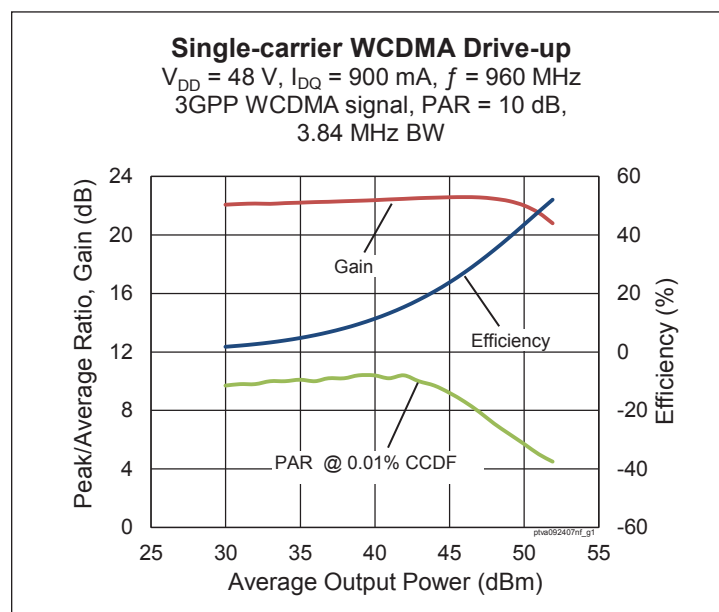


Thermally-Enhanced High Power RF LDMOS FET 240 W, 48 V, 869 – 960 MHz

Description

The PTVA092407NF is a 240-watt LDMOS FET manufactured with Infineon's 48-V LDMOS process. It is designed for use in multi-standard cellular power amplifier applications. It features a single ended design and input matching that allow for use from 869 MHz to 960 MHz. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PTVA092407NF
Package PG-HBSOF-4-1



Features

- Broadband internal input matching
- Typical CW performance, 925 MHz, 48 V
 - Output power at $P_{1dB} = 223\text{ W}$
 - Gain = 20.7 dB
 - Efficiency = 52%
- Capable of handling 10:1 VSWR @ 48 V, 80 W CW output power
- Integrated ESD protection
- Human Body Model class 2 (per ANSI/ESDA/ JEDEC JS-001)
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

Single-carrier WCDMA Specifications (tested in Infineon production test fixture)

$V_{DD} = 48\text{ V}$, $I_{DQ} = 900\text{ mA}$, $P_{OUT} = 80\text{ W avg}$, $f = 960\text{ MHz}$, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	20.5	22	—	dB
Drain Efficiency	η_D	36	39	—	%
Adjacent Channel Power Ratio	ACPR	—	-29.9	-28	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	105	—	—	V
Drain Leakage Current	$V_{DS} = 50\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1	μA
	$V_{DS} = 105\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10	μA
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.16	—	Ω
Operating Gate Voltage	$V_{DS} = 48\text{ V}$, $I_{DQ} = 0.9\text{ A}$	V_{GS}	3	3.75	4	V

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	105	V
Gate-Source Voltage	V_{GS}	−6 to +12	V
Operating Voltage	V_{DD}	0 to +55	V
Junction Temperature	T_J	225	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	−65 to +150	$^{\circ}\text{C}$

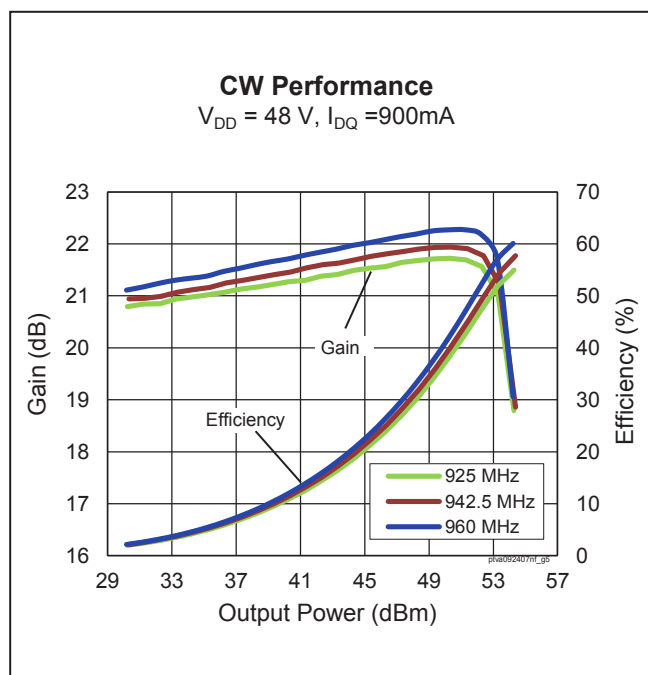
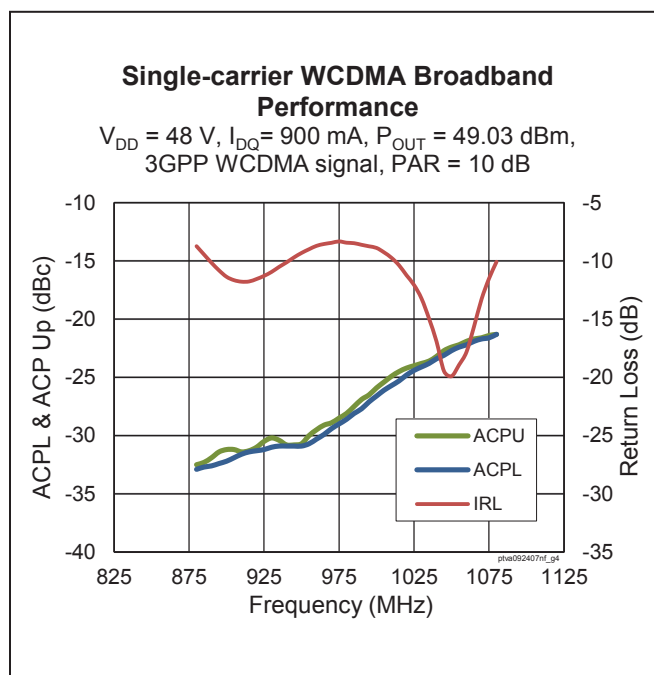
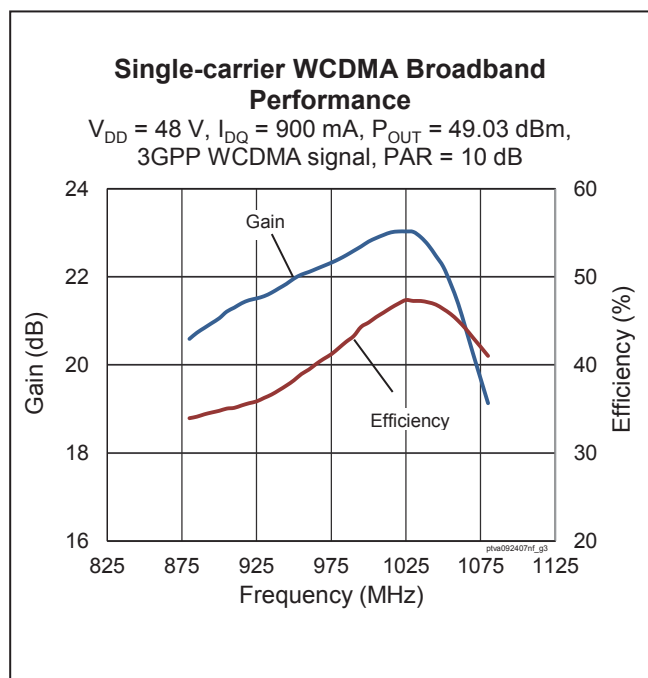
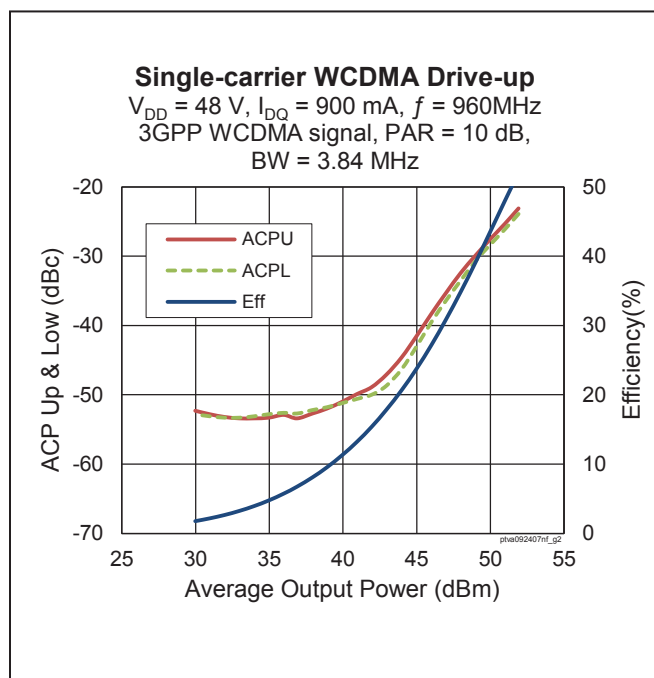
Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$, 240 W CW)	$R_{\theta JC}$	0.31	$^{\circ}\text{C/W}$

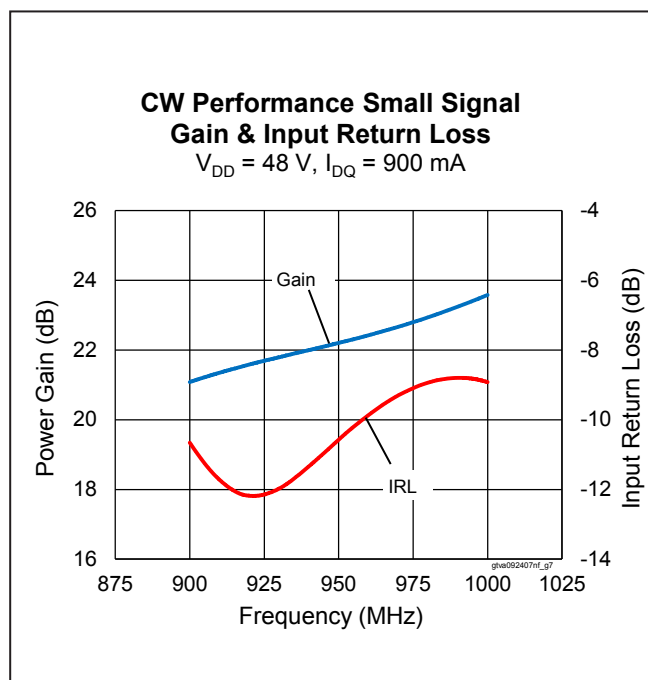
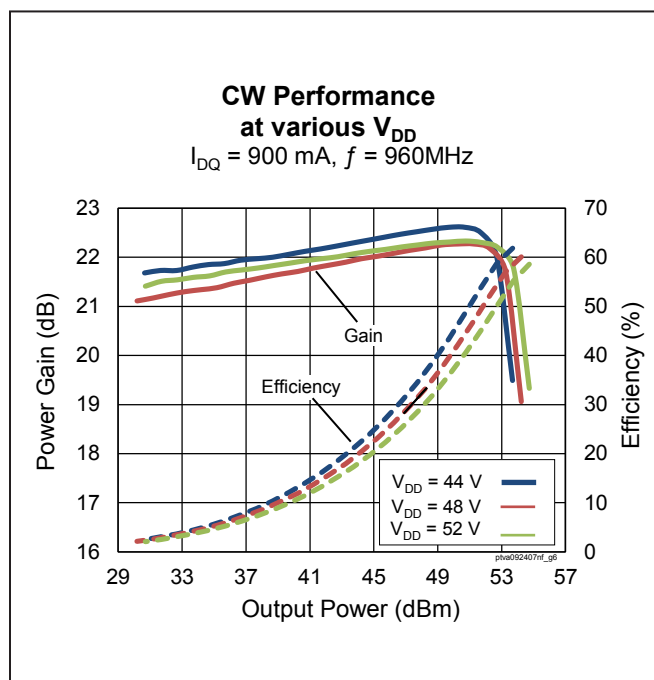
Ordering Information

Type and Version	Order Code	Package Description	Shipping
PTVA092407NF V1 R5	PTVA092407NFV1R5XUMA1	PG-HBSOF-4-1, plastic package	Tape & Reel, 500 pcs

Typical RF Performance (data taken in production test fixture)



Typical RF Performance (cont.)



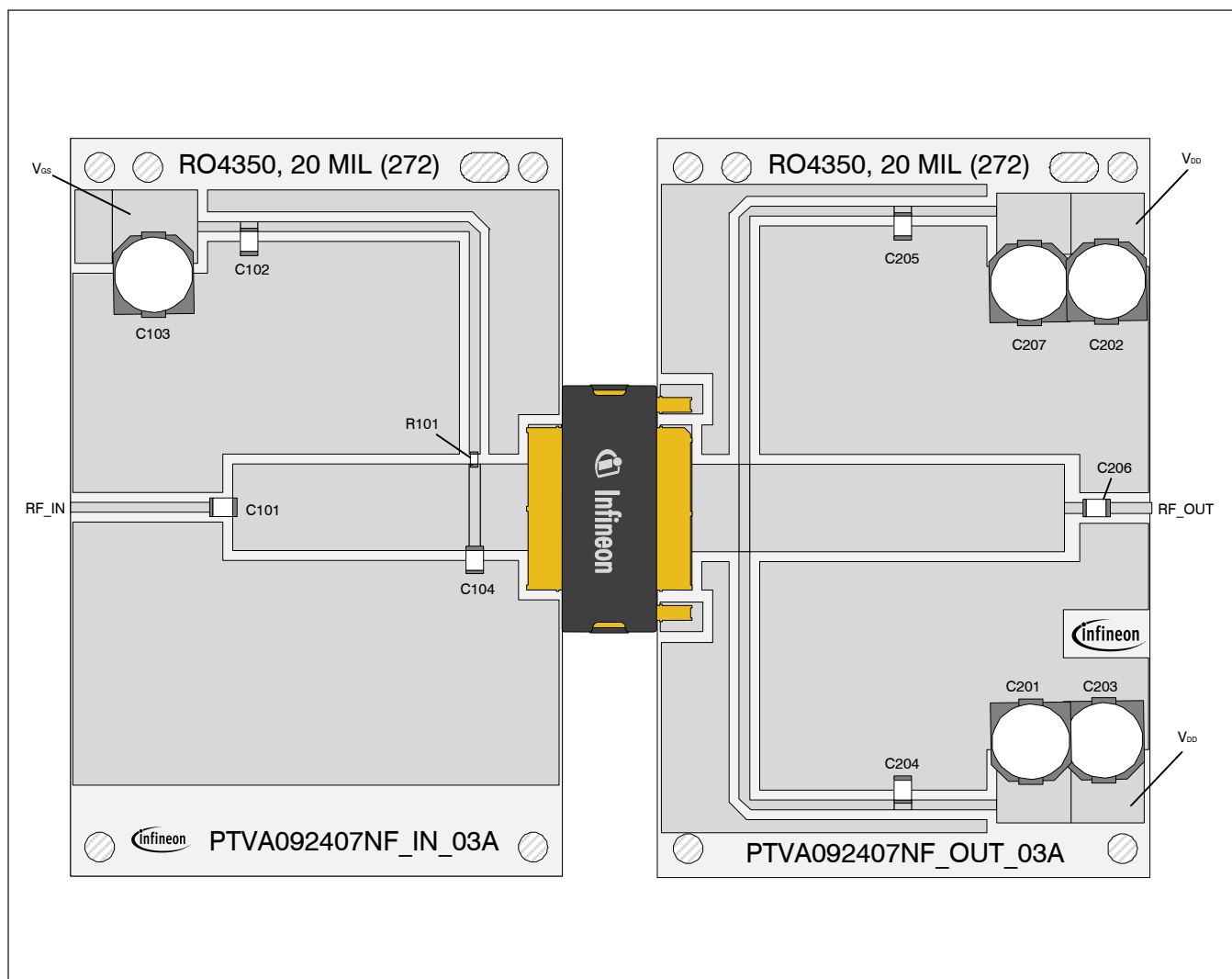
Load Pull Performance

Load Pull Performance – Pulsed CW signal: 10 μs , 10% duty cycle, 48 V, $I_{DQ} = 463 \text{ mA}$

		P_{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{1dB} [dBm]	P_{1dB} [W]	PAE [%]	Zl [Ω]	Gain [dB]	P_{1dB} [dBm]	P_{1dB} [W]	PAE [%]
869	0.69-j3.1	1.63-j0.39	20.79	55.52	356	58.3	2.81+j1.51	22.9	53.26	212	70.2
925	1.24-j3.41	1.61-j0.48	21.3	55.30	339	59.3	2.16+j1.05	23.08	53.64	231	69.3
960	2.26-j3.49	1.34-j0.57	21.17	55.28	337	56.8	1.68+j1.11	23.34	53.23	210	69.8

		P_{3dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs [Ω]	Zl [Ω]	Gain [dB]	P_{3dB} [dBm]	P_{3dB} [W]	PAE [%]	Zl [Ω]	Gain [dB]	P_{3dB} [dBm]	P_{3dB} [W]	PAE [%]
869	0.69-j3.1	1.6-j0.91	18.56	56.25	421.8	57.9	2.7+j1.32	20.79	54.03	253	70.9
925	1.24-j3.41	1.65-j0.62	19.22	56.11	407.9	61.8	2.05+j0.08	20.38	55.63	365.4	71.0
960	2.26-j3.49	1.41-j0.66	19.24	56.06	403.6	60.2	1.62+j0.96	21.23	53.95	248.4	73.0

Reference Circuit, 869 – 960 MHz



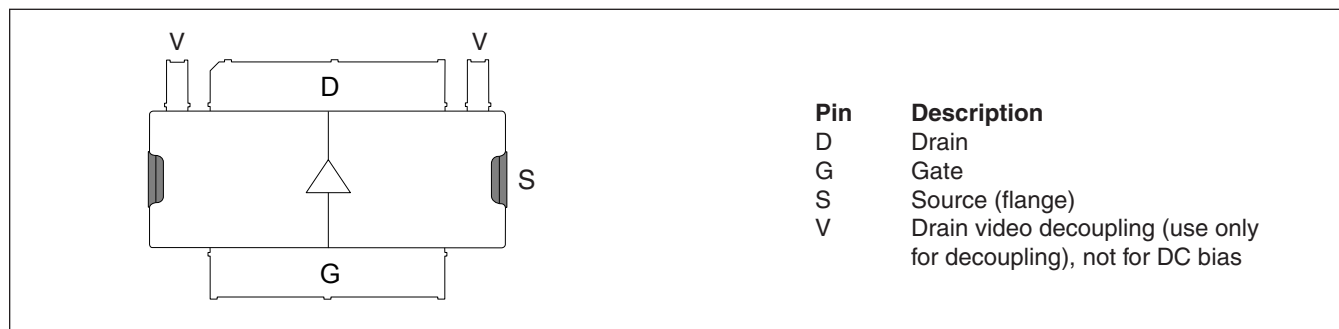
Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)
Reference Circuit Assembly

DUT	PTVA092407NF V1
Test Fixture Part No.	LTN/PTVA092407NF V1
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$, $f = 869 - 960$ MHz
Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower	

Components Information

Component	Description	Manufacturer	P/N
Input			
C101	Capacitor, 47 pF	ATC	ATC100B470KW500XT
C102	Capacitor, 75 pF	ATC	ATC100B750JW500XT
C103	Capacitor, 100 μ F	ATC	PCE4442TR-ND
C104	Capacitor, 3.6 pF	ATC	ATC100B3R6CW500XT
R101	Resistor, 10 ohms	Panasonic Electronic Components	ERJ-8GEYJ100V
Output			
C201, C202, C203, C207	Capacitor, 100 μ F	Panasonic Electronic Components	EEE-FP1V101AP
C204, C205	Capacitor, 75 pF	ATC	ATC100B750JW500XT
C206	Capacitor, 100 pF	ATC	ATC100A101JW150XT

Pinout Diagram (top view)


Package Outline Specifications

Package PG-HBSOF-4-1

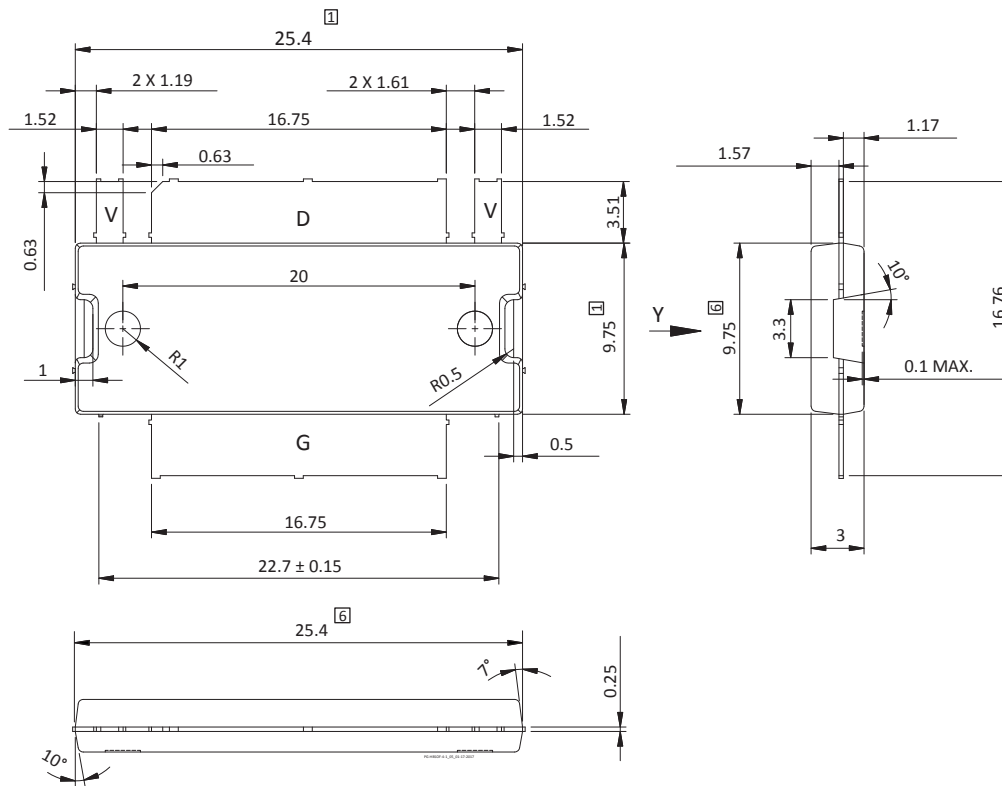


Diagram Notes—unless otherwise specified:

1. Mold/dam bar/metal protrusion of 0.30 mm max per side not included.
2. Metal protrusions are connected to source and shall not exceed 0.10 mm max.
3. Fillets and radii: all radii are 0.3 mm max.
4. Interpret dimensions and tolerances per ISO 8015.
5. Dimensions are mm.
6. Does not include mold/dam bar and metal protrusion.
7. Exposed metal surface is tin-plated, may not be covered by mold compound.
8. All tolerances ± 0.1 mm unless specified otherwise.
9. All metal surfaces are tin-plated, except area of cut.
10. Lead thickness: 0.25 mm.
11. Gold plating thickness: 0.25 micron max.
12. Pins: D = drain; G = gate; S = source; V = Drain video decoupling (use only for decoupling), not for DC bias.

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

Package Outline Specifications

Package PG-HBSOF-4-1

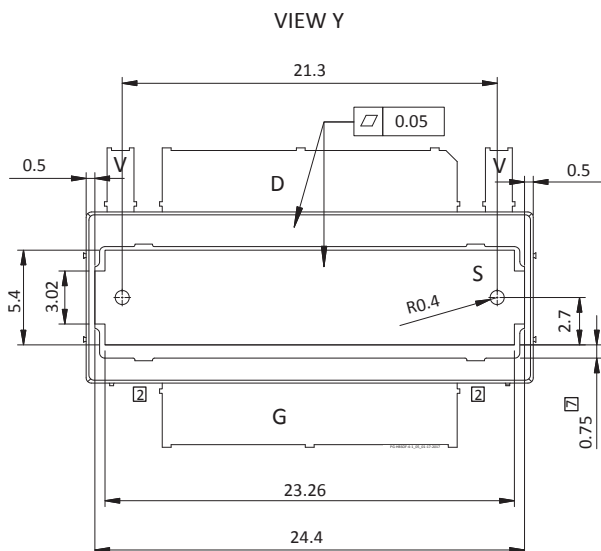


Diagram Notes—unless otherwise specified:

1. Mold/dam bar/metal protrusion of 0.30 mm max per side not included.
2. Metal protrusions are connected to source and shall not exceed 0.10 mm max.
3. Fillets and radii: all radii are 0.3 mm max.
4. Interpret dimensions and tolerances per ISO 8015.
5. Dimensions are mm.
6. Does not include mold/dam bar and metal protrusion.
7. Exposed metal surface is tin-plated, may not be covered by mold compound.
8. All tolerances ± 0.1 mm unless specified otherwise.
9. All metal surfaces are tin-plated, except area of cut.
10. Lead thickness: 0.25 mm.
11. Gold plating thickness: 0.25 micron max.
12. Pins: D = drain; G = gate; S = source; V = Drain video decoupling (use only for decoupling), not for DC bias.

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

Revision History

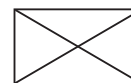
Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2016-03-17	Advance	All	Data Sheet reflects advance specification for product development
02	2016-09-12	Production	All	Data Sheet reflects released product specification
02.1	2016-11-23	Production	2	Revised conditions in DC Characteristics table
02.2	2016-12-01	Production	1	Updated Features list
02.3	2016-12-07	Production	1	Revised typo in Features
02.4	2017-02-07	Production	2	Updated operating voltage and junction temperature

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 2017-02-07

Published by
Infineon Technologies AG
85579 Neubiberg, Germany

© 2016 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.