阅读申明

1.本站收集的数据手册和产品资料都来自互联网，版权归原作者所有。如读者和版权方有任何异议请及时告之，我们将妥善解决。
2.本站提供的中文数据手册是英文数据手册的中文翻译，其目的是协助用户阅读，该译文无法自动跟随原稿更新，同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
3.本站提供的产品资料，来自厂商的技术支持或者使用者的心得体会等，其内容可能存在描叙上的差异，建议读者做出适当判断。
4.如需与我们联系，请发邮件到marketing@iczoom.com，主题请标有“数据手册”字样。

Read Statement

1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.

2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader’ s learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.

3. All product information provided on the website refer to solutions from manufacturers’ technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.

4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with “Datasheets”.

MAGX-000245-014000

GaN on SiC HEMT Power Transistor
14 W, DC - 2.5 GHz, CW Power

Rev. V2

Features

- GaN on SiC Depletion Mode Transistor
- Common-Source Configuration
- Broadband Class AB Operation
- Thermally Enhanced Cu/W Package
- RoHS* Compliant
- +50V Typical Operation
- MTTF = 600 years (T_J < 200°C)

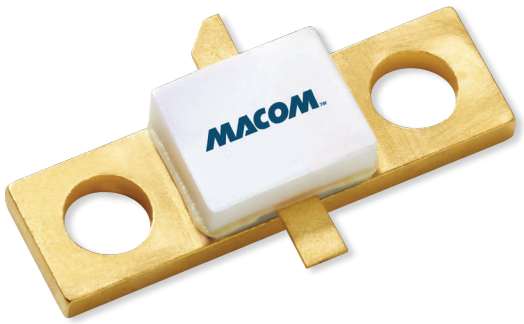
Primary Applications

- RF Lighting
- RF Plasma Generation
- RF Heating
- RF Drying
- Material Processing
- Power Industrial Equipment
- ISM
- Broadcast
- MILCOM
- Datalinks
- Air Traffic Control Radar - Commercial
- Weather Radar - Commercial
- Military Radar - Military

Description

The MAGX-000245-014000 is a gold metalized unmatched Gallium Nitride (GaN) on Silicon Carbide (SiC) RF power transistor suitable for CW applications centered at 2.45GHz for application in ISM/Broadcast/Plasma applications. This product differentiates itself from other GaN power transistors in that it runs well in CW. The matching network is compact and small. The frequency of operation covers DC - 2.5 GHz which captures commercial as well as military applications. This product is designed as a high power driver amplifier or final stage depending on the application. Using state of the art wafer fabrication processes, these high performance transistors provide high gain, efficiency, bandwidth and ruggedness over a wide bandwidth for today's demanding application needs. The MAGX-000245 -014000 is constructed using a thermally enhanced Cu/W flanged ceramic package which provides excellent thermal performance.

MAGX-000245-014000



Ordering Information

Part Number	Description
MAGX-000245-014000	Bulk Packaging
MAGX-S00245-014000	Sample Board (2.45 GHz)

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

GaN on SiC HEMT Power Transistor
14 W, DC - 2.5 GHz, CW Power

Rev. V2

Electrical Specifications[1]: Freq. = 2450 MHz, T_A = 25°C

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Units
RF Functional Tests: V_{DD} = +50 V, I_{DQ} = 15 mA, CW Operation						
Input Power	P_{OUT}= 14 W	P_{IN}	-	0.43	0.58	W
Power Gain	P_{OUT}= 14 W	G_P	13.8	15.2	-	dB
Drain Efficiency	P_{OUT}= 14 W	η_D	55	57	-	%
2nd Harmonics	P_{OUT}= 14 W	2Fc	-	-50	-	dBc
3rd Harmonics	P_{OUT}= 14 W	3Fc	-	-49	-	dBc
Load Mismatch Stability	P_{OUT}= 14 W	VSWR-S	-	5:1	-	-
Load Mismatch Tolerance	P_{OUT}= 14 W	VSWR-T	-	10:1	-	-

Electrical Characteristics: T_A = 25°C

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Units
DC Characteristics						
Drain-Source Leakage Current	V_{GS} = -8 V, V_{DS} = 175 V	I_{DS}	-	-	750	µA
Gate Threshold Voltage	V_{DS} = 5 V, I_D = 2 mA	$V_{GS\ (TH)}$	-5	-3	-2	V
Forward Transconductance	V_{DS} = 5 V, I_D = 500 mA	G_M	0.35	-	-	S
Dynamic Characteristics						
Input Capacitance	V_{DS} = 0 V, V_{GS} = -8 V, F = 1 MHz	C_{ISS}	-	4.4	-	pF
Output Capacitance	V_{DS} = 50 V, V_{GS} = -8 V, F = 1 MHz	C_{OSS}	-	1.9	-	pF
Reverse Transfer Capacitance	V_{DS} = 50 V, V_{GS} = -8 V, F = 1 MHz	C_{RSS}	-	0.2	-	pF

Correct Device Sequencing

Turning the device ON

1. Set V_{GS} to the pinch-off (V_P), typically -5 V.
2. Turn on V_{DS} to nominal voltage (+50V).
3. Increase V_{GS} until the I_{DS} current is reached.
4. Apply RF power to desired level.

Turning the device OFF

1. Turn the RF power off.
2. Decrease V_{GS} down to V_P.
3. Decrease V_{DS} down to 0 V.
4. Turn off V_{GS}.

1. Electrical Specifications measured in MACOM RF evaluation board.

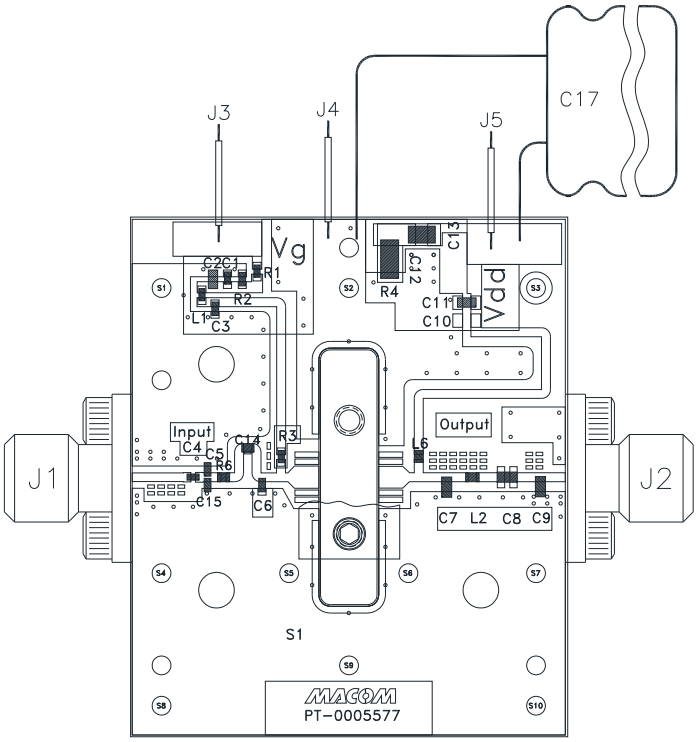
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Absolute Maximum Ratings[2,3,4]

Parameter	Limit
Supply Voltage (V_{DD})	+65 V
Supply Voltage (V_{GG})	-8 to 0 V
Supply Current (I_{DMAX}) for CW Operation at V_{DD} = +65 V	800 mA
Input Power (P_{IN}) for CW Operation at V_{DD} = +50 V	P_{IN} (nominal) + 3 dB
Absolute Max. Junction/Channel Temperature	200ºC
Power Dissipation at 85ºC for CW Operation at V_{DD} = +50 V	11.2 W
MTTF (T_J < 200°C)	600 years
Thermal Resistance, (T_J = 200ºC) V_{DD} = 50 V, I_{DQ} = 15 mA, CW Operation	8.5ºC/W
Operating Temperature	-40 to +95ºC
Storage Temperature	-65 to +150ºC
Mounting Temperature	See solder reflow profile
ESD Min. - Charged Device Model (CDM)	150 V
ESD Min. - Human Body Model (HBM)	500 V

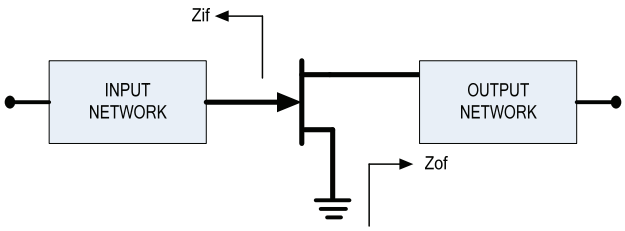
2. Operation of this device above any one of these parameters may cause permanent damage.
3. Channel temperature directly affects a device's MTTF. Channel temperature should be kept as low as possible to maximize lifetime.
4. For saturated performance it is recommended that the sum of ($3*V_{DD}$ + abs(V_{GG})) <175 V.

Test Fixture Assembly (2450 MHz, CW Operation)



Test Fixture Impedances

F (MHz)	Z_{IF} (Ω)	Z_{OF} (Ω)
2450	0.7 +j1.0	17.9 + j15.5



Parts List

Reference Designator	Part	Vendor
C1	0402, 0.1 µF, X7R, 10%, 16 V	Murata
C2	0402, 10 nF, X7R, 10%, 50 V	Murata
C13	0805, 0.1 µf, X7R, 10%, 100 V	TDK
C3, C4	0402, 12 pF, ±1%, 200 V	ATC
C8, C11	0603, 12 pF, ±2%, 250 V	ATC
C5, C15	0402, 2.2 pF, ±0.1 pF , 200 V	ATC
C6	0402, 3.9 pF, ±0.1 pF , 200 V	ATC
C7	0603, 2.4 pF, ±0.05 pF, 250 V	ATC
C17	100 µF, 160 V, Electrolytic Capacitor	Panasonic
C9	0603, 1.5 pF, ±0.05 pF, 250 V	ATC
C10, C12	Do Not Populate	-
L1	10 nH, 0402, 2%	Coilcraft
R1	200 Ω, 0402, 5%	Panasonic
R2	3 KΩ, 0402, 5%,	Panasonic
R3	11 Ω, 0402, 1%	Panasonic
R4	2.2 Ω, 1206, 1%	Panasonic
C14, L2, L6, R6	Copper Shorting Tab	MACOM
J1, J2	SMA Connector	Tyco Electronics

4 Contact factory for Gerber file or additional circuit information.

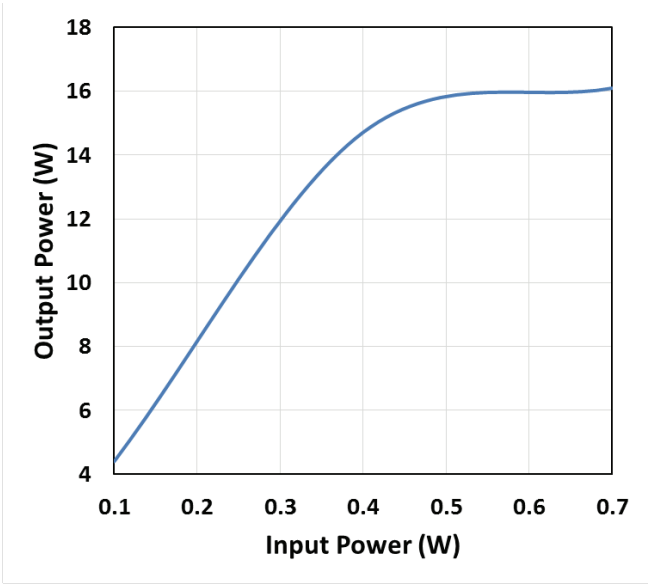
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Application Section

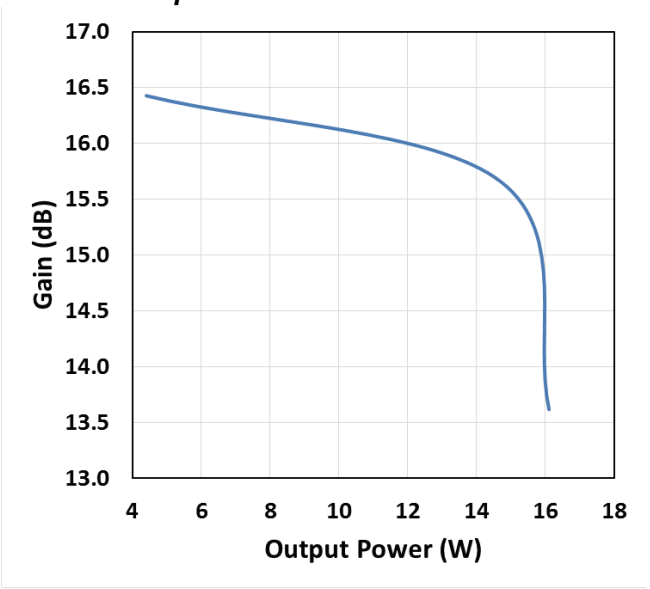
Typical Performance Curves

2450 MHz, V_{DD} = 50 V, I_{DQ} = 15 mA, CW Operation, T_A = 25°C

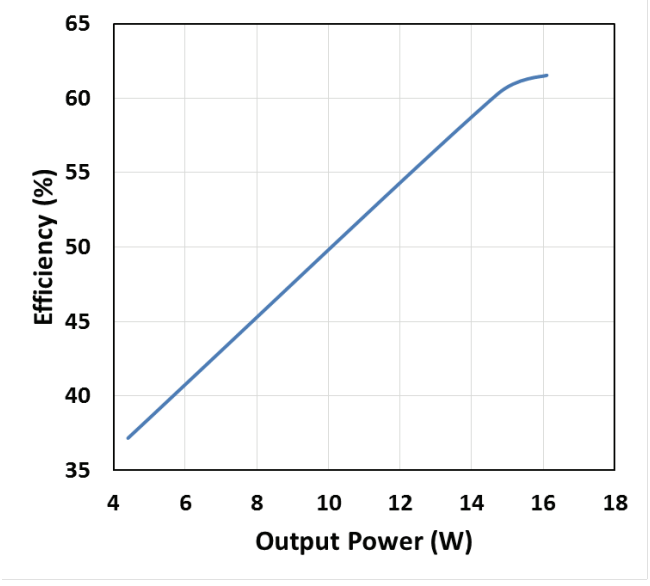
Output Power vs. Input Power



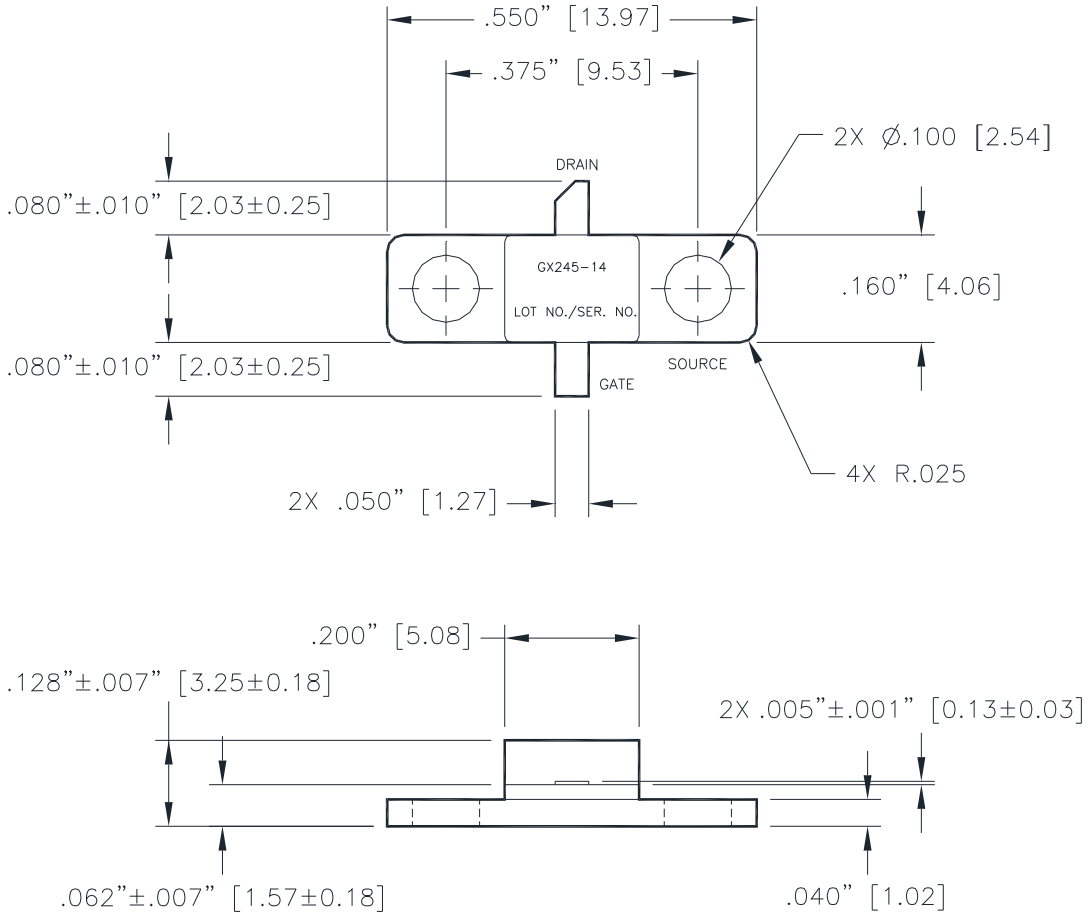
Gain vs. Output Power



Drain Efficiency vs. Output Power



Outline Drawing MAGX-000245-014000



Unless otherwise noted, tolerances are inches ±.005" [millimeters ±0.13mm]

LEAD TRIMMING INSTRUCTIONS
N/A

MARKING INSTRUCTIONS
LOT NO./SER NO. is LLLLLSSS Where LLLLL = last 5 digits of lot and SSS = last 3 digits of serial number.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298