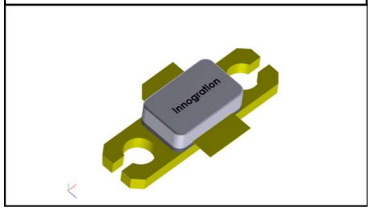
S3U6008V GaN TRANSISTOR

Document Number: S3U6008V
Preliminary Datasheet V1.0

Gallium Nitride 50V 80W, RF Power Transistor

S3U6008V



Description

The S3U6008V is a 80W single ended, input matched GaN HEMT, designed for multiple applications with frequencies up to 6GHz. In typical 2-6G broadband application, it can deliver 80W pulsed CW power.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical CW performance (on Innogration 2-6GHz class AB fixture with device soldered)

V_{ds} = 50V， V_{gs} = -3.27V， I_{dq} = 100mA, Signal mode: Pulse 100us,10%

Freq(GHz)	Pin(dBm)	Psat(dBm)	Psat(W)	Ids(A)	Gain(dB)	Eff(%)
2.0	41.0	49.6	90.8	0.32	8.6	56.6
2.2	41.0	49.7	92.3	0.34	8.7	54.4
2.4	41.0	49.6	90.8	0.39	8.6	46.7
2.6	41.0	49.7	92.5	0.40	8.7	46.6
2.8	41.0	49.4	87.3	0.41	8.4	42.6
3.0	41.0	49.0	80.2	0.43	8.0	37.3
3.2	41.0	49.3	85.1	0.44	8.3	39.0
3.4	41.0	49.0	79.4	0.42	8.0	37.8
3.6	41.0	49.9	97.7	0.51	8.9	38.3
3.8	41.0	50.0	100.0	0.47	9.0	42.3
4.0	41.0	50.1	102.3	0.48	9.1	42.6
4.2	41.0	50.1	102.3	0.48	9.1	43.1
4.4	41.0	50.0	98.9	0.49	9.0	40.7
4.6	41.0	49.4	86.1	0.48	8.4	35.9
4.8	41.0	49.4	86.1	0.50	8.4	34.4
5.0	41.0	49.3	85.1	0.53	8.3	32.1
5.2	41.0	49.4	86.5	0.49	8.4	35.3
5.4	41.0	49.3	84.7	0.48	8.3	35.7
5.6	41.0	49.1	80.4	0.50	8.1	32.1
5.8	41.0	49.6	90.2	0.45	8.6	40.1
6.0	41.0	49.2	82.6	0.43	8.2	38.4

Recommended driver：SMAV2060-30C9, or SMAV0160-25

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 (50V)
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	Vdc
Operating Voltage	V_{DD}	0 to 55	Vdc
Maximum forward gate current	Igf	10.5	mA
Storage Temperature Range	Tstg	-65 to +150	C
Case Operating Temperature	T_C	-55 to +150	C
Operating Junction Temperature	T_J	+225	C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 25°C, T_J=200°C, DC Power Dissipation, FEA	$R_{\theta JC}$	TBD	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}=10.5mA	V_{DSS}		200		V
Gate Threshold Voltage	V_{DS} = 50V, I_D = 10.5mA	V_{GS}(th)	-4		-2	V
Gate Quiescent Voltage	V_{DS} =50V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-3.27		V

2-6GHz broadband

Reference Circuit of Test Fixture Assembly Diagram

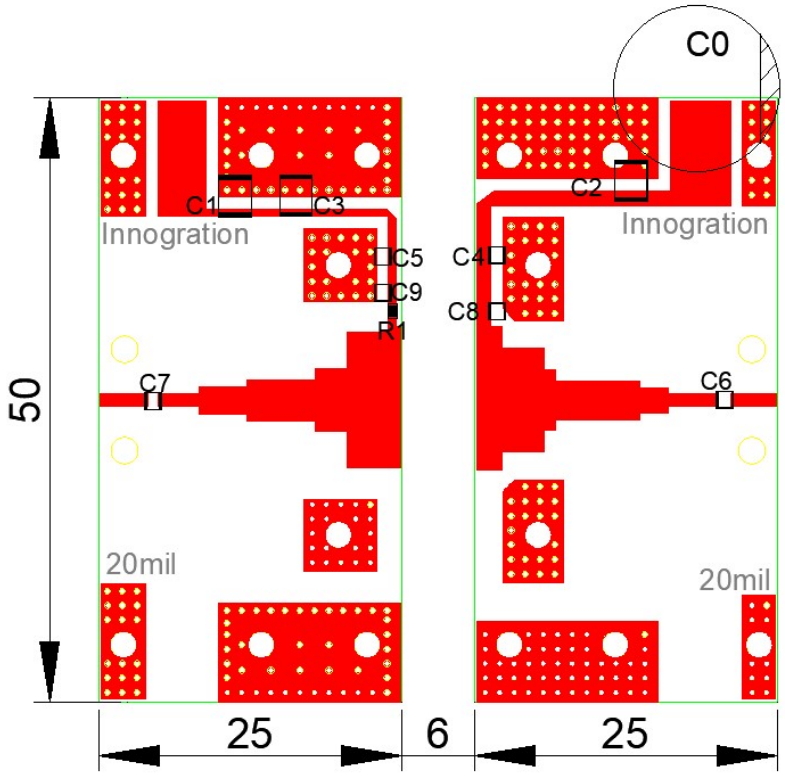
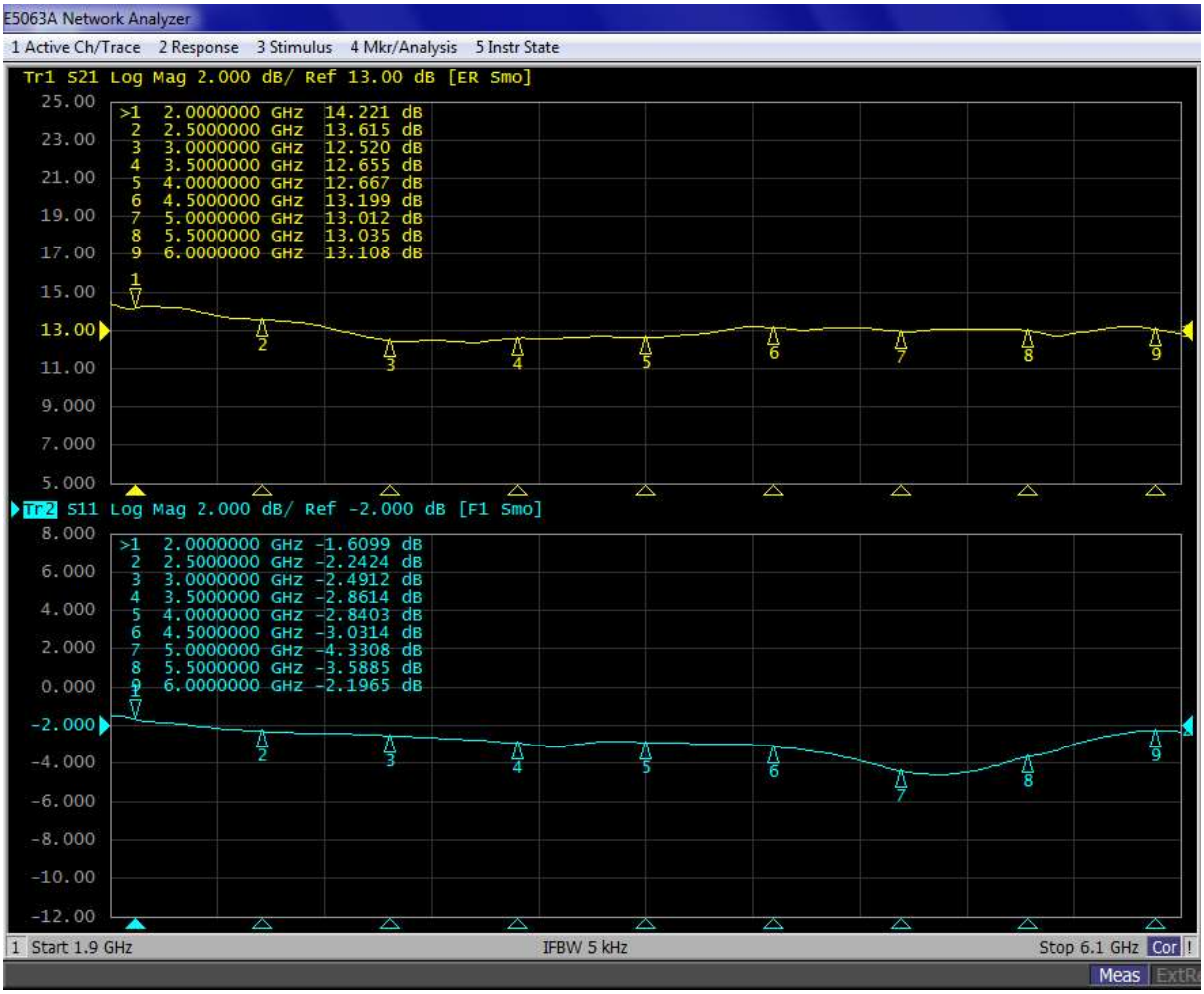


Figure 1. Test Circuit Component Layout (1800-4000MHz)

Table 4. Test Circuit Component Designations and Values

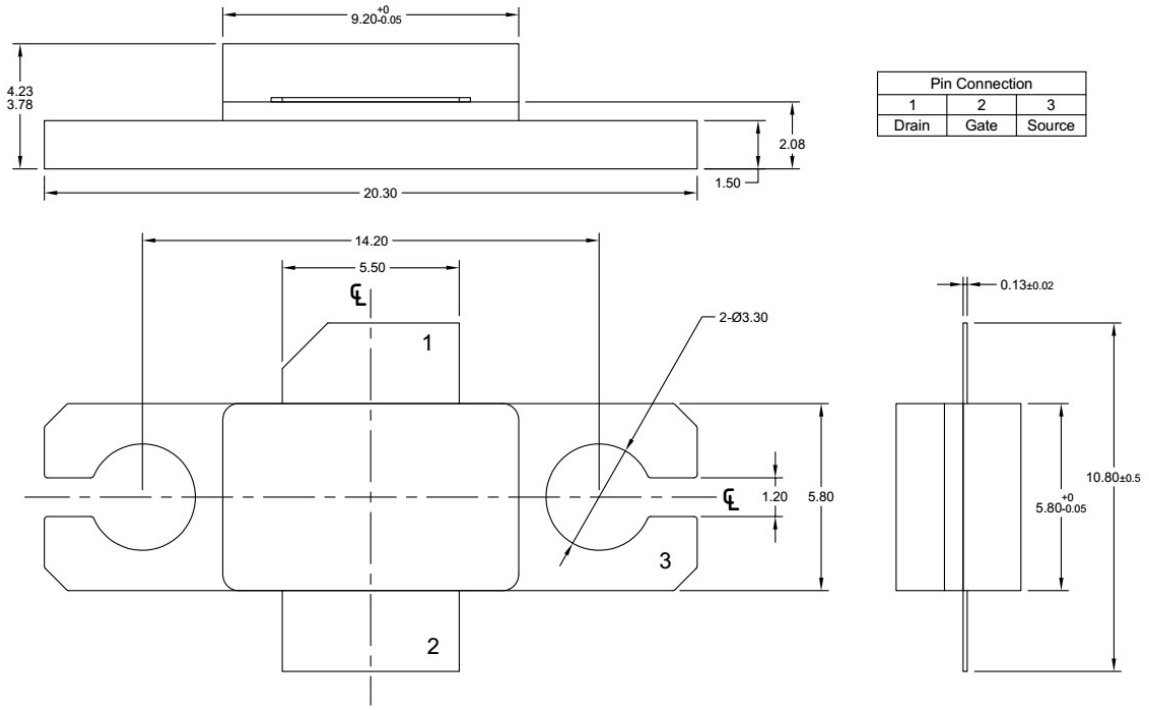
Component	Description	Suggestion
C0	1000uF	Electrolytic capacitors
C1, C2, C3	10uF	1210
C5, C7	5.1pF	Beijing YuanLu HongYuan Electronic Technology CO.,LTD MQ300805
C4, C6	3.9pF	Beijing YuanLu HongYuan Electronic Technology CO.,LTD MQ100505
C8, C9	100pF	Beijing YuanLu HongYuan Electronic Technology CO.,LTD MQ300805
R1	Chip Resistor,10Ω	0805
PCB	Rogers 4350b, thickness 20 mils, 1oz copper	

Figure 2. Network Analyzer result S11 and S21



Package Outline

Flanged ceramic package; 2 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-GXB					10/10/2017

Figure 1. Package Outline PKG-G2E

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2024/8/8	**V1.0**	**Preliminary Datasheet creation**

Application data based on RXT-24-37

Notice