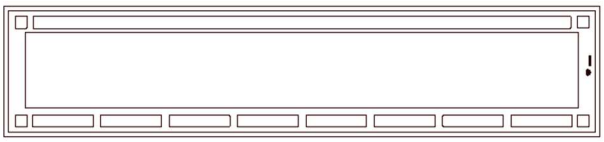
GD400 50V, DC – 2.9GHz, 400W GaN HEMT

FEATURES

- Operating Frequency Range: DC to 2.9GHz
- Operating Drain Voltage: 28V & 50V
- Maximum Output Power (P_{SAT}): 400W
- Bare die shipped in Gel-Pak containers
- Suitable for CW, Pulsed, Linear applications
- 100% KGD DC Production Tested



5.500 X 1.200 mm Die

DESCRIPTION

The GD400 is a 400W (P3dB) unmatched discrete GaN-on-SiC HEMT which operates from DC to 2.9 GHz on a 50V supply rail. The wide bandwidth of the GD400 makes it suitable for a variety of applications including cellular infrastructure, radar, communications, and test instrumentation, and can support CW, linear and pulse operations.

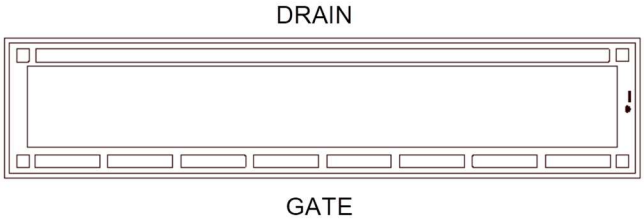
Bare die are shipped in Gel-Pak containers for safe transport and storage.

ABSOLUTE MAXIMUM RATINGS(1, 2)

Parameter	Rating	Symbols and Units
Drain Source Voltage	150	V_{DS} (V)
Gate Source Voltage	-8 to +2	V_{GS} (V)
Operating Voltage	55	V_{dsq} (V)
Junction Temperature	+225	T_{JUNC}(°C)
Storage Temperature	-65 to +150	$T_{STORAGE}$(°C)

1. Exceeding any of these limits may cause permanent damage to this device or seriously limit the life time (MTTF)
2. GalliumSemi does not recommend sustained operation above maximum operating conditions.

BLOCK DIAGRAM



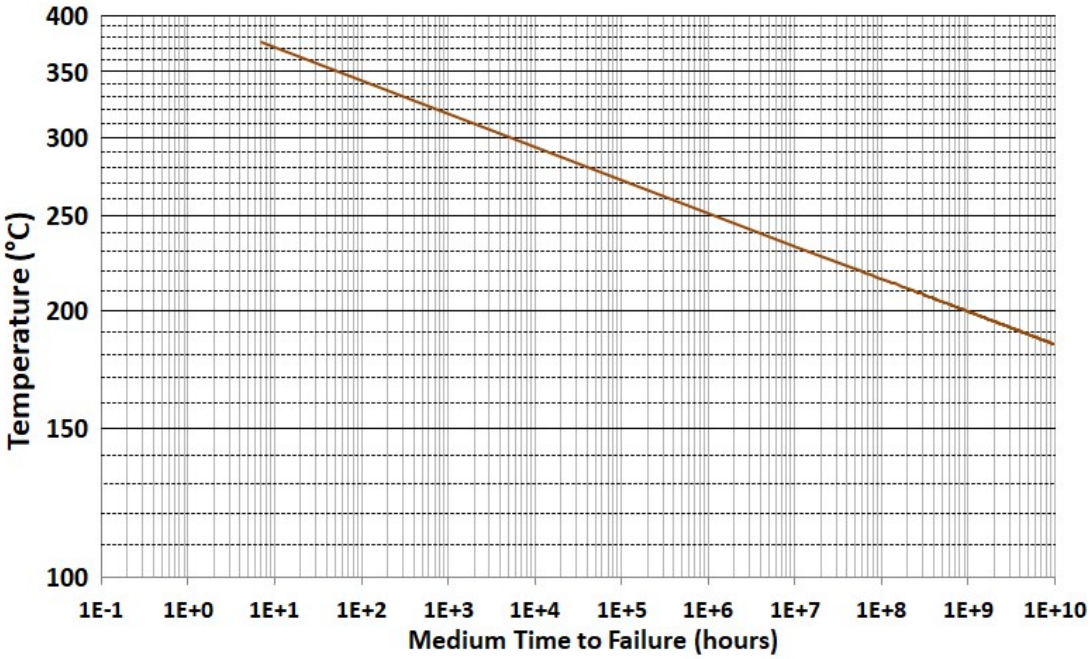
ELECTRICAL SPECIFICATION: TA = 25°C

Parameter	Min.	Typ.	Max.	Symbols and Units	Test conditions
Frequency Range	DC		2900	MHz	
DC Characteristics					
Drain Source Breakdown Voltage	150			V_{BDSS} (V)	
Drain Source Leakage Current		4.4		I_{DLK} (mA)	Vgs = -8V, Vds = 50V
Gate Threshold Voltage	-3.4		-1.5	V_{GS} (V)	Vds = 50V
Operating Conditions					
Gate Bias Voltage		-2.5		V_{GSQ} (V)	
Drain Voltage		50		V_{DSQ} (V)	
Quiescent Drain Current		310		I_{DQ} (mA)	

THERMAL AND RELABILITY INFORMATION -CW [1, 2]: T_c = 85°C

Parameter	Test condition	Value	Units	Notes
Channel Temperature, Tch	Pdiss 123 W	208	°C	
Rth die		1.0	ºC/W	
MTTF		3.0E8	Hrs	

1.Assumes eutectic attach using 1mil low temp solder, mounted to a 8 mil DFN package.
2:Thermal Resistance using Finite Element Analysis (FEA) simulation, calibrated with Infrared measurement on surface temperature.



GaN HEMT BIASING SEQUENCE

To turn the transistor ON

1. Set V_{GS} to -5V
2. Turn on V_{DS} to normal operation voltage (50V)
3. Slowly increase V_{GS} to set I_{DQ} current (410 mA)
4. Apply RF power

To turn the transistor OFF

1. Turn the RF power off
2. Decrease V_{GS} to -1.5V
3. Turn off $V_{D.}$ Wait a few seconds for drain capacitor to discharge
4. Turn off V_{GS}

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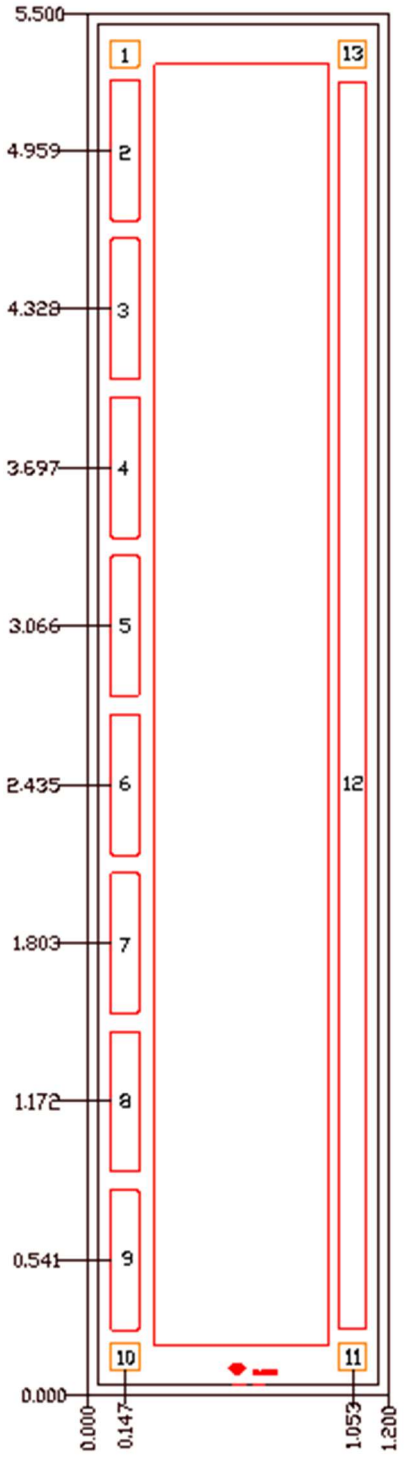
DIE DIMENSIONS



BONDS PADS

Pad nb.	Description	Dimensions
1, 10, 11, 13	Not connected	
2, 3, 4, 5, 6, 7, 8, 9	RF Input / Gate Voltage	0.110 x 0.560
12	RF Output / Drain Voltage	0.110 x 4.960
Backside	Source/ Ground	1.200 x 5.500

Notes:
1. All dimensions are in millimeter
2. Die thickness is 75 um
3. Bond pad metallization: gold
4. Backside metallization: gold