

Features

- 500V/50A,
 $R_{DS(ON)} = 85m\Omega(Typ.)@V_{GS}=10V$
- Planar Technology
- High Ruggedness
- 100% Avalanche Tested
- 100% Rg Tested

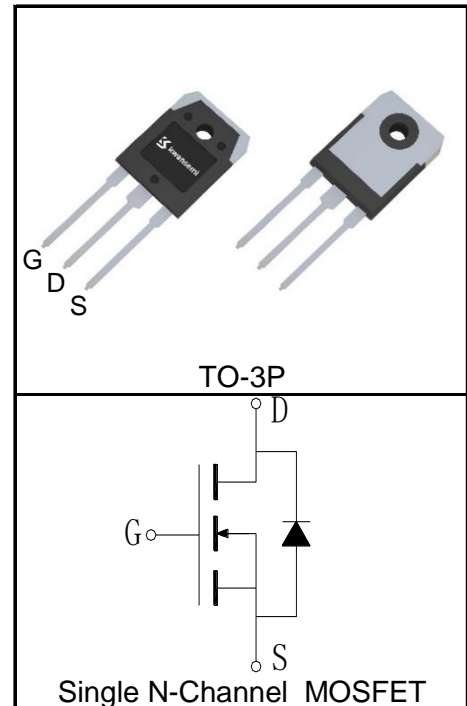
Applications

- Motor Control
- Inverter



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	500	V
V_{GSS}	Gate-Source Voltage	± 30	
T_{Jmax}	Maximum Junction Temperature	150	$^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 50	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$ 200	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$ 50	A
		$T_C=100^\circ\text{C}$ 31	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 694	W
		$T_C=100^\circ\text{C}$ 277	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.18	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	1296	mJ

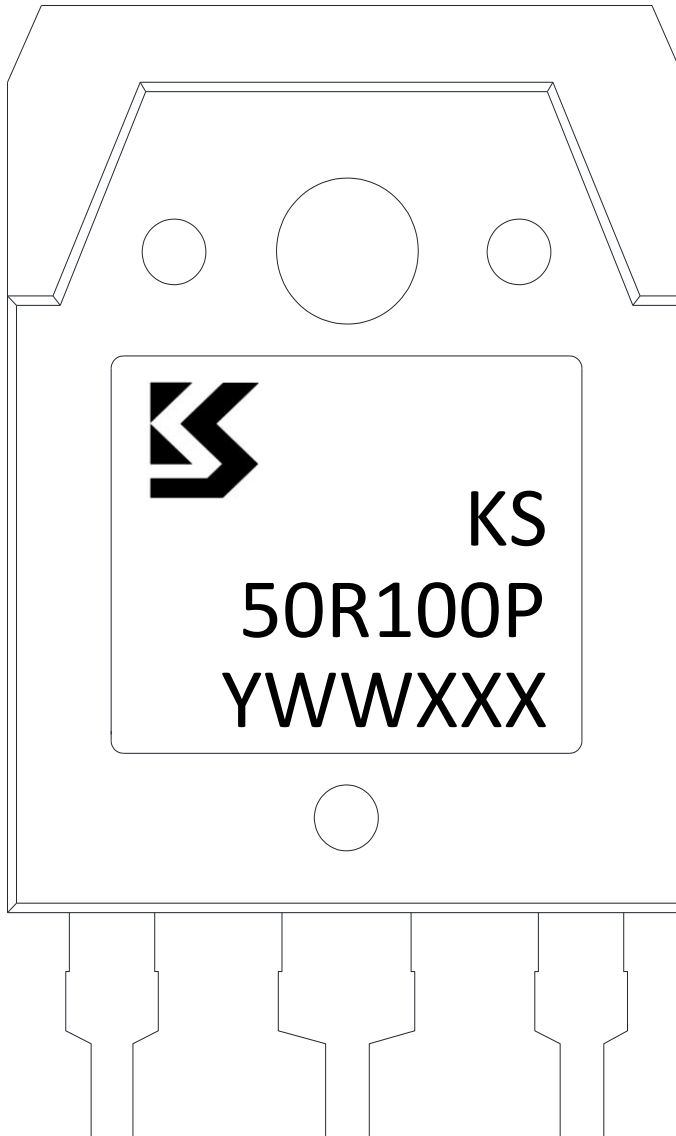
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS50R100QAP			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	500			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=500V, V_{GS}=0V$			1	μA
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$		85	100	$m\Omega$
		$V_{GS}=6V, I_{DS}=10A$		90	115	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.79	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, di_{SD}/dt=100A/\mu s$		524		ns
Q_{rr}	Reverse Recovery Charge			9		μC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.5		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=250V,$ Frequency=200KHz		8285		pF
C_{oss}	Output Capacitance			215		
C_{rss}	Reverse Transfer Capacitance			15		
$t_{d(ON)}$	Turn-on Delay Time			47		
t_r	Turn-on Rise Time	$V_{DD}=250V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=6\Omega$		86		
$t_{d(OFF)}$	Turn-off Delay Time			138		
t_f	Turn-off Fall Time			63		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=250V, V_{GS}=10V,$ $I_{DS}=20A$		138		nC
Q_{gs}	Gate-Source Charge			29		
Q_{gd}	Gate-Drain Charge			30		

- 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 $T_J = 25^\circ\text{C}$, $I_{ASmax} = 72A$, $L = 0.5\text{mH}$, $V_{DD} = 60V$, $R_G = 25\Omega$, $V_{GS} = 10V$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 50A$, $L = 0.5\text{mH}$.
 - 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
KS50R100QAP	TO-3P	Tube	30	-	-

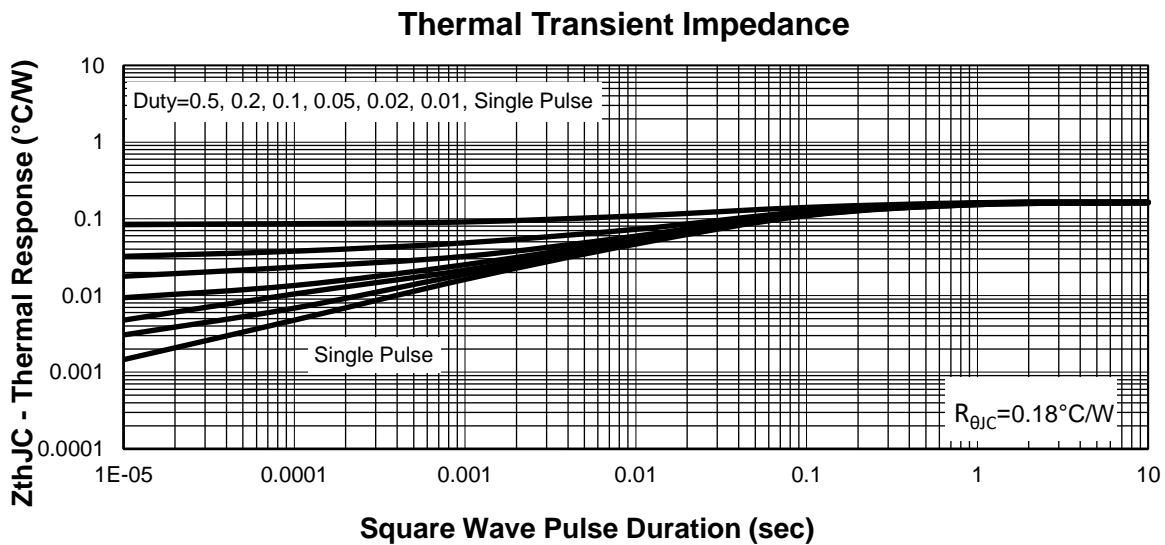
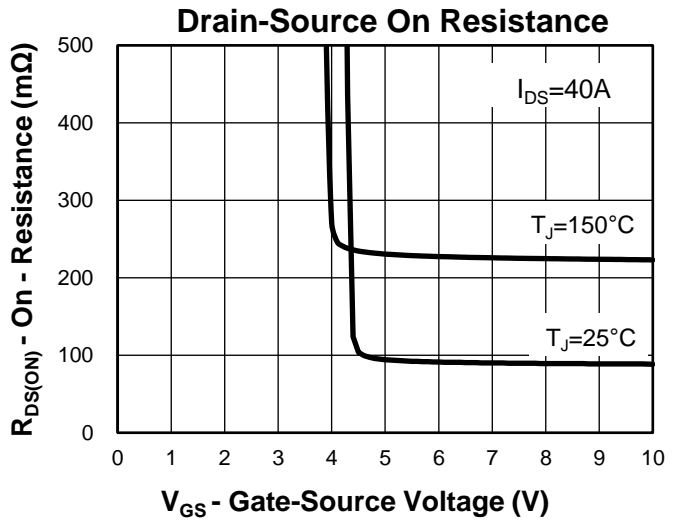
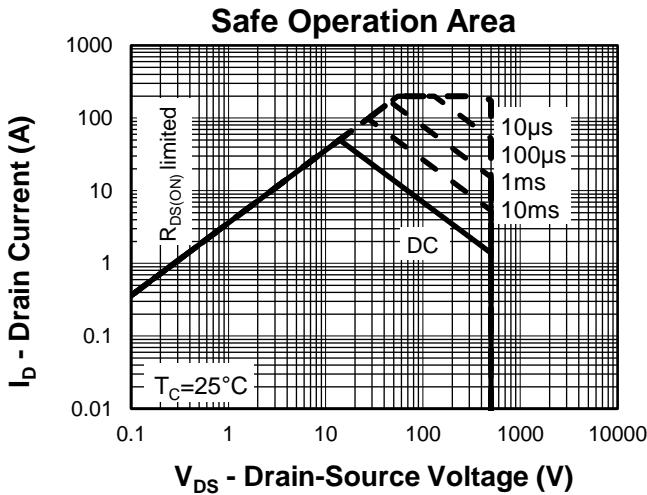
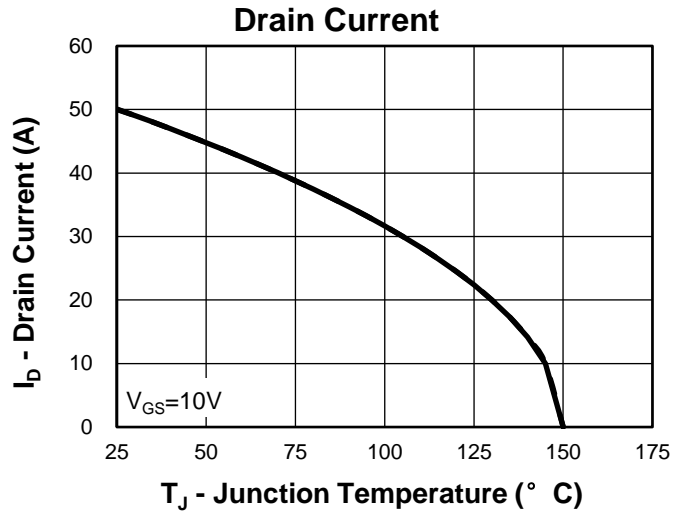
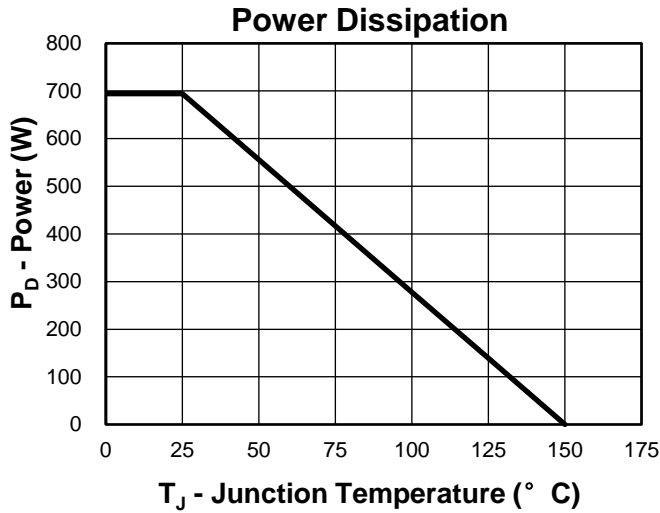


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

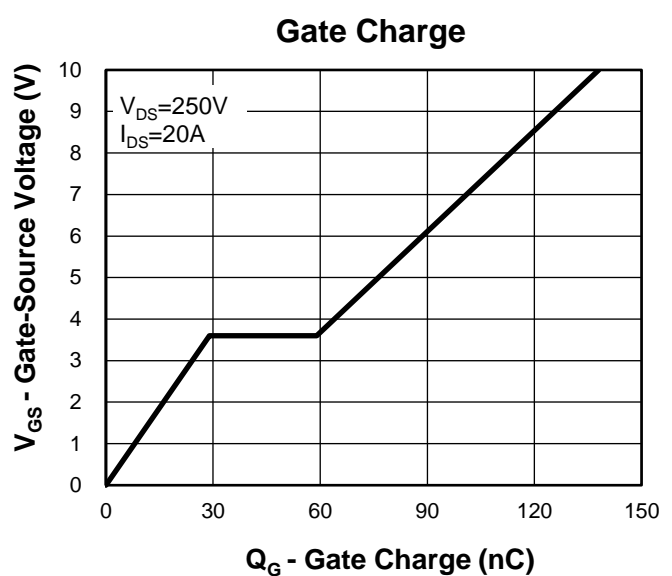
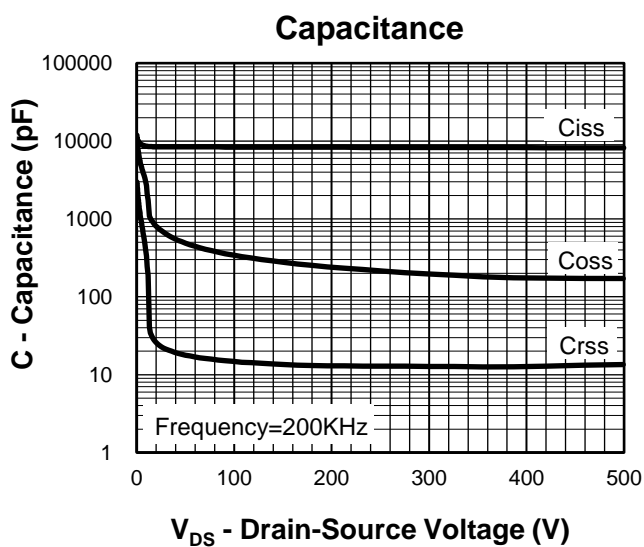
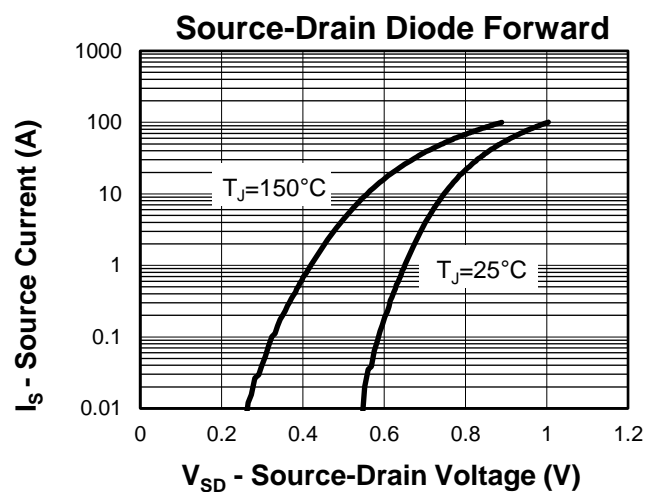
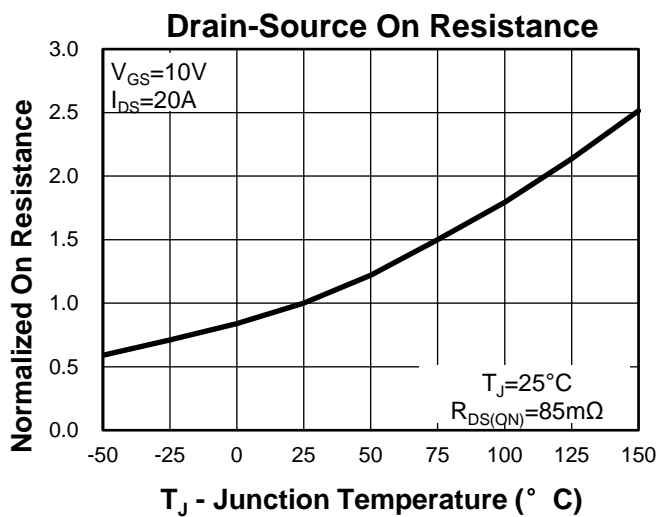
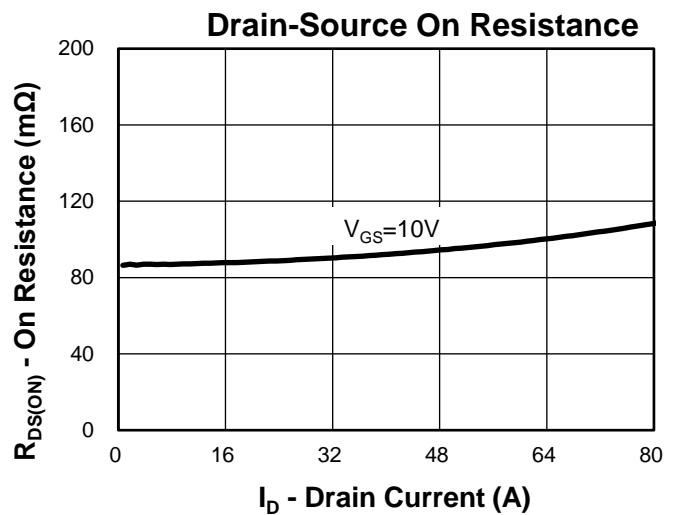
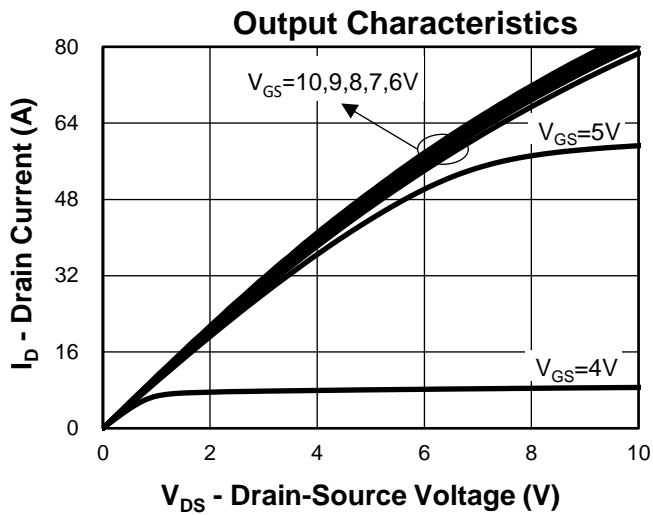
2nd Line: Part Number(50R100P)

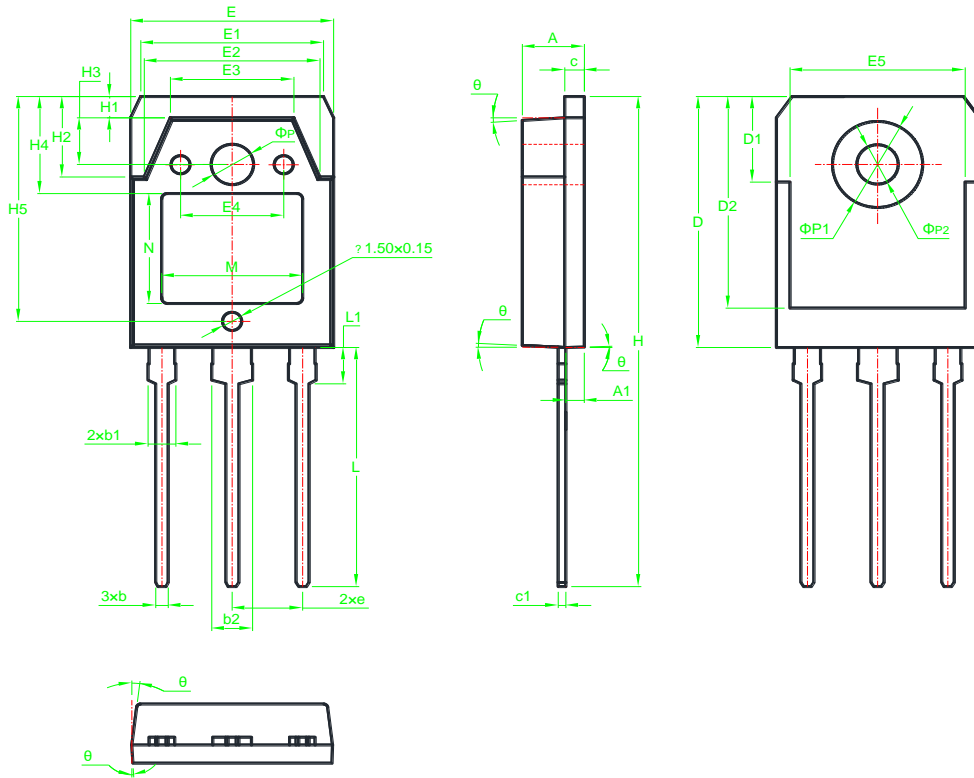
3rd Line: Lot Number(YWWXXX)

Typical Characteristics



Typical Characteristics

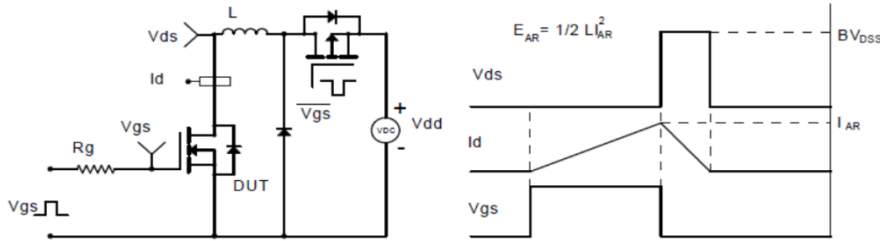


Package Information
TO-3P


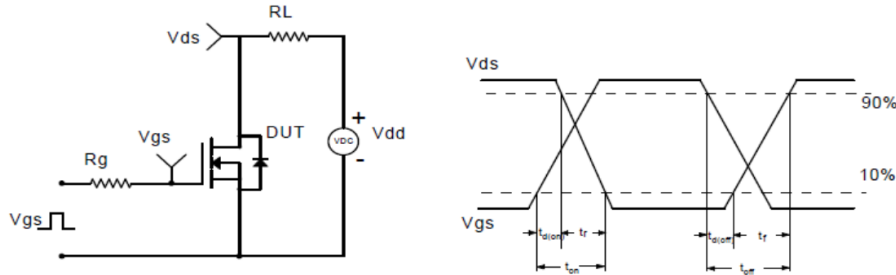
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.65	4.80	4.95	0.183	0.189	0.195	H	39.80	40.00	40.20	1.567	1.575	1.583
A1	1.40	1.50	1.60	0.055	0.059	0.063	H1	0.90	1.10	1.30	0.035	0.043	0.051
b	0.80	1.00	1.20	0.031	0.039	0.047	H2	5.80	6.00	6.20	0.228	0.236	0.244
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	$\varnothing P$	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	$\varnothing P1$	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	$\varnothing P2$	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.

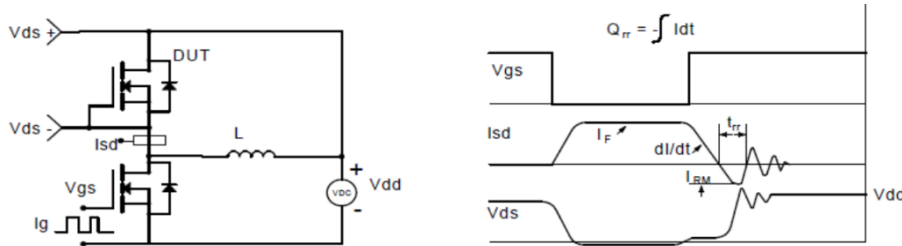
Avalanche Test Circuit and Waveforms



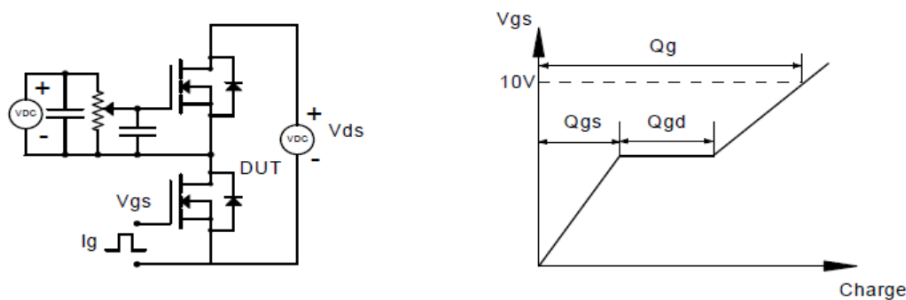
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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