



GaN HEMT 50V, 300W, VHF/UHF Transistor

STCV10370A2C

Description

The STCV10370A2C is a single ended 370watt, GaN HEMT, ideal for 4G/5G or CW applications within UHF up to 1GHz. There is no guarantee of performance when this part is used outside of stated frequencies. It is mainly recommended to use it for narrower bandwidth CW application.

- Typical CW performance across **900-1000MHz** with device soldered

$V_{DD} = 48\text{ Vdc}$, $I_{DQ} = 100\text{mA}$, CW

Freq (MHz)	P2dB (dBm)	P2dB (W)	P2dB Eff (%)	P2dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
900	56.38	434.8	76.1	19.77	56.65	462.4	78.5
950	55.04	319.0	70.2	20.05	55.59	362.6	73.7
1000	54.61	289.3	73.4	19.03	55.18	330.0	77.2

Recommended driver: ITGV22010C6 (50V LDMOS)



Applications

- P band power amplifier
- 5G base station amplifier
- PIM test equipment

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}	55	Vdc
Maximum gate current	I_{gs}	47	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 $T_C = 25^\circ\text{C}$, at $P_d = 140\text{W}$,	$R_{\theta JC}$	1.2	°C /W

Table 3. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 47\text{mA}$	V_{DSS}		200		V



Gate Threshold Voltage	VDS =10V, ID = 47mA	V _{GS(th)}	-4	-3	-2	V
Gate Quiescent Voltage	VDS =50V, IDS=500mA, Measured in Functional Test	V _{GS(Q)}		-3.2		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1GHz, Pout=370W pulse CW for each path All phase, No device damages	VSWR		10:1		

900-1000MHz

Figure 2: Power Gain, Efficiency as function of Pout

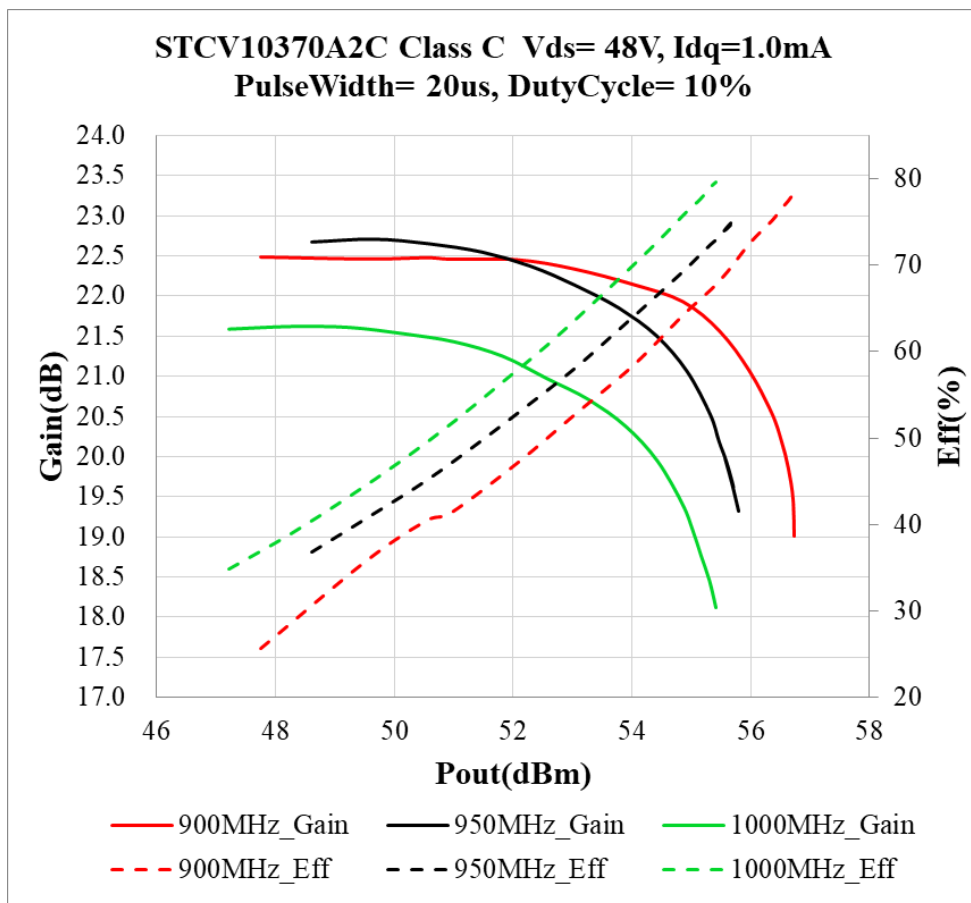




Figure 3: S11 / S21 output from network analyzer

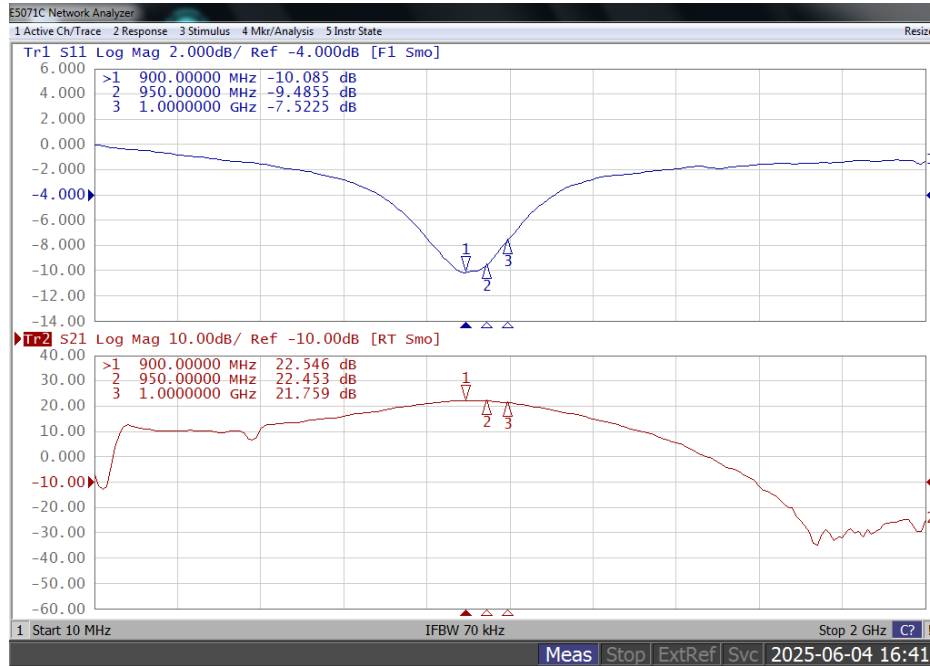


Figure 4: Picture of application board

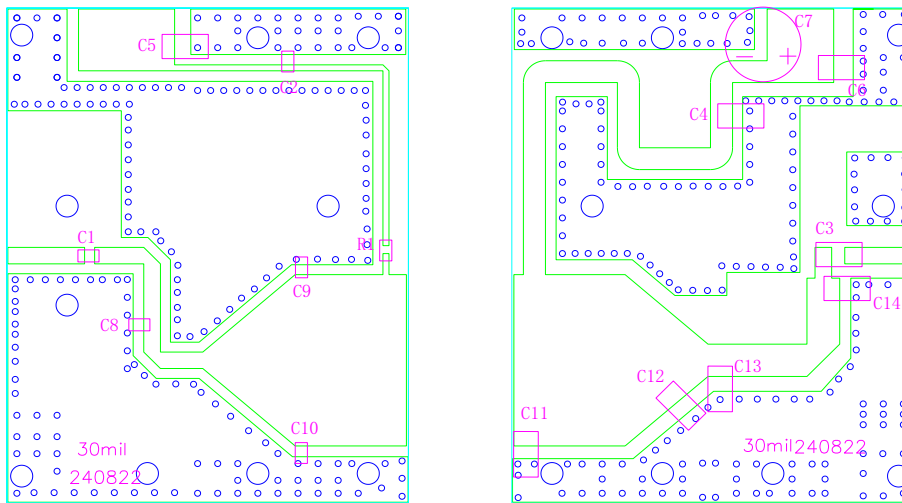
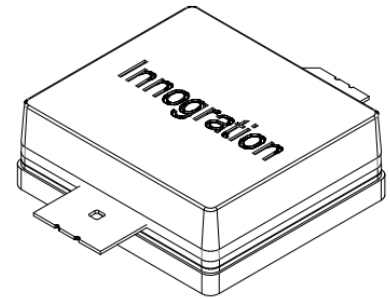
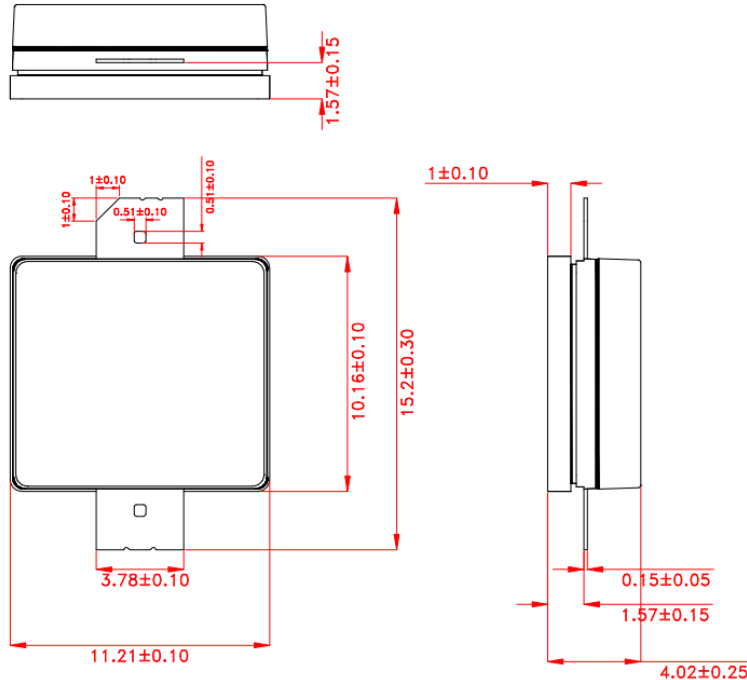


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)

Designator	Footprint	Comment	Quantity
C1	0603/0805	4.7pF	1
C2	0603/0805	47pF	1
C3, C4	1210	47pF	2
C5, C6	1210	10 uF/100V	2
C7		1000 uF/63V	1
C8	0805	2.0 pF	1
C9, C10	0603/0805	6.8 pF	2
C11	1210	5.6 pF	1
C12, C13, C14	1210	3.0 pF	3
R1	0603	10 Ω	1



Package Dimensions (Unit:mm)



Unit:mm

Tolerance ± 0.10 mm, Except as Noted.

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/6/5	V1.0	Preliminary datasheet creation

Application data based on: LSM-25-16

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