

Features

- 20V/40A,
 $R_{DS(ON)} = 10m\Omega(Typ.)@V_{GS}=4.5V$
 $R_{DS(ON)} = 13m\Omega(Typ.)@V_{GS}=2.5V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- ESD Protected (HBM>2000V)

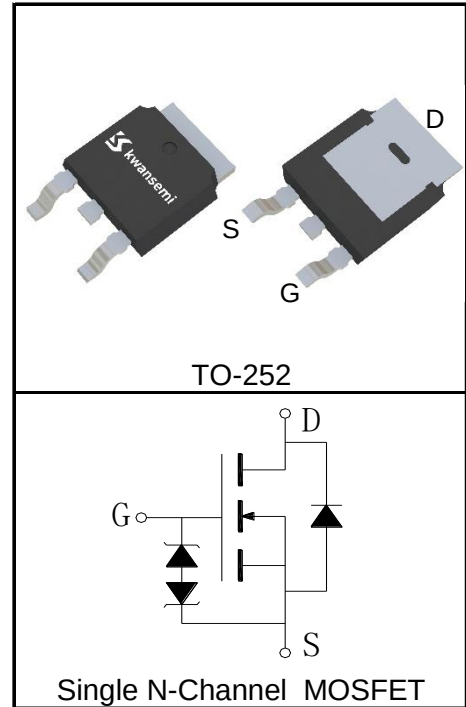
Applications

- Power Switching Appliaction
- Load Switching



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 10	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=4.5V$)	$T_C=25^\circ\text{C}$	A
		$T_C=100^\circ\text{C}$	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	W
		$T_C=100^\circ\text{C}$	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.2	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	24	mJ

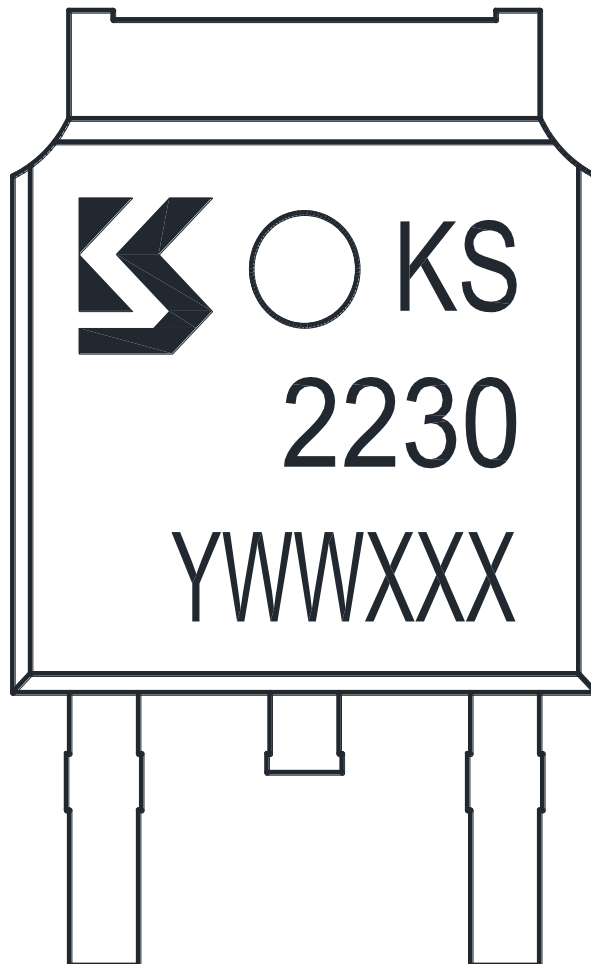
Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS2230DA			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.7	1.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V			±10	μA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =15A		10	13	mΩ
		V _{GS} =2.5V, I _{DS} =10A		13	17	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =15A, V _{GS} =0V		0.89	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =15A, dI _{SD} /dt=100A/μs		9		ns
Q _{rr}	Reverse Recovery Charge			18		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		2.8		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=200KHz		1170		pF
C _{oss}	Output Capacitance			125		
C _{rss}	Reverse Transfer Capacitance			95		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, I _{DS} =15A, V _{GEN} =4.5V, R _G =3Ω		6		ns
t _r	Turn-on Rise Time			11		
t _{d(OFF)}	Turn-off Delay Time			15		
t _f	Turn-off Fall Time			7		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =15A		13		nC
Q _{gs}	Gate-Source Charge			2.2		
Q _{gd}	Gate-Drain Charge			3.2		

- 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 $T_J = 25^{\circ}\text{C}$, $I_{ASmax} = 22A$, $L = 0.1\text{mH}$, $V_{DD} = 10V$, $R_G = 25\Omega$, $V_{GS} = 4.5V$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 14A$, $L = 0.1\text{mH}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

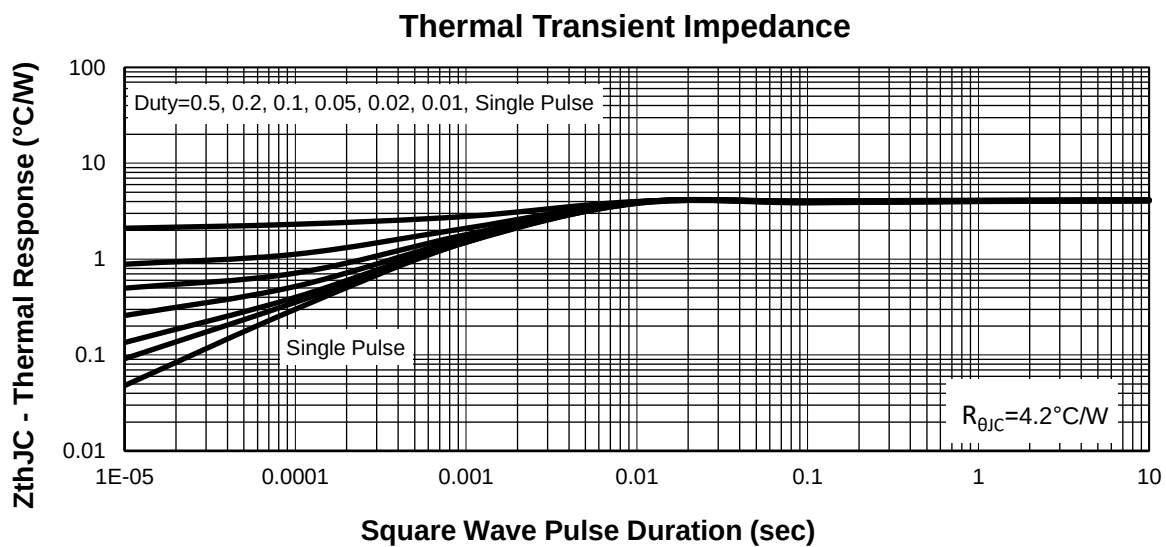
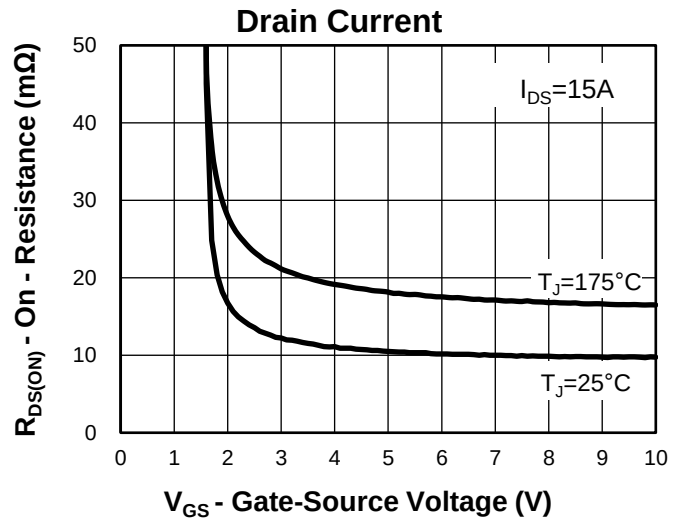
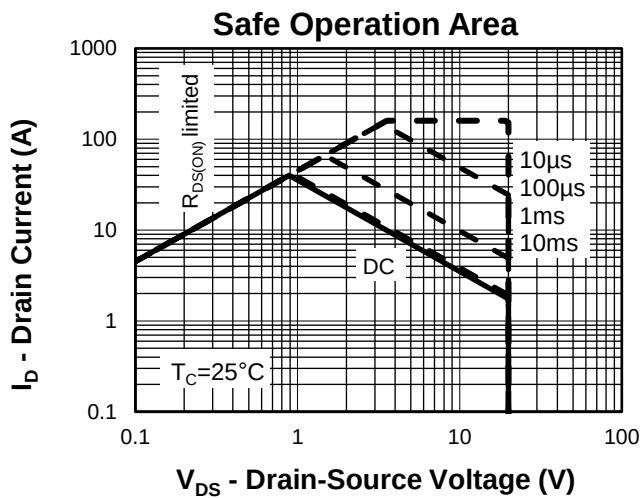
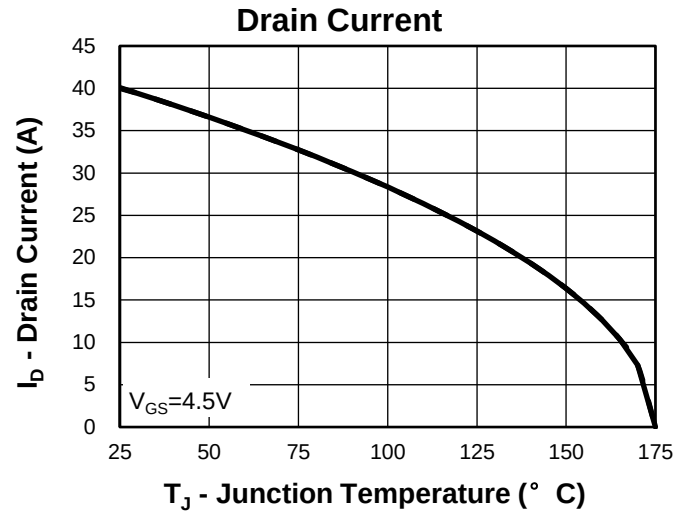
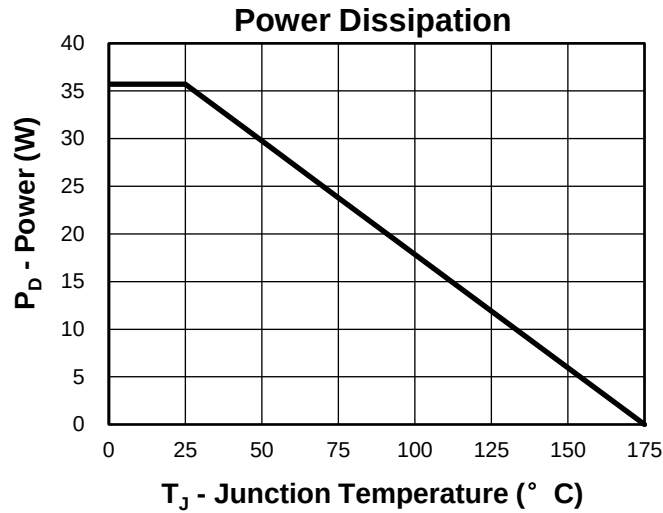
Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS2230DA	TO-252	Tape&Reel	2500	13"	16mm

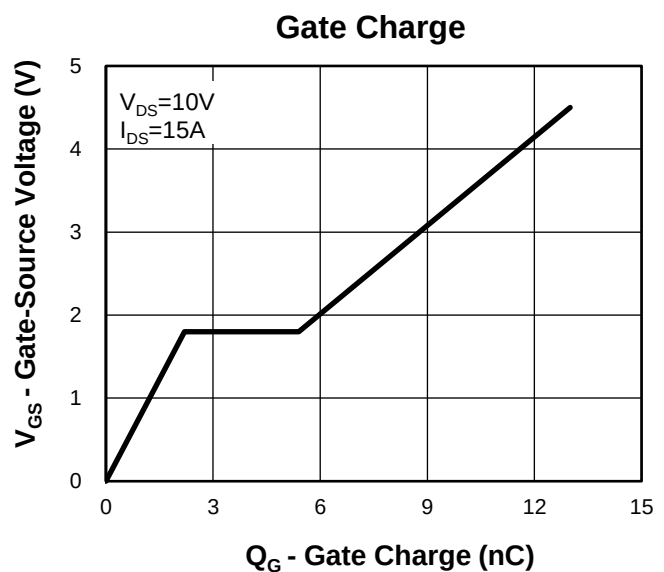
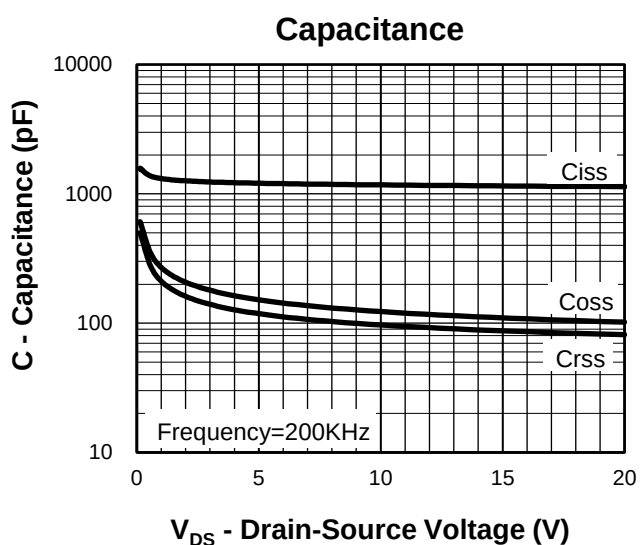
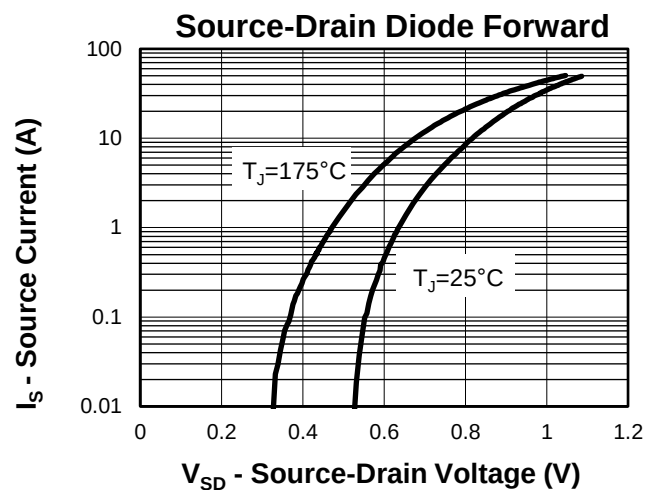
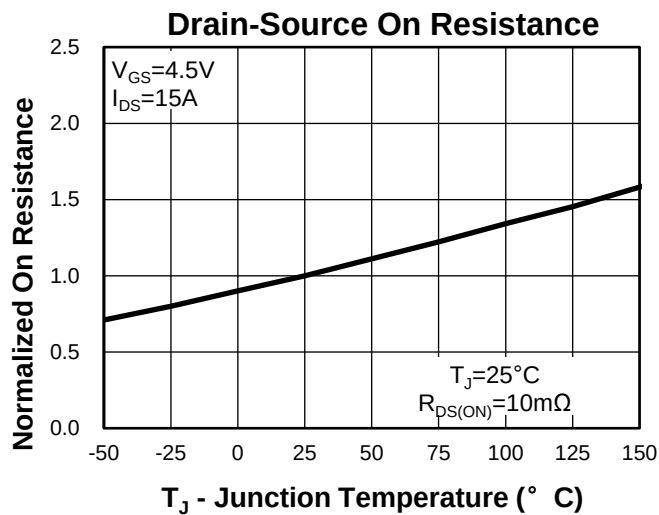
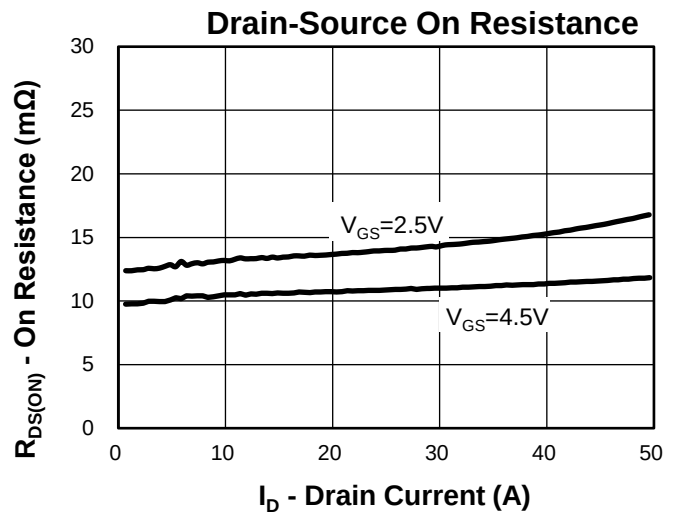
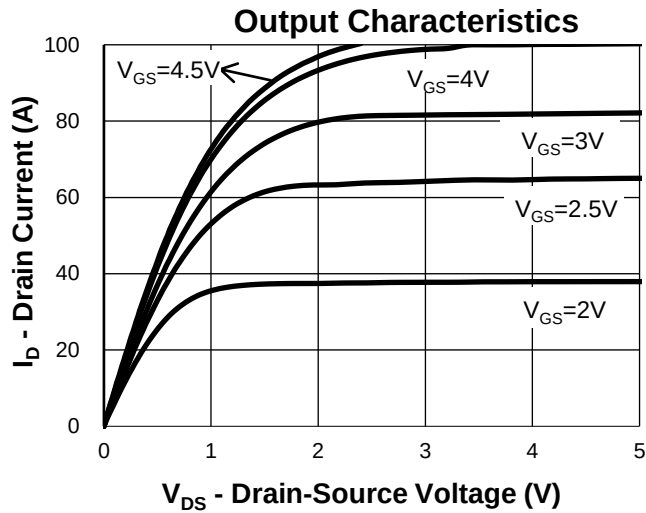


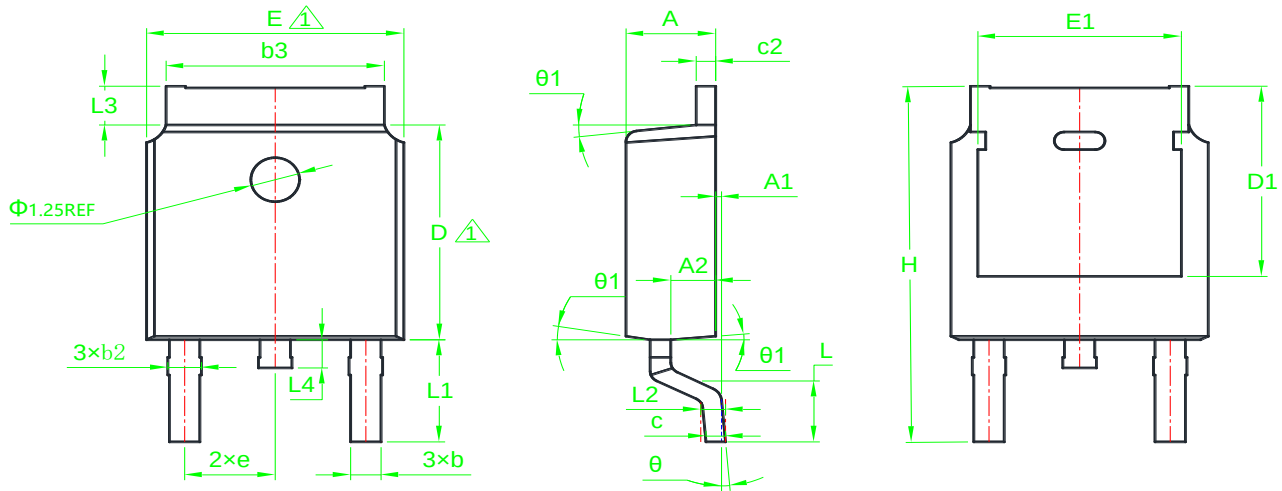
1st Line: Kwansemi LOGO, Kwansemi Code(KS)
2nd Line: Part Number(2230)
3rd Line: Lot Number(YWWXXX)

Typical Characteristics



Typical Characteristics

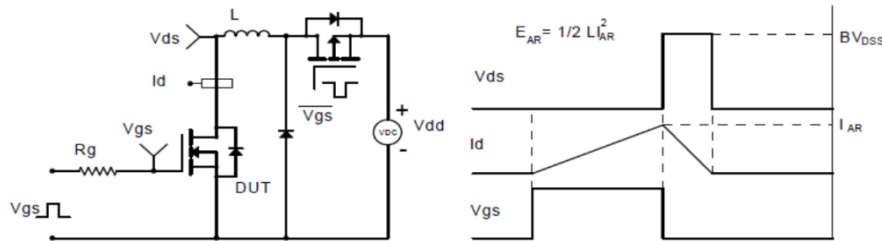


Package Information
TO-252


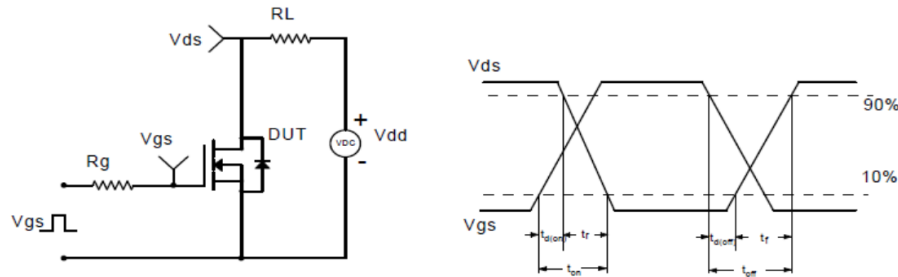
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.38	0.087	0.091	0.094	E	6.40	6.60	6.70	0.252	0.260	0.264
A1	0.00	*	0.15	0.000	*	0.006	E1	4.55	*	5.15	0.179	*	0.203
A2	0.90	1.00	1.10	0.035	0.039	0.043	H	9.60	10.10	10.40	0.378	0.398	0.409
b	0.65	0.75	0.85	0.026	0.030	0.033	L	1.40	1.50	1.70	0.055	0.059	0.067
b2	0.72	*	0.90	0.028	*	0.035	L1	2.90REF			0.114REF		
b3	5.13	5.33	5.46	0.202	0.210	0.215	L2	0.508BSC			0.020BSC		
c	0.47	0.51	0.54	0.019	0.020	0.021	L3	0.90	*	1.25	0.035	*	0.049
D	6.00	6.10	6.20	0.236	0.240	0.244	L4	0.60	*	1.00	0.024	*	0.039
D1	5.25	5.35	5.60	0.207	0.211	0.220	theta	0°	*	10°	0°	*	10°
e	2.286BSC			0.090BSC			theta1	5°	*	9°	5°	*	9°

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

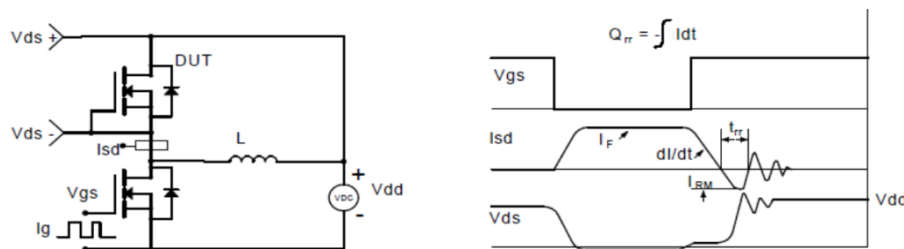
Avalanche Test Circuit and Waveforms



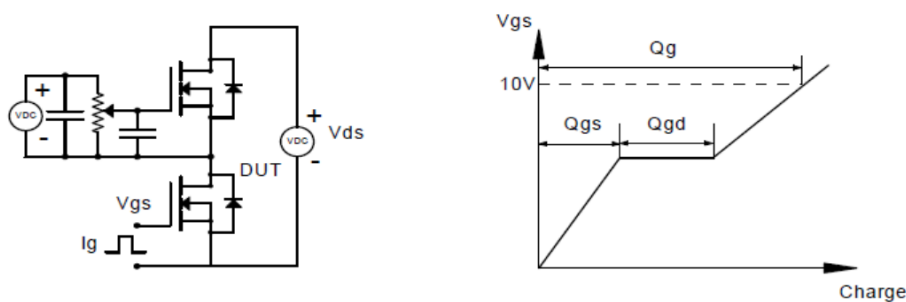
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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