Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

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

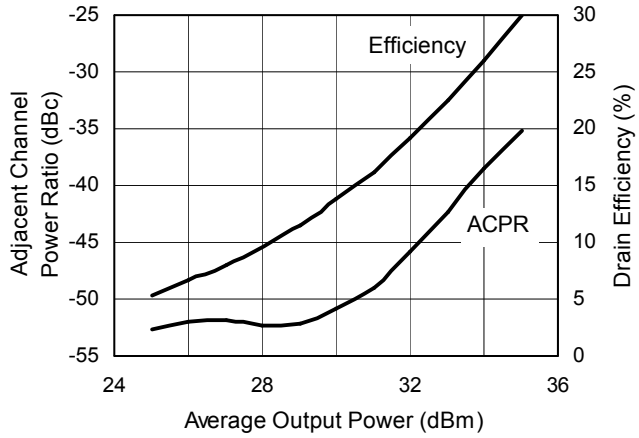
Description

The PTF210101M is an unmatched 10-watt *GOLDMOS*® FET intended for class AB base station applications in the 2110 to 2170 MHz band. This LDMOS device offers excellent gain, efficiency and linearity performance in a small footprint.

PTF210101M
Package PG-RFP-10

Single-carrier WCDMA Drive-up

V_{DD} = 28 V, I_{DQ} = 180 mA, f = 2170 MHz, 3GPP WCDMA signal, P/A R = 8 dB, 3.84 MHz bandwidth



Features

- Typical WCDMA performance
  - Average output power = 2.0 W
  - Gain = 15 dB
  - Efficiency = 20%
  - ACPR = –45 dB
- Typical CW performance
  - Output Power at P–1dB = 10 W
  - Gain = 14 dB
  - Efficiency = 50%
- Integrated ESD protection: Human Body Model Class 1 (minimum)
- Excellent thermal stability
- Low HCI drift
- Capable of handling 10:1 VSWR @ 28 V, 10 W (CW) output power
- Pb-free and RoHS compliant

RF Characteristics

Two-Tone Measurements (not subject to production test—verified by design/characterization in Infineon test fixture)
V_{DD} = 28 V, I_{DQ} = 180 mA, P_{OUT} = 10 W PEP, f = 2170 MHz, tone spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	15	—	—	dB
Drain Efficiency	η_D	35	—	—	%
Intermodulation Distortion	IMD	—	—	–28	dBc

All published data at T_{CASE} = 25°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 V, I_{DS} = 10 µA	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	µA
On-State Resistance	V_{GS} = 10 V, V_{DS} = 0.1 A	$R_{DS(on)}$	—	0.83	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ} = 180 mA	V_{GS}	2.5	3.2	4.0	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	150	°C
Total Device Dissipation	P_D	19	W
Above 25°C derate by		0.15	W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 10 W DC)	$R_{\theta JC}$	6.5	°C/W

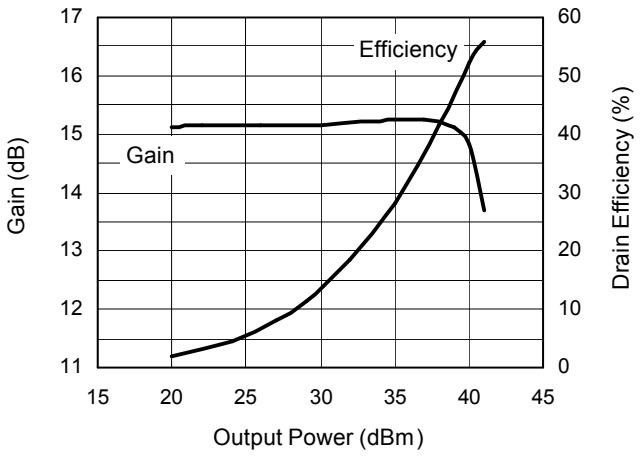
Ordering Information

Type	Package Outline	Package Description	Marking
PTF210101M	PG-RFP-10	Molded plastic, SMD	0211

Typical Performance (data taken in production test fixture)

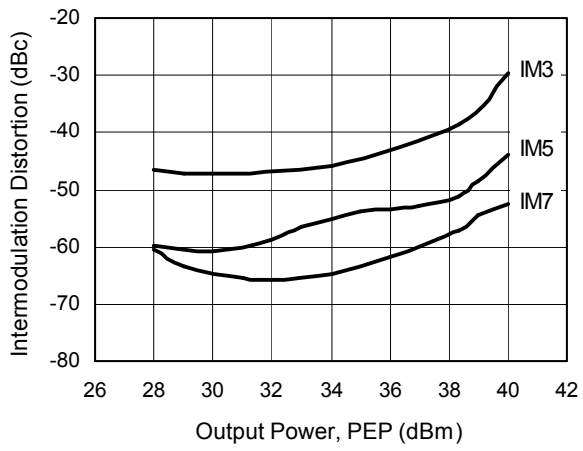
Power Sweep, CW Conditions

V_{DD} = 28 V, I_{DQ} = 180 mA, f = 2170 MHz



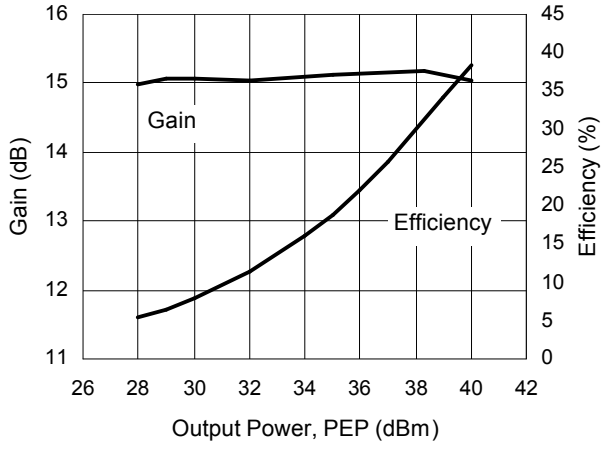
Two-Tone Drive-up

V_{DD} = 28 V, I_{DQ} = 180 mA, f_1 = 2169, f_2 = 2170 MHz



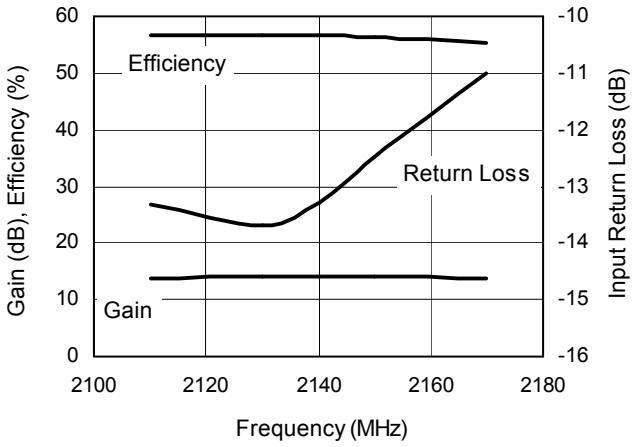
Two-Tone Power Sweep

V_{DD} = 28 V, I_{DQ} = 180 mA, f_1 = 2169, f_2 = 2170 MHz



Broadband Performance

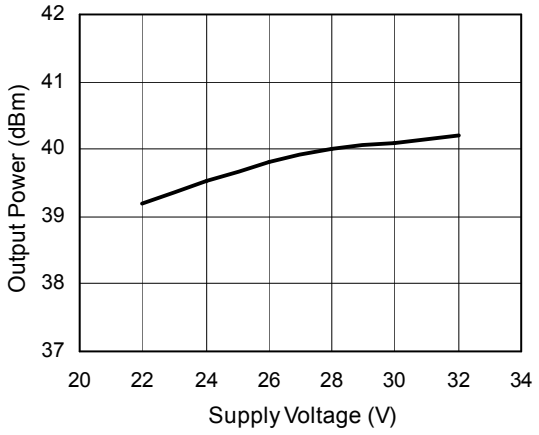
V_{DD} = 28 V, I_{DQ} = 180 mA, P_{OUT} = 41 dBm



Typical Performance (cont.)

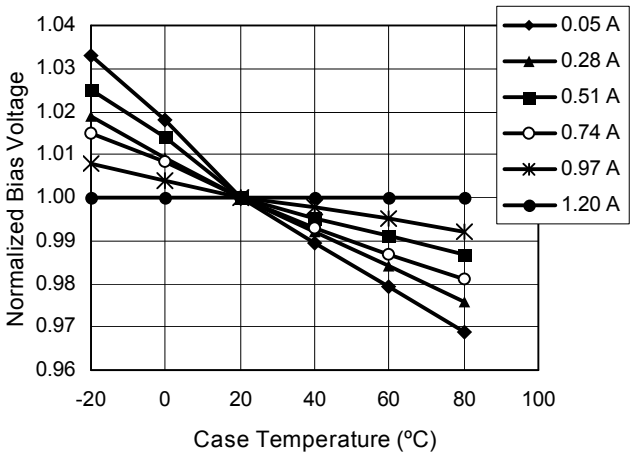
Voltage Sweep

I_{DQ} = 180 mA, f = 2110 MHz

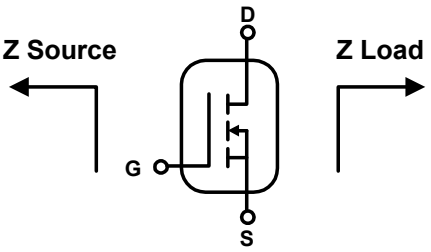


Gate-Source Voltage vs. Temperature

Voltage normalized to typical gate voltage, series show current.

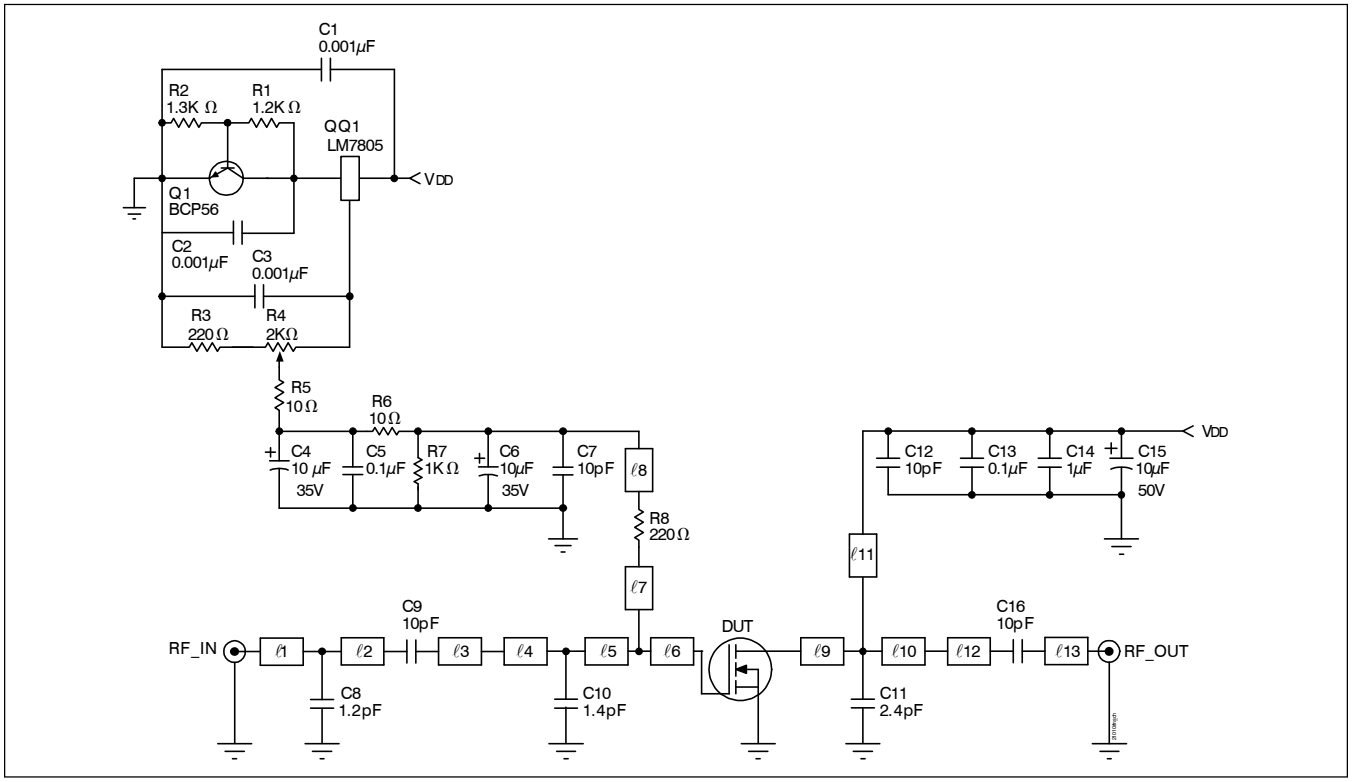


Broadband Circuit Impedance



Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
2080	2.4	–6.0	2.1	–3.3
2110	2.1	–5.8	2.1	–3.1
2140	1.8	–5.2	2.1	–2.9
2170	1.6	–4.9	2.0	–2.8
2200	1.4	–4.5	2.0	–2.6

Reference Circuit



Reference circuit schematic for ƒ = 2170 MHz

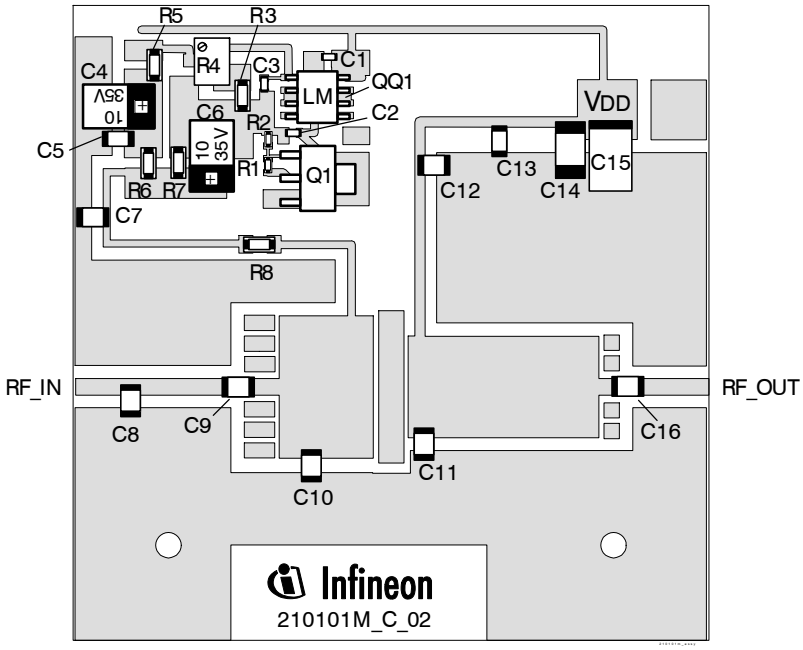
Circuit Assembly Information

DUT	PTF210101M	LDMOS Transistor	
PCB	0.76 mm [.030"] thick, ε_r = 3.48	Rogers 4350	1 oz. copper

Microstrip	Electrical Characteristics at 2170 MHz[1]	Dimensions: L x W (mm)	Dimensions: L x W (in.)
ℓ1	0.048 λ, 50.0 Ω	3.99 x 1.63	0.157 x 0.064
ℓ2	0.139 λ, 50.0 Ω	11.63 x 1.63	0.458 x 0.064
ℓ3	0.034 λ, 50.0 Ω	2.84 x 1.63	0.112 x 0.064
ℓ4	0.025 λ, 9.6 Ω	1.93 x 14.27	0.076 x 0.562
ℓ5	0.068 λ, 9.6 Ω	5.21 x 14.27	0.205 x 0.562
ℓ6	0.028 λ, 9.6 Ω	2.16 x 14.27	0.085 x 0.562
ℓ7	0.176 λ, 81.0 Ω	15.11 x 0.69	0.595 x 0.027
ℓ8	0.193 λ, 81.0 Ω	16.66 x 0.69	0.656 x 0.027
ℓ9	0.015 λ, 12.9 Ω	1.19 x 10.16	0.047 x 0.400
ℓ10	0.233 λ, 12.9 Ω	17.93 x 10.16	0.706 x 0.400
ℓ11	0.197 λ, 67.0 Ω	16.76 x 1.02	0.660 x 0.040
ℓ12	0.020 λ, 50.0 Ω	1.68 x 1.63	0.066 x 0.064
ℓ13	0.072 λ, 50.0 Ω	6.68 x 1.63	0.263 x 0.064

[1]Electrical characteristics are rounded.

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, C6	Tantalum capacitor, 10 µF, 35 V	Digi-Key	PCS6106TR-ND
C5, C13	Capacitor, 0.1 µF	Digi-Key	PCC104BCT-ND
C7, C9, C12, C16	Ceramic capacitor, 10 pF	ATC	100B 100
C8	Ceramic capacitor, 1.2 pF	ATC	100B 1R2
C10	Ceramic capacitor, 1.4 pF	ATC	100B 1R4
C11	Ceramic capacitor, 2.4 pF	ATC	100B 2R4
C14	Capacitor, 1.0 µF	ATC	920C105
C15	Tantalum capacitor, 10 µF, 50 V	Garrett Electronics	TPSE106K050R0400
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, R8	Chip Resistor 220 ohms	Digi-Key	P221ECT-ND
R4	Potentiometer 2 k-ohms	Digi-Key	3224W-202ETR-ND
R5, R6	Chip Resistor 10 ohms	Digi-Key	P10ECT-ND
R7	Chip Resistor 1 k-ohms	Digi-Key	P1KECT-ND

**Gerber Files for this circuit available on request*

Package Outline Specifications

Package PG-RFP-10 (TSSOP-10 Outline)

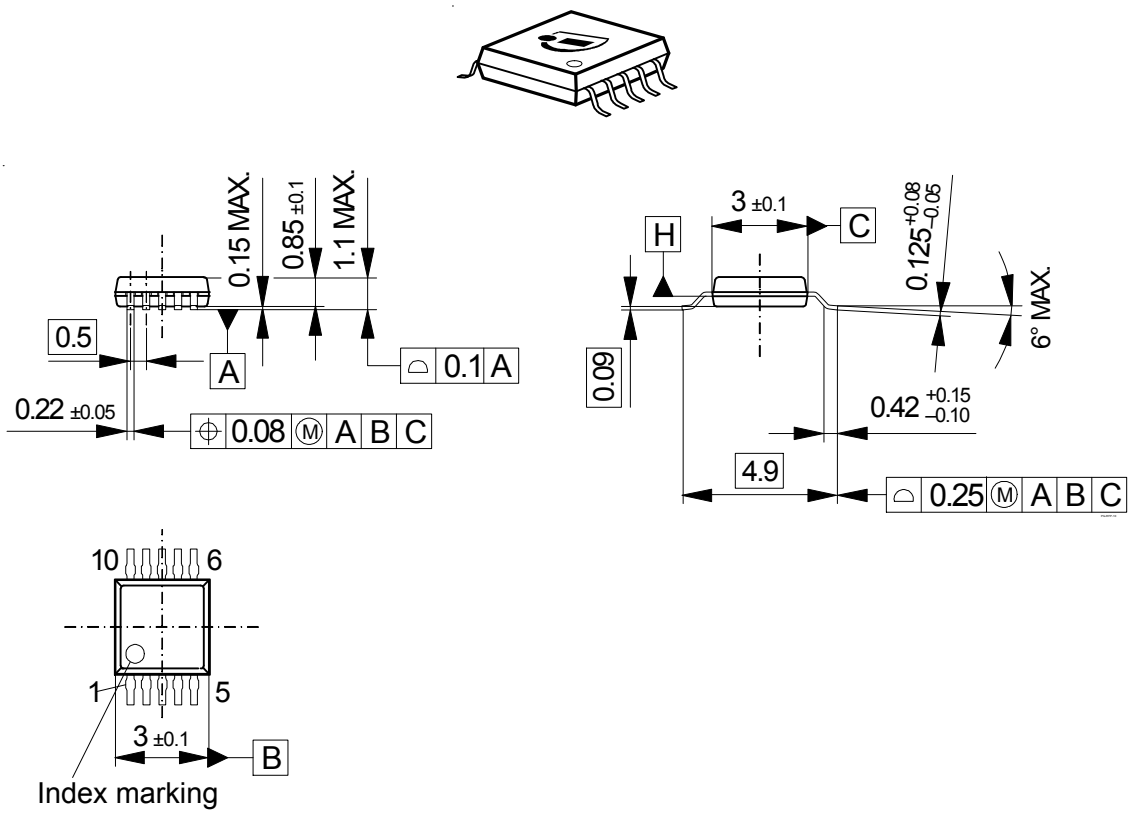


Diagram Notes—unless otherwise specified:

1. All tolerances ± 0.127 [.005] unless specified otherwise.
2. Dimensions are mm
3. Lead thickness: 0.09
4. Pins: 1 – 5 = gate, underside = source, 6 – 10 = drain

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

PTF210101M

Revision History:	2009-02-18	Data Sheet
Previous version:	2005-12-05, Data Sheet	

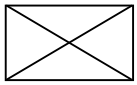
Page	Subjects (major changes since last revision)
6	Fixed typing error

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-GOLDMOS) USA
or +1 408 776 0600 International



Edition 2009-02-18

Published by
Infineon Technologies AG
81726 Munich, Germany

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.