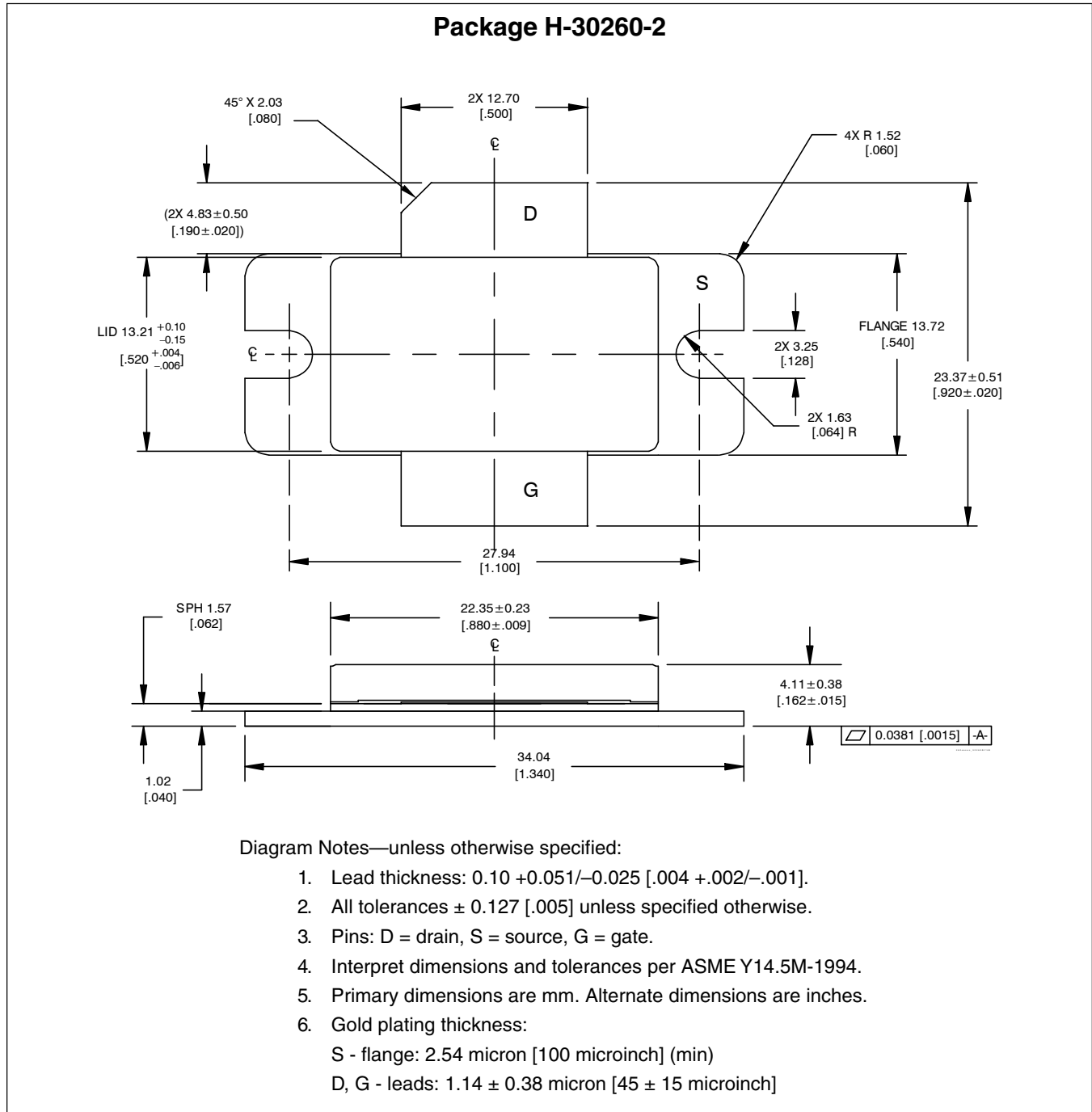


Reference circuit assembly diagram* (not to scale)

Component	Description	Suggested Manufacturer	P/N or Comment
C1, C2, C3	Capacitor, 0.001 μ F	Digi-Key	PCC1772CT-ND
C4, C10	Capacitor, 4.7 μ F, 16 V	Digi-Key	PCS3475CT-ND
C5, C11, C17, C23	Capacitor, 0.1 μ F	Digi-Key	PCC104BCT-ND
C6, C12	Capacitor, 10 pF AVX	Garrett Electronics	08051J100GBTTR
C7	Ceramic capacitor, 0.6 pF	ATC	100B 0R6
C8, C13, C19, C27	Ceramic capacitor, 10 pF	ATC	100B 100
C9	Ceramic capacitor, 1.5 pF	ATC	100B 1R5
C14, C15, C20, C21	Ceramic capacitor, 1 μ F	Digi-Key	445-1411-2-ND
C16, C22	Capacitor, 2.2 μ F	Digi-Key	445-1447-2-ND
C18, C24	Electrolytic capacitor, 100 μ F, 50 V	Digi-Key	PCE3718CT-ND
C25, C26	Ceramic capacitor, 1.4 pF	ATC	100B 1R4
C28	Ceramic capacitor, 0.2 pF	ATC	100A 0R2
L1, L2	Ferrite, 8.9 mm	Elna Magnetics	BDS 4.6/3/8.9-4S2
Q1	Transistor	Infinition Technologies	BCP56
QQ1	Voltage regulator	National Semiconductor	LM7805
R1	Chip resistor 1.2k ohms	Digi-Key	P1.2KGCT-ND
R2	Chip resistor 1.3k ohms	Digi-Key	P1.3KGCT-ND
R3, R5	Chip resistor 510 ohms	Digi-Key	P510ECT-ND
R4	Not used		
R6, R7	Chip resistor 10 ohms	Digi-Key	P10ECT-ND
R8	Potentiometer, 2 k-ohms	Digi-Key	3224W-202ETR-ND

*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)

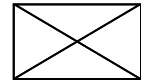
We Listen to Your Comments

Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document.

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

highpowerRF@infineon.com

To request other information, contact us at:
+1 877 465 3667 (1-877-GO-LDMOS) USA
or +1 408 776 0600 International



GOLDMOS® is a registered trademark of Infineon Technologies AG.

Edition 2008-03-12

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

**© 2006 Infineon Technologies AG
All Rights Reserved.**

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (www.infineon.com/rfpower).

Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.