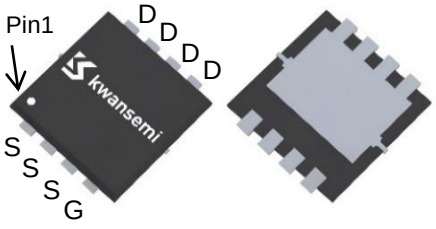
KS6210MB

Single N-Channel Advanced Power MOSFET

Features

- 60V/33A,
  $R_{DS\ (ON)}$ =13mΩ(Typ.)@V_{GS}=10V
  $R_{DS\ (ON)}$ =15mΩ(Typ.)@V_{GS}=4.5V
- Super High Dense Cell Design
- Fast Switching Speed
- 100% avalanche tested

Pin Description



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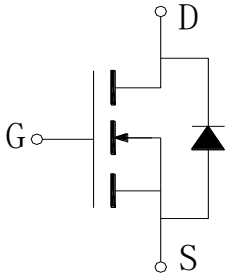


Single N-Channel MOSFET

Applications

- Switching Application Systems

RoHS Pb HF Halogen-Free

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	
T_{Jmax}	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_C=25°C	33	A
Mounted on Large Heat Sink				
I_{DP} ①	Pulse Drain Current	T_C=25°C	132	A
I_D ②	Continuous Drain Current@T_C(V_{GS}=10V)	T_C=25°C	33	A
		T_C=100°C	20	
	Continuous Drain Current@T_A(V_{GS}=10V) ③	T_A=25°C	10	
		T_A=70°C	8	
P_D	Maximum Power Dissipation@T_C	T_C=25°C	32	W
		T_C=100°C	13	
	Maximum Power Dissipation@T_A ③	T_A=25°C	3.5	
		T_A=70°C	2.3	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3.8	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	35	°C/W
Drain-Source Avalanche Ratings			
E_{AS} ④	Avalanche Energy, Single Pulsed	110	mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

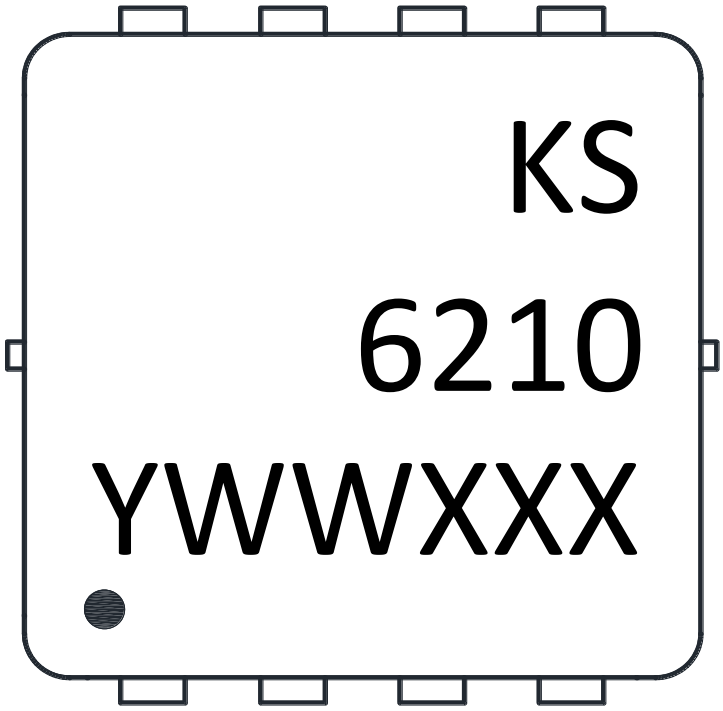
Symbol	Parameter	Test Condition	KS6210MB			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.2	1.7	2.3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		13	16	mΩ
		V_{GS}=4.5V, I_{DS}=15A		15	20	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V		0.87	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A, dI_{SD}/dt=100A/μs		25		ns
Q_{rr}	Reverse Recovery Charge			37		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		2.1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, Frequency=1.0MHz		2635		pF
C_{oss}	Output Capacitance			110		
C_{rss}	Reverse Transfer Capacitance			100		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=30V, I_{DS}=20A, V_{GS}=10V,R_G=3Ω		14		ns
t_r	Turn-on Rise Time			22		
$t_{d(OFF)}$	Turn-off Delay Time			43		
t_f	Turn-off Fall Time			21		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=30V, V_{GS}=10V, I_{DS}=20A		51		nC
Q_{gs}	Gate-Source Charge			7.5		
Q_{gd}	Gate-Drain Charge			11		

Notes:

①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t≤10sec.
④Limited by T_{Jmax}, Starting T_J = 25°C, I_{ASmax} =21A, L=0.5mH, V_{DD} = 30V, R_G = 25Ω, V_{GS}=10V.Part not recommended for use above this value.100% Final Test at I_{AS}=10A, L=0.5mH.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

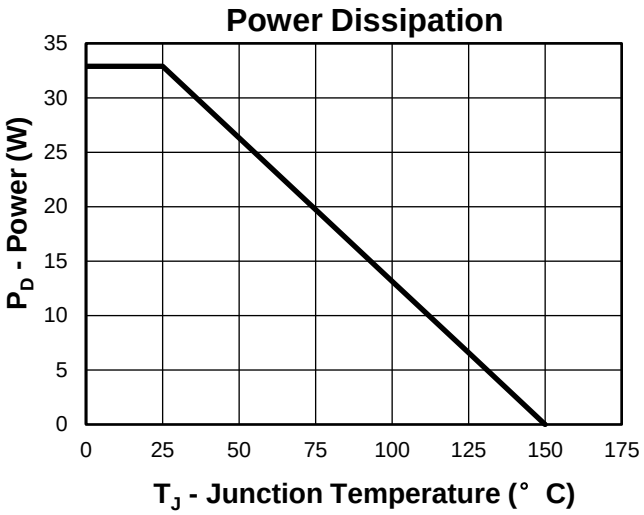
Ordering and Marking Information

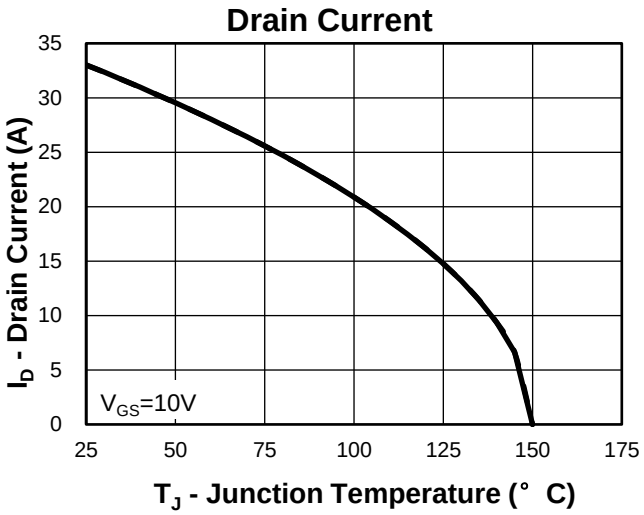
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS6210MB	PDFN3333	Tape&Reel	5000	13"	12mm

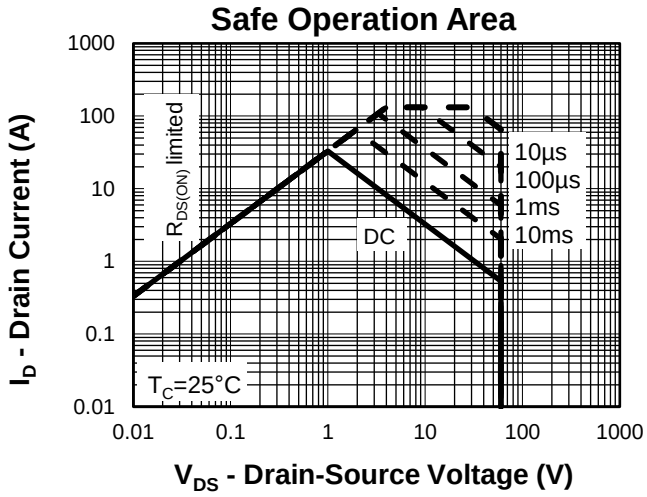


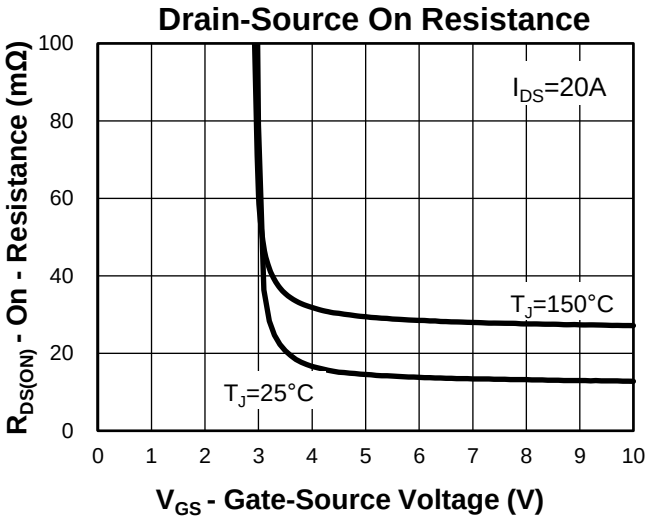
1st Line: Kwansemi Code(KS)
2nd Line: Part Number(6210)
3rd Line: Lot Number(YWWXXX)

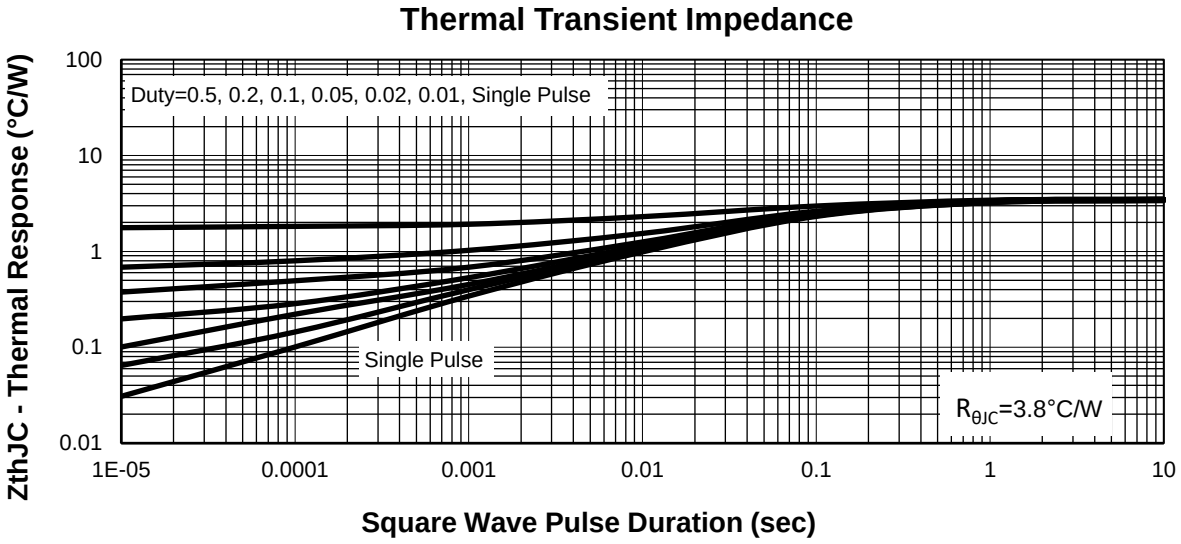
Typical Characteristics





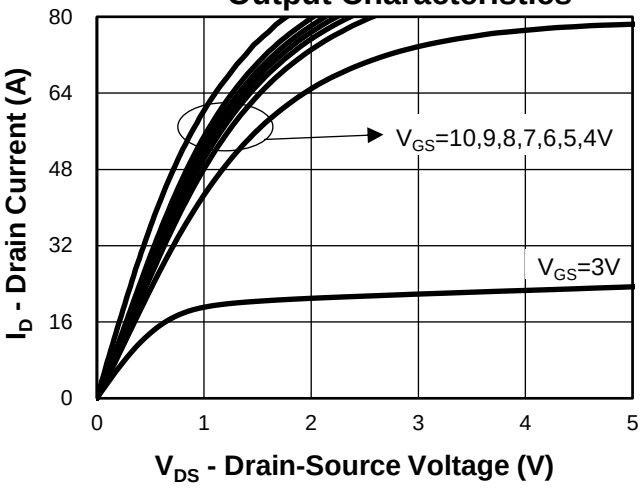




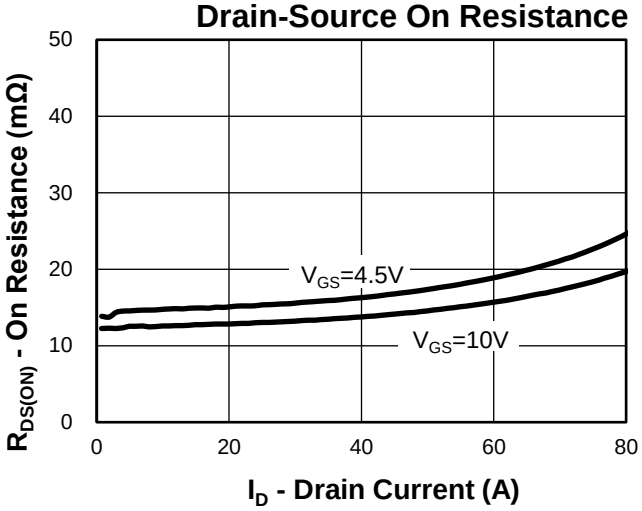


Typical Characteristics

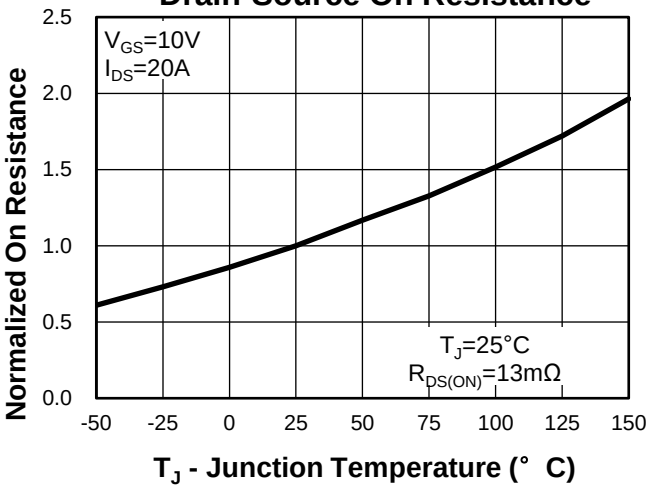
Output Characteristics



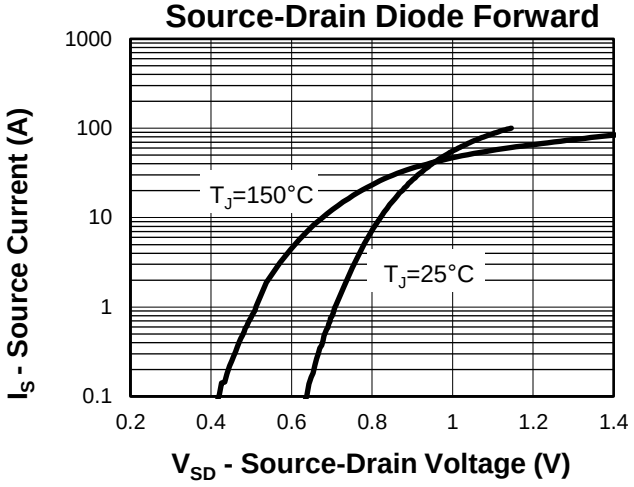
Drain-Source On Resistance



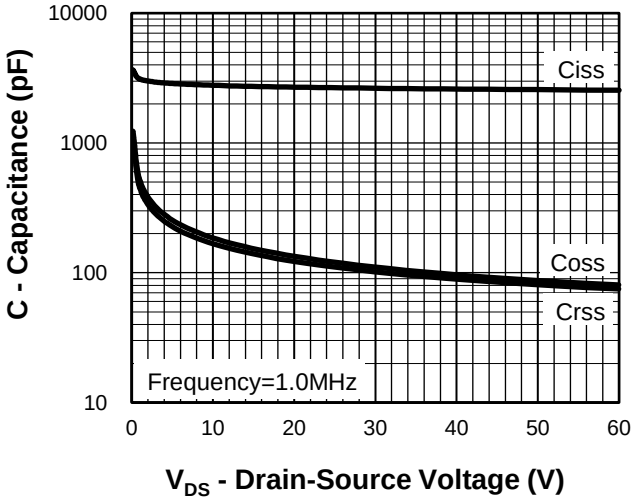
Drain-Source On Resistance



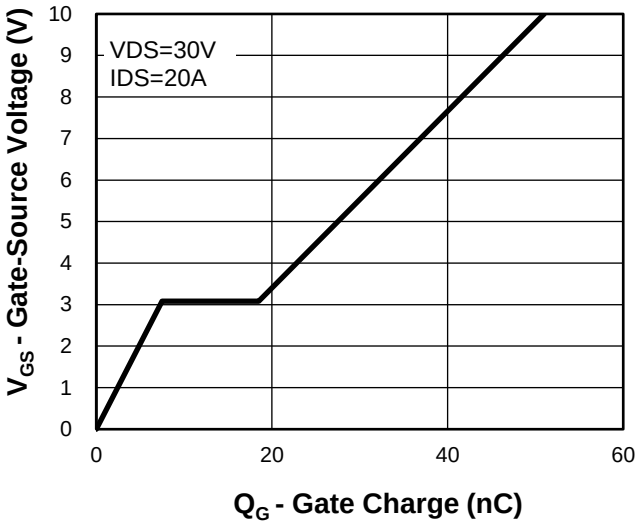
Source-Drain Diode Forward



Capacitance



Gate Charge



Package Information

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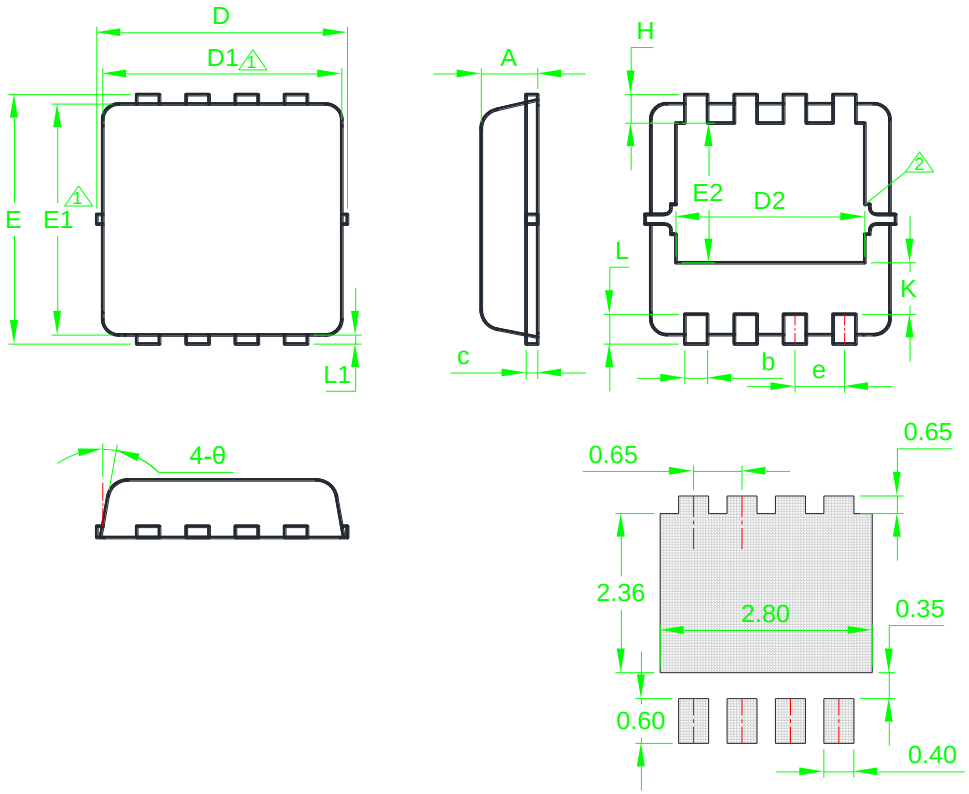
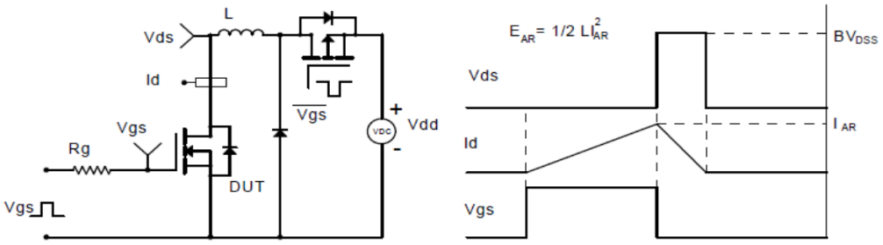


Land pattern
(Only for Reference)

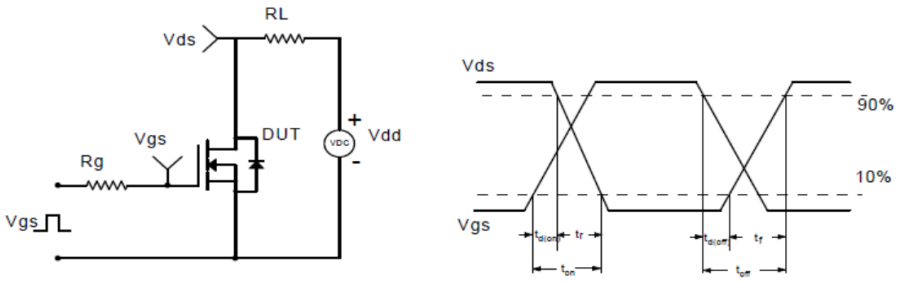
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.80	0.90	0.028	0.031	0.035	E2	1.40	*	1.95	0.055	*	0.077
b	0.25	0.30	0.35	0.010	0.012	0.014	e	0.65BSC			0.026BSC		
c	0.10	0.20	0.30	0.004	0.008	0.012	H	0.30	0.40	0.50	0.012	0.016	0.020
D	3.20	3.30	3.40	0.126	0.130	0.134	K	0.50	*	*	0.020	*	*
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	2.35	2.45	2.55	0.093	0.096	0.100	L1	0.15BSC			0.006BSC		
E	3.20	3.30	3.40	0.126	0.130	0.134	θ	6°	*	12°	6°	*	12°
E1	2.90	3.05	3.20	0.114	0.120	0.126							

1. Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.
2. The size and shape of exposed pad are variable depending on mold.

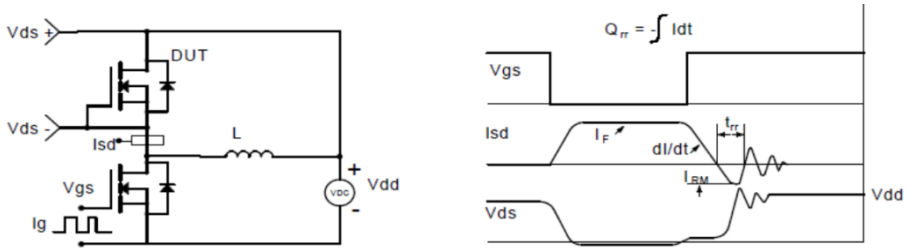
Avalanche Test Circuit and Waveforms



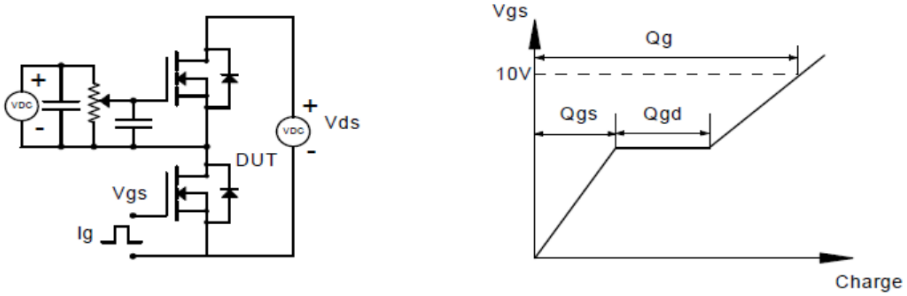
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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