

## Features

- 20V/3A,  
 $R_{DS(ON)} = 43m\Omega(Typ.)@V_{GS}=4.5V$   
 $R_{DS(ON)} = 55m\Omega(Typ.)@V_{GS}=2.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

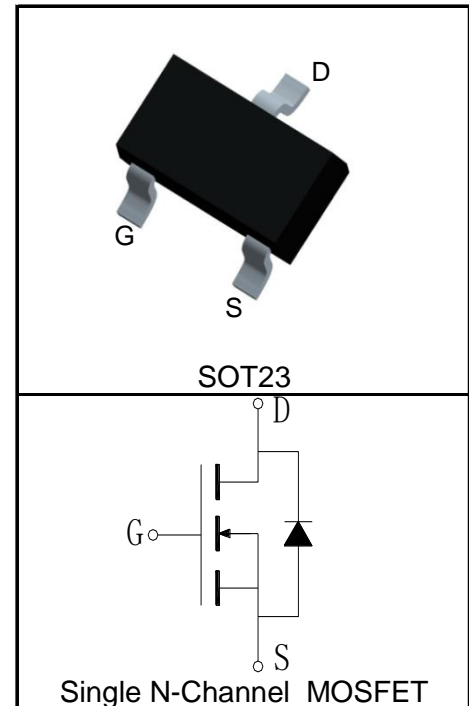
## Applications

- Load Switch



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_A=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	20	V
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_A=25^\circ\text{C}$ 1.3	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{(1)}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ 12	A
$I_D^{(2)}$	Continuous Drain Current( $V_{GS}=4.5V$ )	$T_A=25^\circ\text{C}$ 3	A
		$T_A=70^\circ\text{C}$ 2.4	
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 1	W
		$T_A=70^\circ\text{C}$ 0.64	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	-	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	125	$^\circ\text{C}/\text{W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	TBD	mJ

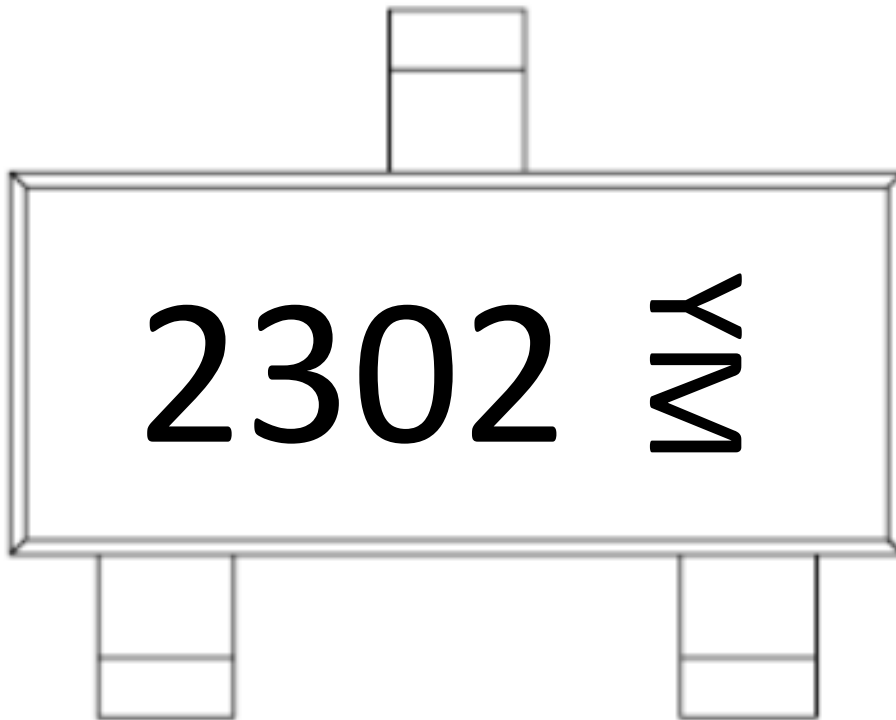
**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS2302AA			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	20			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.4	0.65	1	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=2A$		43	56	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=1.5A$		55	78	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=2A, V_{GS}=0V$		0.75	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=2A, di_{SD}/dt=100A/\mu s$		15		ns
$Q_{rr}$	Reverse Recovery Charge			6		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.2		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz		480		pF
$C_{oss}$	Output Capacitance			80		
$C_{rss}$	Reverse Transfer Capacitance			55		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, I_{DS}=2A,$ $V_{GEN}=4.5V, R_G=6\Omega$		12		ns
$t_r$	Turn-on Rise Time			55		
$t_{d(OFF)}$	Turn-off Delay Time			19		
$t_f$	Turn-off Fall Time			11		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V,$ $I_{DS}=2A$		4		nC
$Q_{gs}$	Gate-Source Charge			0.7		
$Q_{gd}$	Gate-Drain Charge			1.2		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - ③ When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.
  - ④ Limited by  $T_{Jmax}$ . Starting  $T_J = 25^\circ\text{C}$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

**Ordering and Marking Information**

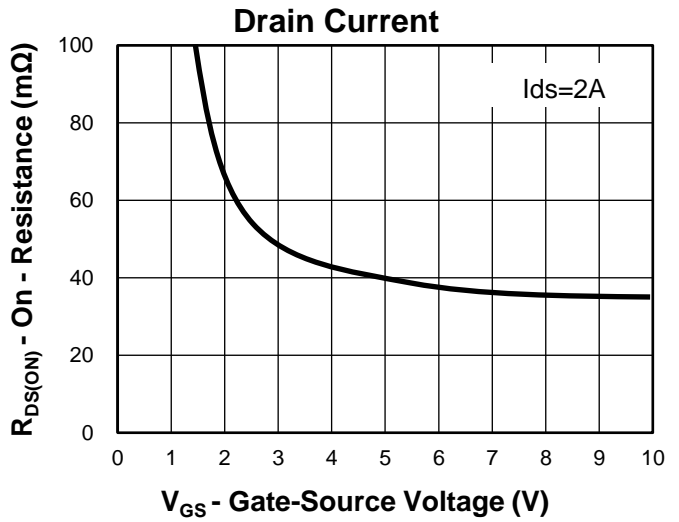
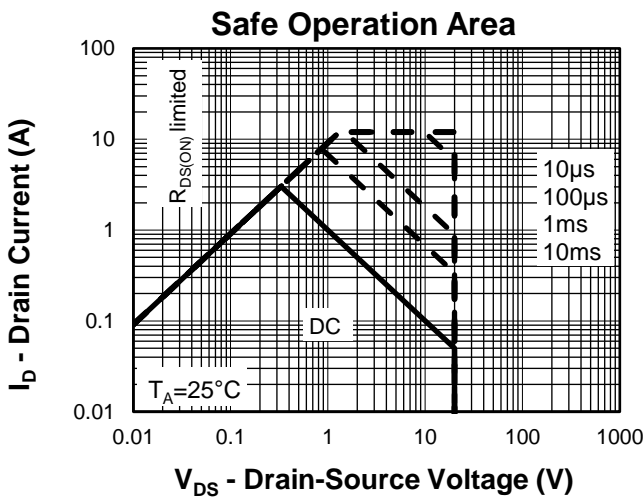
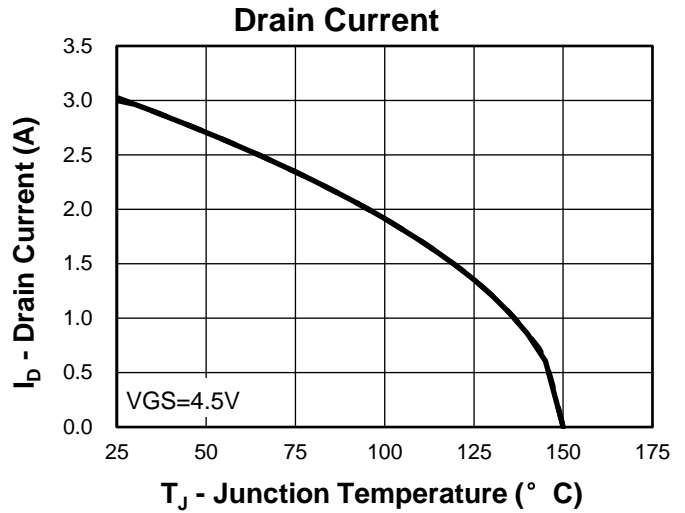
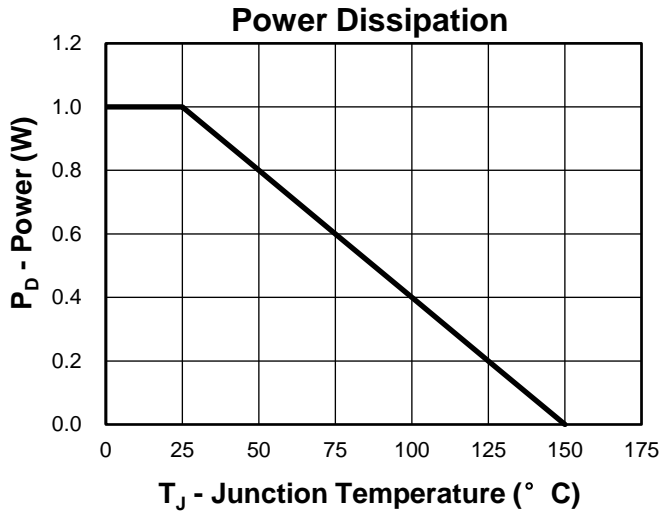
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS2302AA	SOT23	Tape&Reel	3000	7"	8mm



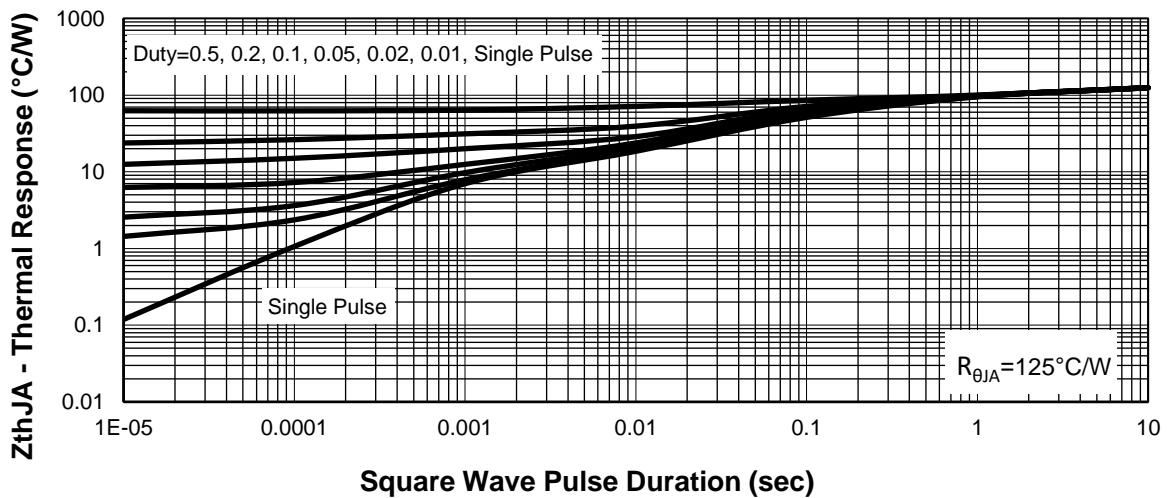
Y =Year,2017-A,2018-B,etc.

M =Month,Jan-1,Feb-2,....Sep-9,Oct-A,Nov-B,Dec-C.

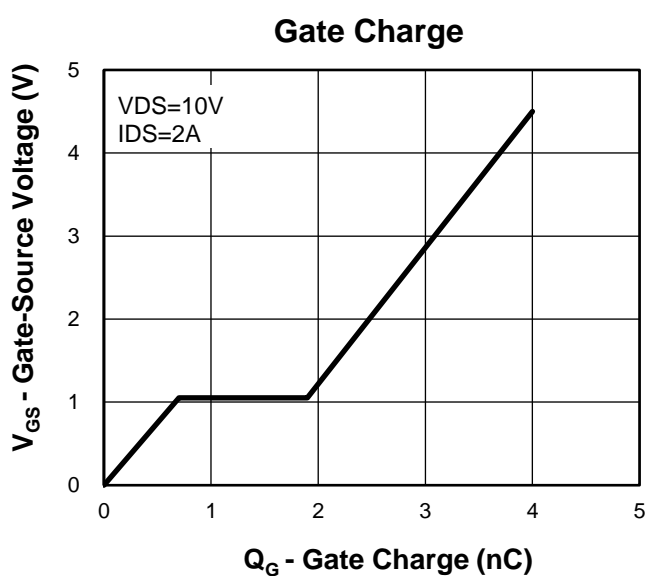
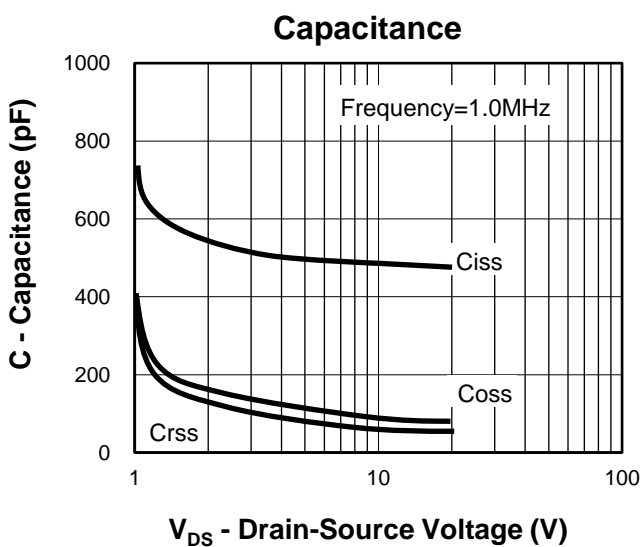
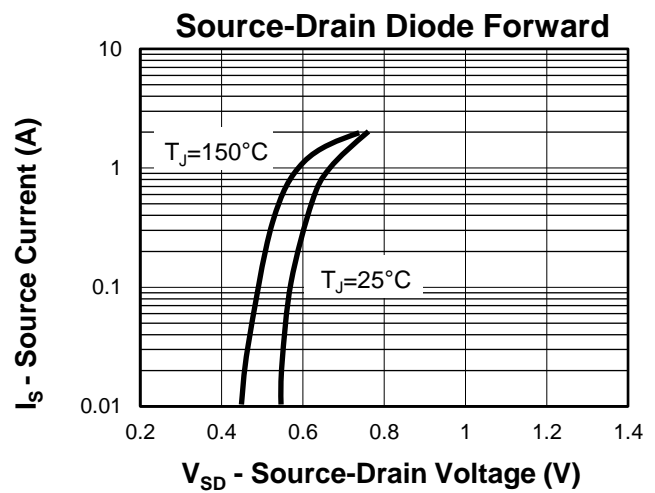
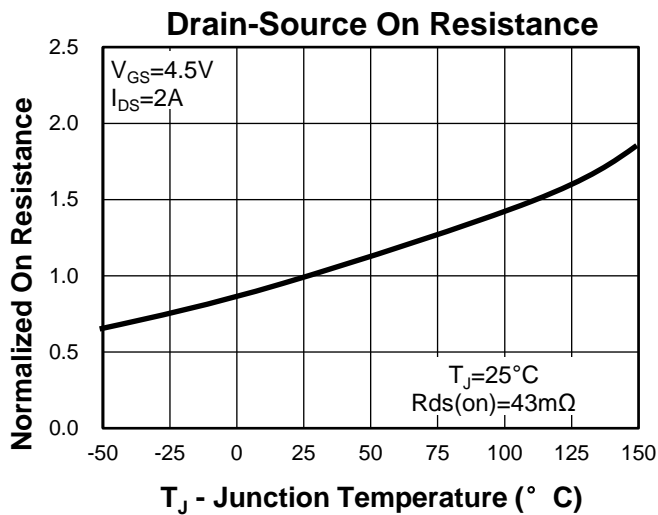
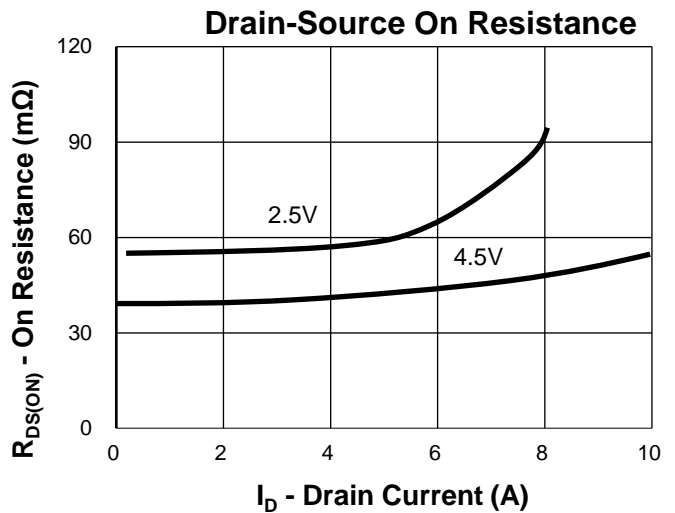
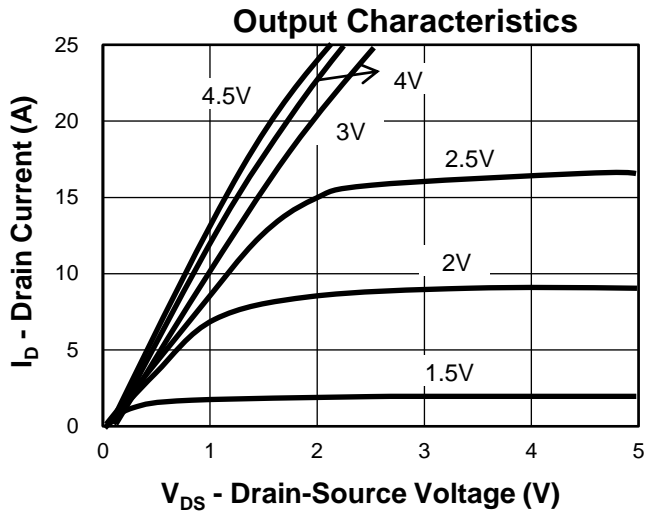
### Typical Characteristics

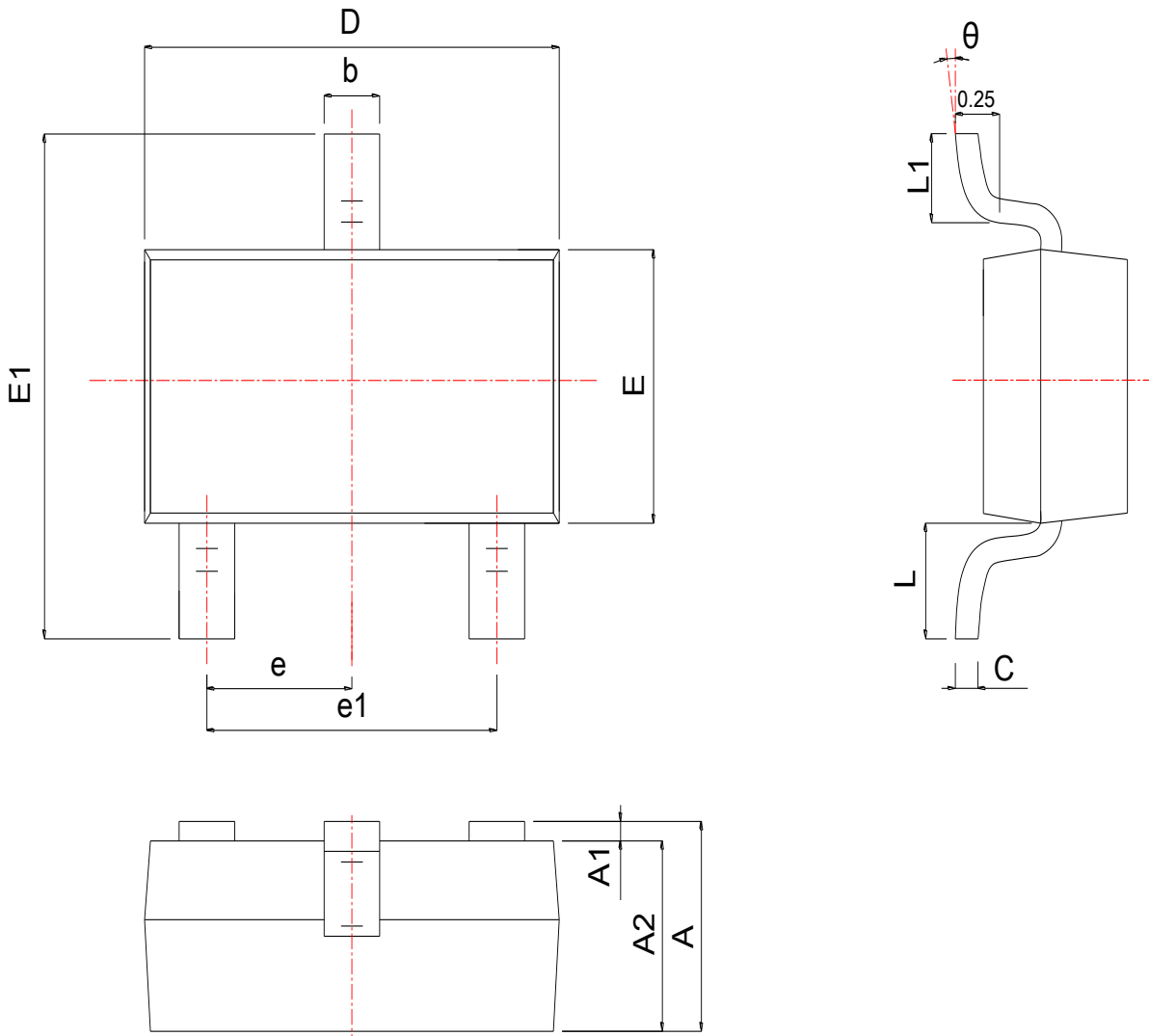


### Thermal Transient Impedance



### Typical Characteristics



**Package Information**
**SOT23**


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.900	1.025	1.150	0.035	0.040	0.045
A1	0.050	0.075	0.100	0.002	0.003	0.004
A2	0.900	0.975	1.020	0.035	0.038	0.040
b	0.300	0.400	0.500	0.012	0.016	0.020
c	0.080	0.115	0.150	0.003	0.005	0.006
D	2.800	2.900	3.000	0.110	0.114	0.118
E	1.200	1.300	1.400	0.047	0.051	0.055
E1	2.250	2.400	2.550	0.089	0.094	0.100
e	0.950 TYP			0.037 TYP		
e1	1.800	1.900	2.000	0.071	0.075	0.079
L	0.540 REF			0.021 REF		
L1	0.400	0.500	0.600	0.016	0.018	0.020
θ	0°	*	8°	0°	*	8°

### Avalanche Test Circuit and Waveforms



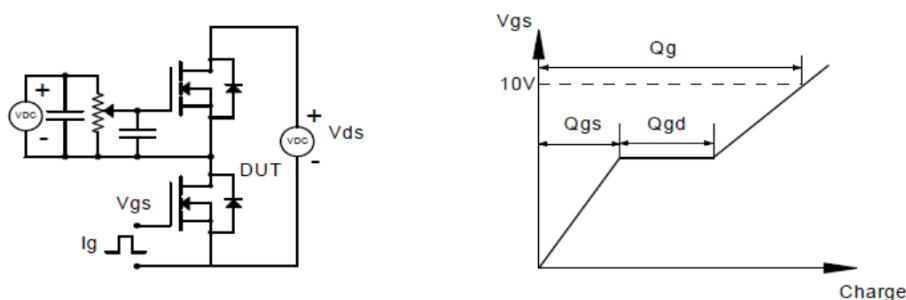
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

Kwansemi Semiconductor Co.,Ltd

Email:Sales@kwansemi.com

Web:www.kwansemi.com

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