



Gallium Nitride, 500W, 2.7-3.5GHz RF Power Transistor

Description

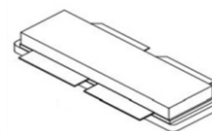
The GTAH35500D4 is a 500W 28V, both input and output matched GaN HEMT, ideal for pulsed amplifier applications from 2.7-3.5GHz, and **at higher voltage 32V, capable to output more than 650W.**

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

- Typical performance across 2.7-3.5GHz class AB application circuit with device soldered

Pulsed CW Signal: 100us width, 10% duty cycle, Vds=28V Idq=150mA

GTAH35500D4



Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2700	56.31	427.5	55.9	11.25	57.7	589.3	61.9
2800	56.01	398.7	57.0	12.42	57.42	551.6	63.4
2900	56.26	422.4	58.9	11.25	57.38	547.4	64.2
3000	56.13	409.9	56.8	12.77	57.39	548.1	62.9
3100	56.56	452.9	56.4	12.33	57.7	589.2	61.2
3200	56.52	448.5	55.6	12.29	57.72	591.3	60.6
3300	56.6	457.6	54.6	12.19	57.82	605.4	60.1
3400	56.34	430.3	54.0	11.38	57.74	593.9	60.0
3500	56.16	413.0	54.6	11.76	57.46	557.6	60.4

Vds=32V Idq=100mA

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
2700	57.31	538.8	55.0	11.63	58.66	734.0	60.8
2800	57.16	519.9	56.8	12.86	58.48	703.9	63.1
2900	57.3	537.4	58.6	11.76	58.48	704.1	64.3
3000	57.29	535.5	57.7	13.32	58.5	707.7	63.5
3100	57.65	582.7	56.9	12.9	58.78	755.5	62.1
3200	57.62	577.8	55.7	12.85	58.79	756.2	61.1
3300	57.67	584.4	55.0	12.8	58.89	775.2	60.5
3400	57.68	586.1	55.6	11.77	58.86	769.0	60.5
3500	57.39	548.2	55.2	12.27	58.54	715.0	60.8

Recommended driver: GTAH35120C6

Applications

- S band pulse 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



Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	32	Vdc
Maximum gate current	I_{gs}	108	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 $T_C = 85^\circ\text{C}$, at $P_{out}=500\text{W}$ Pulse at 3.1GHz	$R_{\theta JC}$	0.15	°C /W

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

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=-8\text{V}$; $I_{DS}=144\text{mA}$	V_{DSS}		150		V
Gate Threshold Voltage	$V_{DS}=10\text{V}$, $I_D=144\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS}=28\text{V}$, $I_{DS}=150\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-2.6		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	3.1 GHz, $P_{out}=500\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2: Median Lifetime vs. Channel Temperature

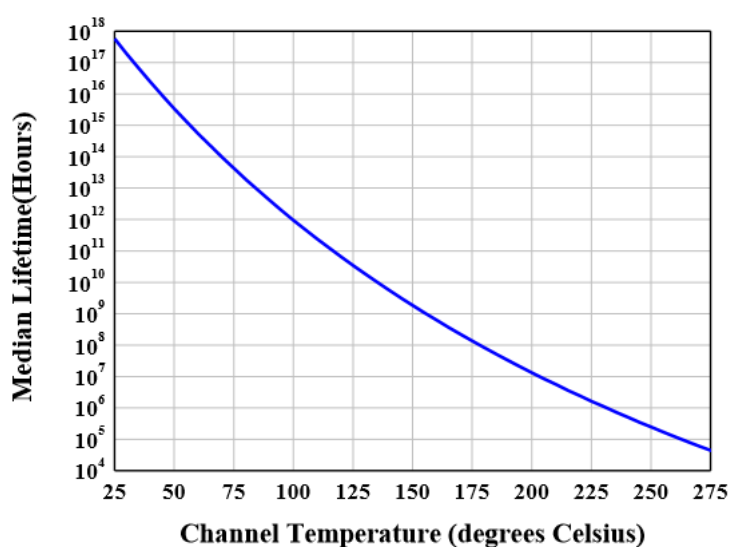
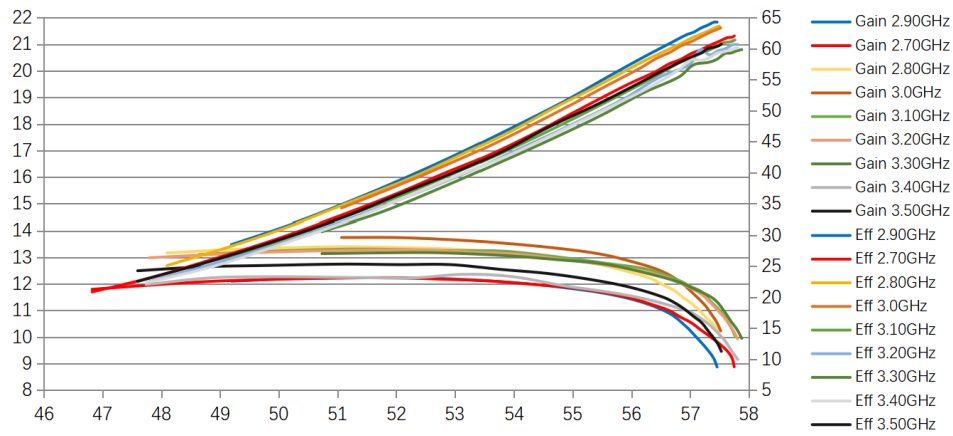




Figure 3: Efficiency and power gain as function of P_{out} at different VDD (Pulsed CW Signal: 100us width , 10% duty cycle)

28V:



32V:

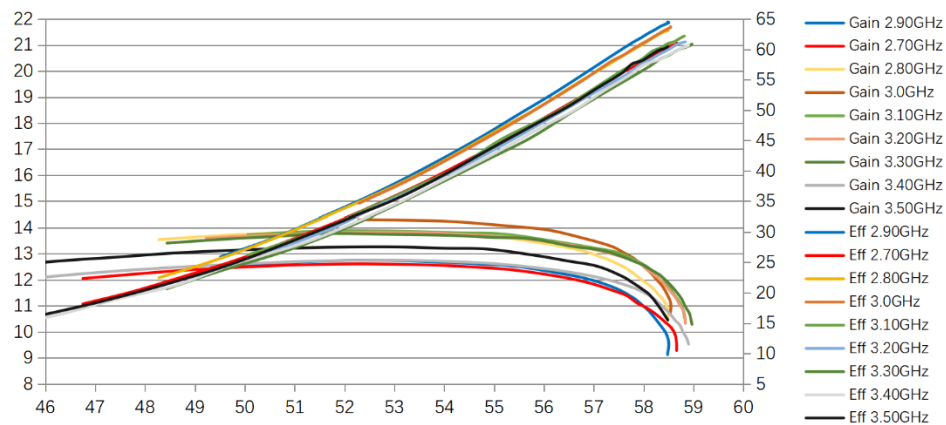


Figure 4: Network analyzer output, S11 and S21 (2.7-3.5GHz Class AB)

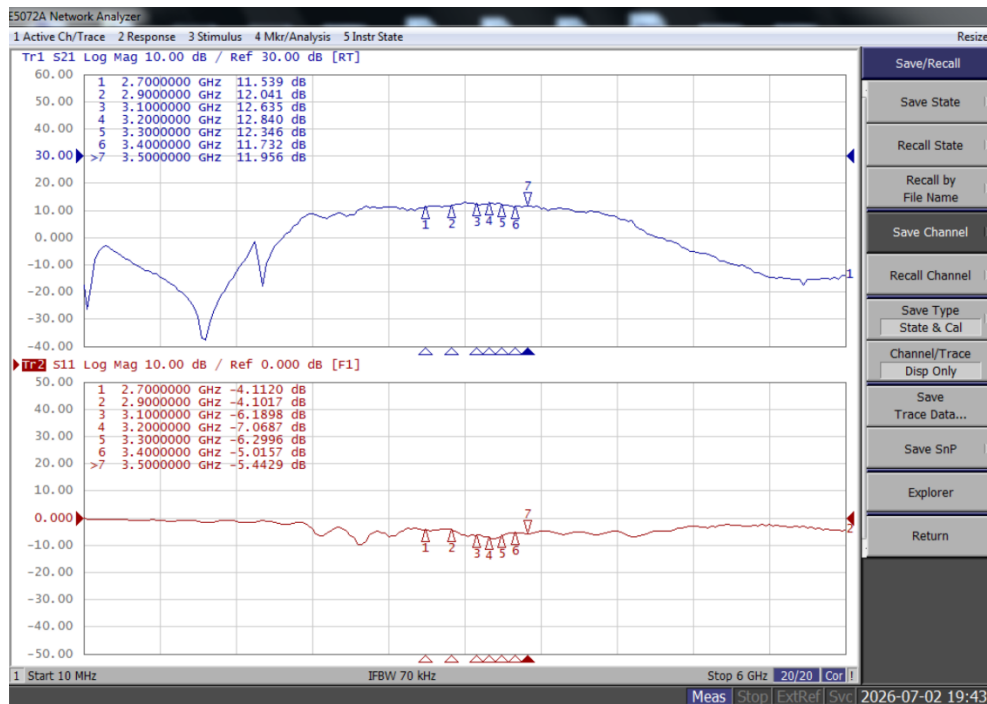


Figure 5: Picture of application board 2.7-3.5GHz class AB

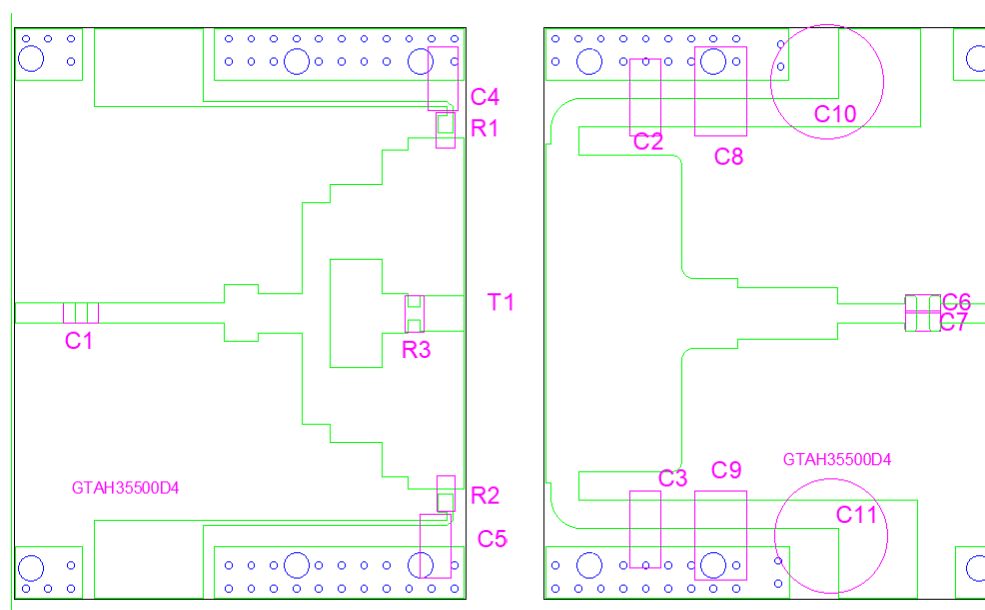


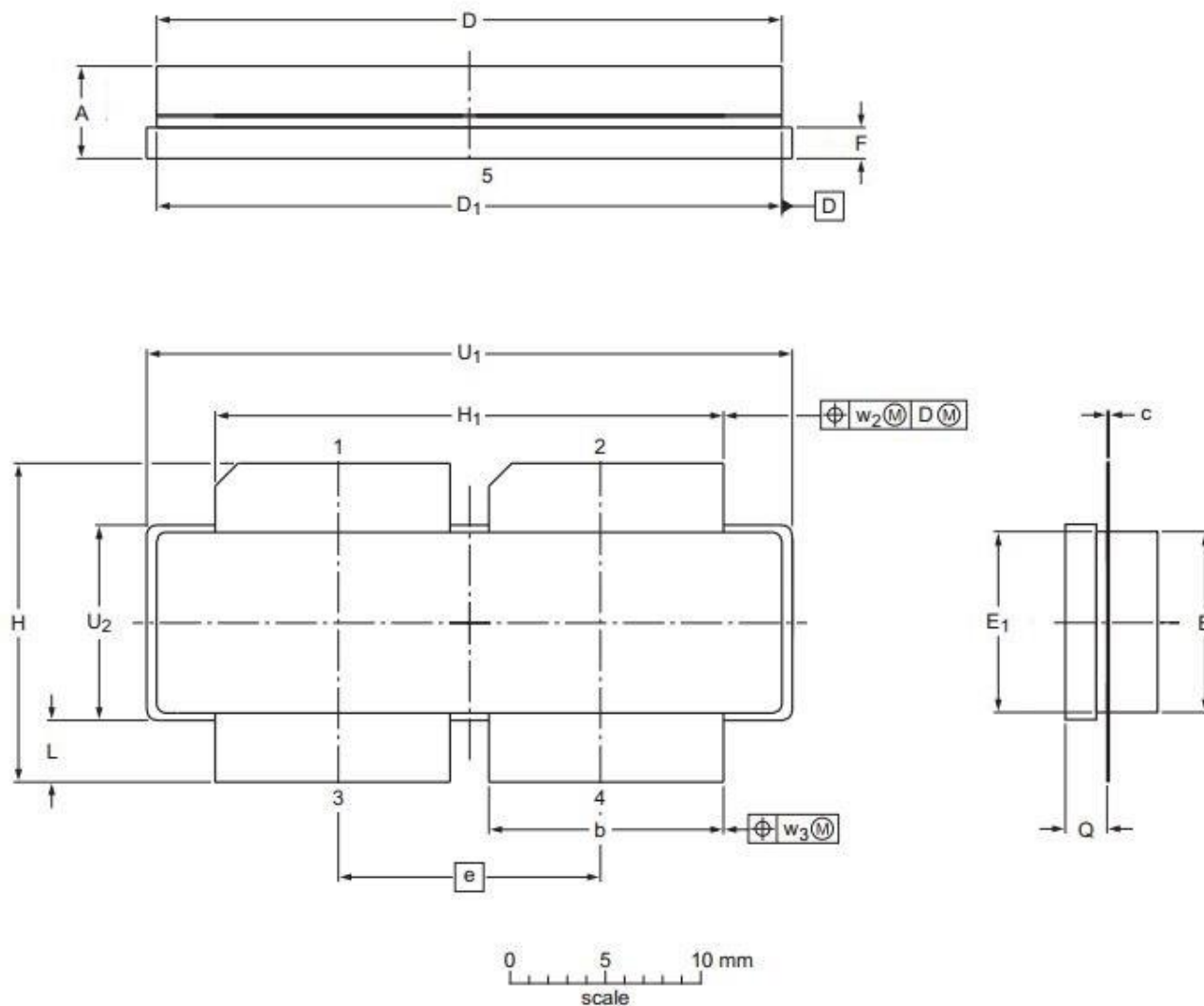
Table 4. Bill of materials of application board (PCB layout upon request)

Part	Quantity	Description	Part Number	Manufacture
C1,C2,C3,C4, C5	5	8.2pF High Q Capacitor	251SHF8R2BSE	TEMEX
C6,C7	2	5.1pF High Q Capacitor	251SHF5R1BSE	TEMEX
C8,C9	2	10uF MLCC	RS80R2A106M	MARUWA
C10,C11	2	1000uF		
R1,R2,R3	3	10 Ω Power Resistor	ESR03EZPF100	ROHM
T1	1	500W GaN Dual Transistor	GTAH35500D4	Innegration



Package Outline

Earless flanged ceramic package; 4 leads (1、2—DRAIN、3、4—GATE、5—SOURCE)



UNIT	A	b	c	D	D ₁	e	E	E ₁	F	H	H ₁	L	Q	U ₁	U ₂	W ₂	W ₂
mm	4.7	11.81	0.18	31.55	31.52	13.72	9.50	9.53	1.75	17.12	25.53	3.48	2.26	32.39	10.29	0.25	0.25
	4.2	11.56	0.10	30.94	30.96		9.30	9.27	1.50	16.10	25.27	2.97	2.01	32.13	10.03		
inches	0.185	0.465	0.007	1.242	1.241	0.540	0.374	0.375	0.069	0.674	1.005	0.137	0.089	1.275	0.405	0.01	0.01
	0.165	0.455	0.004	1.218	1.219		0.366	0.365	0.059	0.634	0.995	0.117	0.079	1.265	0.395		

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-D4					03/12/2013



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/7/7	V1.0	Preliminary Datasheet Creation

Application data based on: LWH-26-17

Notice

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

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

Innegration 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 Innegration 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 Innegration and authorized distributors

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