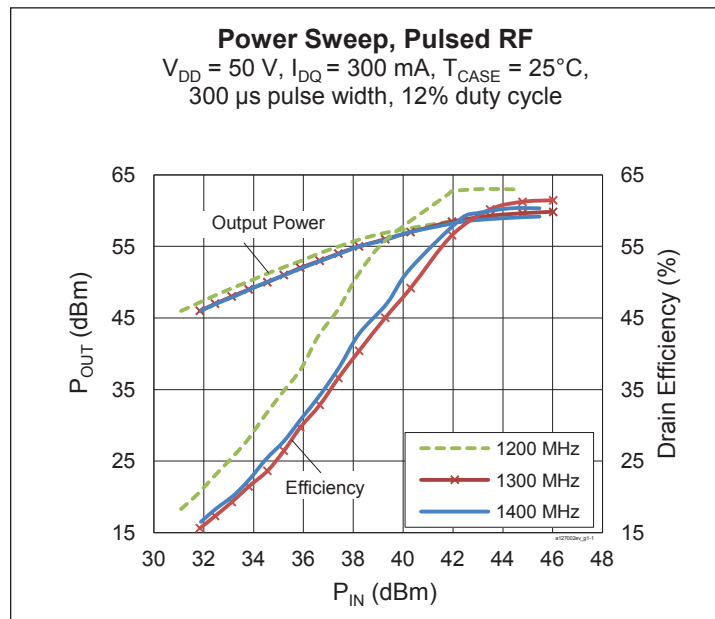


Thermally-Enhanced High Power RF LDMOS FET 700 W, 50 V, 1200 – 1400 MHz

Description

The PTVA127002EV LDMOS FET is designed for use in power amplifier applications in the 1200 to 1400 MHz frequency band. Features include high gain and thermally-enhanced package with bolt-down flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PTVA127002EV
Package H-36275-4



Features

- Broadband input and output matching
- High gain and efficiency
- Integrated ESD protection
- Low thermal resistance
- Excellent ruggedness
- Pb-free and RoHS compliant
- Capable of withstanding a 10:1 load mismatch (all phase angles) at 700 W peak under RF pulse, 300 μs , 10% duty cycle.

RF Characteristics

Pulsed RF Performance (tested in Infineon test fixture)

$V_{DD} = 50\text{ V}$, $I_{DQ} = 150\text{ mA}$ per side, $P_{OUT} = 700\text{ W}$, $f_1 = 1200\text{ MHz}$, $f_2 = 1300\text{ MHz}$, $f_3 = 1400\text{ MHz}$, 300 μs pulse width, 12% duty cycle

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	15.5	16	—	dB
Drain Efficiency	η_D	50	56	—	%
Gain Flatness	ΔG	—	1.0	1.3	dB
Return Loss	IRL	—	-20	-11	dB

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

RF Characteristics

Typical RF Performance (not subject to production test, verified by design/characterization in Infineon test fixture)

$V_{DD} = 50\text{ V}$, $I_{DQ} = 150\text{ mA}$ per side, Input signal ($t_r = 7\text{ ns}$, $t_f = 5\text{ ns}$), $300\text{ }\mu\text{s}$ pulse width, 12% duty cycle, class AB test

Mode of Operation	f (MHz)	IRL (dB)	P _{1dB}			P _{3dB}			Max P _{droop} (pulse) @ P _{1dB}	t _r (ns) @ P _{1dB}	t _f (ns) @ P _{1dB}
			Gain (dB)	Eff (%)	P _{OUT} (W)	Gain (dB)	Eff (%)	P _{OUT} (W)			
300 μs , 12% Duty Cycle	1200	-20	16.6	57	710	14.6	57	810	0.2	5	<2
	1300	-16	15.8	54	840	13.8	55	950	0.3	5	<2
	1400	-20	15.7	54	730	13.7	53	820	0.2	5	<2

Typical RF Performance (tested on LTN/PTVA127002EV E5 Infineon test fixture)

$V_{DD} = 50\text{ V}$, $I_{DQ} = 150\text{ mA}$ per side, Input signal ($t_r = 7\text{ ns}$, $t_f = 5\text{ ns}$), 32 ms pulse width, 50% duty cycle, class AB test

Mode of Operation	Compression	f (MHz)	P _{IN} (dBm)	Gain (dB)	IRL (dB)	I (A)	Eff (%)	P _{OUT} (dBm)	P _{OUT} (W)
32 ms, 50% Duty Cycle	P _{1dB}	1300	42.0	16.1	22.6	22.7	56.6	58.1	641
	P _{3dB}	1300	44.4	14.1	19.0	25.2	55.8	58.5	703

DC Characteristics (single side)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	105	—	—	V
Drain Leakage Current	$V_{DS} = 50\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
	$V_{DS} = 105\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10.0	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.1	—	Ω
Operating Gate Voltage	$V_{DS} = 50\text{ V}$, $I_{DQ} = 150\text{ mA}$	V_{GS}	3	3.35	4	V
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1.0	μA

Maximum Ratings

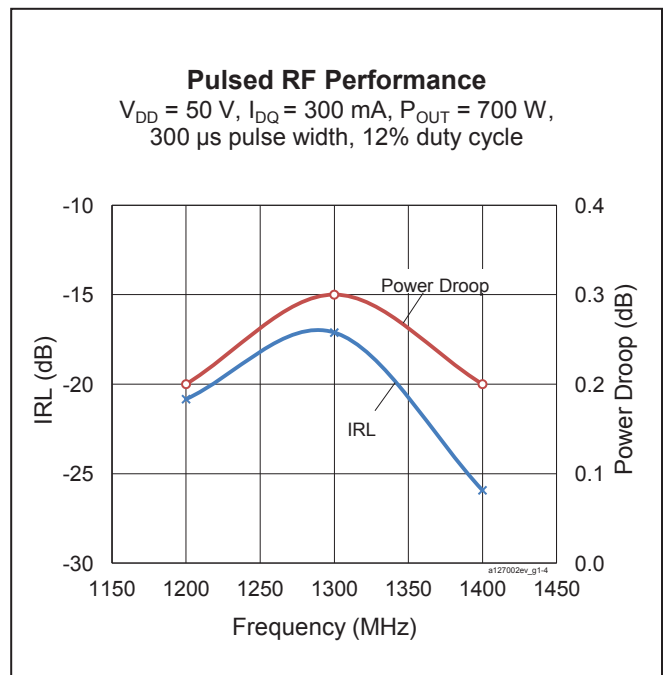
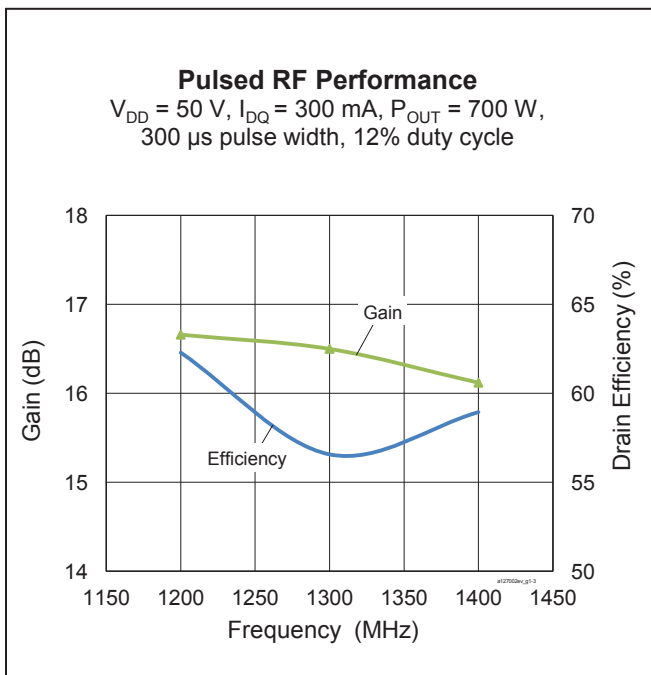
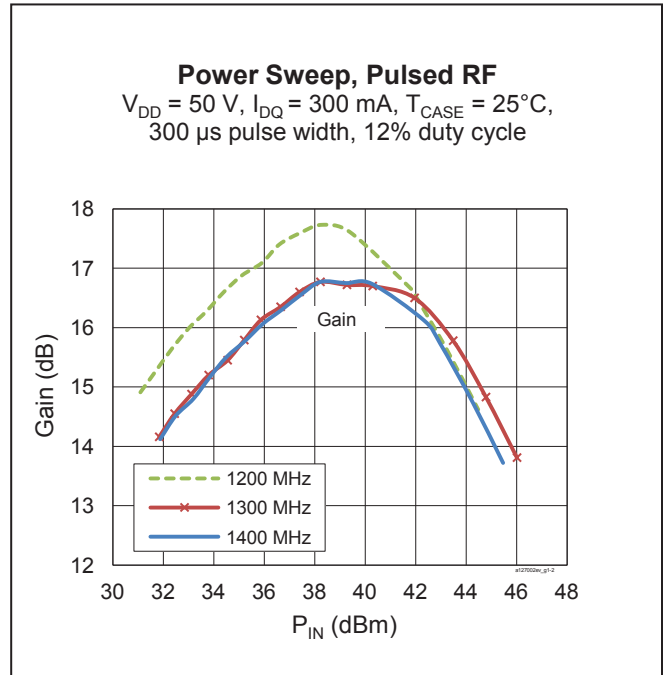
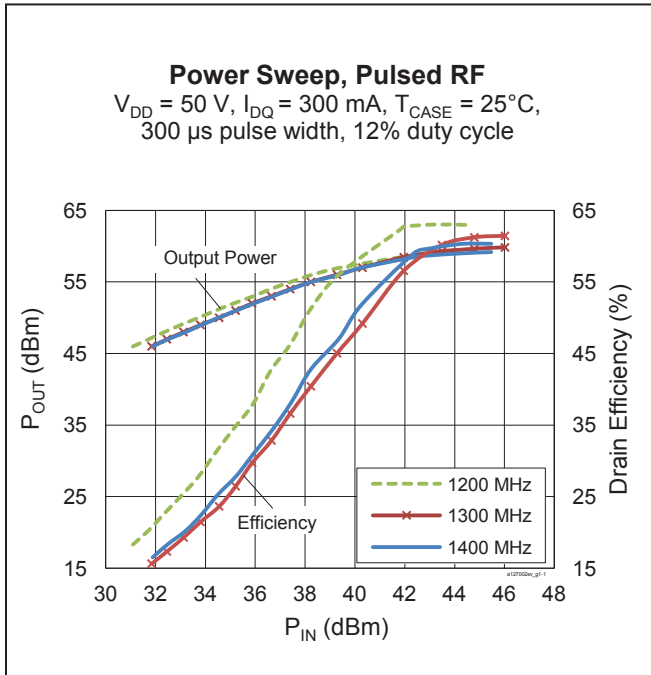
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	105	V
Gate-Source Voltage	V_{GS}	-6 to +12	V
Junction Temperature	T_J	200	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$, 700 W CW)	$R_{\theta JC}$	~0.36	$^{\circ}\text{C/W}$

Ordering Information

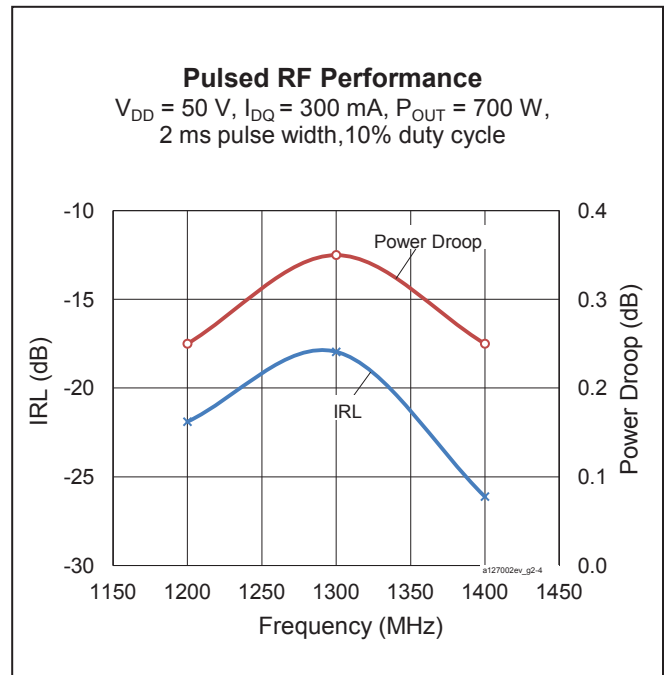
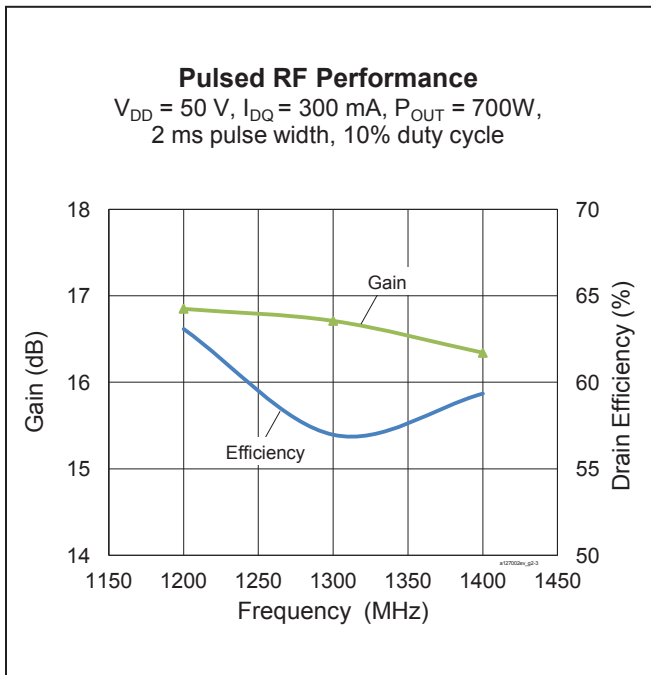
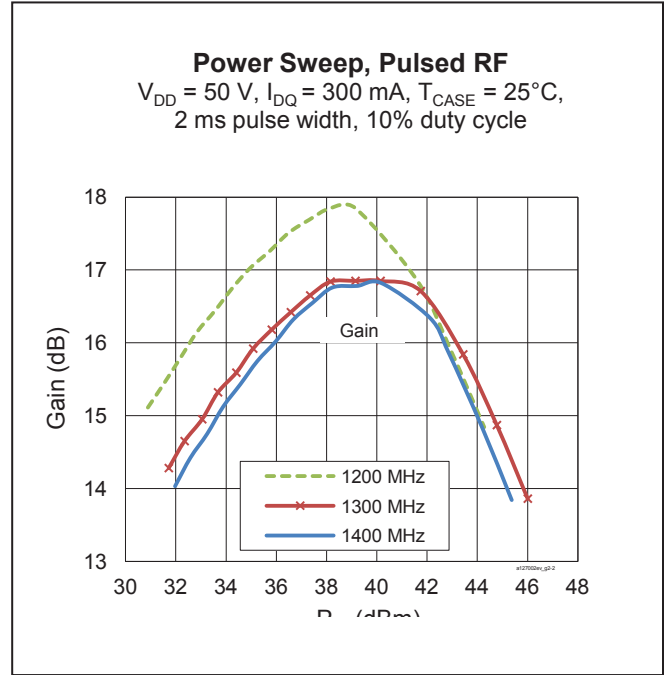
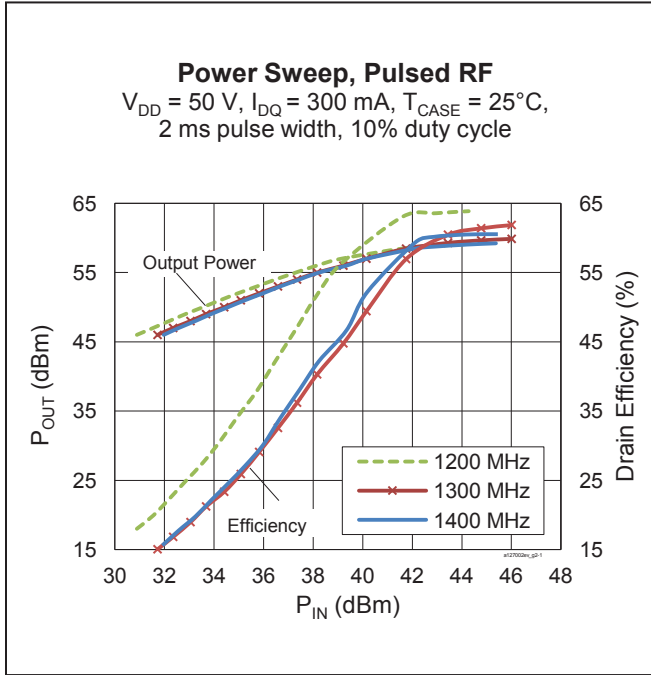
Type and Version	Order Code	Package Description	Shipping
PTVA127002EV V1	PTVA127002EVV1XWSA1	H-36275-4, bolt-down	Tray
PTVA127002EV V1 R250	PTVA127002EVV1R250XTMA1	H-36275-4, bolt-down	Tape & Reel, 250 pcs

See next page for Typical RF Performance

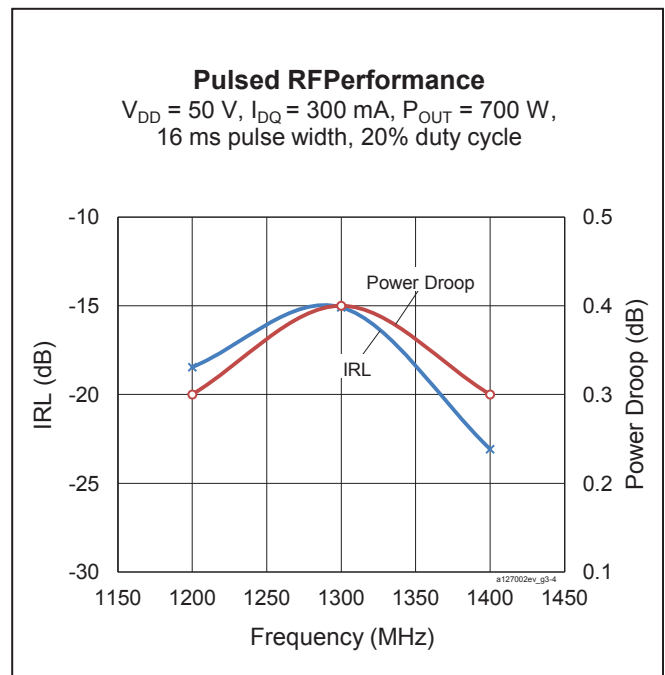
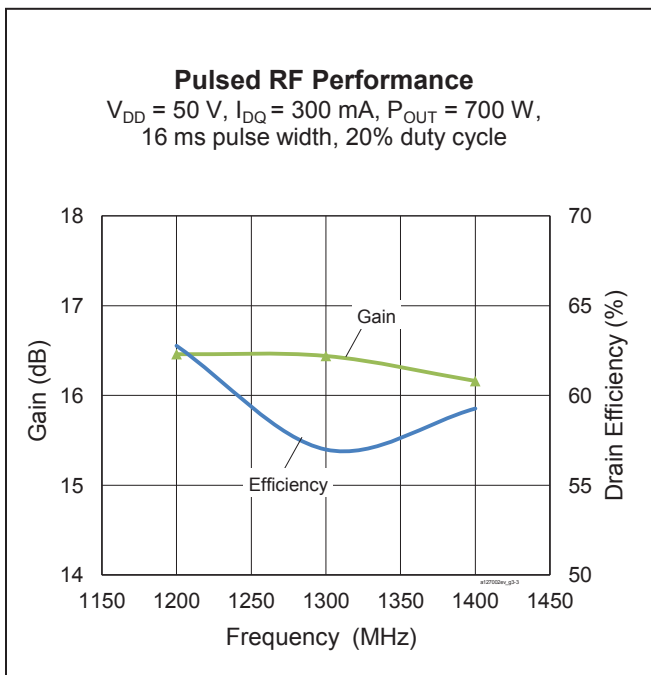
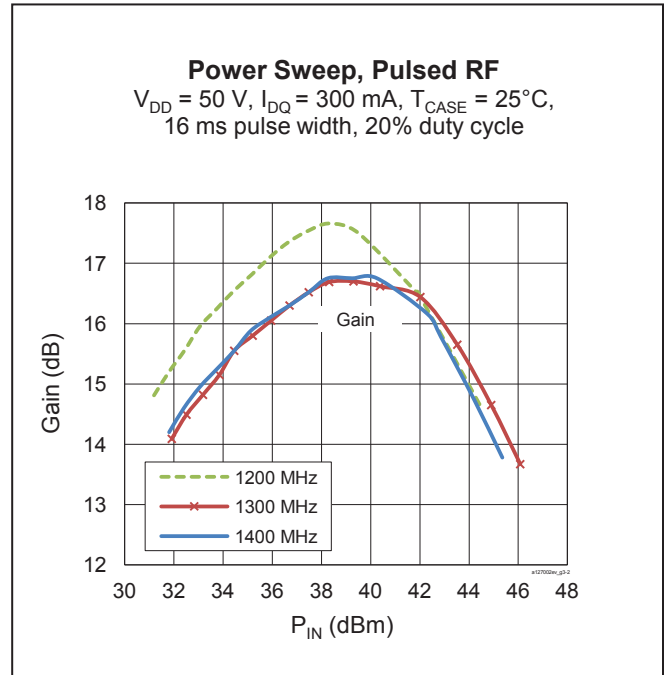
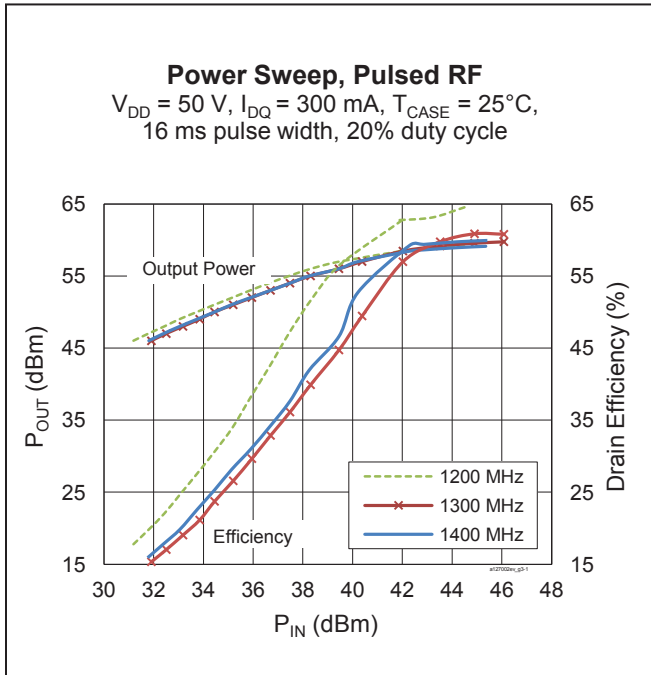
Typical RF Performance (data taken in production test fixture)



Typical RF Performance (cont.)

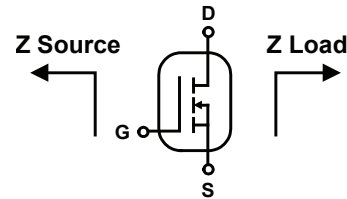


Typical RF Performance (cont.)



Broadband Circuit Impedance

Freq [MHz]	Z Source Ω		Z Load Ω	
	R	jX	R	jX
1200	0.84	-1.27	0.90	-0.97
1300	0.97	-1.06	0.72	-0.47
1400	1.35	-1.12	0.63	0.03



Load Pull Performance (single side)

Load Pull at Max P_{OUT} Point – 16 μ s pulse width, 10% duty cycle, class AB, $V_{DD} = 50$ V, 150 mA

Freq [MHz]	ZI [Ω]	P_{IN} [dBm]	P_{OUT} [dBm]	P_{OUT} [W]	P_G [dB]	PAE Eff [%]	Z _{OUT} [Ω]
1200	1.91 – j2.04	41.40	56.40	436.52	15.00	53.80	1.30 – j2.03
1300	2.72 – j3.13	42.24	56.54	450.82	14.30	54.48	1.25 – j1.94
1400	4.83 – j1.46	41.66	56.31	427.56	14.65	53.27	1.03 – j1.94

Load Pull at Max G_T Point – 16 μ s pulse width, 10% duty cycle, class AB, $V_{DD} = 50$ V, 150 mA

Freq [MHz]	ZI [Ω]	P_{IN} [dBm]	P_{OUT} [dBm]	P_{OUT} [W]	P_G [dB]	PAE Eff [%]	Z _{OUT} [Ω]
1200	1.91 – j2.04	38.10	54.72	296.48	16.62	57.89	3.03 – j3.11
1300	2.72 – j3.13	38.84	54.83	304.09	15.99	62.54	3.22 – j1.63
1400	4.83 – j1.46	37.21	53.42	219.79	16.21	57.25	2.30 – j0.09

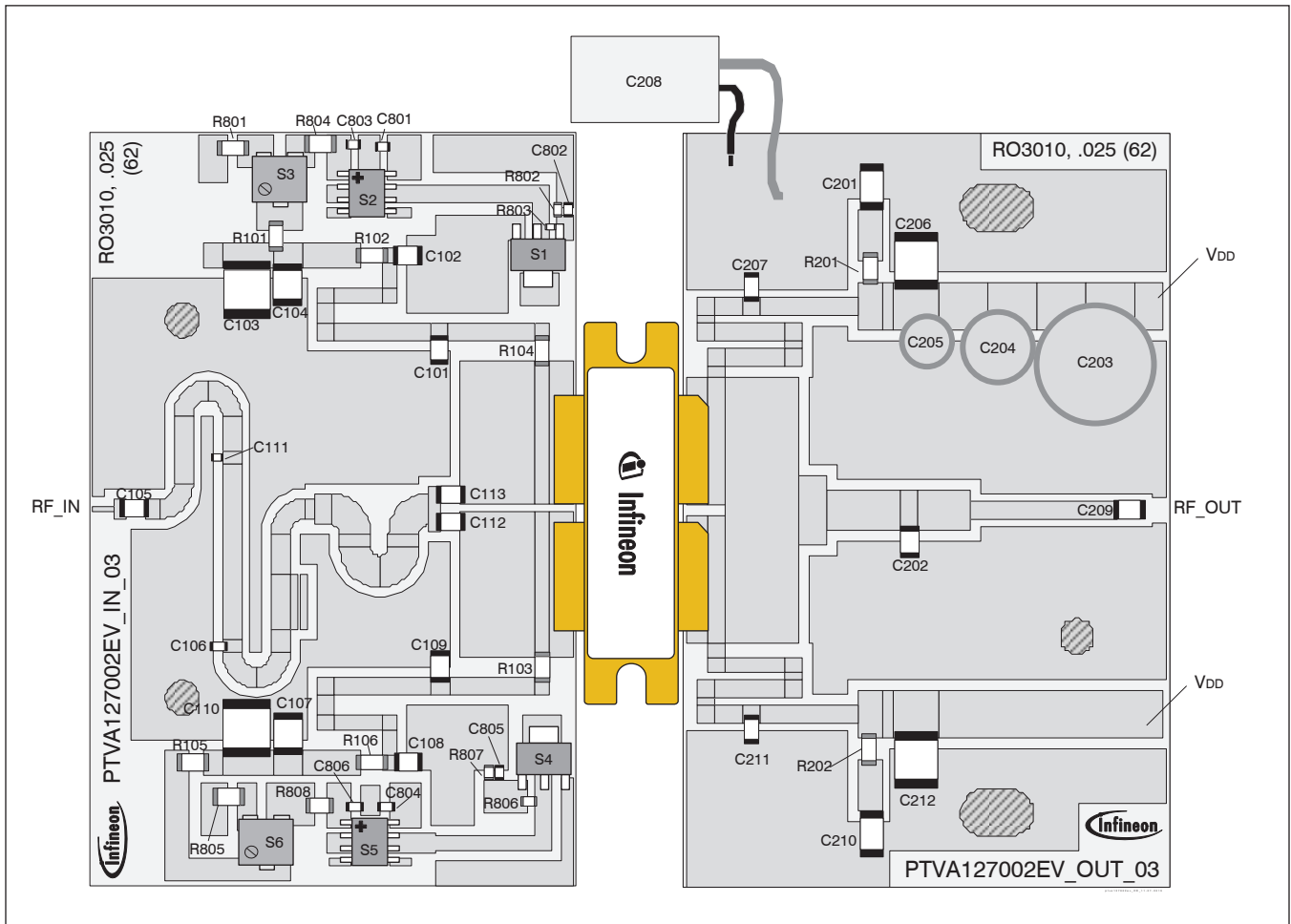
Load Pull at Max Efficiency Point – 16 μ s pulse width, 10% duty cycle, class AB, $V_{DD} = 50$ V, 150 mA

Freq [MHz]	ZI [Ω]	P_{IN} [dBm]	P_{OUT} [dBm]	P_{OUT} [W]	P_G [dB]	PAE Eff [%]	Z _{OUT} [Ω]
1200	1.91 – j2.04	39.60	55.80	380.19	16.20	60.71	2.22 – j2.43
1300	2.72 – j3.13	39.44	55.23	333.43	15.79	63.71	2.81 – j1.90
1400	4.83 – j1.46	39.39	55.19	330.37	15.80	62.26	2.40 – j1.45

Z Optimum – 16 μ s pulse width, 10% duty cycle, class AB, $V_{DD} = 50$ V, 150 mA

Freq [MHz]	ZI [Ω]	P_{IN} [dBm]	P_{OUT} [dBm]	P_{OUT} [W]	P_G [dB]	PAE Eff [%]	Z _{OUT} [Ω]
1200	1.91 – j2.04	39.18	55.58	361.41	16.40	60.50	2.41 – j2.50
1300	2.72 – j3.13	39.50	55.30	338.84	15.80	62.60	2.73 – j1.51
1400	4.83 – j1.46	40.00	55.60	363.08	15.60	60.70	1.86 – j1.37

Reference Circuit , 1200 – 1400 MHz



Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

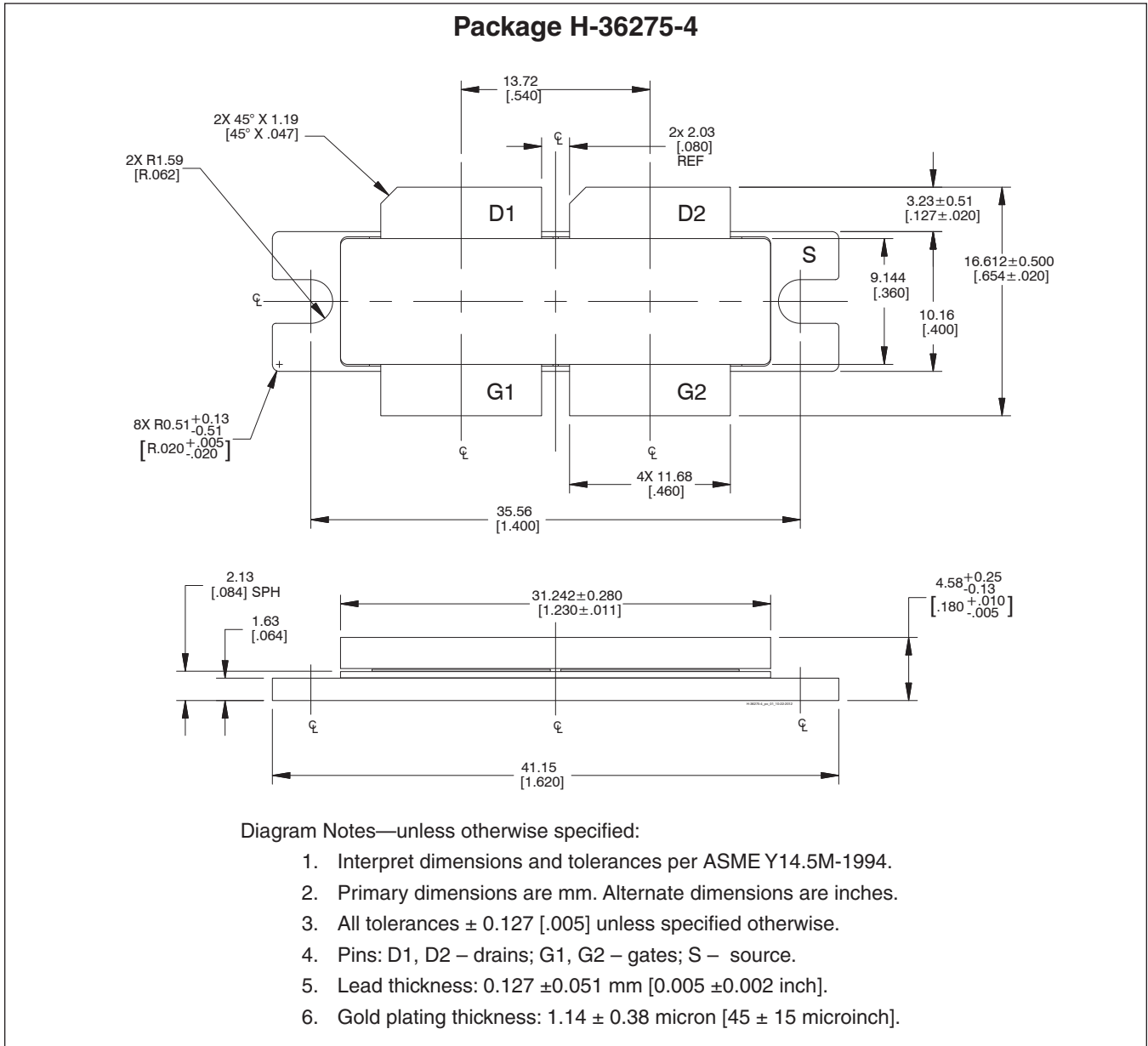
Reference Circuit Assembly

DUT	PTVA27002EV V1
Test Fixture Part No.	LTN/PTVA127002EV V1
PCB	Rogers 3010, 0.635mm [0.025"] thick, 2 oz. copper, $\epsilon_r = 10.2$, $f = 1930 - 1990$ MHz
Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower	

Components Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101, C102, C108, C109	Capacitor, 39 pF	ATC	ATC100B390KW500XB
C103, C110	Capacitor, 10 μ F	TDK Corporation	C5750X5R1H106K230KA
C104, C107	Capacitor, 1 μ F	TDK Corporation	C4532X7R2A105M230KA
C105, C112, C113	Capacitor, 56 pF	ATC	ATC100B560JW500XB
C106	Capacitor, 3.9 pF	ATC	ATC800A3R9CW250
C111	Capacitor, 6.2 pF	ATC	ATC100A6R2CW150XB
C801, C802, C803, C804, C805, C806	Capacitor, 1000 pF	Panasonic Electronic Components	ECJ-1VB1H102K
R101, R105	Resistor, 1000 Ω	Panasonic Electronic Components	ERJ-8GEYJ102V
R102, R106	Resistor, 5.6 Ω	Panasonic Electronic Components	ERJ-8GEYJ5R6V
R103, R104, R804, R808	Resistor, 10 Ω	Panasonic Electronic Components	ERJ-8GEYJ100V
R801, R805	Resistor, 2000 Ω	Panasonic Electronic Components	ERJ-8GEYJ202V
R802, R807	Resistor, 1300 Ω	Panasonic Electronic Components	ERJ-3GEYJ132V
R803, R806	Resistor, 1200 Ω	Panasonic Electronic Components	ERJ-3GEYJ122V
S1, S4	Transistor	Infineon Technologies	BCP56
S2, S5	Voltage Regulator	National Semiconductor	LM7805
S3, S6	Potentiometer, 2k Ω	Bourns Inc.	3224W-1-202E
Output			
C201, C210	Capacitor, 1 μ F	TDK Corporation	C4532X7R2A105M230KA
C202	Capacitor, 2.2 μ F	ATC	ATC100B2R2CW500
C203	Capacitor, 100 μ F	Cornell Dubilier Electronics (CDE)	SK101M100ST
C204	Capacitor, 22 μ F	Cornell Dubilier Electronics (CDE)	SEK220M100ST
C205	Capacitor, 10 μ F	Cornell Dubilier Electronics (CDE)	SEK100M100ST
C206, C212	Capacitor, 10 μ F	TDK Corporation	C5750X5R1H106K230KA
C207, C211	Capacitor, 39 pF	ATC	ATC100B390KW500
C208	Capacitor, 6800 μ F	Panasonic Electronic Components	ECO-S2AP682EA
C209	Capacitor, 56 pF	ATC	ATC100B560JW500
R201, R202	Resistor, 5.6 Ω	Panasonic Electronic Components	ERJ-8RQJ5R6V

Package Outline Specifications



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

Revision History

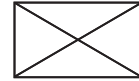
Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2013-10-01	Advance	All	Data Sheet reflects advance specification for product development
02	2014-03-04	Preliminary	All	Data Sheet reflects preliminary specification
02.1	2014-09-30	Preliminary	2	Added LTN/PTVA127002EV E5 test fixture
03	2014-11-11	Production	All	Data Sheet reflects released product specifications Includes Reference Circuit
03.1	2015-06-18	Production	8	Corrected frequency range

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



Edition 2015-06-18

**Published by
Infineon Technologies AG
85579 Neubiberg, Germany**

**© 2014 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.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [RF MOSFET Transistors](#) category:

Click to view products by [Infineon](#) manufacturer:

Other Similar products are found below :

[MRF166W](#) [MHT1006NT1](#) [FH2164](#) [MRFE8VP8600HR5](#) [BLF245](#) [BLF278](#) [ARF1511](#) [ARF465BG](#) [BF 2030 E6814](#) [BLF861A](#) [3SK263-5-TG-E](#) [VRF154FL](#) [MRF6S20010GNR1](#) [DU1215S](#) [DU28200M](#) [VRF150MP](#) [MMRF1015NR1](#) [MRF154](#) [MRF175LU](#) [MRF6S20010GNR1](#) [UF28100M](#) [MW6S010GNR1](#) [MW6S010GNR1](#) [DU2820S](#) [SD2943W](#) [SD2932BW](#) [SD2941-10W](#) [MRF24301HR5](#) [ARF469AG](#) [ARF463BP1G](#) [MMRF1019NR4](#) [MHT1008NT1](#) [MMRF1014NT1](#) [MRF426](#) [MRF422](#) [BLW96](#) [ARF468AG](#) [VRF161MP](#) [ARF468BG](#) [MRFE6VP61K25NR6](#) [MRFE6VP5300NR1](#) [A2T27S020NR1](#) [UF2840P](#) [MMRF1304NR1](#) [MRFE6S9060GNR1](#) [MMRF1008GHR5](#) [A2T27S007NT1](#) [AFT09MP055NR1](#) [DU2860U](#) [MHT1803A](#)