

Features

- -20V/-2.8A,
 $R_{DS(ON)} = 120\text{m}\Omega(\text{Typ.})@V_{GS}=-4.5\text{V}$
 $R_{DS(ON)} = 160\text{m}\Omega(\text{Typ.})@V_{GS}=-2.5\text{V}$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Optimized Gate Charge to Minimize Switching Losses

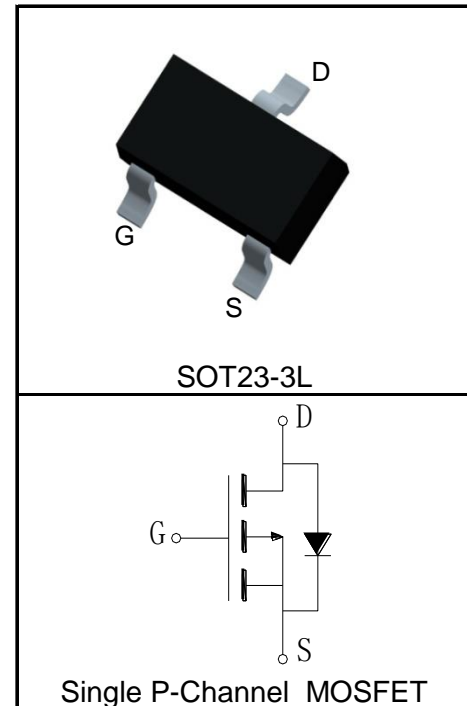
Applications

- Load Switch
- Power Management



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 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	$T_A=25^\circ\text{C}$ -1.4	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ -11	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=-4.5\text{V}$)	$T_A=25^\circ\text{C}$ -2.8	A
		$T_A=70^\circ\text{C}$ -2.2	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 1.3	W
		$T_A=70^\circ\text{C}$ 0.8	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	-	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C}/\text{W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	TBD	mJ

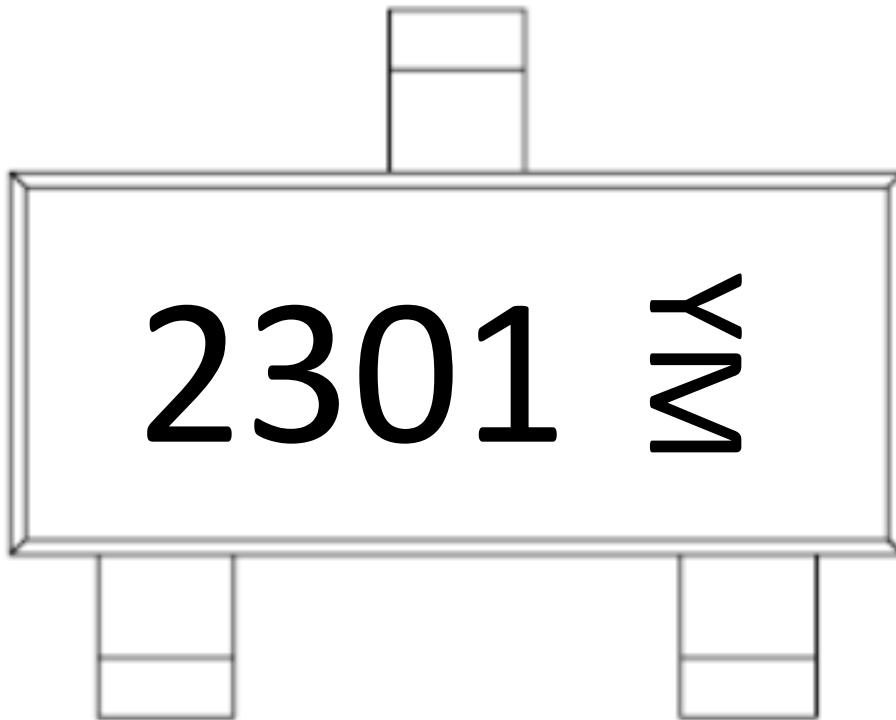
Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS2301EC			Unit
			Min.	Typ.	Max.	
Static Characteristics						
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	μA
		$T_J=125^\circ C$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.4	-0.7	-1	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_{DS}=-2.5A$		120	150	$m\Omega$
		$V_{GS}=-2.5V, I_{DS}=-1.5A$		160	230	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=-2.5A, V_{GS}=0V$		-0.9	-1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=-2.5A, dI_{SD}/dt=-100A/\mu s$		13		ns
Q_{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.8		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz		290		pF
C_{oss}	Output Capacitance			55		
C_{rss}	Reverse Transfer Capacitance			30		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, I_{DS}=-2.5A,$ $V_{GEN}=-4.5V, R_G=6\Omega$		10		ns
t_r	Turn-on Rise Time			6		
$t_{d(OFF)}$	Turn-off Delay Time			21		
t_f	Turn-off Fall Time			8		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=-10V, V_{GS}=-4.5V,$ $I_{DS}=-2.5A$		2.9		nC
Q_{gs}	Gate-Source Charge			0.5		
Q_{gd}	Gate-Drain Charge			0.7		

- 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.

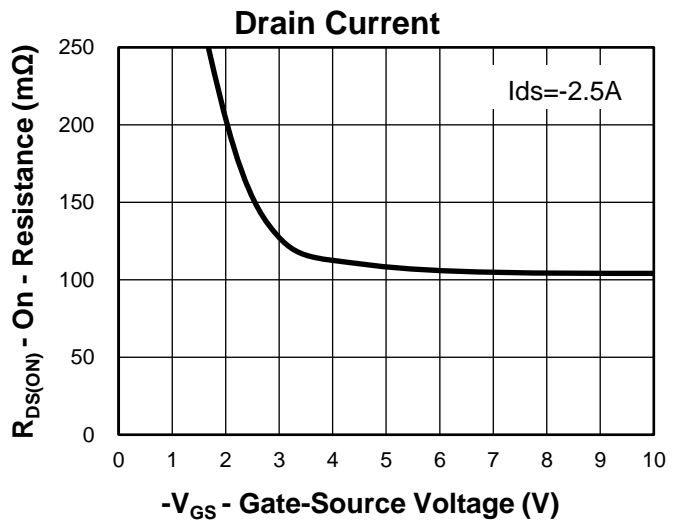
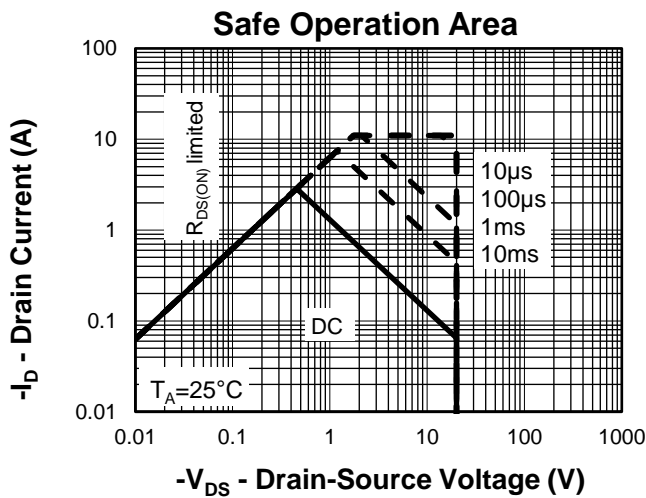
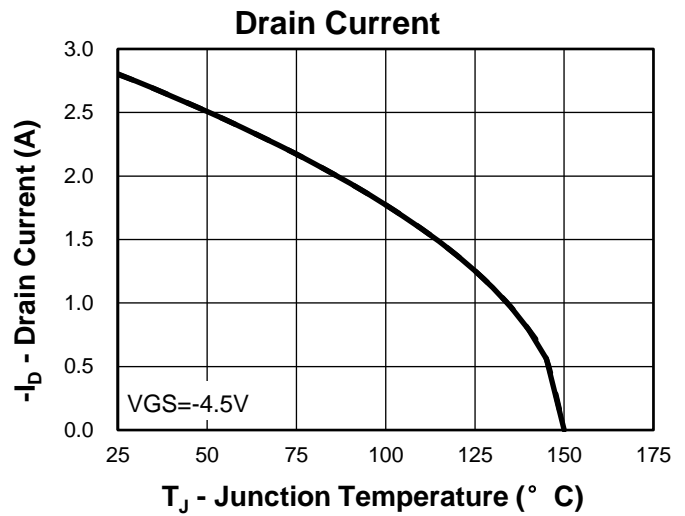
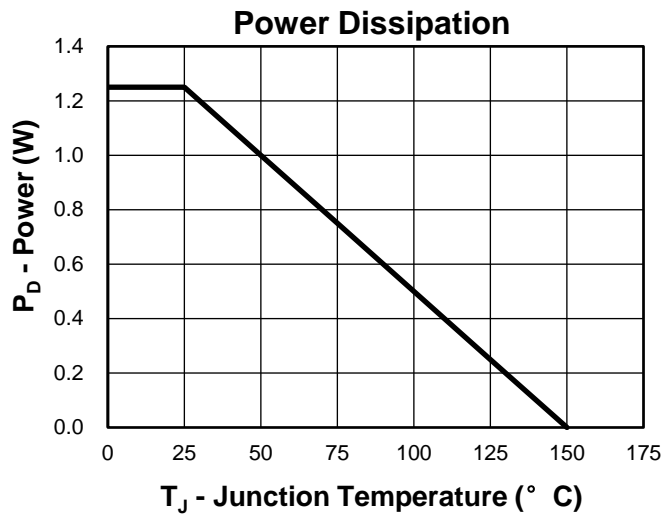
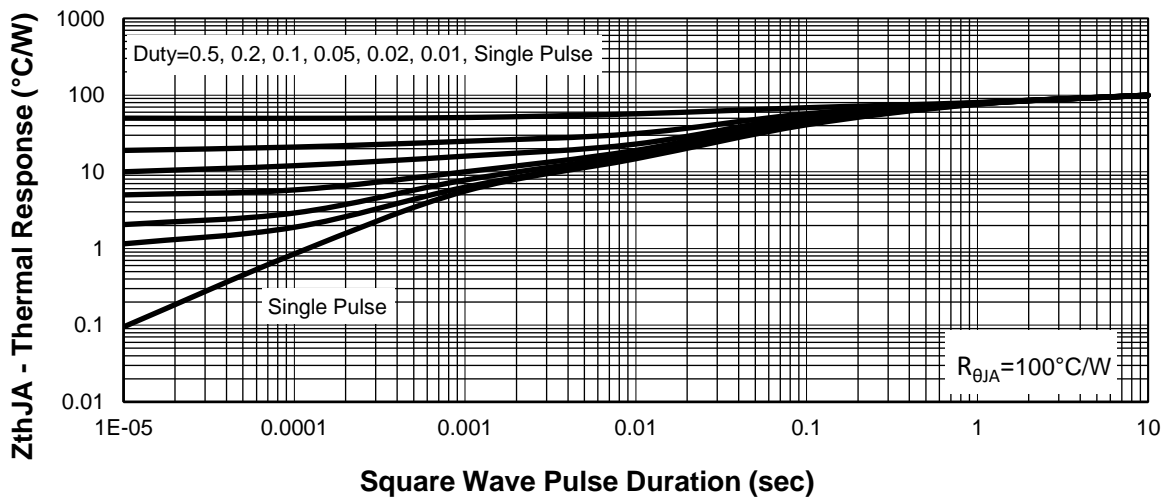
Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS2301EC	SOT23-3L	Tape&Reel	3000	7"	8mm

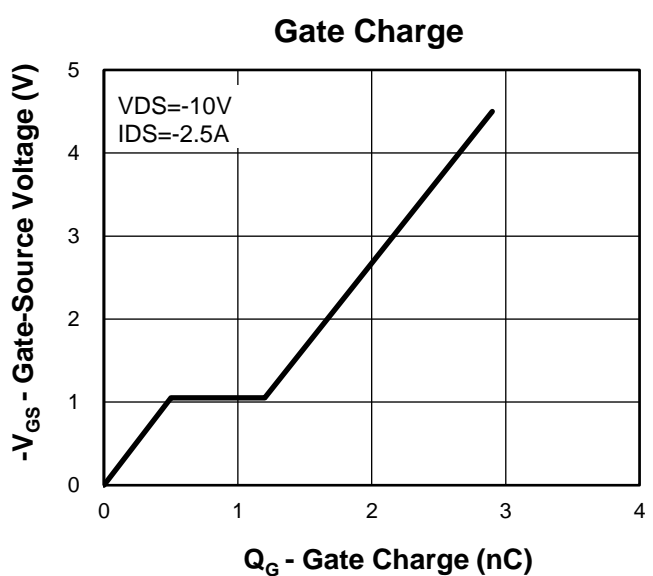
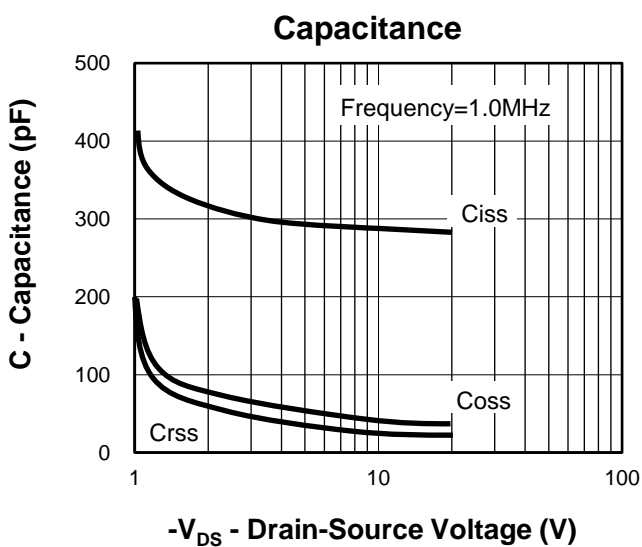
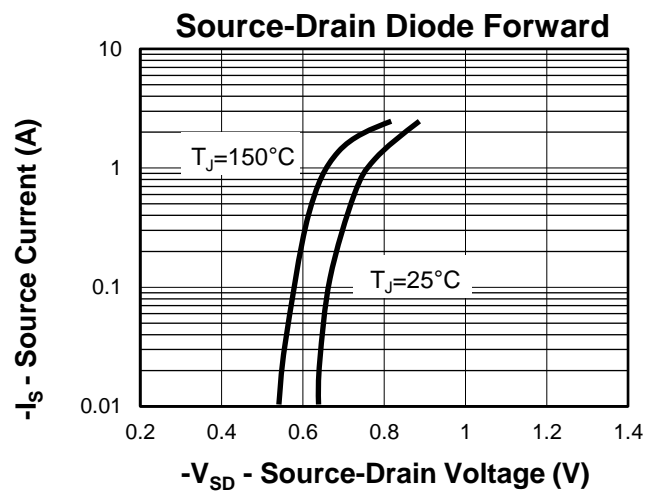
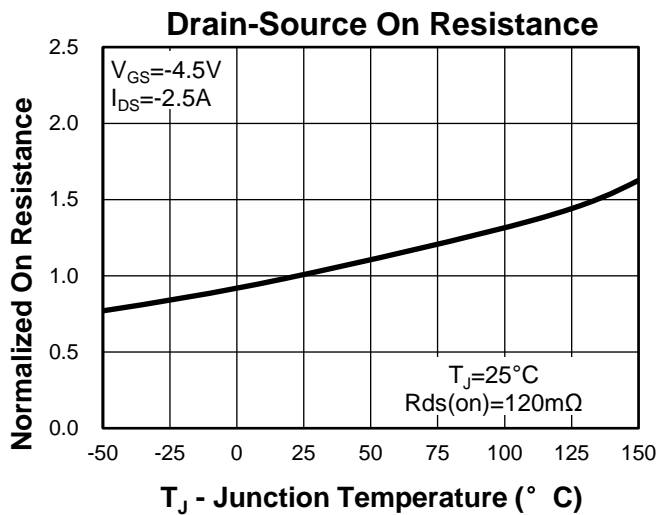
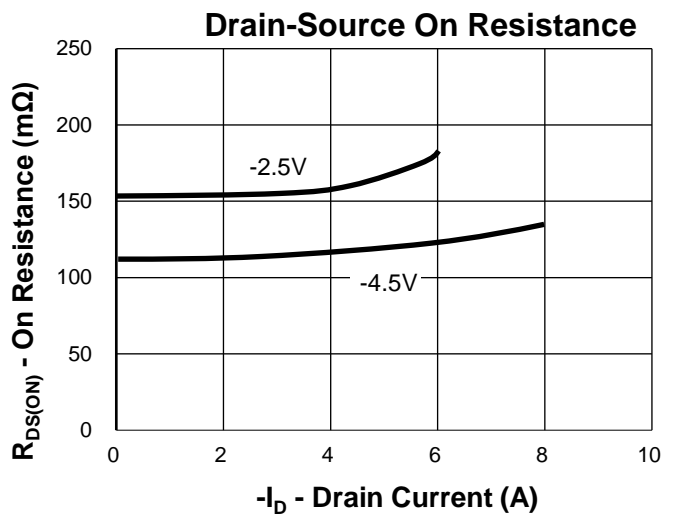
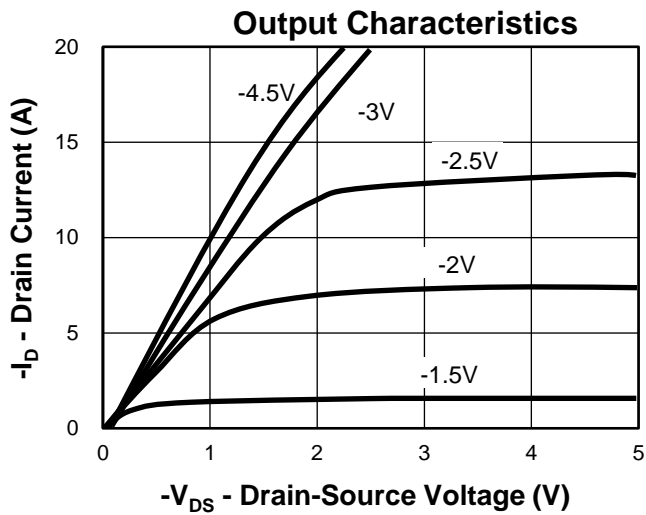


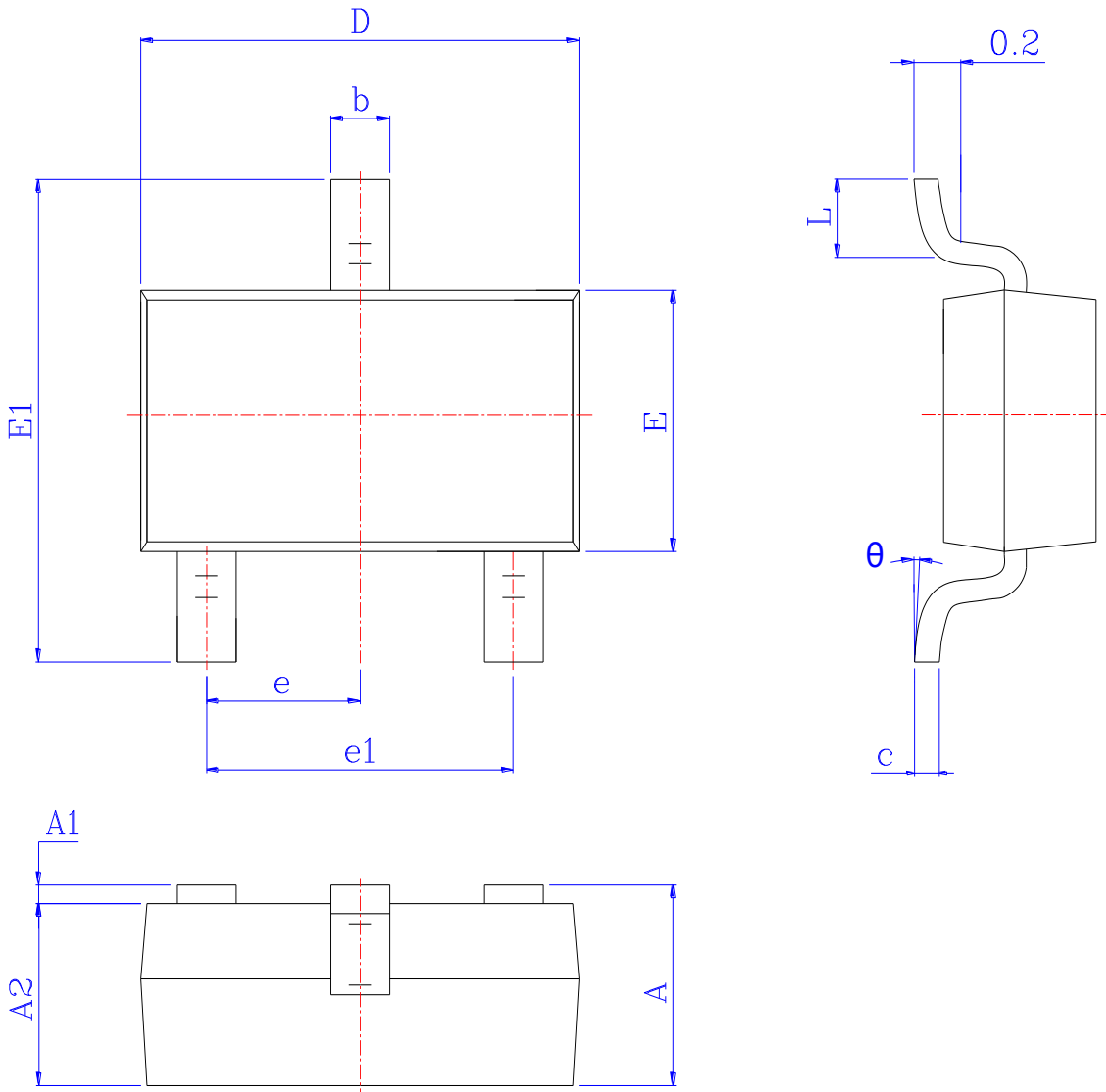
Y =Year,2017-A,2018-B,etc.

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

Typical Characteristics

Thermal Transient Impedance


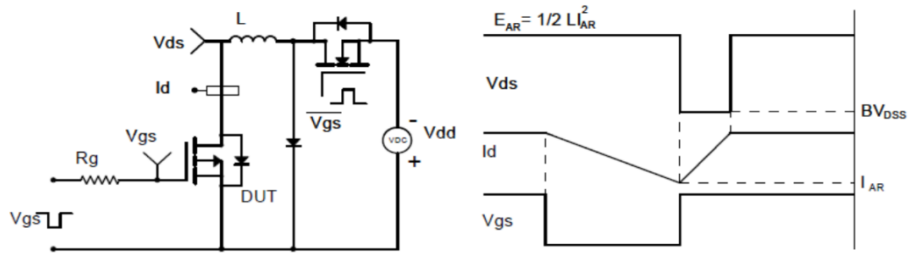
Typical Characteristics



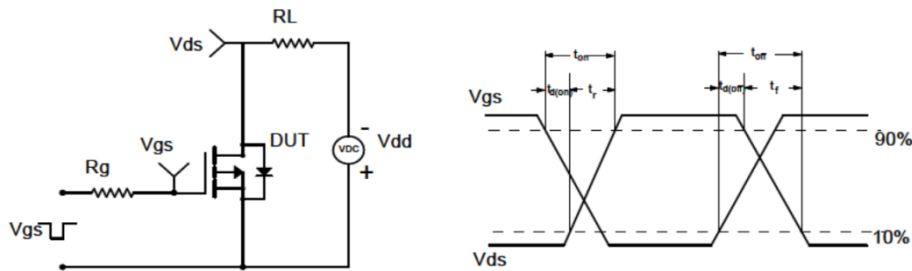
Package Information
SOT23-3L


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.950	1.150	1.450	0.037	0.045	0.057
A1	0.000	*	0.150	0.000	*	0.006
A2	0.900	1.100	1.300	0.035	0.043	0.051
b	0.300	0.400	0.500	0.012	0.016	0.020
c	0.080	0.150	0.200	0.003	0.006	0.008
D	2.800	2.925	3.050	0.110	0.115	0.120
E	1.500	1.600	1.750	0.059	0.063	0.069
E1	2.650	2.800	3.000	0.104	0.110	0.118
e	0.950 BSC			0.037 BSC		
e1	1.800	1.900	2.000	0.071	0.075	0.079
L	0.300	0.450	0.600	0.012	0.018	0.024
θ	0°	4°	8°	0°	4°	8°

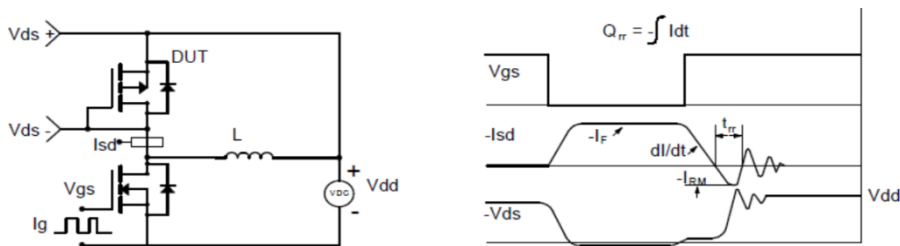
Avalanche Test Circuit and Waveforms



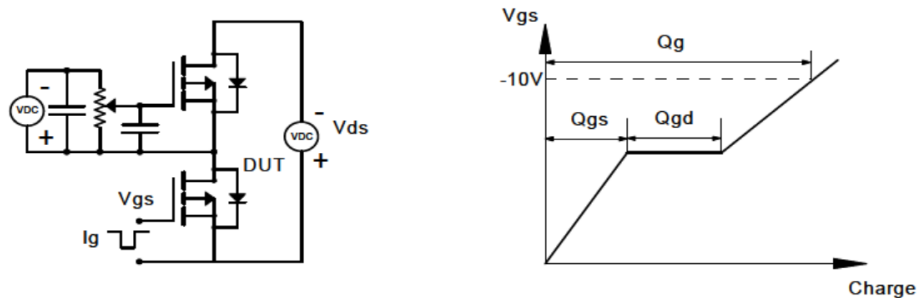
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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