GaN 28V 70W,C band RF Power Transistor

XTAH58070A2C

Description

The XTAH58070A2C is a 70W internally matched, GaN HEMT, designed from 5.0 to 6.0GHz, especially 5G NR or LTE application, as well as either Pulse or CW application There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical performance (on narrow band fixture with device soldered)

V_{DD}=28V I_{DQ}=100mA, CW

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)
5000	38.38	49.18	82.79	6.02	10.80	49.12
5100	38.50	49.21	83.37	6.14	10.71	48.49
5200	38.61	49.26	84.33	6.04	10.65	49.87
5300	38.70	49.30	85.11	5.97	10.60	50.92
5400	38.31	49.26	84.33	5.74	10.95	52.47
5500	37.90	49.12	81.66	5.67	11.22	51.44
5600	38.01	49.03	79.98	5.54	11.02	51.56
5700	38.62	49.02	79.80	5.52	10.40	51.63
5800	38.21	48.88	77.27	5.39	10.67	51.20
5900	38.43	48.83	76.38	5.28	10.40	51.67
6000	38.31	48.86	76.91	5.33	10.55	51.54

Recommended driver: XTAH80010PD

Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

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 (28V)
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}	-10,+2	Vdc
Operating Voltage	V_{DD}	36	Vdc
Maximum Forward Gate Current @ TC = 25°C	Igmax	16	mA

Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+225	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	120	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2.Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, RF CW operation	$R_{\theta JC}$	1.6	C/W

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

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=16mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =16mA	V_{GS}(th)	-4		-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-2.35		V

Typical performance

5-6GHz

Figure 2: Small singal gain and return loss Vs Frequency

Vds=28V, Idq=100mA, input power=0dBm

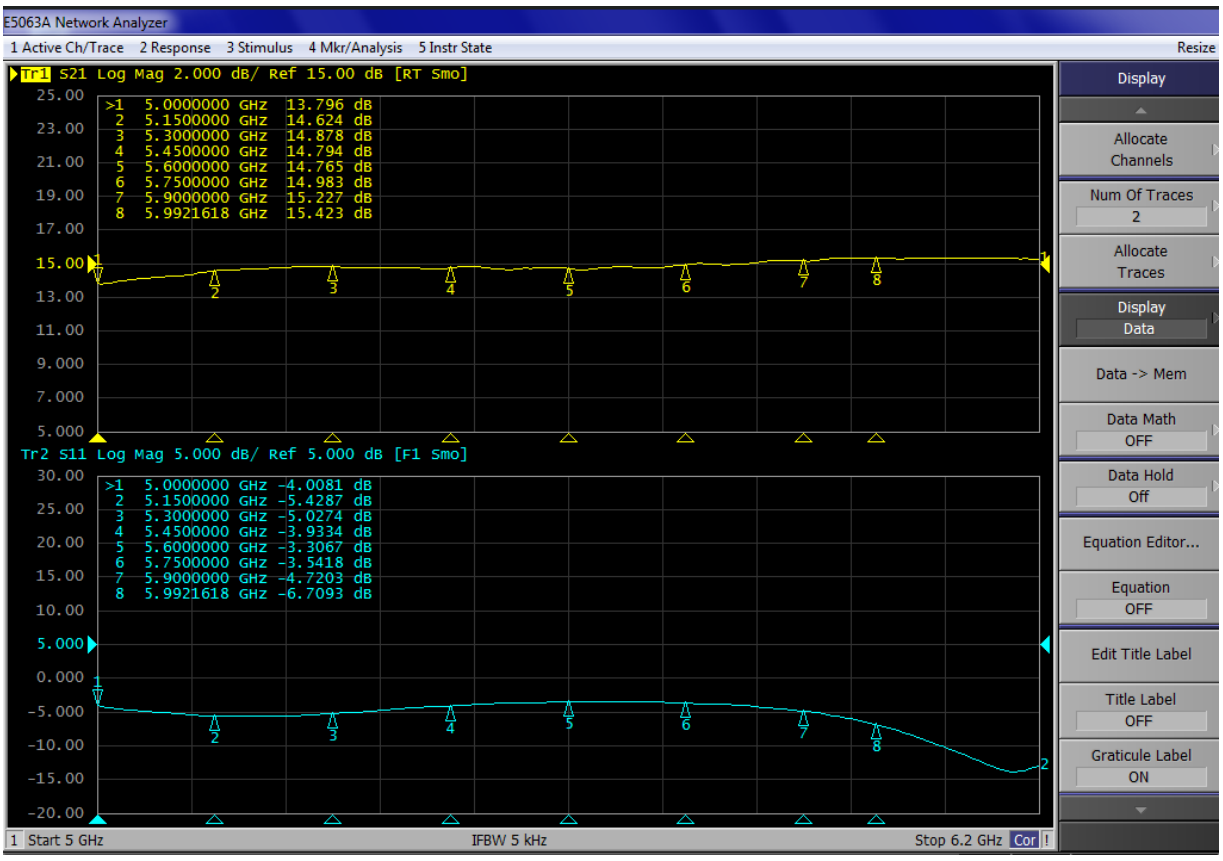
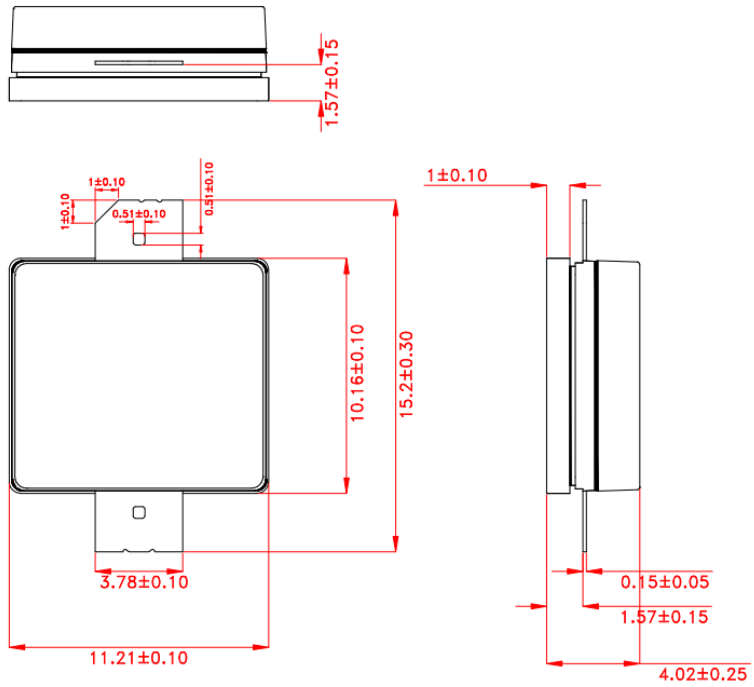


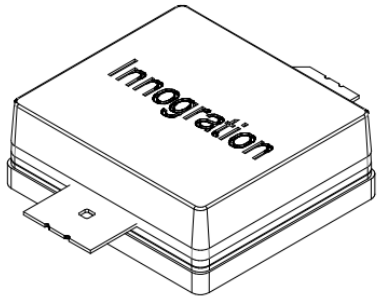
Figure 4: Picture and Bill of materials of application circuit

(Layout Gerber file upon request，30mils RO4350B)

Component	Description	Suggestion
C7	470uF/63V	
C5,C6	10uF	10uF/100V
C1,C2, C3, C4	3.9pF(MQ300805)	
R1	Chip Resistor,10Ω	0805
PCB	30mil Rogers 4350B	

Package Dimensions （Unit:mm）





Unit:mm

Tolerance ±0.10mm,Except as Noted.

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/7/23	V1.0	Preliminary Datasheet Creation

Application data based on YHG-25-26

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