



GaN, HF-3GHz, RF Power Transistor

Description

The XTAH30160BY4 is a 160W 28V, both input and output matched GaN HEMT, ideal for multiple applications within up to 3.0GHz. .

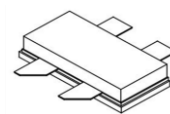
In typical broadband application, it can deliver >100W CW across the full band 0.3-3GHz

There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical performance across 0.3-3GHz class AB application circuit with device soldered

$V_{gs} = -2.24V$, $V_{ds} = 28V$, $I_{dq} = 500mA$ Signal mode : CW

XTAH30160BY4



Freq (MHz)	Pin (dBm)	Pout (dBm)	Pout (W)	IDS (A)	Gain (dB)	Eff (%)
300	37.5	50.25	106	6.80	12.8	55.6
400	39.1	51.41	138	7.57	12.3	65.3
500	37.7	51.45	140	6.84	13.8	72.9
600	39.2	50.58	114	6.30	11.4	64.8
700	38.6	51.45	140	7.98	12.8	62.5
800	38.3	51.80	151	8.57	13.5	63.1
900	39.1	51.84	153	8.10	12.7	67.4
1000	38.1	51.23	133	7.55	13.1	62.8
1100	38.5	51.36	137	9.08	12.9	53.8
1200	39.4	52.02	159	10.76	12.6	52.8
1300	39.9	52.72	187	11.70	12.8	57.1
1400	39.6	52.10	162	9.15	12.5	63.3
1500	39.2	51.69	148	9.13	12.5	57.7
1600	39.3	51.24	133	8.47	12.0	56.1
1700	39.1	50.90	123	8.82	11.8	49.8
1800	39.5	51.41	138	9.77	12.0	50.6
1900	39.4	51.63	146	10.66	12.3	48.8
2000	38.7	51.50	141	10.85	12.8	46.5
2100	38.6	51.99	158	10.80	13.4	52.3
2200	38.7	51.88	154	11.70	13.2	47.1
2300	39.9	51.97	157	12.31	12.0	45.7
2400	40.1	51.96	157	12.46	11.9	45.0
2500	39.5	52.17	165	12.64	12.7	46.6
2600	38.2	52.19	166	11.60	14.0	51.0
2700	38.7	52.05	160	10.76	13.4	53.2
2800	37.7	51.62	145	10.55	13.9	49.2
2900	39.7	52.03	160	11.50	12.3	49.6
3000	39.7	51.34	136	8.94	11.6	54.4



Applications

- P/L/S band pulse power amplifier
- wideband 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

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)

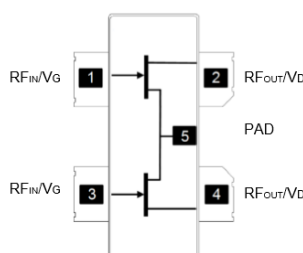


Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	36	Vdc
Maximum gate current	I_{gs}	43.6	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 $P_{diss} = 150\text{W}$	$R_{\theta JC}$	0.8	°C /W

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

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 43.6\text{mA}$	V_{DSS}		150		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 43.6\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$, $I_{DS} = 500\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.2		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	3 GHz, $P_{out} = 100\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		



Figure 2: Median Lifetime vs. Channel Temperature

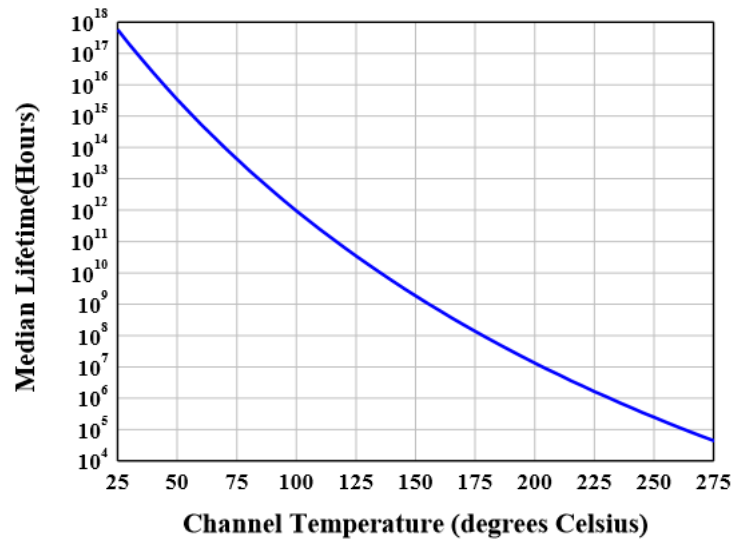


Figure 3: Network analyzer output S11/S21

28V:

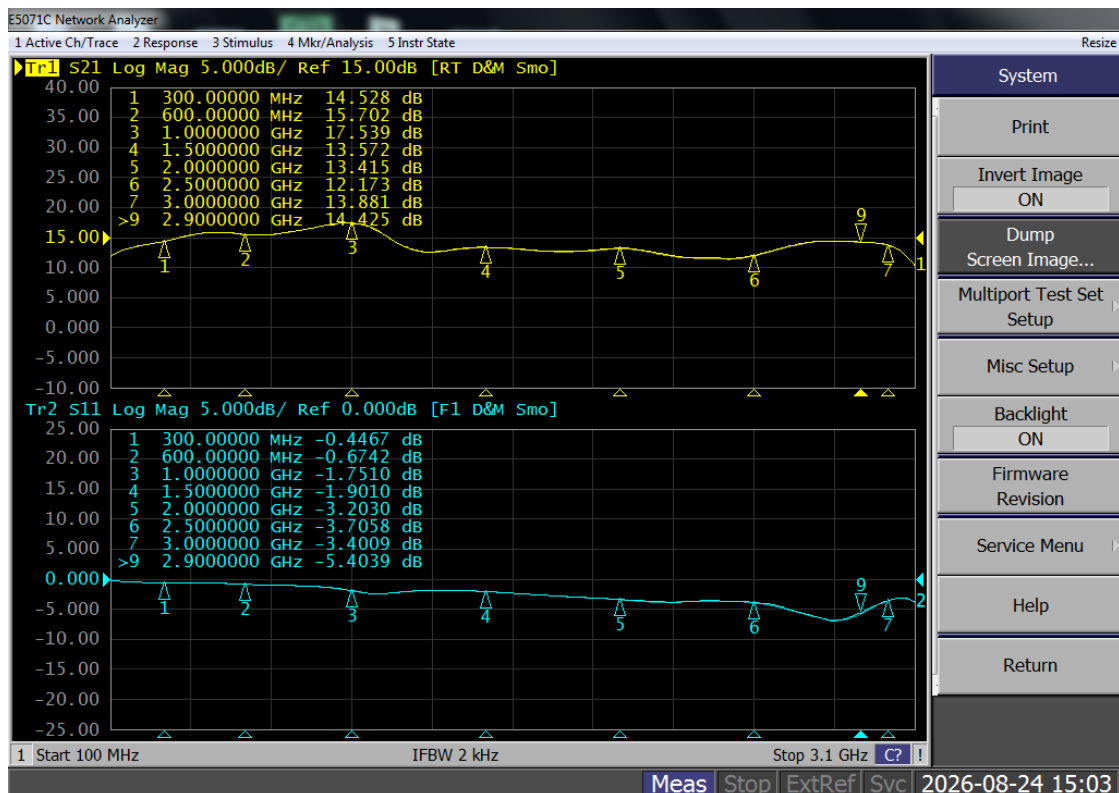


Figure 4: Picture of application board 0.3-3GHz class AB

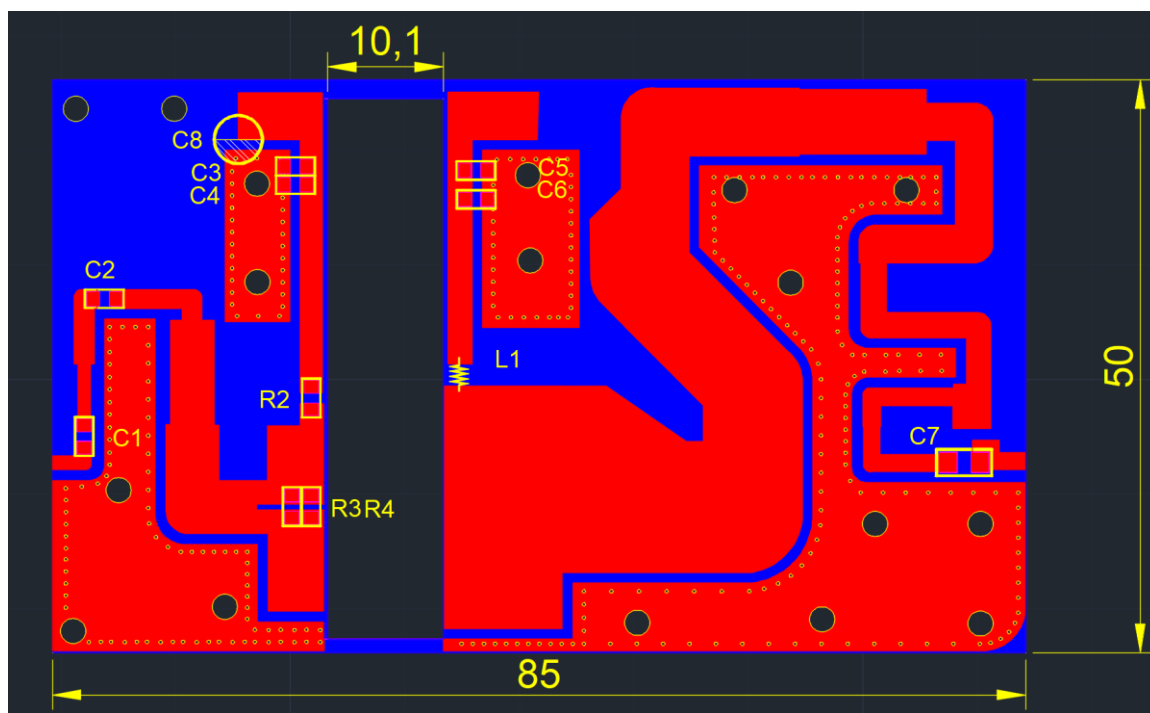
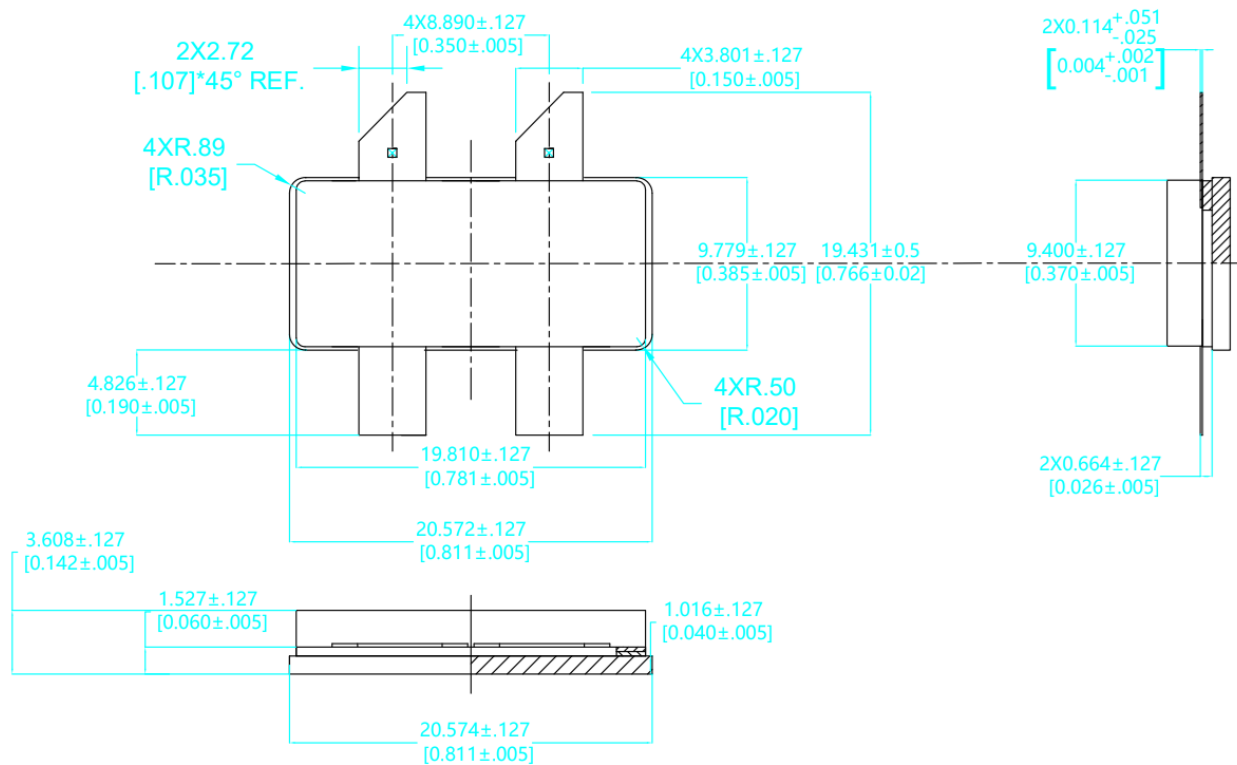


Table 4. Bill of materials of application board (PCB layout upon request)

Component	Description	Suggested Manufacturer
C1,C2	20pF(MQ300805)	
C3,C5	1uF (0805)	//
C4,C6	10nF (0805)	//
C7	33pF(MQ301111)	
C8	82uF / 100v	
L1	1mm, 4 turns, diameter :3mm	//
R2,R3	Chip Resistor,10Ω (0603)	//
R4	Chip Resistor,51Ω (0805)	//
PCB	Rogers4350B, 20mils	//



Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/8/24	V1.0	Preliminary Datasheet Creation

Application data based on: SYX-26-41

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