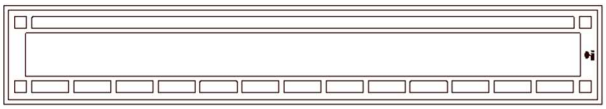
GD300 50V, DC – 2.9GHz, 300W GaN HEMT

FEATURES

- Operating Frequency Range: DC to 2.9GHz
- Operating Drain Voltage: 28V & 50V
- Maximum Output Power (P_{SAT}): 300W
- Bare die shipped in Gel-Pak containers
- Suitable for CW, Pulsed, Linear applications
- 100% KGD DC Production Tested



5.500 X 0.900 mm Die

DESCRIPTION

The GD300 is a 300W (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 GD300 makes it suitable for a variety of applications including cellular infrastructure, radar, communications, and test instrumentation, and can support CW, linear and pulse operations.

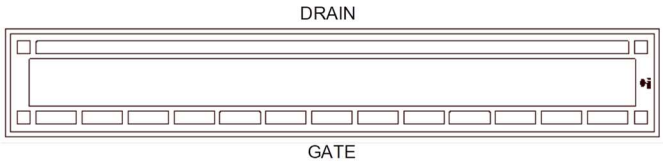
Bare die are shipped in Gel-Pak containers for safe transport and storage.

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



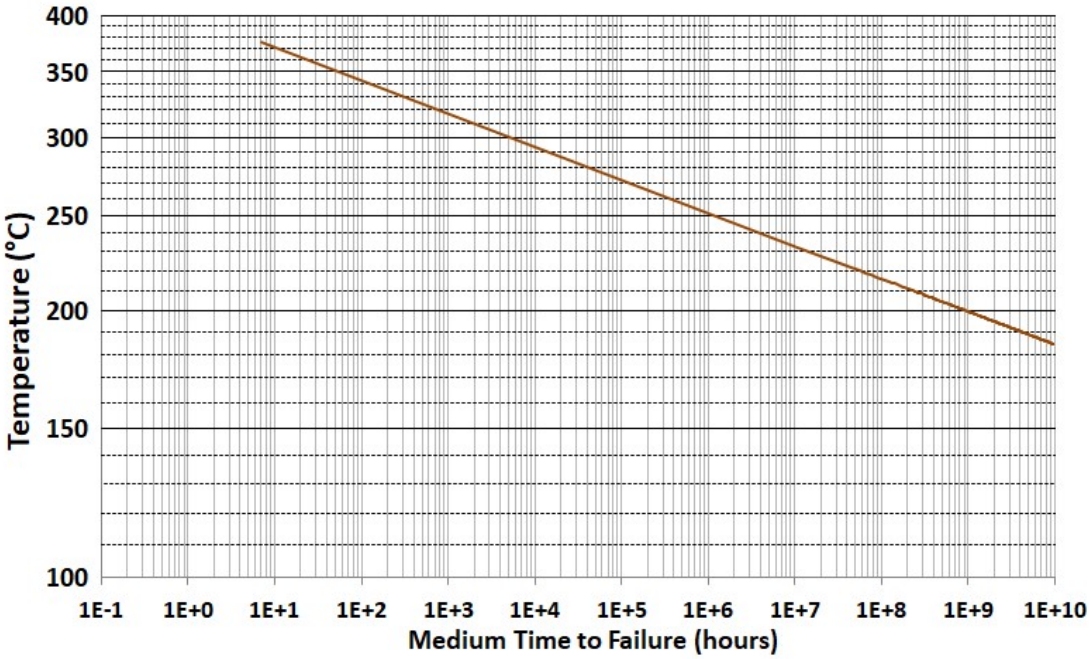
ELECTRICAL SPECIFICATION: TA = 25°C

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 125 W	240	°C	
Rth die		1.27	ºC/W	
MTTF		3.0E6	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

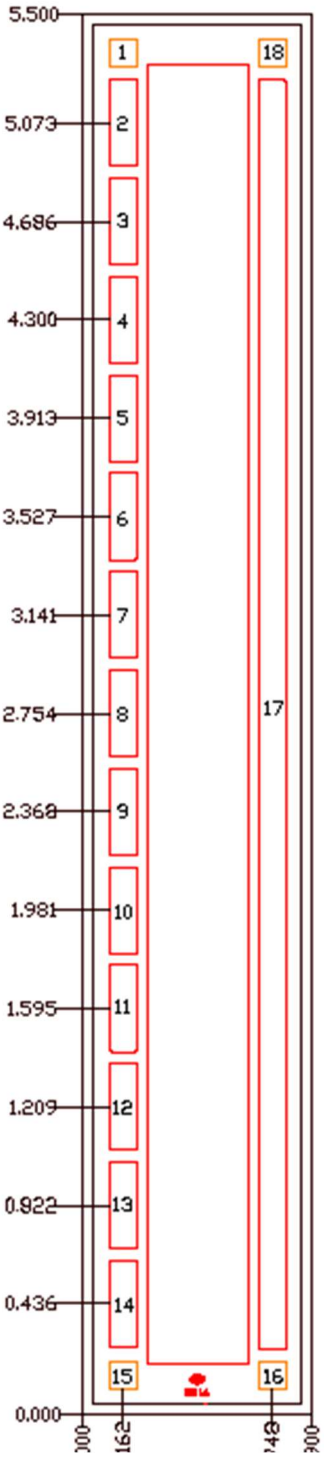
1. Set V_{GS} to -5V
2. Turn on V_{DS} to normal operation voltage (50V)
3. Slowly increase V_{GS} to set I_{DQ} current (310 mA)
4. Apply RF power

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}

GD300 50V, DC – 2.9GHz, 300W GaN HEMT

DIE DIMENSIONS



BOND PADS

Pad nb.	Description	Dimensions
1, 15, 16, 18	Not connected	
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	RF Input / Gate Voltage	0.110 x 0.340
17	RF Output / Drain Voltage	0.110 x 4.980
Backside	Source/ Ground	0.900 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

HANDLING PRECAUTIONS

Parameter	Symbol	Class	Test Methodology
ESD* – Human Body Model	HBM	Class 1A (250 V)	ANSI/ESDA/JEDEC Standard JS-001
ESD* – Charged Device Model	CDM	Class C3 (1500 V)	ANSI/ESDA/JEDEC Standard JS-002

* Tested in DFN 3x6 package

CONTACT INFORMATION

To request latest information and samples, please contact us at:

Web: https://www.galliumsemi.com/

Email: sales@galliumsemi.com

IMPORTANT NOTICE

Even though Gallium Semiconductor believes the material in this document to be reliable, it makes no guarantees as to its accuracy and disclaims all responsibility for any damages that may arise from using its contents. Contents in this document are subject to change at any time without prior notice. Customers should obtain and validate the most recent essential information prior to making orders for Gallium Semiconductor products. The information provided here or any use of such material, whether about the information itself or anything it describes, does not grant any party any patent rights, licenses, or other intellectual property rights. Without limiting the generality of the aforementioned, Gallium Semiconductor products are neither warranted nor approved for use as crucial parts in medical, lifesaving, or life-sustaining applications, or in any other applications where a failure would likely result in serious personal injury or death.

GALLIUM SEMICONDUCTOR DISCLAIMS ANY AND ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO SUCH PRODUCTS, WHETHER BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.