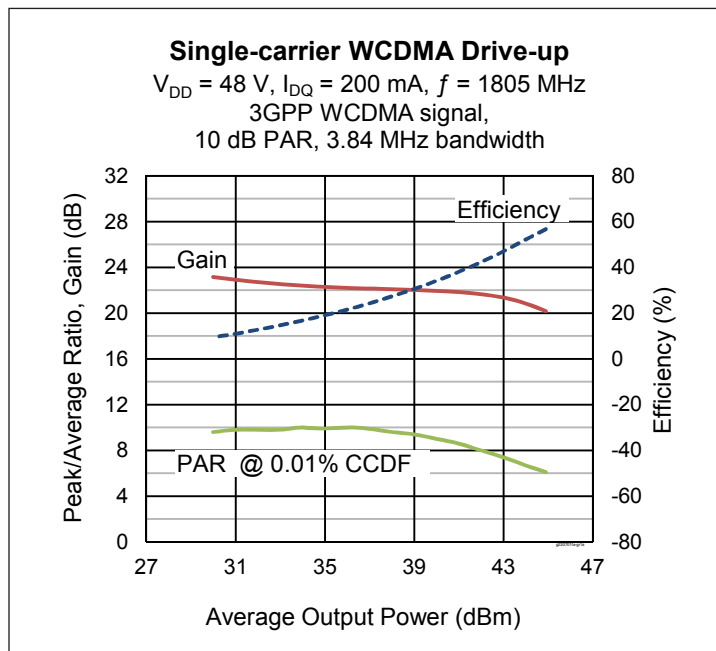


Thermally-Enhanced High Power RF GaN HEMT 70 W, 50 V, 1805 – 2170 MHz

Description

The GTVA220701FA is a 70-watt (P_{3dB}) GaN high electron mobility transistor (HEMT) for use in multi-standard cellular power amplifier applications. It features input matching, high efficiency, and a thermally-enhanced package with earless flange.

GTVA220701FA
Package H-37265J-2



Features

- GaN HEMT technology
- Input matched
- Typical CW performance, 1880 MHz, 48 V
 - Output power at $P_{3dB} = 45\text{ W}$
 - Efficiency = 60.7%
 - Gain = 21.6 dB
- Human Body Model, Class 1A (per ANSI/ESDA/ JEDEC JS-001)
- Capable of handling 10:1 VSWR @ 48 V, 40 W (CW) output power
- RoHS-compliant

RF Characteristics

Single-carrier LTE Specifications (tested in Infineon test fixture)

$V_{DD} = 48\text{ V}$, $I_{DQ} = 200\text{ mA}$, $P_{OUT} = 6.3\text{ W avg}$, $f = 2170\text{ MHz}$, 3GPP signal, 3.84 channel bandwidth, peak/average = 10.6 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	20.75	22	—	dB
Drain Efficiency	η_D	24.5	27	—	%
Adjacent Channel Power Ratio	ACPR	—	-36.5	-33	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	$V_{GS} = -8\text{ V}$, $I_D = 7.2\text{ mA}$	$V_{(BR)DSS}$	150	—	—	V
Drain-source Leakage Current	$V_{GS} = 8\text{ V}$, $V_{DS} = 10\text{ V}$	I_{DSS}	—	—	5	mA
Gate Threshold Voltage	$V_{DS} = 10\text{ V}$, $I_D = 7.2\text{ mA}$	$V_{GS(th)}$	-3.8	-3.0	-2.3	V

Recommended Operating Conditions

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Drain Operating Voltage		V_{DD}	0	—	50	V
Gate Quiescent Voltage	$V_{DS} = 48\text{ V}$, $I_D = 0.2\text{ A}$	$V_{GS(Q)}$	—	-2.8	—	V

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DSS}	125	V
Gate-source Voltage	V_{GS}	-10 to +2	V
Gate Current	I_G	20	mA
Drain Current	I_D	13.5	A
Junction Temperature	T_J	225	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

Operation above the maximum values listed here may cause permanent damage. Maximum ratings are absolute ratings; exceeding only one of these values may cause irreversible damage to the component. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. For reliable continuous operation, the device should be operated within the operating voltage range (V_{DD}) specified above.

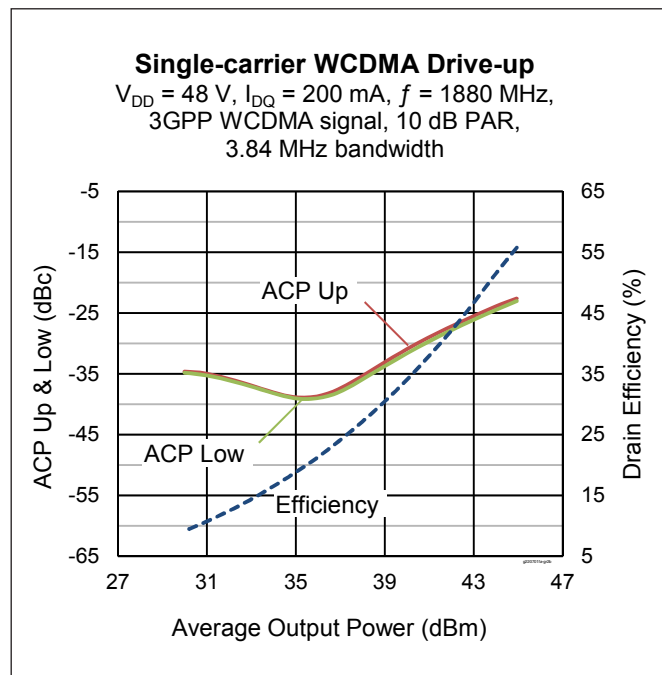
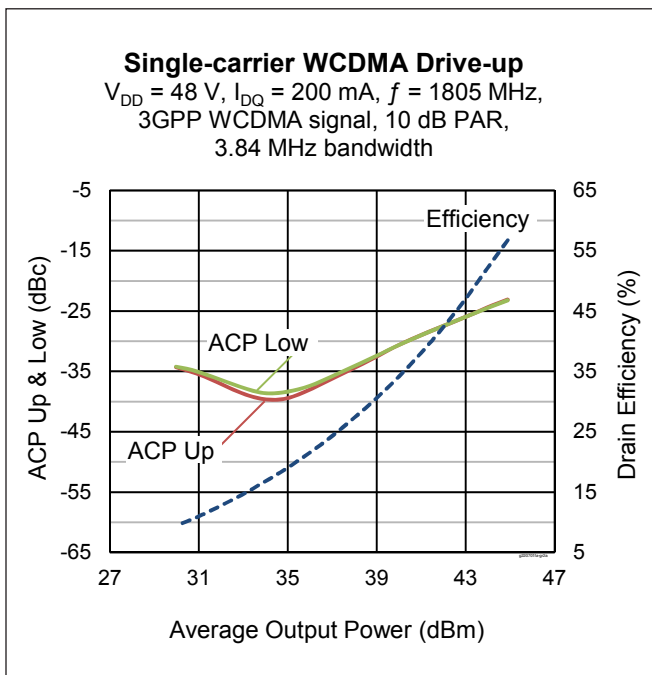
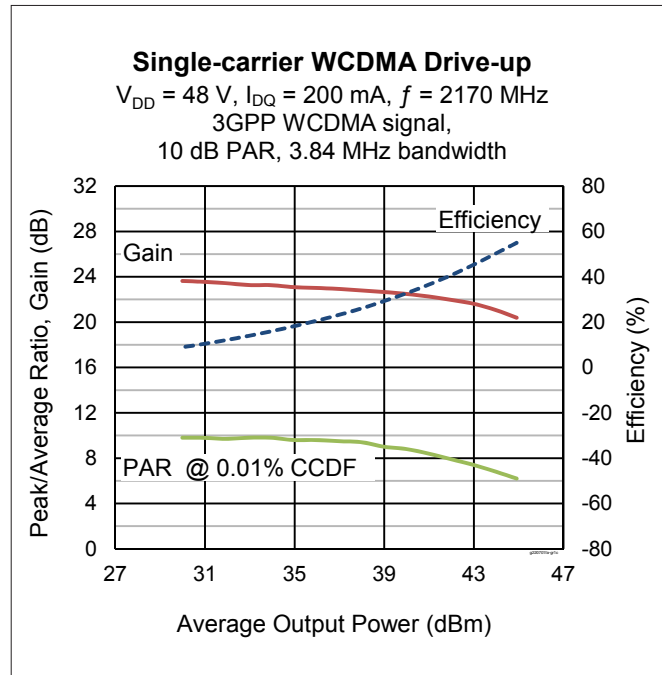
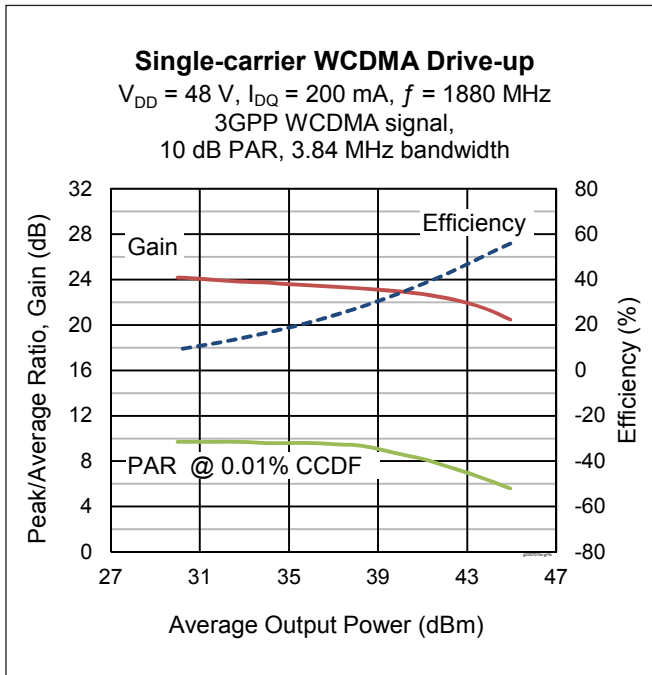
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance ($T_{CASE} = 70\text{ °C}$, 55 W (CW), $V_{DD} = 48\text{ V}$, 2170 MHz)	$R_{\theta JC}$	2.36	°C/W

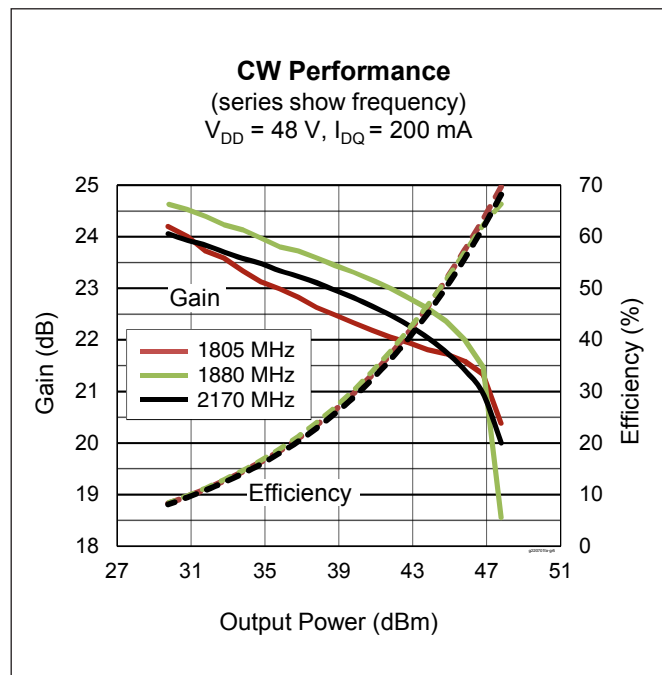
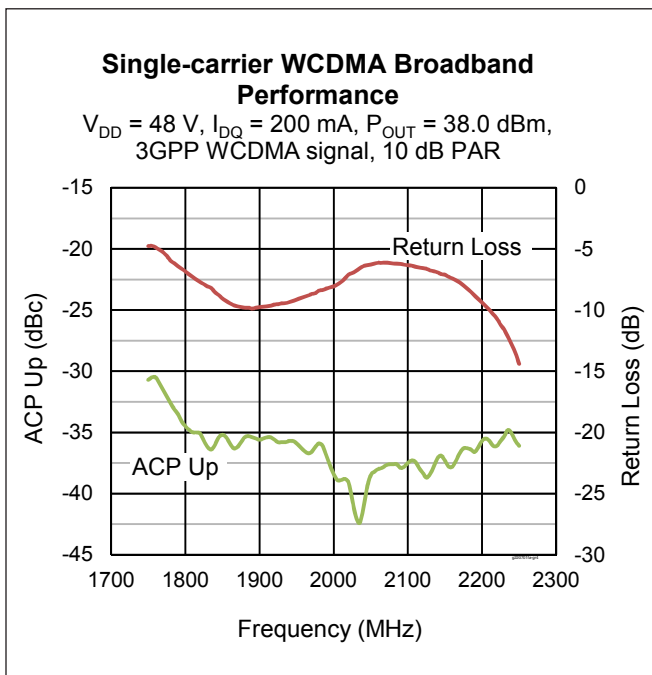
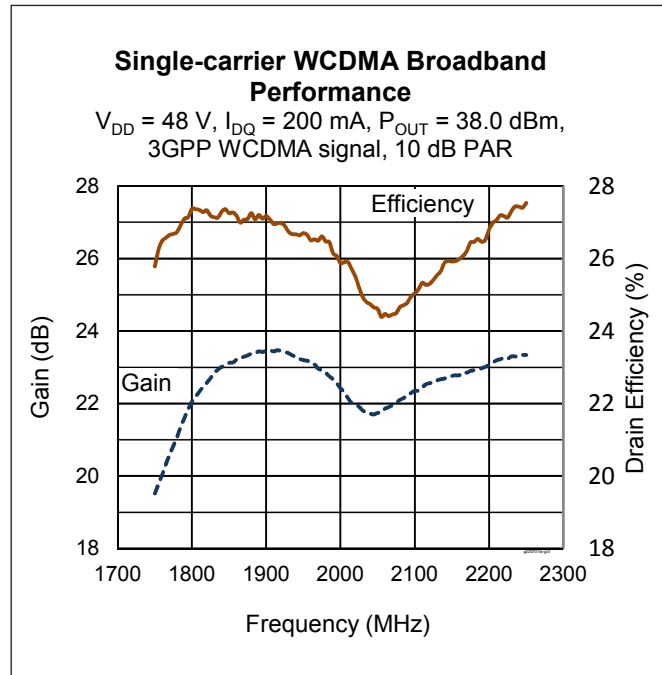
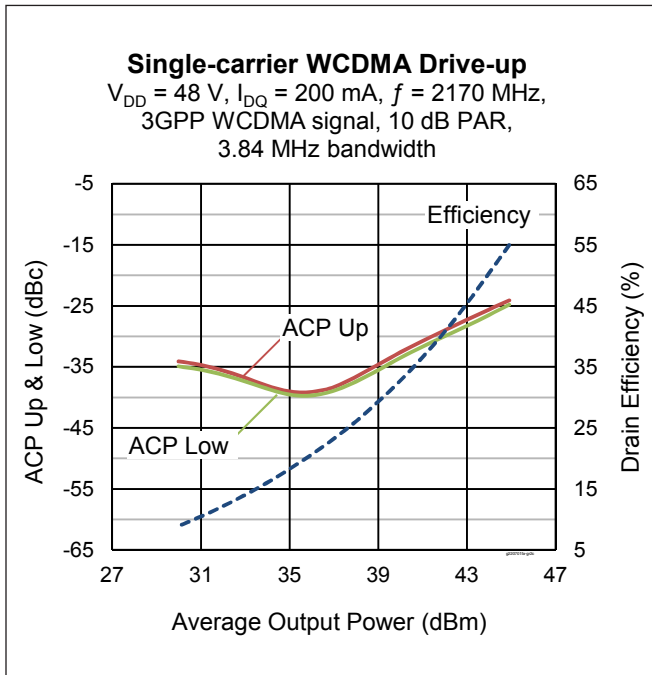
Ordering Information

Type and Version	Order Code	Package	Shipping
GTVA220701FA V1 R0	GTVA220701FAV1R0XTMA1	H-37265J-2, earless flange	Tape & Reel, 50 pcs
GTVA220701FA V1 R2	GTVA220701FAV1R2XTMA1	H-37265J-2, earless flange	Tape & Reel, 250 pcs

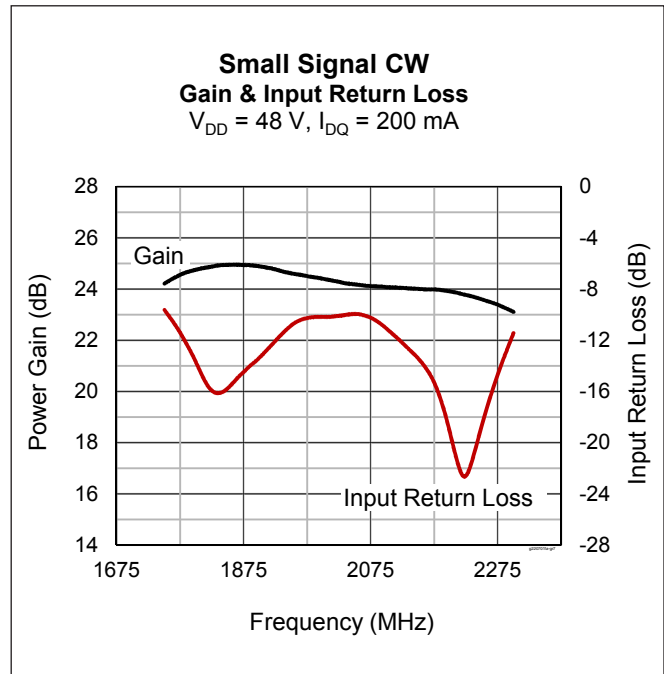
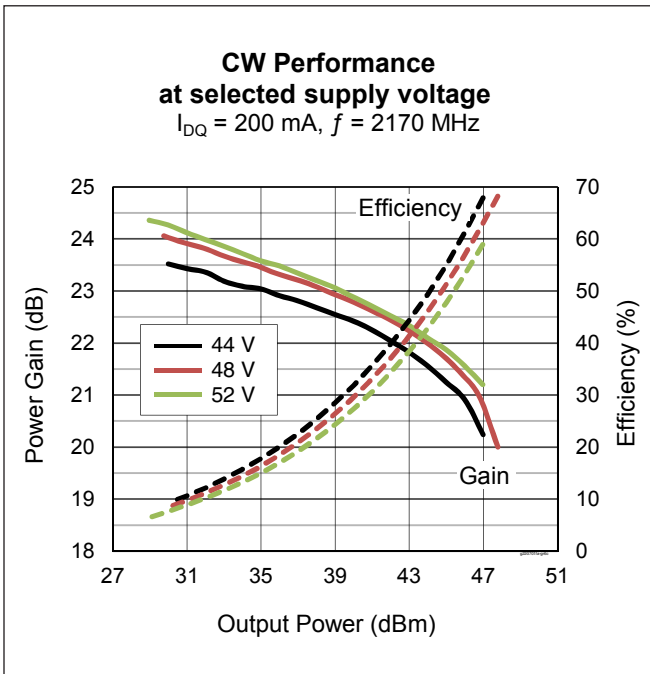
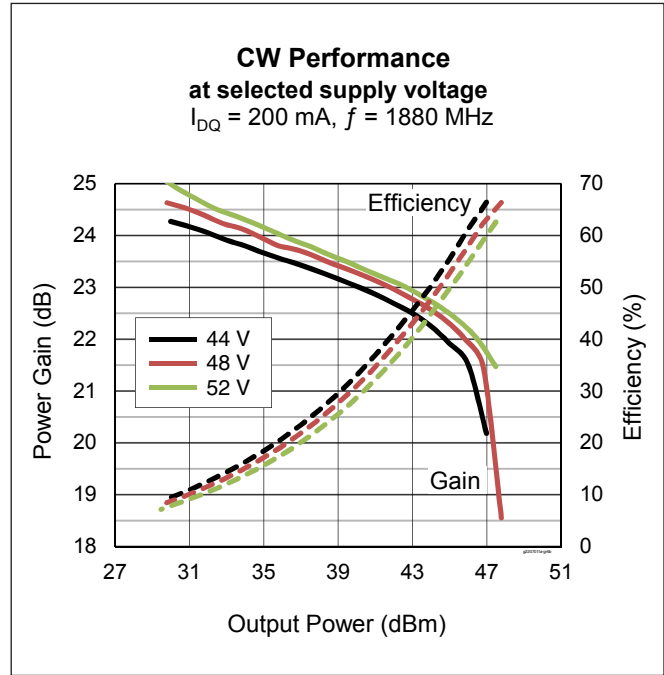
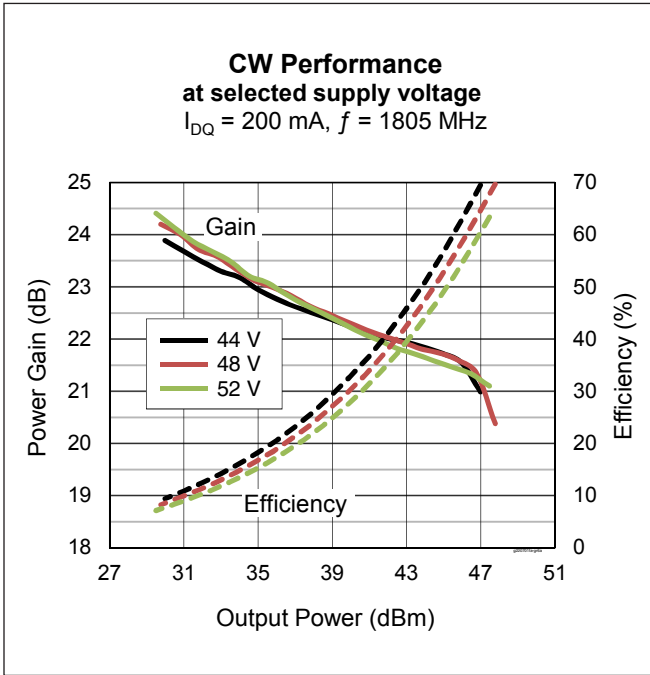
Typical Performance (data taken in an Infineon production test fixture)



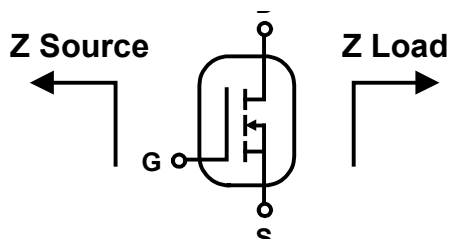
Typical Performance (cont.)



Typical Performance (cont.)



Broadband Circuit Impedance (combined leads)

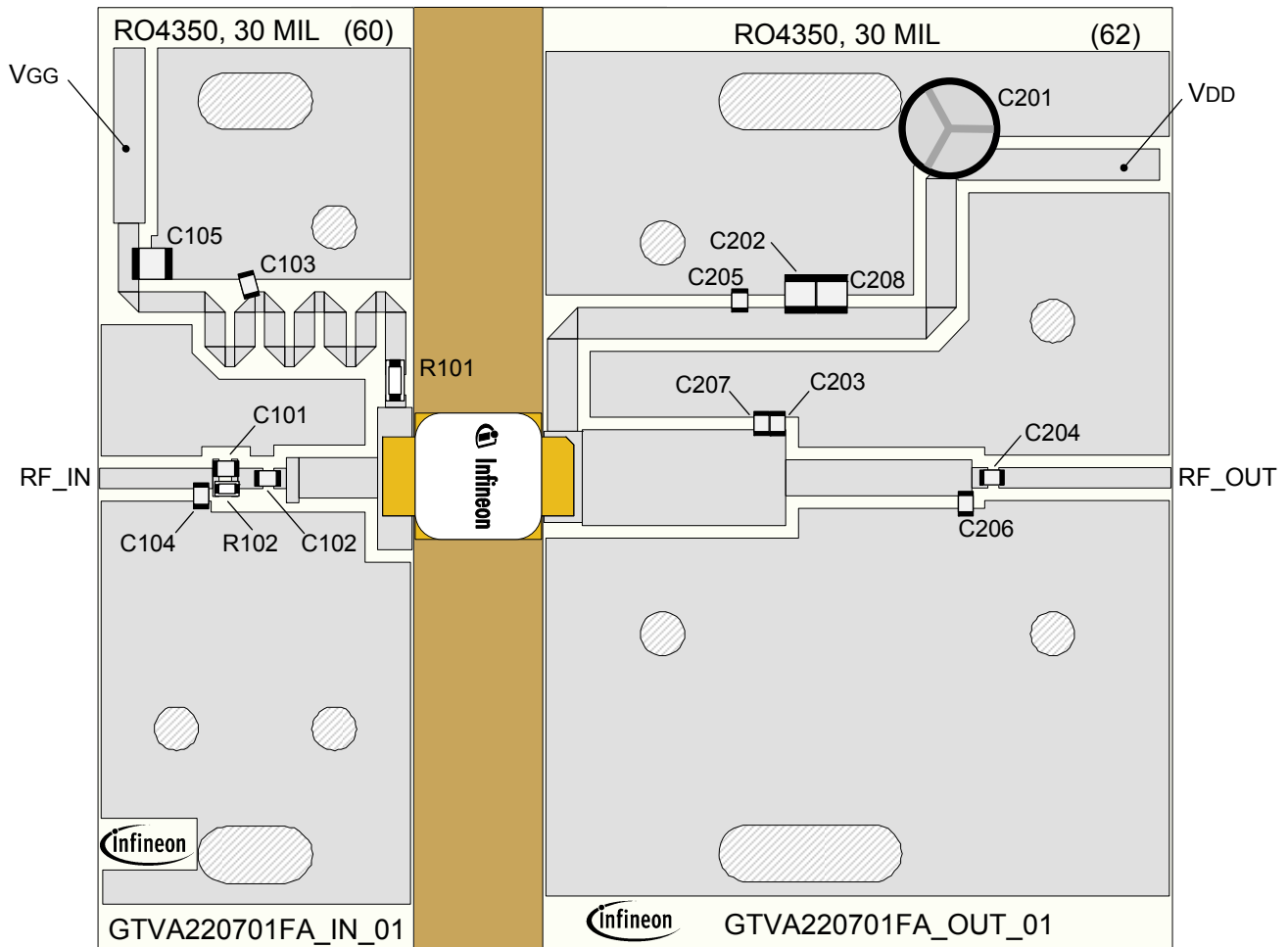


Freq [MHz]	Z Source Ω		Z Load Ω	
	R	jX	R	jX
1805	1.95	-5.67	12.02	5.87
1840	2.01	-6.27	11.94	3.94
1880	2.43	-7.17	11.33	3.15
2100	9.95	-9.38	10.39	0.02
2140	11.40	-8.40	10.31	-0.75
2170	11.61	-9.07	10.50	-2.23

Reference Circuit, tuned for 1805 MHz to 2170 MHz

DUT	GTVA220701FA V1
Test Fixture Part No.	LTN/GTVA220701FA V1
PCB	Rogers 4350, 0.762 mm [.030"] thick, 2 oz. copper, $\epsilon_r = 3.66$
Find Gerber files for this test fixture on the Infineon Web site at http://www.infineon.com/rfpower	

Reference Circuit (cont.)



Reference circuit assembly diagram (not to scale)

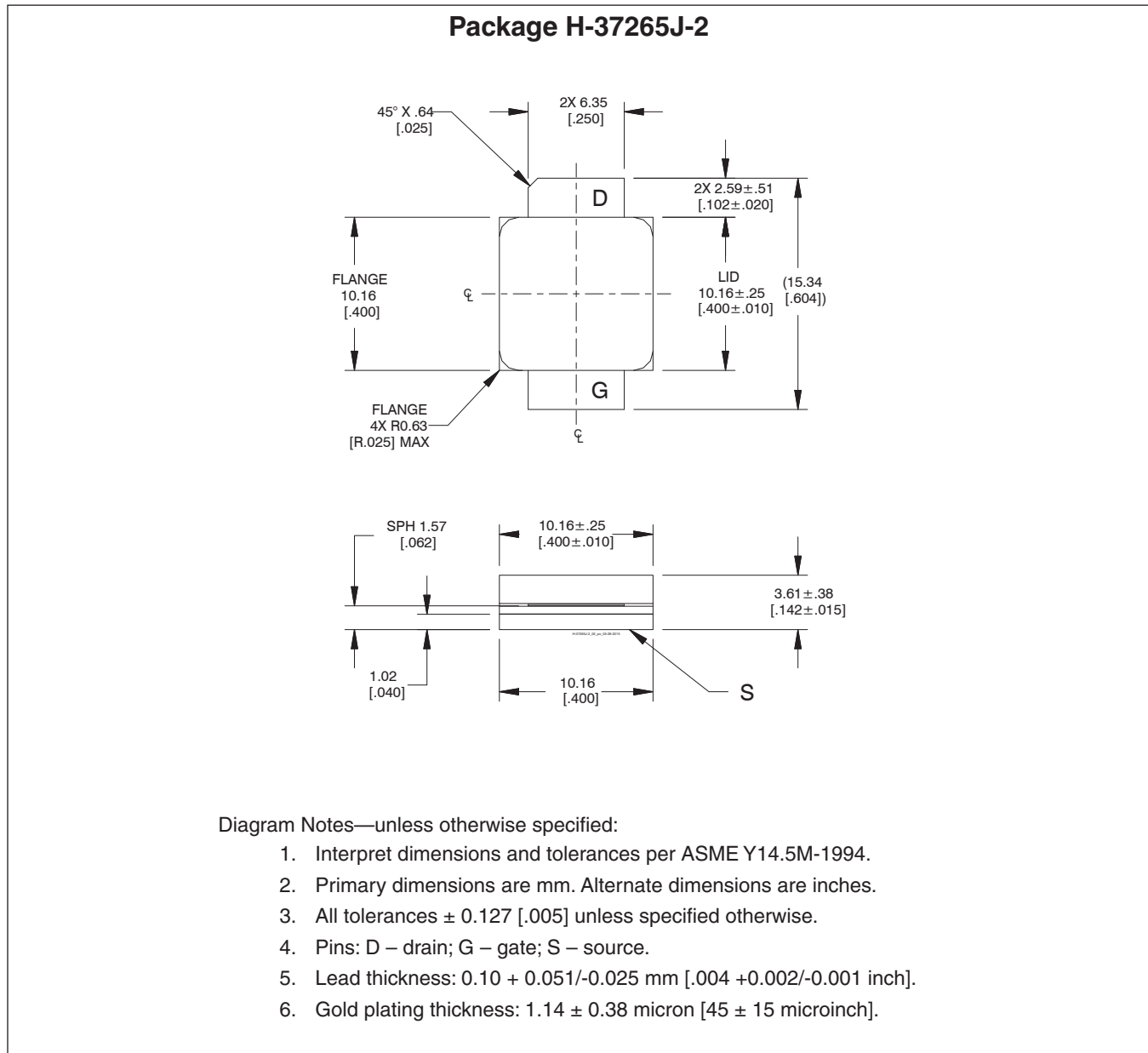
Reference Circuit (cont.)

Components Information

Component	Description	Manufacturer	P/N
In			
C101	Capacitor, 2.4 pF	ATC	ATC600F2R4JT250XT
C102, C103	Capacitor, 20 pF	ATC	ATC600F200JT250XT
C104	Capacitor, 1 pF	ATC	ATC600F1R0JT250XT
C105	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
R101	Resistor, 10 ohms	Panasonic Electronic Components	ERJ-8GEYJ100V
R102	Resistor, 330 ohms	Panasonic Electronic Components	ERJ-3GEYJ331V
Out			
C201	Capacitor, 47 μ F	Cornell Dubilier Electronics (CDE)	SEK470M100ST
C202, C208	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
C203	Capacitor, 1 pF	ATC	ATC600F1R0JT250XT
C204, C205	Capacitor, 20 pF	ATC	ATC600F200JT250XT
C206	Capacitor, 0.7 pF	ATC	ATC600F0R7JT250XT
C207	Capacitor, 0.3 pF	ATC	ATC600F0R3JT250XT

Package Outline Specifications, next page

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	Page	Subjects (major changes at each revision)
01	2015-08-18	Advance	all	Data Sheet reflects advance specification for product development
02	2016-04-01	Production	all	Product released to production. Add firm specifications, performance information, and reference circuit information,
03	2017-04-06	Production	1 2	Remove "Integrated ESD protection" from Features Restructure tables for clarity.

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 2017-04-06

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

**© 2015 – 2017 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.