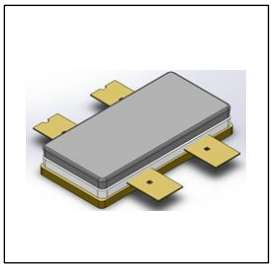
ITGV10120B4C LDMOS TRANSISTOR

Document Number: ITGV10120B4C
Preliminary Datasheet V1.0

30Wx2, HF to UHF, 28V High Power RF LDMOS FETs



Description

The ITGV10120B4C is a 60-watt, Push Pull, high performance, highly rugged, unmatched LDMOS transistor, designed for any general applications at frequencies from HF to UHF, in new generation highly cost effective open cavity package.

Typical broadband CW performance

ITGV10120B4C VDD=28V VGS=3.5V IDQ=330mA CW						
F (MHz)	Pin (dBm)	Pout (dBm)	Pout (W)	Ids (A)	Gain (dB)	Eff (%)
100	31.0	49.53	90	5.69	18.5	56.3
150	31.0	49.52	90	5.53	18.5	57.8
200	31.0	49.66	92	5.46	18.7	60.5
250	31.0	49.75	94	5.35	18.8	63.0
300	31.0	49.70	93	5.14	18.7	64.8
350	31.0	49.60	91	5.10	18.6	63.9
400	30.7	49.30	85	4.97	18.6	61.2
450	30.6	49.05	80	4.90	18.5	58.6
500	31.0	48.78	76	4.90	17.8	55.0

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI drift
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Pb-free, RoHS-compliant

Suitable Applications

- 30-88MHz (Ground communication)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 136-174MHz (Commercial ground communication)
- Laser Exciter
- Synchrotron
- MRI
- Plasma generator
- Weather Radar

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+110	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+55	Vdc
Storage Temperature Range	Tstg	-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 T_C= 85°C, T_J=200°C, DC test	$R_{\theta JC}$	1.2	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics (T_A = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics (per half section)					
Drain-Source Voltage V_{GS}=0, I_{DS}=1.0mA	$V_{(BR)DSS}$		110		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 75V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Zero Gate Voltage Drain Leakage Current (V_{DS} = 28V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Gate--Source Leakage Current (V_{GS} = 10 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 28V, I_D = 600 μA)	$V_{GS}(th)$	——	2.65	——	V
Gate Quiescent Voltage (V_{DD} = 28 V, I_D = 300 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.5	——	V

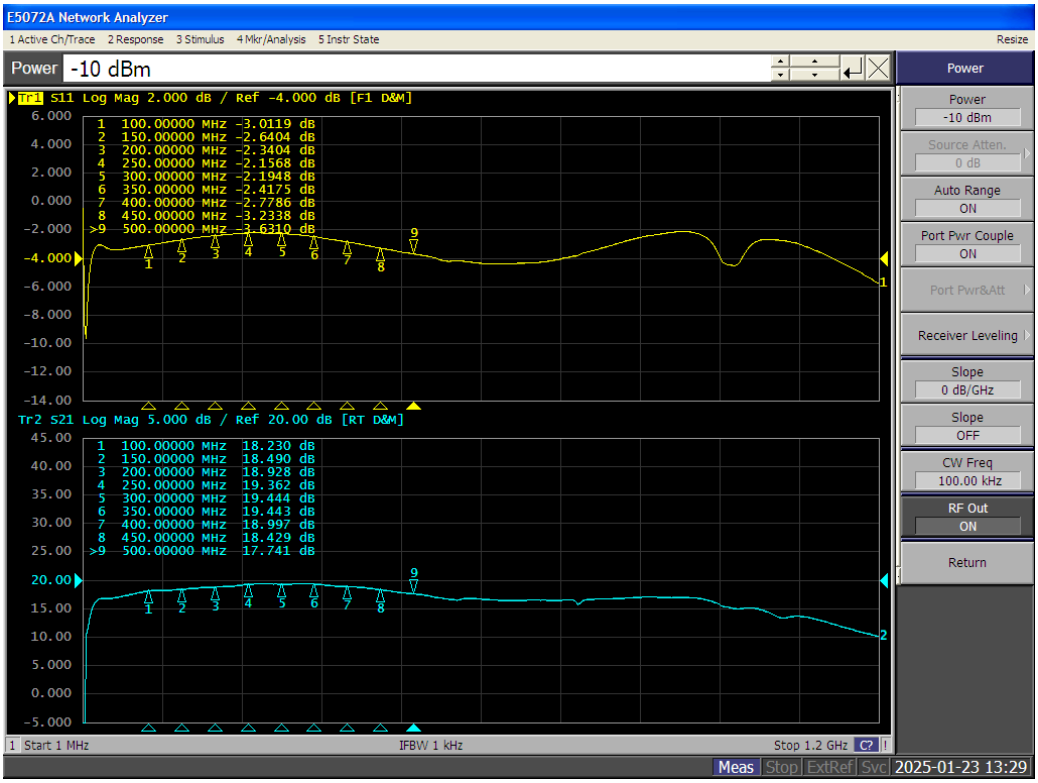
Load Mismatch (In Innogration Test Fixture, 50 ohm system): V_{DD} = 28 Vdc, I_{DQ} = 600 mA, f =700MHz, pulse width:100us, duty cycle:10%

Load 10:1 All phase angles, at 60W Pulsed CW Output Power	No Device Degradation

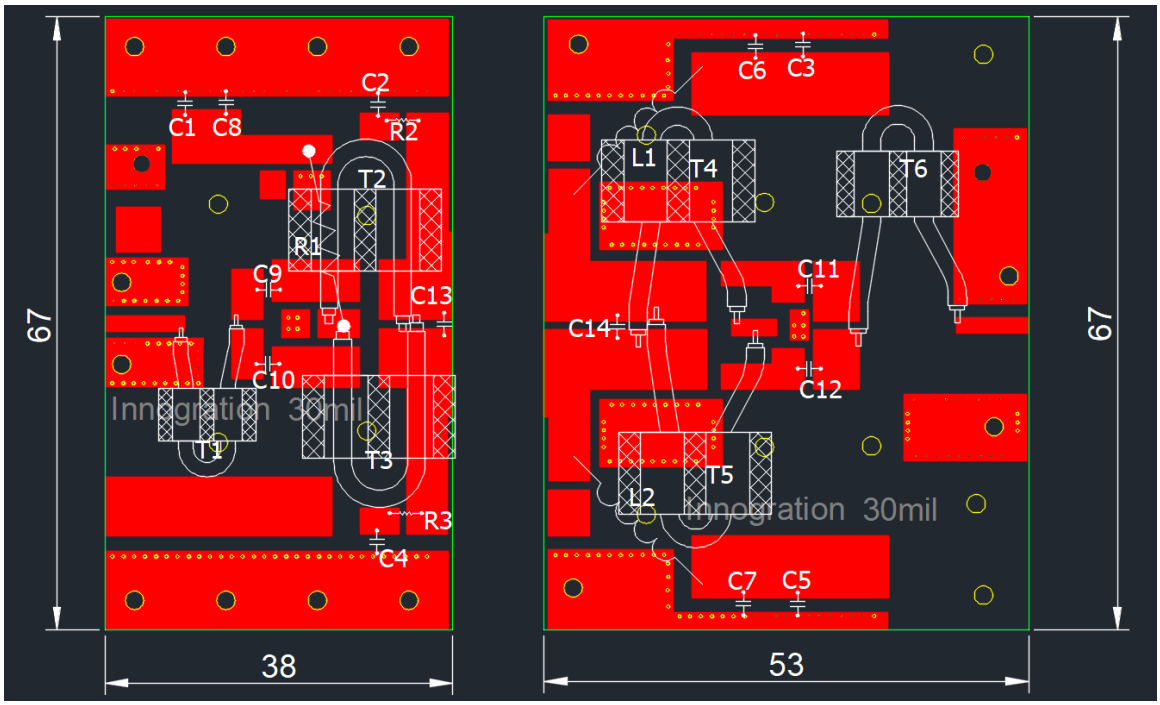
100-500MHz

TYPICAL CHARACTERISTICS

Figure 1: Network analyzer output S11/221



Reference Circuit of Test Fixture Assembly Diagram



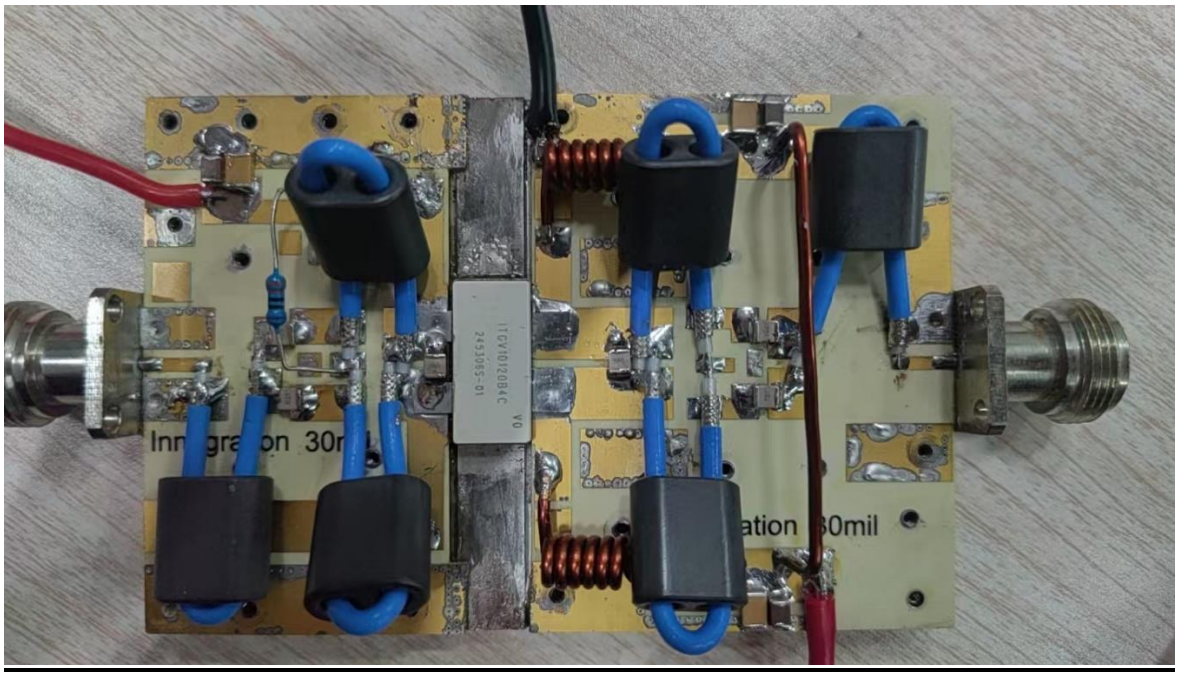
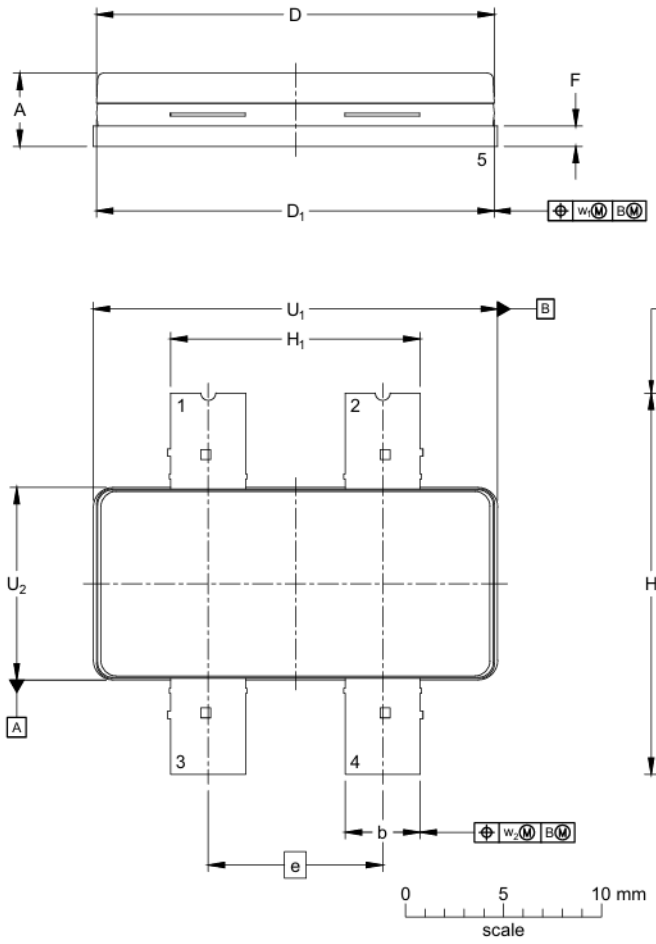


Table 5. Test Circuit Component Designations and Values

Component	Description	Suggestion
C1~C5	10uF/1210	Ceramic Multilayer Capacitor
C6,C7,C8	10nF/1812	Ceramic Multilayer Capacitor
C9,C10	820pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C11,C12	750pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C13	6.8pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
C14	5.6pF	BEIJING YUANLU HONGYUAN ELECTRONIC TECHNOLOGY CO., LTD.MQ301111
T1	50ohm 65mm	SFRFBU-086-50 BN-61-202
T2,T3	25ohm 65mm	SFRFBU-086-25 BN-61-202
T4,T5	25ohm 65mm	SFRFBU-086-25 BN-61-202
T6	50ohm 65mm	SFRFBU-086-50 BN-61-202
L1,L2	Φ 1mm Inner diameter 3.5mm 6 turns	DIY
R1	330 Ω	Pulg-in Resistor
R2,R3	51 Ω /1206	Chip Resistor
PCB	30Mil Rogers4350	

Earless Flanged Plastic Air Cavity Package; 4 leads



Dimensions

Unit		A	b	c	D	D_1	E	E_1	e	F	H	H_1	$Q^{(1)}$	U_1	U_2	v	w_1	w_2	y
mm	max	4.01	3.91	0.18	20.42	20.37	9.80	9.75		1.14	19.53	12.83	1.68	20.70	9.91	0.50	0.50	0.50	0.10
	nom								8.89										
	min	3.40	3.71	0.13	20.12	20.17	9.50	9.55		0.94	19.33	12.57	1.45	20.50	9.70				

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2025/1/23	Rev 1.0	Preliminary Datasheet Creation

Application data based on SYX-25-04

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