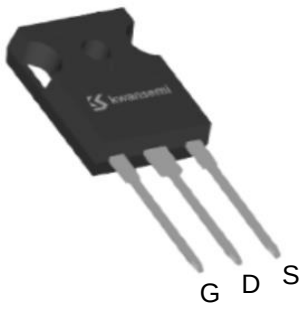
KSC2002PAP

Single N-Channel Advanced Power MOSFET

Features

- 200V/125A,
  $R_{DS\ (ON)}$ =17mΩ(Typ.)@V_{GS}=10V
- Low $R_{DS\ (ON)}$
- Planar Technology
- Reliable and Rugged
- 100% Avalanche Tested

Pin Description



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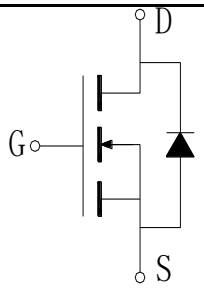


Single N-Channel MOSFET

Applications

- DC-DC Converters and Off-line UPS
- Power Management in Inverter System

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		200	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	125	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	500	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	125	A
		T_C=100°C	88	
P_D	Maximum Power Dissipation	T_C=25°C	652	W
		T_C=100°C	326	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.23	°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		1681	mJ

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

Symbol	Parameter	Test Condition	KSC2002PAP			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	200			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=200V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2	3	4	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		17	22	mΩ
		V_{GS}=6V, I_{DS}=20A		19	26	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		121		ns
Q_{rr}	Reverse Recovery Charge			370		nC
Dynamic Characteristics ⑥						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=100V, Frequency=1.0MHz		5735		pF
C_{oss}	Output Capacitance			940		
C_{rss}	Reverse Transfer Capacitance			495		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=100V, I_{DS}=40A, V_{GEN}=10V,R_G=6Ω		38		ns
t_r	Turn-on Rise Time			41		
$t_{d(OFF)}$	Turn-off Delay Time			92		
t_f	Turn-off Fall Time			30		
Gate Charge Characteristics ⑥						
Q_g	Total Gate Charge	V_{DS}=100V, V_{GS}=10V, I_{DS}=40A		340		nC
Q_{gs}	Gate-Source Charge			49		
Q_{gd}	Gate-Drain Charge			134		

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.

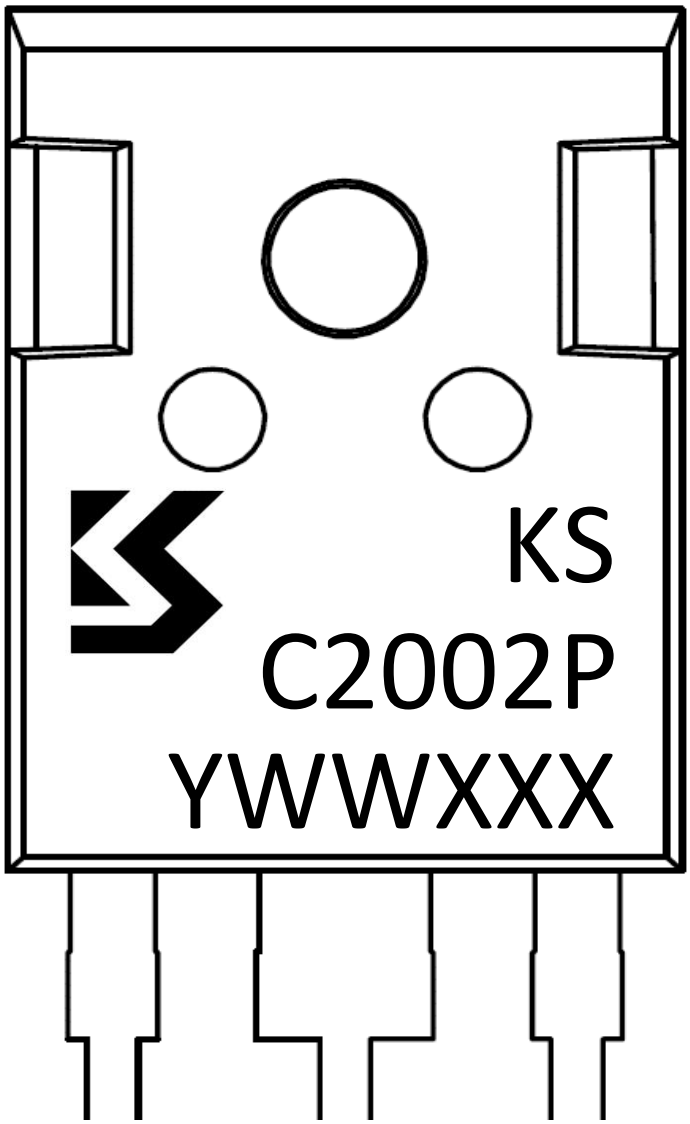
④Limited by T_{Jmax}, I_{AS} =82A, L=0.5mH, V_{DD} = 48V, R_G = 25Ω , Starting TJ = 25°C,100% tested and guaranteed.

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

⑥Guaranteed by design, not subject to production testing.

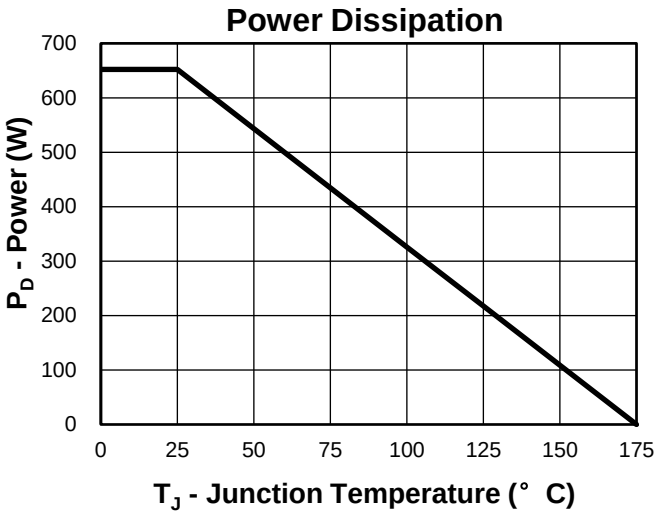
Ordering and Marking Information

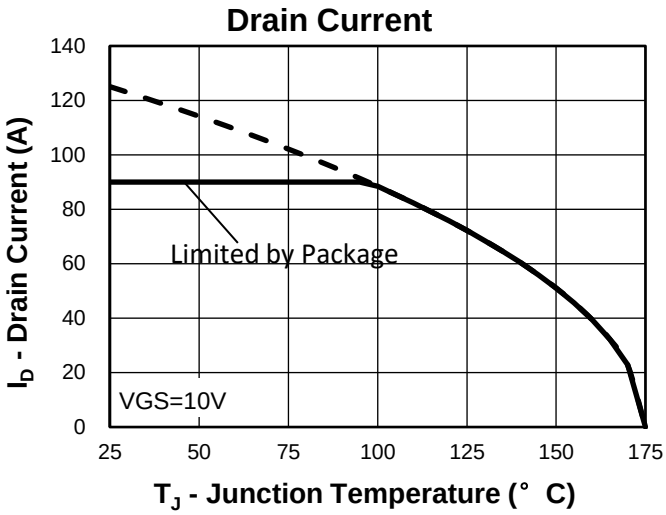
Device	Package	Packaging	Quantity	Reel Size	Tape width
KSC2002PAP	TO-247	Tube	30	-	-

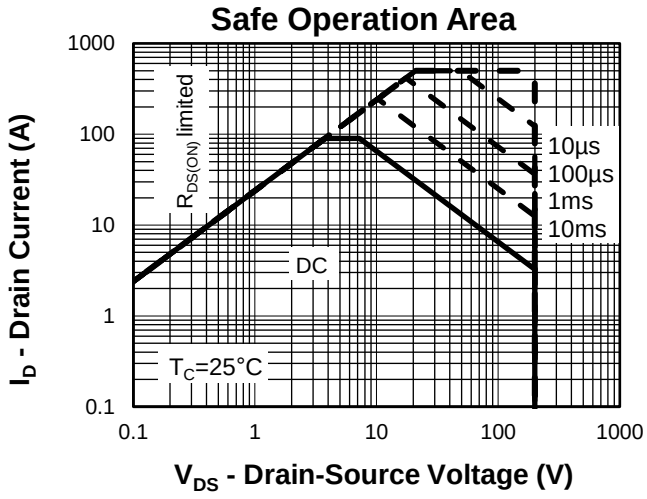


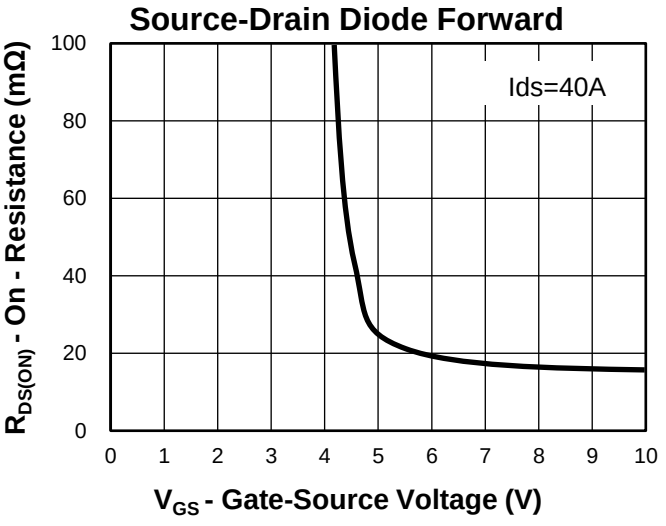
1st Line: Kwansemi LOGO，Kwansemi Code(KS)
2nd Line: Part Number(C2002P)
3rd Line: Lot Number(YWWXXX)

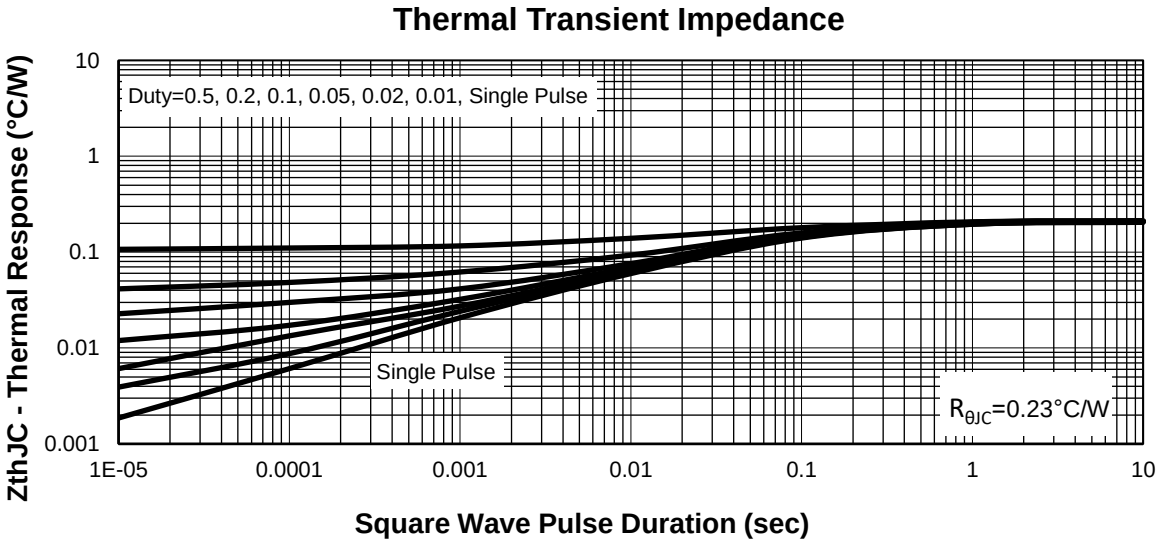
Typical Characteristics











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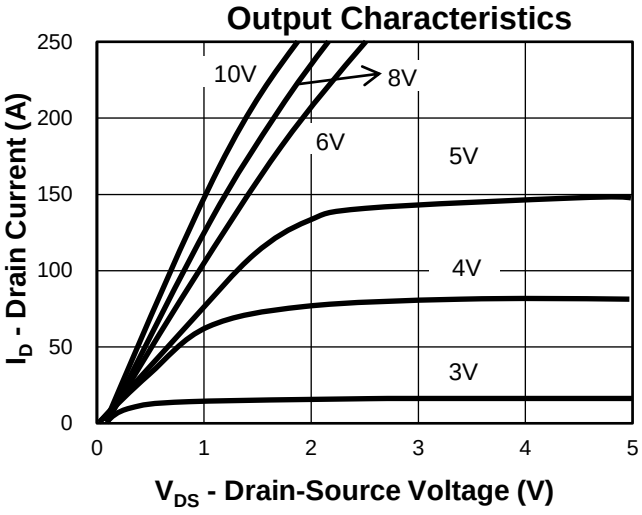

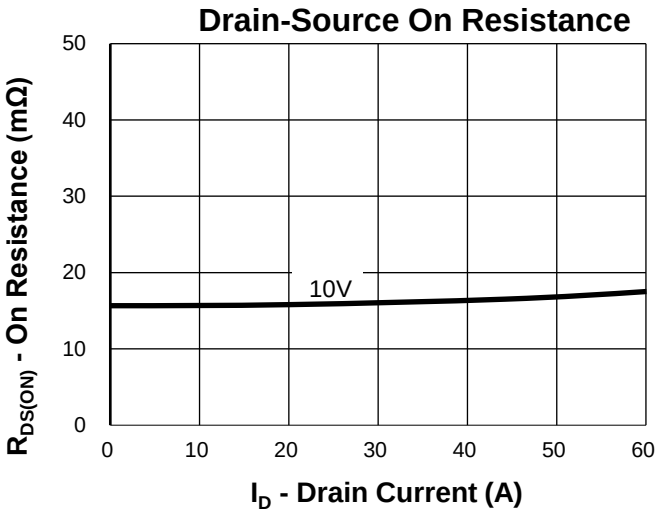

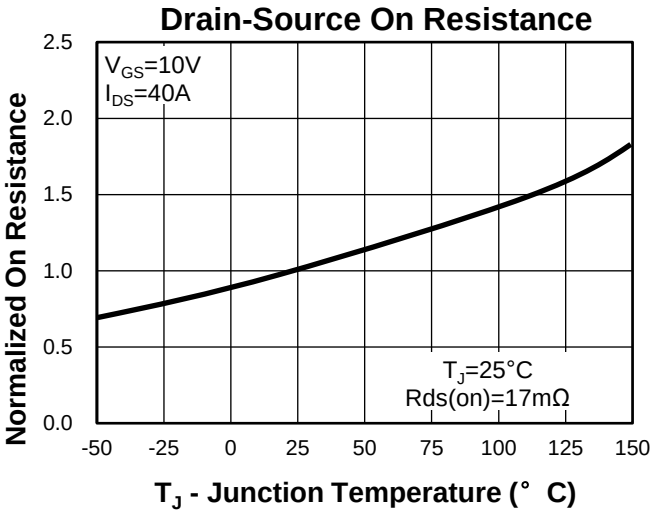

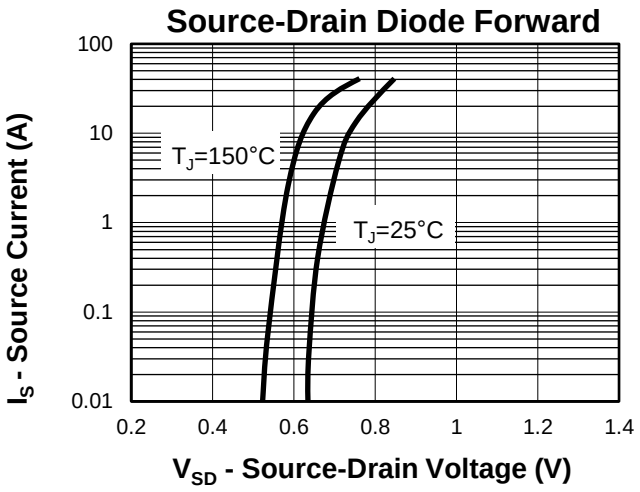

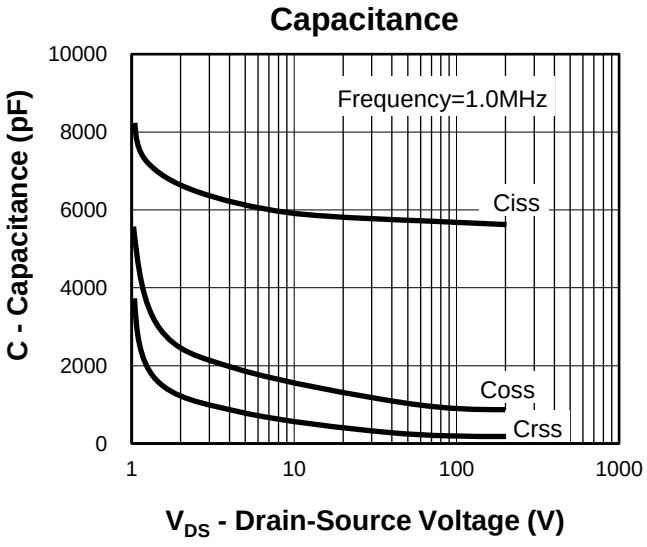

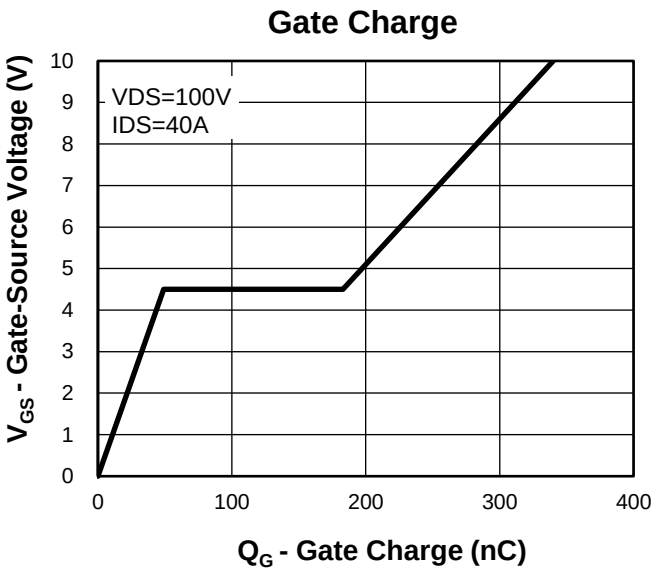

Package Information

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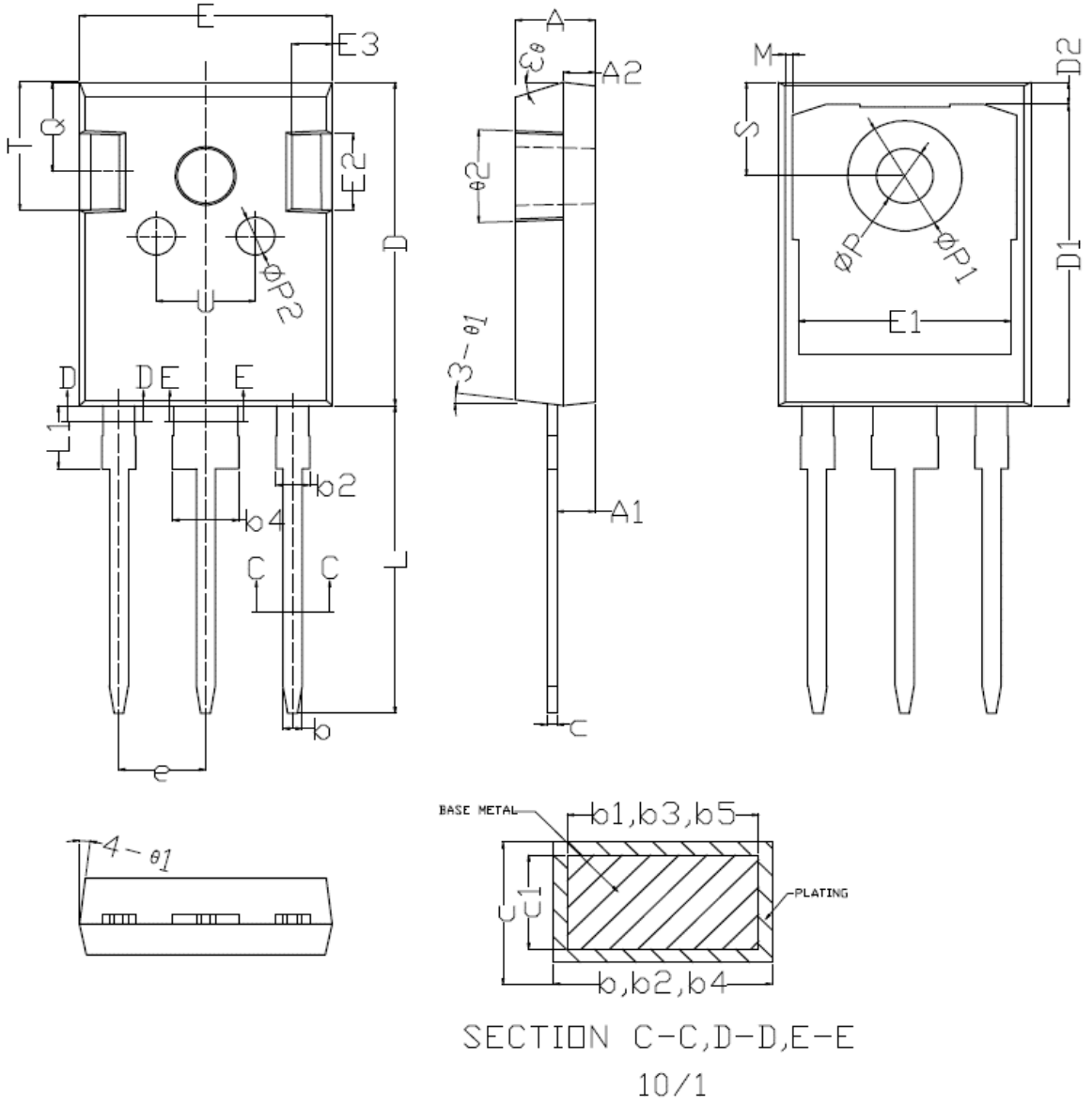
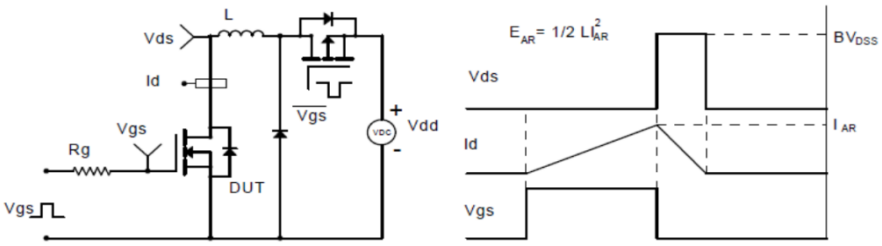


SECTION C-C,D-D,E-E

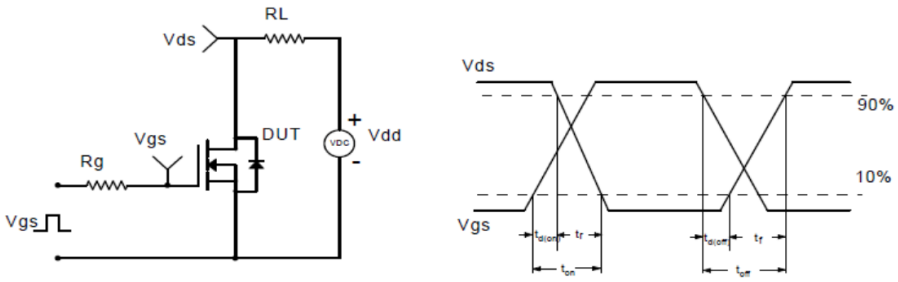
10/1

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	E2	4.90	5.00	5.10	0.193	0.197	0.201
A1	2.31	2.41	2.51	0.091	0.095	0.099	E3	2.40	2.50	2.60	0.094	0.098	0.102
A2	1.90	2.00	2.10	0.075	0.079	0.083	e	5.44 BSC			0.21 BSC		
b	1.16	1.21	1.26	0.046	0.048	0.050	L	19.80	19.92	20.10	0.780	0.784	0.791
b1	1.15	1.20	1.25	0.045	0.047	0.049	L1	*	*	4.30	*	*	0.169
b2	1.95	2.10	2.15	0.077	0.083	0.085	M	0.35	0.50	0.75	0.014	0.020	0.030
b3	1.94	2.09	2.14	0.076	0.082	0.084	Φp	3.50	3.60	3.70	0.138	0.142	0.146
b4	3.10	3.15	3.20	0.122	0.124	0.126	Φp1	7.00	7.20	7.40	0.276	0.283	0.291
b5	3.09	3.14	3.19	0.122	0.124	0.126	Φp2	2.40	2.50	2.60	0.094	0.098	0.102
c	0.59	0.61	0.66	0.023	0.024	0.026	Q	5.60	5.80	6.00	0.220	0.228	0.236
c1	0.58	0.60	0.65	0.023	0.024	0.026	S	6.05	6.15	6.25	0.238	0.242	0.246
D	20.90	21.00	21.10	0.823	0.827	0.831	T	9.80	10.00	10.20	0.386	0.394	0.402
D1	16.25	16.55	16.85	0.640	0.652	0.663	U	6.00	6.20	6.40	0.236	0.244	0.252
D2	1.05	1.20	1.35	0.041	0.047	0.053	θ1	5°	7°	9°	5°	7°	9°
E	15.70	15.80	15.90	0.618	0.622	0.626	θ2	3°	5°	8°	3°	5°	8°
E1	13.10	13.30	13.50	0.516	0.524	0.531	θ3	13°	16°	19°	13°	16°	19°

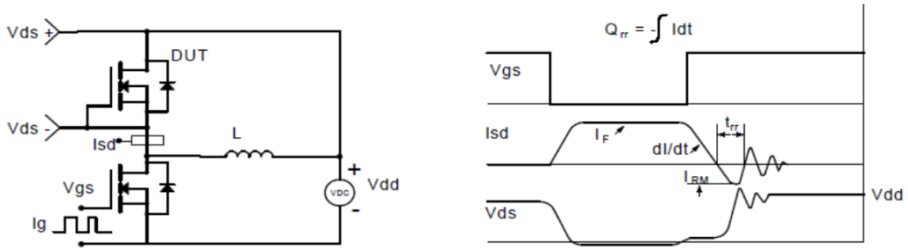
Avalanche Test Circuit and Waveforms



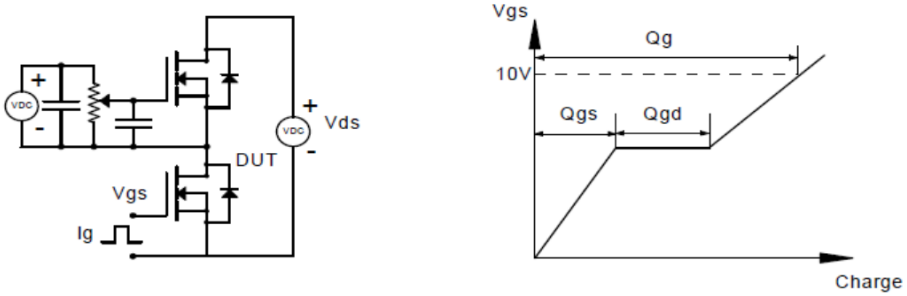
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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