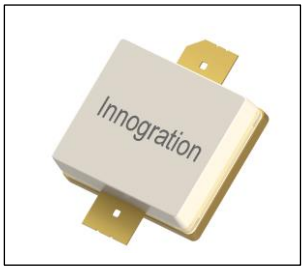
GaN HEMT 28V,HF-1.5GHz 110W, RF Power Transistor



Description

The XTAH15110A2C is a 110W GaN HEMT, designed for multiple application 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 650-860MHz class AB RF Performance with device soldered on heatsink **with single device**

  Vds=28V, Idq=100mA, CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
650	48.96	78.6	47.6	17.98	50.57	114.1	57.4
700	50.2	104.6	56.1	18.29	51.81	151.9	66.9
750	49.26	84.3	53.3	18.17	51.32	135.5	66.4
800	48.91	77.9	54.9	18.12	51.15	130.3	69.1
860	48.74	74.9	57.8	18.33	50.9	123.1	72.1

Applications

- L band power amplifier
- P band power amplifier
- ISM/RF Energy power amplifier

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	Igs	31.5	mA
Storage Temperature Range	Tstg	-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°C, at Pdiss=65W	RθJC	1.7	°C /W

Table 3. Electrical Characteristics (TA = 25℃ unless otherwise noted)

DC Characteristics (measured on wafer prior to packaging)

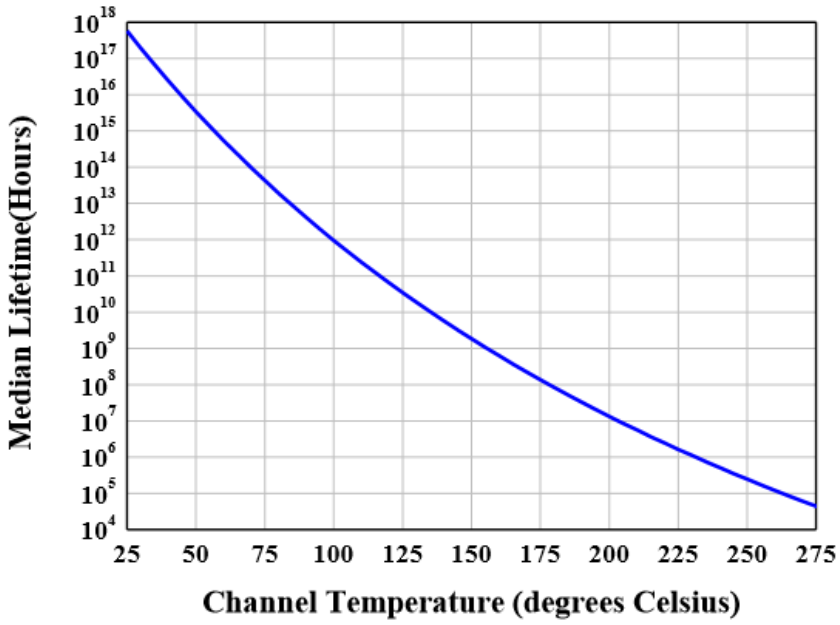
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=31.5mA	V_{DSS}		150		V
Gate Threshold Voltage	VDS =10V, ID = 31.5mA	$V_{GS(th)}$	-4		-2	V

Gate Quiescent Voltage	VDS =28V, IDS=100mA, Measured in Functional Test	$V_{GS(Q)}$		-3.15		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, Pout=110W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature



650-860MHz(1 device)

Typical performance

Figure 4: Network analyzer output S11/S21

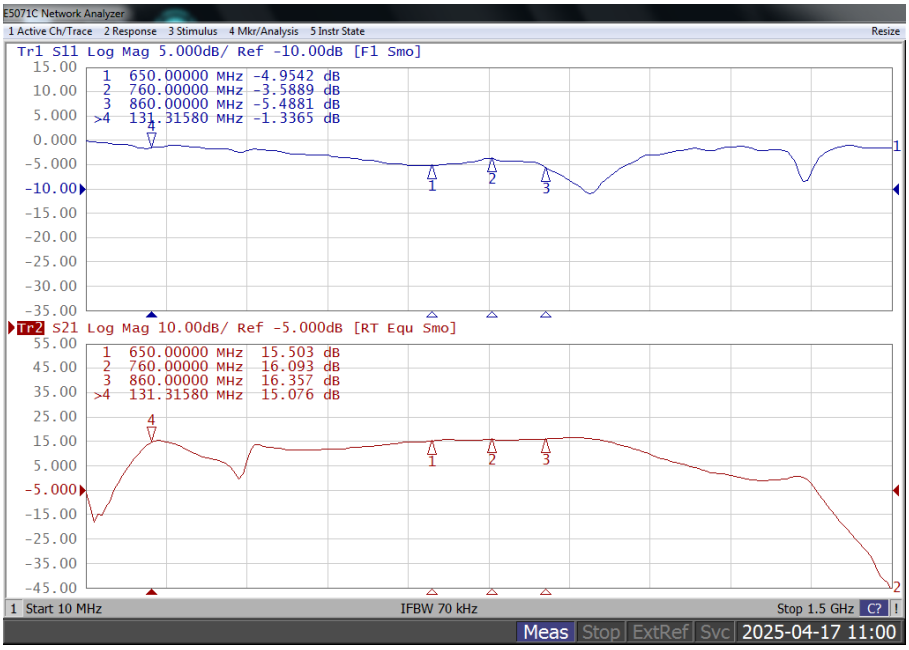


Figure 5: Picture of application board

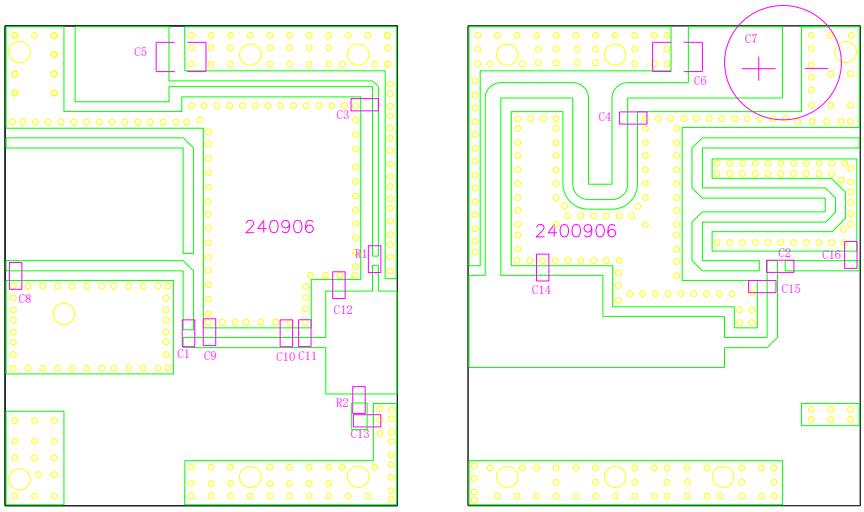
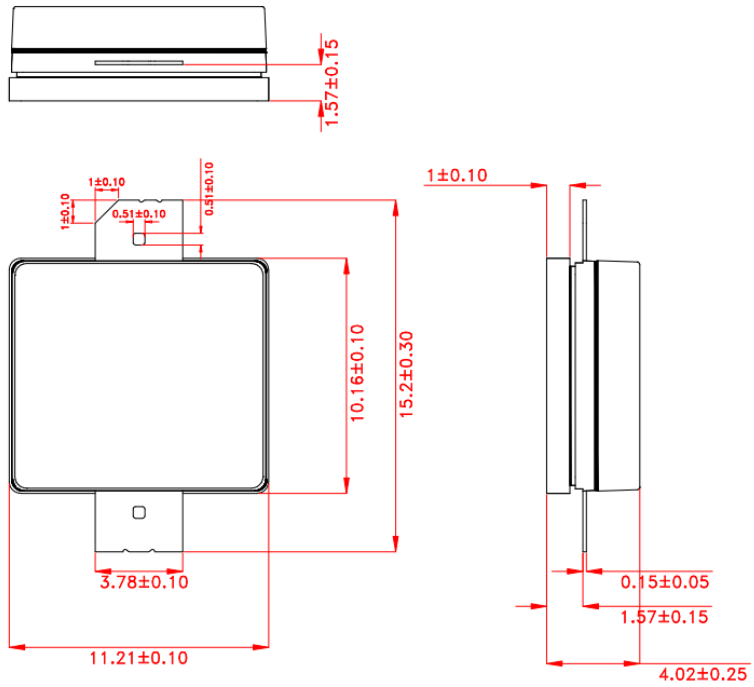


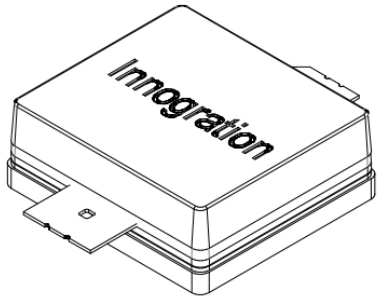
Table 4. Bill of materials of application board (PCB layout upon request)

Designator	Comment	Footprint	Quantity
C1	20 pF	0805	1
C2, C3, C4	82 pF	0805	3
C5, C6	10 uF/100V	1210	2
C7	1000 uF/63V		1
R1, R2	10 Ω	0603	2
C8, C9, C15	3.9 pF	0603/0805	3

Designator	Comment	Footprint	Quantity
C10	6.8 pF	0603/0805	1
C11, C12, C14	10 pF	0805	3
C13	10uF/16V	0603	1
C16	1.2 pF	0805	1
PCB	20mils RO4350B		

Package Dimensions （Unit:mm）





Unit:mm

Tolerance ±0.10mm,Except as Noted.

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/4/17	V1.0	Preliminary Datasheet Creation

Application data based on: LSM-25-05

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