



## Gallium Nitride 50V, 280W, DC-3GHz RF Power Transistor

### Description

The SL3028VS is a 280W, **single ended** GaN HEMT, designed for multiple applications with frequencies up to 3GHz. It is optimized thermally to support CW application.

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

- VDS=50V Vgs=-3.17V Idq=100mA on wideband application board with device soldered at different Pulsed conditions

Signal mode: Pulsed CW, **100us width, 10% duty cycle.**

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
700	54.73	297.2	56.8	22.13	55.34	342.4	60.0
750	54.55	285.1	62.0	23.03	55.79	379.2	70.2
800	54.24	265.5	63.8	21.81	55.64	366.2	72.9
850	53.4	219.0	61.2	21.37	55.06	320.4	69.9
900	52.65	184.1	56.2	21.88	54.22	264.5	60.1
950	53.45	221.6	60.1	21.72	55.16	328.2	69.8
1000	52.81	191.2	53.6	20.02	54.82	303.4	66.5

Signal mode: Pulsed CW, **300us width, 50% duty cycle.**

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
700	54.4	275.2	54.1	21.64	55.08	322.3	58.1
750	54.49	281.0	61.1	22.63	55.67	368.8	69.2
800	53.71	235.2	60.0	21.61	55.45	350.6	70.9
850	53.02	200.4	58.3	21.19	54.87	306.8	67.9
900	52.4	173.9	54.4	21.64	54.06	254.5	58.7
950	53.38	217.8	59.3	21.46	54.98	315.1	67.4
1000	52.56	180.3	52.1	19.9	54.62	289.7	64.8

### Applications

- L band power amplifier application
- P band power amplifier application
- S band power amplifier application

### 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

### SL3028VS

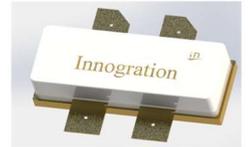
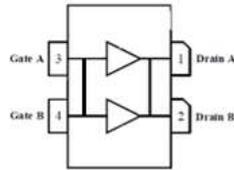


Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)



**\*Notice: Both leads at input and output are internally connected, device is only usable as single ended**

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	$V_{DD}$	32	Vdc
Maximum gate current	$I_{gs}$	36	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 $T_C = 85^\circ\text{C}$ , at $P_d = 120\text{W}$ ,	$R_{\theta JC}$	0.8	°C /W

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

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$ ; $I_{DS} = 36\text{mA}$	$V_{DSS}$		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$ , $I_D = 36\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$ , $I_{DS} = 100\text{mA}$ , Measured in Functional Test	$V_{GS(Q)}$		-3.2		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	50V 2GHz, $P_{out} = 280\text{W}$ pulsed CW, All phase, No device damages	VSWR		10:1		

Figure 2: Network analyzer output, S11 and S21

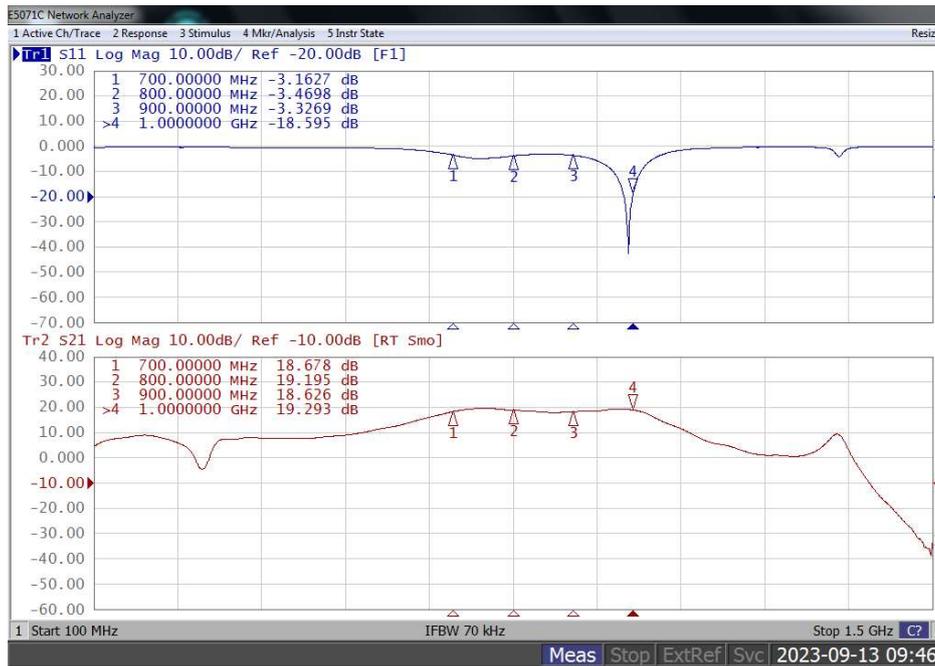


Figure 4: Picture of application board for 0.7-1GHz Class AB

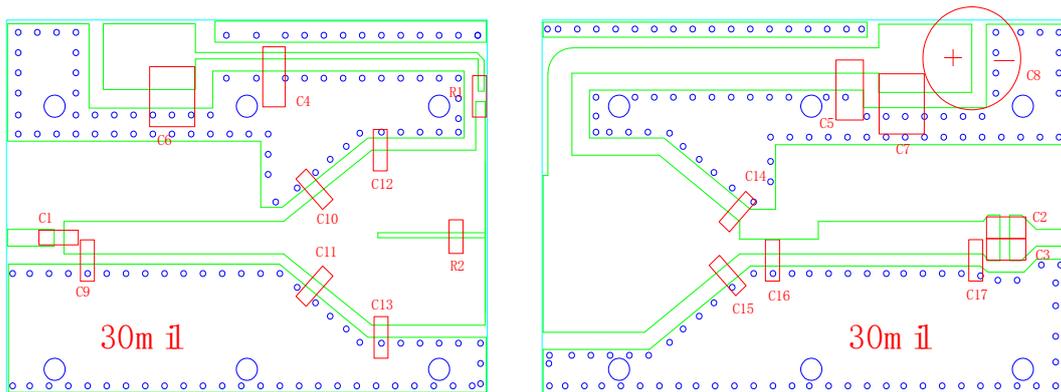
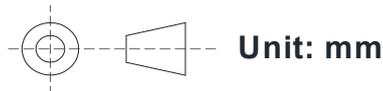
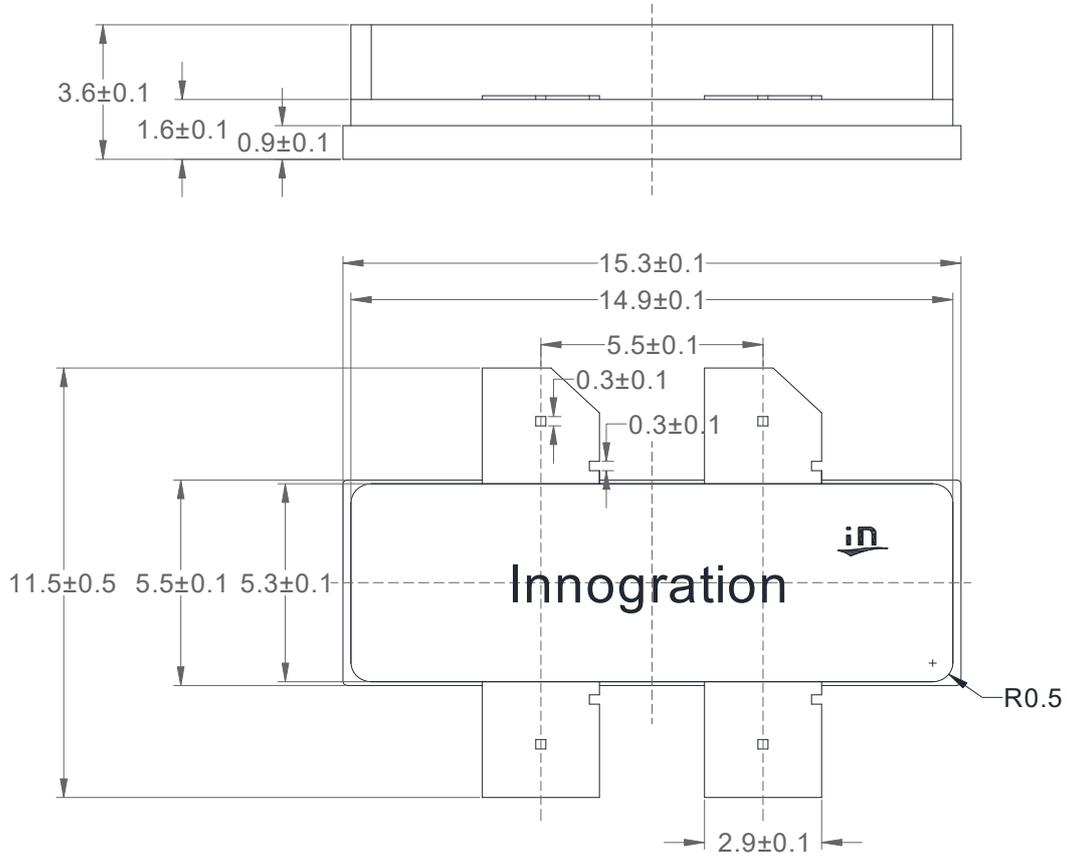


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 30Mils)

Designator	Footprint	Comment	Quantity
C1, C9, C14, C15, C16	0805	4.7pF	5
C2, C3, C4, C5	0805/1210	47pF	4
C6, C7	1210	10uF/100V	2
C8		220uF/63V	1
C10, C11, C12, C13	0805	10 pF	4
C17	0805	2.4pF	1
R1, R2	0603	10R	2
Designator	Footprint	Comment	Quantity



Earless Flanged Ceramic Package; 4 leads





## Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/9/13	V1.0	Production Datasheet Creation

Application data based on LSM-23-30

## Notice

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