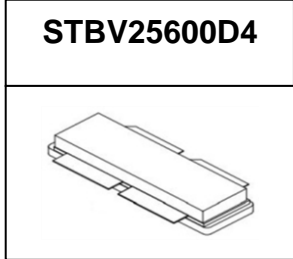




GaN 50V, 600W, 2.45GHz RF Power Transistor



Description

The STBV25600D4 is a 600W capable, internally matched GaN HEMT, ideal for ISM or RF energy applications at 2450MHz narrow band. There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical RF performance at 2450MHz applications
Vds=50V, Vgs=-4.8V, CW, Tc=25 degree C, Air cooling , **heatsink size: 95*130*18mm**

Freq(MHz)	Pin(dBm)	Psat(dBm)	Psat(W)	IDS(A)	Gain(dB)	Eff(%)
2445	41.15	57.9	616.60	17.5	16.75	70.5
2450	41.1	57.84	608.14	17.1	16.74	71
2455	41.2	57.75	603.50	16.7	16.55	72

Note:

Performance might be varied under different load conditions due to loadpull effect, application report with isolator included upon request

Recommended driver: STAV25035C6

Applications

- 2.45GHz RF Energy
- S band 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 _{DSS}	+200	Vdc
Gate--Source Voltage	V _{GS}	-8 to +0.5	Vdc
Operating Voltage	V _{DD}	55	Vdc
Maximum gate current	I _{gs}	102	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 = 25°C, at Pd=250W	R _{θJC}	0.41	°C /W



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

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

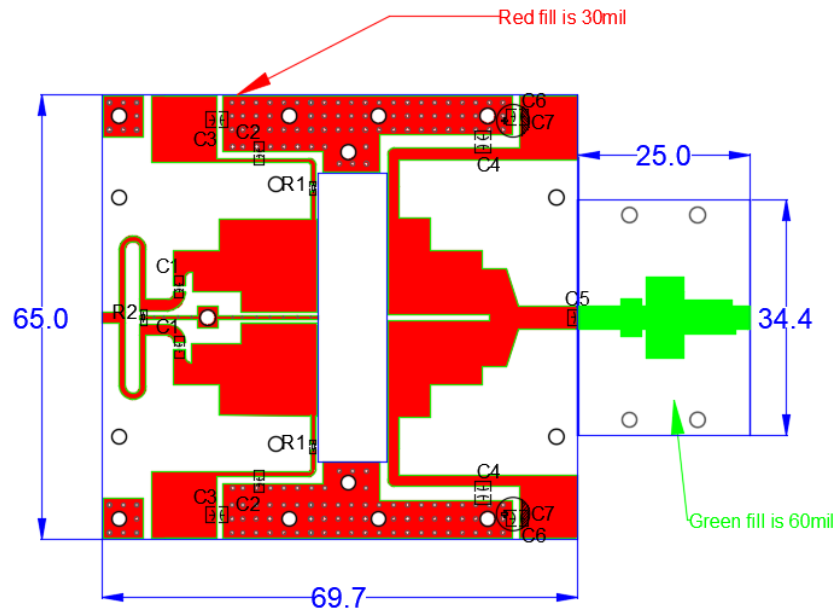
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=90mA	V _{DSS}		200		V
Gate Threshold Voltage	VDS =10V, ID = 90mA	V _{GS(th)}	-4	-	-2	V
Gate Quiescent Voltage	VDS =50V, IDS=500mA, Measured in Functional Test	V _{GS(Q)}		-3.34		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.45GHz, Pout=600W pulse CW All phase, No device damages	VSWR		5:1		

Reference Circuit of Test Fixture Assembly Diagram

DXF file upon request



Component	Description	Suggestion
C1, C2	15pF/ MQ300805	
C4	15pF/ MQ300709	
C5	MIN02-002CC120J-F	Dubilier - CDE
C3, C6,	10uF, 100V	1210
C7	4700uF/63V	
R1	Chip Resistor,10Ω	0805
R2	Chip Resistor,100Ω	1206
PCB	Rogers tc350-plus, r= 3.5, thickness 30 mils, 1oz copper (red fill) ; //Taconic RF-35TC-0600-A, thickness 60 mils, 1oz copper(green fill)	



Figure 2: Power gain, Eff as function of Pout

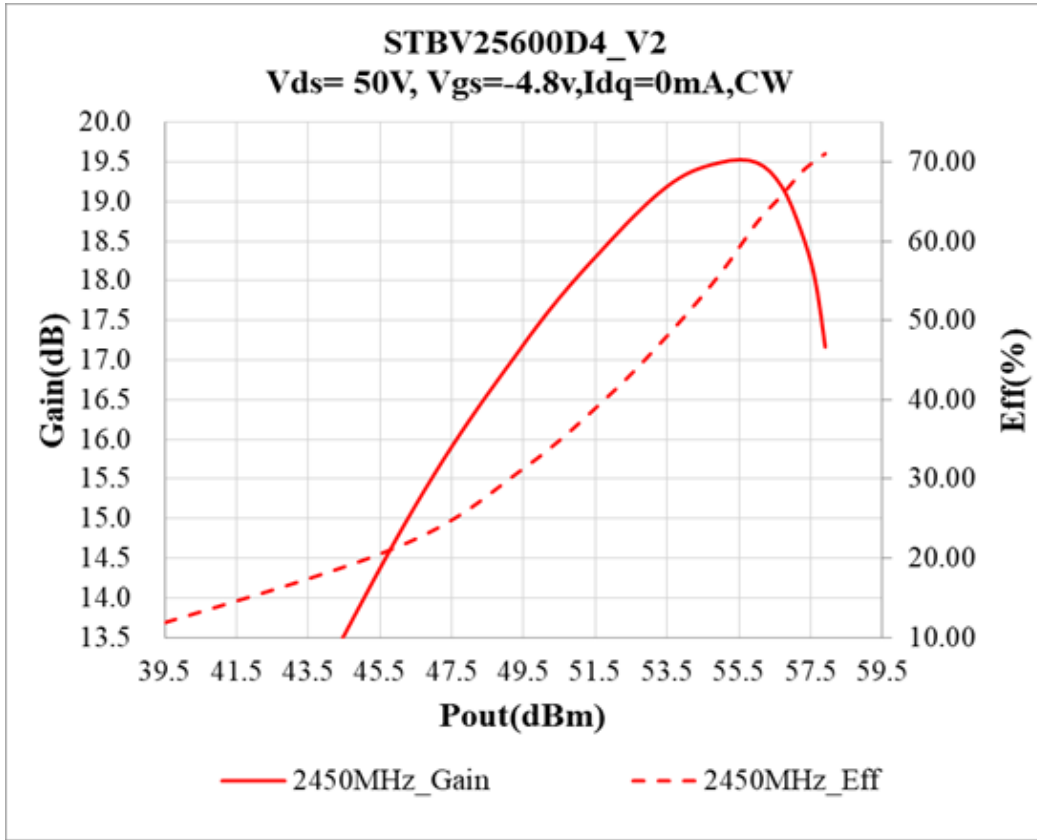


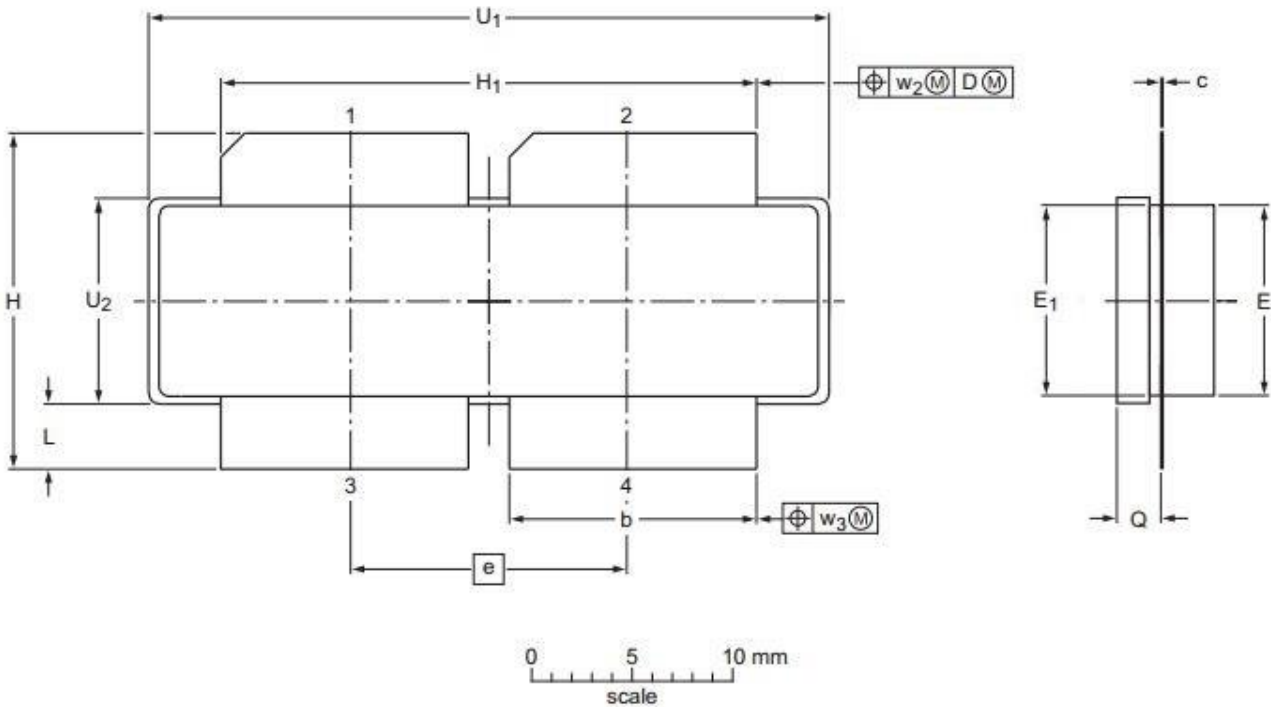
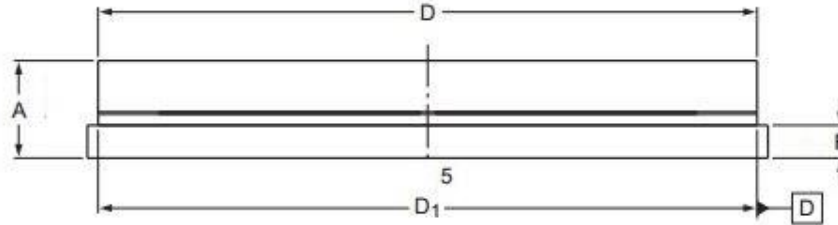
Figure 3: Network analyzer output S11/S21





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
2024/11/20	Rev 1.0	Preliminary datasheet creation

Application data based on: YHG-24-22

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