

ITEV01600B4 LDMOS TRANSISTOR

Document Number: ITEV01600B4
Product Datasheet V1.0

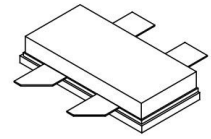
600W, 50V High Power RF LDMOS FETs

Description

The ITEV01600B4 is a 600-watt capable, high performance, unmatched LDMOS FET, designed for HF/VHF. It can be used for both CW and pulse application.

It is featured for high power and high ruggedness, low cost, suitable for ISM RF Energy application.

ITEV01600B4



- Typical Performance (On Innogration 13.56MHz fixture with device soldered):

ITEV01600B4 VGS=3.36V VDS=50V IDQ=200mA CW						
Freq(MHz)	Pout(dBm)	Pout(W)	IDS(A)	Pin(dBm)	Gain(dB)	Eff(%)
13.56	58.02	633.9	16.38	42.37	15.65	77.40
13.56	57.8	602.6	15.97	41.38	16.42	75.46
13.56	57.59	574.1	15.6	40.47	17.12	73.60
13.56	57.36	544.5	15.25	39.47	17.89	71.41
13.56	57.1	512.9	14.83	38.46	18.64	69.17
13.56	56.82	480.8	14.43	37.49	19.33	66.64
13.56	56.5	446.7	14	36.49	20.01	63.81
13.56	56.14	411.1	13.49	35.51	20.63	60.96

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- On chip RC network enable high stability and ruggedness
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Excellent thermal stability, low HCI drift
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	135	Vdc
Gate--Source Voltage	V_{GS}	-7 to +10	Vdc
Operating Voltage	V_{DD}	+55	Vdc
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 ,Case Temperature 80°C, 600W CW, 50 Vdc, IDQ = 200 mA	$R_{\theta JC}$	0.4	°C/W
Transient thermal impedance from junction to case $T_j = 150^\circ C$; $t_p = 100 \mu s$; Duty cycle = 20 %	Z_{th}	0.08	°C/W

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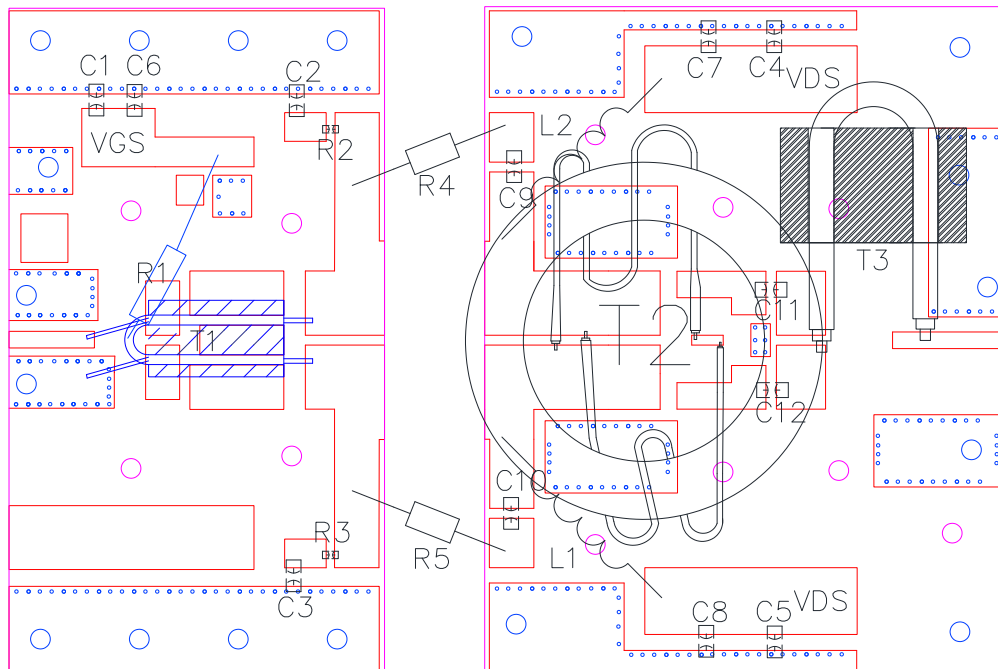
Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics (TA = 25 °C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics (Per Side)					
Drain-Source Voltage V _{GS} =0, I _{DS} =18.0mA	V _{(BR)DSS}	130			V
Zero Gate Voltage Drain Leakage Current (V _{DS} = 50V, 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} = 50V, I _D = 600 μA)	V _{GS(th)}		2.6		V
Gate Quiescent Voltage (V _{DD} = 50 V, I _D = 200 mA, Measured in Functional Test)	V _{GS(Q)}		3.36		V
Common Source Input Capacitance (V _{GS} = 0V, V _{DS} =50 V, f = 1 MHz) Each section side of device measured	C _{ISS}		200		pF
Common Source Output Capacitance (V _{GS} = 0V, V _{DS} =50 V, f = 1 MHz) Each section side of device measured	C _{OSS}		50		pF
Common Source Feedback Capacitance (V _{GS} = 0V, V _{DS} =50 V, f = 1 MHz) Each section side of device measured	C _{RSS}		1		pF

Reference Circuit of Test Fixture (13.56MHz)



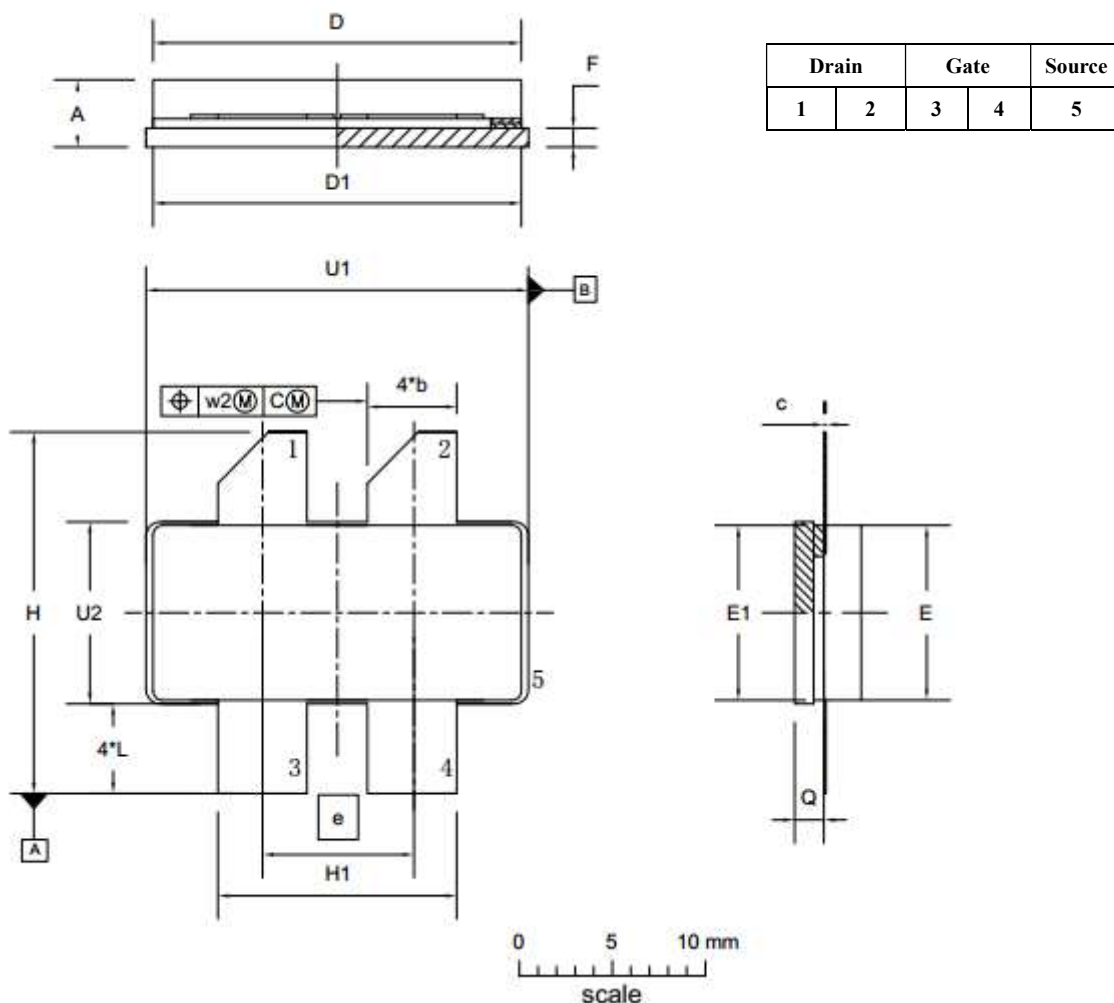
Component	Description	Suggestion
C1~C5	10uF Ceramic multilayer capacitor	
C6~C12	Ceramic multilayer capacitor, 10nF	
R1	300 Ω	
R2,R3	10 Ω	
R4,R5	200 Ω Power resistor	
L1,L2	No.43 ferrite core ,10 turns	
T1	4:1 No.43 ferrite core	
T2	4:1 No.43 ferrite core,12.5ohm coaxial cable 300mm	SFF-12.5-1.5
T3	25ohm No.43 ferrite core, 150mm	SFF-25-1.5
PCB	0.762mm [0.030"] thick, $\epsilon_r=3.48$, Rogers RO4350B, 1 oz. copper	

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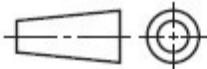
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Package Outline

Earless Flanged Ceramic Package; 4 leads



UNIT	A	b	c	D	D ₁	e	E	E ₁	F	H	H ₁	L	Q	U ₁	U ₂	W ₁	W ₂
mm	4.72	4.67	0.15	20.02	19.96	7.90	9.50	9.53	1.14	19.94	12.98	5.33	1.70	20.70	9.91	0.25	0.51
	3.43	4.93	0.08	19.61	19.66		9.30	9.25	0.89	18.92	12.73	4.32	1.45	20.45	9.65		
inches	0.186	0.194	0.006	0.788	0.786	0.311	0.374	0.375	0.045	0.785	0.511	0.210	0.067	0.815	0.390	0.01	0.02
	0.135	0.184	0.003	0.772	0.774		0.366	0.364	0.035	0.745	0.501	0.170	0.057	0.805	0.380		

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4					03/12/2013

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2023/2/28	Rev 1.0	Preliminary Datasheet

Application data based on HL-23-05

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