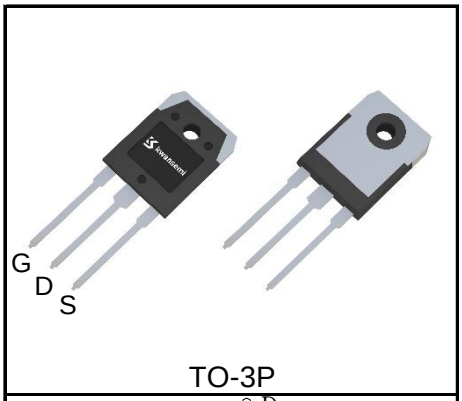
KS12007QAP

Single N-Channel Advanced Power MOSFET

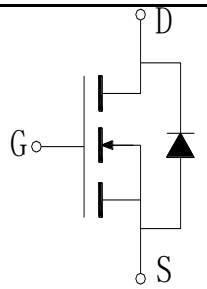
Features

- 100V/123A,
  $R_{DS\ (ON)}$ =10mΩ(Typ.)@V_{GS}=10V
  $R_{DS\ (ON)}$ =12mΩ(Typ.)@V_{GS}=4.5V
- Planar Technology
- High Ruggedness
- Enhanced FBSOA for superior linear mode operation
- 100% Avalanche Tested
- 100% Rg Tested

Pin Description



TO-3P



Single N-Channel MOSFET

Applications

- Motor Control
- Inverter

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		100	V
V_{GSS}	Gate-Source Voltage		±20	
T_{Jmax}	Maximum Junction Temperature		175	°C
T_J,T_{STG}	Operating and Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	123	A
Mounted on Large Heat Sink				
I_{DP} ①	Pulse Drain Current	T_C=25°C	492	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	123	A
		T_C=100°C	87	
P_D	Maximum Power Dissipation	T_C=25°C	468	W
		T_C=100°C	234	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.32	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient		50	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ④	Avalanche Energy, Single Pulsed		2162	mJ

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

Symbol	Parameter	Test Condition	KS12007QAP			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	0.9	1.4	1.9	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}=40A		10	13	mΩ
		V_{GS}=4.5V, I_{DS}=20A		12	16	mΩ
Diode Characteristics						
V_{SD} ⑤	Diode Forward Voltage	I_{SD}=40A, V_{GS}=0V		0.84	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=40A, dI_{SD}/dt=100A/μs		141		ns
Q_{rr}	Reverse Recovery Charge			424		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Frequency=1.0MHz		3520		pF
C_{oss}	Output Capacitance			655		
C_{rss}	Reverse Transfer Capacitance			430		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=50V, I_{DS}=40A, V_{GEN}=10V,R_G=6Ω		29		ns
t_r	Turn-on Rise Time			65		
$t_{d(OFF)}$	Turn-off Delay Time			132		
t_f	Turn-off Fall Time			43		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_{DS}=40A		311		nC
Q_{gs}	Gate-Source Charge			9.7		
Q_{gd}	Gate-Drain Charge			125		

Notes:

①Pulse width limited by safe operating area.

②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 90A.

③When mounted on 1 inch square copper board, t≤10sec. The value in any given application depends on the user's specific board design.

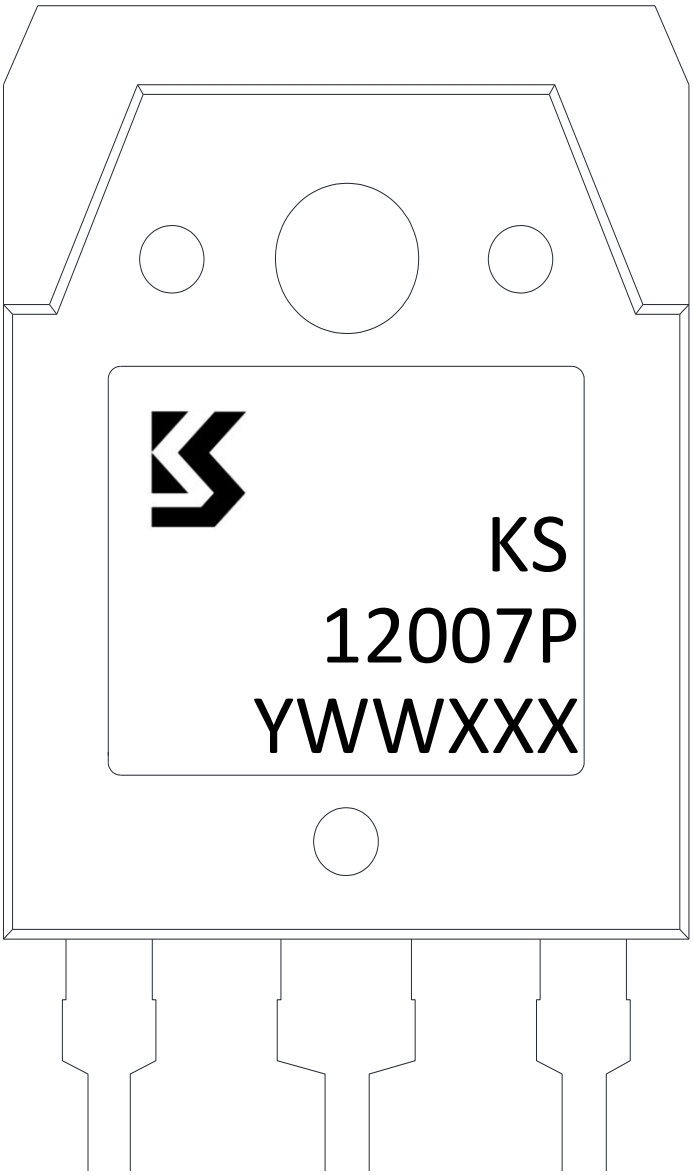
④Limited by T_{Jmax}, Starting T_J = 25°C, I_{ASmax} =93A, L=0.5mH, V_{DD} = 50V, R_G = 25Ω, V_{GS}=10V.Part not recommended for use above this value.100% Final Test at I_{AS}=65A, L=0.5mH.

⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.

⑥Guaranteed by design, not subject to production testing.

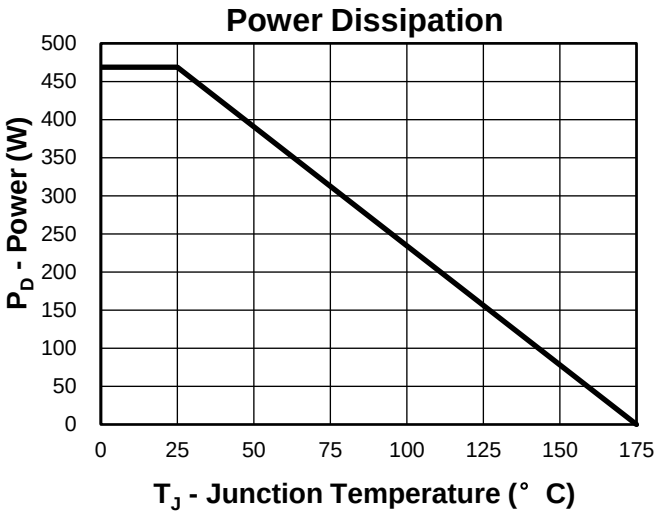
Ordering and Marking Information

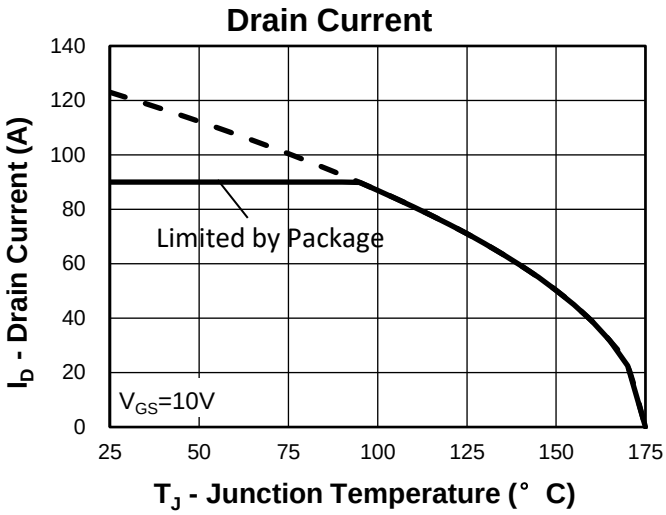
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS12007QAP	TO-3P	Tube	30	-	-

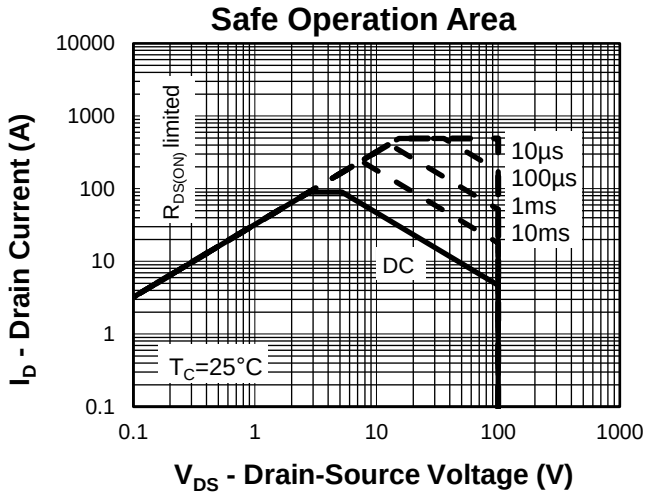


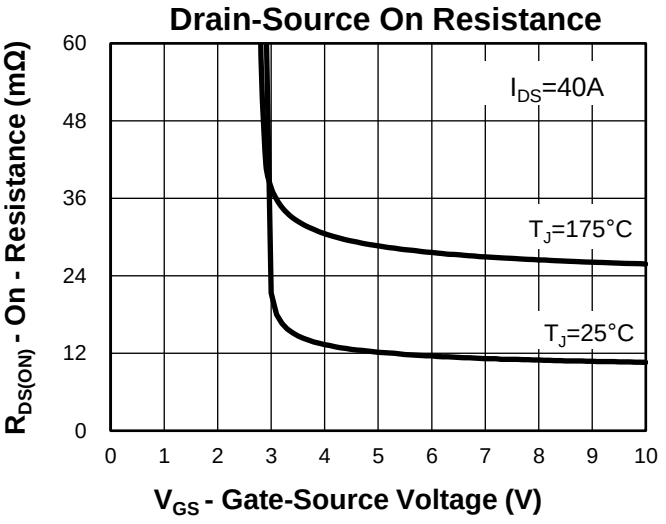
1st Line: Kwansemi LOGO， Kwansemi Code(KS)
2nd Line: Part Number(12007P)
3rd Line: Lot Number(YWWXXX)

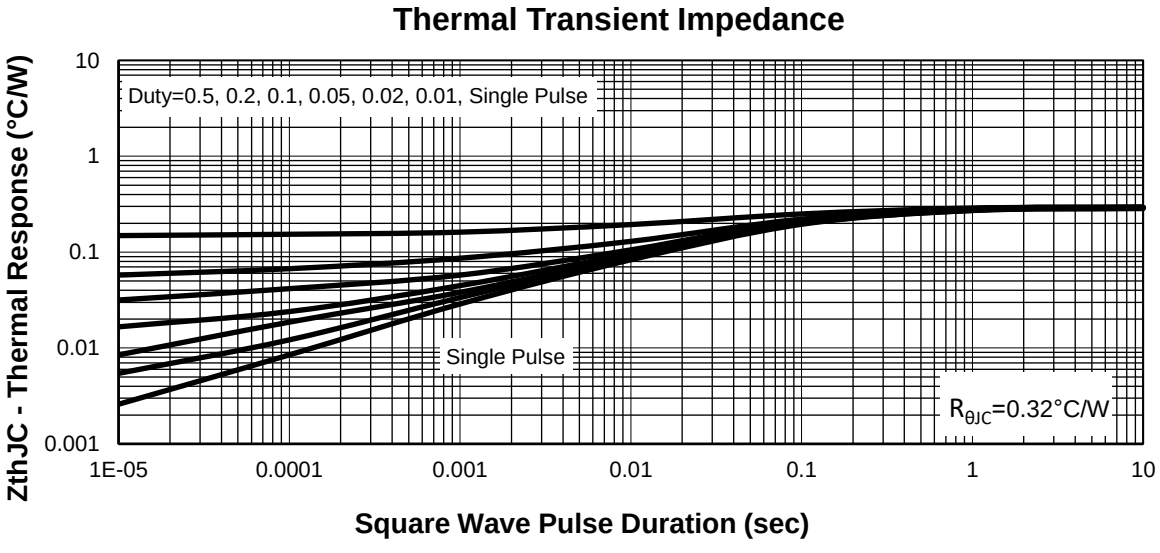
Typical Characteristics











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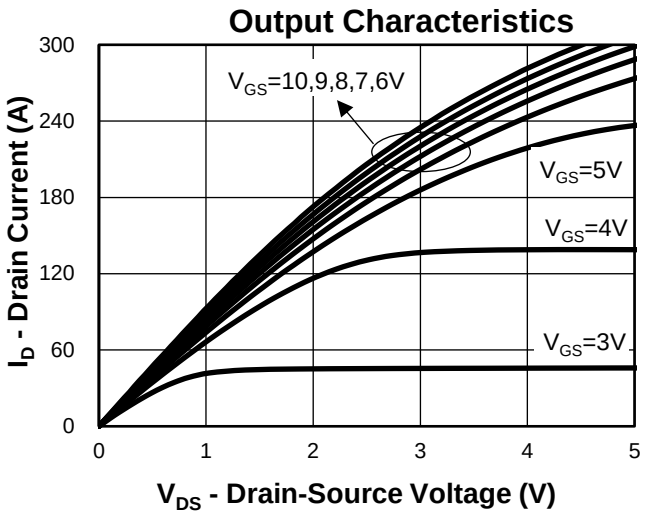
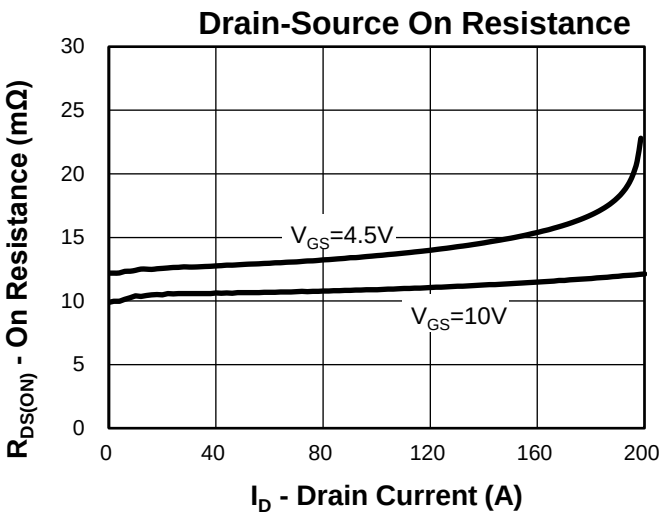
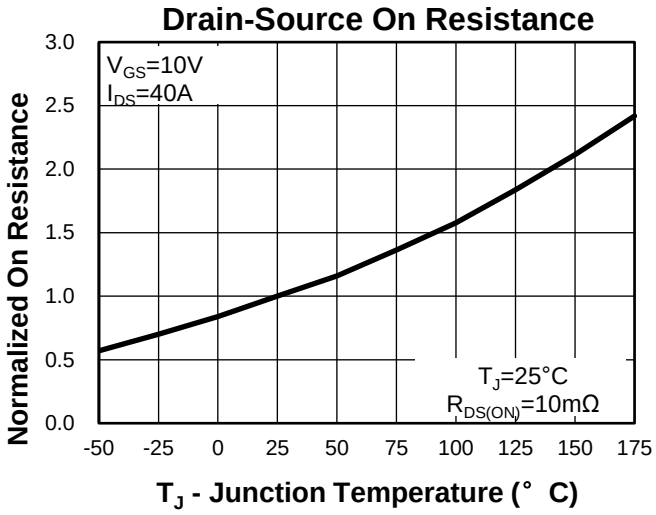
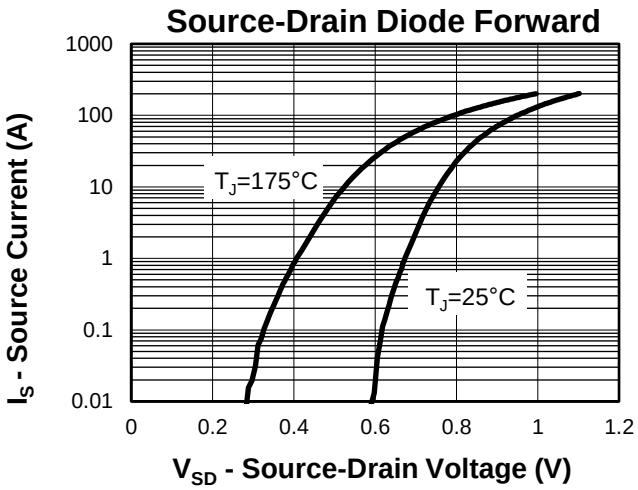
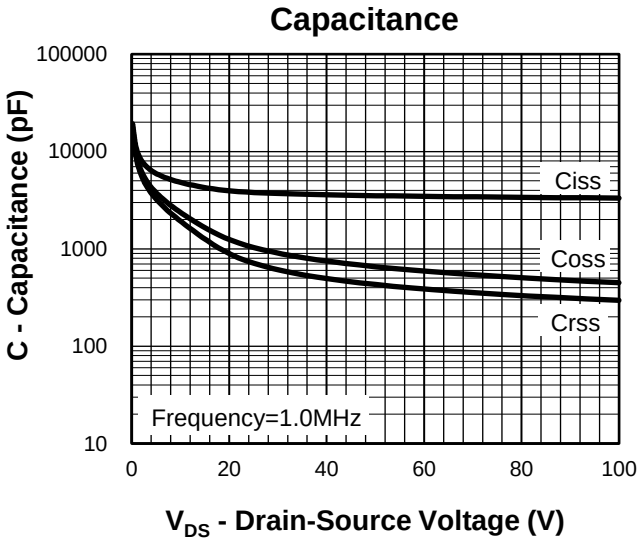
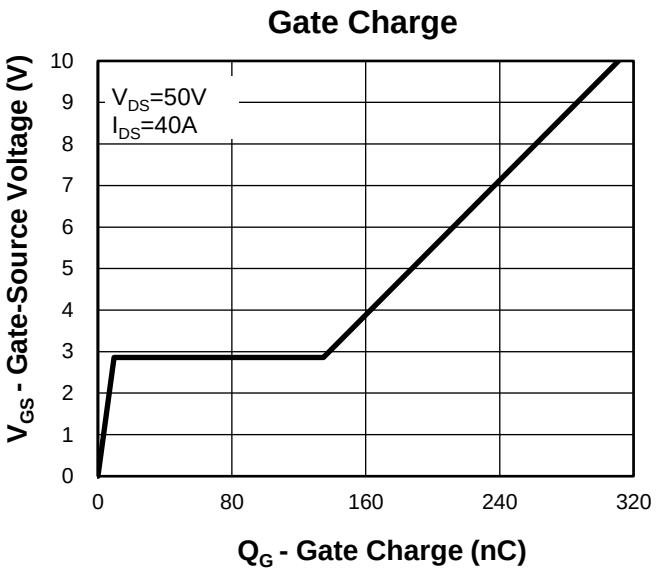






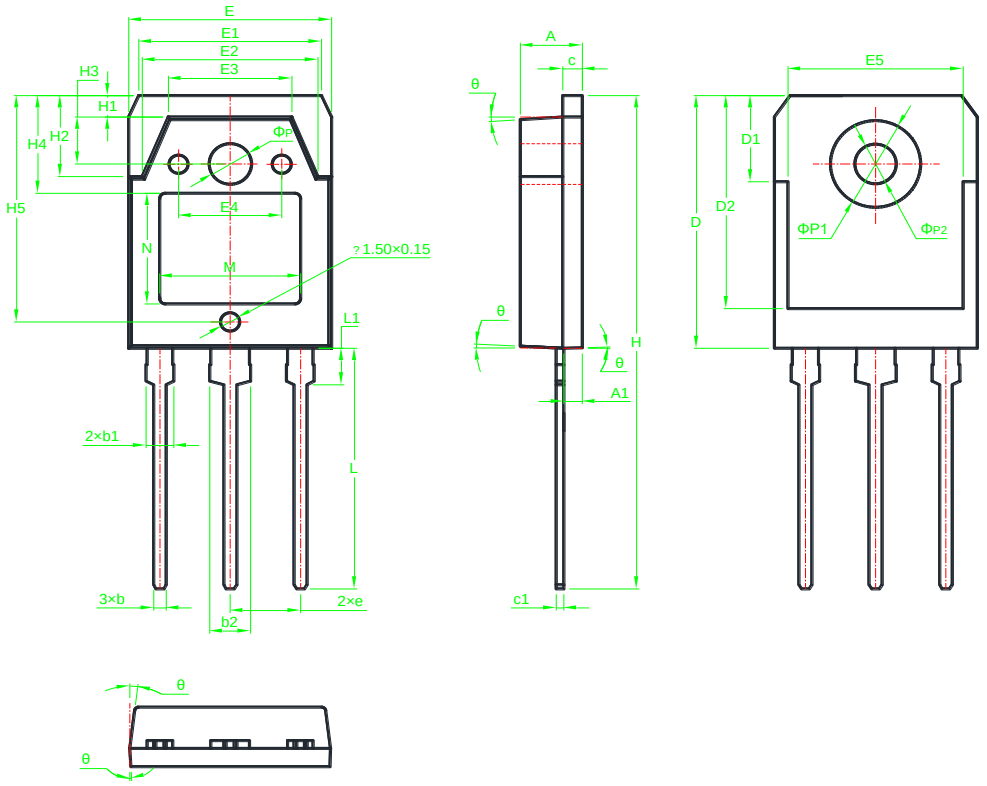






Package Information

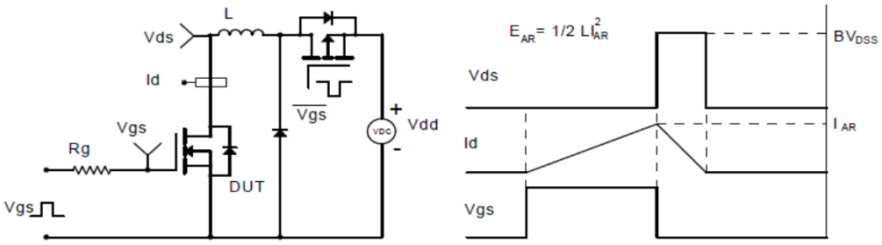
TO-3P



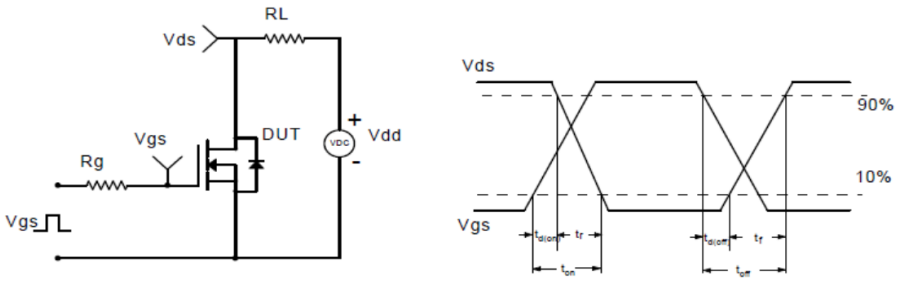
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.65	4.80	4.95	0.183	0.189	0.195	H	39.80	40.00	40.20	1.567	1.575	1.583
A1	1.40	1.50	1.60	0.055	0.059	0.063	H1	0.90	1.10	1.30	0.035	0.043	0.051
b	0.80	1.00	1.20	0.031	0.039	0.047	H2	5.80	6.00	6.20	0.228	0.236	0.244
b1	1.90	2.10	2.30	0.075	0.083	0.091	H3	4.75	4.95	5.15	0.187	0.195	0.203
b2	2.90	3.10	3.30	0.114	0.122	0.130	H4	7.15	7.35	7.55	0.281	0.289	0.297
c	1.45	1.50	1.55	0.057	0.059	0.061	H5	17.30	17.50	17.70	0.681	0.689	0.697
c1	0.50	0.60	0.65	0.020	0.024	0.026	L	19.70	20.00	20.30	0.776	0.787	0.799
D	17.70	18.70	19.70	0.697	0.736	0.776	L1	3.40	3.55	3.70	0.134	0.140	0.146
D1	6.70	6.90	7.10	0.264	0.272	0.280	M	10.85	11.00	11.15	0.427	0.433	0.439
D2	16.60	16.80	17.00	0.654	0.661	0.669	N	8.70	8.90	9.10	0.343	0.350	0.358
E	15.45	15.60	15.75	0.608	0.614	0.620	e	5.40	5.44	5.48	0.213	0.214	0.216
E1	13.65	13.80	13.95	0.537	0.543	0.549	ØP	3.25	3.40	3.55	0.128	0.134	0.140
E2	13.35	13.50	13.65	0.526	0.531	0.537	ØP1	3.00	3.15	3.30	0.118	0.124	0.130
E3	9.50	9.65	9.80	0.374	0.380	0.386	ØP2	6.70	6.90	7.10	0.264	0.272	0.280
E4	7.75	7.90	8.05	0.305	0.311	0.317	θ	0°	*	7°	0°	*	7°
E5	13.40	13.55	13.70	0.528	0.533	0.539							

Note: Dimensions do not inclusive burrs and mold flash.

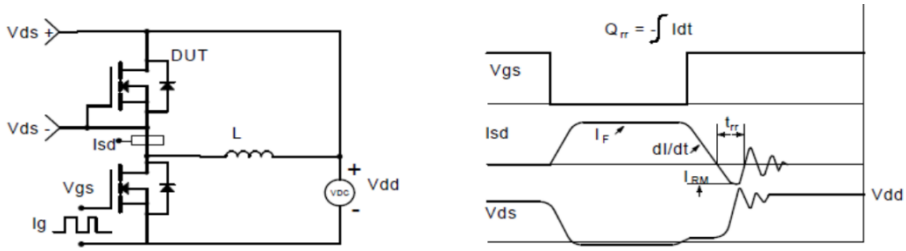
Avalanche Test Circuit and Waveforms



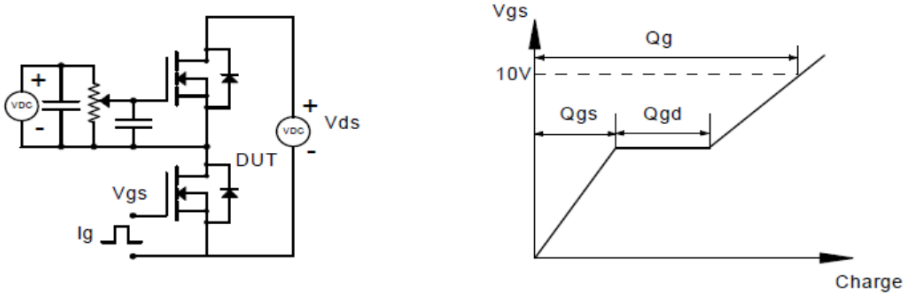
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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