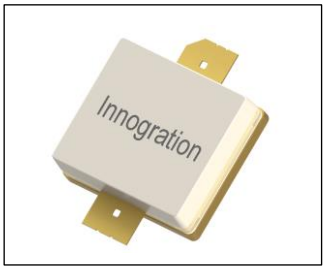
GaN HEMT 28V, HF-1.5GHz 65W, RF Power Transistor

Description



The STBH15065A2C is a 65W GaN HEMT, 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 class AB RF Performance with device soldered

  Vds=28V, Idq=100mA，CW

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
650	47.7	58.9	64.2	18.41	48.15	65.2	66.6
700	47.88	61.4	63.5	19.1	48.33	68.1	64.8
750	47.45	55.7	58.3	18.64	48.03	63.6	60.0
800	47.52	56.5	57.3	18.74	48.55	71.6	63.7
830	48.22	66.3	63.1	18.58	49	79.5	68.5
860	48.56	71.9	67.0	18.06	49.13	81.9	70.5

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}	+200	Vdc
Gate--Source Voltage	V_{GS}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	50	Vdc
Maximum gate current	Igs	16.8	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=30W	$R_{\theta JC}$	2.8	°C /W

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

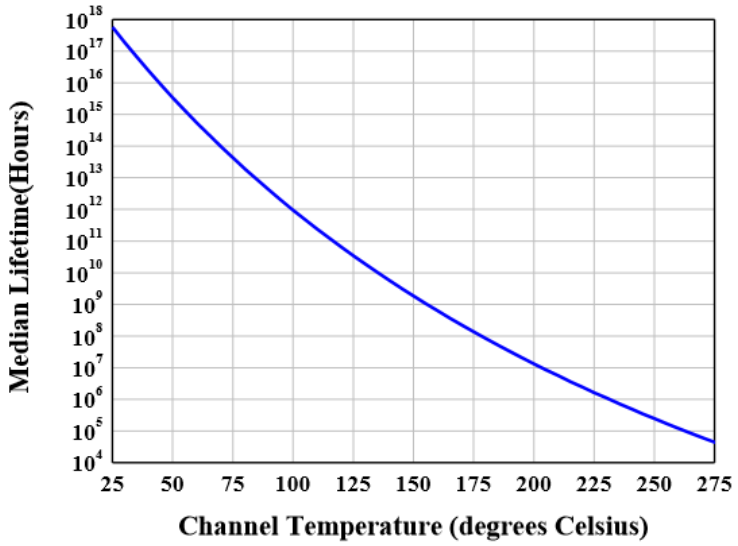
DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=16.8mA	V_{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 16.8mA	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	VDS =28V, IDS=100mA, Measured in Functional Test	$V_{GS(Q)}$		-3.3		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, Pout=65W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature



650-860MHz
Typical performance

Figure 3: Network analyzer output S11/S21

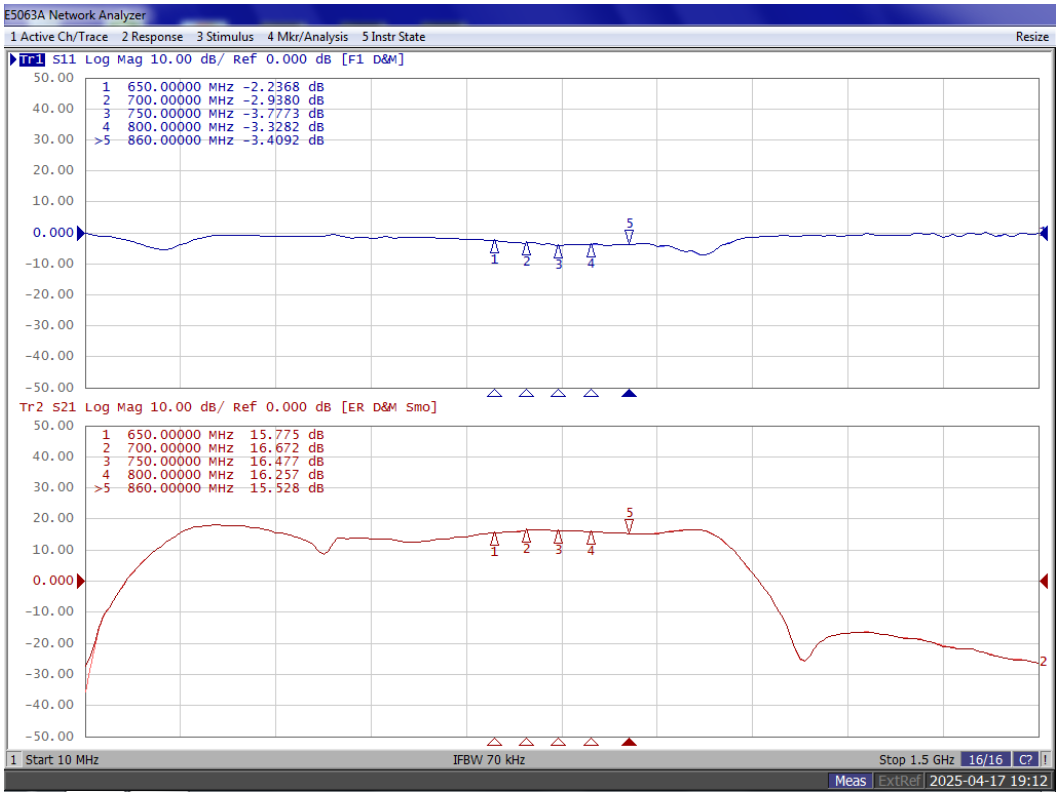
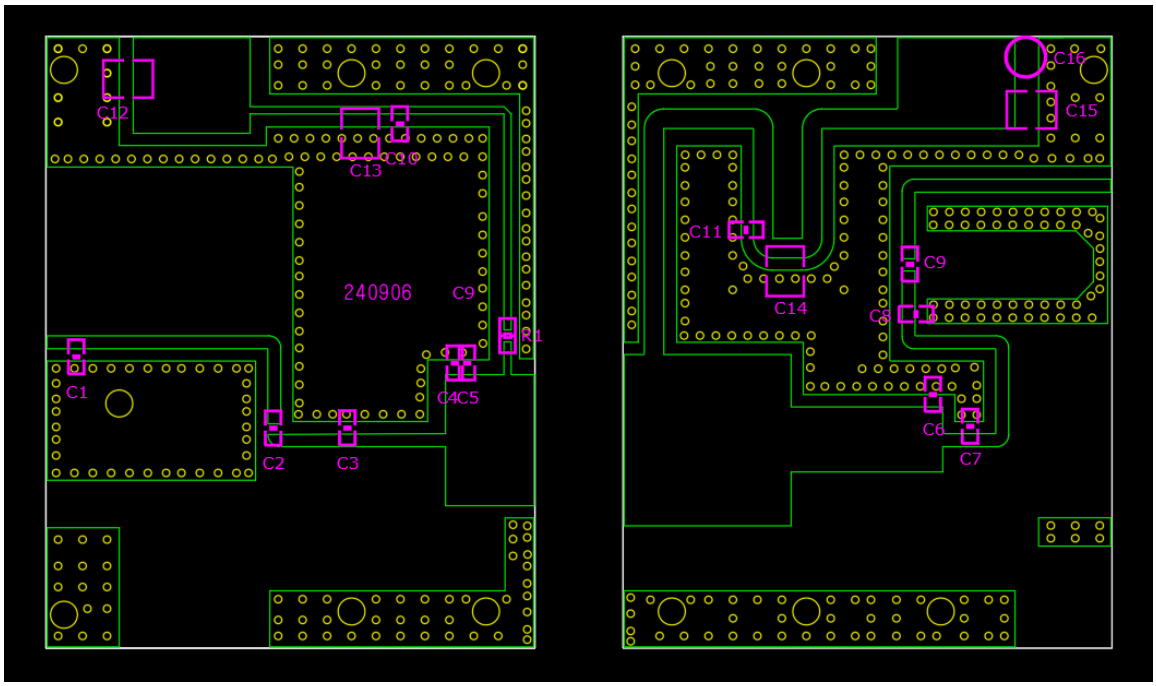
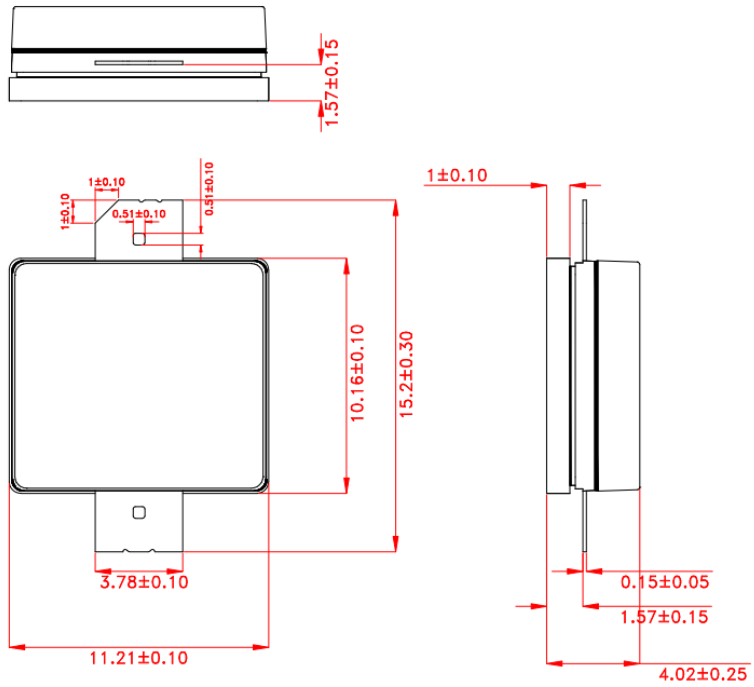


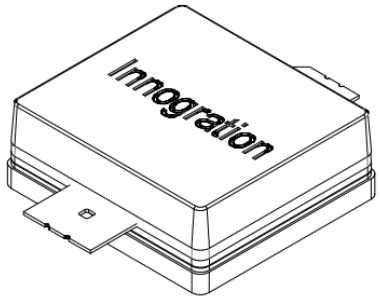
Figure 4: Picture of application board



Reference	Footprint	Value	Quantity
C1,	0805	2.4pF	1
C2	0805	36pF	1
C3	0805	15pF	1
C4	0805	6.8pF	1
C5	0805	15pF	1
C6	0805	2.2pF	1
C7	0805	0.3pF	1
C8	0805	3pF	1
C9、C10、C11	0805	120pF	3
C12、C13、C14、C15	1210	10uF/63V	4
C16		470uF/63V	1
R1	0603	10ohm	1
PCB	RO4350B	20mils	

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: ZYX-25-09

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