SU1532V GaN TRANSISTOR

Document Number: SU1532V
Preliminary Datasheet V1.2

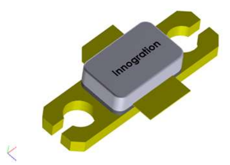
Gallium Nitride 50V 320W, RF Power Transistor

Description

The SU1532V is a 320W single ended GaN HEMT, designed for multiple applications with frequencies up to 1.5GHz.

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

SU1532V



• Typical performance (on Innogration narrow band production fixture with device soldered)

V_{DD}=50V I_{DQ}=145mA, CW

Freq(MHz)	Gp (dB)	P_{3dB}W)	Eff(%)
1300	17	320	78

- Typical performance (on fixture with device soldered)：V_{DD}=50V I_{DQ}=180mA,

Pulse CW, Pulse Width=100 us, Duty cycle=10% ,

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gp(dB)	Eff(%)
960	38.1	55.1	324	1.22	17	53
1030	38.1	55.2	331	1.2	17.1	55
1090	38.1	55.36	344	1.2	17.26	57
1150	38.3	55.6	363	1.08	17.3	67
1215	38.2	55.26	336	0.88	17.06	76

- Typical performance (on fixture with device soldered)：V_{DD}=50V I_{DQ}=180mA, CW

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gp(dB)	Eff(%)
1200	40.2	55.3	339	10.2	15.1	66.4%
1300	40	54.6	288	7.76	14.6	74.3%
1400	39.9	54.3	269	7.63	14.4	70.6%

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

SU1532V GaN TRANSISTOR

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+150	Vdc
Gate--Source Voltage	V_{GS}	-8 to 0	Vdc
Operating Voltage	V_{DD}	0 to 55	Vdc
Maximum forward gate current	Igf	39.6	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= 85°C, T_J=200°C, DC Power Dissipation, FEA	$R_{\theta JC}$	1	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}=39.6mA	V_{DSS}		150		V
Gate Threshold Voltage	V_{DS} = 50V, I_D = 39.6mA	V_{GS}(th)		-3.4		V
Gate Quiescent Voltage	V_{DS} =50V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-3.2		V

Functional Tests (In Innogration broadband Test Fixture, 50 ohm system) :V_{DD} = 50 Vdc, I_{DQ} = 100 mA, f = 1300 MHz, CW

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain @ P3dB	Gp		17		dB
Drain Efficiency@P3dB$_t$	Eff		65		%
3dB Compressed point	P3dB		320		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases(No device damage)	VSWR		10:1		Ψ

Reference Circuit of Test Fixture Assembly Diagram

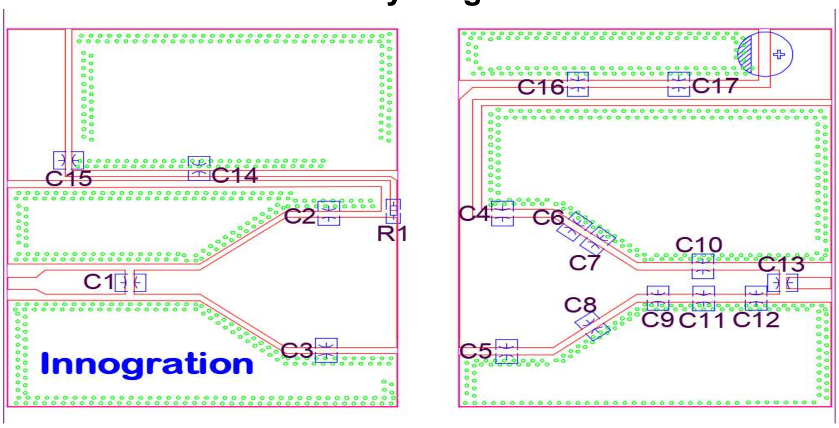


Figure 1. Test Circuit Component Layout (1300MHz) RO4350B 30mils

Table 4. Test Circuit Component Designations and Values

Part	description	Model
C1,C13,C14,C16	47pF	ATC800B
C2,C3	3.9pF	DLC70B
C4,C5	2pF	DLC70B
C6,C7,C8,C10	1.2pF	DLC70B
C9	1pF	DLC70B
C11	0.3pF	DLC70B
C12	0.5pF	DLC70B
C15,C17	10uF	10uF/50V
R1	12Ω	0805

Figure 2. Gain and Efficiency at 1300MHz, CW ,Vgs = -3.31V, VDS= 50V, IDQ = 145mA

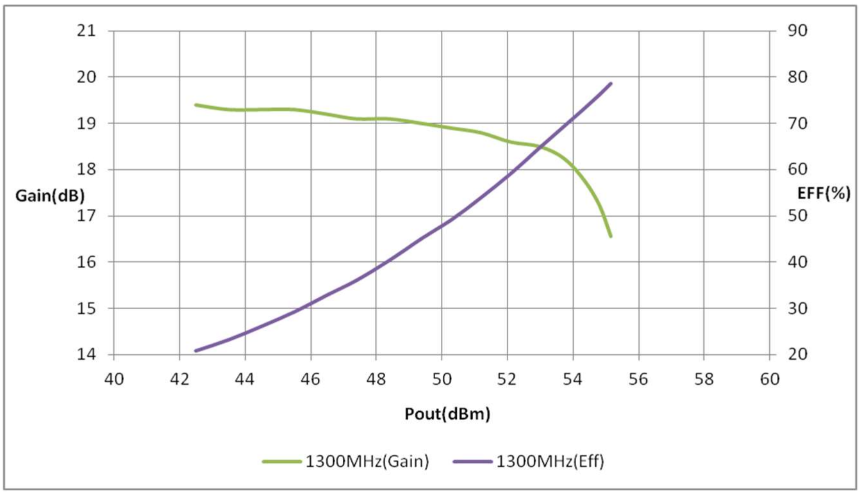
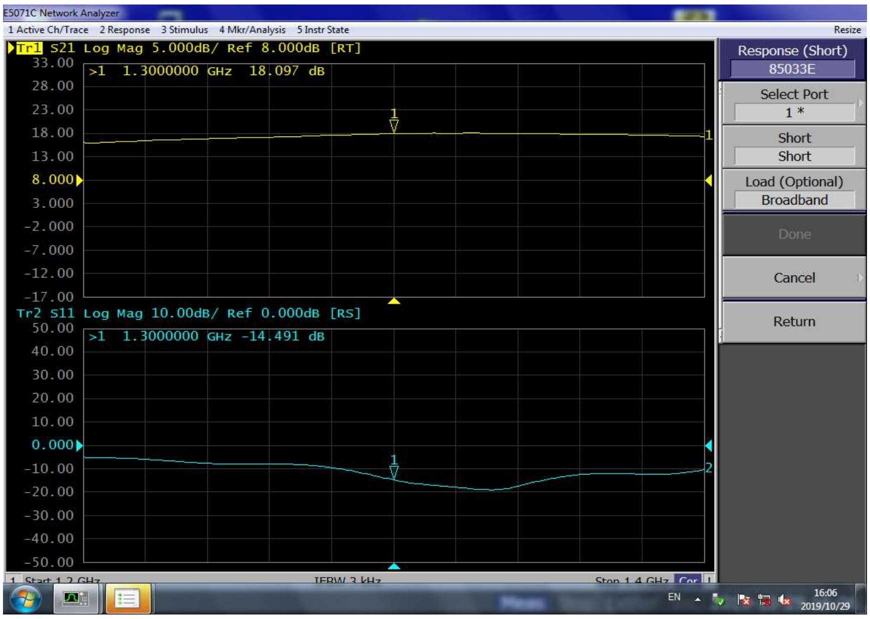
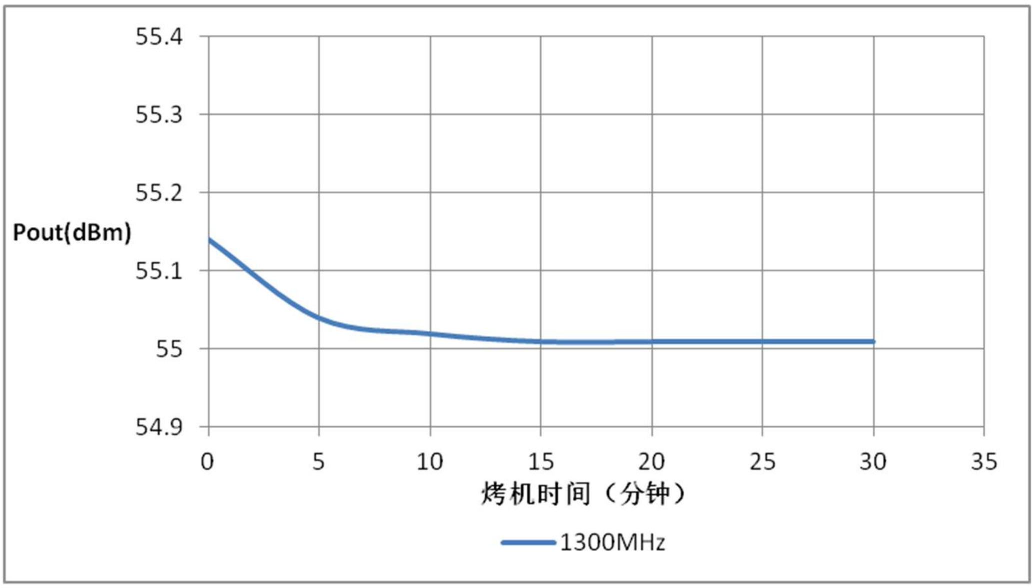


Figure 3. Network Analyzer result S11 and S21 Vgs = -3.31V, VDS= 50V, IDQ = 145mA



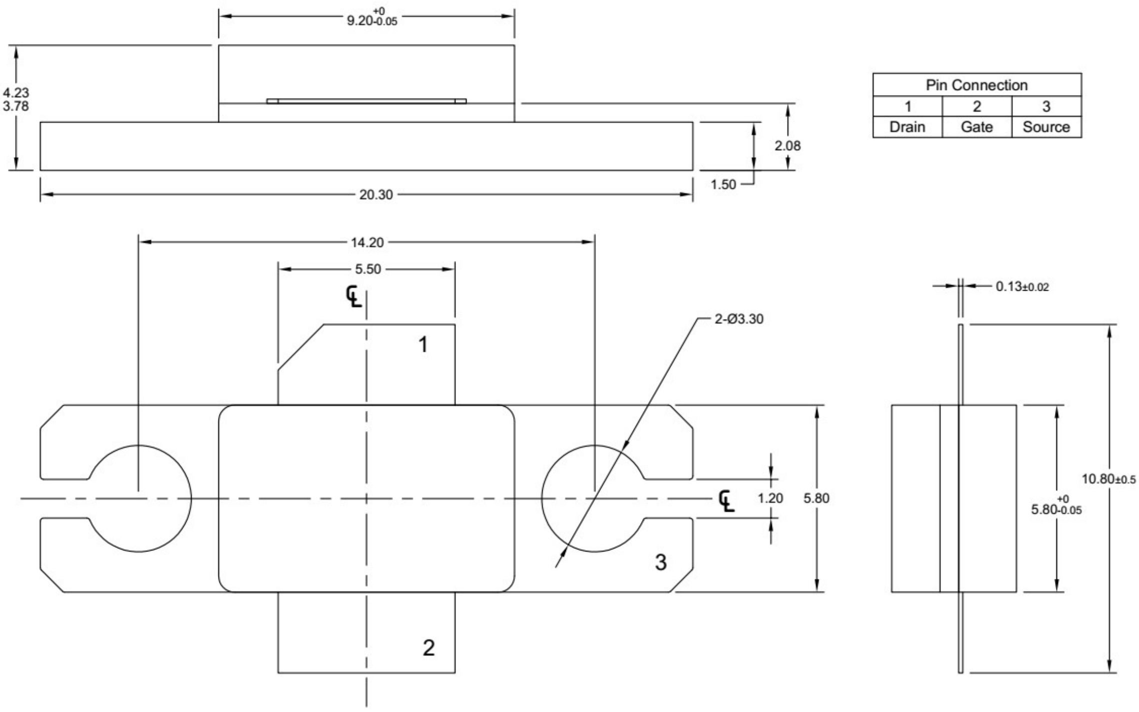
Subject to change without notice

Figure 3. Power drop over time in fanless cooling system



Package Outline

Flanged ceramic package; 2 leads



Unit：mm
Tolerances(unless specified)：x.x ±0.1
x.xx ±0.05

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
2020/6/25	V1.0	Preliminary Datasheet
2021/5/26	V1.1	Modify the typo of P3dB in Tab 3
2022/2/18	V1.2	Modify the typo of 120W on 1st page to 320W

Application data based on ZL-19-34/35, GZY-20-26

Notice

Specifications are subject to change without notice. Innogration believes the information within the data sheet to be reliable. Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.
“Typical” parameter is the average values expected by Innogration in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer’s technical experts for each application.
Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility.
For any concerns or questions related to terms or conditions, please check with Innogration and authorized distributors