

Features

- -20V/-4.5A,
 $R_{DS(ON)} = 32m\Omega(Typ.)@V_{GS}=-4.5V$
 $R_{DS(ON)} = 42m\Omega(Typ.)@V_{GS}=-2.5V$
 $R_{DS(ON)} = 53m\Omega(Typ.)@V_{GS}=-1.8V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- ESD Protected (HBM>4000V)

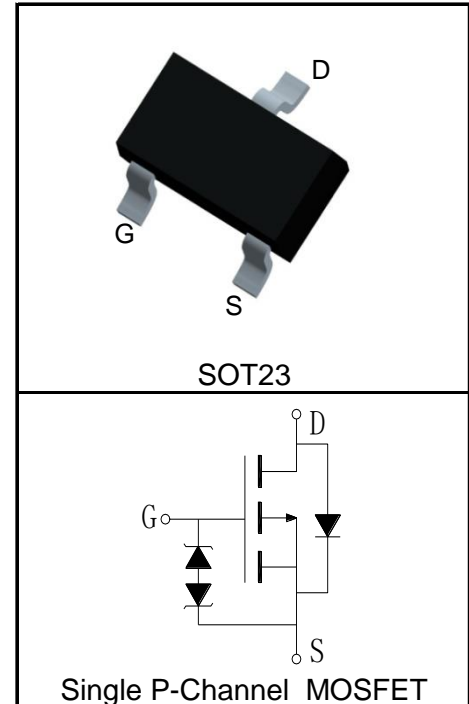
Applications

- Load Switch



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	± 8	
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	$T_A=25^\circ\text{C}$ -1.2	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ -18	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=-4.5V$)	$T_A=25^\circ\text{C}$ -4.5	A
		$T_A=70^\circ\text{C}$ -3.6	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 1	W
		$T_A=70^\circ\text{C}$ 0.64	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	80	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	125	$^\circ\text{C}/\text{W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	TBD	mJ

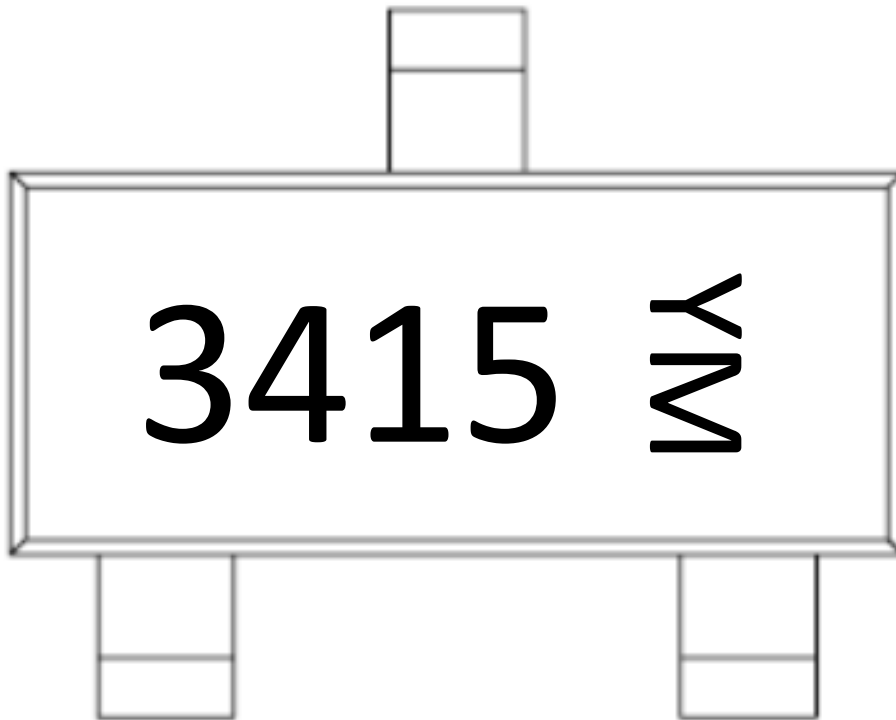
Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS3415AA			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
		$T_J=125^\circ\text{C}$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.3	-0.6	-0.9	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_{DS}=-4A$		32	40	$m\Omega$
		$V_{GS}=-2.5V, I_{DS}=-4A$		42	55	
		$V_{GS}=-1.8V, I_{DS}=-2A$		53	70	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=-4A, V_{GS}=0V$		-0.84	-1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=-4A, dI_{SD}/dt=-100A/\mu s$		18		ns
Q_{rr}	Reverse Recovery Charge			11		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		18		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz		945		pF
C_{oss}	Output Capacitance			90		
C_{rss}	Reverse Transfer Capacitance			75		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, I_{DS}=-4A,$ $V_{GEN}=-4.5V, R_G=6\Omega$		13		ns
t_r	Turn-on Rise Time			10		
$t_{d(OFF)}$	Turn-off Delay Time			49		
t_f	Turn-off Fall Time			25		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=-10V, V_{GS}=-4.5V,$ $I_{DS}=-4A$		7.1		nC
Q_{gs}	Gate-Source Charge			1.8		
Q_{gd}	Gate-Drain Charge			2.3		

- 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

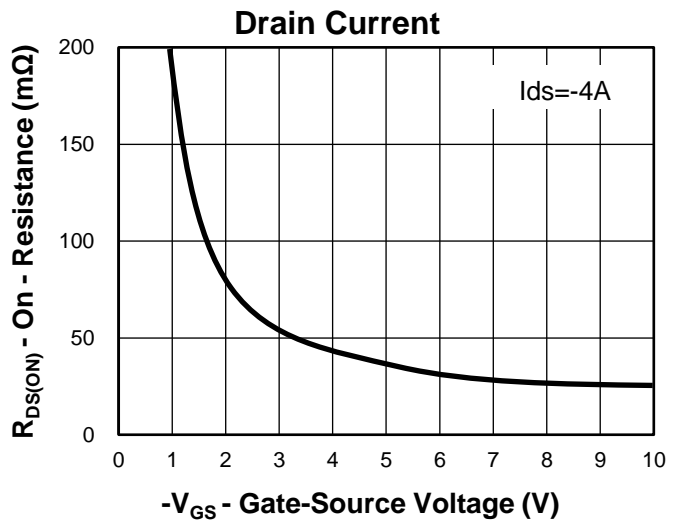
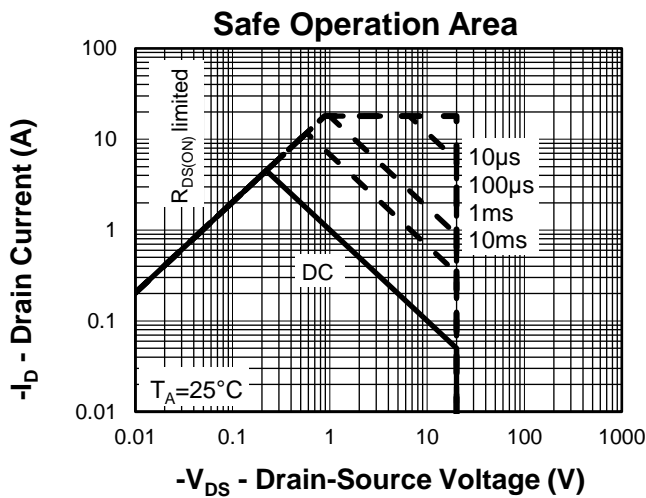
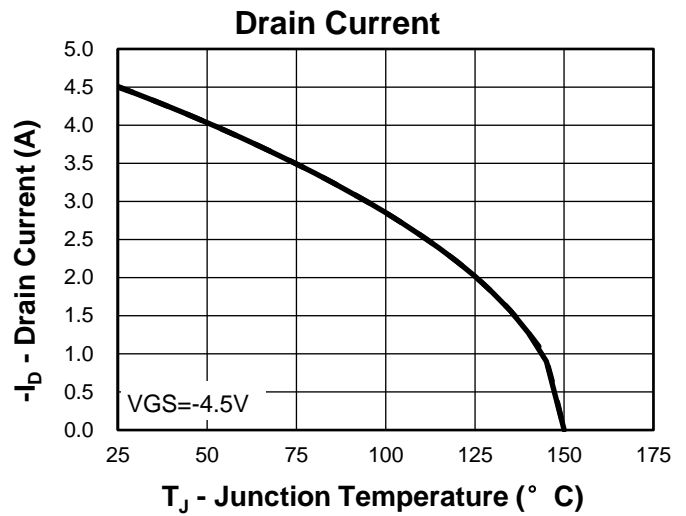
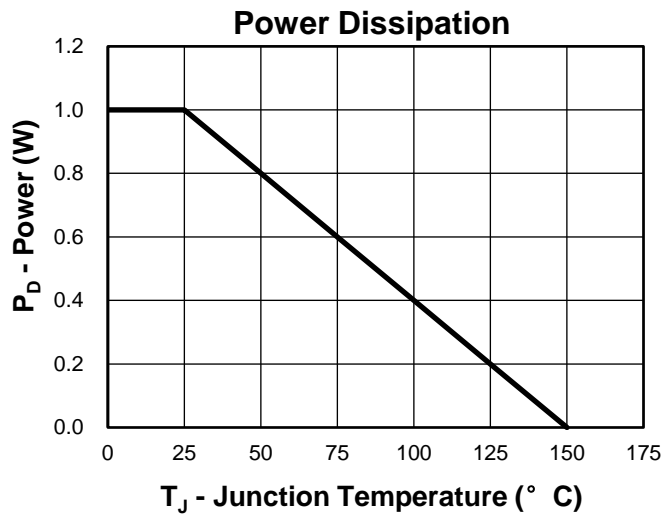
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS3415AA	SOT23	Tape&Reel	3000	7"	8mm



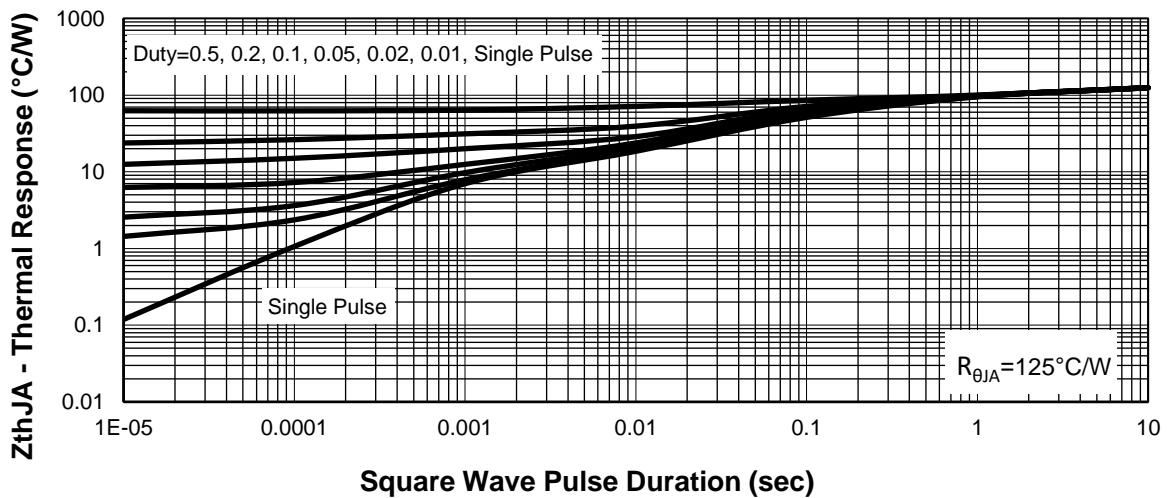
Y =Year,2017-A,2018-B,etc.

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

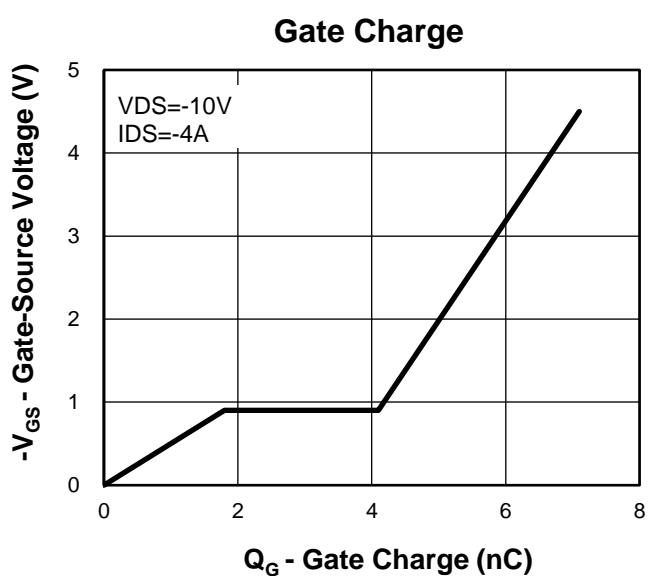
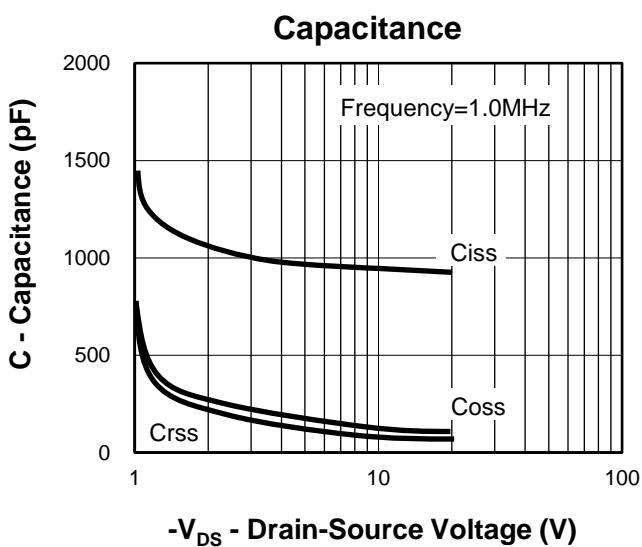
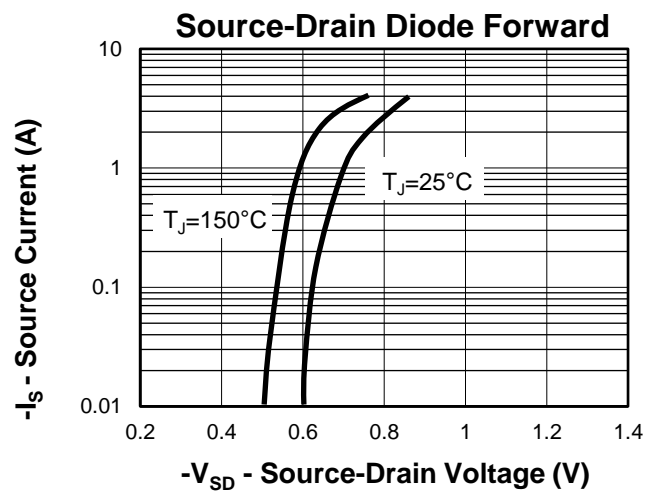
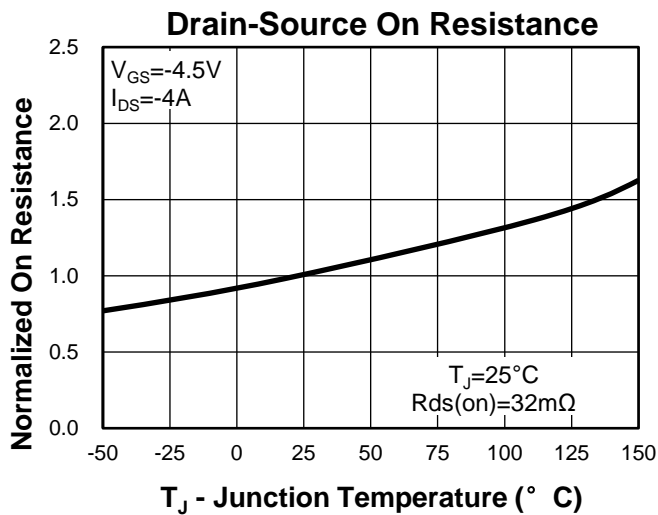
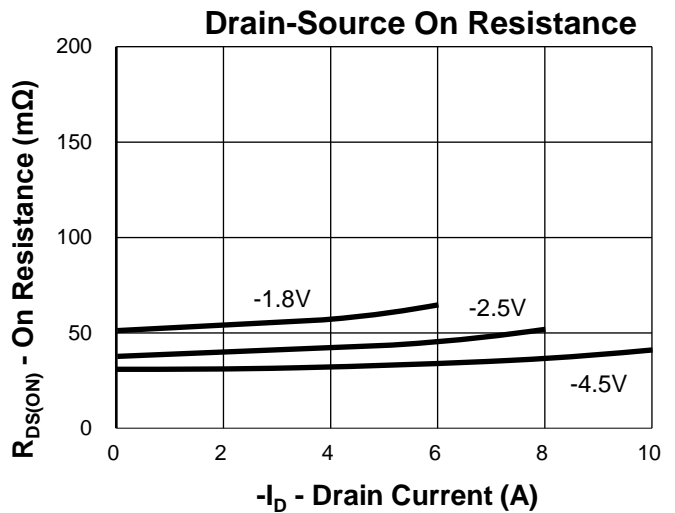
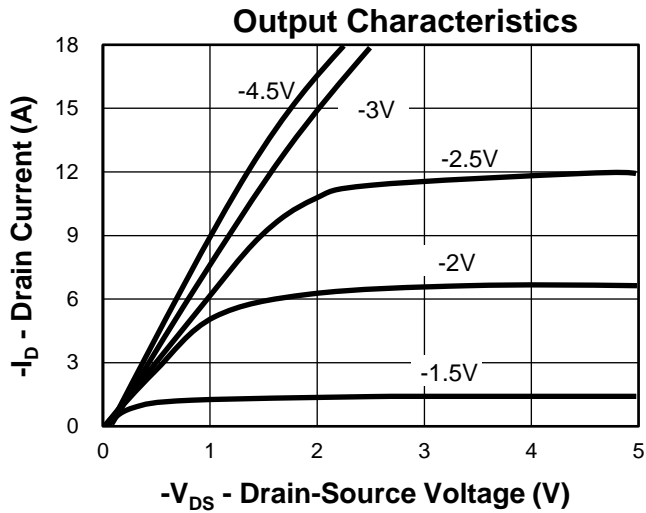
Typical Characteristics

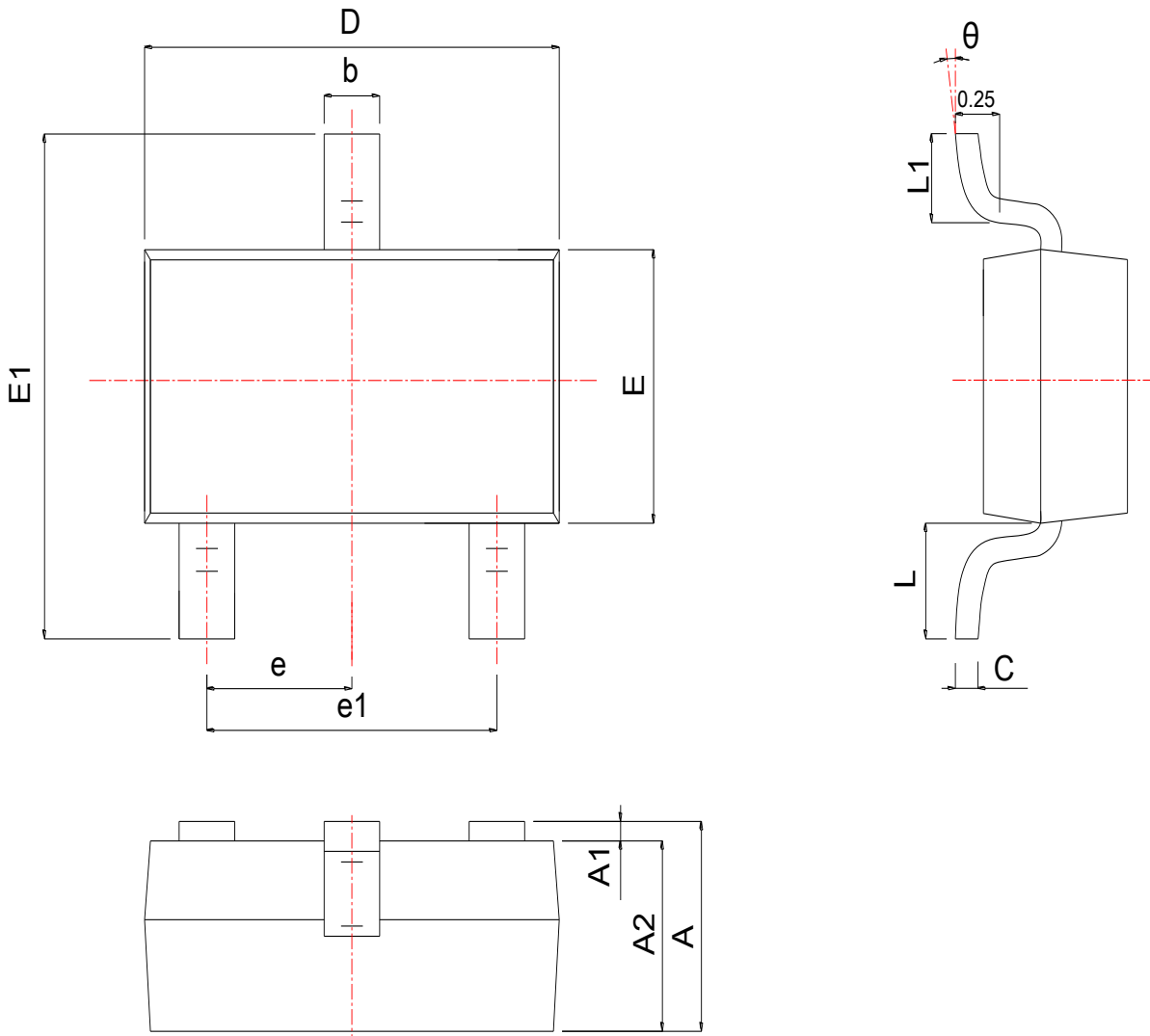


Thermal Transient Impedance



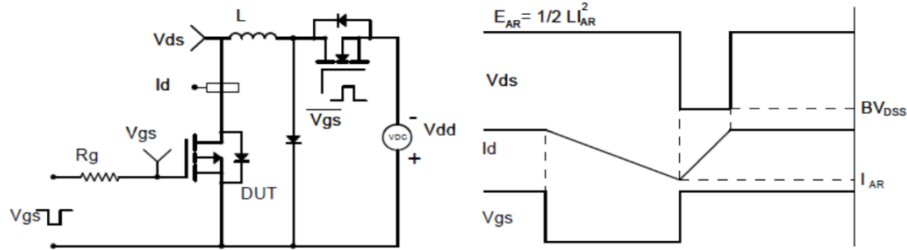
Typical Characteristics



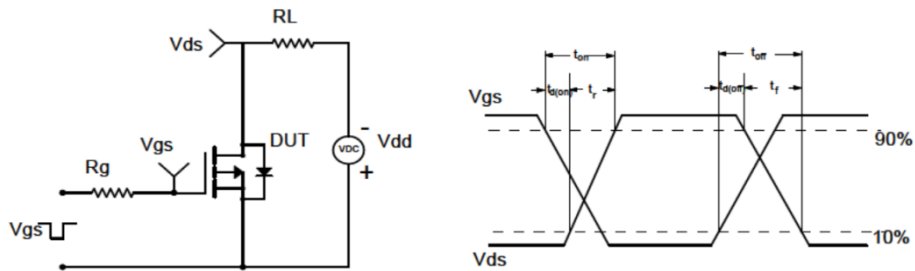
Package Information
SOT23


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°

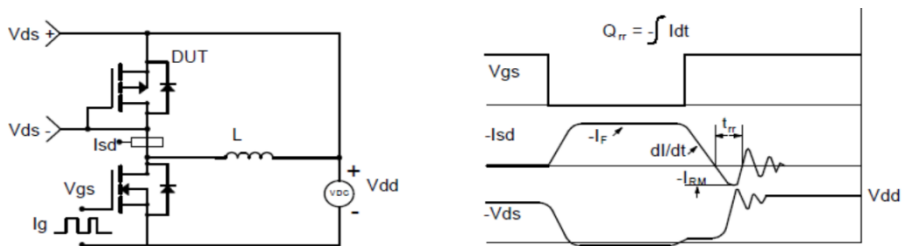
Avalanche Test Circuit and Waveforms



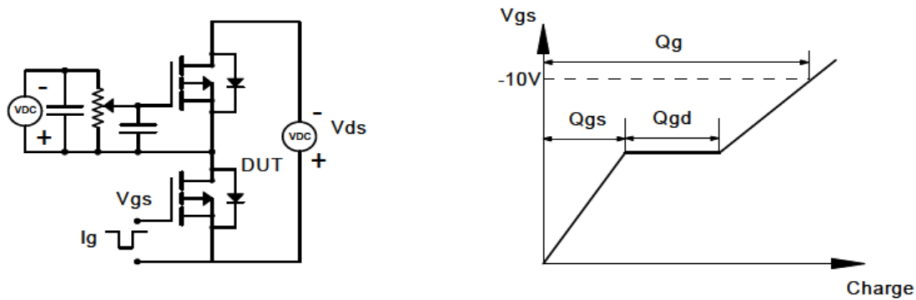
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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