



Gallium Nitride 28V 100W, RF Power Transistor

Description

The GTAH35100A2 is a 100W internally matched, GaN HEMT, designed for multiple applications especially LTE/LTE-A from 3600 to 4200MHz..

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

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

$V_{DD}=28V$ $I_{DQ}=400mA$, Pulse CW, Pulse width=20uS, Duty cycle=20%.

Frequency (MHz)	Gp (dB)	P_{1dB} (W)	η_D (%)	P_{SAT} (W)	η_D (%)
3600	12.0	93	45	128	52
3700	12.6	96	53	129	59
3800	12.6	81	56	111	61

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

$V_{DD}=28V$ $I_{DQ}=400mA$, 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)	$P_{AVG}=20W$					$P_{AVG}=25W$				
	Gp (dB)	η_D (%)	ACPR _{5MHz} (dBc)	CCDF (dB)	P_{peak} (W)	Gp (dB)	η_D (%)	ACPR _{5MHz} (dBc)	CCDF (dB)	P_{peak} (W)
3600	11.0	24.7	-38.0	8.0	125	10.8	27.4	-35.7	7.4	135
3700	11.9	28.8	-37.8	8.0	127	11.7	32.0	-35.6	7.3	134
3800	11.8	32.4	-36.0	7.6	116	11.6	35.8	-34.0	6.9	122

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

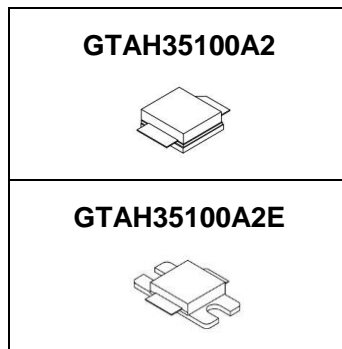
1. Set VGS to the pinch-off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

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 @ $T_C = 25^{\circ}\text{C}$	I_{gmax}	27	mA
Storage Temperature Range	T_{stg}	-65 to +150	$^{\circ}\text{C}$
Case Operating Temperature	T_C	+150	$^{\circ}\text{C}$
Operating Junction Temperature(See note 1)	T_J	+200	$^{\circ}\text{C}$
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 MTTF

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	$V_{DS} = 28\text{V}$, $I_{DS} = 400\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.47		V

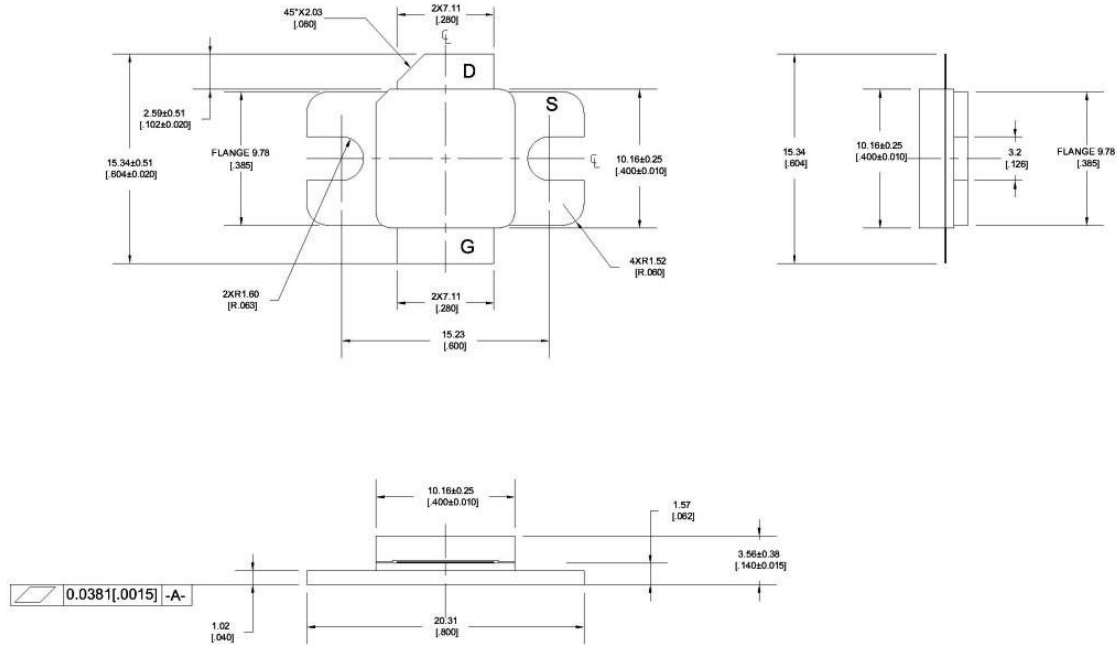
Functional Tests (In 3.6-3.8GHz Production Fixture, 50 ohm system) : $V_{DD} = 28\text{Vdc}$, $I_{DQ} = 400\text{mA}$, $f = 3800\text{MHz}$, WCDMA Signal,
 $P_{out} = 20\text{W}$

Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain	G_p		12		dB
Drain Efficiency @ P_{out}	Eff		28		%
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

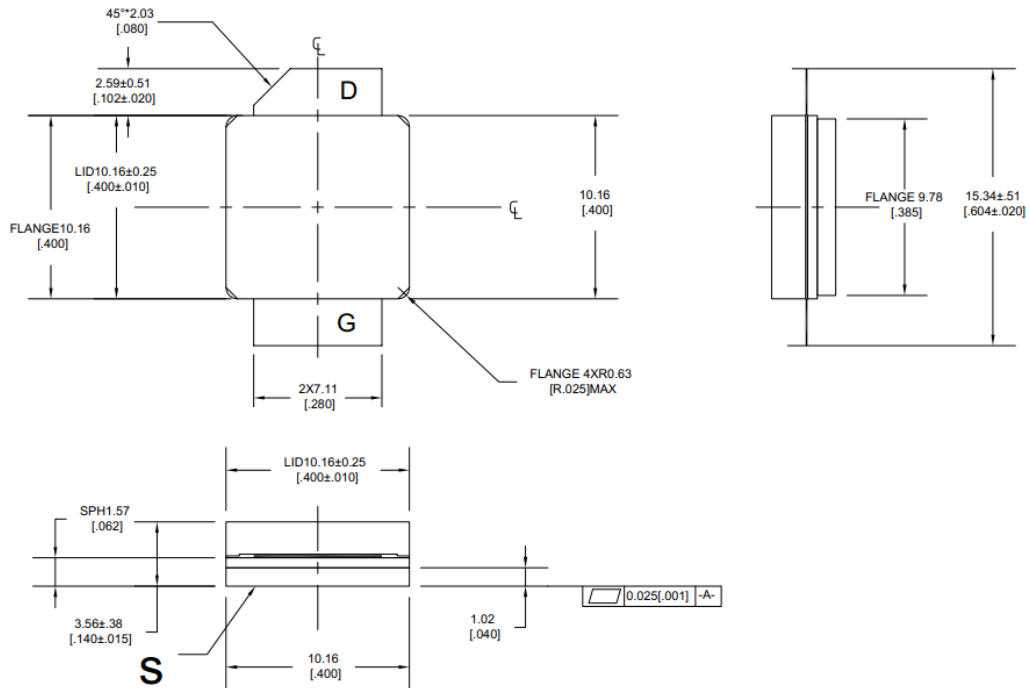


Package Outline

Eared Flanged ceramic package; 2 leads (A2E)



Earless Flanged ceramic package; 2 leads (A2)





Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2017/5/18	V1.0	Preliminary Datasheet Creation
2017/6/20	V1.1	Preliminary Datasheet
2017/7/27	V1.2	Maximum rating modified, function test condition modified

Notice

Specifications are subject to change without notice. Innogrations believes the information within the data sheet to be reliable. Innogrations makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innogrations 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.

Innogrations 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 Innogrations 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 Innogrations and authorized distributors

Copyright © by Innogrations (Suzhou) Co.,Ltd.