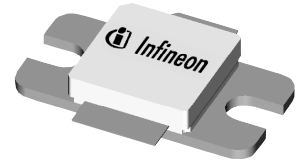


Thermally-Enhanced High Power RF LDMOS FETs 30 Watt, 1805 – 1880 MHz, 1930 – 1990 MHz

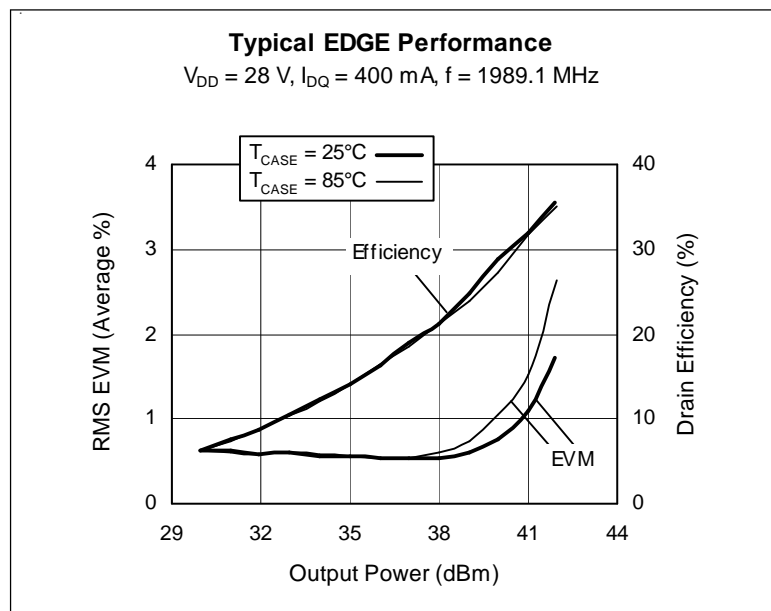
Description

The PTF180301E and PTF180301F are 30-watt, internally-matched GOLDMOS FETs intended for GSM EDGE and CDMA applications in the DCS/PCS band. Thermally-enhanced packaging provides the coolest operation available. Full gold metallization ensures excellent device life-time and reliability.

PTF180301E
Package 30265



PTF180301F*
Package 31265



Features

- Thermally-enhanced packaging
- Broadband internal matching
- Typical EDGE performance
 - Average output power = 15 W
 - Gain = 16.5 dB
 - Efficiency = 34%
- Typical CW performance
 - Output power at P-1dB = 40 W
 - Gain = 15.5 dB
 - Efficiency = 47%
- Integrated ESD protection: Human Body Model, Class 1 (minimum)
- Excellent thermal stability
- Low HCI drift
- Capable of handling 10:1 VSWR @ 28 V, 30 W (CW) output power

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)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 400\text{ mA}$, $P_{OUT} = 15\text{ W}$, $f = 1989.8\text{ MHz}$

Characteristic	Symbol	Min	Typ	Max	Units
Error Vector Magnitude	EVM (RMS)	—	1.5	—	%
Modulation Spectrum @ 400 kHz	ACPR	—	-62	—	dBc
Modulation Spectrum @ 600 kHz	ACPR	—	-73	—	dBc
Gain	G_{ps}	—	16.5	—	dB
Drain Efficiency	η_D	—	34	—	%

*See Infineon distributor for future availability.

RF Characteristics (cont.)

Two-Tone Measurements (tested in Infineon test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 400\text{ mA}$, $P_{OUT} = 30\text{ W PEP}$, $f = 1990\text{ MHz}$, tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Units
Gain	G_{ps}	14.5	16.5	—	dB
Drain Efficiency	η_D	35	36	—	%
Intermodulation Distortion	IMD	—	-30	-27	dBc

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\ \mu\text{A}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.27	—	Ω
Operating Gate Voltage	$V_{DS} = 28\text{ V}$, $I_{DQ} = 400\text{ mA}$	V_{GS}	2.5	3.2	4.0	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	100	nA

Maximum Ratings

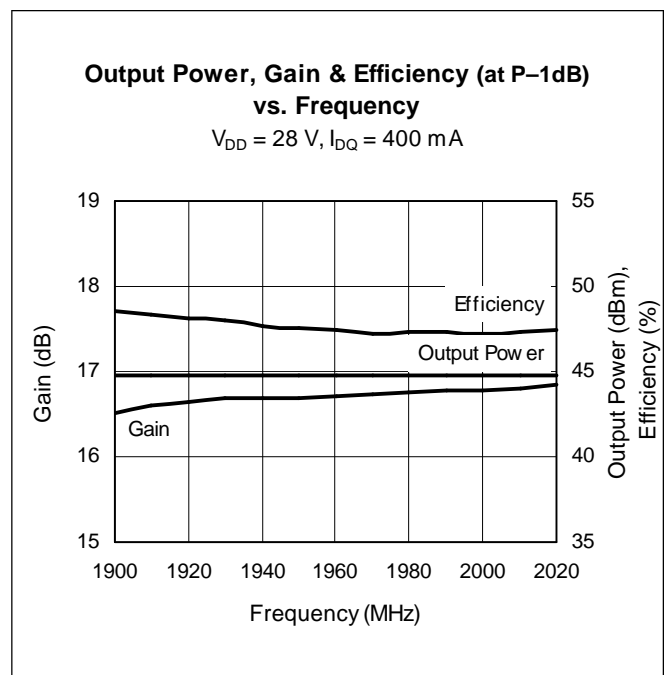
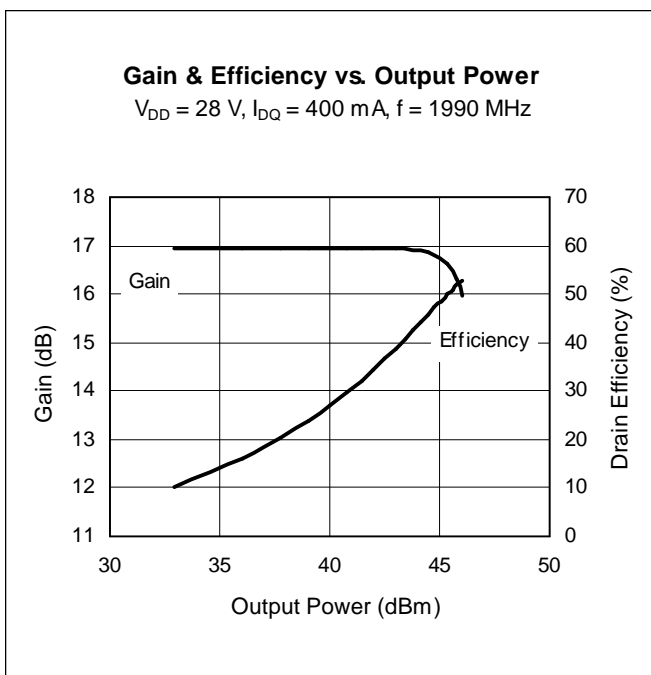
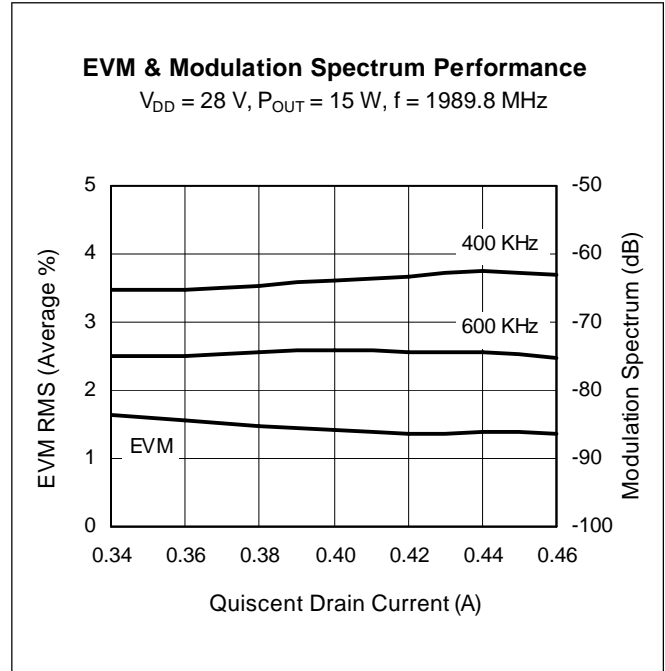
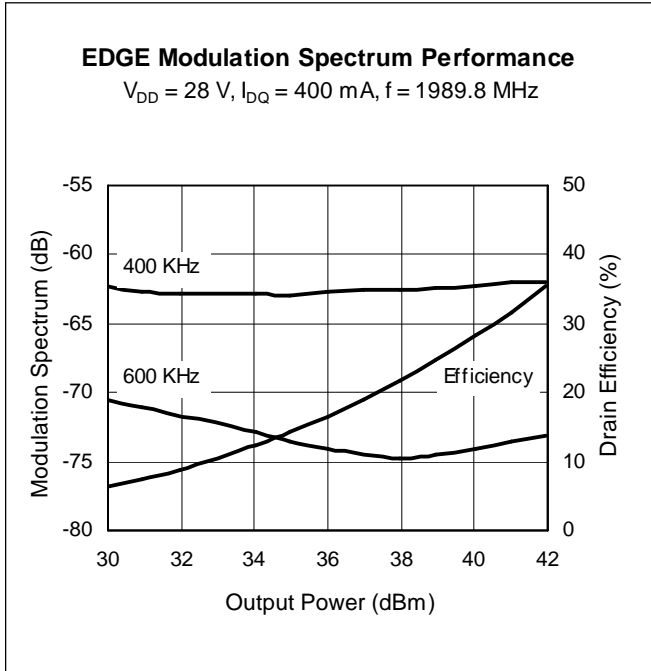
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	-0.5 to +12	V
Junction Temperature	T_J	200	$^\circ\text{C}$
Total Device Dissipation	P_D	145	W
Above 25°C derate by		0.83	W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^\circ\text{C}$
Thermal Resistance ($T_{CASE} = 70^\circ\text{C}$, 30 W CW)	$R_{\theta JC}$	1.2	$^\circ\text{C/W}$

Ordering Information

Type	Package Outline	Package Description	Marking
PTF180301E	30265	Thermally-enhanced slotted flange, single-ended	PTF180301E
PTF180301F*	31265	Thermally-enhanced earless flange, single-ended	PTF180301F

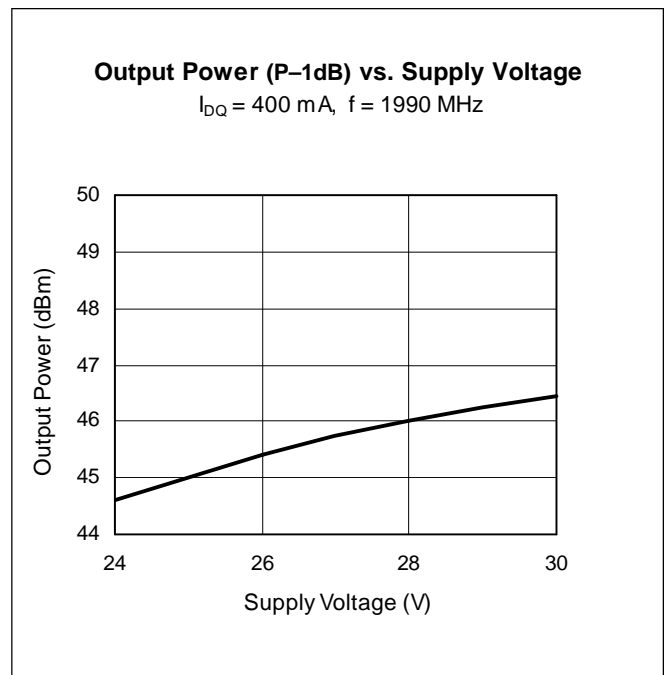
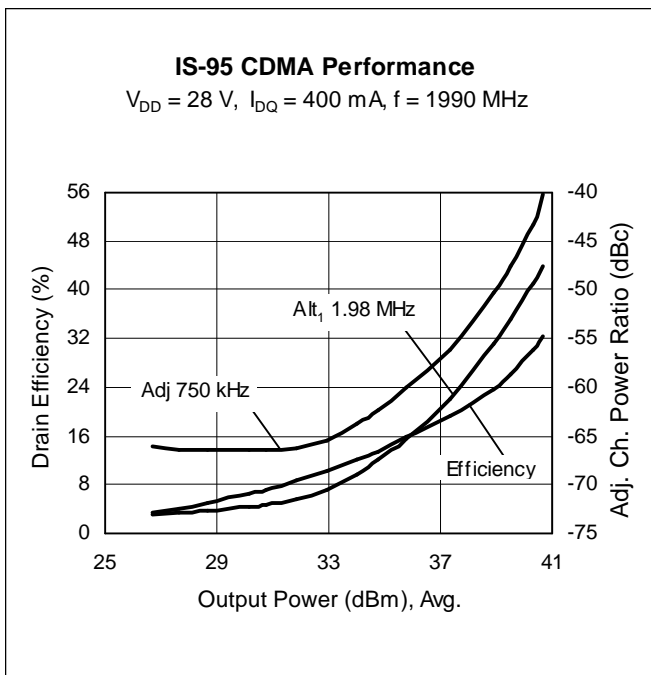
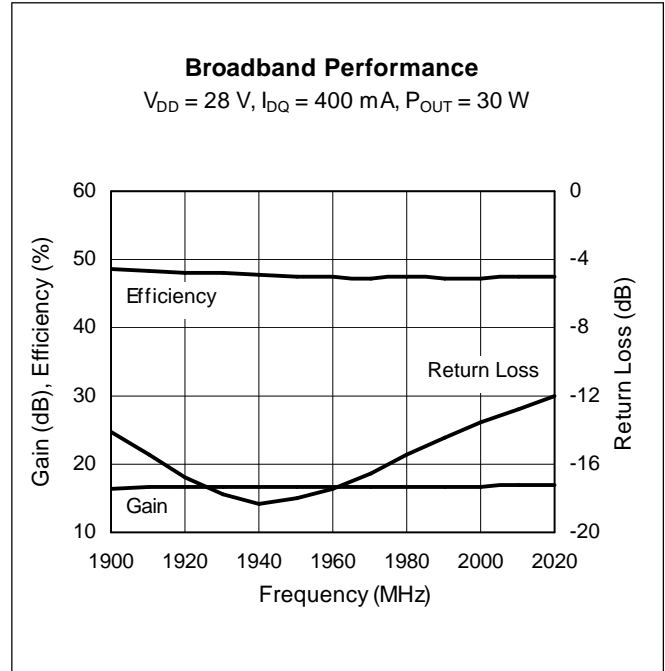
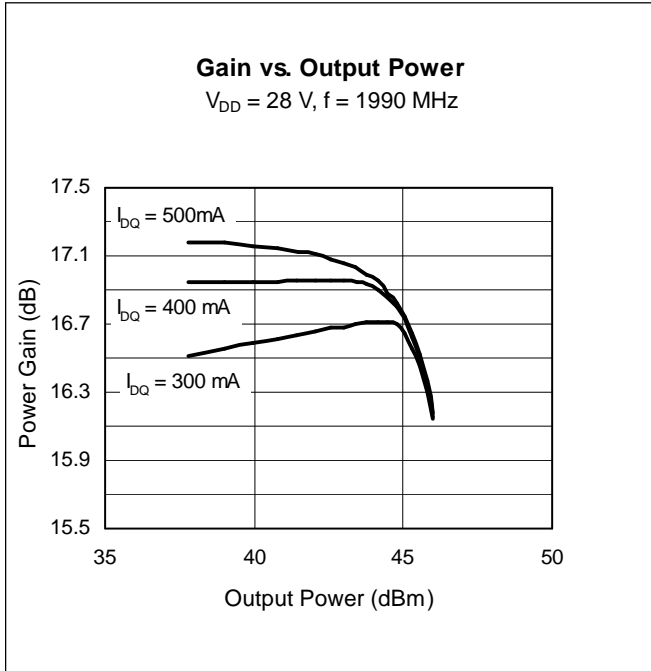
*See Infineon distributor for future availability.

Typical Performance (data taken in production test fixture)

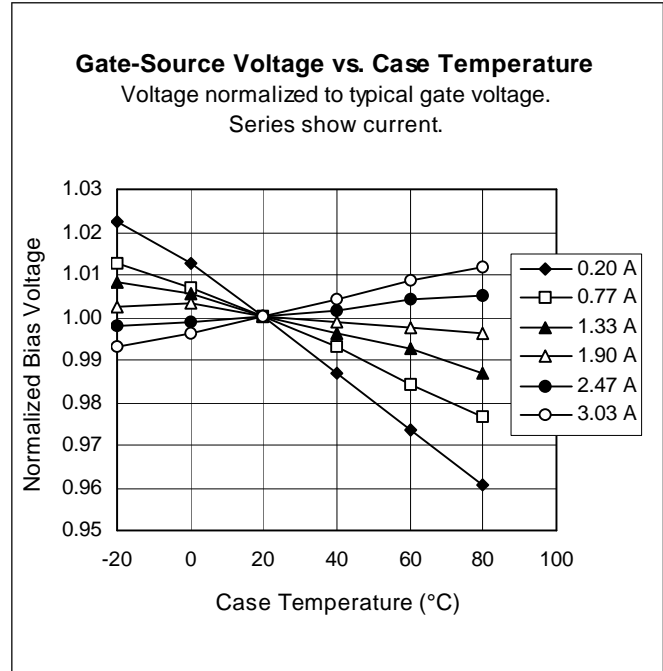
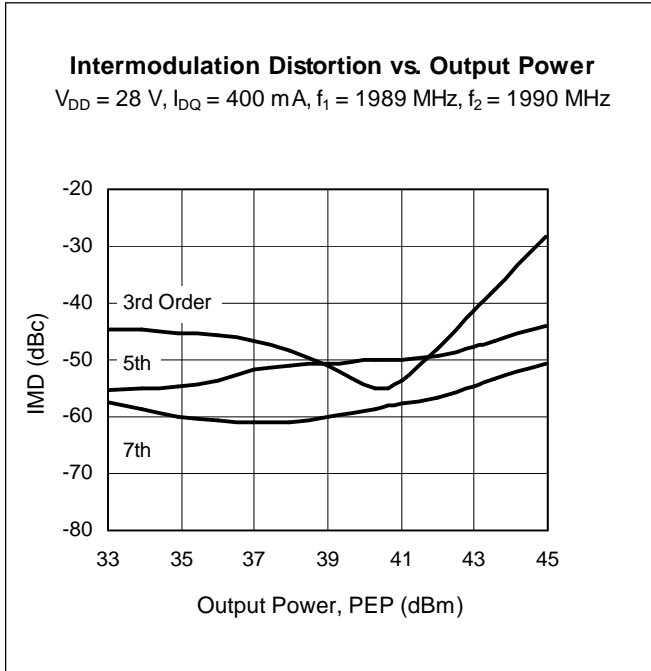


All published data at $T_{CASE} = 25^{\circ}\text{C}$ unless otherwise indicated

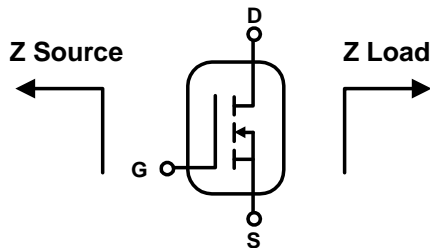
Typical Performance (cont.)



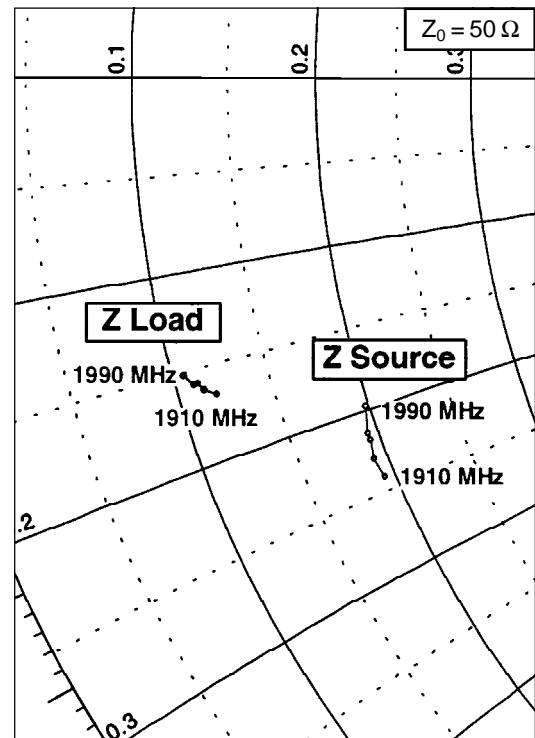
Typical Performance (cont.)



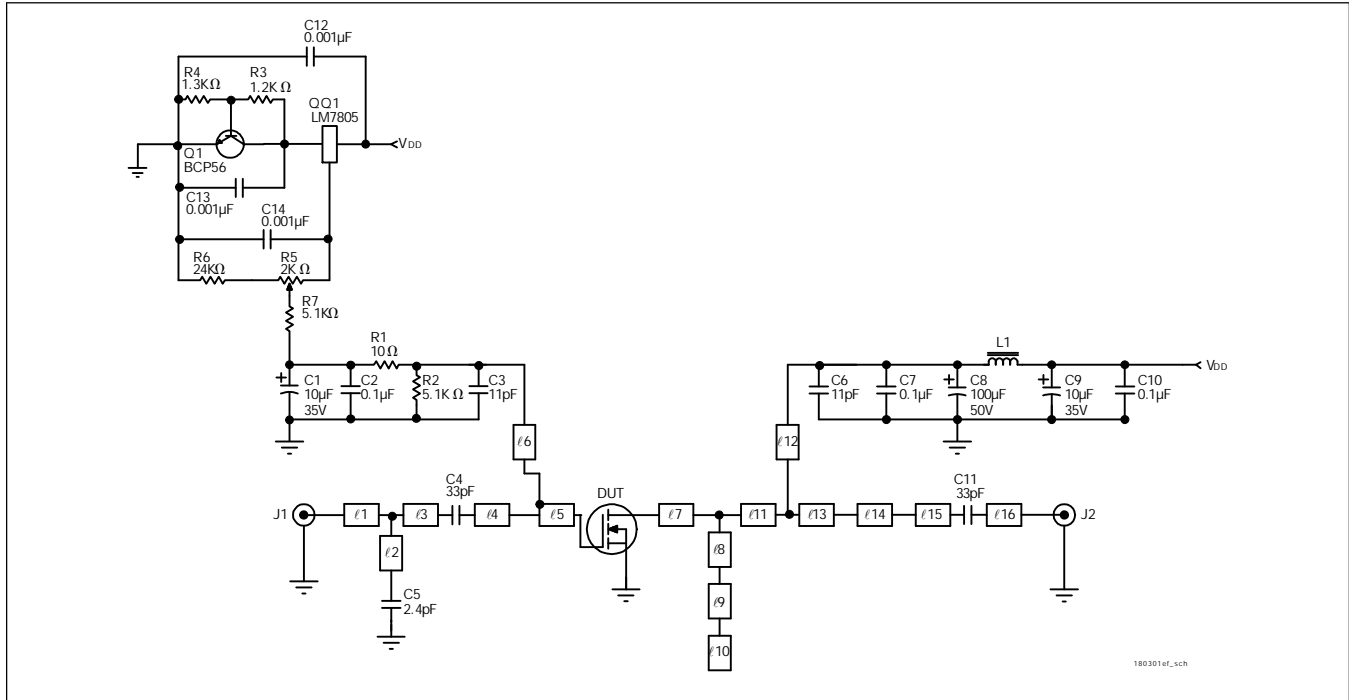
Broadband Circuit Impedance



Frequency MHz	Z Source W		Z Load W	
	R	jX	R	jX
1910	9.7	-12.1	6.0	-8.3
1930	9.6	-11.5	5.7	-8.1
1950	9.7	-10.9	5.6	-7.9
1960	9.7	-10.7	5.5	-7.9
1990	9.9	-9.9	5.3	-7.6



Reference Circuit



Reference Circuit Schematic for $f = 1990$ MHz

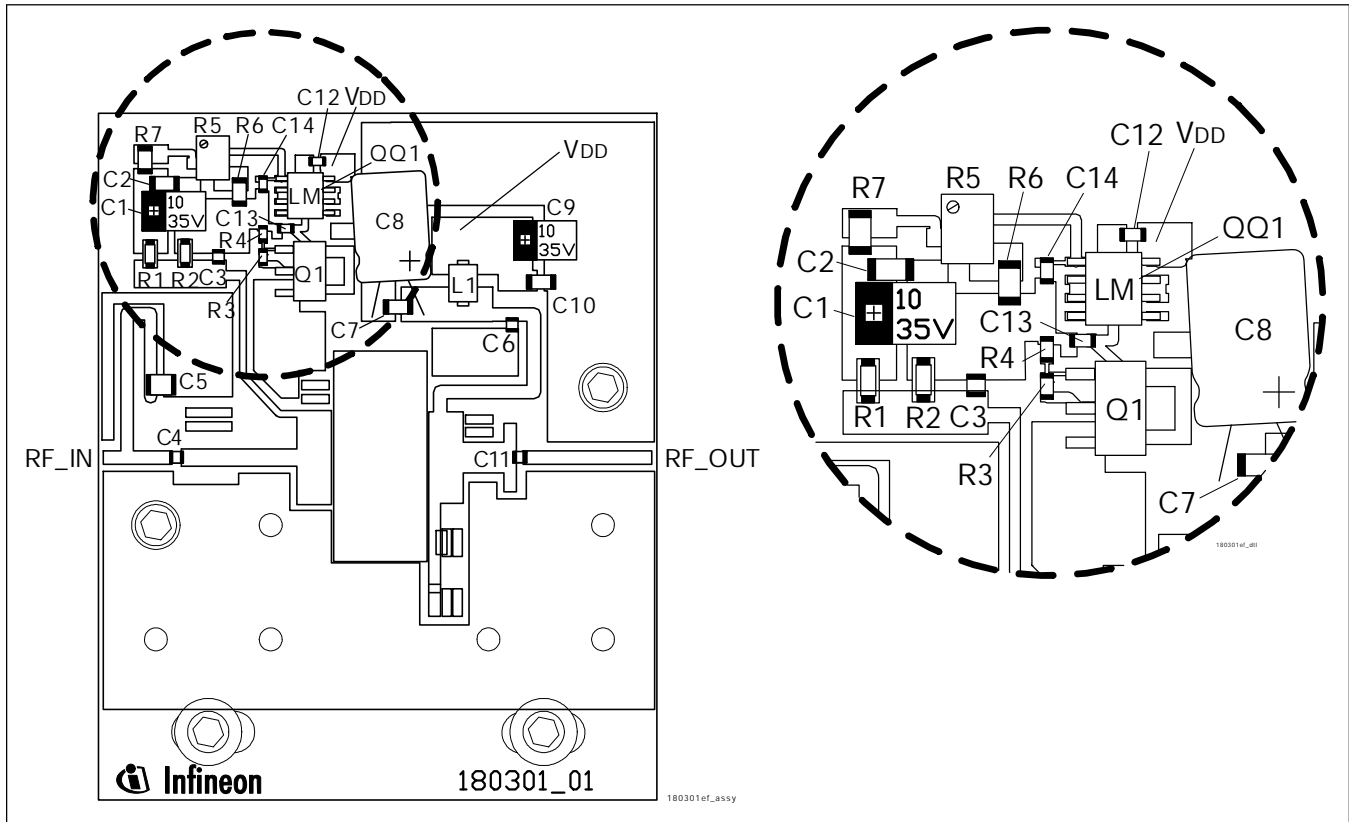
Circuit Assembly Information

DUT	PTF180301E or PTF180301F	LDMOS Transistor	
PCB	0.76 mm [.030"] thick, $\epsilon_r = 4.5$	Rogers TMM4	2 oz. copper

Microstrip	Electrical Characteristics at 1960 MHz*	Dimensions: L x W (mm)	Dimensions: L x W (in.)
l1	0.033 λ , 50.0 Ω	2.67 x 1.42	0.105 x 0.056
l2	0.329 λ , 50.0 Ω	27.05 x 1.32	1.065 x 0.052
l3	0.062 λ , 50.0 Ω	5.08 x 1.42	0.200 x 0.056
l4	0.16 λ , 42.0 Ω	12.70 x 1.83	0.500 x 0.072
l5	0.032 λ , 11.6 Ω	3.61 x 10.03	0.142 x 0.395
l6	0.206 λ , 70.0 Ω	17.40 x 0.71	0.685 x 0.028
l7	0.008 λ , 11.6 Ω	0.64 x 10.03	0.025 x 0.395
l8	0.037 λ , 56.0 Ω	2.92 x 1.17	0.115 x 0.046
l9	0.037 λ , 34.0 Ω	2.92 x 2.46	0.115 x 0.097
l10	0.041 λ , 56.0 Ω	3.30 x 1.17	0.130 x 0.046
l11	0.017 λ , 11.6 Ω	1.27 x 10.03	0.050 x 0.395
l12	0.269 λ , 50.0 Ω	21.97 x 1.45	0.865 x 0.057
l13	0.033 λ , 11.6 Ω	2.49 x 10.03	0.098 x 0.395
l14	0.055 λ , 28.0 Ω	4.32 x 3.30	0.170 x 0.130
l15	0.018 λ , 14.3 Ω	1.32 x 7.87	0.052 x 0.310
l16	0.186 λ , 50.0 Ω	15.24 x 1.42	0.600 x 0.056

*Electrical characteristics are rounded.

Reference Circuit (cont.)

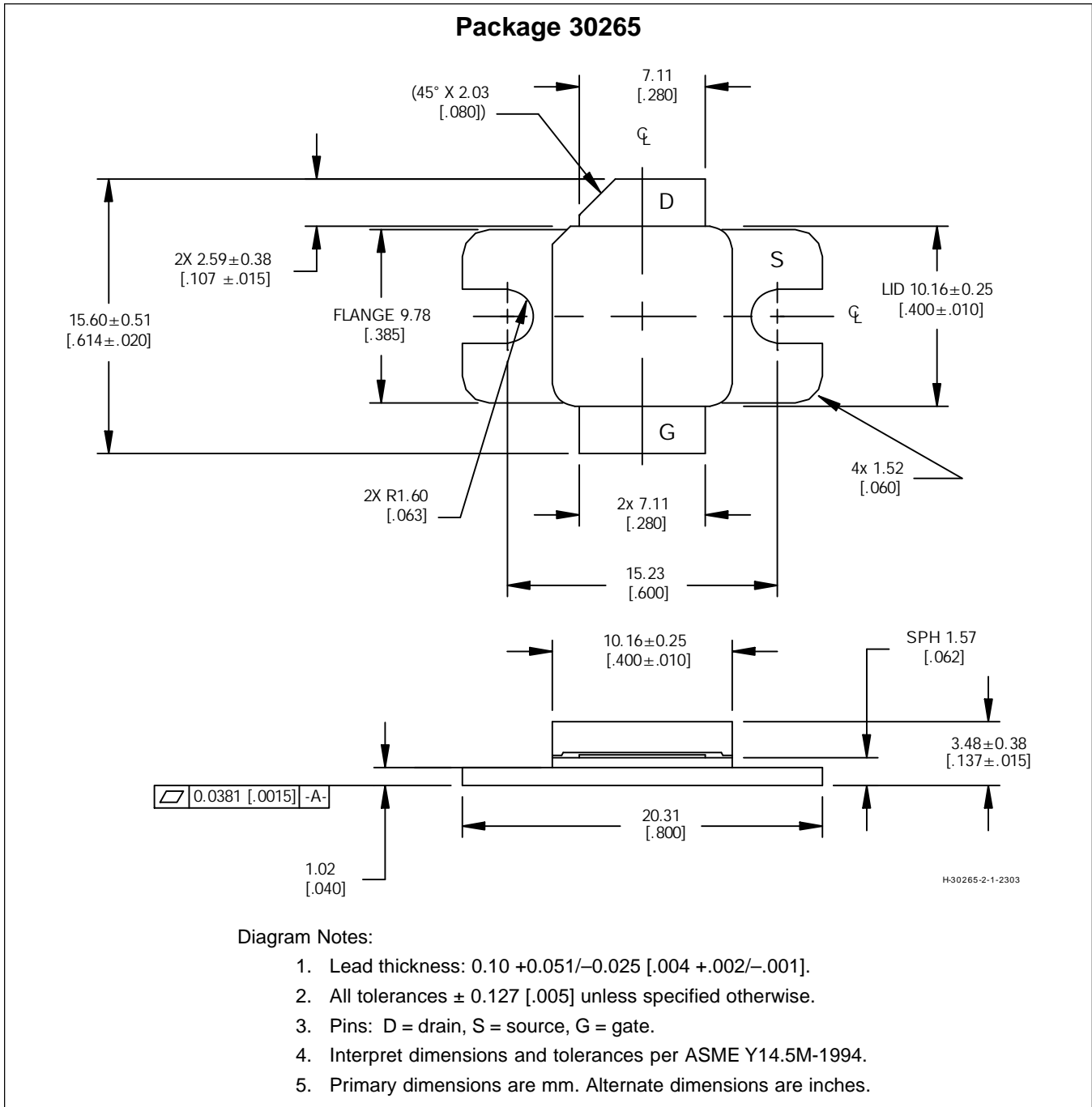


Reference circuit assembly (not to scale)¹

Component	Description	Manufacturer	P/N or Comment
C1, C9	Capacitor, 10 μ F, 35 V, Tant TE Series	Digi-Key	PCS6106TR-ND, SMD
C2, C7, C10	Capacitor, 0.1 μ F	Digi-Key	PCC104BCT
C3, C6	Capacitor, 11 pF	ATC	100A 110
C4, C11	Capacitor, 33 pF	ATC	100A 330
C5	Capacitor, 2.4 pF	ATC	100B 2R4
C8	Capacitor, 100 μ F, 50 V	Digi-Key	P5571-ND
C12, C13, C14	Capacitor, 0.001 μ F	Digi-Key	PCC1772CT-ND
L1	Ferrite	Philips	BDS4.6/3/8.9-4S2
Q1	Transistor	National Semiconductor	BCP56
QQ1	Voltage regulator	Infineon Technologies	LM7805
R1	Resistor, 10 ohm, 1/4 W	Digi-Key	P10ECT-ND
R2, R7	Resistor, 5.1 k-ohm, 1/4 W	Digi-Key	P5.1KECT-ND
R3	Resistor, 1.2 k-ohm, 1/10 W, 0603	Digi-Key	PI.2KGCT-ND
R4	Resistor, 1.3 k-ohm, 1/10 W, 0603	Digi-Key	PI.3KGCT-ND
R5	Potentiometer 2 k-ohm, 1/4 W	Digi-Key	3224W-202ETR-ND
R6	Resistor, 24 k-ohm, 1/4 W, 1206	Digi-Key	P24KECT-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/rfpower>

*Information not yet available for Package 31265. See your Infineon distributor for future availability.

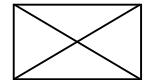
Page	Subjects (major changes since last revision)

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Edition 04-10-07

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

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