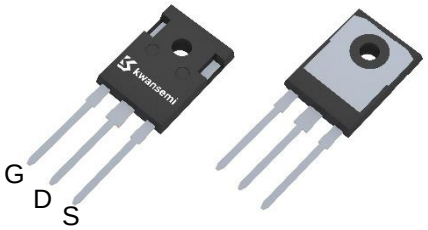
KSD2010PAT

Single N-Channel Advanced Power MOSFET

Features

- 250V/85A,
  $R_{DS\,(ON)}$ =18mΩ(Typ.)@V_{GS}=10V
- Excellent Q_G x $R_{DS(on)}$ product(FOM)
- SGT Technology
- High Ruggedness
- 100% Avalanche Tested
- 100% Rg Tested

Pin Description



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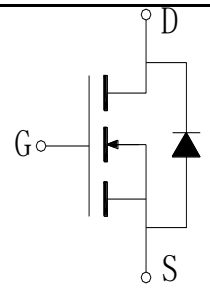


Single N-Channel MOSFET

Applications

- Uninterruptible Power Supply
- 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		250	V
V_{GSS}	Gate-Source Voltage		±30	
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	85	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	340	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	85	A
		T_C=100°C	60	
P_D	Maximum Power Dissipation	T_C=25°C	405	W
		T_C=100°C	202	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.37	°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		961	mJ

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

Symbol	Parameter	Test Condition	KSD2010PAT			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	250			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=250V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2.5	3.5	4.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ⑤	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=40A		18	20.5	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		55		ns
Q_{rr}	Reverse Recovery Charge			138		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.2		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=125V, Frequency=1.0MHz		10315		pF
C_{oss}	Output Capacitance			270		
C_{rss}	Reverse Transfer Capacitance			20		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=125V, I_{DS}=40A, V_{GEN}=10V,R_G=3Ω		15		ns
t_r	Turn-on Rise Time			39		
$t_{d(OFF)}$	Turn-off Delay Time			54		
t_f	Turn-off Fall Time			28		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=125V, V_{GS}=10V, I_{DS}=40A		139		nC
Q_{gs}	Gate-Source Charge			52		
Q_{gd}	Gate-Drain Charge			27		

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. The value in any given application depends on the user's specific board design.

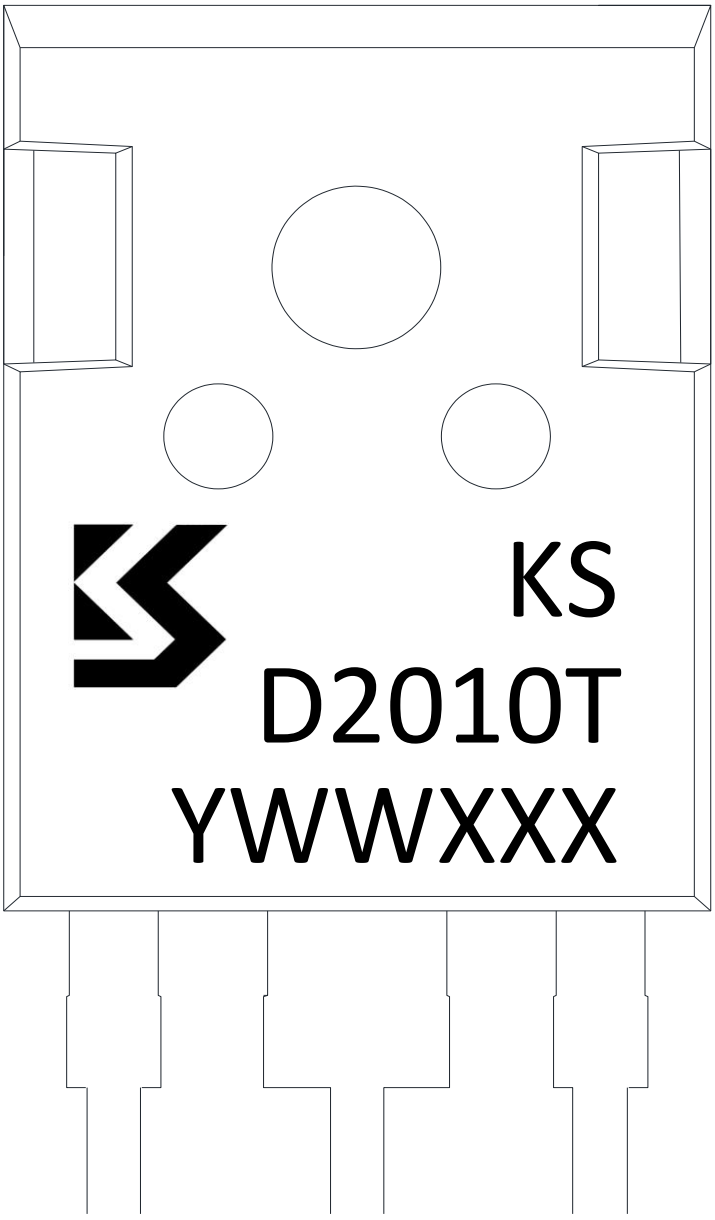
④Limited by T_{Jmax}, Starting T_J = 25°C, I_{ASmax} =62A, L=0.5mH, V_{DD} = 48V, R_G = 25Ω, V_{GS}=10V.Part not recommended for use above this value.100% Final Test at I_{AS}=42A, L=0.5mH.

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

⑥Guaranteed by design, not subject to production testing.

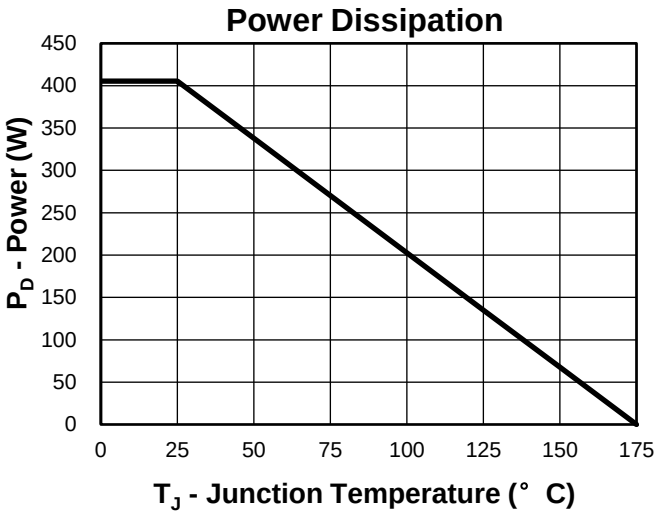
Ordering and Marking Information

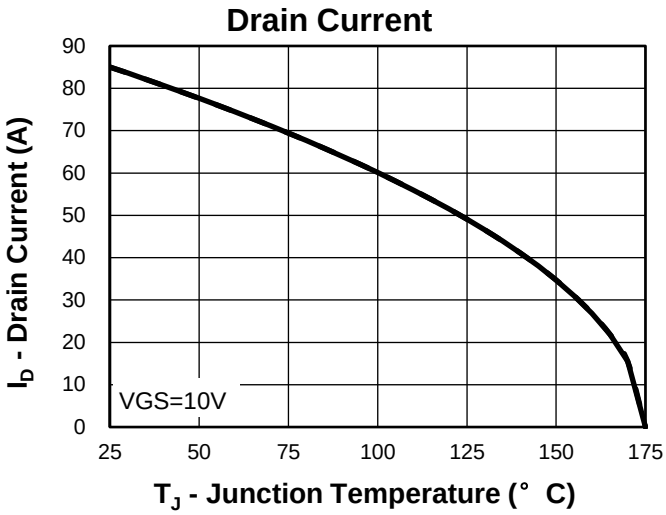
Device	Package	Packaging	Quantity	Reel Size	Tape width
KSD2010PAT	TO-247	Tube	30	-	-

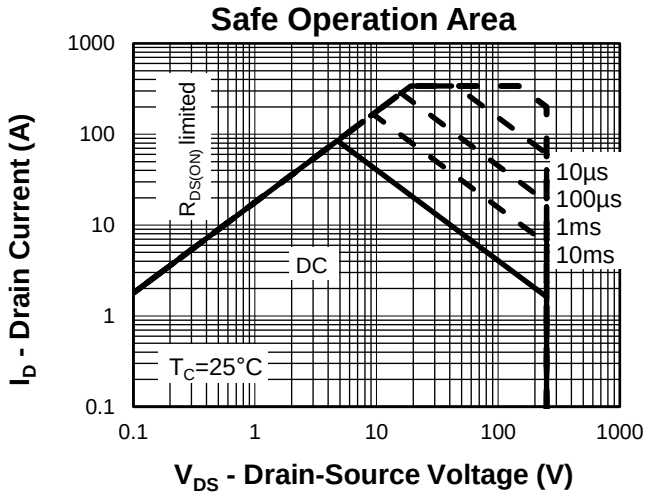


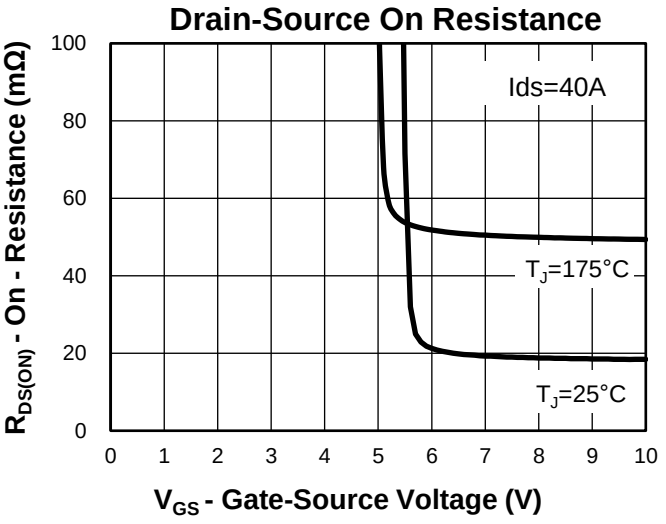
1st Line: Kwansemi LOGO， Kwansemi Code(KS)
2nd Line: Part Number(D2010T)
3rd Line: Lot Number(YWWXXX)

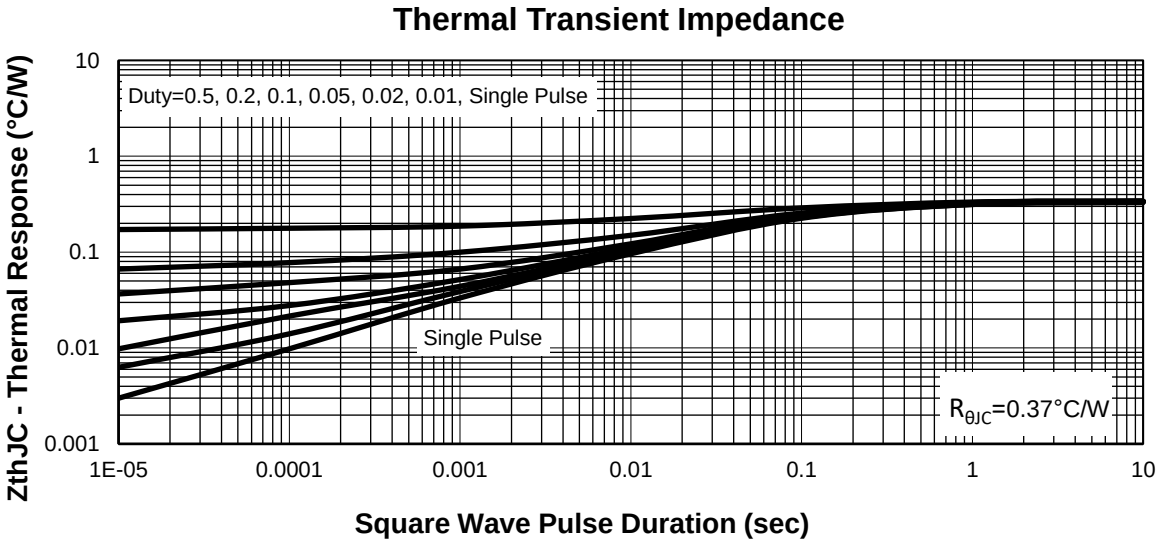
Typical Characteristics



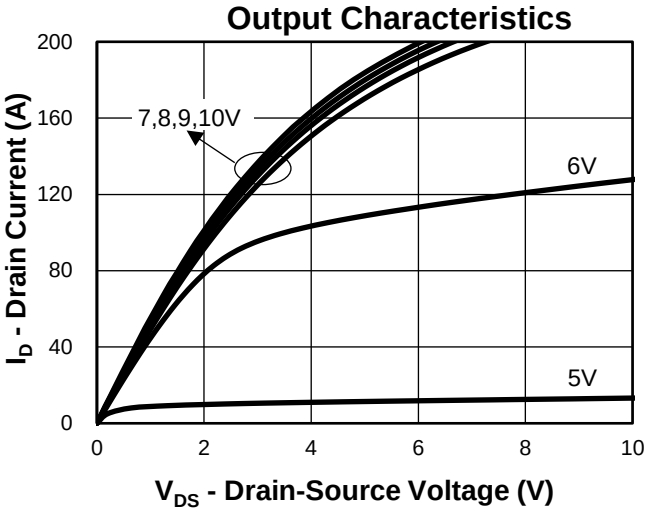


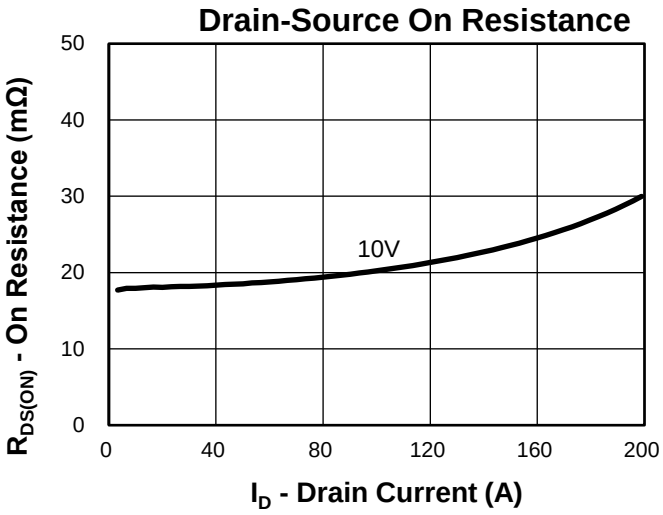


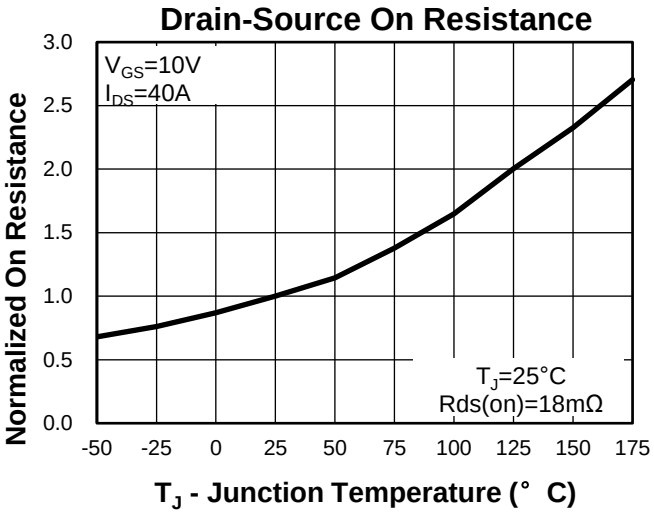


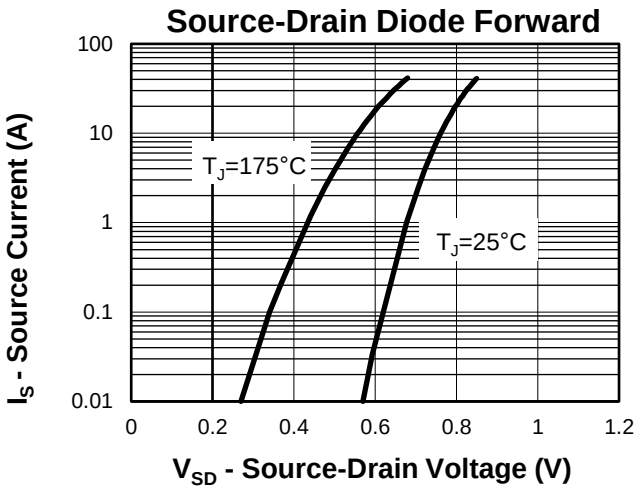


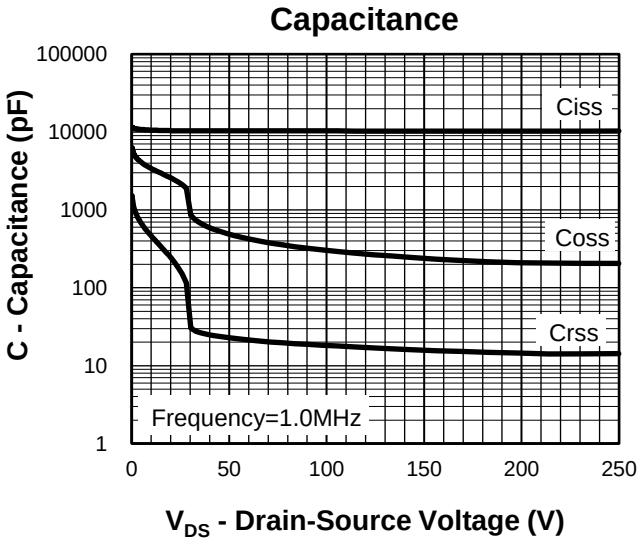
Typical Characteristics

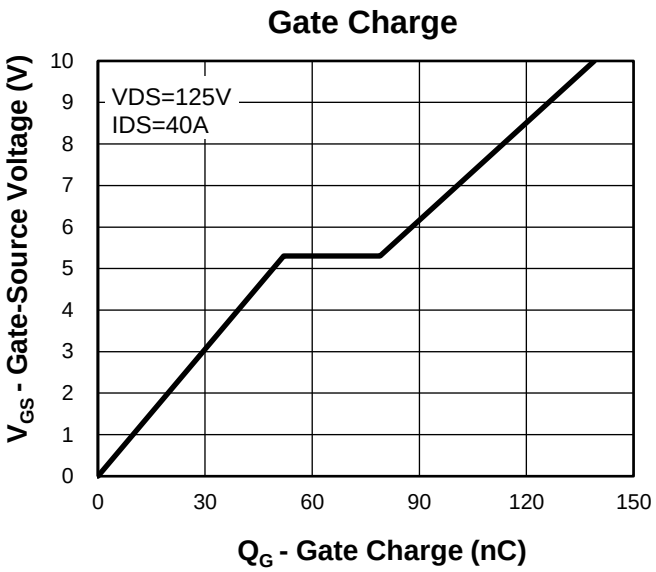












Package Information

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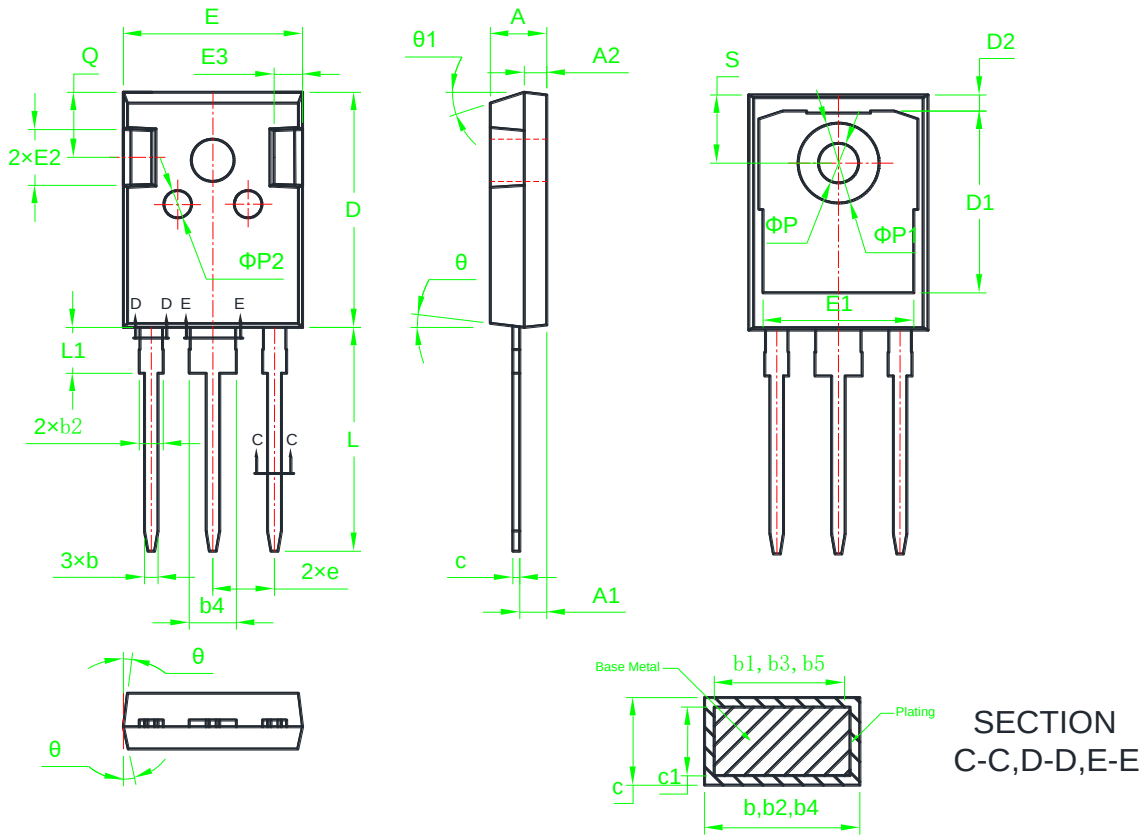
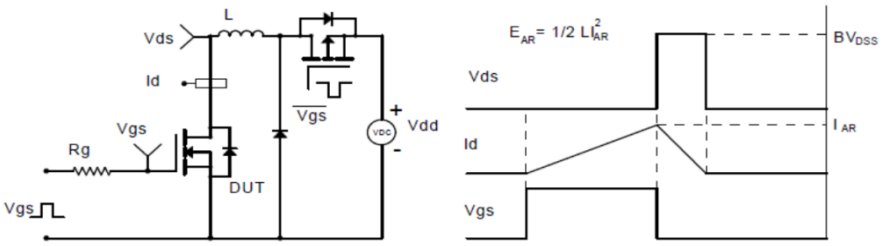


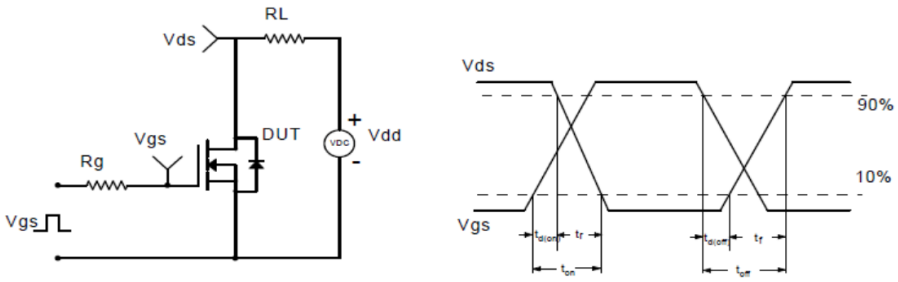
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.90	5.00	5.10	0.193	0.197	0.201	E	15.70	15.80	15.90	0.618	0.622	0.626
A1	2.31	2.41	2.51	0.091	0.095	0.099	E1	13.10	13.30	13.50	0.516	0.524	0.531
A2	1.90	2.00	2.10	0.075	0.079	0.083	E2	4.90	5.00	5.10	0.193	0.197	0.201
b	1.16	1.21	1.26	0.046	0.048	0.050	E3	2.40	2.50	2.60	0.094	0.098	0.102
b1	1.15	1.20	1.25	0.045	0.047	0.049	e	5.44BSC			0.214BSC		
b2	1.95	2.10	2.15	0.077	0.083	0.085	L	19.80	19.92	20.10	0.780	0.784	0.791
b3	1.94	2.09	2.14	0.076	0.082	0.084	L1	*	*	4.30	*	*	0.169
b4	3.10	3.15	3.20	0.122	0.124	0.126	Q	5.60	5.80	6.00	0.220	0.228	0.236
b5	3.09	3.14	3.19	0.122	0.124	0.126	S	6.05	6.15	6.25	0.238	0.242	0.246
c	0.59	0.61	0.66	0.023	0.024	0.026	ØP	3.50	3.60	3.70	0.138	0.142	0.146
c1	0.58	0.60	0.65	0.023	0.024	0.026	ØP1	7.00	7.20	7.40	0.276	0.283	0.291
D	20.90	21.00	21.10	0.823	0.827	0.831	ØP2	2.40	2.50	2.60	0.094	0.098	0.102
D1	16.25	16.55	16.85	0.640	0.652	0.663	θ	5°	7°	9°	5°	7°	9°
D2	1.05	*	1.35	0.041	*	0.053	θ 1	13°	16°	19°	13°	16°	19°

Note: Dimensions do not inclusive burrs and mold flash.

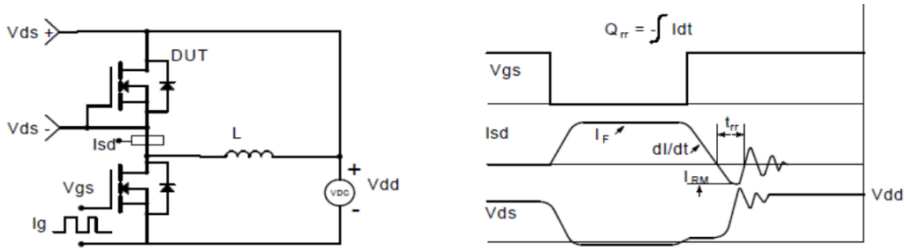
Avalanche Test Circuit and Waveforms



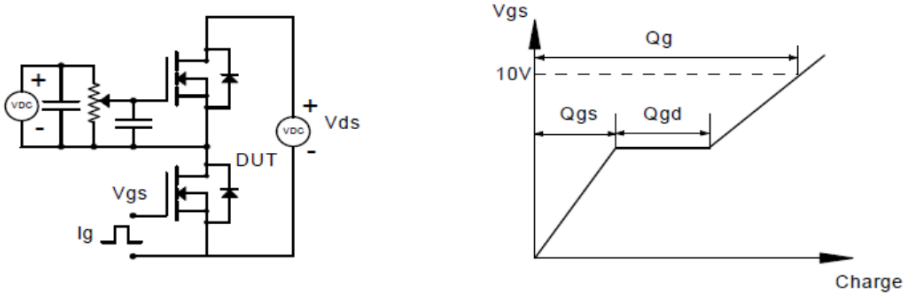
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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