TXTJ290P02U-G

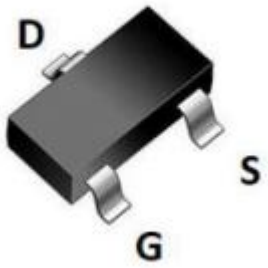
Silicon P-Channel Power MOSFET

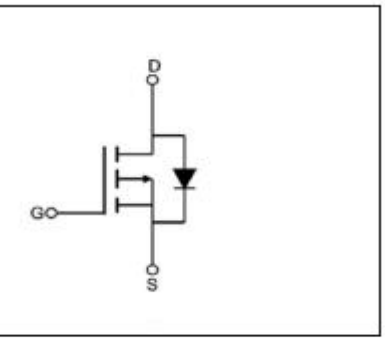
General Description :

The TXTJ290P02U-G uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOT-23, which accords with the RoHS standard and Halogen-free.

V_{DSS}	-20	V
I_D	-6	A
P_D	1	W
$R_{DS(ON)type}$	29	mΩ

SOT-23





Features :

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Applications :

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute (Tc= 25℃unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-20	V
I_D	Continuous Drain Current	-6	A
I_{DM}	Pulsed Drain Current	-22	A
V_{GS}	Gate-to-Source Voltage	±12	V
P_D	Power Dissipation	1	W
T_J , T_{stg}	Operating Junction and Storage Temperature Range	–55 to 150	℃

Electrical Characteristics (Tc= 25℃unless otherwise specified) ：

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-20	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=-20V, V_{GS}= 0V,T_a=25℃	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+12V	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-12V	--	--	-0.1	μA

ON Characteristics[a3]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-4.5V,I_D=-2A	--	29	35	mΩ
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=-2.5V,I_D=-1A	--	34	53	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	0.4	0.6	1.0	V
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-10V f=1.0MHz	--	765	--	pF
C_{oss}	Output Capacitance		--	121	--	
C_{rss}	Reverse Transfer Capacitance		--	73	--	

Resistive Switching Characteristics[a4]						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-10V, I_D=-2A V_{GS}=-4.5V,R_G=3Ω	--	11	--	ns
tr	Rise Time		--	30	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	50	--	
t_f	Fall Time		--	50	--	
Q_g	Total Gate Charge	V_{DD}=-10V, I_D=-2A V_{GS}=-4.5V	--	9	--	nC
Q_{gs}	Gate to Source Charge		--	1.7	--	
Q_{gd}	Gate to DrainCharge		--	2.2	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current a2(Body Diode)		--	--	-6	A
V_{SD}	Diode Forward Voltage a3	I_S=-1A,V_{GS}=0V	--	--	-1.2	V

Symbol	Parameter	Typ.	Units
$R_{\theta JA}$	Thermal Resistance Junction-Ambient. a2	110	℃ /W

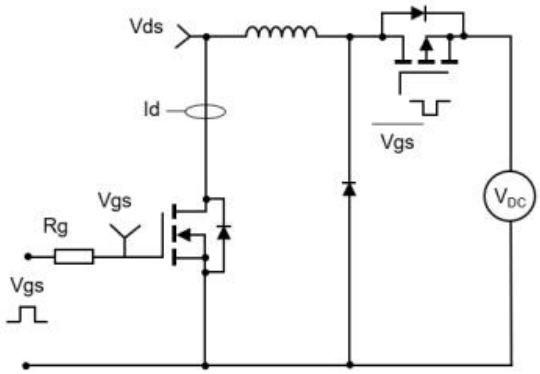
a2 : Surface Mounted on FR4 Board, t≤10sec.

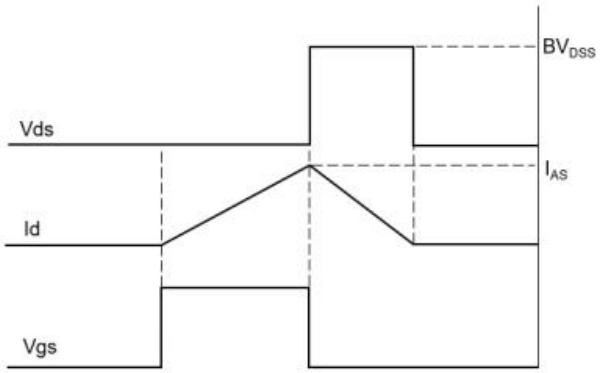
a3 : Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

a4 : Guaranteed by design, not subject to production

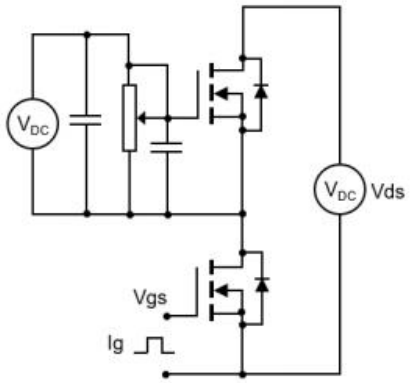
Test Circuit & Waveform

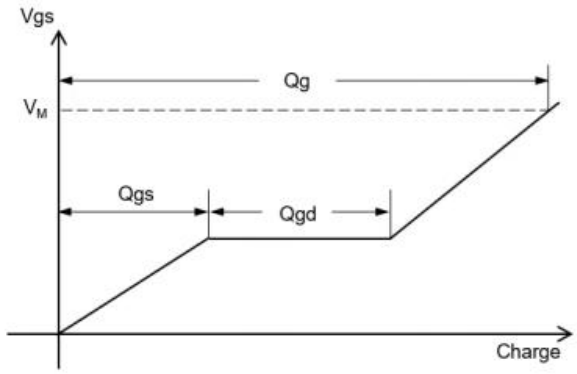
1. Unclamped Inductive Switching Test Circuit & Waveform



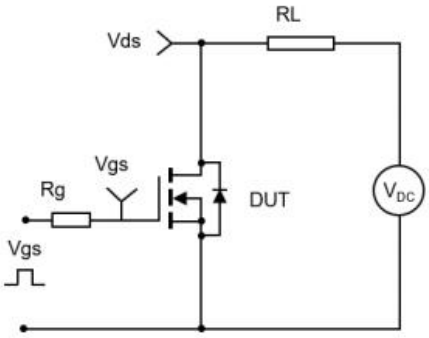


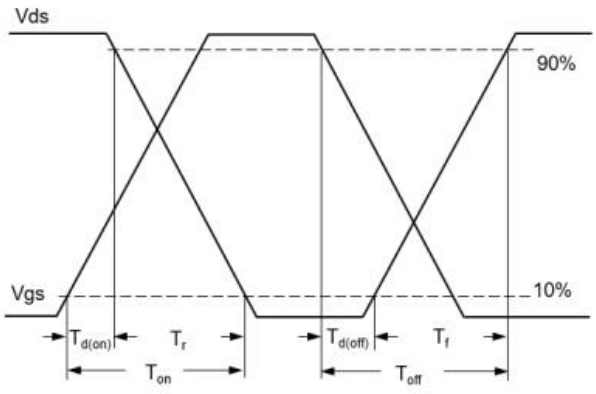
2. Gate Charge Test Circuit & Waveform





3. Resistive Switching Test Circuit & Waveform





Characteristics Curve :

Fig1 Output Characteristics

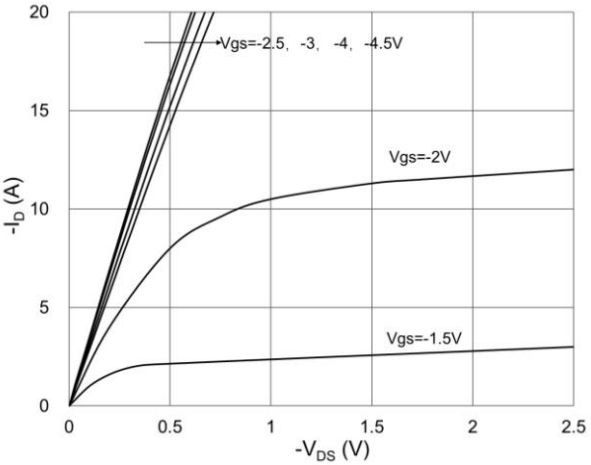


Fig2 Normalized R_{DSON} vs. T_J

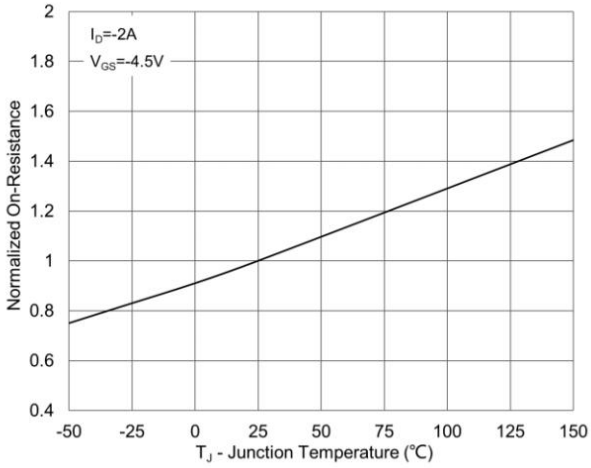


Fig3 Gate Charge Waveform

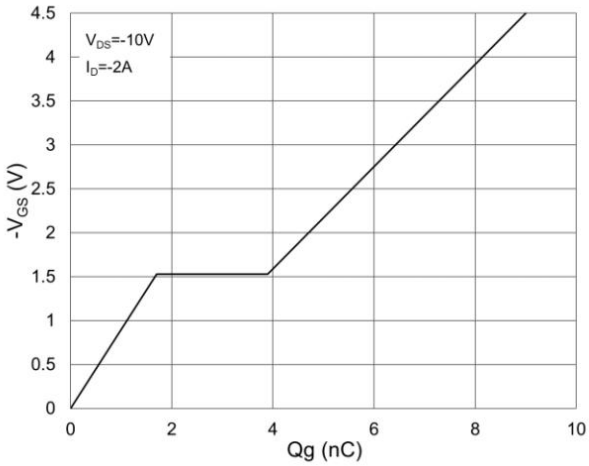


Fig4 Transfer Characteristics

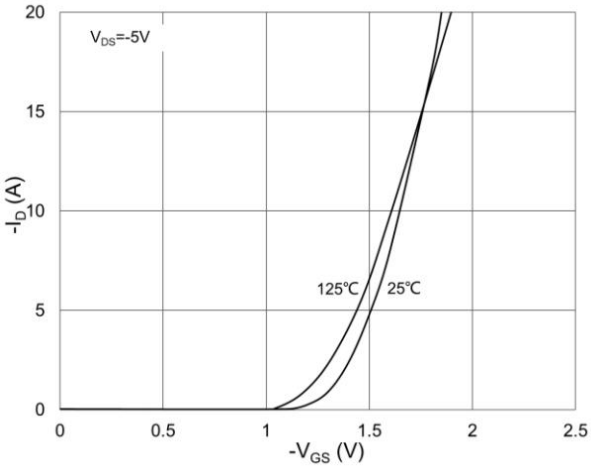


Fig5 Rds(on) vs. Drain Current and Gate Voltage

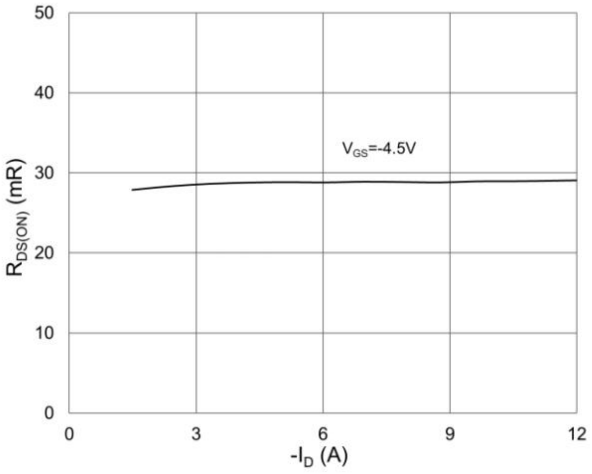


Fig6 Rds(on) vs. Gate Voltage

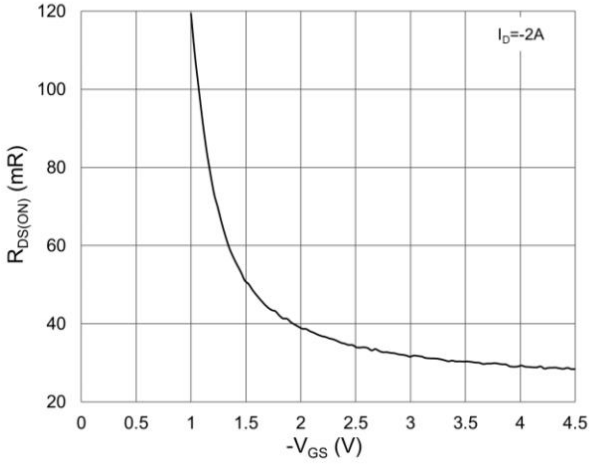


Fig7 Capacitance Characteristics

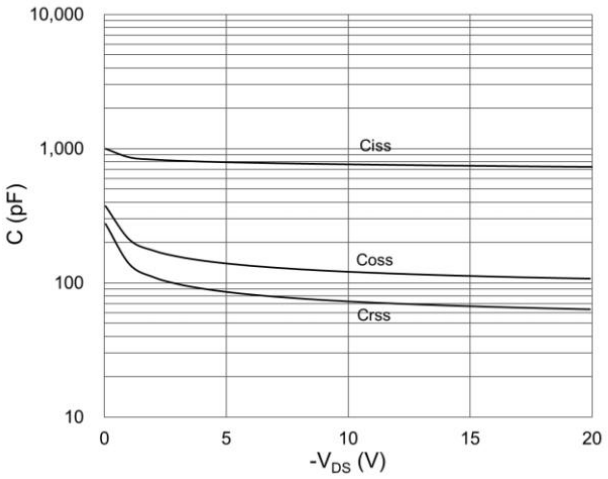


Fig8 Drain Current Derating

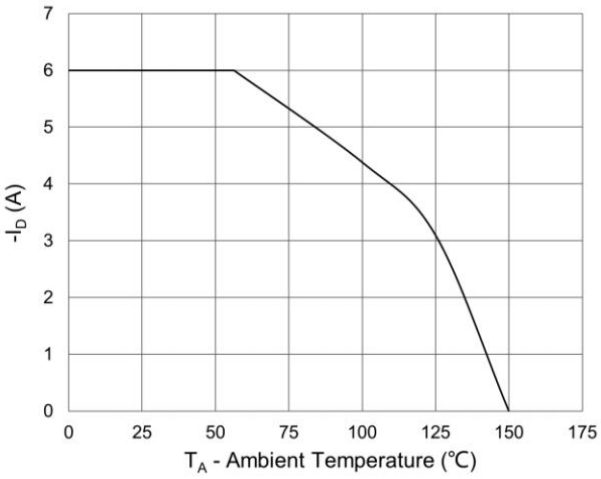


Fig9 Power Dissipation

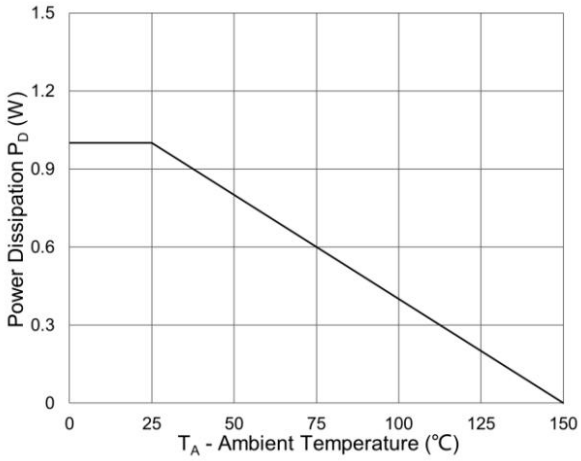


Fig10 Source-Drain Diode Forward Characteristics

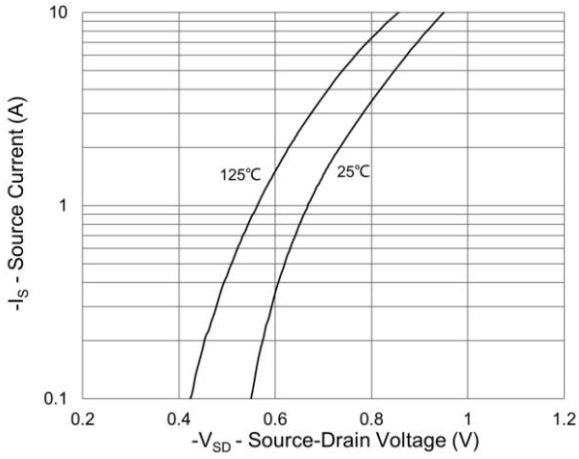


Fig11 Normalized Threshold Voltage vs. T_J

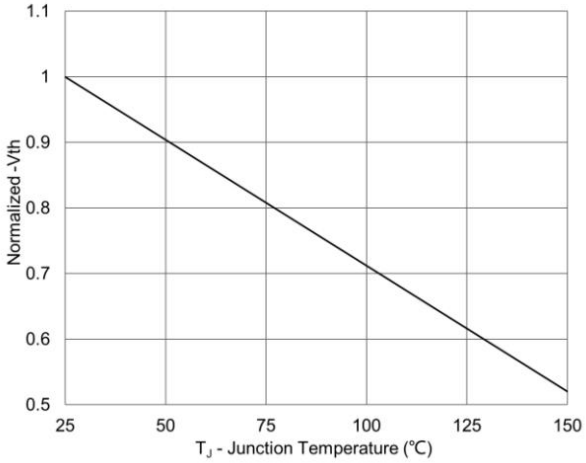


Fig12 Normalized Breakdown Voltage vs. T_J

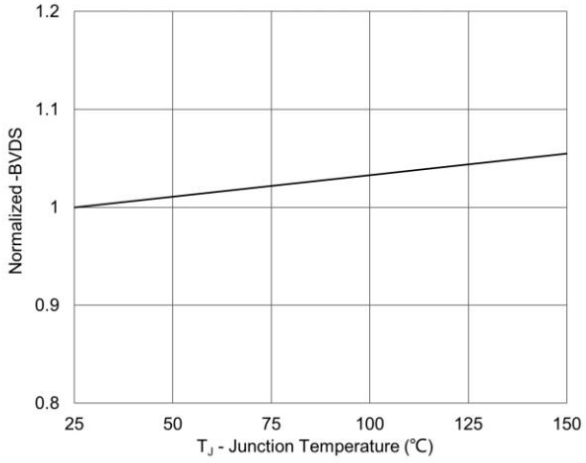


Fig13 Maximum Safe Operation Area

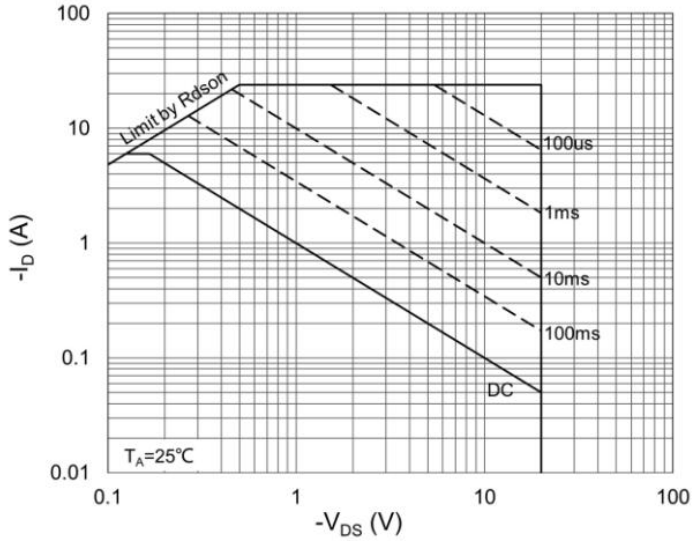
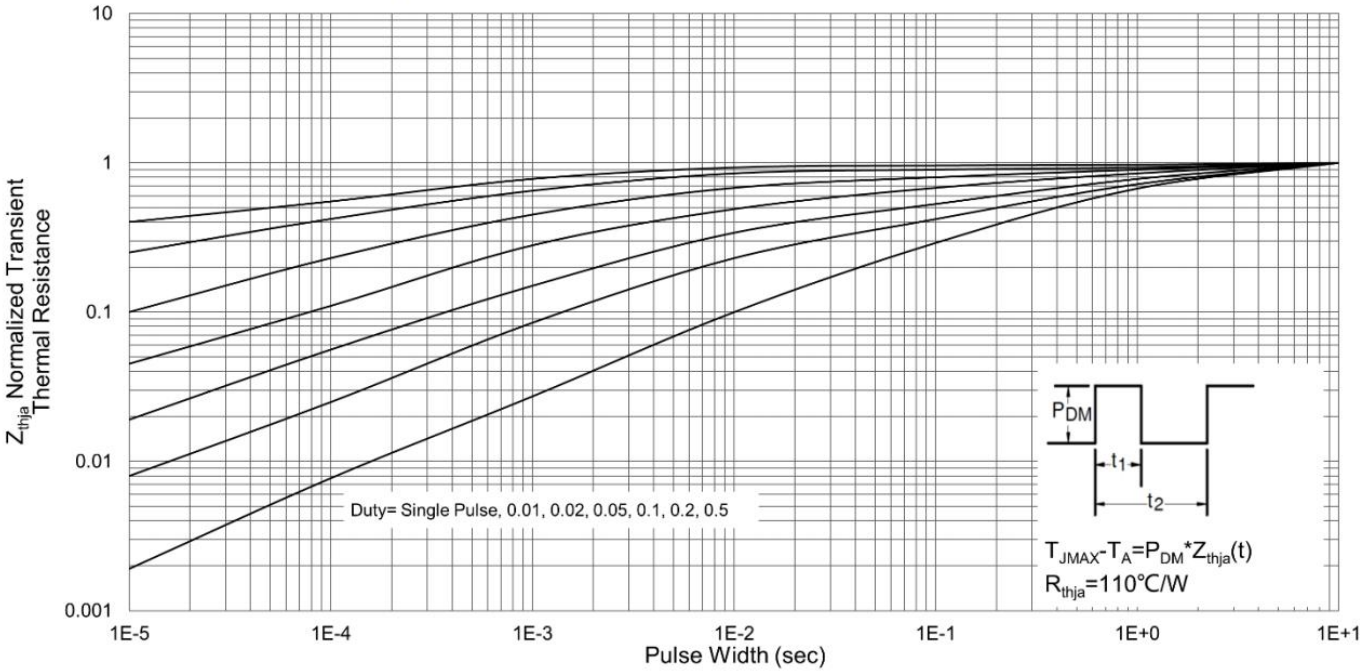
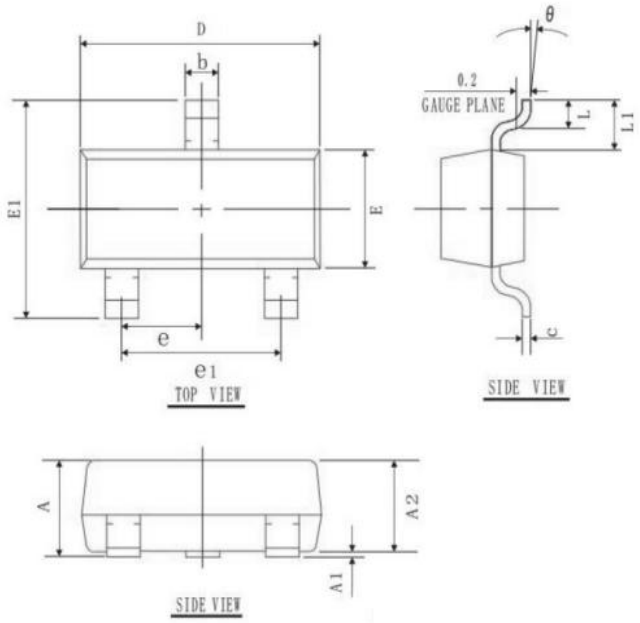


Fig14 Normalized Transient Impedance



SOT-23 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		