N-Channel Enhancement Mode Power MOSFET

Description

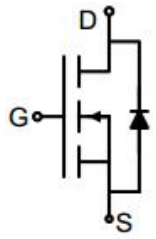
The GT1K2N10I uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 100V
- I_D (at V_{GS} = 10V) 3.3A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 110mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 135mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram

SOT-23

Ordering Information

Device	Package	Marking	Packaging
GT1K2N10I	SOT-23	GT1K2N10	3000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Continuous Drain Current	T_C = 25ºC	I_D	3.3	A
	T_C = 100ºC		2	
Pulsed Drain Current (note1)		I_{DM}	13.2	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	1.6	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient, t≤10s	R_{thJA}	78	ºC/W

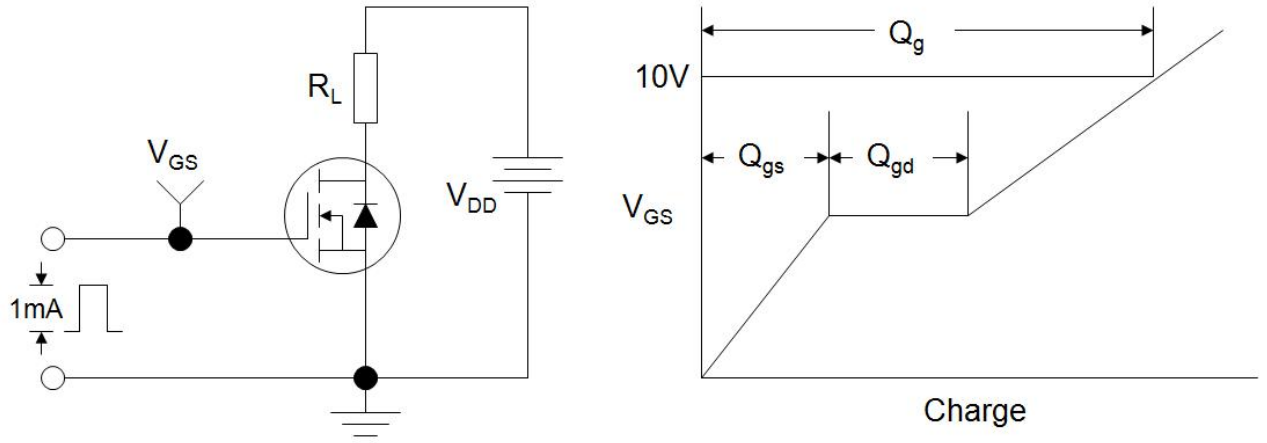
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.2	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 3A	--	91	110	mΩ
		V_{GS} = 4.5V, I_D = 2A	--	113	135	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 3A	--	3	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	145	--	pF
Output Capacitance	C_{oss}		--	40	--	
Reverse Transfer Capacitance	C_{rss}		--	3	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 3A, V_{GS} = 10V	--	4.2	--	nC
Gate-Source Charge	Q_{gs}		--	0.6	--	
Gate-Drain Charge	Q_{gd}		--	1.1	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 3A, R_G = 2Ω	--	15	--	ns
Turn-on Rise Time	t_r		--	4	--	
Turn-off Delay Time	$t_{d(off)}$		--	21	--	
Turn-off Fall Time	t_f		--	3	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	3.3	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 3A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 3A, V_{GS} = 0V di/dt=100A/us	--	40	--	nC
Reverse Recovery Time	Trr		--	33	--	ns

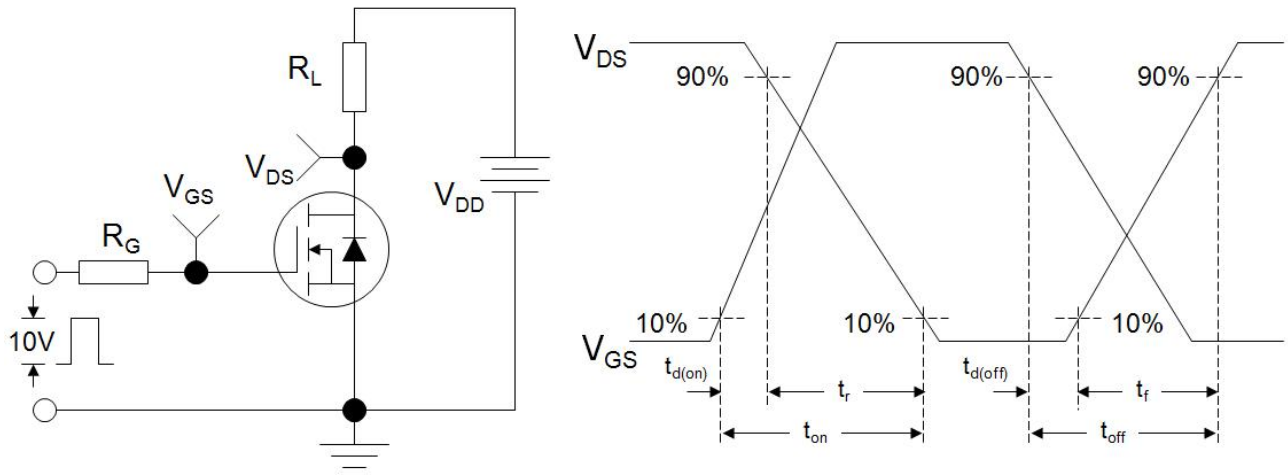
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

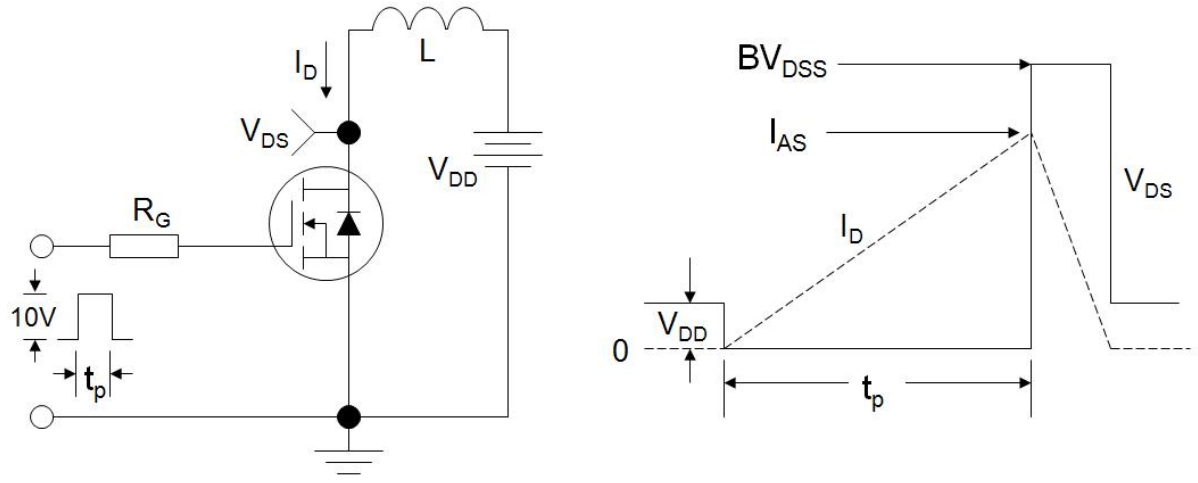
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

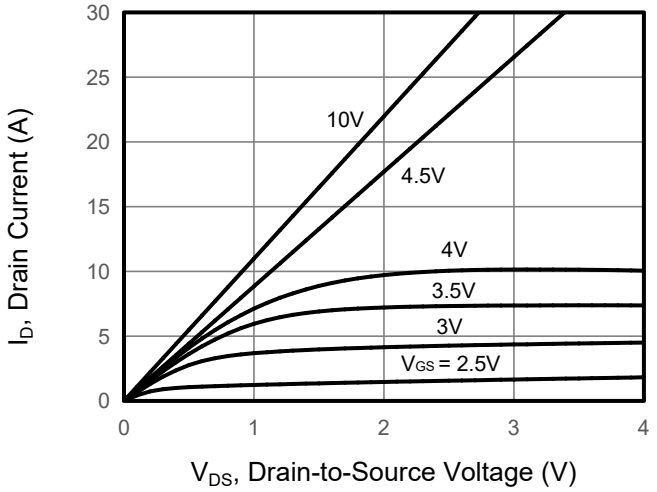


Figure 2. Transfer Characteristics

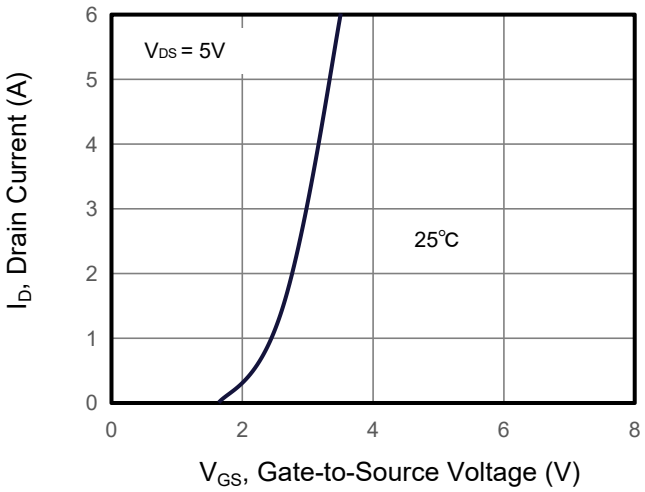


Figure 3. Drain Source On Resistance

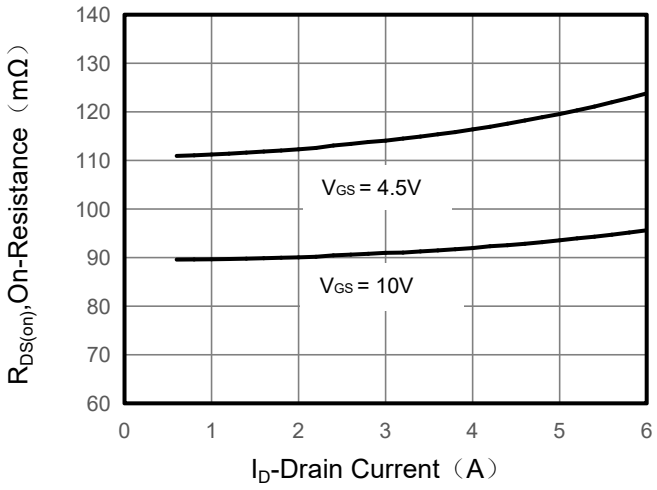


Figure 4. Gate Charge

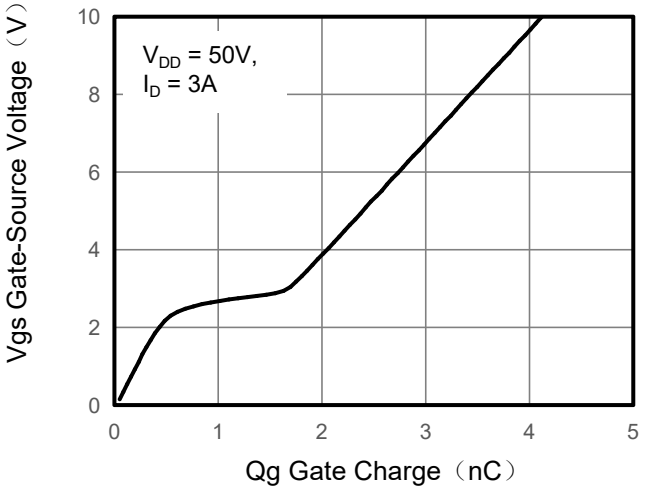


Figure 5. Capacitance

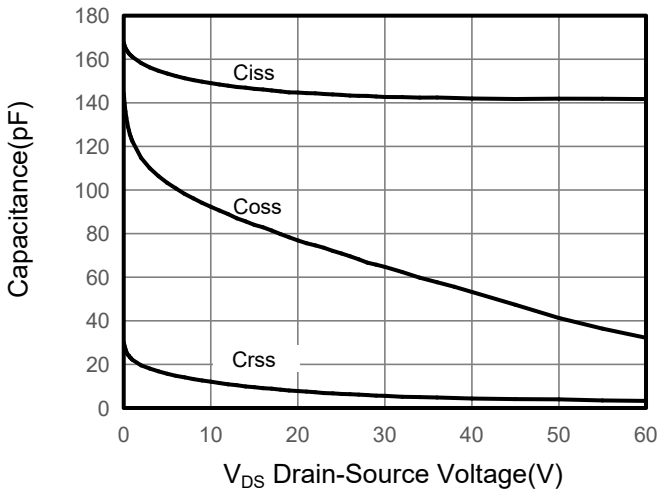
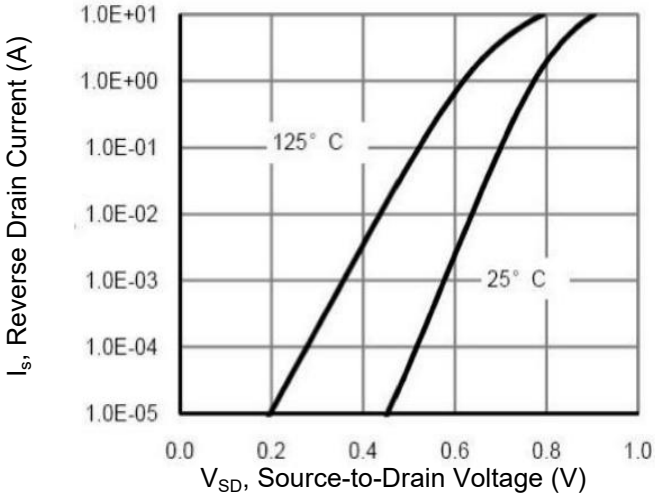


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

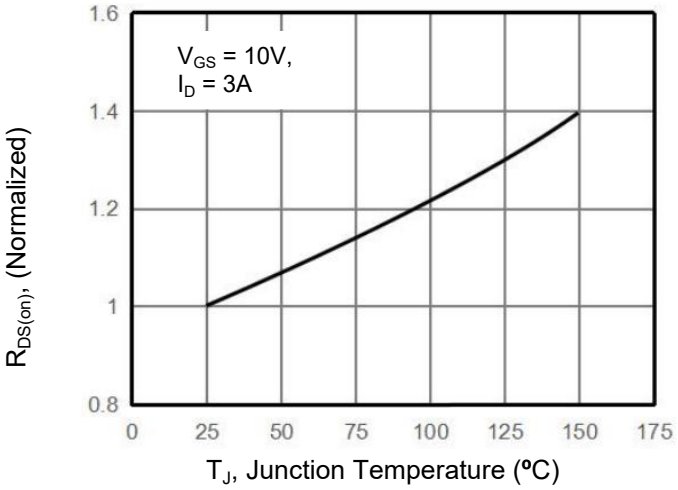


Figure 8. Safe Operation Area

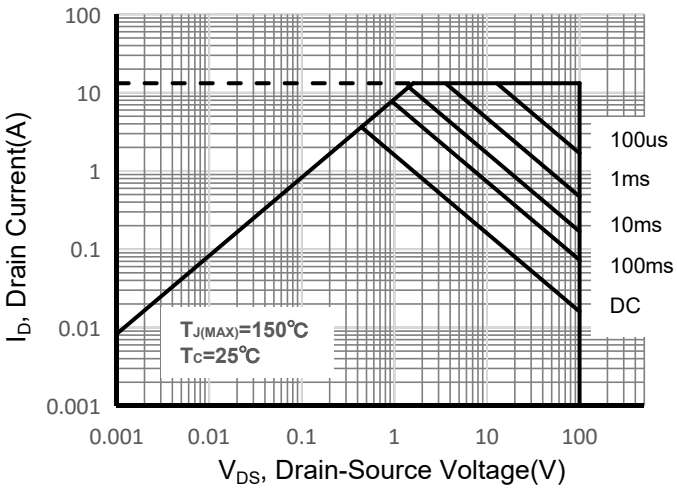


Figure 9. Maximum Continuous Drain Current vs Case Temperature

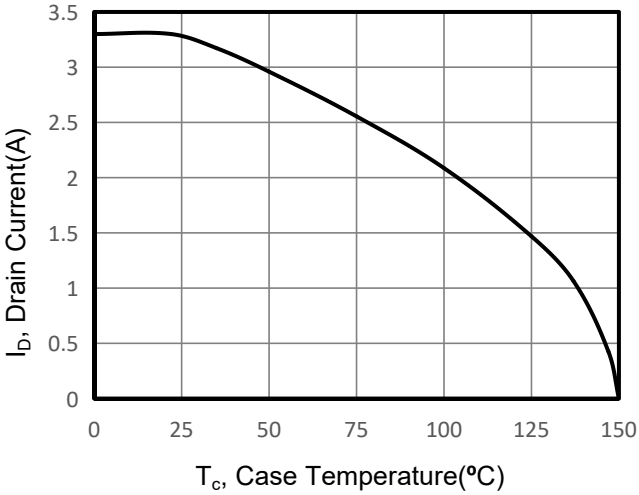
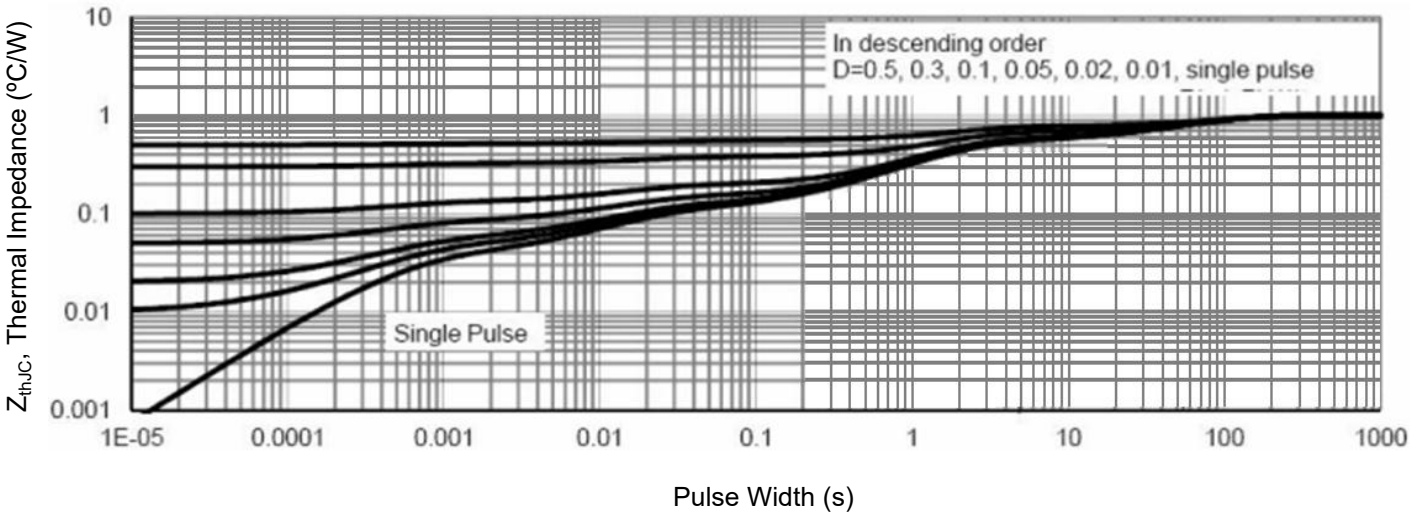
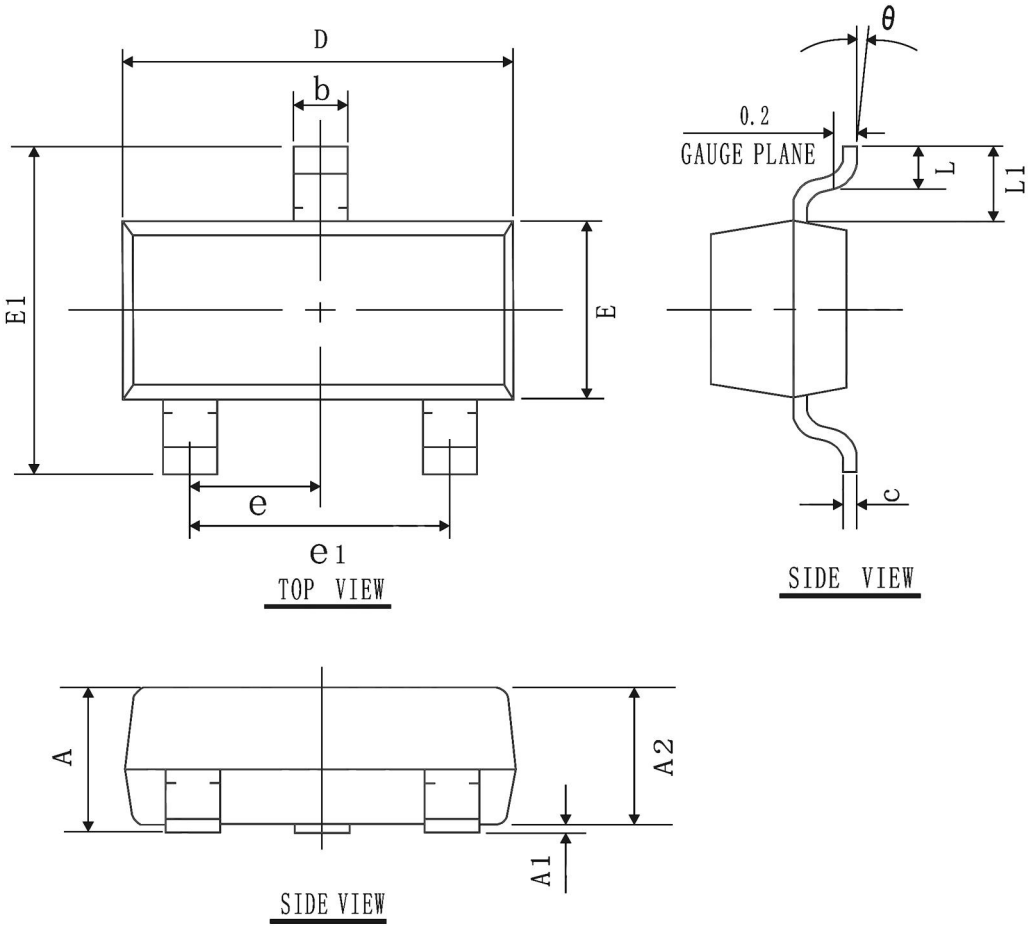


Figure 10. Normalized Maximum Transient Thermal Impedance



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		