



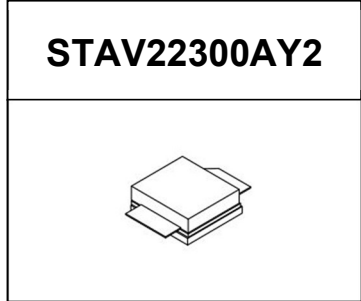
Gallium Nitride 50V, 300W, 1.8-2.2GHz RF Power Transistor

Description

The STAV22300AY2 is an input matched, single ended 300watt, GaN HEMT, ideal for 5G applications from 1.8 to 2.2GHz.

There is no guarantee of performance when this part is used outside of stated frequencies.

- WCDMA 3GPP TM1 64 DPCH 9.9 dB PAR @ 0.01% CCDF. VDS = 50 V, IDQ = 300 mA, (On innegration Class AB application board with device soldered)



Freq (MHz)	47dBm			47.5dBm		
	ACPR(dBc)	G(dB)	Eff(%)	ACPR(dBc)	G(dB)	Eff(%)
2110	-37.76	17.72	32.63	-36.64	17.67	34.38
2140	-37.08	17.88	34.20	-35.79	17.82	36.02
2170	-35.95	17.87	35.80	-34.73	17.81	37.55

Applications

- Sub-2GHz pulse or CW amplifier
- 5G base station amplifier
- Doherty power amplifier

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
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

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)

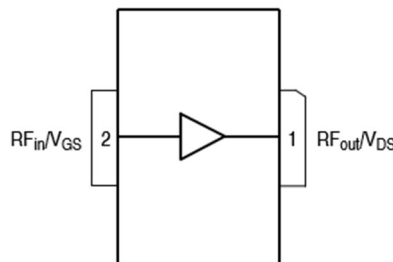


Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+200	Vdc
Gate--Source Voltage	V _{GS}	-8 to +0.5	Vdc
Operating Voltage	V _{DD}	55	Vdc
Maximum gate current	I _{gs}	36	mA



Storage Temperature Range	T _{stg}	-65 to +150	°C
Case Operating Temperature	T _c	+150	°C
Operating Junction Temperature	T _J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA T _c = 85°C, at Pd=80W	R _{θJC}	TBD	°C /W

Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)

DC Characteristics (Each path, measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{GS} =-8V; I _{DS} =36mA	V _{DSS}		200		V
Gate Threshold Voltage	V _{DS} =10V, I _D = 36mA	V _{GS(th)}	-4		-2	V
Gate Quiescent Voltage	V _{DS} =50V, I _{DS} =300mA, Measured in Functional Test	V _{GS(Q)}		-3.14		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.14GHz, P _{out} =300W pulse CW for each path All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature

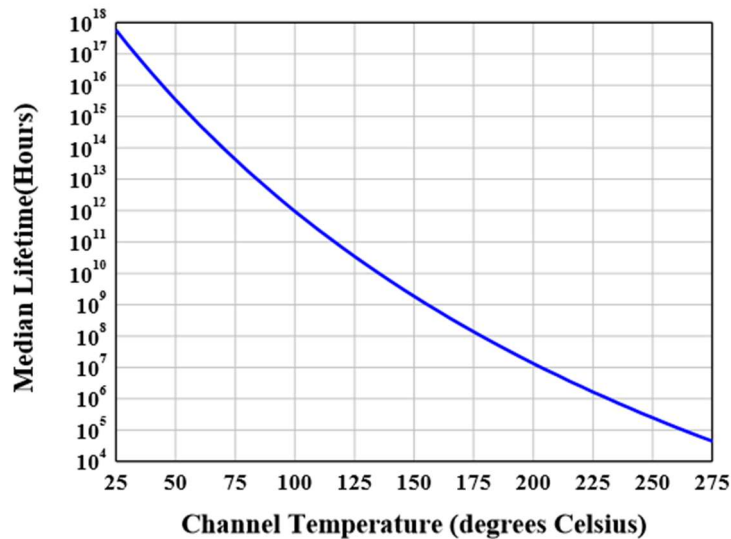




Figure 3: Efficiency and power gain as function of Pout

(VDD = 50Vdc, IDQ = 300 mA, Pulse width=20us, duty cycle=10%)

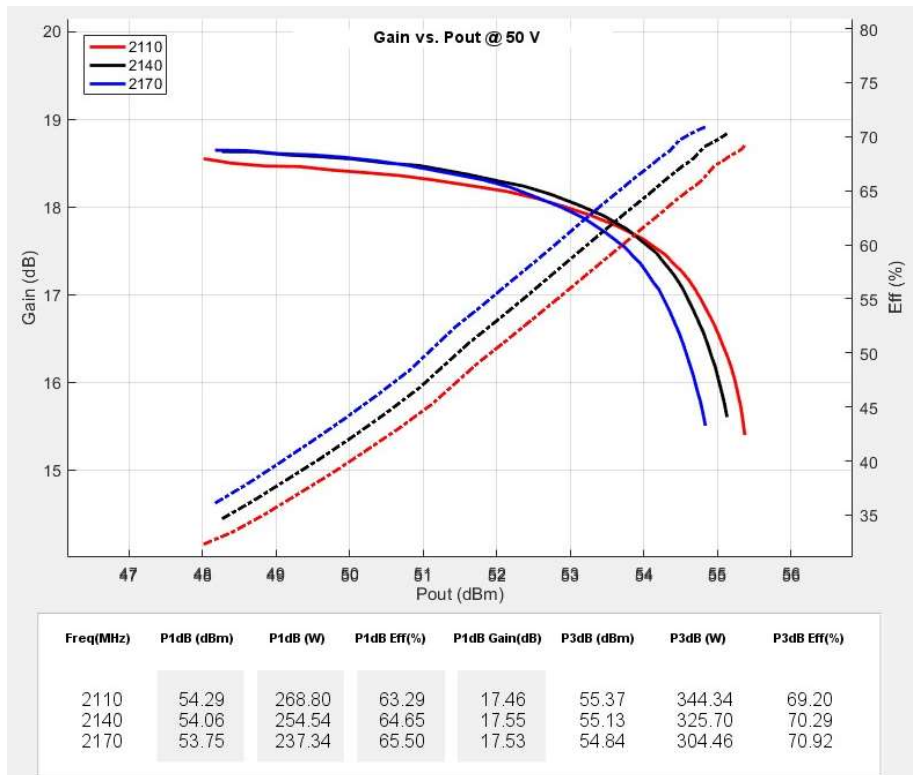


Figure 4: S11 / S21 output from network analyzer

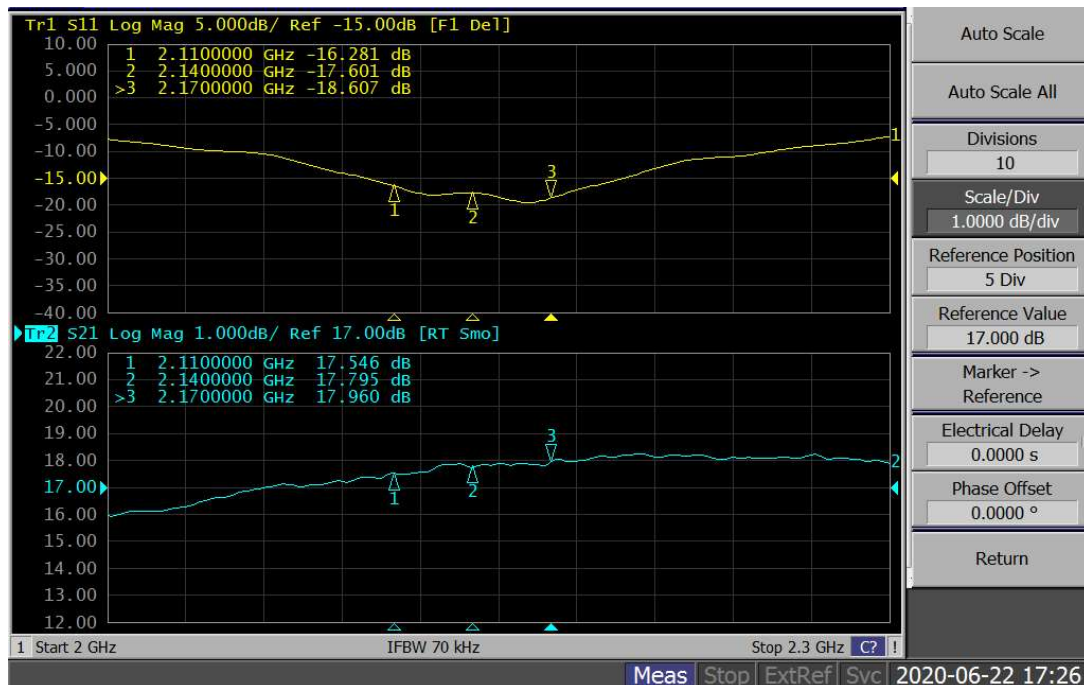
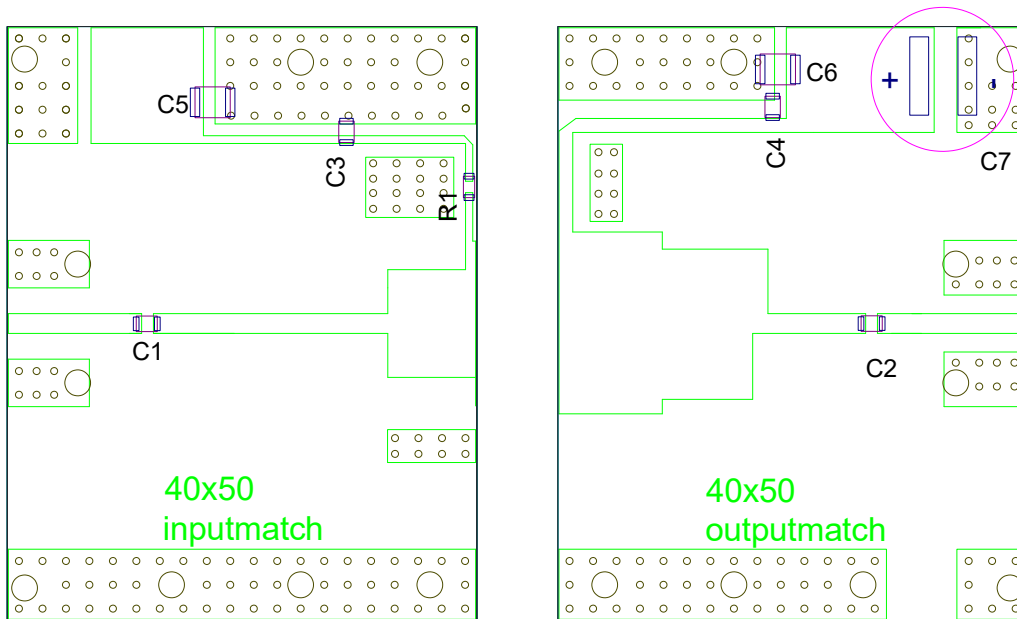


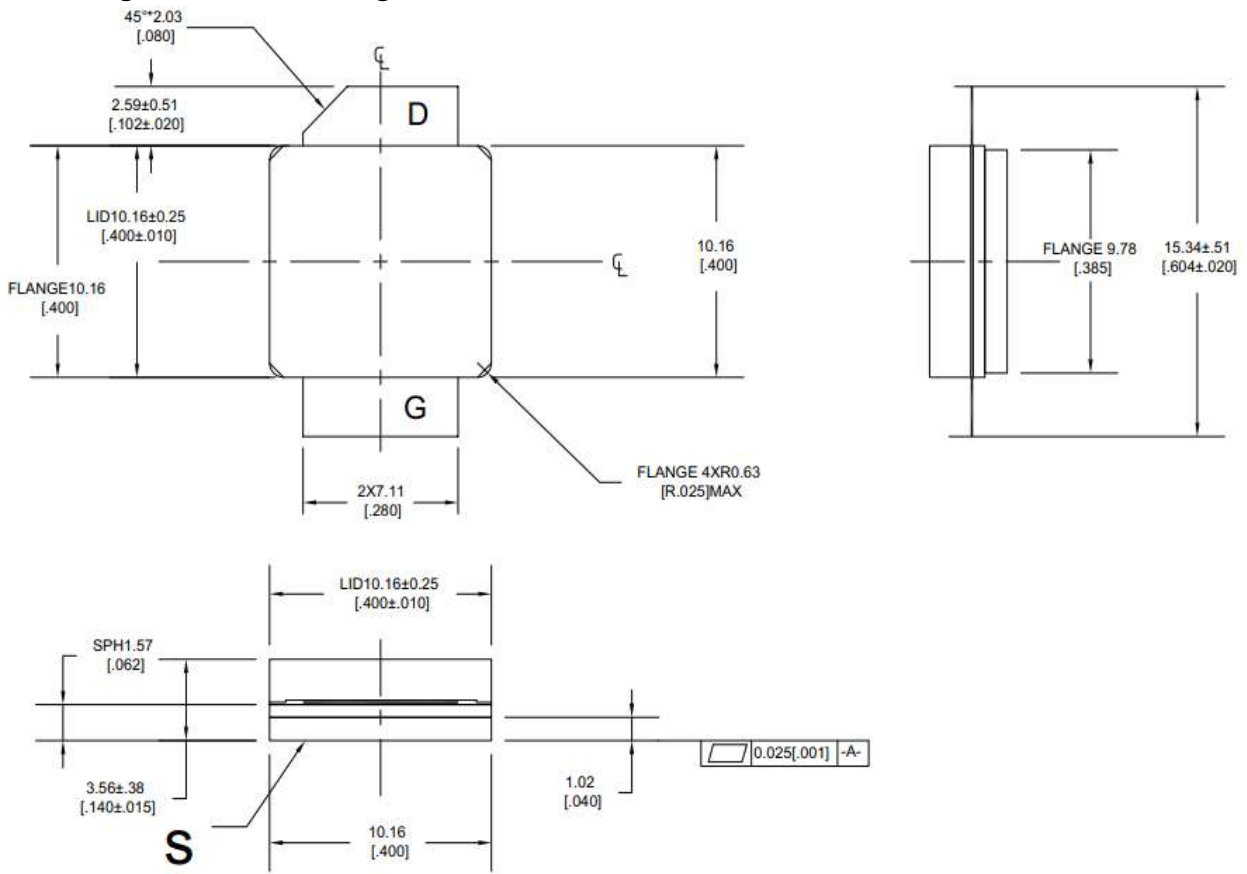
Figure 5: Picture of application board of 2.1-2.2GHz Class AB



Designator	Comment	Footprint	Quantity
C1, C2, C3, C4	10pF	0805	4
C5, C6	10uF	1210	2
C7	100uF/63V		2
R1	10ohm	0603	1



Earless Flanged Ceramic Package; 2 leads



Unit: mm [inch]

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



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2020/6/23	V1.0	Preliminary Datasheet Creation

Application data based on: LWH-20-06

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.