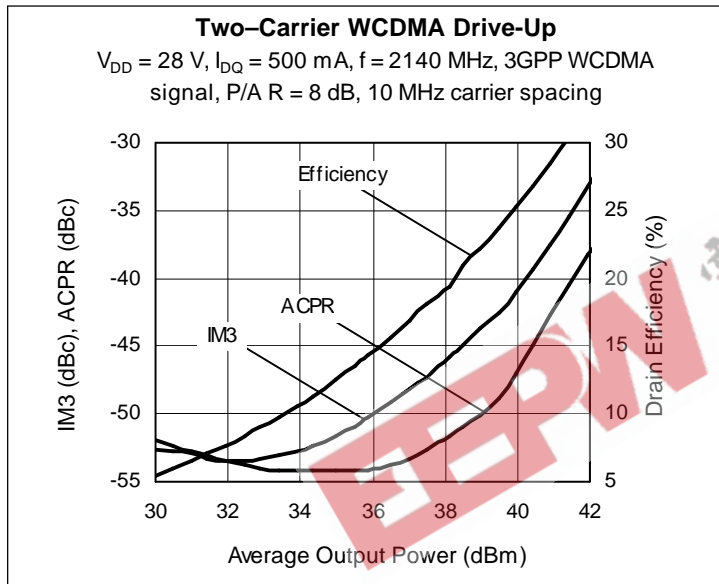


LDMOS RF Power Field Effect Transistor 45 W, 2110–2170 MHz

Description

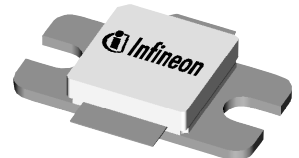
The PTF210451 is a 45 W internally matched *GOLDMOS* FET intended for WCDMA applications from 2110 to 2170 MHz. Full gold metallization ensures excellent device lifetime and reliability.



Features

- Internal matching for wideband performance
- Typical two-carrier WCDMA performance
 - Average output power = 11.5 W
 - Gain = 14 dB
 - Efficiency = 27%
 - IM3 = -37 dBc
- Typical CW performance
 - Output power at P-1dB = 50 W
 - Linear gain = 14 dB
 - Efficiency = 53%
- Integrated ESD protection: Human Body Model, Class 1 (minimum)
- Excellent thermal stability
- Low HCI Drift
- Capable of handling 10:1 VSWR @ 28 V, 45 W (CW) output power

PTF210451E
Package 30265



ESD: Electrostatic discharge sensitive device — observe handling precautions!

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

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

$V_{DD} = 28\text{ V}$, $I_{DQ} = 500\text{ mA}$, $P_{OUT} = 11.5\text{ W AVG}$

$f_1 = 2140\text{ MHz}$, $f_2 = 2150\text{ MHz}$, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 8 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Units
Intermodulation Distortion	IMD	—	-37	—	dBc
Gain	G_{ps}	—	14	—	dB
Drain Efficiency	η_D	—	27	—	%

Two-Tone Measurements (tested in Infineon test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 500\text{ mA}$, $P_{OUT} = 45\text{ W PEP}$, $f = 2170\text{ MHz}$, Tone Spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Units
Gain	G_{ps}	13	14	—	dB
Drain Efficiency	η_D	35	38	—	%
Intermodulation Distortion	IMD	—	-32	-30	dBc

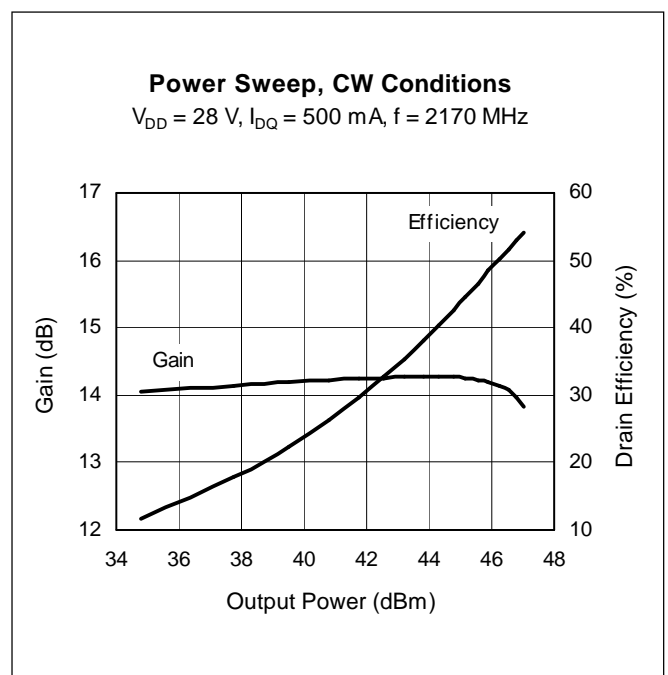
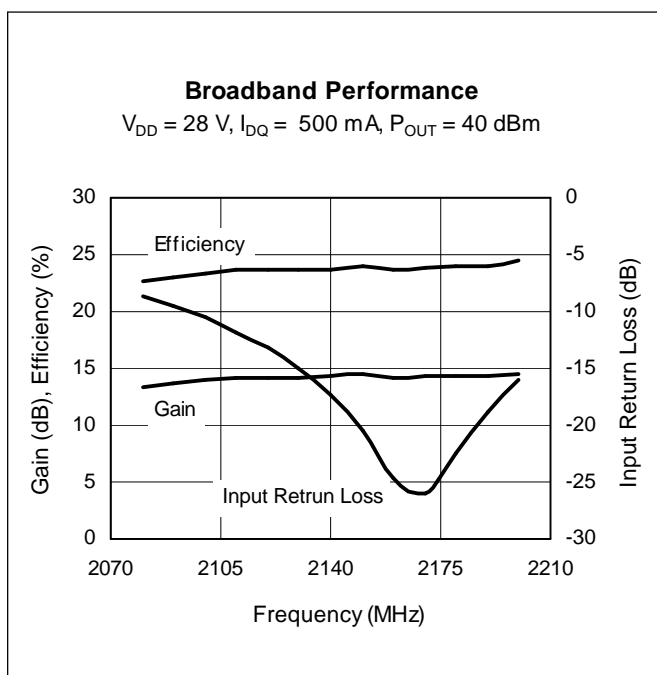
DC Characteristics at $T_{CASE} = 25^{\circ}C$ unless otherwise indicated

Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain–Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 10\ \mu\text{A}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
On–State Resistance	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.2	—	Ω
Operating Gate Voltage	$V_{DS} = 28\text{ V}, I_{DQ} = 500\text{ mA}$	V_{GS}	2.5	3.2	4.0	V
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1.0	μA

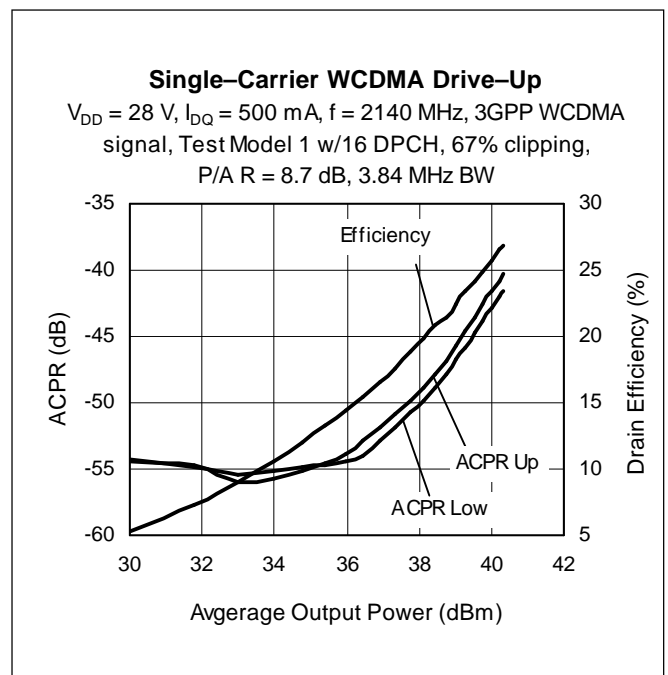
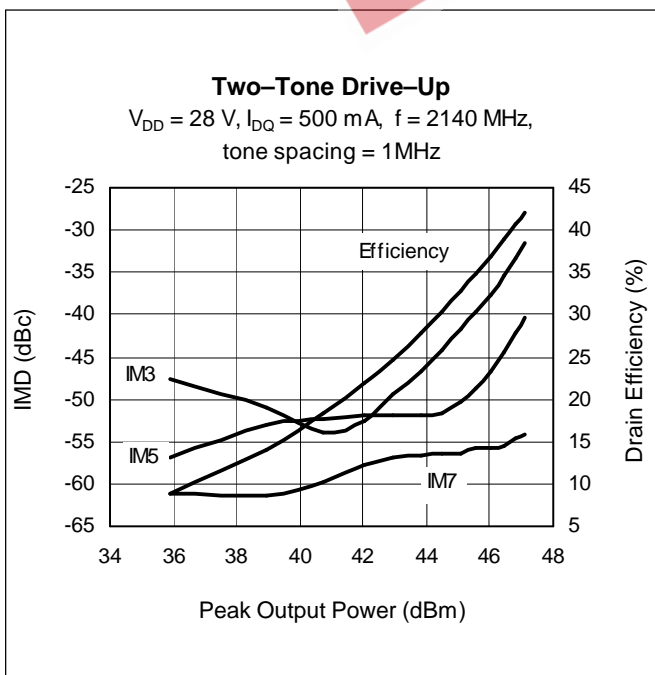
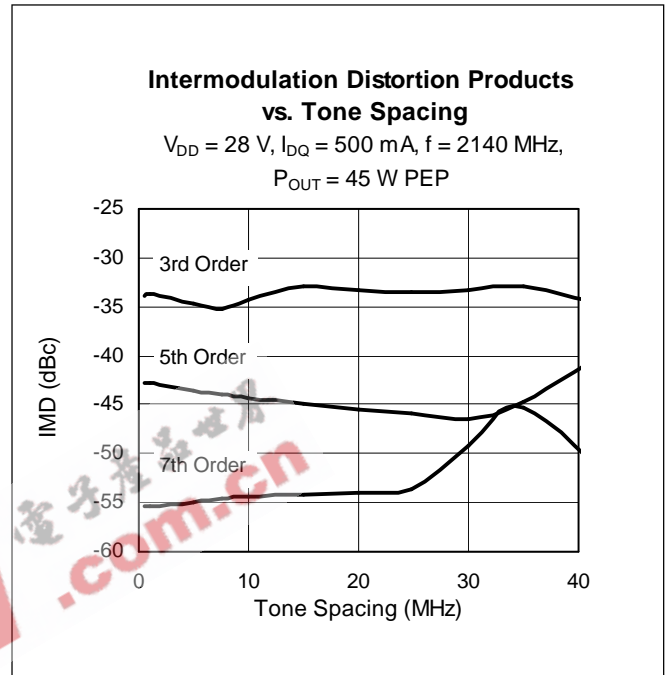
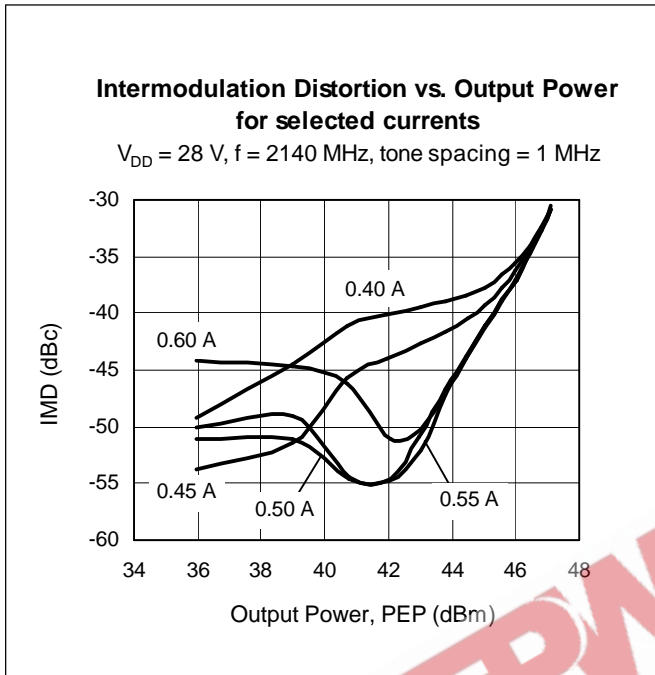
Maximum Ratings

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	$^{\circ}C$
Total Device Dissipation Above 25 $^{\circ}C$ derate by	P_D	175 1.0	W W/ $^{\circ}C$
Storage Temperature Range	T_{STG}	–40 to +150	$^{\circ}C$
Thermal Resistance ($T_{CASE} = 70^{\circ}C, 45\text{ W CW}$)	$R_{\theta JC}$	1.0	$^{\circ}C/W$

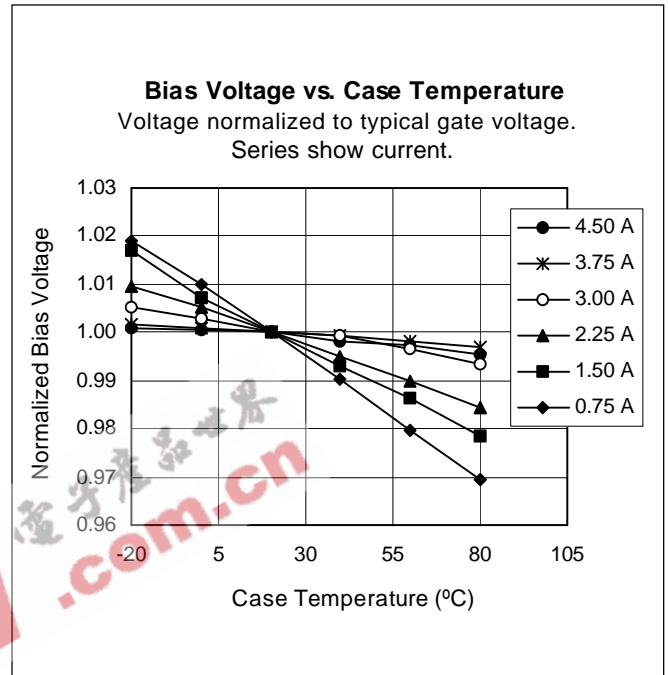
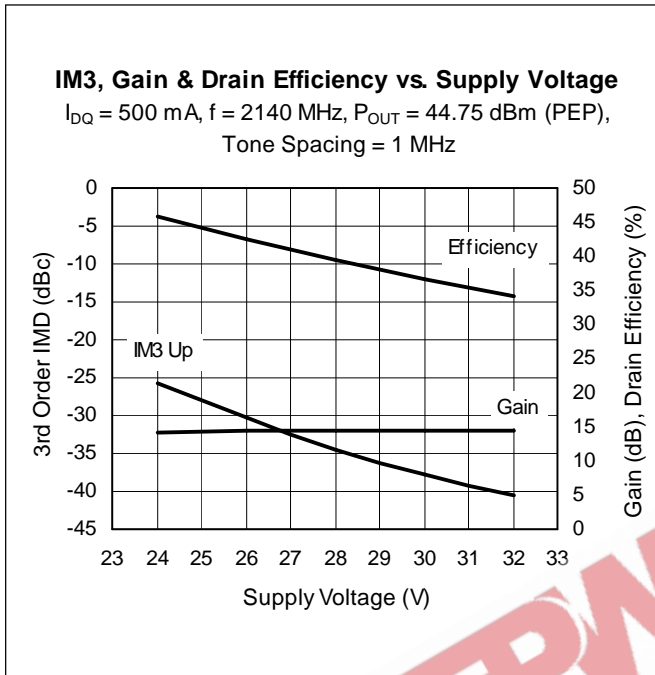
Typical Performance (data taken in production test fixture)



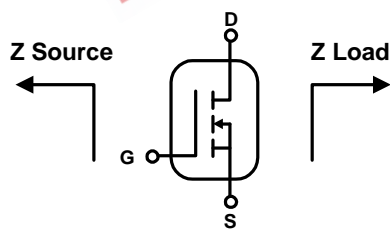
Typical Performance (cont.)



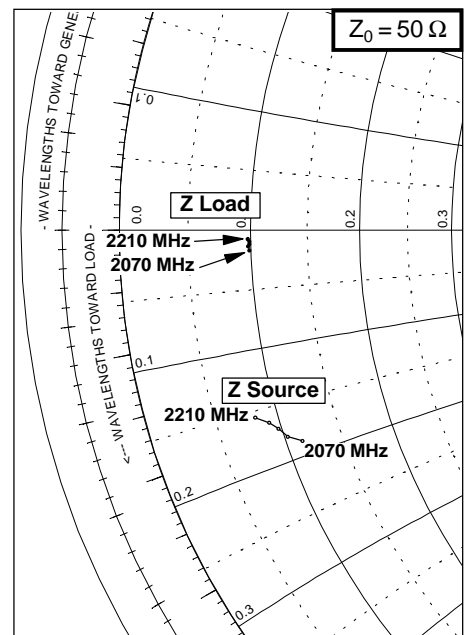
Typical Performance (cont.)



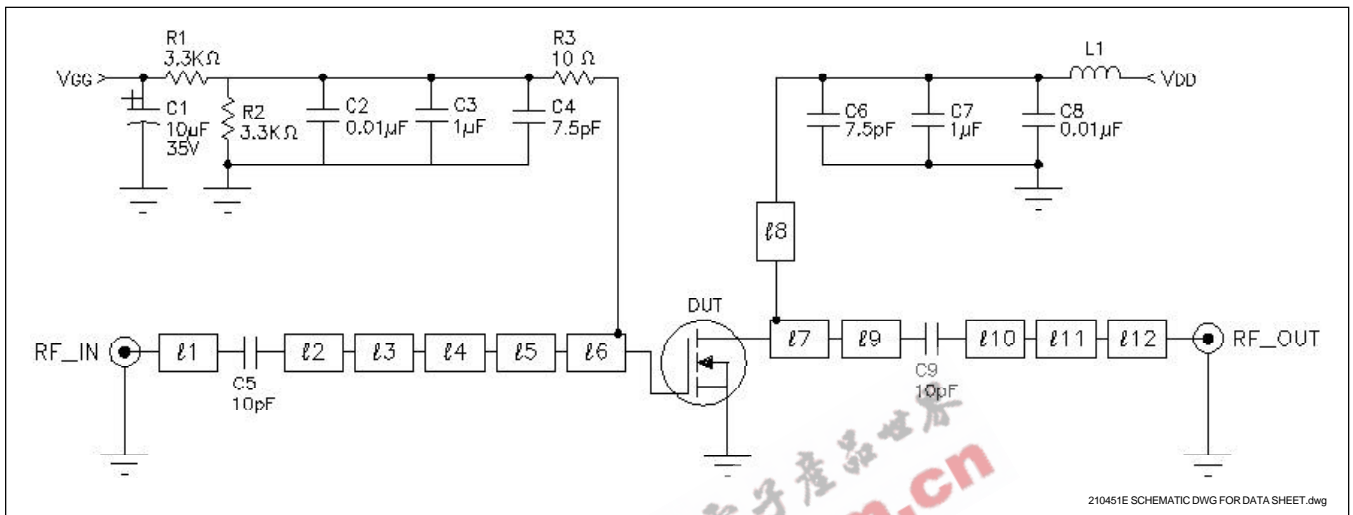
Broadband Circuit Impedance Data



Frequency MHz	Z Source Ω		Z Load Ω	
	R	jX	R	jX
2070	5.72	-9.36	4.94	-0.87
2110	5.17	-8.97	4.90	-0.69
2140	4.88	-8.52	4.96	-0.60
2170	4.59	-8.16	4.96	-0.49
2210	4.08	-7.79	4.88	-0.39



Test Circuit



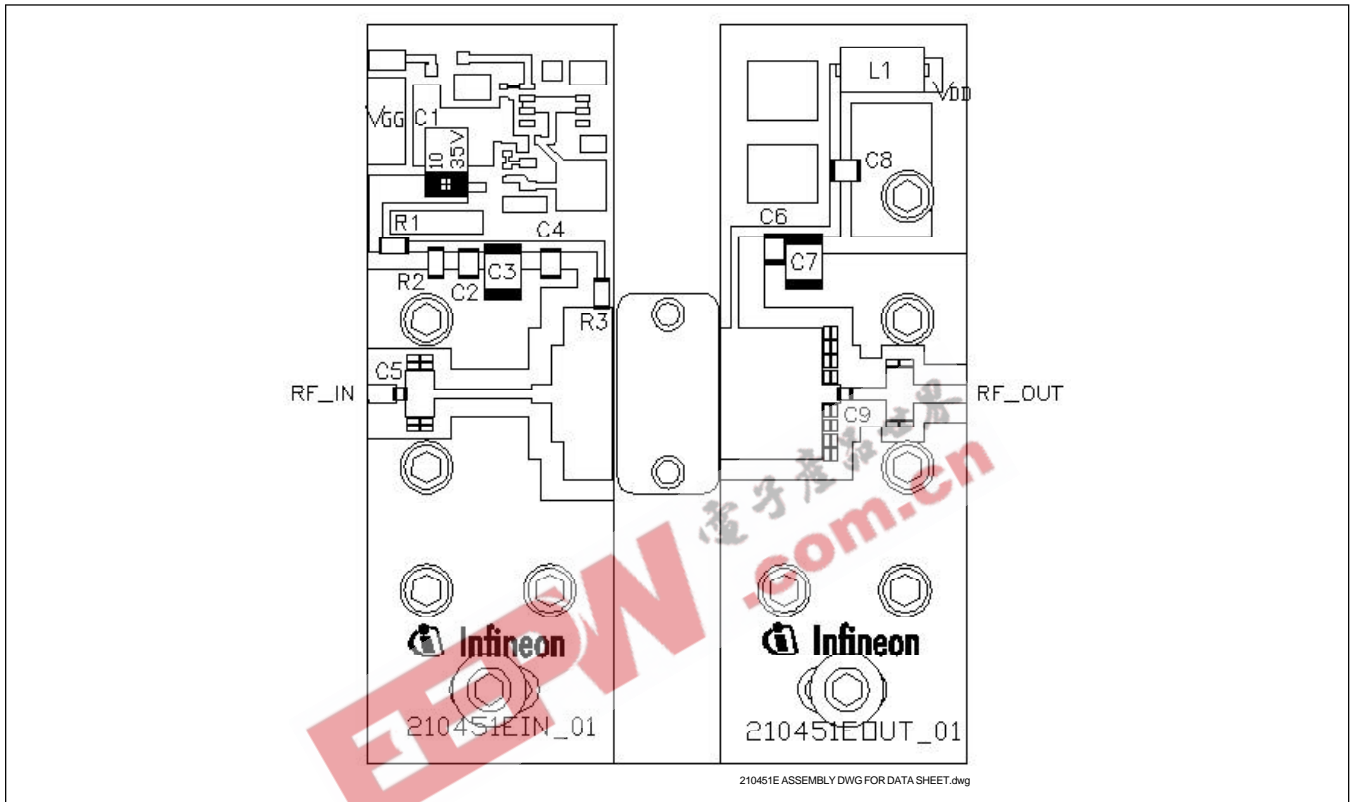
Test Circuit Schematic for 2170 MHz

Circuit Assembly Information

DUT	PTF210451E	LDMOS Transistor	
Circuit Board	0.79 mm. [.031"] thick, $\epsilon_r = 4.5$	Rogers TMM4, 2 oz. copper	

Microstrip	Electrical Characteristics at 2170 MHz	Dimensions: L x W (mm.)	Dimensions: L x W (in.)
l1	0.047 λ , 45 Ω	3.48 x 1.78	0.137 x 0.070
l2	0.040 λ , 23 Ω	2.87 x 4.57	0.113 x 0.180
l3	0.132 λ , 66 Ω	10.08 x 0.89	0.397 x 0.035
l4	0.028 λ , 45 Ω	2.08 x 1.78	0.082 x 0.070
l5	0.018 λ , 12 Ω	26.67 x 10.06	1.050 x 0.396
l6	0.074 λ , 7 Ω	4.98 x 17.68	0.196 x 0.696
l7	0.152 λ , 9 Ω	10.34 x 13.56	0.407 x 0.534
l8	0.257 λ , 68 Ω	19.76 x 0.84	0.778 x 0.033
l9	0.027 λ , 44 Ω	1.98 x 1.83	0.078 x 0.072
l10	0.056 λ , 56 Ω	4.22 x 1.22	0.166 x 0.048
l11	0.036 λ , 19 Ω	2.57 x 5.74	0.101 x 0.226
l12	0.076 λ , 44 Ω	5.64 x 1.80	0.222 x 0.071

Test Circuit (cont.)



Reference Circuit¹ (not to scale)

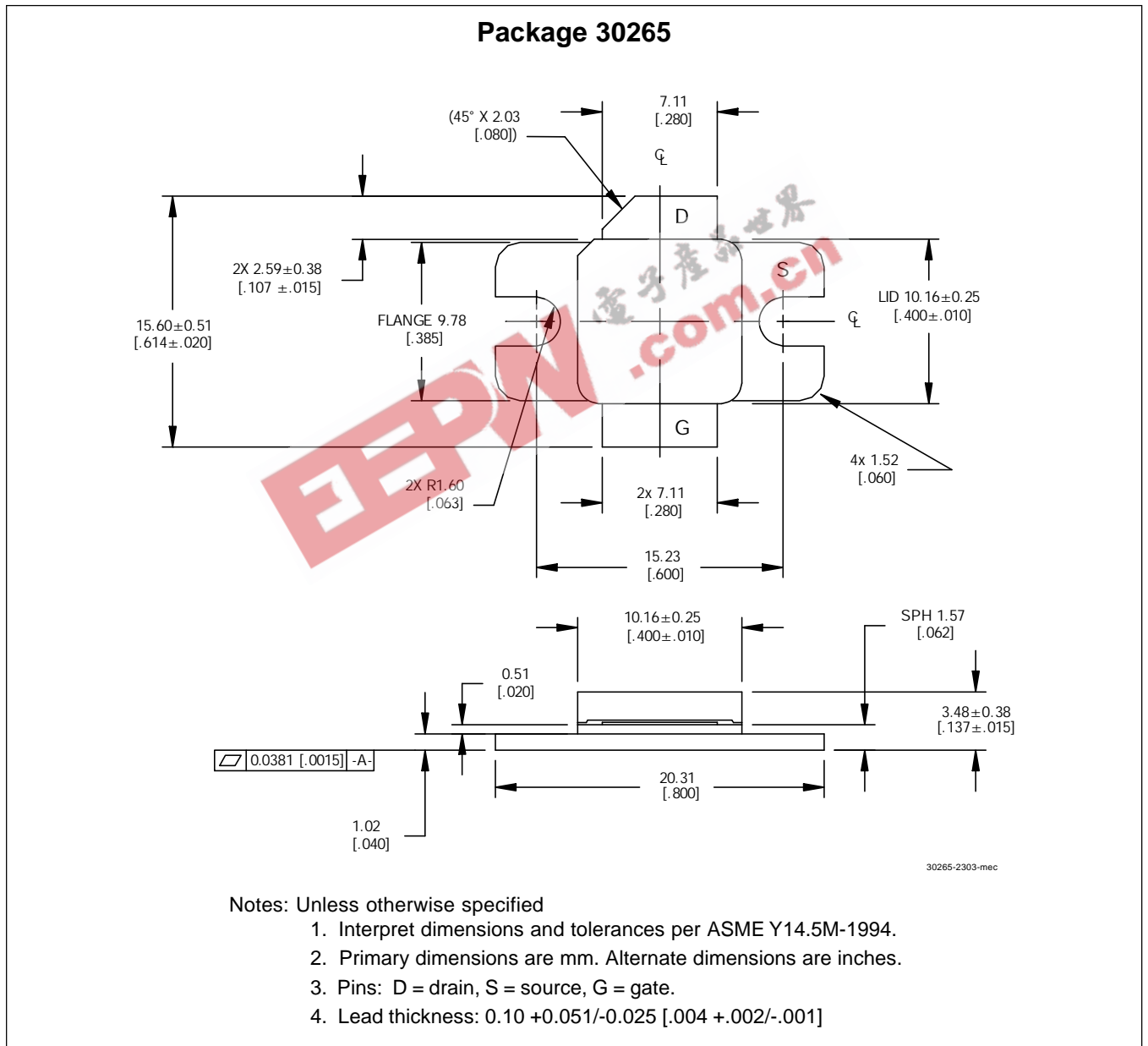
Component	Description	Manufacturer	P/N or Comment
C1	Capacitor, 10 μ F, 35 V, Tantalum TE, SMD	Digi-Key	PCS6106TR-ND
C2, C8	Capacitor, 0.01 μ F	ATC	X08J103AFB ATC 200B103MW
C3, C7	Capacitor, 1 μ F	ATC	X24L105BVC
C4, C6	Capacitor, 7.5 pF	ATC	100B 7R5
C5, C9	Capacitor, 10 pF	ATC	100A 100
L1	Ferrite Bead	Eln Magnetic	#BDS31314.6-452
R1, R2	Resistor, 3.3K ohm, 1/4 W	Digi-Key	P3.3K ECT-ND
R3	Resistor, 10 ohm, 1/4 W	Digi-Key	P10 ECT-ND

¹ Gerber files for this circuit available on request

Ordering Information

Type	Package Outline	Package Description	Marking
PTF210451E	30265	Thermally enhanced, flange	PTF210451E

Package Outline Specifications



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

PTF210451

Revision History: 2003-12-22

Data Sheet

Previous Version: none

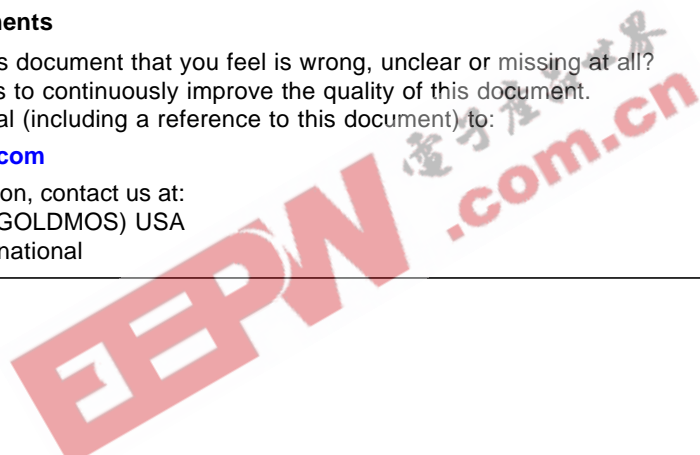
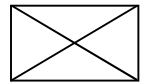
Page	Subjects (major changes since last revision)

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