

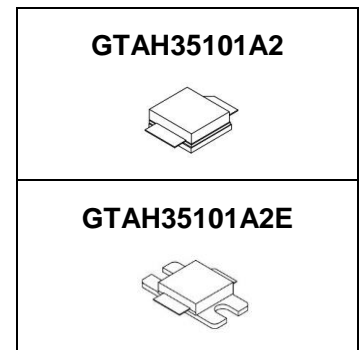


# Gallium Nitride 28V 100W, RF Power Transistor

## Description

The GTAH35101A2 is a 100W internally matched, GaN HEMT, designed for LTE/LTE-A and pulse application from 3100 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)	$\eta_{D}$ (%)	ACPR <sub>5MHz</sub> (dBc)	CCDF (dB)	$P_{peak}$ (W)	Gp (dB)	$\eta_{D}$ (%)	ACPR <sub>5MHz</sub> (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 @ $T_C = 25^{\circ}C$	$I_{gmax}$	27	mA
Storage Temperature Range	$T_{stg}$	-65 to +150	$^{\circ}C$
Case Operating Temperature	$T_C$	+150	$^{\circ}C$



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

Note: 1. Continuous operation at maximum junction temperature will affect MTF  
2. Bias Conditions should also satisfy the following expression:  $P_{diss} < (T_J - T_C) / R_{JC}$  and  $T_C = T_{case}$

**Table 2. Thermal Characteristics**

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

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

**DC Characteristics**

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

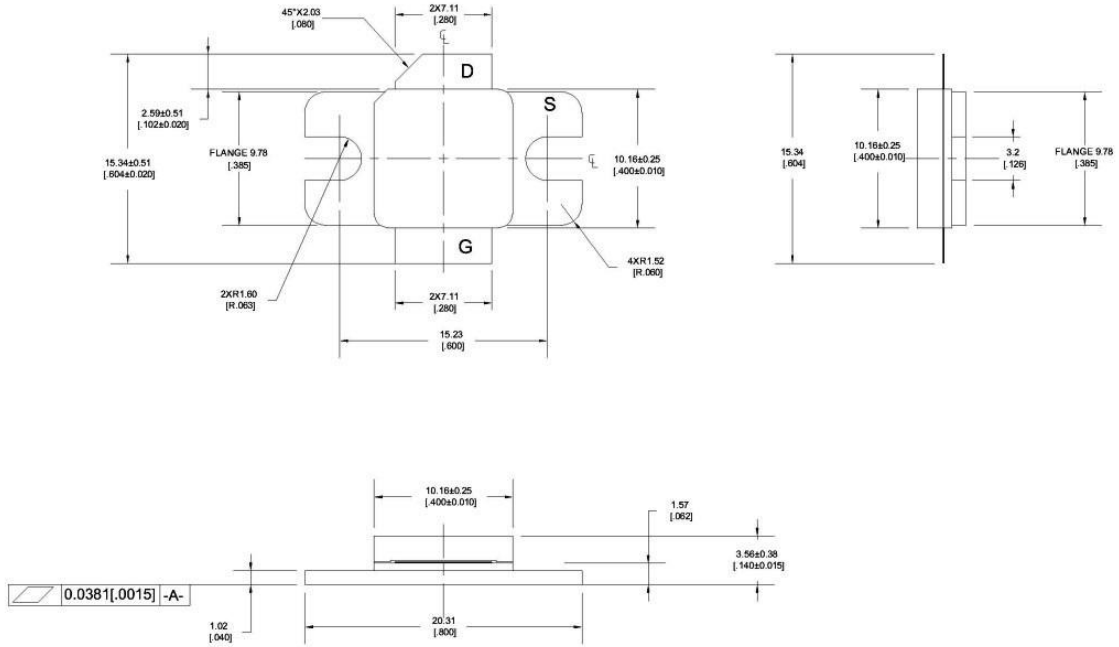
**Functional Tests (In 3.4-3.6GHz Production fixture, 50 ohm system)** :  $V_{DD} = 28\text{Vdc}$ ,  $I_{DQ} = 350\text{mA}$ ,  $f = 3500\text{MHz}$ , WCDMA signal,  
 $P_{out} = 20\text{W}$

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	$G_p$		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

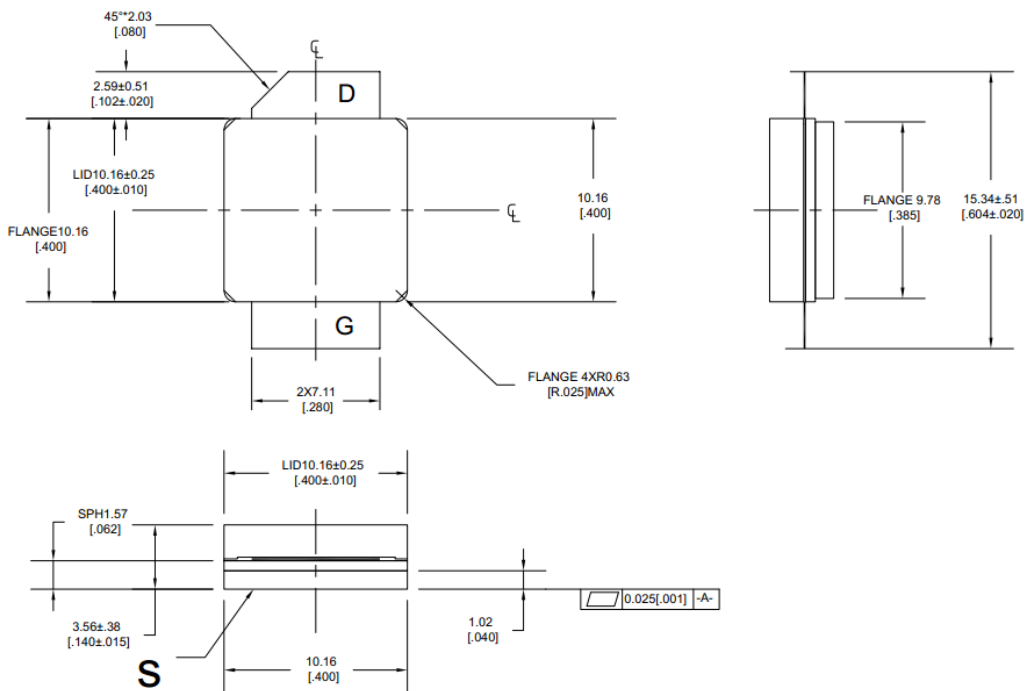
#### Eared Flanged ceramic package; 2 leads (A2E)



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
2018/8/4	V1.3	Modification of band supported according to output match

### Notice

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