

Features

- -20V/-9A,
 $R_{DS(ON)} = 19m\Omega(Typ.)@V_{GS}=-4.5V$
 $R_{DS(ON)} = 25m\Omega(Typ.)@V_{GS}=-2.5V$
 $R_{DS(ON)} = 36m\Omega(Typ.)@V_{GS}=-1.8V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

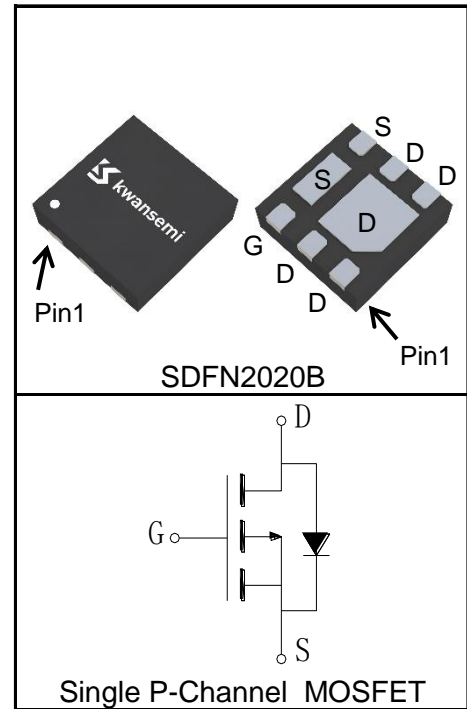
Applications

- Load Switch
- PWM Applications



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A=25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 12	
T_{Jmax}	Maximum Junction Temperature	150	$^\circ C$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_A=25^\circ C$	-2.6 A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_A=25^\circ C$	-36 A
$I_D^{②}$	Continuous Drain Current($V_{GS}=-4.5V$)	$T_A=25^\circ C$	-9 A
		$T_A=70^\circ C$	-7.2 A
P_D	Maximum Power Dissipation	$T_A=25^\circ C$	2.5 W
		$T_A=70^\circ C$	1.6 W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	6	$^\circ C/W$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	50	$^\circ C/W$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	30	mJ

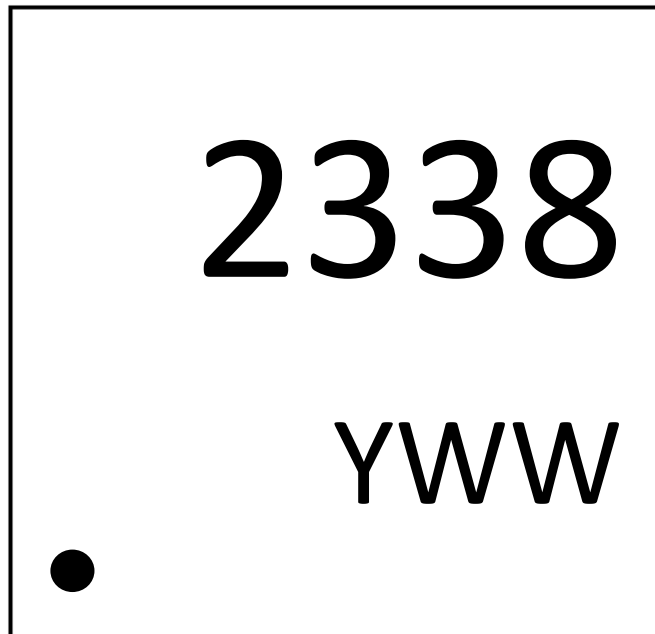
Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS2338UA2			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	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.5	-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	$V_{GS}=-4.5V, I_{DS}=-4A$		19	24	$m\Omega$
		$V_{GS}=-2.5V, I_{DS}=-3A$		25	33	$m\Omega$
		$V_{GS}=-1.8V, I_{DS}=-2A$		36	52	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=-4A, V_{GS}=0V$		-0.83	-1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=-4A, dI_{SD}/dt=-100A/\mu s$		8		ns
Q_{rr}	Reverse Recovery Charge			15		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		8		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz		1100		pF
C_{oss}	Output Capacitance			125		
C_{rss}	Reverse Transfer Capacitance			100		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, I_{DS}=-4A,$ $V_{GEN}=-4.5V, R_G=3\Omega$		15		ns
t_r	Turn-on Rise Time			33		
$t_{d(OFF)}$	Turn-off Delay Time			52		
t_f	Turn-off Fall Time			28		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=-10V, V_{GS}=-4.5V,$ $I_{DS}=-4A$		15		nC
Q_{gs}	Gate-Source Charge			3.1		
Q_{gd}	Gate-Drain Charge			4.2		

- 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 $T_J = 25^\circ\text{C}$, $I_{ASmax} = -11A$, $L=0.5\text{mH}$, $V_{DD} = -15V$, $R_G = 25\Omega$, $V_{GS} = -4.5V$. 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

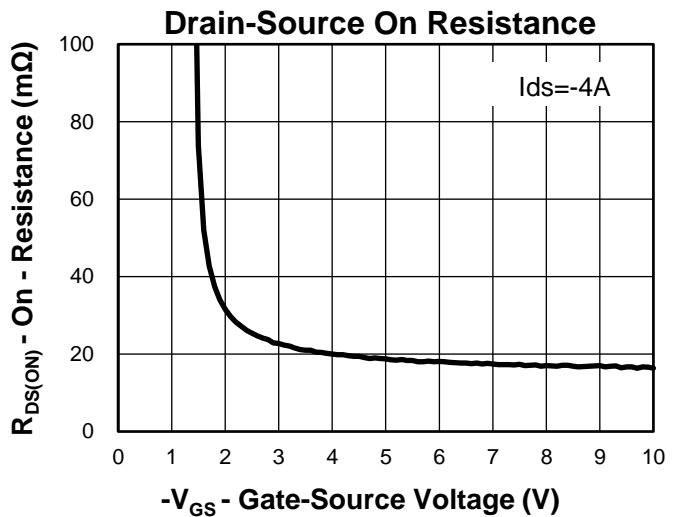
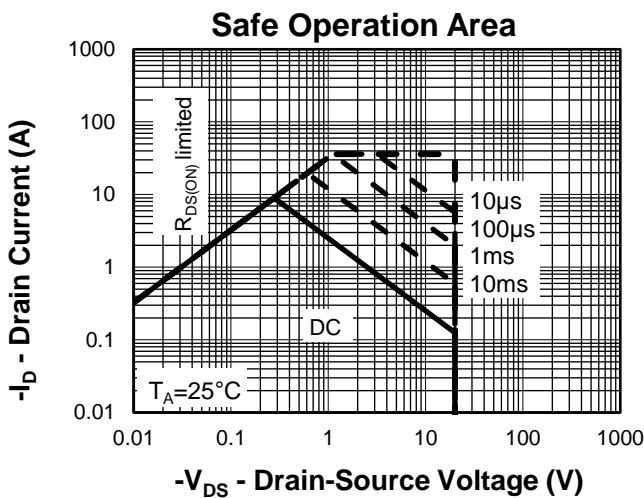
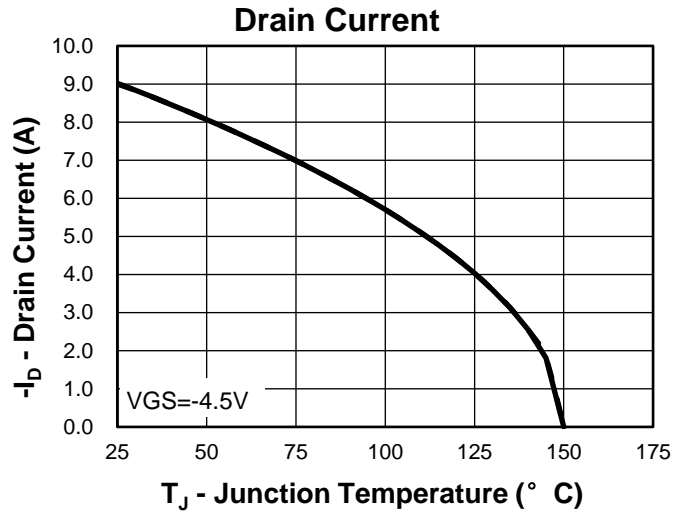
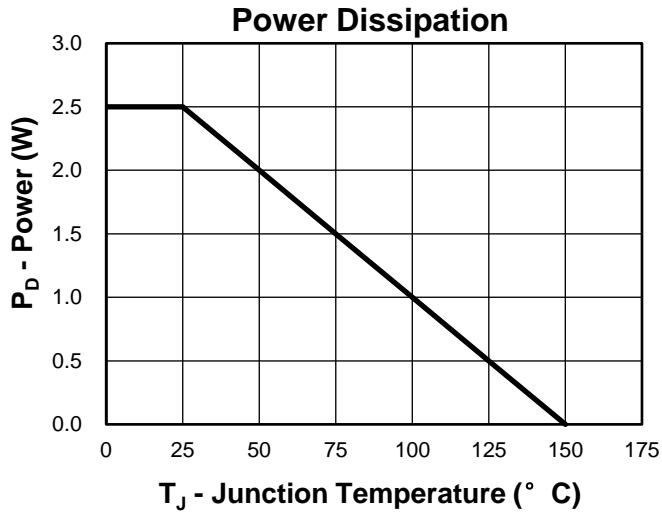
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS2338UA2	SDFN2020B	Tape&Reel	3000	7"	8mm



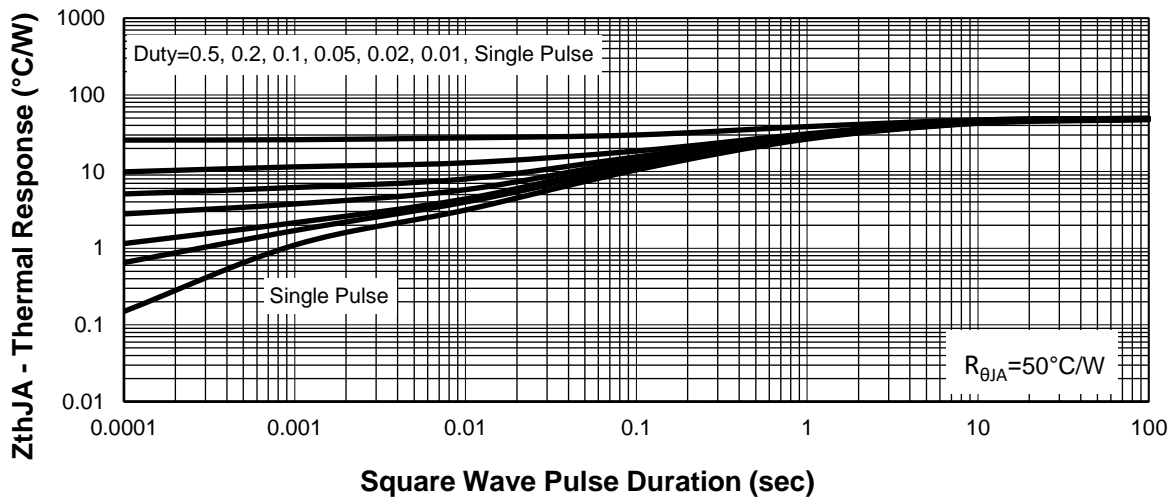
Y =Year,2017-A,2018-B,etc.

WW =Week.

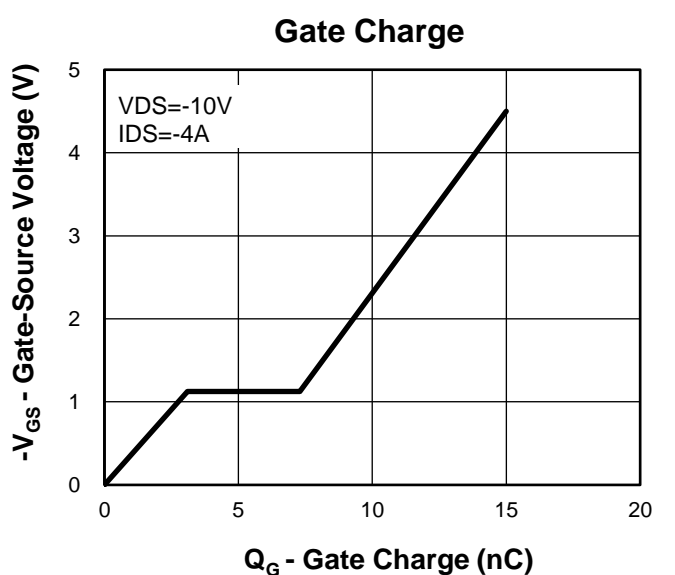
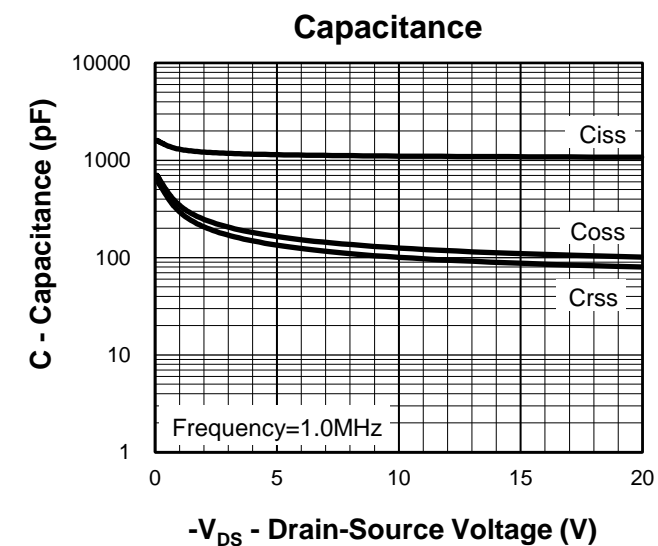
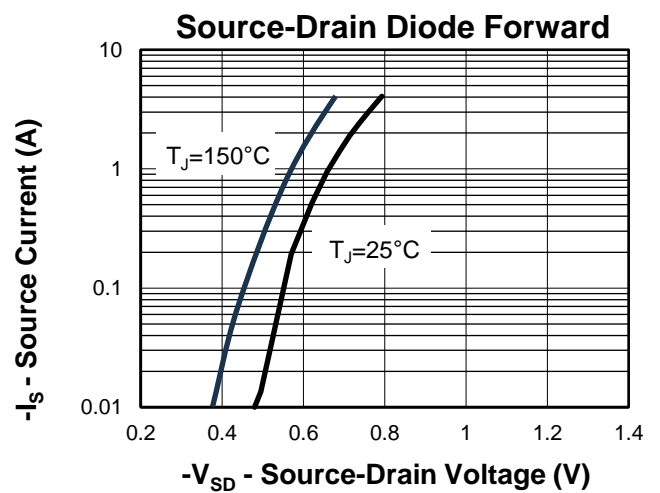
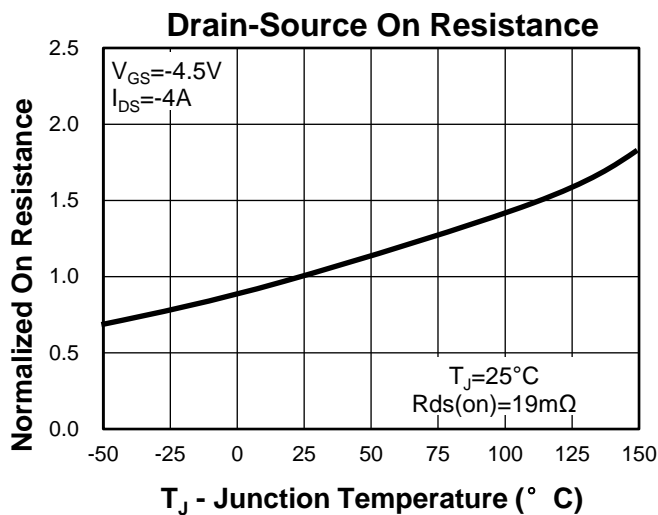
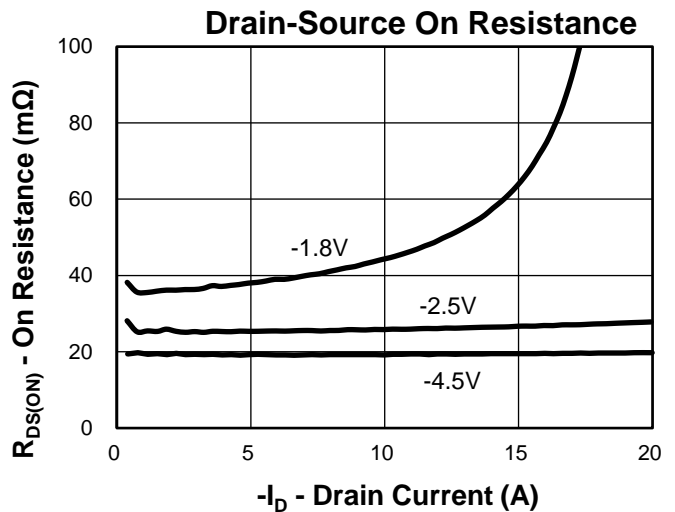
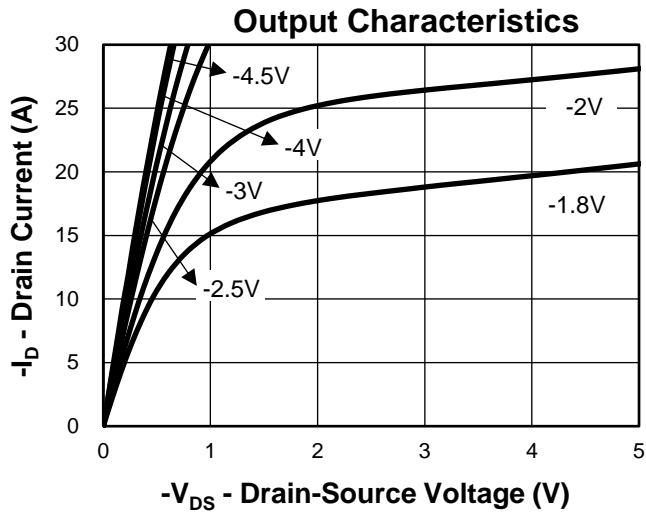
Typical Characteristics

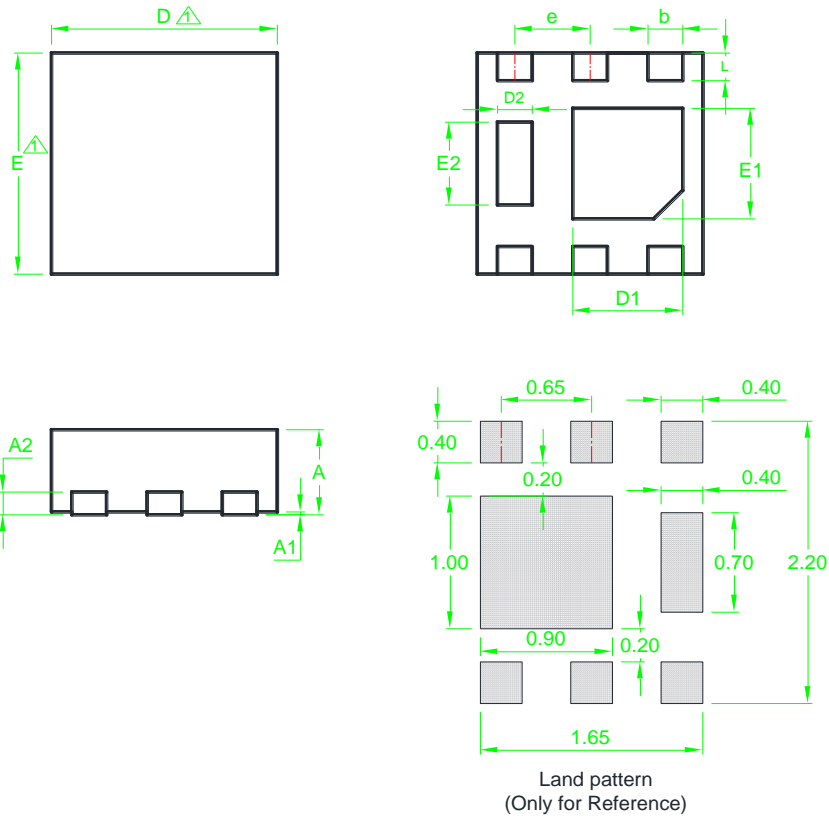


Thermal Transient Impedance



Typical Characteristics

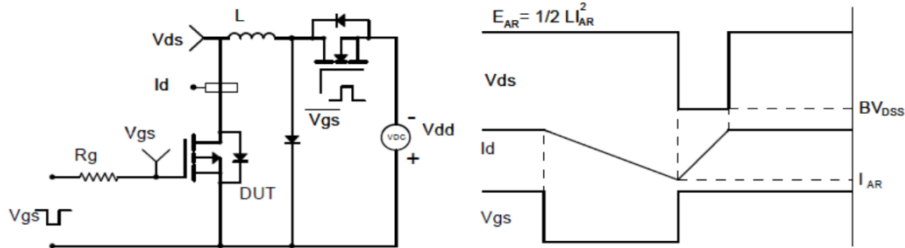


Package Information
SDFN2020B


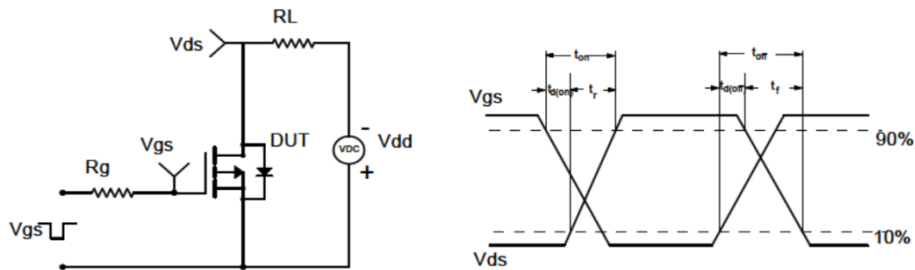
SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0.00	*	0.05	0.000	*	0.002
A2	0.152REF			0.006REF		
b	0.25	0.30	0.35	0.010	0.012	0.014
D	1.90	2.00	2.10	0.075	0.079	0.083
D1	0.80	0.90	1.00	0.031	0.035	0.039
D2	0.20	0.30	0.40	0.008	0.012	0.016
E	1.90	2.00	2.10	0.075	0.079	0.083
E1	0.80	0.95	1.10	0.031	0.037	0.043
E2	0.45	*	0.85	0.018	*	0.033
e		0.65BSC		0.026BSC		
L	0.25	0.30	0.35	0.010	0.012	0.014

① Dimensions D and E do not include mold flash protrusions or gate burrs.

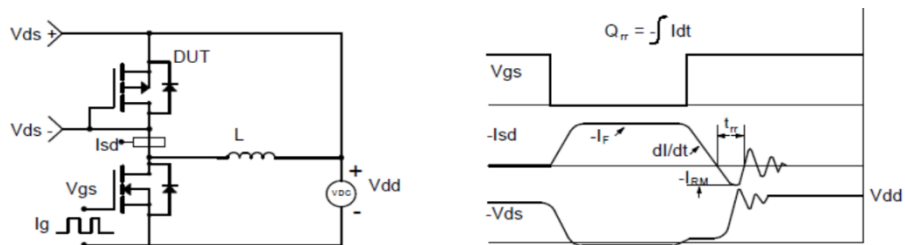
Avalanche Test Circuit and Waveforms



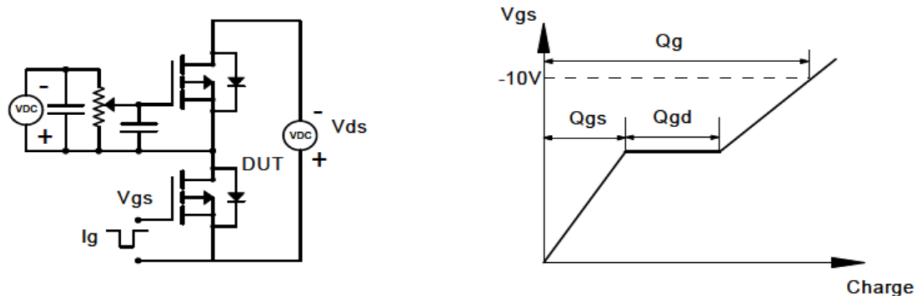
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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