



Gallium Nitride 50V, 450W, 2.5-2.7GHz RF Power Transistor

Description

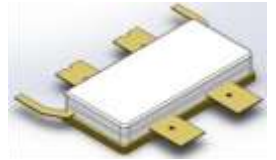
The XTAV27450B4C is a dual path 450watt, Input matched GaN HEMT, ideal for applications from 2.5 to 2.7GHz especially for LTE/4G.

As part of 4GaN™, it is featured by comparable low cost as LDMOS counterpart to enable affordable replacement while with significant performance improvement

- Typical RF performance on 2.6GHz asymmetrical Doherty with device soldered

$V_{DS}=48V$, $I_{DQ-Mian}=260\text{ mA}$ $V_{GS-main}=-3.70V$, $V_{GS-peak}=-5.1V$, Pulsed CW

XTAV27450B4VC



Freq (MHz)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)	P3dB Gain (dB)	P4dB (dBm)	P4dB (W)	P4dB Eff (%)
2500	56.98	499.2	70.9	13.44	57.36	544.1	71.8
2600	56.60	457.2	72.6	14.18	56.89	488.9	73.4
2700	55.91	390.0	71.9	13.74	56.16	413.4	73.6

WCDMA 1C

Freq (MHz)	Pout (dBm)	CCDF (dB)	Ppeak (dBm)	Ppeak (W)	ACPR (dBc)	Gain (dB)	Efficiency (%)
2500	47.50	9.02	56.57	454.0	-27.4	15.5	52.8
2600	47.49	9.07	56.56	453.1	-29.3	15.9	53.4
2700	47.49	8.67	56.16	412.9	-31.6	15.4	52.5

Recommended driver: Doherty 2 stages MCM SMAV2527-60

Applications

- Asymmetrical Doherty amplifier within B41 4G band
- S band power amplifier

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

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

Turning the device OFF

- Turn RF power off
- Reduce VGS down to VP, typically -5 V
- Reduce VDS down to 0 V
- Turn off VGS

Pin Connection definition

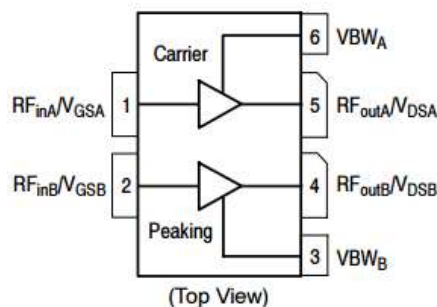




Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+200	Vdc
Gate--Source Voltage	V_{GS}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	55	Vdc
Maximum gate current	I_{gs}	57.6	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 $P_d = 50\text{W}$, on Doherty application board	$R_{\theta JC}$	1.2	°C /W

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

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 22\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 22\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$, $I_{DS} = 260\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-3.7		V

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

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$; $I_{DS} = 36\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$, $I_D = 36\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}$, $I_{DS} = 400\text{mA}$, Measured in Functional Test	$V_{GS(Q)}$		-3.7		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	2.GHz, $P_{out} = 55\text{W}$ WCDMA 1 Carrier in Doherty circuit All phase, No device damages	VSWR		10:1		

Figure 3: Efficiency and power gain as function of Pout (2.5-2.7GHz Doherty)

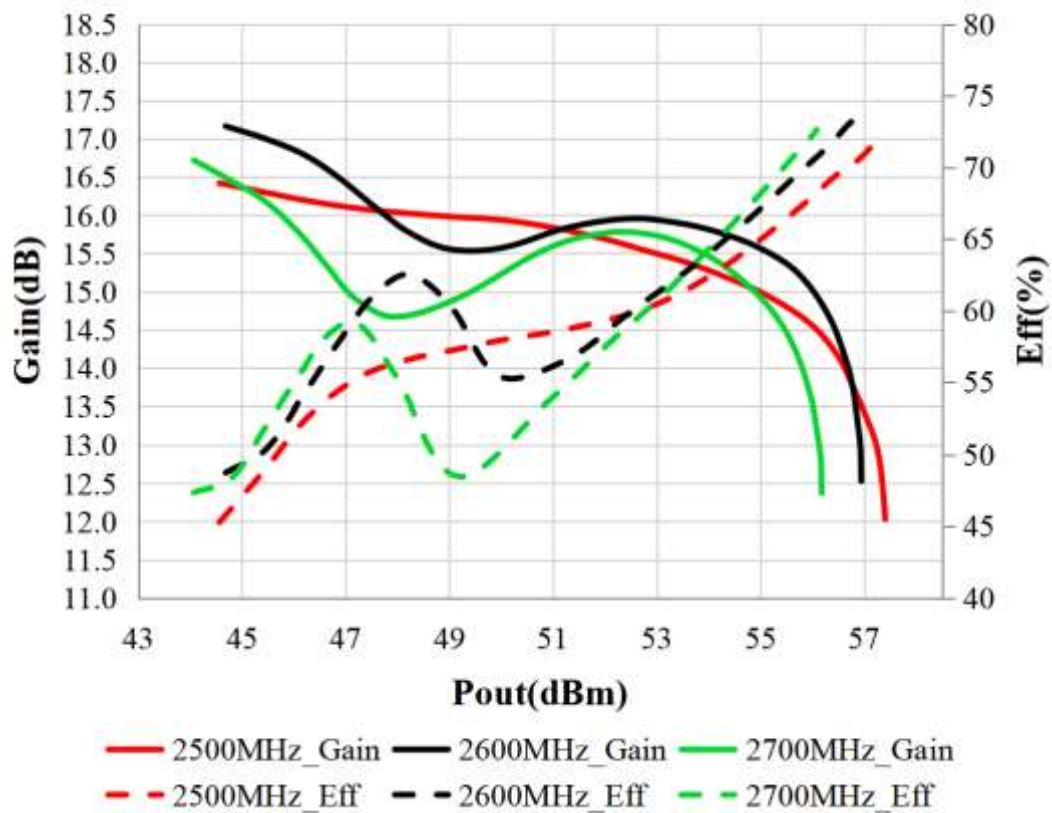


Figure 4: Network analyzer output, S11 and S21 (2.5-2.7GHz Doherty)



Figure 5: Picture of application board Doherty circuit for 2.5-2.7GHz

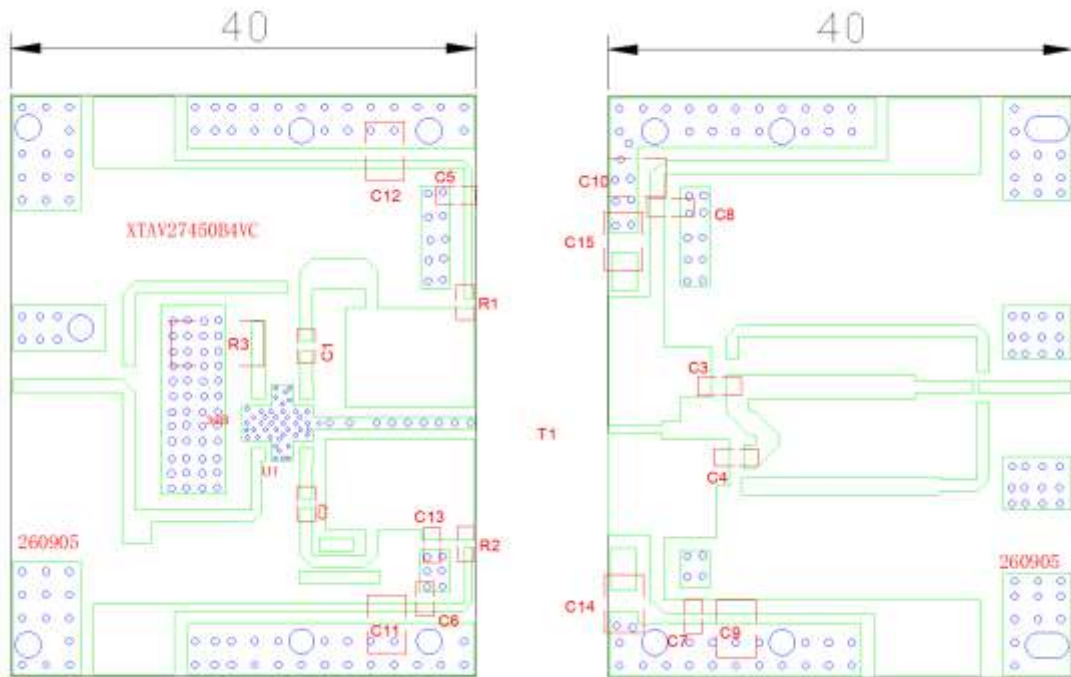
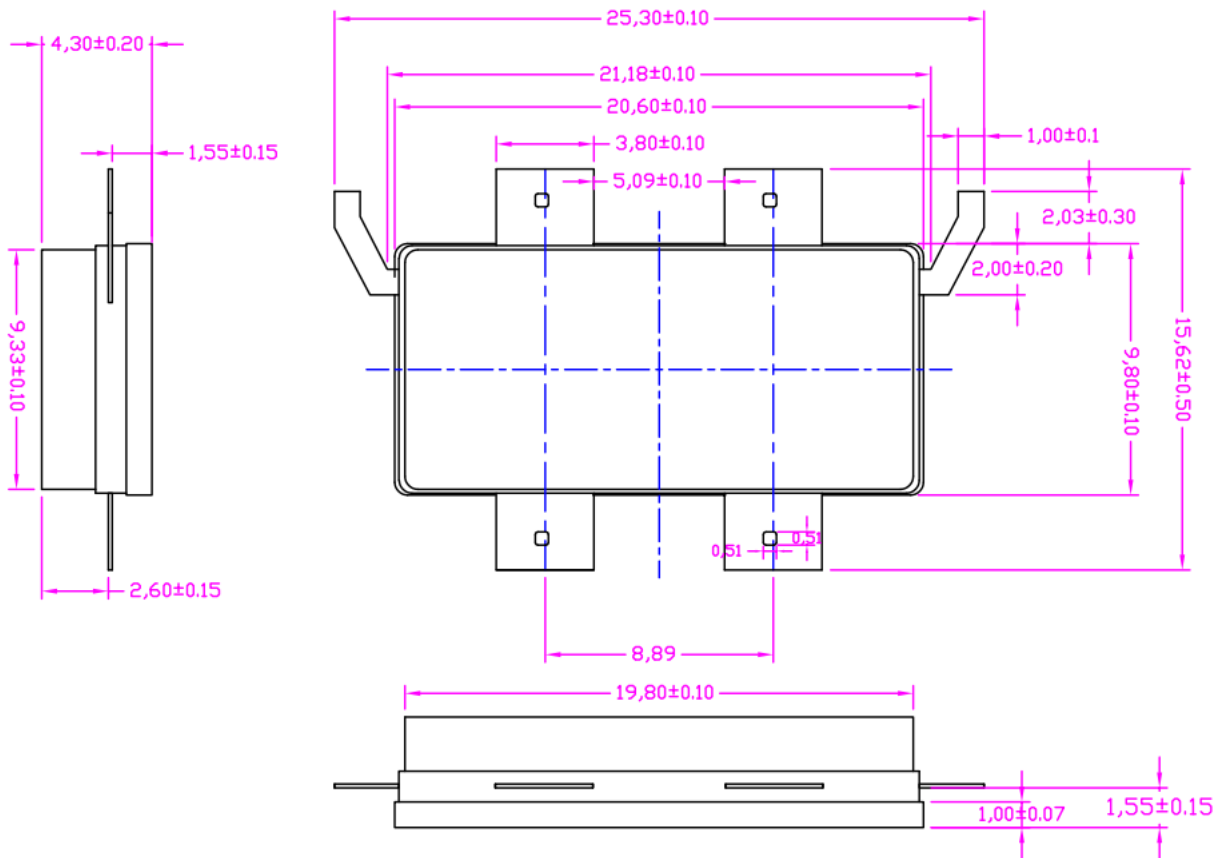


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)

Part	Quantity	Description	Part Number	Manufacture
C1,C2,C4 C5,C6,C7,C8	7	10pF High Q Capacitor	251SHS100BSE	TEMEX
C3	1	2.7pF High Q Capacitor	251SHS2R7BSE	TEMEX
C13	1	1.2pF High Q Capacitor	251SHS1R2BSE	TEMEX
C9,C10,C11,C12,C14,C15	6	10uF MLCC	GRM32EC72A10	Murata
R1,R2	2	10 Ω Power Resistor	ESR03EZPF100	ROHM
R3	1	50 Ω Power Resistor	RFR50-20CT0421B	YT
U1	1	3dB Bridge	HC2500P03	YT
T1	1	450W GaN Dual Transistor	XTBV27450B4VC	Innogrations



Earless Flanged Ceramic Package; 6 leads- B4VC



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/9/12	V1.0	Preliminary Datasheet Creation

Application data based on LWH-26-28

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