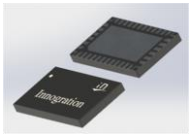
GaN HEMT 28V, 2450MHz 30W, RF Power Transistor

XTAH25032C6



Description

The XTAH25032C6 is a 30W GaN HEMT, designed for ISM/RF Energy application with excellent performance consistency across the full band of 2.4-2.5GHz

The transistor is available in a highly cost effective 10*6mm, surface mount, QFN package with 100% production test to ensure the quality and consistency.It can be used in CW, Pulse and any other modulation modes.

- Typical Class AB RF Performance with device soldered through high density and plated grounding vias
  Vds = 28V,Vgs=-2.7V, CW

Freq (MHz)	P1dB (dBm)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
2400	45.32	18.81	45.77	37.7	79.40
2410	45.40	18.52	45.75	37.5	79.15
2420	45.23	19.28	45.72	37.3	79.00
2430	45.23	19.25	45.74	37.4	79.10
2440	45.23	19.38	45.71	37.2	79.02
2450	45.23	19.53	45.73	37.3	79.05
2460	45.10	20.01	45.68	36.9	79.07
2470	45.22	19.67	45.74	37.5	79.45
2480	45.27	19.73	45.67	36.8	79.30
2490	45.24	19.48	45.65	36.7	79.50
2500	45.07	19.95	45.64	36.7	79.20

Applications

- S band power amplifier
- ISM/RF Energy power amplifier

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

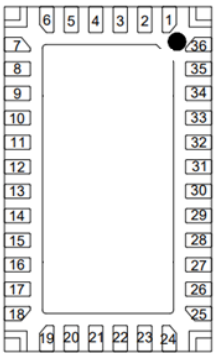
1. Set VGS to the pinch--off (VP) voltage, typically –5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)



Pin No.	Symbol	Description
8,9,10,11,14,15,16,17	RF IN/Vgs	RF Input, Vgs bias
26,27,28,29,32,33,34,35	RF OUT/VDD	RFOutput, Drain bias
Rest Pins and Package Base	GND	DC/RF Ground. Must be soldered directly to heatsink or copper coin for CW application.

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	12	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=8W	RθJC	3.8	°C /W

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

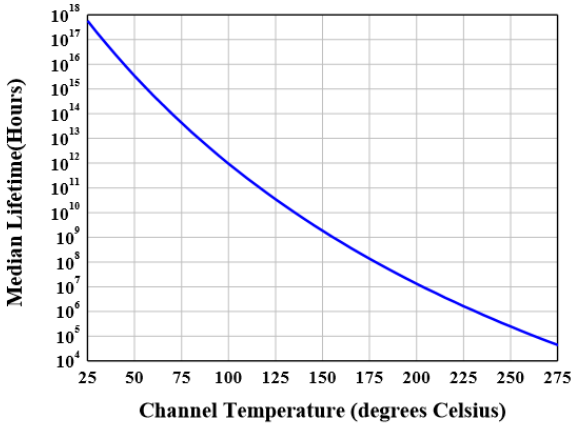
DC Characteristics (main path, measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=8mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 8mA	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	VDS =28V, IDS=100mA, Measured in Functional Test	$V_{GS(Q)}$		-2.42		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.5GHz, Pout=30W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature



Typical performance

Figure 3: Network analyzer output S11/S21

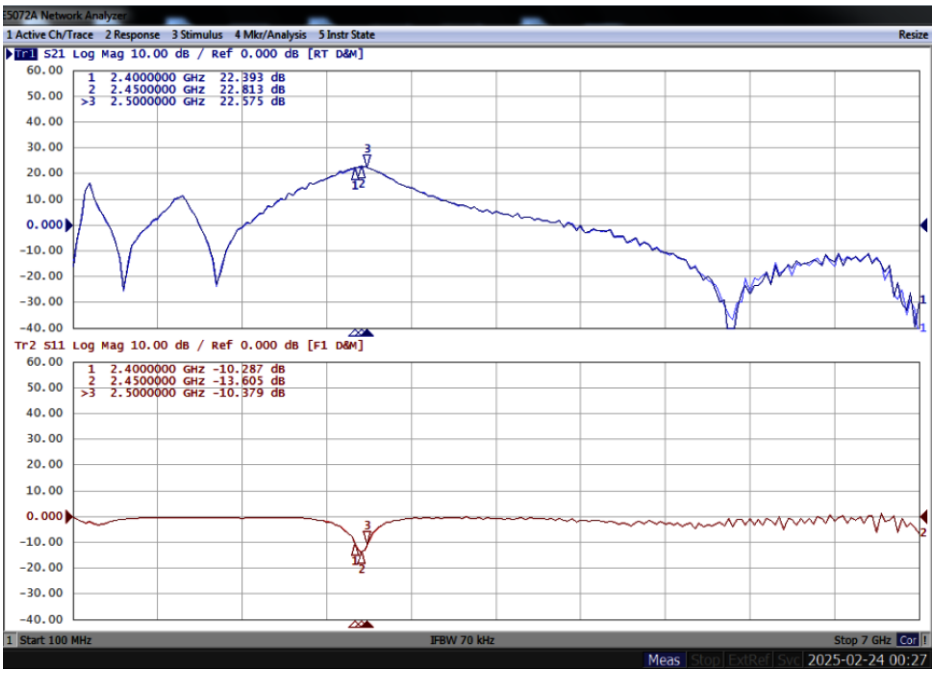
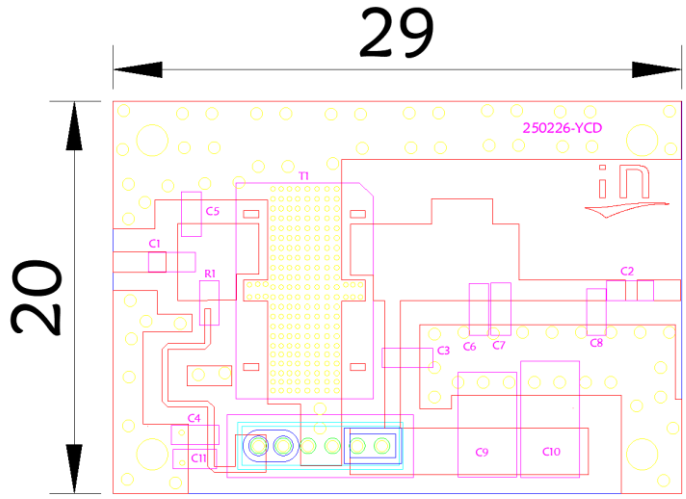
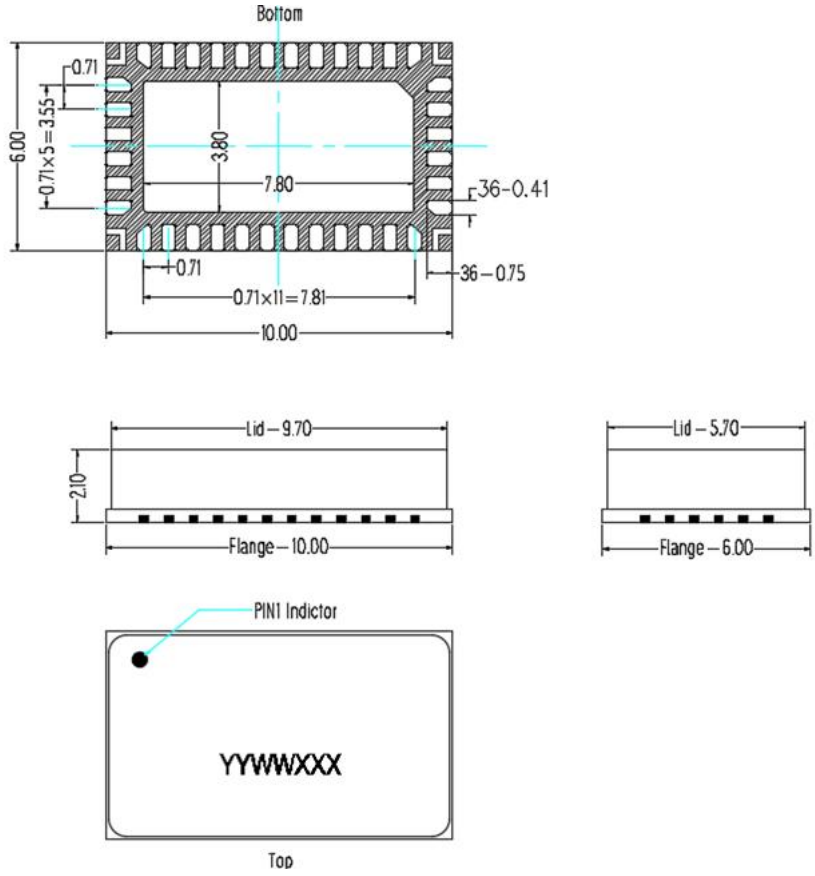


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)



Designator	Footprint	Comment	Quantity
C1, C2, C3, C4	0603	12 pF HIGH Q	4
C9,C10,C11	1210	10uF/100V	3
C6	0603	1.2 pF HIGH Q	1
C7	0603	0.3 pF HIGH Q	1
C8	0603	0.4 pF HIGH Q	1
C5	0603	0.5 pF HIGH Q	1
R1	0603	10R	1
T1		XTAH25032C6	1

10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are ±0.2mm.

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/2/26	**V1.0**	**Advanced Datasheet Creation**

Application data based on: LWH-25-04

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