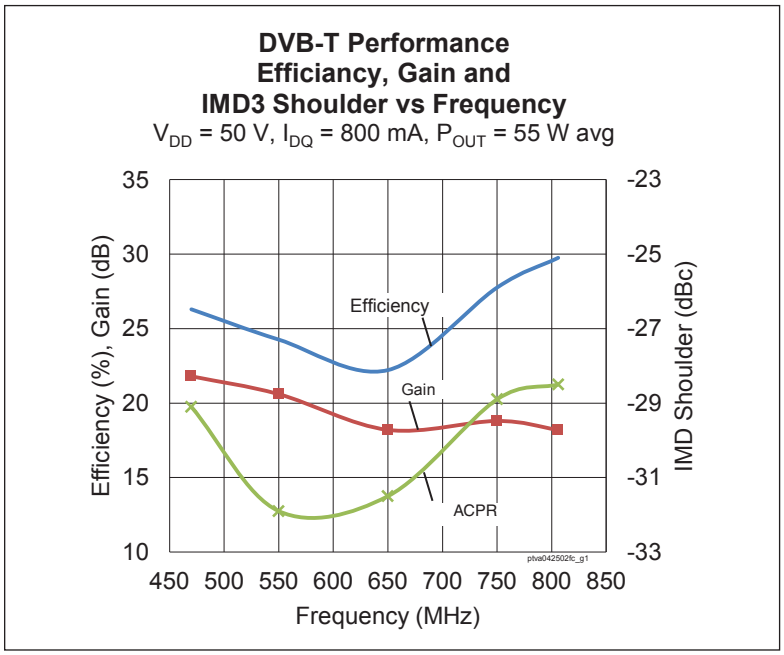
PTVA042502EC
PTVA042502FC

green Product

Thermally-Enhanced High Power RF LDMOS FET
250 W, 50 V, 470 – 806 MHz

Description

The PTVA042502EC and PTVA042502FC LDMOS FETs are designed for use in power amplifier applications in the 470 MHz to 806 MHz frequency band. Features include high gain and thermally-enhanced package with bolt-down or earless flanges. Manufactured with Infineon's advanced LDMOS process, these devices provide excellent thermal performance and superior reliability.



PTVA042502EC
Package H-36248-4

PTVA042502FC
Package H-37248-4

Features

- Input matched
- Integrated ESD protection
- Human Body Model Class 1C (per ANSI/ESDA/JEDEC JS-001)
- Low thermal resistance
- RoHS compliant
- Capable of withstanding a 10:1 VSWR at 55W average power under DVB-T signal condition

RF Characteristics

DVB-T (8K OFDM, 64QAM) Characteristics (tested in Infineon test fixture)
V_{DD} = 50 V, I_{DQ} = 800 mA, f = 806 MHz, input PAR = 10.5 dB (unclipped), output PAR = 7.8 dB @ 0.01% CCDF probability

Characteristic	Symbol	Min	Typ	Max	Unit
Average Output Power	P_{OUT}	—	55	—	W
Gain	G_{ps}	17.5	19	—	dB
Drain Efficiency	η_D	23	25.5	—	%
Adjacent Channel Power Ratio	ACPR	—	–29.5	–25	dBc
(ACPR integrated over 200 KHz BW at + 4.3 MHz offset from center frequency)					

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 mA	$V_{(BR)DSS}$	105	—	—	V
Drain Leakage Current	V_{DS} = 50 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	µA
	V_{DS} = 105 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	µA
On-State Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.1	—	Ω
Operating Gate Voltage	V_{DS} = 50 V, I_{DQ} = 800 mA	V_{GS}	3.0	3.7	4.0	V
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1.0	µA

Maximum Ratings

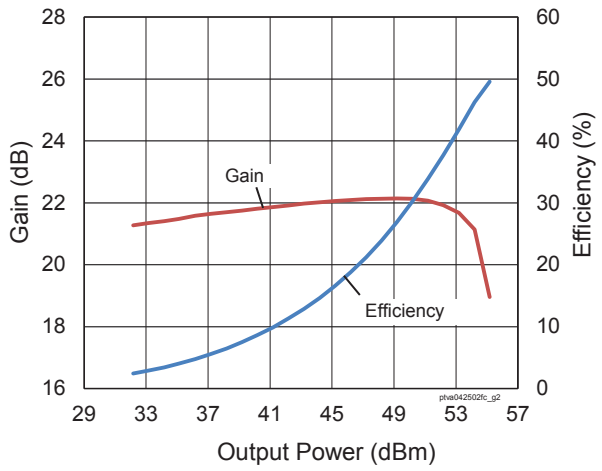
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	105	V
Gate-Source Voltage	V_{GS}	–6 to +12	V
Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{STG}	–65 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 55 W CW)	$R_{\theta JC}$	0.4	°C/W

Ordering Information

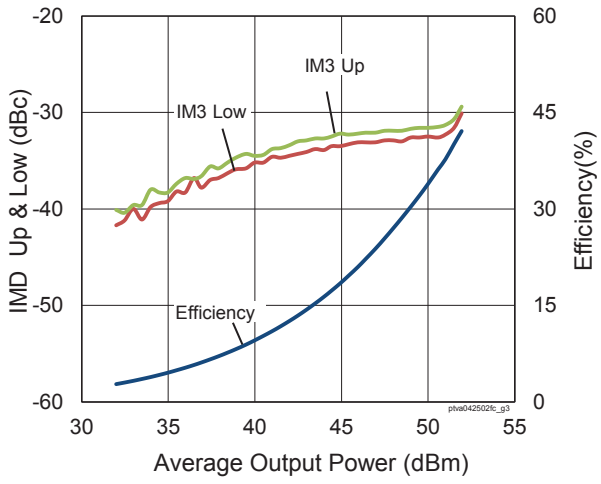
Type and Version	Order Code	Package and Description	Shipping
PTVA042502EC V1 R0	PTVA042502ECV1R0XTMA1	H-36248-4, push-pull, bolt-down	Tape & Reel, 50pcs
PTVA042502EC V1 R250	PTVA042502ECV1R250XTMA1	H-36248-4, push-pull, bolt-down	Tape & Reel, 250pcs
PTVA042502FC V1 R0	PTVA042502FCV1R0XTMA1	H-37248-4, push-pull, earless	Tape & Reel, 50pcs
PTVA042502FC V1 R250	PTVA042502FCV1R250XTMA1	H-37248-4, push-pull, earless	Tape & Reel, 250pcs

Typical Performance

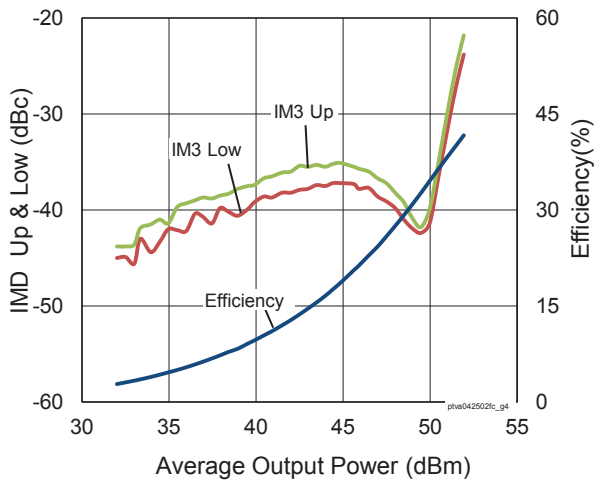
CW Performance
V_{DD} = 50 V, I_{DQ} = 800mA, f = 470 MHz



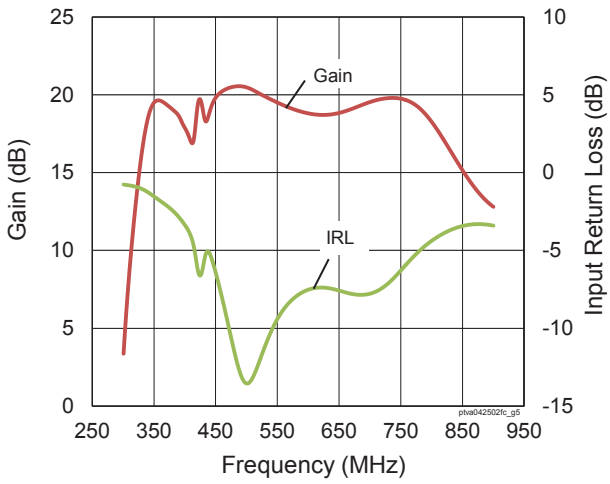
Two Tone Drive-up
V_{DD} = 50 V, I_{DQ} = 800 mA, f = 470 MHz,
1MHz Tone Spacing



Two Tone Drive-up
V_{DD} = 50 V, I_{DQ} = 800 mA, f = 806 MHz,
1MHz Tone Spacing



Small Signal CW
Gain & Input Return Loss
V_{DD} = 50 V, I_{DQ} = 800 mA



Load Pull Performance

Pulsed CW signal: 16 µs, 10% duty cycle, 50 V, 100 mA

		P_{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]
500	0.9 – j1.4	2.9 + j0.8	22.4	54.05	254	71.2	2.5 + j4.5	24.6	50.59	115	79.5
600	0.7 – j2.0	2.2 + j0.8	21.1	52.15	164	61.8	2.2 + j3.6	23.4	49.27	85	76.3
700	1.4 – j2.8	2.1 + j0.8	20.5	52.64	184	59.6	1.9 + j3.4	22.9	49.97	99	75.3
859	3.7 – j4.9	2.0 + j0.2	19.1	52.38	173	62.2	1.8 + j1.9	21.2	50.44	111	74.1

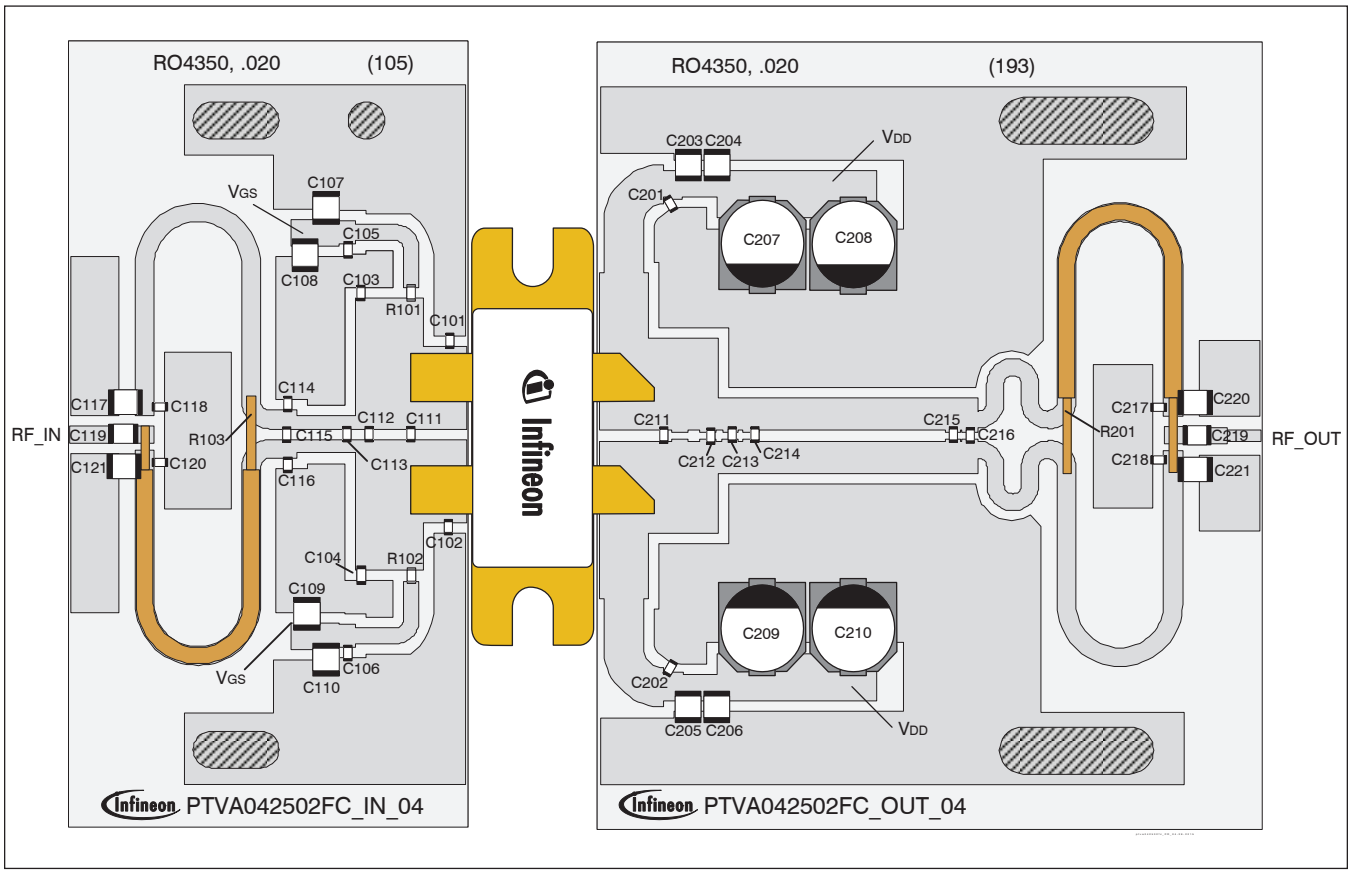
Pulsed CW signal: 16 µs, 10% duty cycle, 50 V, 100 mA

		P_{3dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]	Zl [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE [%]
500	0.9 – j1.4	2.9 + j0.6	20.3	54.58	287	74.1	2.6 + j4.1	22.4	51.49	141	80.0
600	0.7 – j2.0	2.3 + j0.7	19.0	52.77	189	62.2	2.3 + j3.2	21.1	50.39	109	76.9
700	1.4 – j2.8	2.2 + j0.7	18.4	53.34	216	60.2	1.8 + j3.2	20.7	50.60	115	75.8
859	3.7 – j4.5	2.0 + j0.1	17.0	53.11	205	63.9	1.8 + j1.8	19.1	51.08	128	73.6

All published data at T_{CASE} = 25°C unless otherwise indicated

ESD: *Electrostatic discharge sensitive device—observe handling precautions!*

Reference Circuit , 470 – 806 MHz



Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

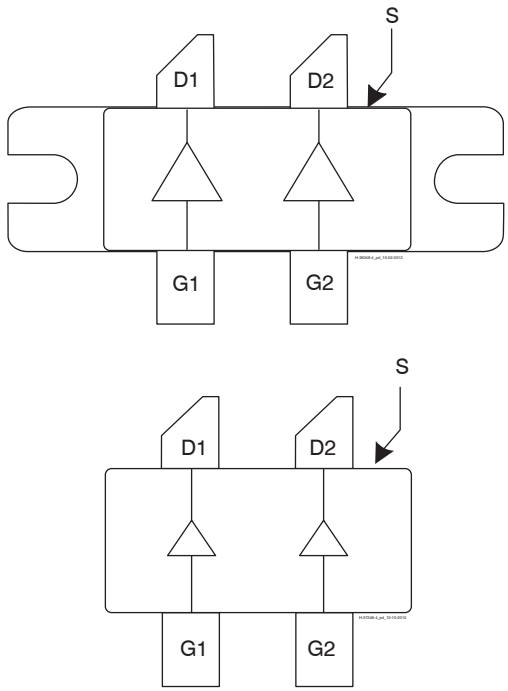
Reference Circuit Assembly

DUT	PTVA042502EC or PTVA042502FC
Test Fixture Part No.	LTN/PTVA042502EC V1 or LTN/PTVA042502FC V1
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, ε_r = 3.66, f = 470 – 806 MHz
Find Gerber files for this test fixture on the Infineon Web site at www.infineon.com/rfpower	

Components Information

Component	Description	Manufacturer	P/N
Input			
C101, C102	Capacitor, 20 pF	ATC	ATC100A200JW150XB
C103, C104, C112, C115	Capacitor, 8.2 pF	ATC	ATC100A8R2JW150XB
C105, C106	Capacitor,120 pF	ATC	ATC700A120KP150XB
C107, C108, C109, C110, C117, C121	Capacitor, 4.7 µF	Murata Electronics North America	GRM32ER71H475KA88L
C111, C113	Capacitor, 10 pF	ATC	ATC100A100JW150XB
C114, C116	Capacitor, 6.8 pF	ATC	ATC100A6R8JW150XB
C118, C120	Capacitor, 100 pF	ATC	ATC100A101JW150XB
C119	Capacitor, 91 pF	ATC	ATC100A910JW150XB
R101, R102	Resistor, 1K Ω	Panasonic Electronic Components	ERJ-8GEYJ102V
R103	Coax, 25 Ω	AMWAYE	UT-090C-25
Output			
C201, C202	Capacitor, 270 pF	ATC	ATC700A271KP150XB
C203, C204, C205, C206, C220, C221	Capacitor, 4.7 µF	Murata Electronics North America	GRM32ER71H475KA88L
C207, C208, C209, C210	Capacitor, 100 µF	Panasonic Electronic Components	EEE-FP1V101AP
C211	Capacitor, 3.9 pF	ATC	ATC100A3R9CW150XB
C212	Capacitor, 6.8 pF	ATC	ATC100A6R8JW150XB
C213, C215	Capacitor, 8.2 pF	ATC	ATC100A8R2JW150XB
C214	Capacitor, 5.6 pF	ATC	ATC100A5R6CW150XB
C216	Capacitor, 3.3 pF	ATC	ATC100A3R3CW150XB
C217, C218	Capacitor, 100 pF	ATC	ATC100A101JW150XB
C219	Capacitor, 91 pF	ATC	ATC100A910JW150XB
R201	Coax, 25 Ω	AMWAYE	UT-090C-25

Pinout Diagram (top view)



Pin	Description
D1	Drain device 1
D2	Drain device 2
G1	Gate device 1
G2	Gate device 2
S	Source (Flange)

Lead connections for PTVA042502EC and PTVA042502FC

Package Outline Specifications

Package H-36248-4

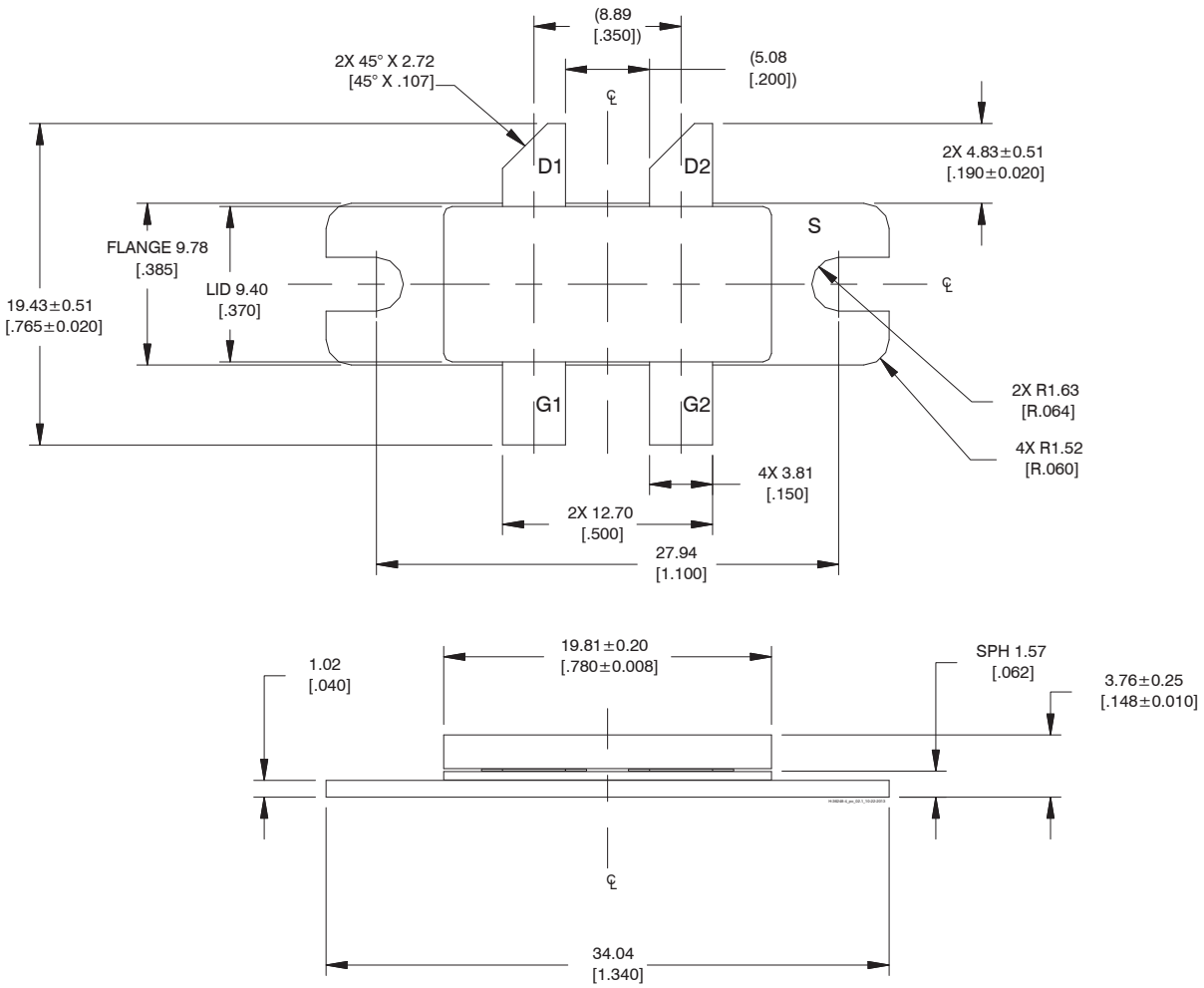


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances ± 0.127 [.005] unless specified otherwise.
4. Pins: D1, D2 – drains; G1, G2 – gates; S – source.
5. Lead thickness: 0.10 + 0.076/–0.025 mm [0.004+0.003/–0.001 inch].
6. Gold plating thickness: 1.14 ± 0.38 micron [45 ± 15 microinch].

Package Outline Specifications (cont.)

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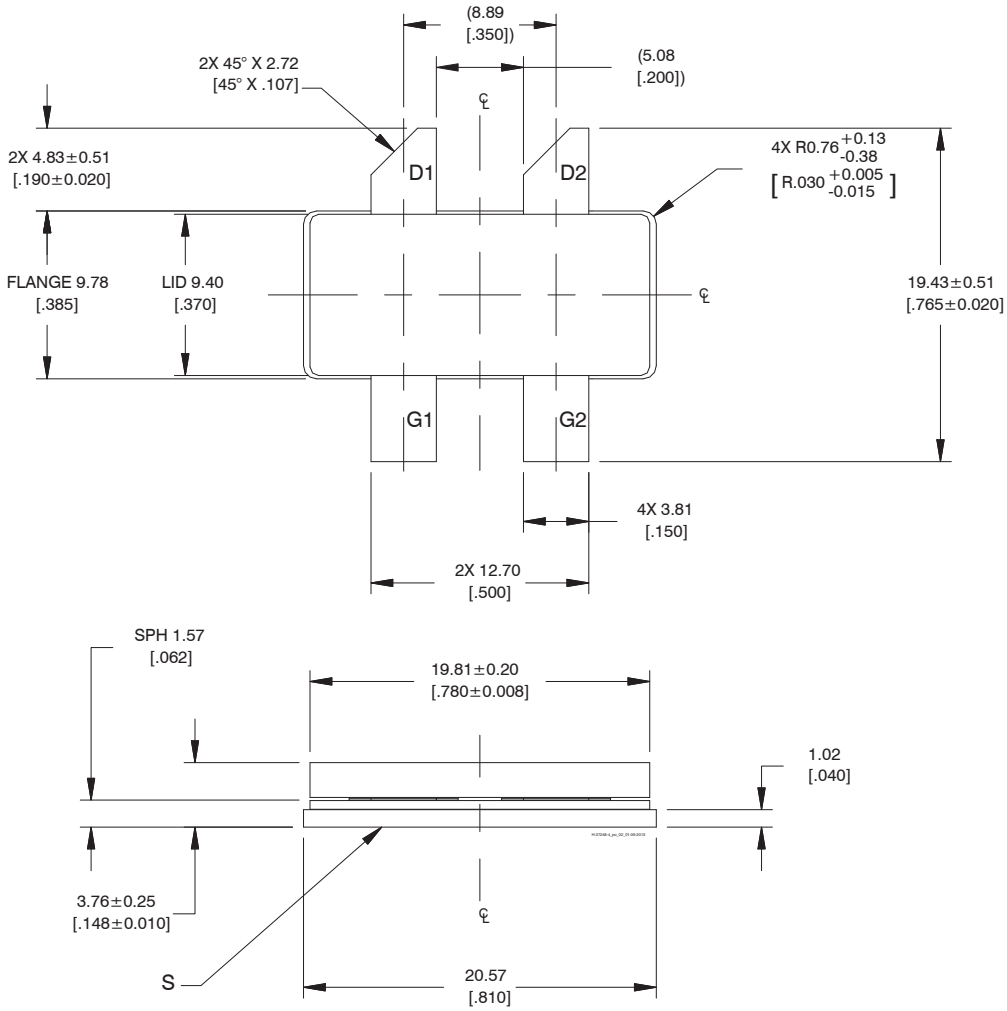

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http://www.infineon.com/rfpower

Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2012-09-19	Preliminary	All	Data Sheet reflects preliminary specification
02	2013-10-01	Preliminary	1 3 1, 2, 4, 5 6	Updated DVB-T characteristics, updated frequency range Updated DVB-T performance graphs Added H-36248-4 package information, pinout diagram and package outline Updated package outline specification
02.1	2013-10-20	Preliminary	1, 2	Removed obsolete Pulsed Characteristics from Features, Removed Obsolete Pulsed CW table
03	2014-05-26	Production	All 1, 2 3, 4	Data Sheet reflects released product specification Updated Features, DVB-T Charateristics table, thermal resistance Updated all grahps, added loadpull information
03.1	2016-04-19	Production	1, 2	Added ESD rating, updated ordering information

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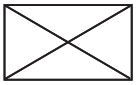

Edition 2016-04-19

Published by
Infineon Technologies AG
85579 Neubiberg, Germany

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