

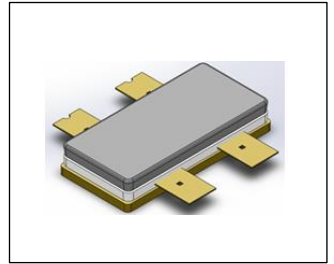


GaN HEMT 28V, 120W, General purpose RF Power Transistor

Description

The XTAH15120B4C is a 120W GaN HEMT, Push pull configured, designed for multiple applications, up to 1.5GHz. It can be used in CW, Pulse and any other modulation modes.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.



- Typical broadband Class AB RF Performance with device soldered on heatsink

XTAH15120B4C ^{V0} VGS=-2.60V VDS=28V IDQ=450mA CW								
Freq (MHz)	Pout (dBm)	Pout (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff (%)	2 nd (dBc)	3 rd (dBc)
100	50.37	108.9	6.48	33.35	17.02	60.02	-33.60	-12.20
150	50.13	103.0	5.99	33.31	16.82	61.43	-23.60	-10.60
200	50.10	102.3	5.74	33.20	16.90	63.67	-27.00	-9.50
250	50.04	100.9	5.47	33.34	16.70	65.90	-29.60	-10.70
300	50.20	104.7	5.59	32.50	17.70	66.90	-33.90	-12.40
350	50.04	100.9	5.37	32.11	17.93	67.12	-33.00	-13.70
400	50.04	100.9	5.43	32.36	17.68	66.38	-36.00	-15.20
450	50.18	104.2	5.52	31.55	18.63	67.44	-34.50	-16.00
500	50.05	101.2	5.73	31.85	18.20	63.05	-39.00	-18.40

Applications

- P band power amplifier
- L band power amplifier
- ISM/RF Energy power amplifier at 1.3GHz,915MHz,433MHz etc

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

1. Set VGS to the pinch--off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically -5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+150	Vdc
Gate--Source Voltage	V _{GS}	-8 to +0.5	Vdc
Operating Voltage	V _{DD}	36	Vdc
Maximum gate current	I _{gs}	27.2	mA
Storage Temperature Range	T _{stg}	-65 to +150	°C



Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA $T_C = 85^\circ\text{C}$, at $P_{\text{diss}} = 50\text{W}$	$R_{\theta JC}$	1.6	°C /W

Table 3. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

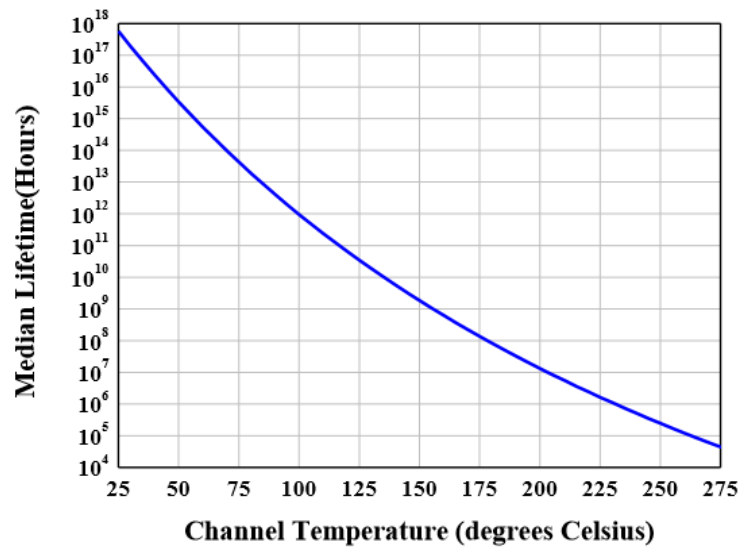
DC Characteristics (Each path, measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 13.6\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 13.6\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$, $I_{DS} = 450\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.6		V

Ruggedness Characteristics

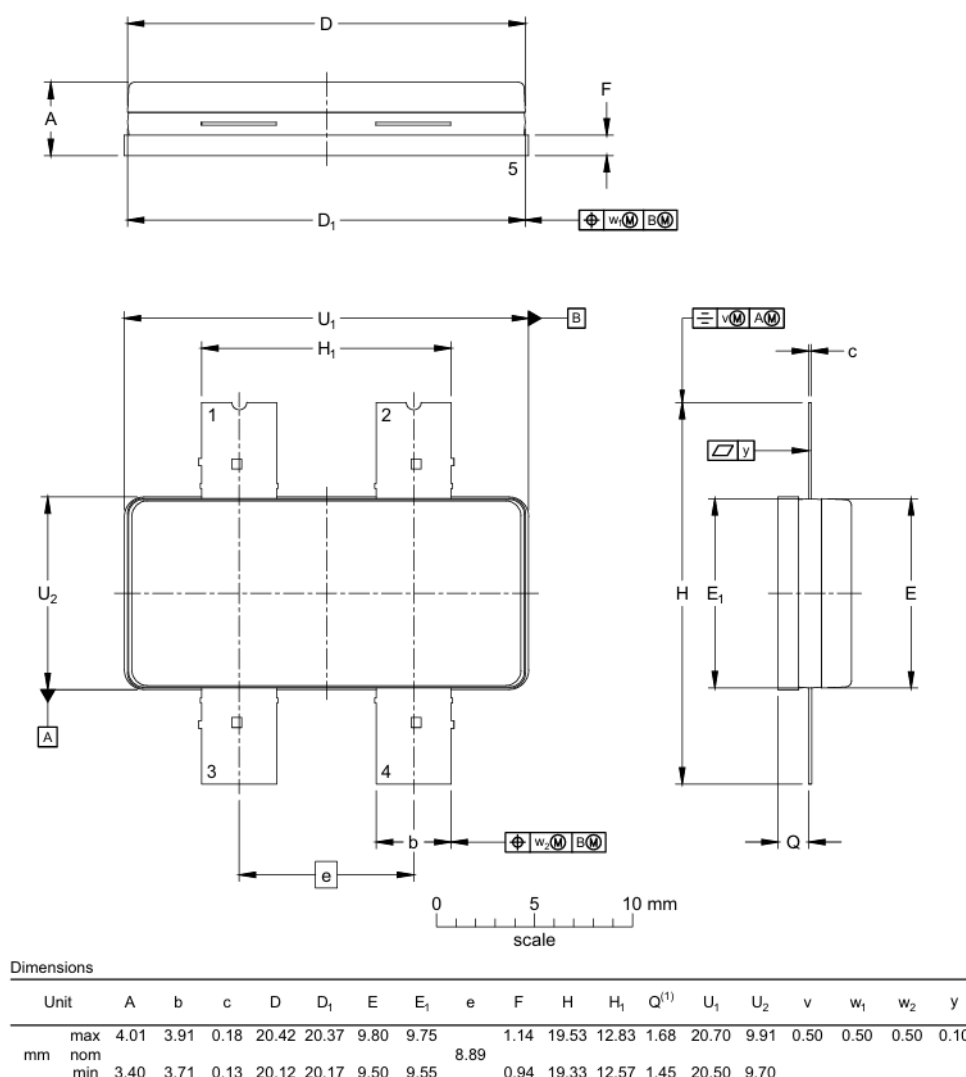
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, $P_{\text{out}} = 120\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature





Earless Flanged Plastic Air Cavity Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/1/15	V1.0	Advanced Datasheet Creation

Application data based on: TC-25-04

Notice

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