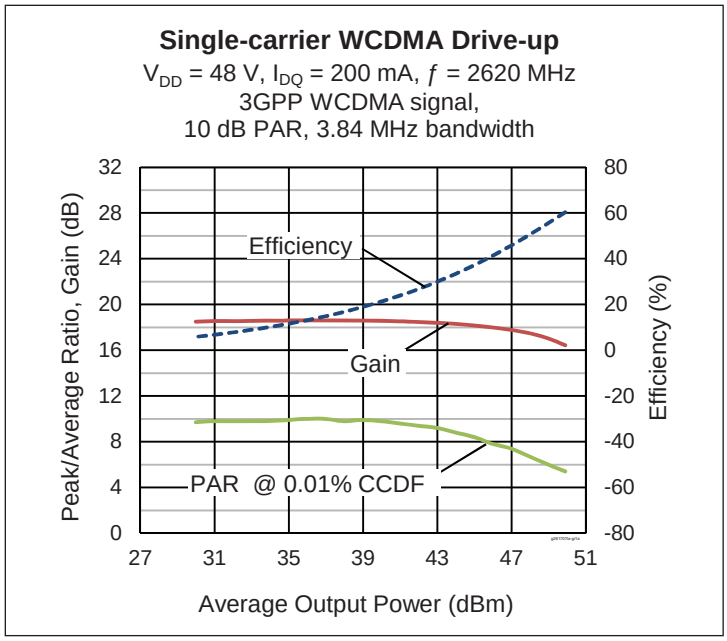
Thermally-Enhanced High Power RF GaN HEMT
170 W, 50 V, 2620 – 2690 MHz

Description

The GTVA261701FA is a 170-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.

GTVA261701FA
Package H-37265J-2



Features

- GaN HEMT technology
- Input Matched
- Typical CW performance, 2690 MHz, 48 V, single side
  - Output power at P_{3dB} = 170 W
  - Efficiency = 75%
  - Gain = 15 dB
- Integrated ESD protection
- ESD: Human Body Model, Class 1B (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 WCDMA Specifications (tested in Infineon test fixture)

V_{DD} = 48 V, I_{DQ} = 200 mA, P_{OUT} = 40 W avg, f = 2690 MHz. 3GPP WDMA signal, 3.84 MHz channel bandwidth, 10 dB peak/average @ 0.01% CCDF.

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	16	17	—	dB
Drain Efficiency	η_D	38	43	—	%
Adjacent Channel Power Ratio	ACPR	—	–29	–25	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	V_{GS} = –8 V, I_D = 21 mA	$V_{(BR)DSS}$	150	—	—	V
Gate Threshold Voltage	V_{DS} = 10 V, I_D = 21 mA	$V_{GS(th)}$	–3.8	–3.0	–2.3	V
Gate Quiescent Voltage	V_{DS} = 50 V, I_D = 1.0 A	$V_{GS(Q)}$	—	–2.8	—	V
Drain-source Leakage Current	V_{GS} = –8 V, V_{DS} = 50 V	I_{DSS}	—	—	5	mA

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DSS}	125	V
Gate-source Voltage	V_{GS}	–10 to +2	V
Operating Voltage	V_{DD}	0 to +50	V
Gate Current	IG	20	mA
Drain Current	Id	7.5	A
Junction Temperature	T_J	225	°C
Storage Temperature Range	T_{STG}	–65 to +150	°C
Thermal Resistance (T_{CASE} = 70°C, 48 V, 50 W CW, 2620 MHz)	$R_{\theta JC}$	1.07	°C/W

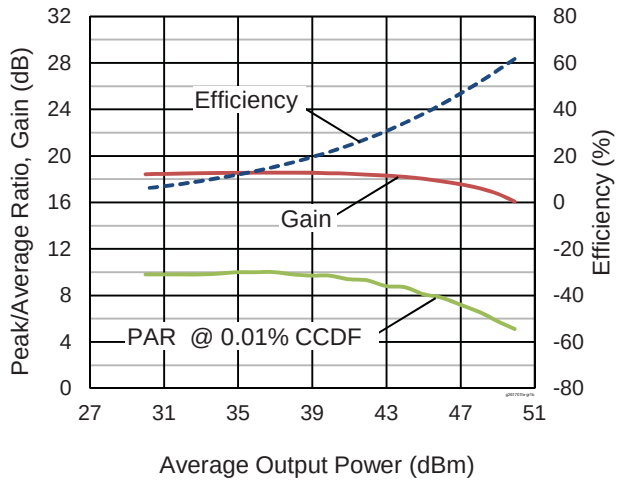
Ordering Information

Type and Version	Order Code	Package Description	Shipping
GTVA261701FA V1 RO	GTVA261701FAV1R0XTMA1	H-37265J-2, earless flange	Tape & Reel, 50 pcs
GTVA261701FA V1 R2	GTVA261701FAV1R2XTMA1	H-37265J-2, earless flange	Tape & Reel, 250 pcs

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

Single-carrier WCDMA Drive-up

V_{DD} = 48 V, I_{DQ} = 200 mA, f = 2655 MHz
3GPP WCDMA signal,
10 dB PAR, 3.84 MHz bandwidth



Single-carrier WCDMA Drive-up

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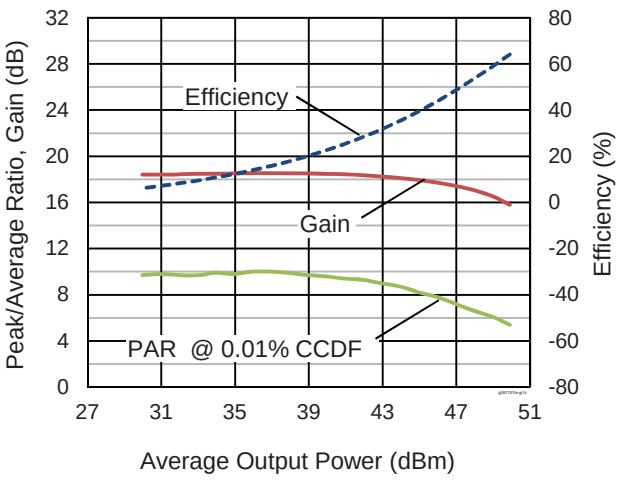

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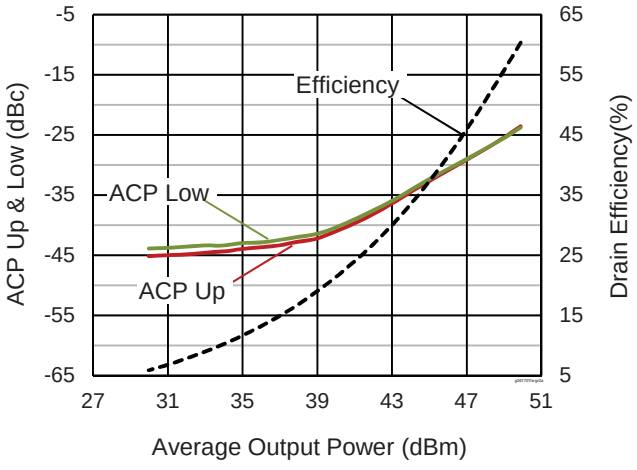

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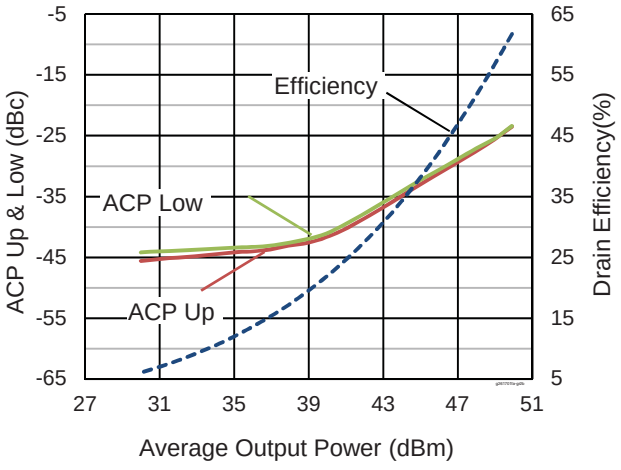
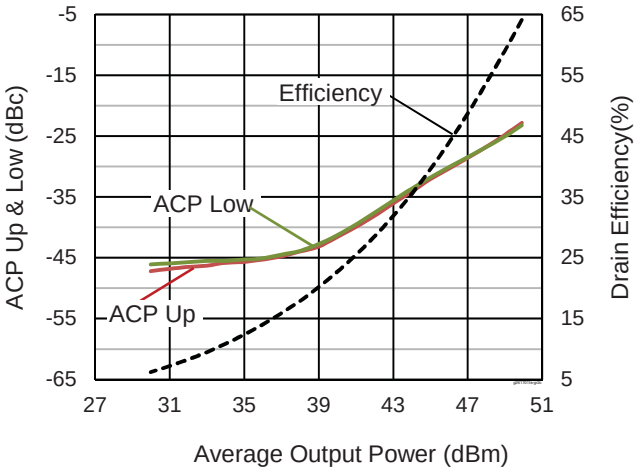


Typical Performance (cont.)

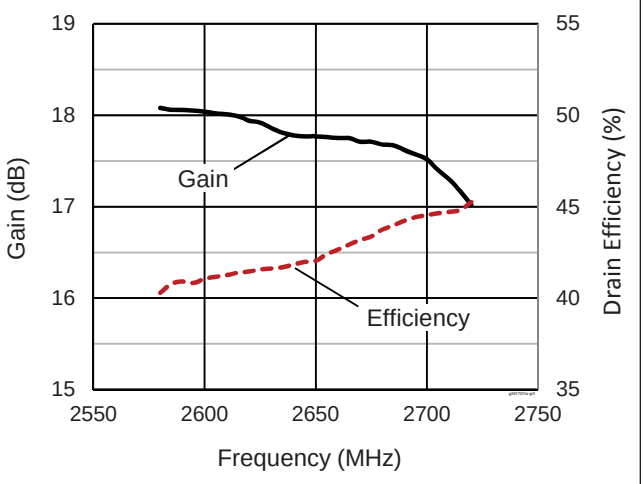
Single-carrier WCDMA Drive-up

V_{DD} = 48 V, I_{DQ} = 200 mA, f = 2690 MHz,
3GPP WCDMA signal,
10 dB PAR, 3.84 MHz bandwidth



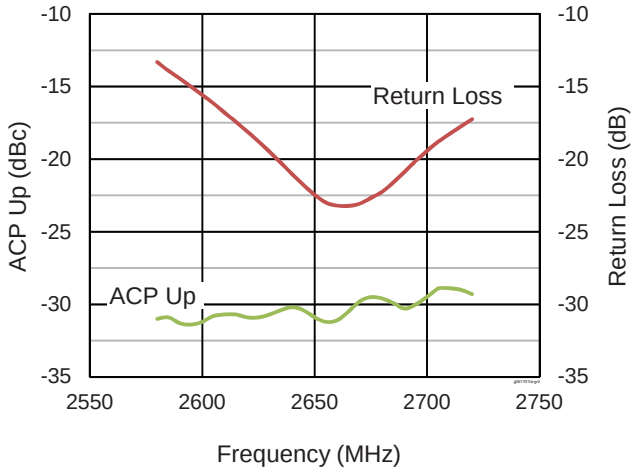
Single-carrier WCDMA
Broadband Performance

V_{DD} = 48 V, I_{DQ} = 200 mA, P_{OUT} = 46.0dBm,
3GPP WCDMA signal, 10.0 dB PAR



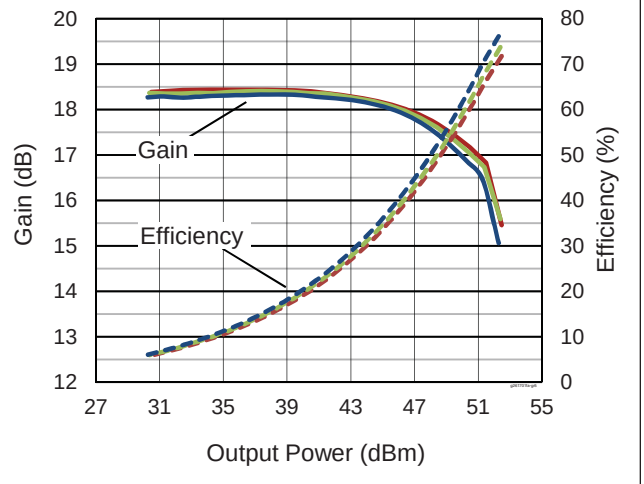
Single-carrier WCDMA
Broadband Performance

V_{DD} = 48 V, I_{DQ} = 200 mA, P_{OUT} = 46 dBm,
3GPP WCDMA signal, 10.0 dB PAR

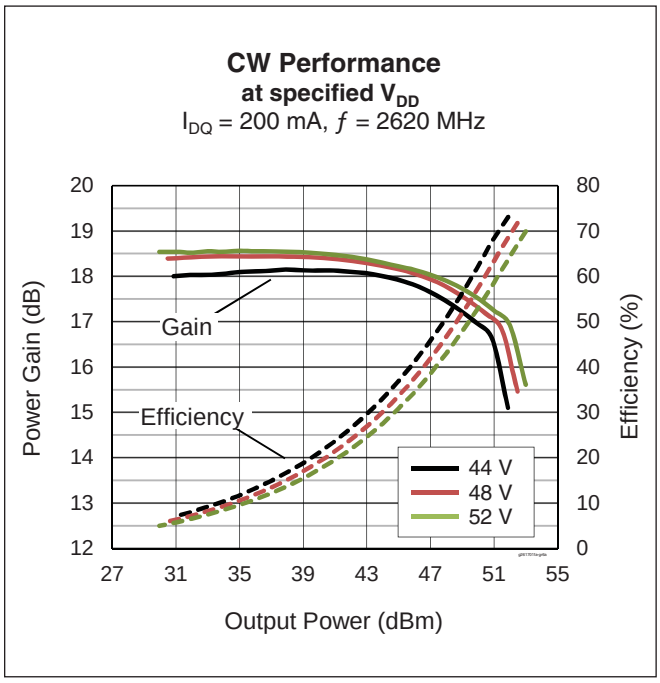


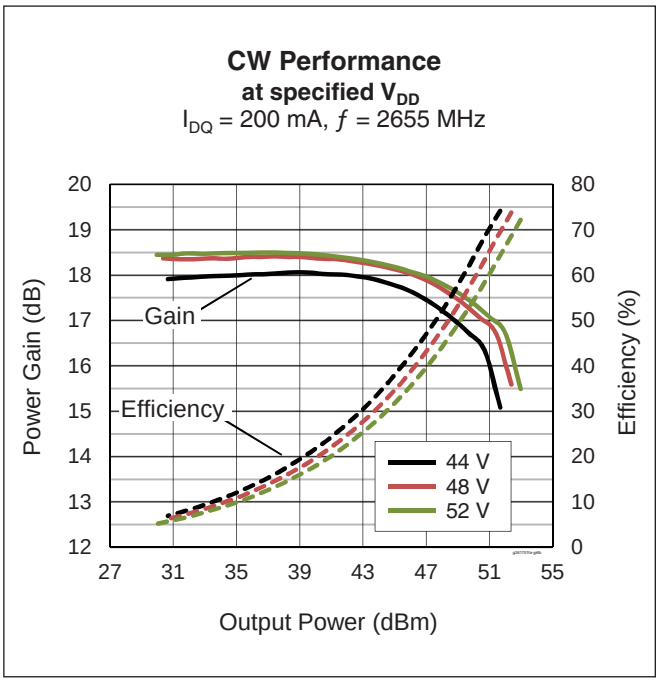
CW Performance

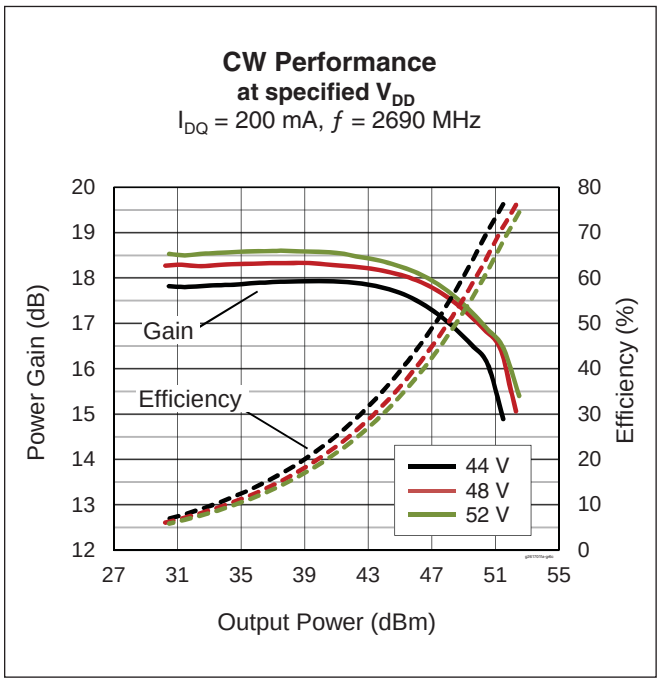
V_{DD} = 48 V, I_{DQ} = 200 mA

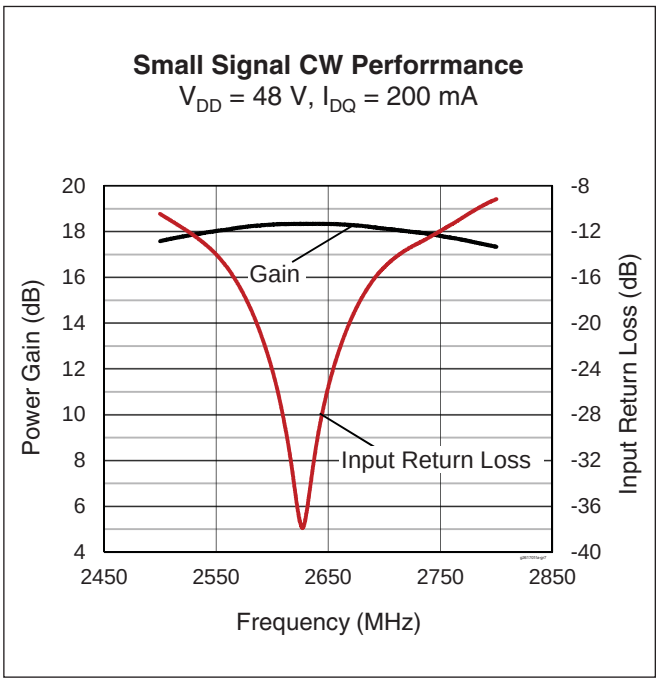


Typical Performance (cont.)

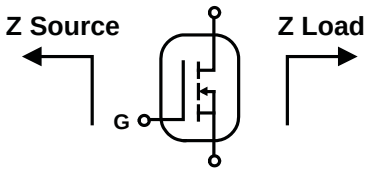








Load Pull Performance



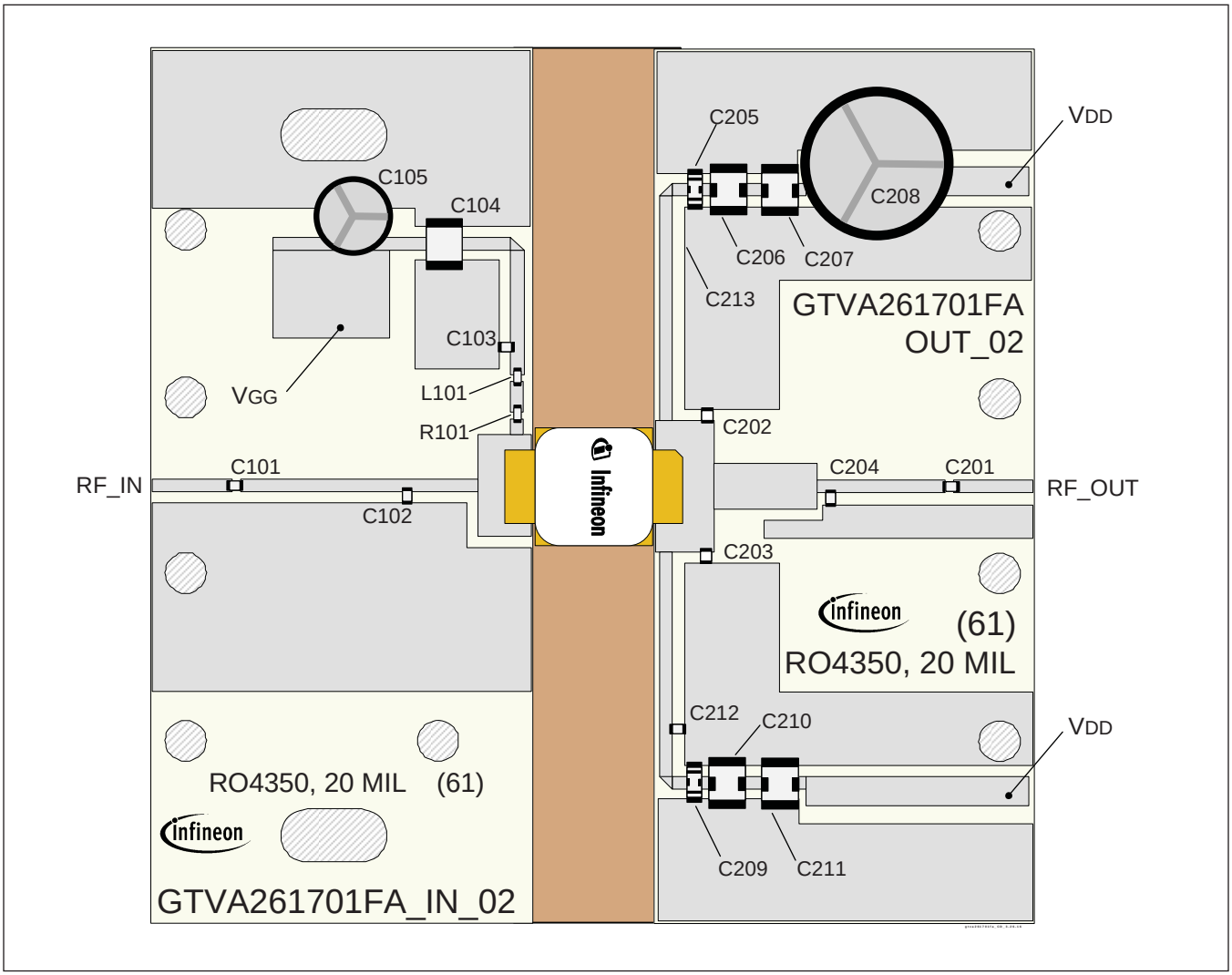
Single side, pulsed CW signal: 10 µsec, 10% duty cycle; 48 V, 200 mA

Class AB		P_{3dB}									
		Max Output Power					Max Efficiency				
Freq [MHz]	Z_{source} [Ω]	Z_{load} [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	Efficiency [%]	Z_{load} [Ω]	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	Efficiency [%]
2620	12.0 – j 5.7	2.9 – j2.0	15.0	53.81	240	64.8	2.1 – j0.0	16.7	51.62	145	76.9
2655	15.0 – j 8.0	2.6 – j2.3	14.8	53.68	233	65.3	2.2 – j0.2	16.3	51.76	150	75.9
2690	16.6 – j10.0	2.8 – j2.2	14.6	53.71	235	66.7	2.1 – j0.2	16.1	51.93	156	77.0

See next page for reference circuit infomation

Reference Circuit tuned for 2620 to 2690 MHz

DUT	GTVA261701FA V1
Test Fixture Part No.	LTN/GTVA261701FA
PCB	Rogers 4350, 0.508 mm [.020"] thick, 2 oz. copper, ε_r = 3.66
Find Gerber files for this test fixture on the Infineon Web site at **http://www.infineon.com/rfpower**	



Reference circuit assembly diagram (not to scale)

Reference Circuit (cont.)

Components Information

Component	Description	Manufacturer	P/N
In			
C101, C103	Capacitor, 10 pF	ATC	ATC800A100JT250T
C102	Capacitor, 1.3 pF	ATC	ATC800A1R3CT250T
C104	Capacitor, 0.047 µF	Johanson Dielectrics Inc.	101X43W474MV4E
C105	Capacitor, 100 µF	Panasonic Electronic Components	EEE-FT1V101AP
L101	Inductor, 100 nH	ATC	ATC0603WL101JT
R101	Resistor, 10 ohms	Panasonic Electronic Components	ERJ-8GEYJ100V
Out			
C201, C212, C213	Capacitor, 10 pF	ATC	ATC800A100JT250T
C202, C203	Capacitor, 1.9 pF	ATC	ATC800A1R9CT250T
C204	Capacitor, 1 pF	ATC	ATC800A1R0CT250T
C205, C209	Capacitor, 10 µF	Johanson Dielectrics Inc.	101X18W103MV4E
C206, C207, C210, C211	Capacitor, 0.047 µF	Johanson Dielectrics Inc.	101X43W474MV4E
C208	Capacitor, 220 µF	Panasonic Electronic Components	ECA-2AHG221

See next page for package mechanical specifications

Package Outline Specifications

Package H-37265J-2

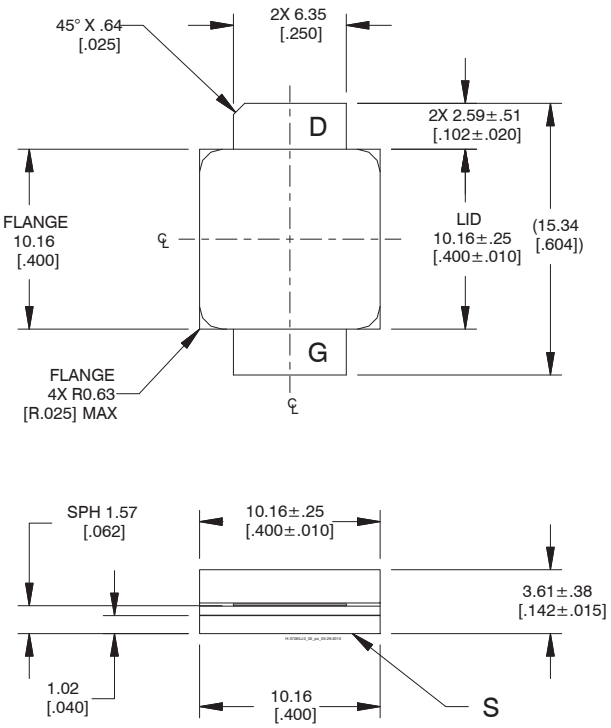


Diagram Notes—unless otherwise specified:

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: D – drain; G – gate; S – source.
5. Lead thickness: 0.10 + 0.051/-0.025 mm [.004 +0.002/-0.001 inch].
6. Gold plating thickness: 1.14 ± 0.38 micron [45 ± 15 microinch].

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	2015-05-29	Advance	All	Data Sheet reflects advance specification for product development
02	2015-06-29	Preliminary	All	Data Sheet reflects preliminary specification
03	2016-03-28	Production	3 to 8	Information for production-released product, including firm specifications, performance curves, load pull table, and reference circuit information.

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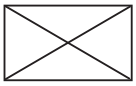

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