OBJECTIVE

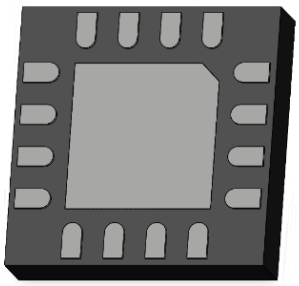
Dynax

DF1G0015-08N

RF GaN POWER AMPLIFIER for Wireless Infrastructure

20 – 1500 MHz, 7 W,
RF GaN POWER AMPLIFIER

DF1G0015-08N is a 7 W RF GaN HEMT Transistor with first generation RF GaN technology from Dynax, which is ideal for 20 MHz to 1500 MHz ultra wideband applications.
It features fully input and output matching.



Package Type: LGA 4×4mm

Applications

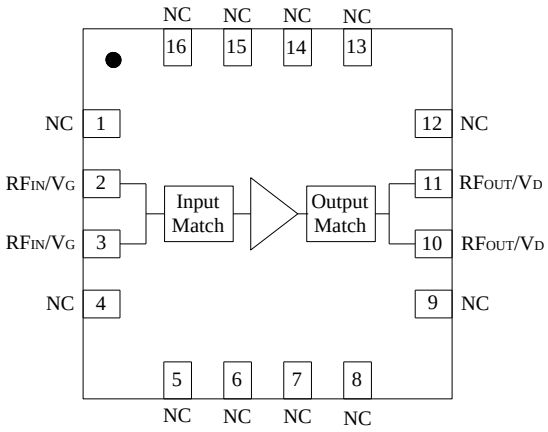
- Wideband or Narrowband Amplifiers
- Test Instrumentations

Typical RF Performance [1]

- Frequency: 20 – 1500 MHz
- Saturation Output Power: 7 W
- Saturation Drain Efficiency: 56% @650MHz
- Power Gain: 18 dB @650MHz

Note:

[1] Typical Performance in Dynax DF1G0015-08N Class AB Demo with the device soldered onto the heatsink, test condition: V_{DD} = 28 V, I_{DQ} = 30 mA, Input signal Pulsed CW, Pulse Width = 100 μs, Duty Cycle = 10 %.



(Top View)
Figure 1. Pin Connection

OBJECTIVE

Table 1. Maximum Ratings

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	150	V
Gate-Source Voltage	V_{GS}	-10 ~ +2	V
Operating Voltage	V_{DD}	0 ~ +55	V
Maximum Forward Gate Current	I_{GMAX}	1.0	mA
Storage Temperature Range	T_{STG}	-65 ~ +150	℃
Operating Junction Temperature	T_J	225	℃
Absolute Maximum Channel Temperature [2]	T_{MAX}	275	℃

[2] Functional operation above 225℃ has not been characterized and is not implied. Operation at T_{MAX} (275℃) reduces median time to failure by an order of magnitude; Operation beyond T_{MAX} could cause permanent damage.

Table 2. Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance at Average Power by Infrared Measurement, Active Die Surface-to-Case $T_{base-plate}$ = 85℃, P_D = TBD	$R_{thjc(IR)}$	TBD	℃/W
Thermal Resistance at Average Power by Finite Element Analysis, Junction-to-Case $T_{base-plate}$ = 85℃, P_D = TBD	$R_{thjc(FEA)}$	TBD	℃/W

Table 3. Ordering Information

Device	Package Type	Marking
DF1G0015-08N	LGA 4×4mm	LL08A

Table 4. Bias Sequences

Bias-up Sequence	Bias-down Sequence
Set V_{GS} to -5 V	Turn off RF power
Turn on V_{DS} to 28 V	Reduce V_{DS} down to 0 V
Increase V_{GS} until I_{DS} current is attained	Turn off V_{GS}
Apply RF input power	

Table 5. Electrical Characteristics (T_A = 25 ℃ unless otherwise noted**)**

Characteristic	Symbol	Min.	Typ.	Max.	Unit
DC Characteristics (measured on wafer prior to packaging)					
Drain-Source Leakage Current (V_{GS} = -10 V, V_{DS} = 150 V)	I_{DSS}	-	-	1.0	mA
Drain-Source Breakdown Voltage (V_{GS} = -10 V, I_D = 1.0 mA)	$V_{(BR)DSS}$	150	-	-	V
Gate Threshold Voltage (V_{DS} = 28 V, I_D = 1.0 mA)	$V_{GS(th)}$	-4.0	-3.2	-1.0	V
Gate Quiescent Voltage (V_{DD} = 28 V, I_D = 30 mA)	$V_{GS(Q)}$	-	-3.0	-	V
RF Characteristics					
Typical Performance [3]					
Saturation Output Power	P_{sat}	-	7	-	W
Saturation Drain Efficiency	η_D	-	56	-	%
Power Gain	G_P	-	18	-	dB
Gain Flatness	G_F	-	3	-	dB

[3] Typical Performance in Dynax DF1G0015-08N Class AB Demo with the device soldered onto the heatsink, test condition: V_{DD} = 28 V, I_{DQ} = 30 mA, f = 20 – 1500 MHz, Input signal Pulsed CW, Pulse Width = 100 μs, Duty Cycle = 10 %.

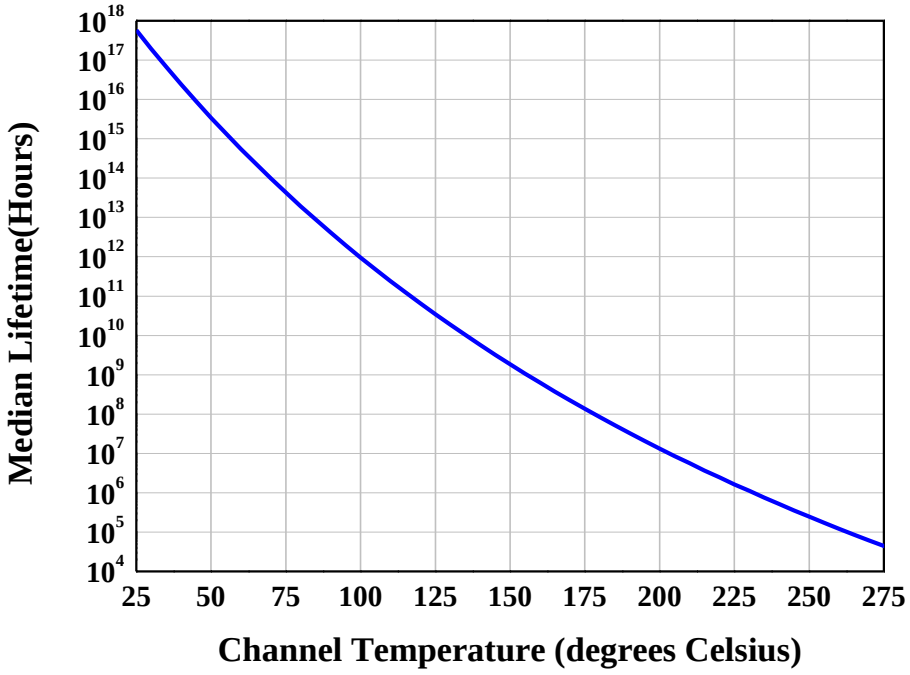
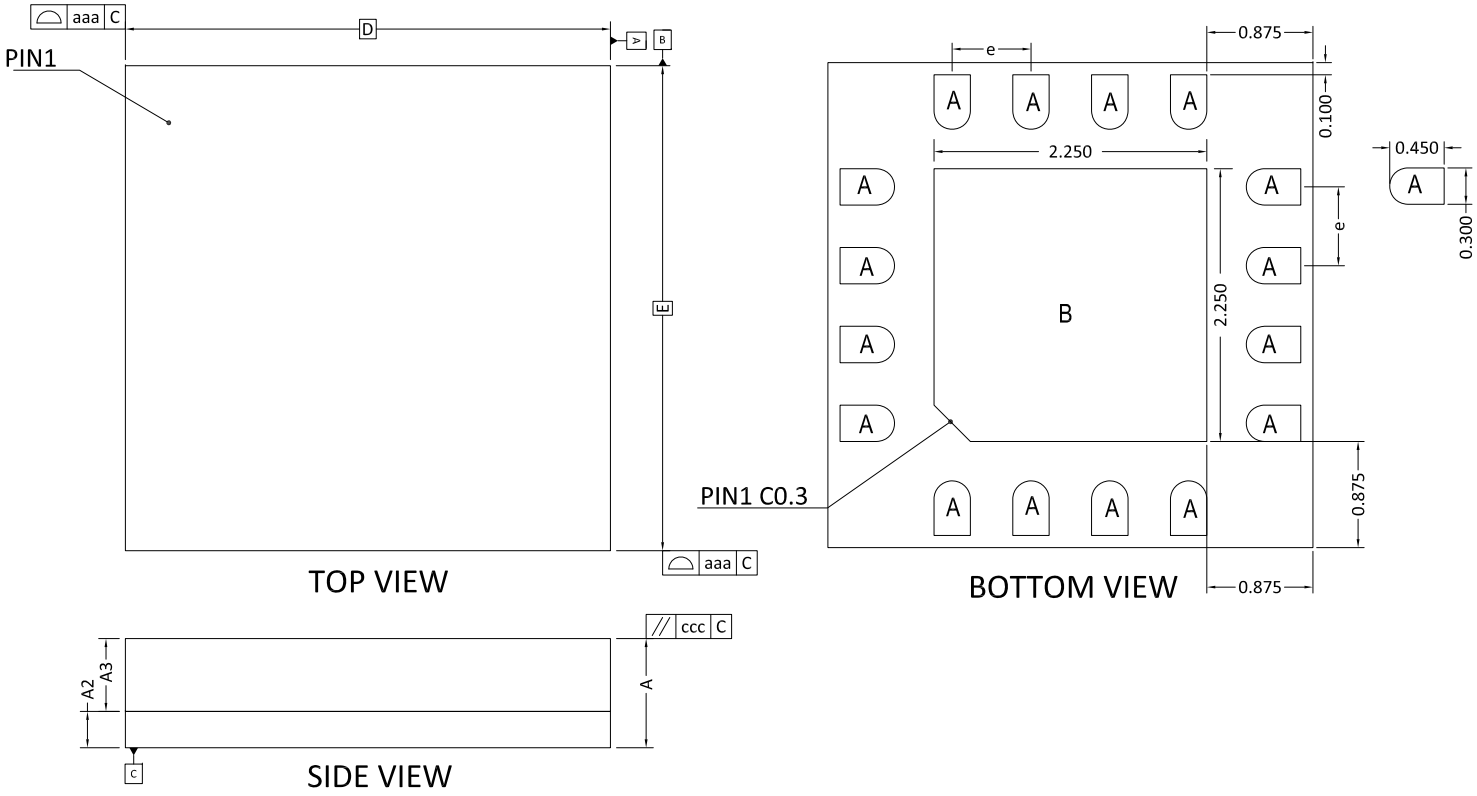


Figure 2. Median Lifetime vs. Channel Temperature

Package Dimensions

Package Type: LGA 4×4mm



MILLIMETER			
SYMBOL	MIN	NOR	MAX
A	0.82	0.90	0.98
A2	0.27	0.30	0.33
A3	0.55	0.60	0.65
D	3.90	4.00	4.10
E	3.90	4.00	4.10
e	0.65 BSC		
aaa	0.10		
ccc	0.05		

Product Documentation and Software

Refer to the following resources to aid your design process.

Application Notes

- AN_02: User Guide for GaN HEMT Transistor

Document Revision History

The following table summarizes revisions to this document.

Status	Revision	Date	Description
Objective datasheet	V01	08/23/2021	Initial version.
Objective datasheet	V02	11/04/2021	Update typical RF performance and POD drawing.

Abbreviations

Acronym	Description
CW	Continuous Waveform
GaN	Gallium Nitride
HEMT	High Electron Mobility Transistor
MTTF	Median Time To Failure
VSWR	Voltage Standing-Wave Ratio

Disclaimer

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