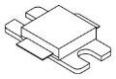
Gallium Nitride 28V 100W, RF Power Transistor

GTAH35101A2

GTAH35101A2E



Description

The GTAH35101A2 is a 100W internally matched, GaN HEMT, designed for multiple application especially LTE/LTE-A from 2700 to 3800MHz.

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

- Typical performance (on fixture with device soldered):

V_{DD}=28V I_{DQ}=350mA, Test signal: WCDMA, 3GPP test model 1; 1 to 64 DPCH; Channel Bandwidth=3.84MHz,PAR =10.5 dB at 0.01 % probability on CCDF.

Frequency (MHz)	P_{AVG}=16W					P_{AVG}=25W				
	Gp (dB)	η_D (%)	$ACPR_{5MHz}$ (dBc)	CCDF (dB)	P_{peak} (W)	Gp (dB)	η_D (%)	$ACPR_{5MHz}$ (dBc)	CCDF (dB)	P_{peak} (W)
3100	13.1	31.8	-35.2	8.0	100	12.6	38.2	-32.5	6.6	114
3200	13.5	28.2	-37.7	8.3	107	13.1	34.6	-34.0	7.0	126
3300	13.1	27.3	-38.0	8.2	104	12.6	33.4	-33.6	6.8	118
3400	13.7	26.3	-40.7	8.9	121	13.4	32.4	-37.1	7.7	146
3500	14.2	25.9	-38.5	9.0	127	13.9	31.2	-36.6	7.8	150
3600	14.2	26.0	-34.3	8.8	121	13.9	32.0	-32.9	7.3	134

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 (28V)
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}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current @ TC = 25°C	Igmax	27	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C

Operating Junction Temperature(See not2 1)	T_J	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	Pdiss	125	W

Note: 1. Continuous operation at maximum junction temperature will affect MTTF
2.Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, RF CW operation	$R_{\theta JC}$	1.44	C/W

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

DC Characteristics

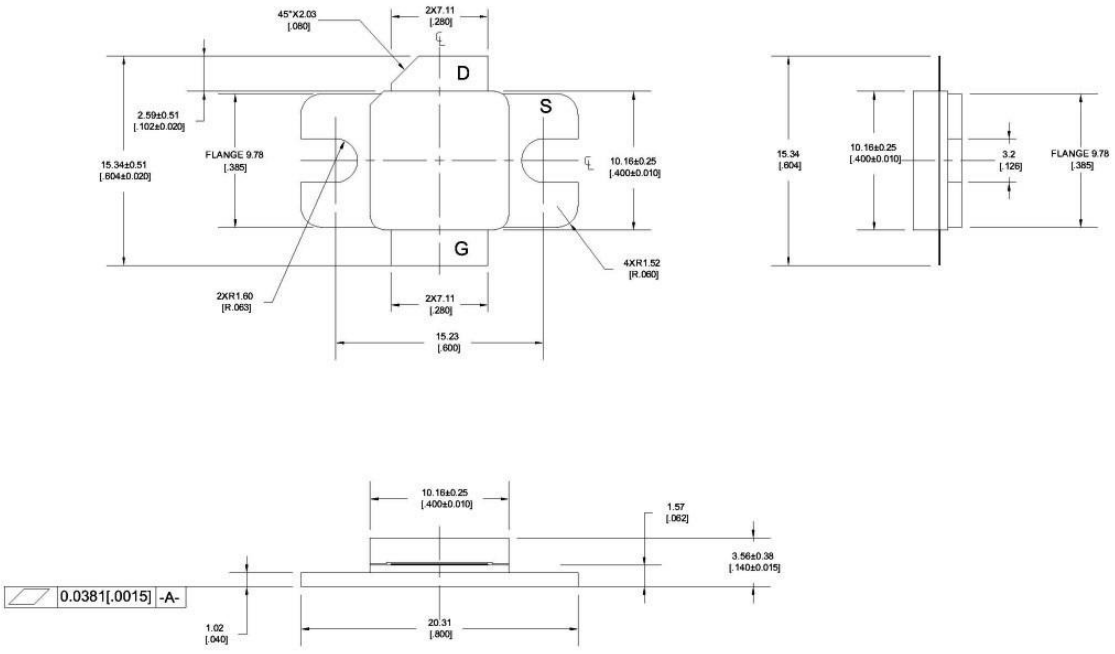
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=27mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D = 27mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=100mA, Measured in Functional Test	$V_{GS(Q)}$		-2.47		V

Functional Tests (In 3.4-3.6GHz Production fixture, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 350 mA, f = 3500 MHz, WCDMA signal, Pout=20W

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		14		dB
Drain Efficiency @ P_{out}	Eff		34		%
Saturated Power by CCDF Test	P_{SAT}	100			W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Package Outline

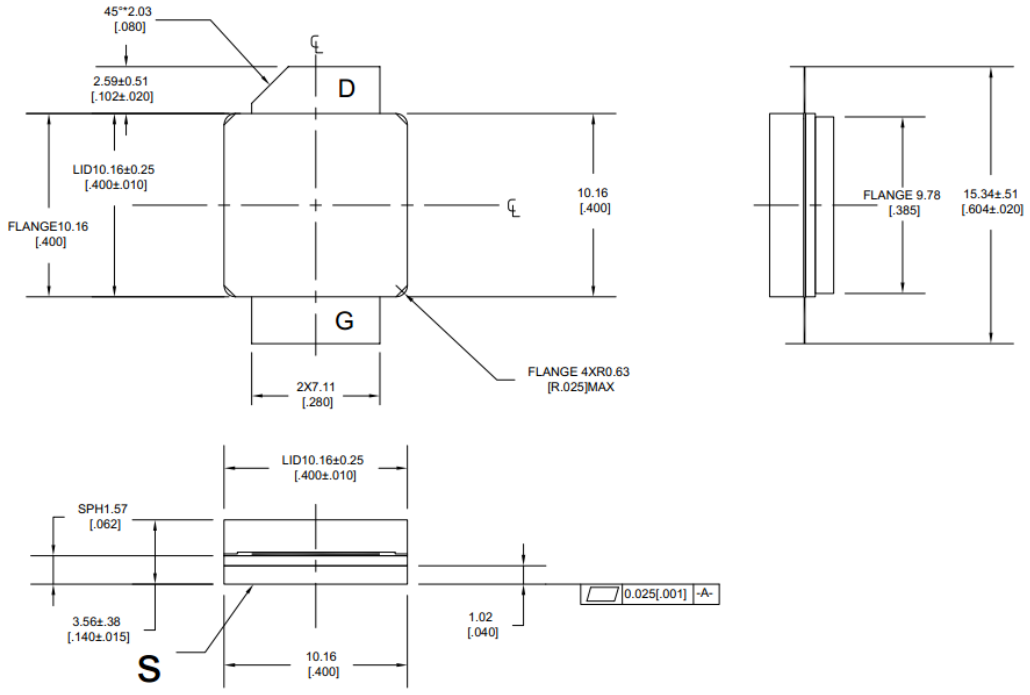
Eared Flanged ceramic package; 2 leads (A2E)



Unit：mm [inch]

Tolerance .xx +/- 0.01 .xxx +/- 0.005 inches

Earless Flanged ceramic package; 2 leads (A2)



Unit：mm [inch]

Tolerance .xx +/- 0.01 .xxx +/- 0.005 inches

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2017/6/16	V1.0	Preliminary Datasheet Creation
2017/6 /20	V1.1	Maximum rating modified, function test condition modified
2017/7/27	V1.2	Maximum rating modified, function test data modified

Notice