

Features

- 100V/0.17A,
 $R_{DS(ON)} = 3.5\Omega(\text{Typ.})@V_{GS}=10V$
 $R_{DS(ON)} = 4.2\Omega(\text{Typ.})@V_{GS}=4.5V$
- Super High Dense Cell Design
- Voltage Controlled Small Signal Switch
- Reliable and Rugged
- ESD Protected (HBM>2000V)

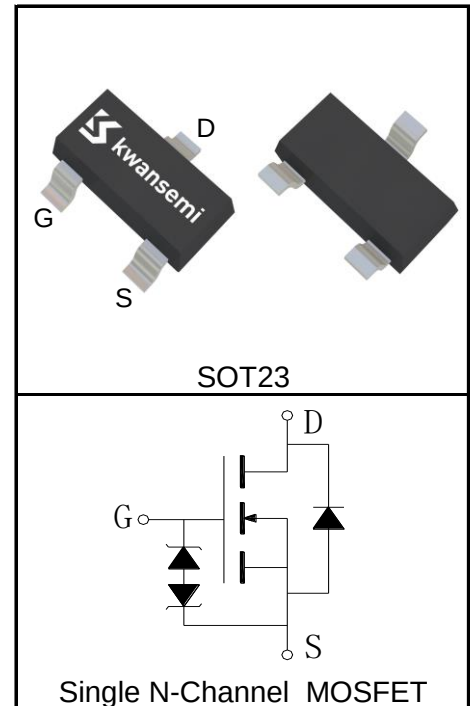
Applications

- Switching Application



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		100	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _J ,T _{STG}	Operating and Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _A =25°C	0.17	A
Mounted on Large Heat Sink				
I _{DP} ^①	Pulse Drain Current	T _A =25°C	0.68	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _A =25°C	0.17	A
		T _A =70°C	0.13	
P _D	Maximum Power Dissipation	T _A =25°C	0.36	W
		T _A =70°C	0.23	
T _L	Maximum Lead Temperature for Soldering Purposes(1/8’’ from case for 10 s)		260	°C
R _{θJA} ^③	Thermal Resistance-Junction to Ambient		350	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^④	Avalanche Energy, Single Pulsed		0.25	mJ

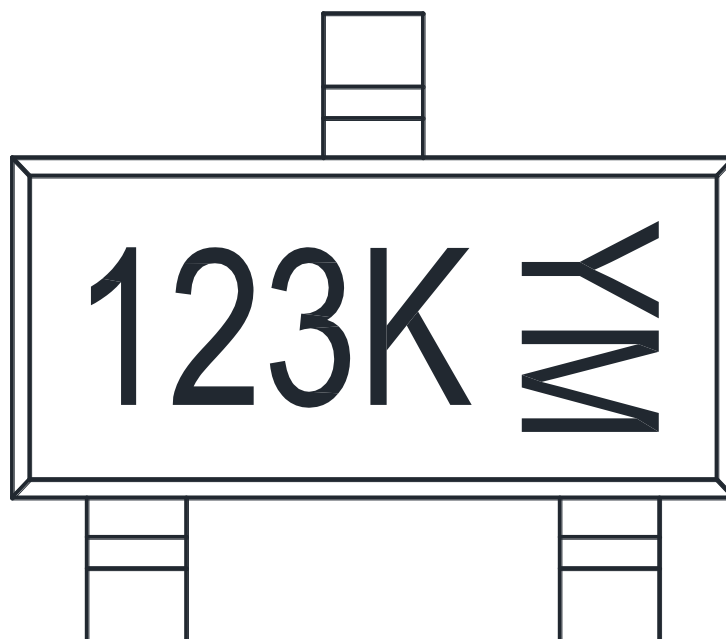
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	Rating			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.4	2	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±10	μA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =0.17A		3.5	6	Ω
		V _{GS} =4.5V, I _{DS} =0.17A		4.2	10	Ω
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =0.17A, V _{GS} =0V		0.83	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =0.17A, dI _{SD} /dt=100A/μs		12		ns
Q _{rr}	Reverse Recovery Charge			4		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		35		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Frequency=1.0MHz		35		pF
C _{oss}	Output Capacitance			3		
C _{rss}	Reverse Transfer Capacitance			2		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =50V, I _{DS} =0.17A, V _{GEN} =10V, R _G =6Ω		7		ns
t _r	Turn-on Rise Time			12		
t _{d(OFF)}	Turn-off Delay Time			9		
t _f	Turn-off Fall Time			4		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _{DS} =0.17A		2.7		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 $T_J = 25^{\circ}\text{C}$, $I_{ASmax} = 1A$, $L = 0.5\text{mH}$, $V_{DD} = 48V$, $R_G = 25\Omega$, $V_{GS} = 10V$. Part not recommended for use above this value.
 - 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

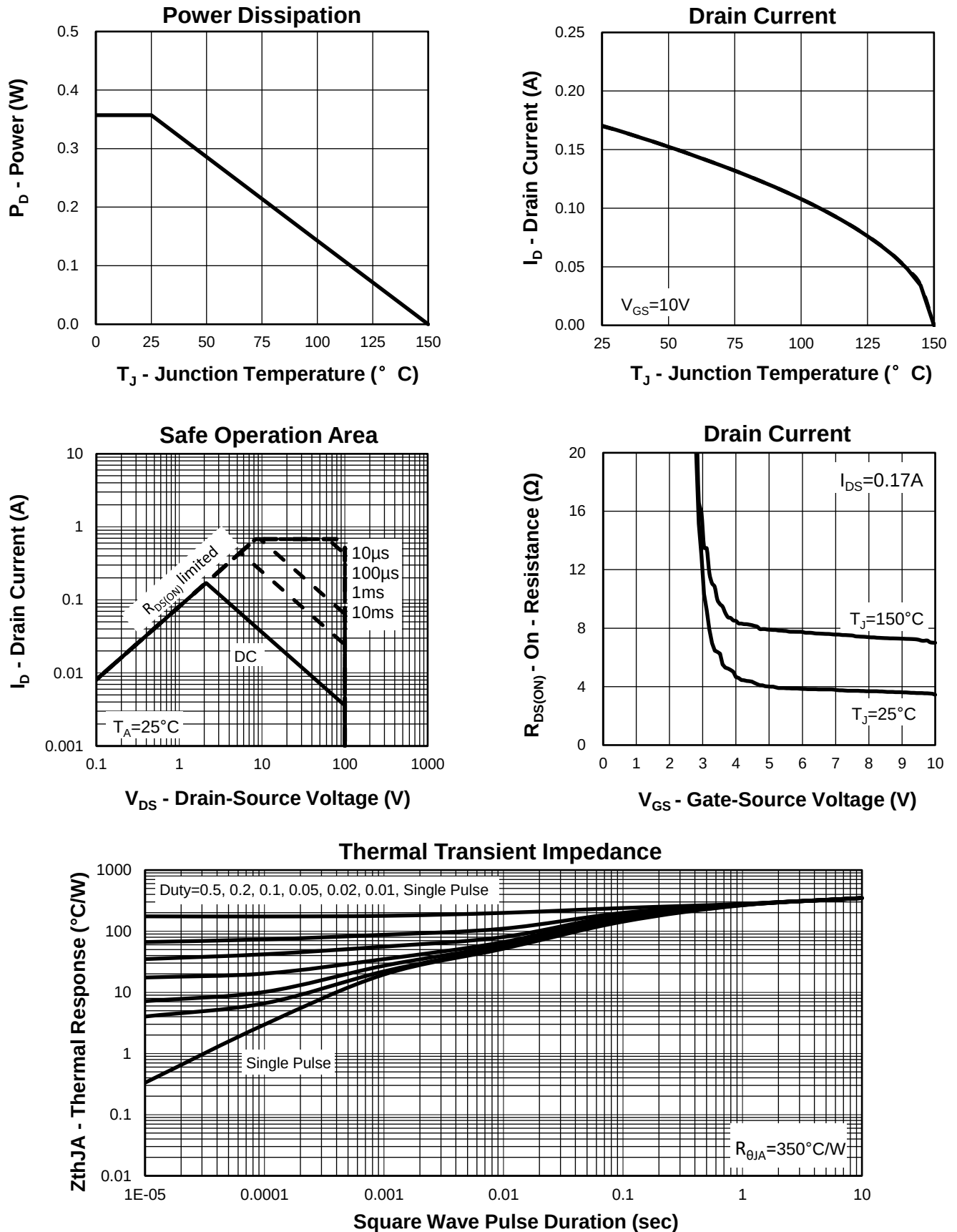
Device	Package	Packaging	Quantity	Reel Size	Tape width
BSS123K	SOT23	Tape&Reel	3000	7"	8mm



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

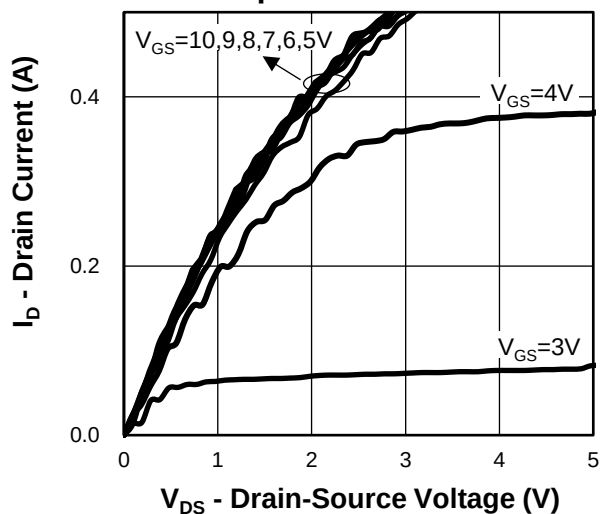
M =Month,Jan-1,Feb-2,....Sep-9,Oct-A,Nov-B,Dec-C.

Typical Characteristics

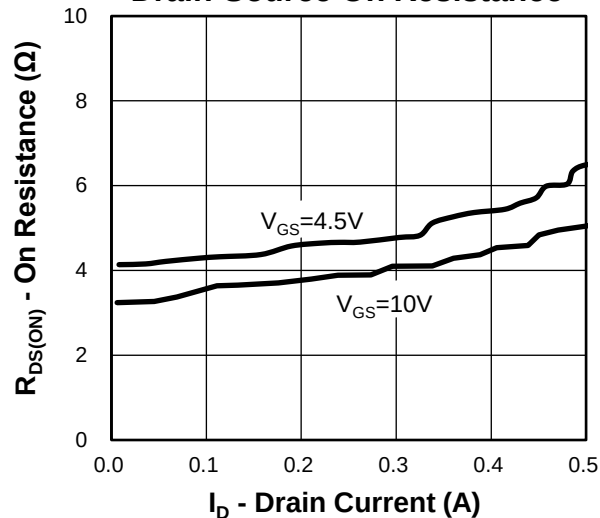


Typical Characteristics

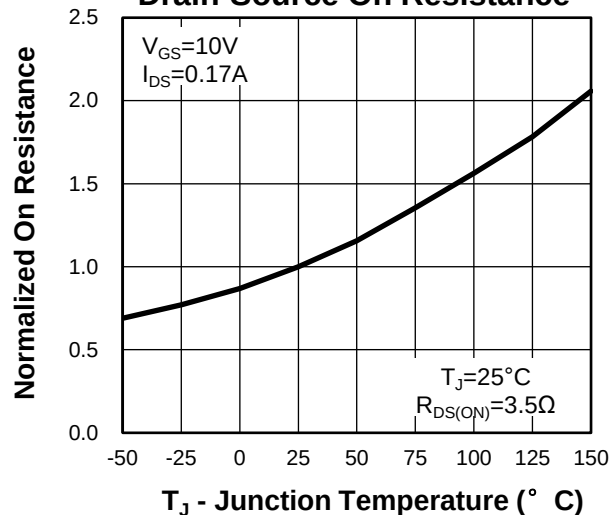
Output Characteristics



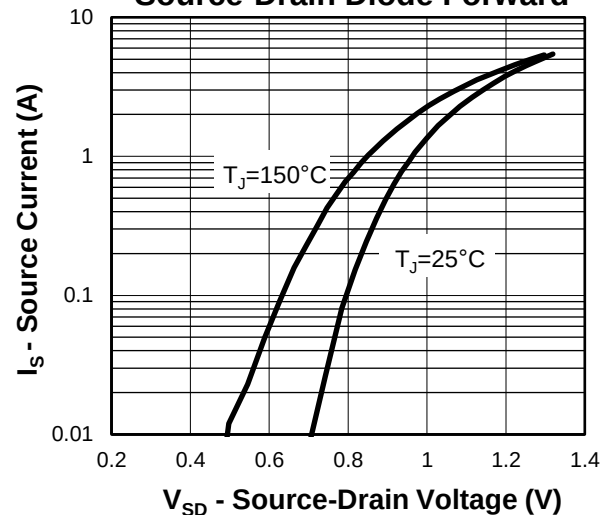
Drain-Source On Resistance



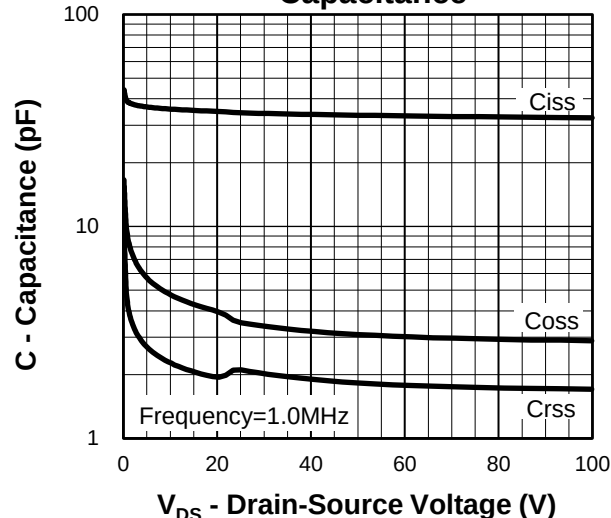
Drain-Source On Resistance



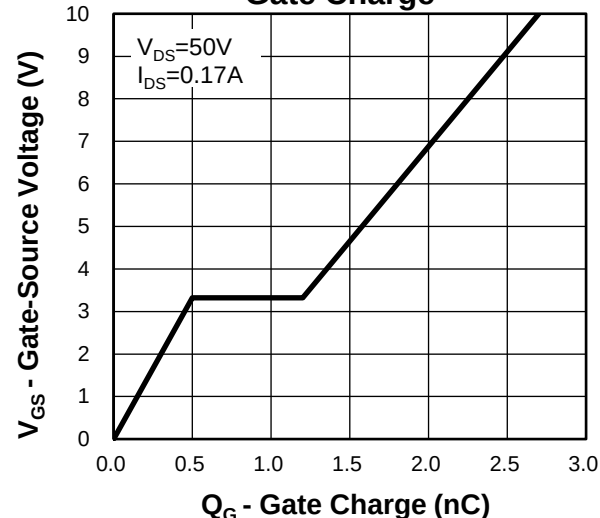
Source-Drain Diode Forward

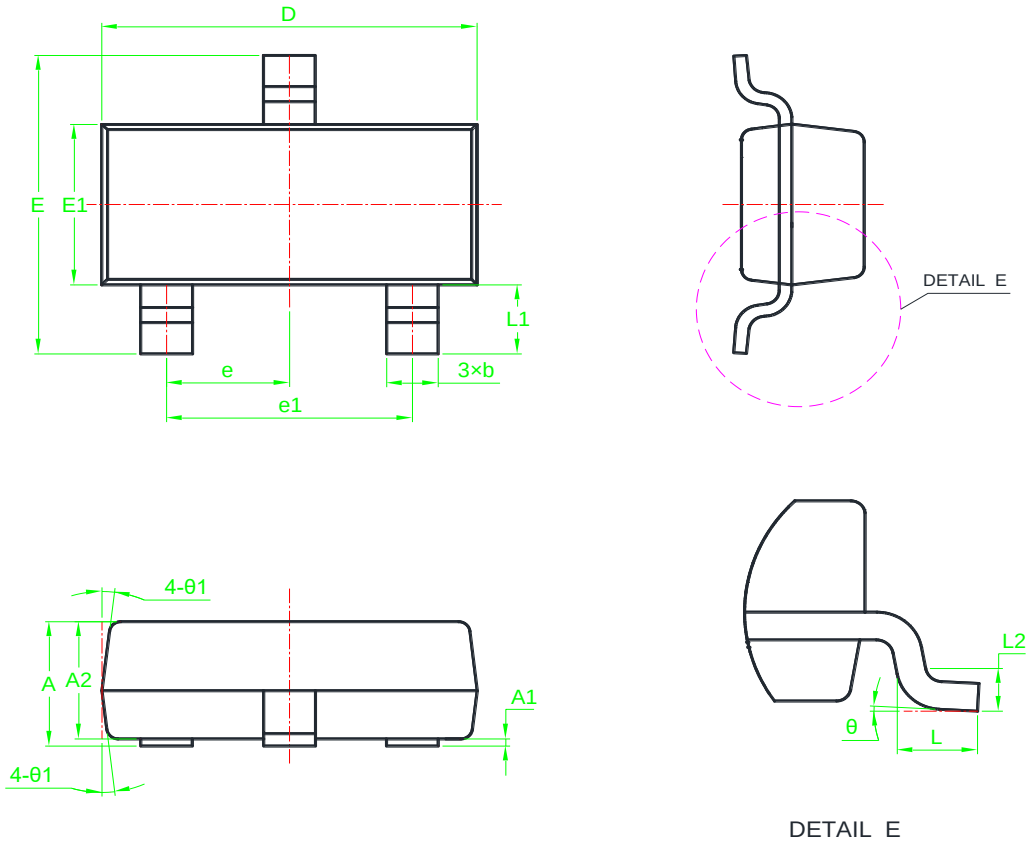


Capacitance



Gate Charge

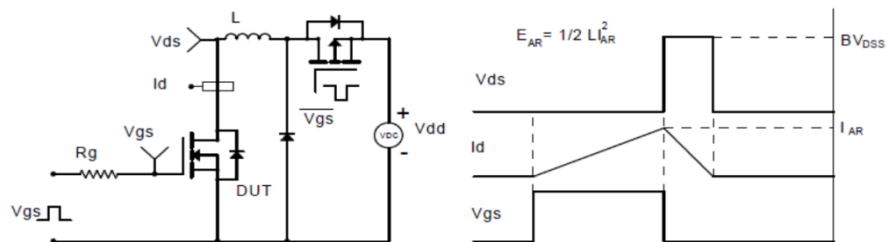


Package Information
SOT23


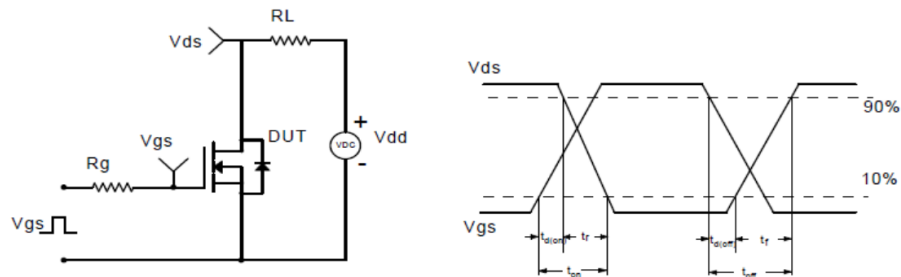
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	*	1.12	0.035	*	0.044	e	0.95BSC			0.037BSC		
A1	0.01	*	0.10	0.000	*	0.004	e1	1.90BSC			0.075BSC		
A2	0.80	0.90	1.02	0.031	0.035	0.040	L	0.30	0.40	0.50	0.012	0.016	0.020
b	0.30	0.40	0.50	0.012	0.016	0.020	L1	0.54REF			0.021REF		
D	2.80	2.90	3.00	0.110	0.114	0.118	L2	0.254BSC			0.010BSC		
E	2.25	2.40	2.55	0.089	0.094	0.100	θ	0°	*	8°	0°	*	8°
E1	1.20	1.30	1.40	0.047	0.051	0.055	θ 1	0°	*	10°	0°	*	10°

Note: Dimensions do not inclusive burrs and mold flash.

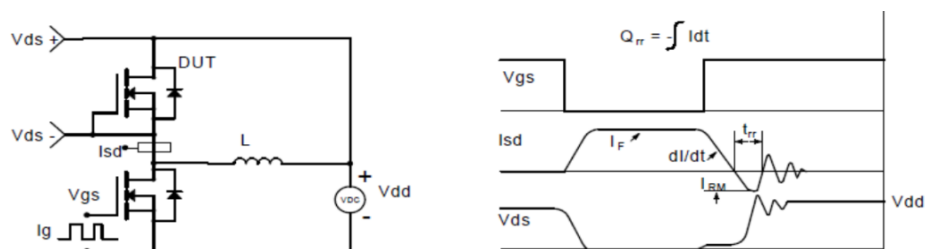
Avalanche Test Circuit and Waveforms



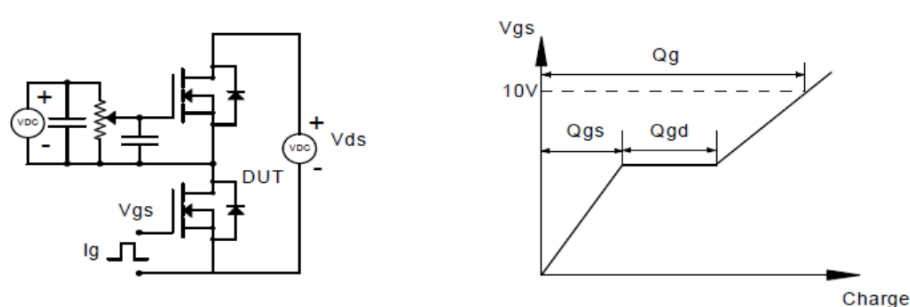
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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