



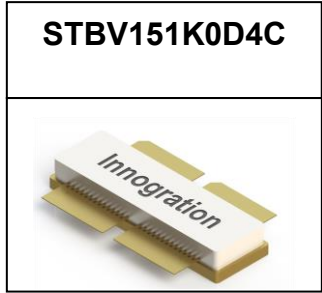
**GaN HEMT 50V, 1000W, 1.3-1.6GHz RF Power Transistor**

**Description**

The STBV151K0D4C is a dual path 1000watt , Input matched GaN HEMT, ideal for applications from 1.3 to 1.6GHz Doherty application especially for LTE/5G within L band

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

- Typical RF performance on 1.42-1.55GHz asymmetrical Doherty with device soldered VDS= 50V, IDQ=290mA(Vgm=-3.26V, Vgp=-6.30V) Pulsed CW: 20uS width, 10% cycle.



Freq (MHz)	Pout (dBm)	CCDF (dB)	ACPR (dBc)	Gain (dB)	Efficiency (%)
1420	51.00	8.98	-32.04	15.44	56.22
1430	51.00	8.87	-32.00	15.56	56.85
1480	51.00	8.79	-29.90	15.87	58.22
1530	51.00	9.28	-29.33	15.80	56.60
1550	51.00	9.15	-28.65	15.76	56.10

**Applications**

- Asymmetrical Doherty amplifier within L band
- L band power amplifier
- CW or pulsed Amplifier

**Important Note: Proper Biasing Sequence for GaN HEMT Transistors**

**Turning the device ON**

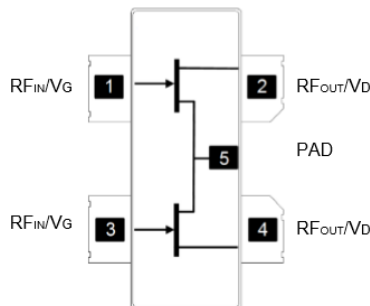
1. Set VGS to the pinch-off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

**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 <sub>DSS</sub>	+200	Vdc



Gate—Source Voltage	$V_{GS}$	-8 to +0.5	Vdc
Operating Voltage	$V_{DD}$	55	Vdc
Maximum gate current	$I_{gs}$	127	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 $P_d = 100\text{W}$ , on Doherty application board	$R_{\theta JC}$	0.45	°C /W

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

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$ ; $I_{DS} = 47\text{mA}$	$V_{DSS}$		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$ , $I_D = 47\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$ , $I_{DS} = 300\text{mA}$ , Measured in Functional Test	$V_{GS(Q)}$		-3.24		V

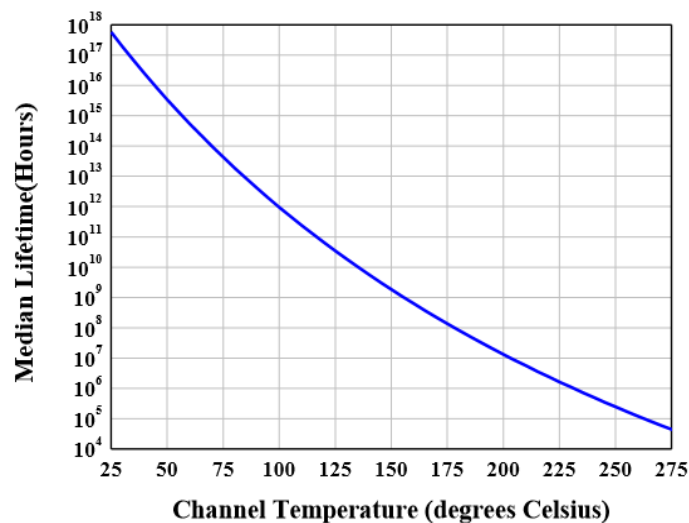
**DC Characteristics ( Peak path, measured on wafer prior to packaging)**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$ ; $I_{DS} = 80\text{mA}$	$V_{DSS}$		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$ , $I_D = 80\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$ , $I_{DS} = 300\text{mA}$ , Measured in Functional Test	$V_{GS(Q)}$		-3.2		V

**Ruggedness Characteristics**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.5GHz, $P_{out} = 120\text{W}$ WCDMA 1 Carrier in Doherty circuit All phase, No device damages	VSWR		10:1		

**Figure 2: Median Lifetime vs. Channel Temperature**





### 1.4-1.5GHz

Figure 3: Efficiency and power gain as function of Pout

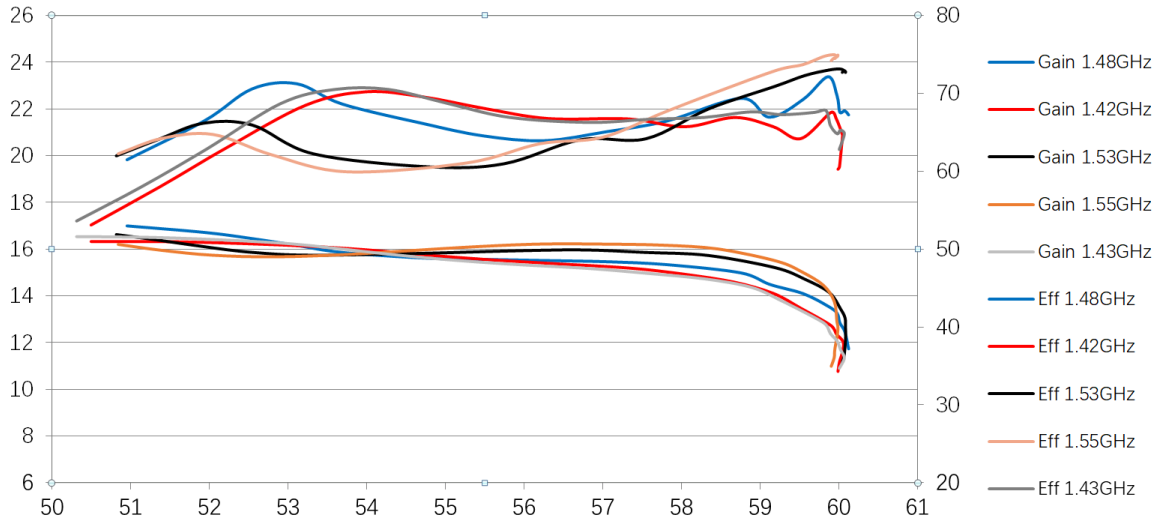
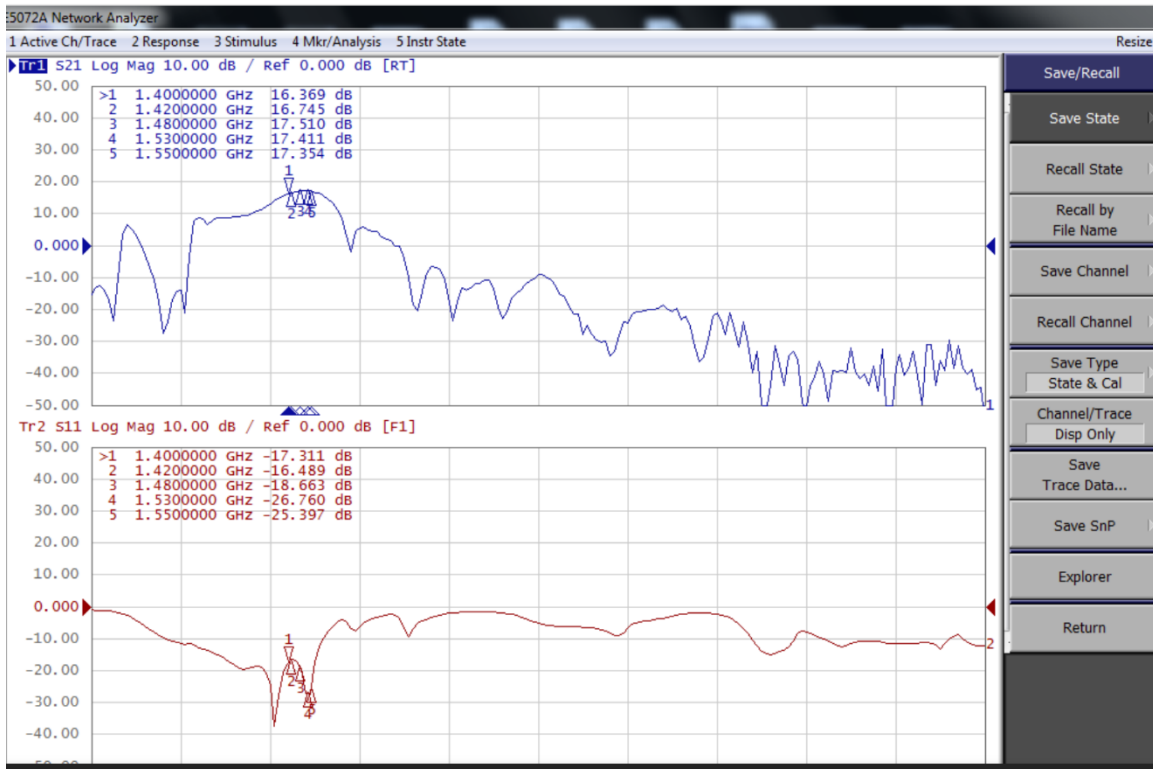
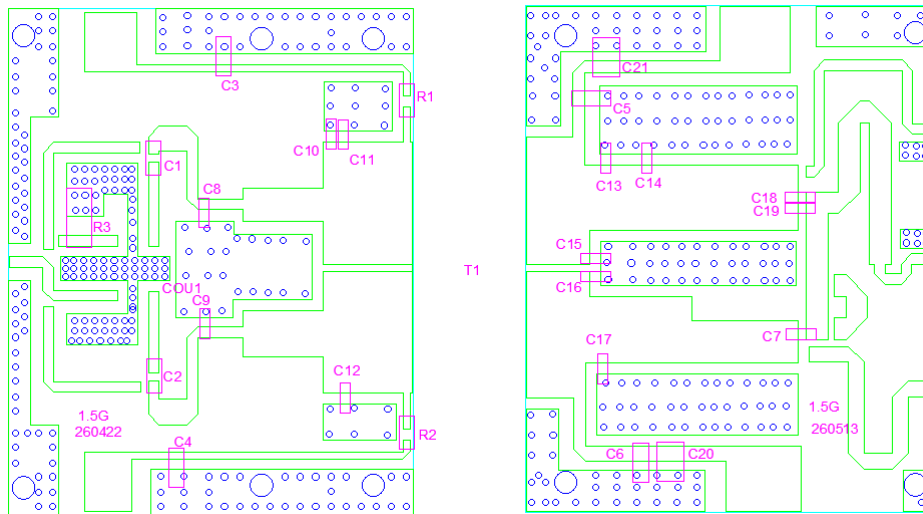


Figure 4: Network analyzer output, S11 and S21



**Figure 5: Picture of application board Doherty circuit**

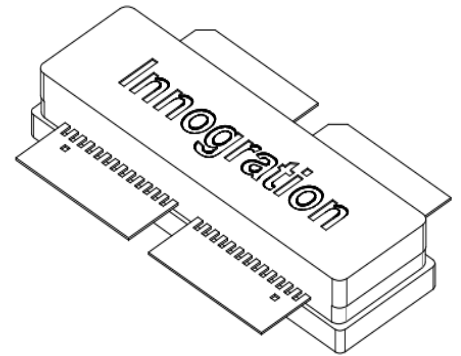
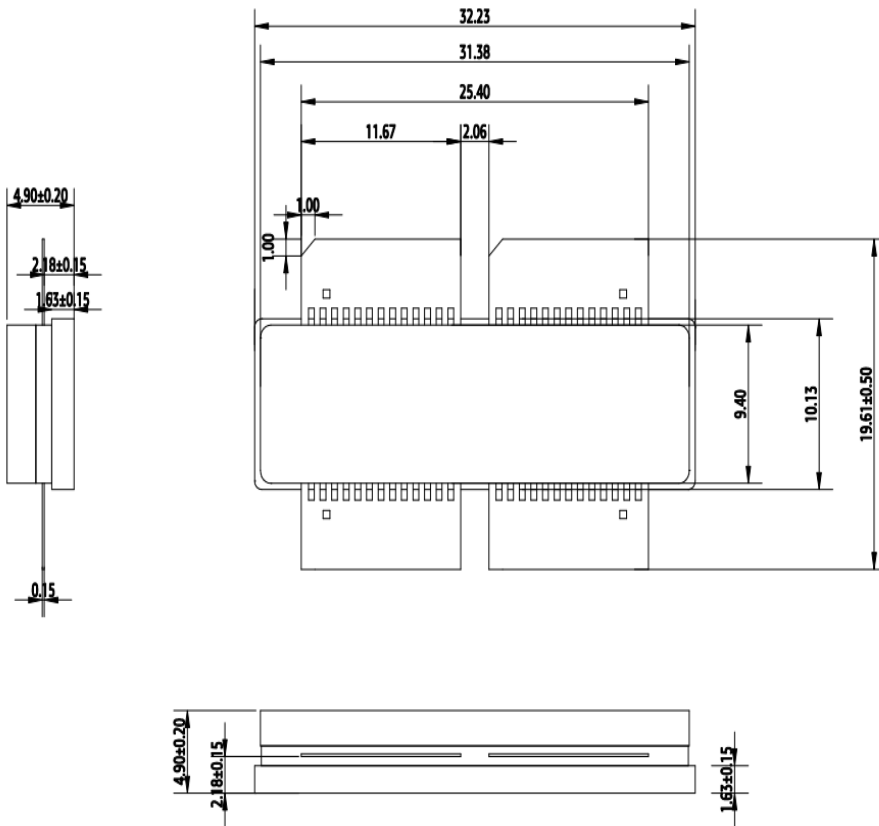


**Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)**

Part	Quantity	Description	Part Number	Manufacture
C1,C2,C3,C4 C5,C6,C7	7	30pF High Q Capacitor	251SHS300BSE	TEMEX
C8	1	1.5pF High Q Capacitor	251SHS1R5BSE	TEMEX
C9,C15	2	2.7pF High Q Capacitor	251SHS2R7BSE	TEMEX
C10,C18,C19	3	2.4pF High Q Capacitor	251SHS2R4BSE	TEMEX
C11,C12	2	3.9pF High Q Capacitor	251SHS3R9BSE	TEMEX
C13	1	2pF High Q Capacitor	251SHS2R0BSE	TEMEX
C14	1	1pF High Q Capacitor	251SHS1R0BSE	TEMEX
C16	1	4.7pF High Q Capacitor	251SHS4R7BSE	TEMEX
C17	1	5.1pF High Q Capacitor	251SHS5R1BSE	TEMEX
C20,C21	2	10uF MLCC	GRM32EC72A106ME05	Murata
R1,R2	2	10 Ω Power Resistor	ESR03EZPF100	ROHM
R3	1	50 Ω Power Resistor	RFR50-20CT0421B	YT
COU1	1	3 dB Bridge	XC1400P03	Anaren
T1	1	1000W GaN Dual Transistor	STBV151K0D4C	Innogrations



**Earless Flanged Plastic Air Cavity Package; 4 leads**



Unit:mm  
Tolerance ±0.10mm, Except as Noted.

**Revision history**

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/5/13	V1.0	Preliminary Datasheet Creation

Application data based on: LWH-26-09

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