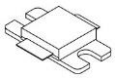
Gallium Nitride 28V 120W, RF Power Transistor

GTAH27120A2

GTAH27120A2E



Description

The GTAH27120A2 is a 120W internally matched, GaN HEMT, designed for multiple application especially MC-GSM/WCDMA/LTE, from 1800 to 2700MHz

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

- Typical performance (on wide band fixture with device soldered)

V_{DD}=28V I_{DQ}=1200mA, 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)	$P_{L(AV)}$ (W)	Gp (dB)	η_D (%)	$ACPR_{5M}$ (dBc)
1800	10	16.9	22.0	-42.4
1900	10	17. 7	21.6	-41.5
2000	10	18.8	22.9	-41.2
2100	10	18.8	21.5	-41.3
2200	10	18.3	22.0	-40.6
2300	10	18.0	21.3	-41.7
2400	10	17.8	20.1	-43.2
2500	10	18.3	20.3	-41.2
2600	10	18.3	21.1	-40.4
2700	10	17.4	23.5	-40.1

- Typical performance (on narrow band fixture with device soldered)

V_{DD}=32V I_{DQ}=340mA, CW.

Frequency(MHz)	Gp (dB)	P_{SAT}(W)	Efficiency (%)
2400	16.2	181	63
2450	16.5	174	64
2500	16.4	165	65

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	RθJC	1.44	C/W

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

DC Characteristics

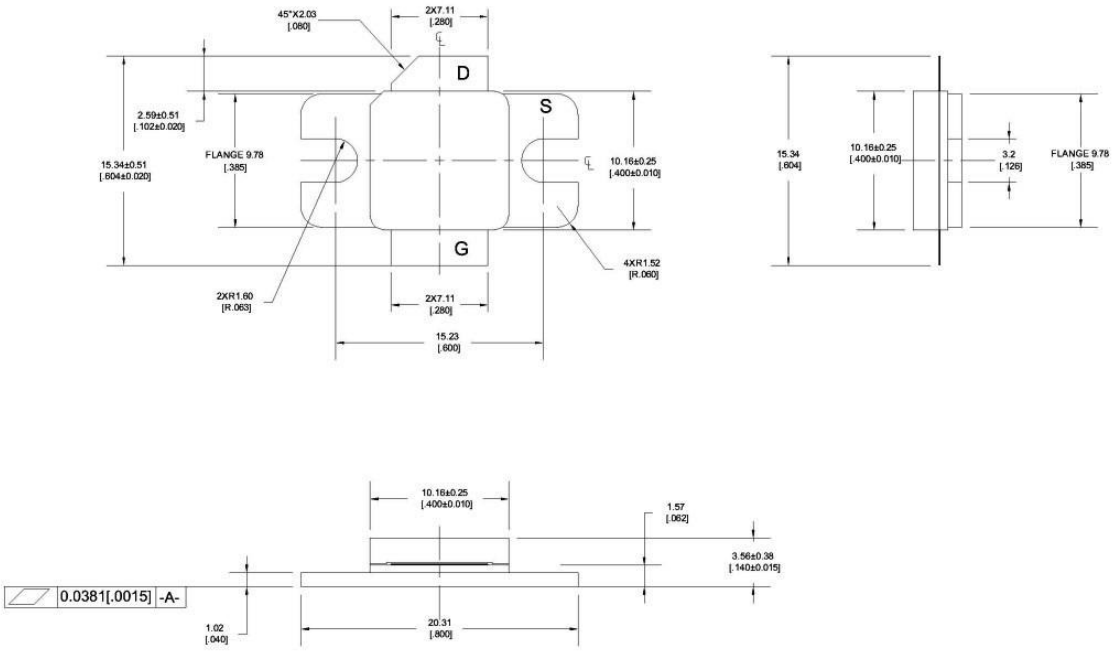
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=27mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D = 27mA	V_{GS}(th)		-2.7		V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=1200mA, Measured in Functional Test	$V_{GS(Q)}$		-2.31		V

Functional Tests (In 2.3-2.7GHz Production fixture, 50 ohm system) :V_{DD} = 28 Vdc, I_{DQ} = 1200 mA, f = 2500 MHz, WCDMA signal, Pout=24W

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	Gp		17		dB
Drain Efficiency @ P_{out}	Eff		37		%
Saturated Power by CCDF test	P_{SAT}	120			W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		Ψ

Package Outline

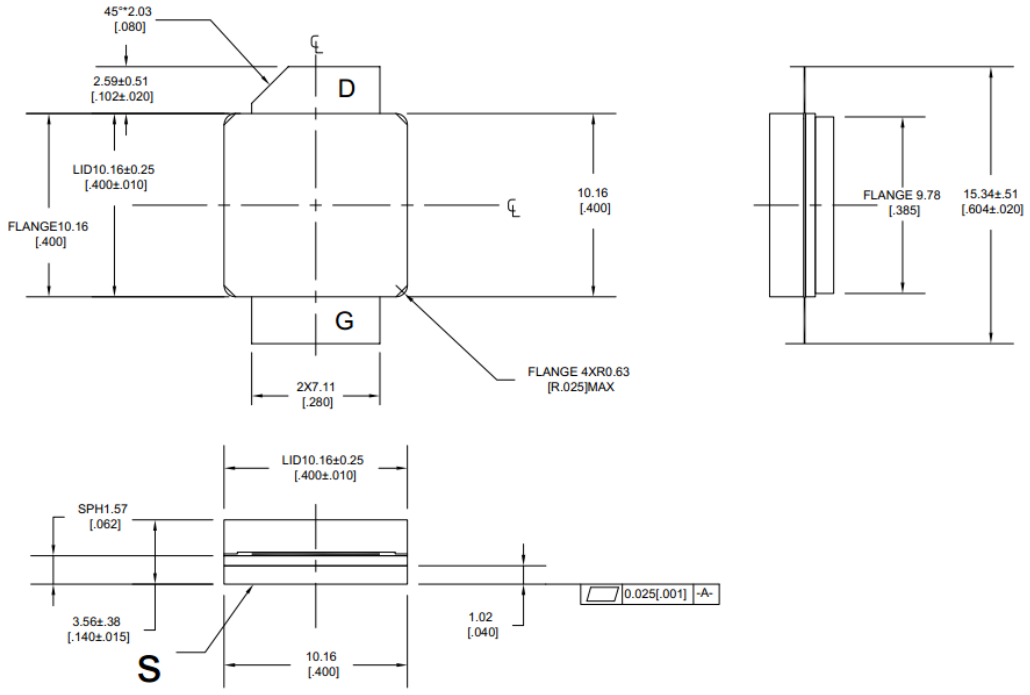
Eared Flanged ceramic package; 2 leads (A2E)



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
2017/5/27	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