

## P-Channel Enhancement Mode Power MOSFET

<p><b>Description</b></p> <p>The G32KP10I uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge. It can be used in a wide variety of applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>● <math>V_{DS}</math> -100V</li> <li>● <math>I_D</math> (at <math>V_{GS} = -10V</math>) -1A</li> <li>● <math>R_{DS(ON)}</math> (at <math>V_{GS} = -10V</math>) &lt; 3.2Ω</li> <li>● <math>R_{DS(ON)}</math> (at <math>V_{GS} = -4.5V</math>) &lt; 5Ω</li> <li>● 100% Avalanche Tested</li> <li>● RoHS Compliant</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>● Power switch</li> <li>● DC/DC converters</li> </ul>	<p>Schematic diagram</p> <p>SOT-23</p>
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<b>Ordering Information</b>			
<b>Device</b>	<b>Package</b>	<b>Marking</b>	<b>Packaging</b>
G32KP10I	SOT-23	G32KP10	3000pcs/Reel

<b>Absolute Maximum Ratings</b> $T_C = 25^\circ\text{C}$ , unless otherwise noted			
<b>Parameter</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
Drain-Source Voltage	$V_{DS}$	-100	V
Continuous Drain Current	$I_D$	-1	A
Pulsed Drain Current (note1)	$I_{DM}$	-4	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_D$	0.77	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	°C

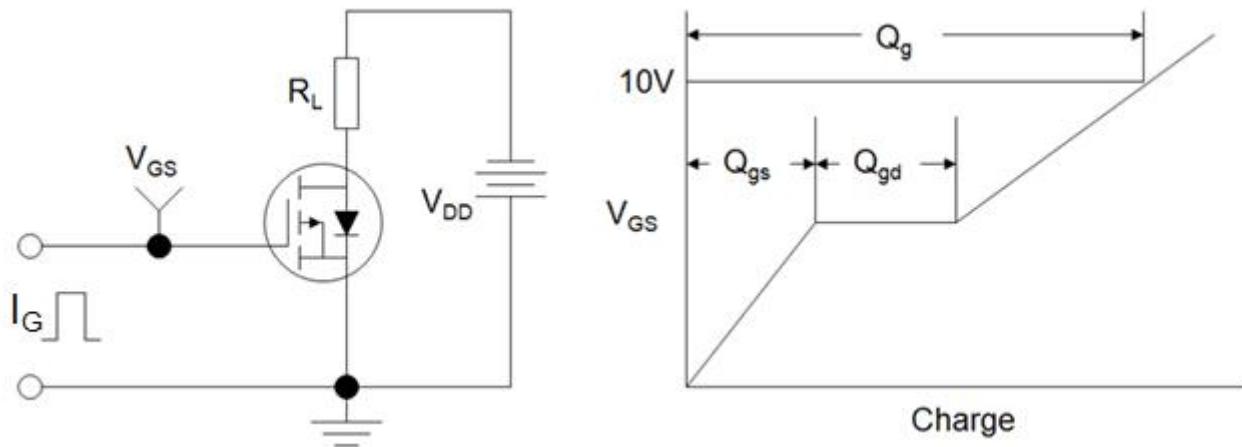
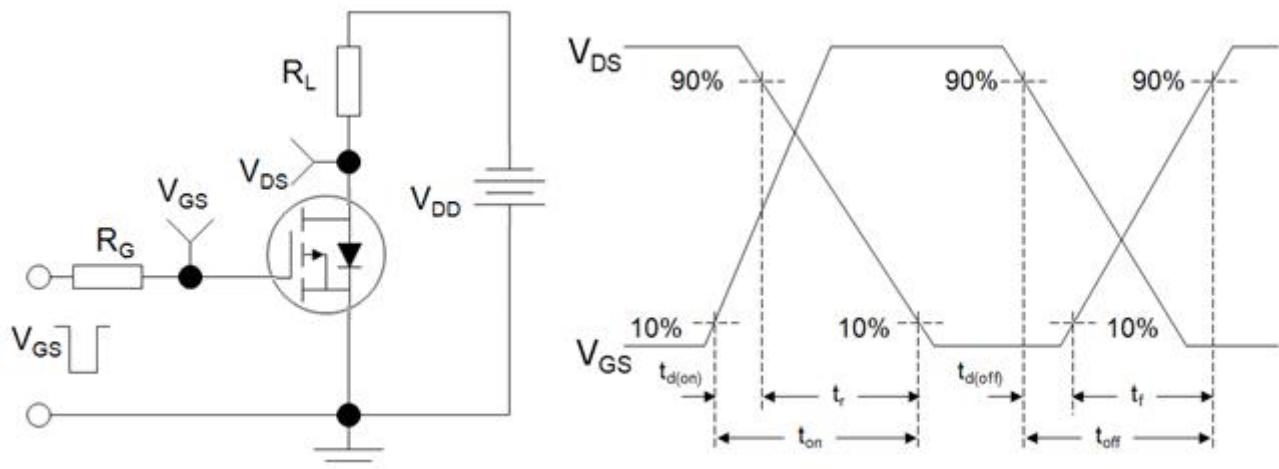
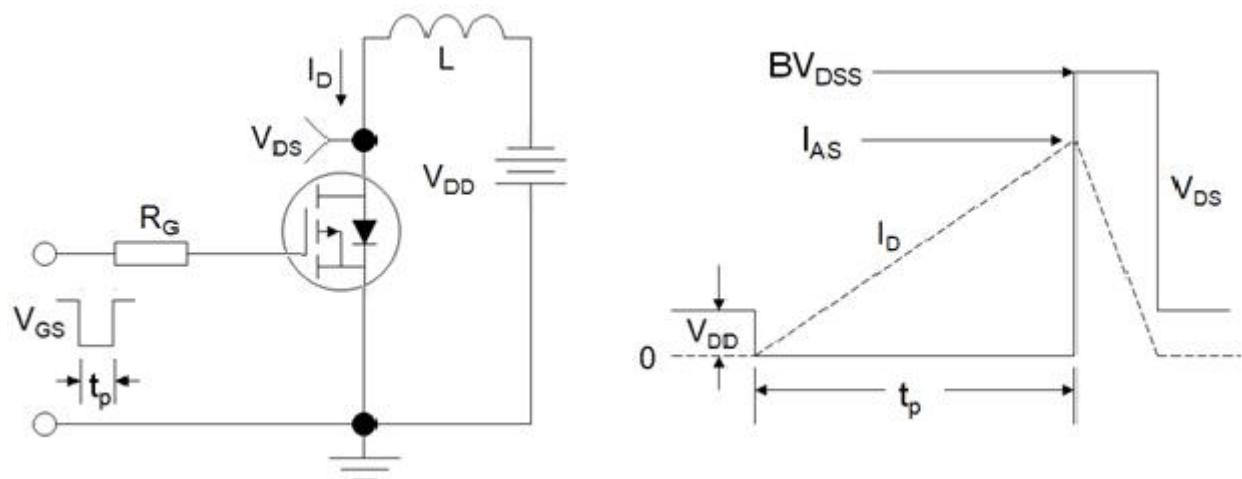
<b>Thermal Resistance</b>			
<b>Parameter</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
Thermal Resistance, Junction-to-Ambient	$R_{thJA}$	162	°C/W

**Specifications**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{V}, I_D = -250\mu\text{A}$	-100	--	--	V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{\text{DS}} = -100\text{V}, V_{\text{GS}} = 0\text{V}$	--	--	-1	$\mu\text{A}$
Gate-Source Leakage	$I_{\text{GSS}}$	$V_{\text{GS}} = \pm 20\text{V}$	--	--	$\pm 10$	$\mu\text{A}$
Gate-Source Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = -250\mu\text{A}$	-1	-2	-3	V
Drain-Source On-Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = -10\text{V}, I_D = -0.5\text{A}$	--	2.4	3.2	$\Omega$
		$V_{\text{GS}} = -4.5\text{V}, I_D = -0.5\text{A}$	--	3	5	
Forward Transconductance	$g_{\text{FS}}$	$V_{\text{DS}} = -5\text{V}, I_D = -0.5\text{A}$	--	0.7	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{\text{iss}}$	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = -50\text{V}, f = 1.0\text{MHz}$	--	78	--	pF
Output Capacitance	$C_{\text{oss}}$		--	12	--	
Reverse Transfer Capacitance	$C_{\text{rss}}$		--	7	--	
Total Gate Charge	$Q_g$	$V_{\text{DD}} = -50\text{V}, I_D = -0.5\text{A}, V_{\text{GS}} = -10\text{V}$	--	3.2	--	nC
Gate-Source Charge	$Q_{\text{gs}}$		--	0.5	--	
Gate-Drain Charge	$Q_{\text{gd}}$		--	1.1	--	
Turn-on Delay Time	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = -50\text{V}, I_D = -0.5\text{A}, R_G = 2.5\Omega$	--	32	--	ns
Turn-on Rise Time	$t_r$		--	10	--	
Turn-off Delay Time	$t_{\text{d}(\text{off})}$		--	28	--	
Turn-off Fall Time	$t_f$		--	9	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	-1	A
Body Diode Voltage	$V_{\text{SD}}$	$T_J = 25^\circ\text{C}, I_{\text{SD}} = -0.5\text{A}, V_{\text{GS}} = 0\text{V}$	--	--	-1.2	V
Reverse Recovery Charge	$Q_{\text{rr}}$	$I_F = -0.5\text{A}, V_{\text{GS}} = 0\text{V}$ $dI/dt = -100\text{A}/\mu\text{s}$	--	21	--	nC
Reverse Recovery Time	$T_{\text{rr}}$		--	18	--	ns

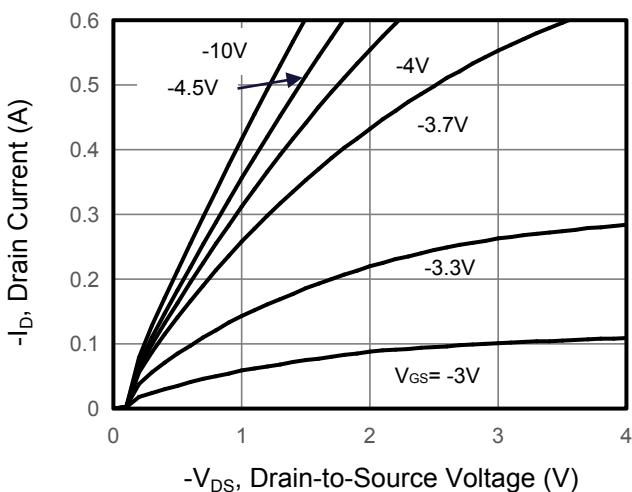
**Notes**

- Repetitive Rating: Pulse width limited by maximum junction temperature
- EAS condition :  $T_J=25^\circ\text{C}$ ,  $V_{\text{DD}}=-50\text{V}$ ,  $V_{\text{GS}}=-10\text{V}$ ,  $L=0.5\text{mH}$ ,  $R_G=25\Omega$
- Identical low side and high side switch with identical  $R_G$

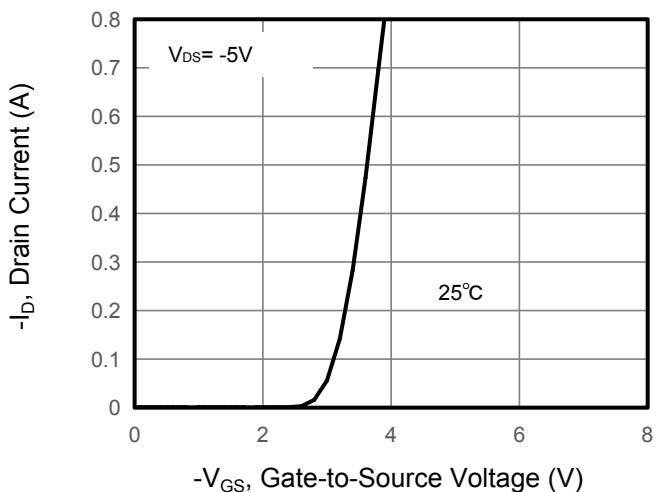
**Gate Charge Test Circuit**

**Switch Time Test Circuit**

**EAS Test Circuit**


**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

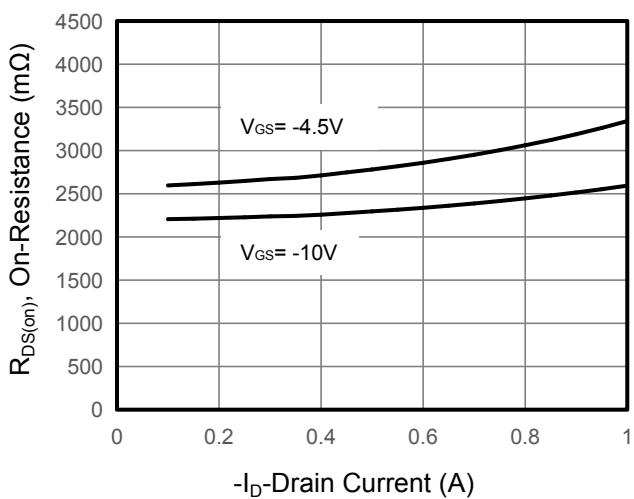
**Figure 1. Output Characteristics**



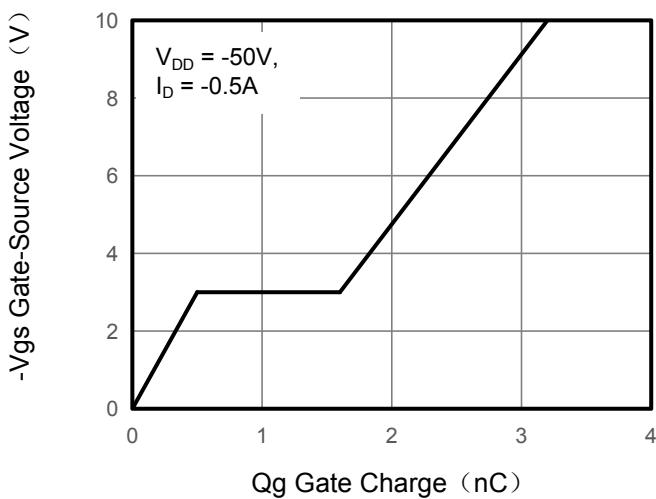
**Figure 2. Transfer Characteristics**



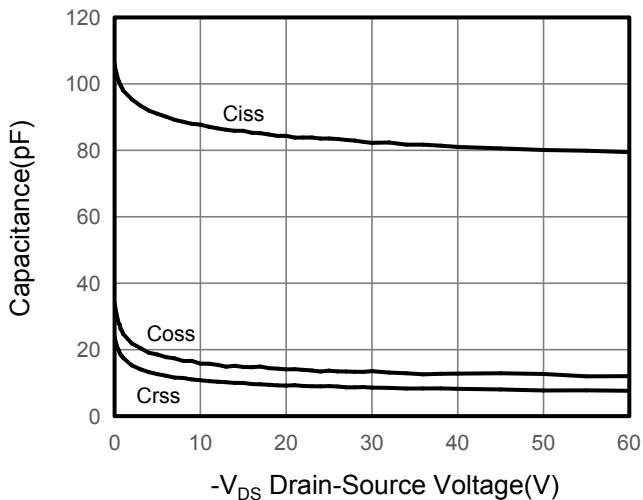
**Figure 3. Drain Source On Resistance**



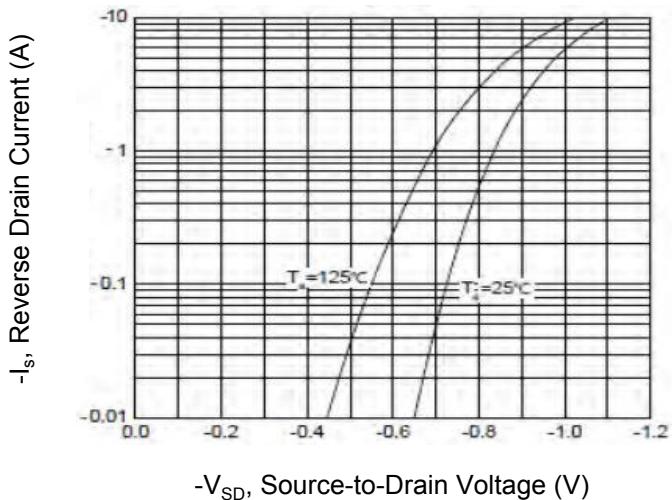
**Figure 4. Gate Charge**



**Figure 5. Capacitance**

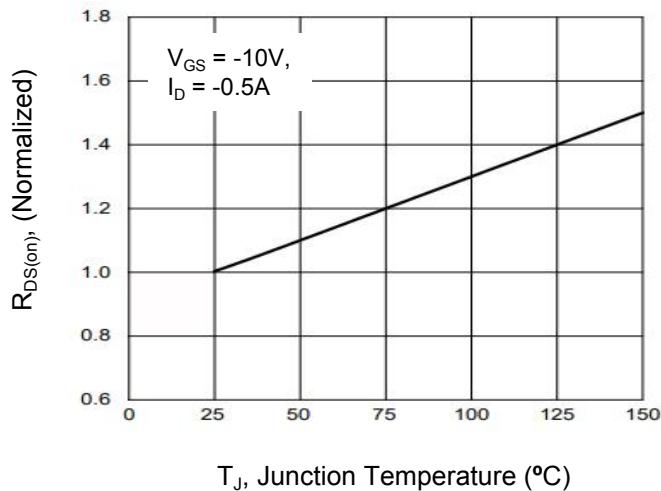


**Figure 6. Source-Drain Diode Forward**

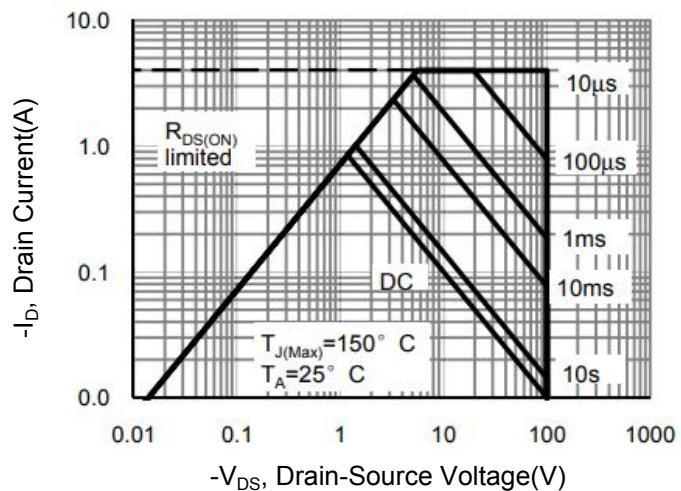


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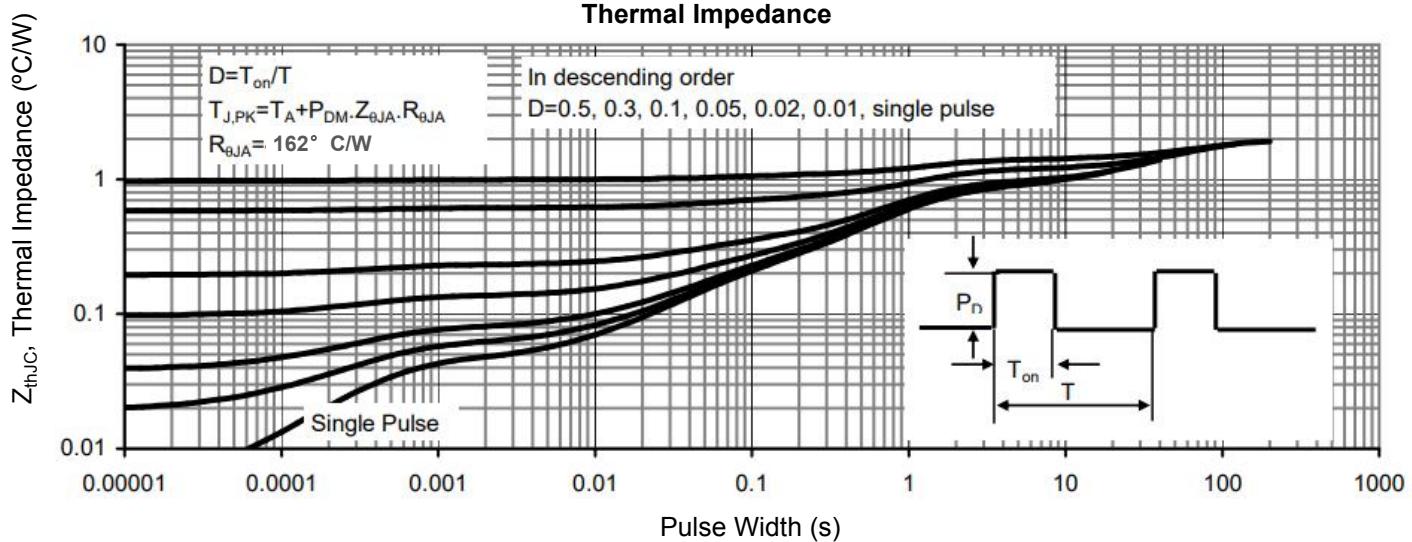
**Figure 7. Drain-Source On-Resistance**

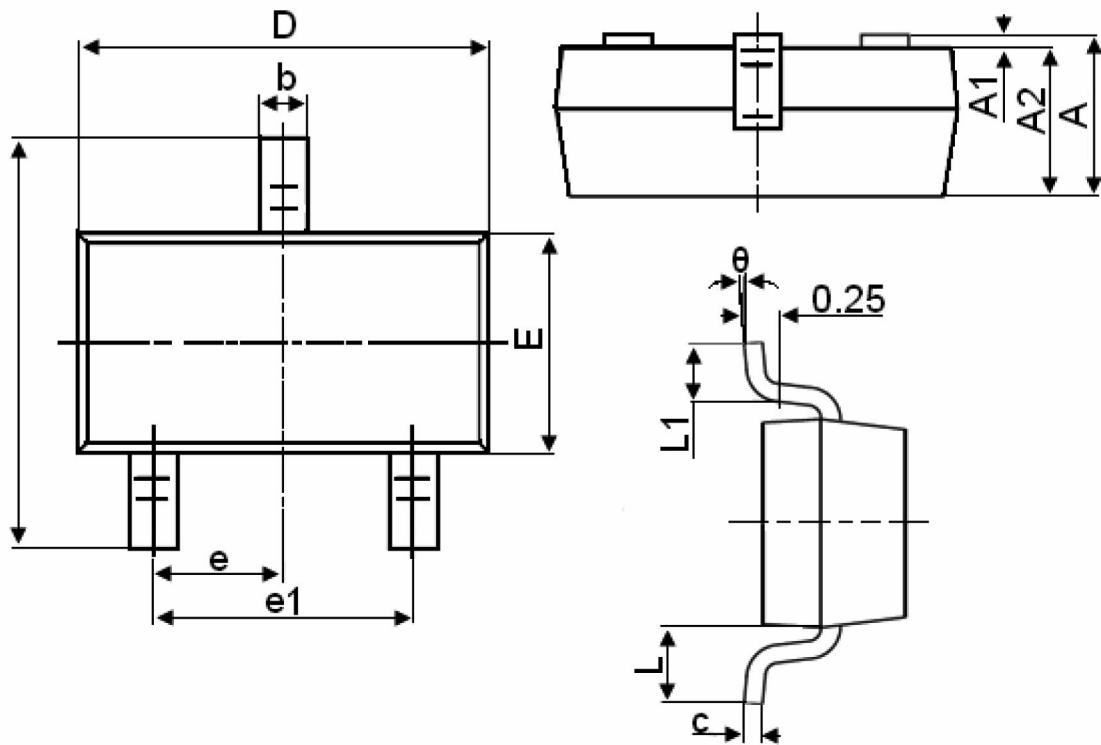


**Figure 10. Safe Operation Area**



**Figure 9. Normalized Maximum Transient Thermal Impedance**



**SOT-23 Package Information**


Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°