

## Features

- 100V/118A,  
 $R_{DS(ON)} = 11m\Omega(Typ.)@V_{GS}=10V$
- Planar Technology
- High Ruggedness
- Enhanced FBSOA for superior linear mode operation
- 100% Avalanche Tested
- 100% Rg Tested

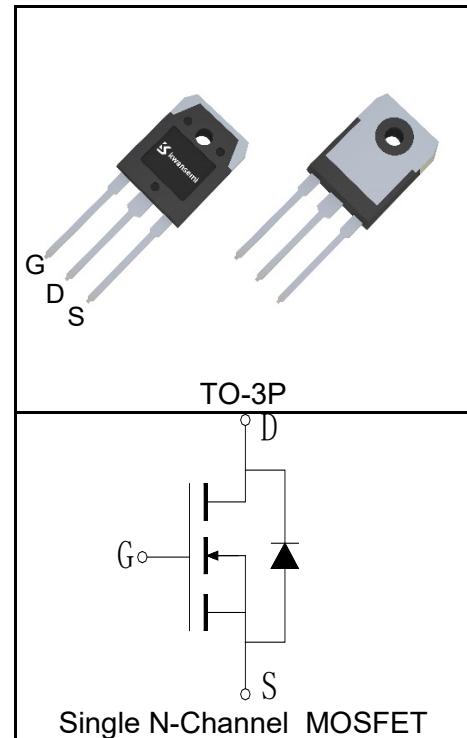
## Applications

- Motor Control
- Inverter



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	100	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	
$T_{Jmax}$	Maximum Junction Temperature	175	$^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 118	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$ 472	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$ 118	A
		$T_C=100^\circ\text{C}$ 84	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 468	W
		$T_C=100^\circ\text{C}$ 234	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.32	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	2209	mJ

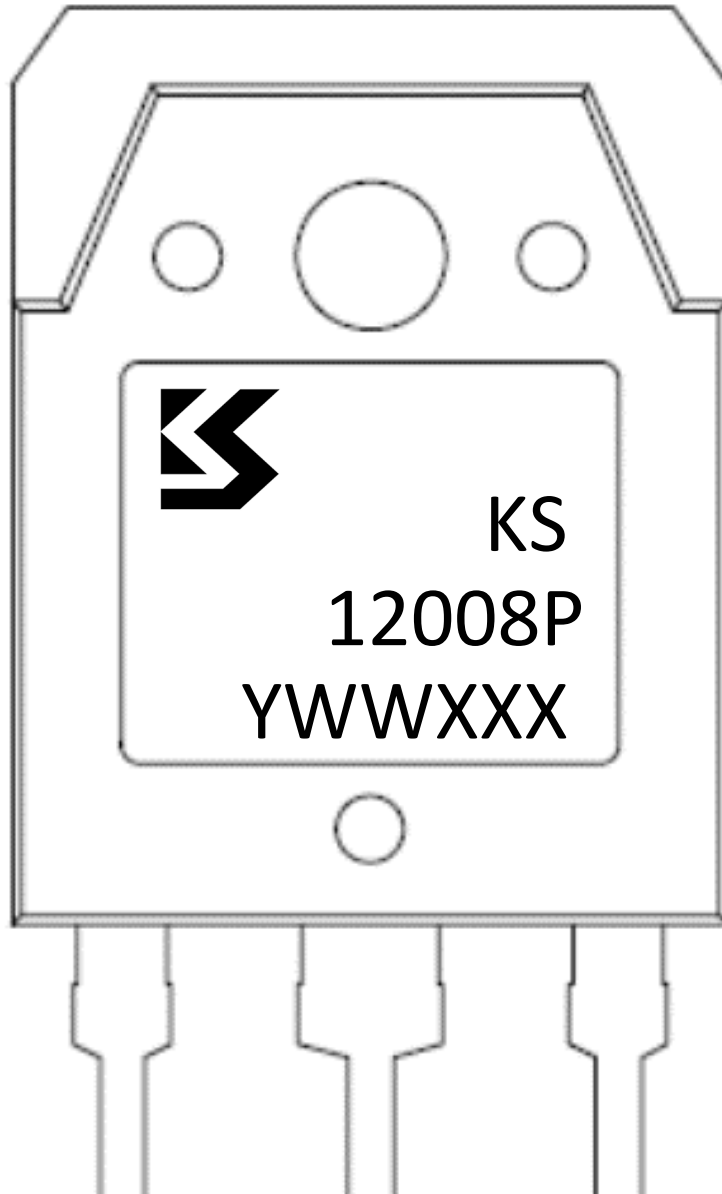
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS12008QAP			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ C$			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	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(on)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		11	13.5	$m\Omega$
		$V_{GS}=6V, I_{DS}=20A$		14	18.5	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.85	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, di_{SD}/dt=100A/\mu s$		124		ns
$Q_{rr}$	Reverse Recovery Charge			365		nC
<b>Dynamic Characteristics</b> <sup>(6)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		0.9		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=50V, \text{Frequency}=1.0MHz$		3675		pF
$C_{oss}$	Output Capacitance			670		
$C_{riss}$	Reverse Transfer Capacitance			415		
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, I_{DS}=40A, V_{GEN}=10V, R_G=6\Omega$		25		ns
$t_r$	Turn-on Rise Time			71		
$t_{d(off)}$	Turn-off Delay Time			110		
$t_f$	Turn-off Fall Time			38		
<b>Gate Charge Characteristics</b> <sup>(6)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_{DS}=40A$		240		nC
$Q_{gs}$	Gate-Source Charge			17		
$Q_{gd}$	Gate-Drain Charge			135		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 90A.
  - 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  $T_J = 25^\circ C$ ,  $I_{ASmax} = 94A$ ,  $L = 0.5mH$ ,  $V_{DD} = 50V$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 10V$ . Part not recommended for use above this value. 100% Final Test at  $I_{AS} = 67A$ ,  $L = 0.5mH$ .
  - 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
KS12008QAP	TO-3P	Tube	30	-	-

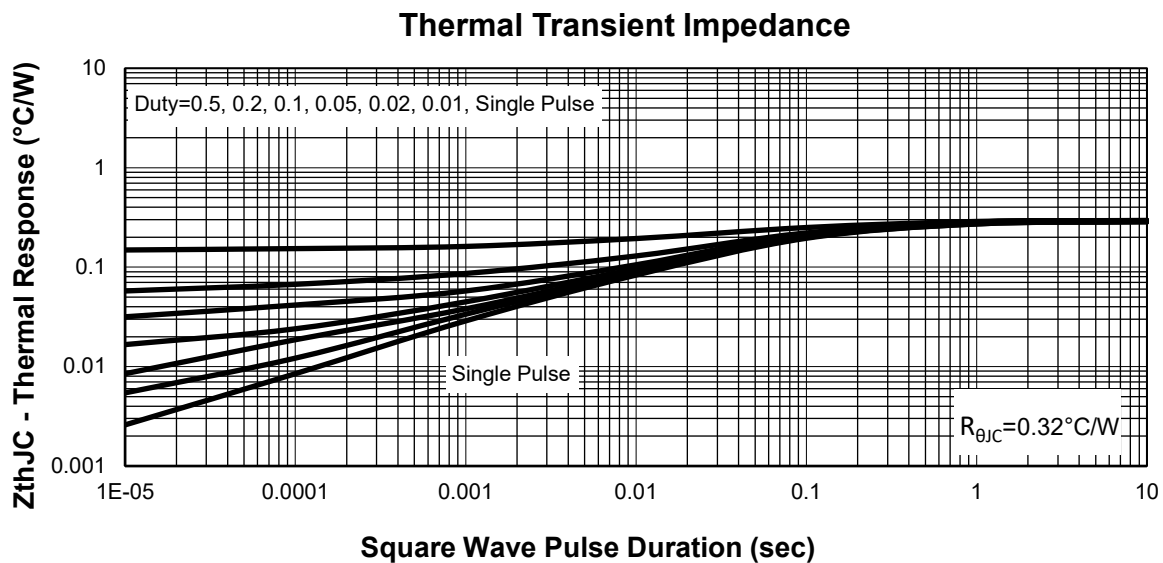
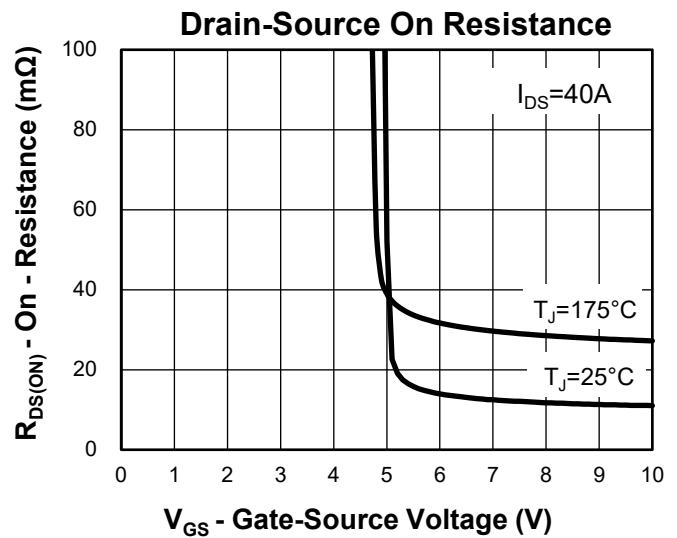
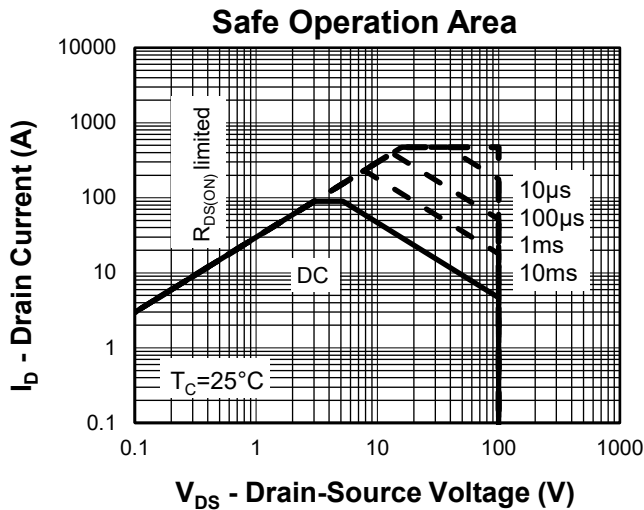
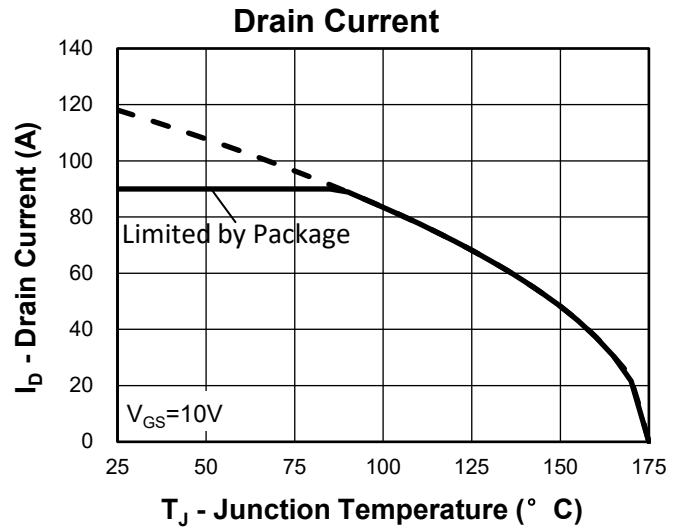
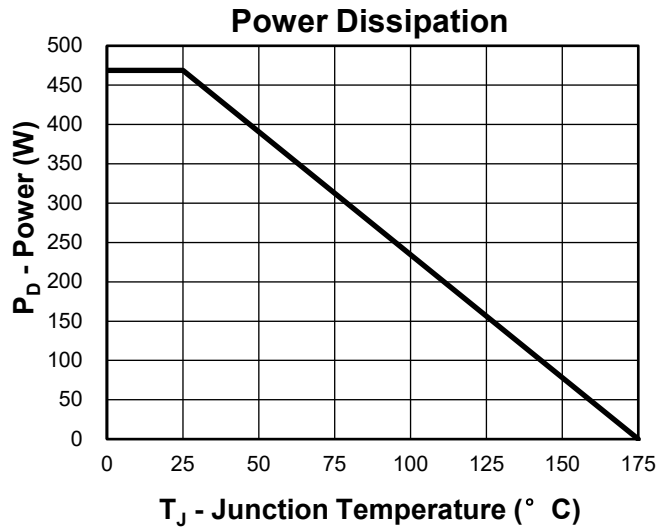


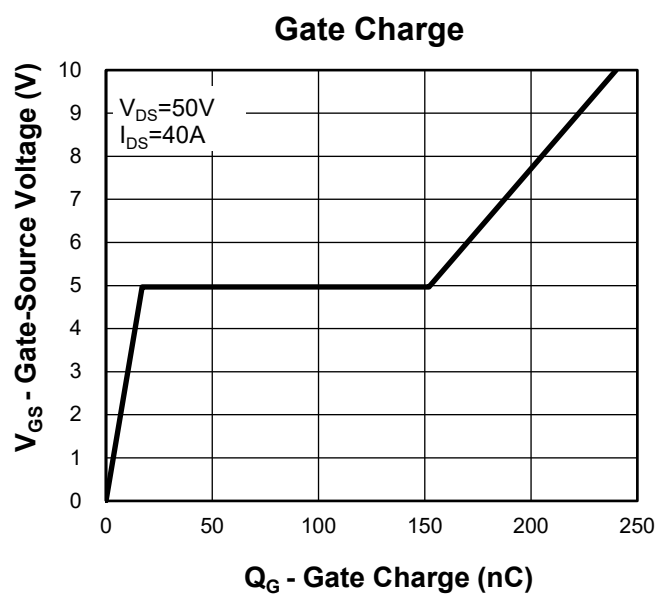
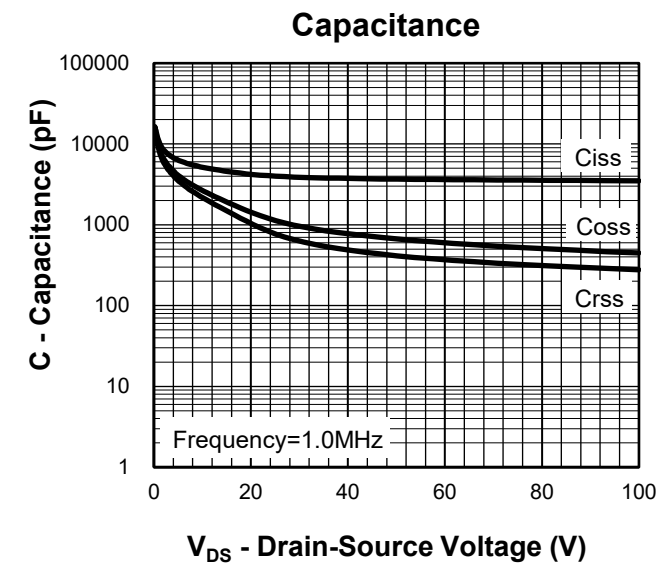
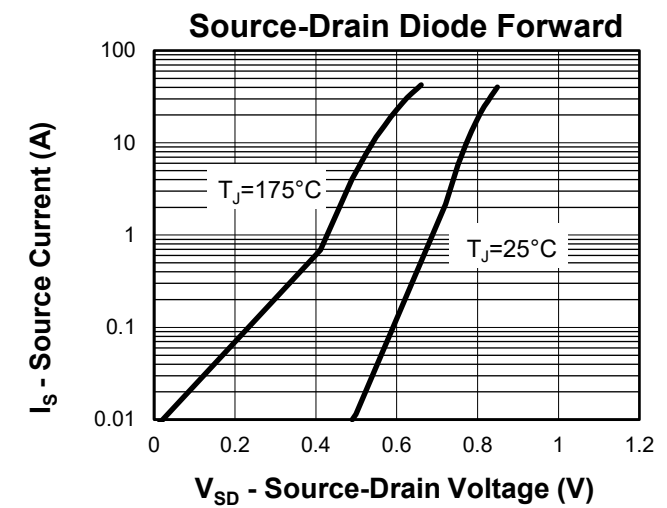
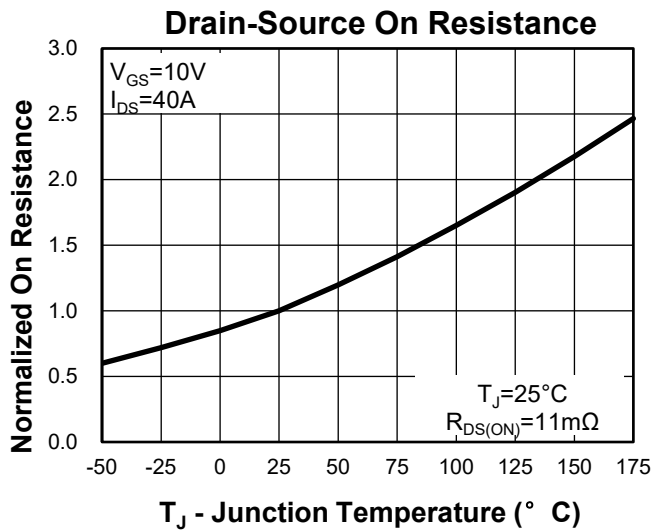
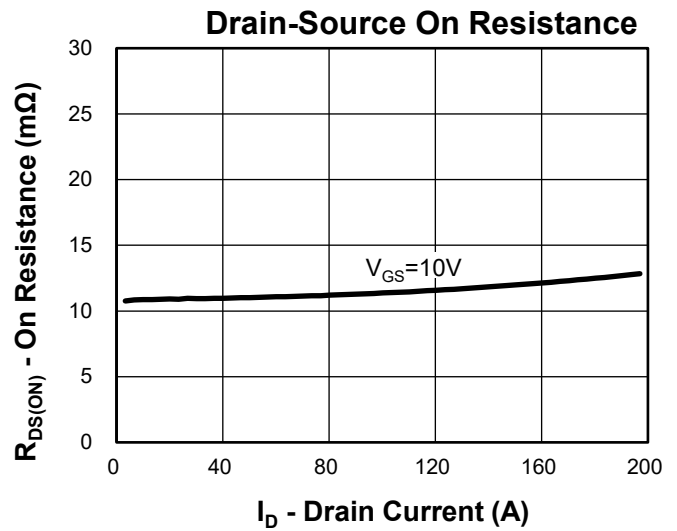
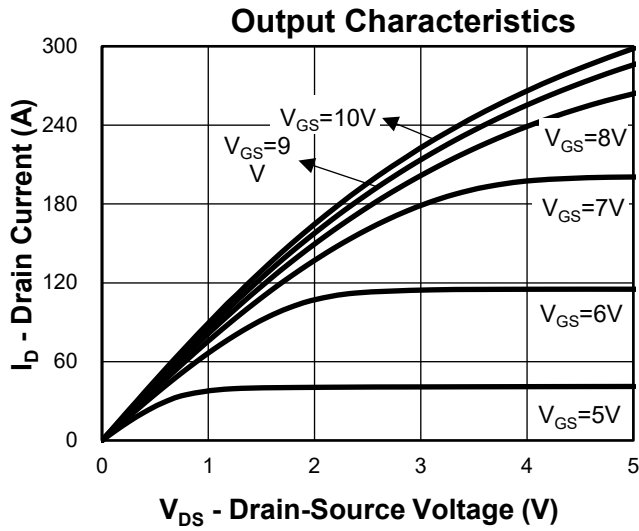
1st Line: Kwansemi LOGO, Kwansemi Code(KS)

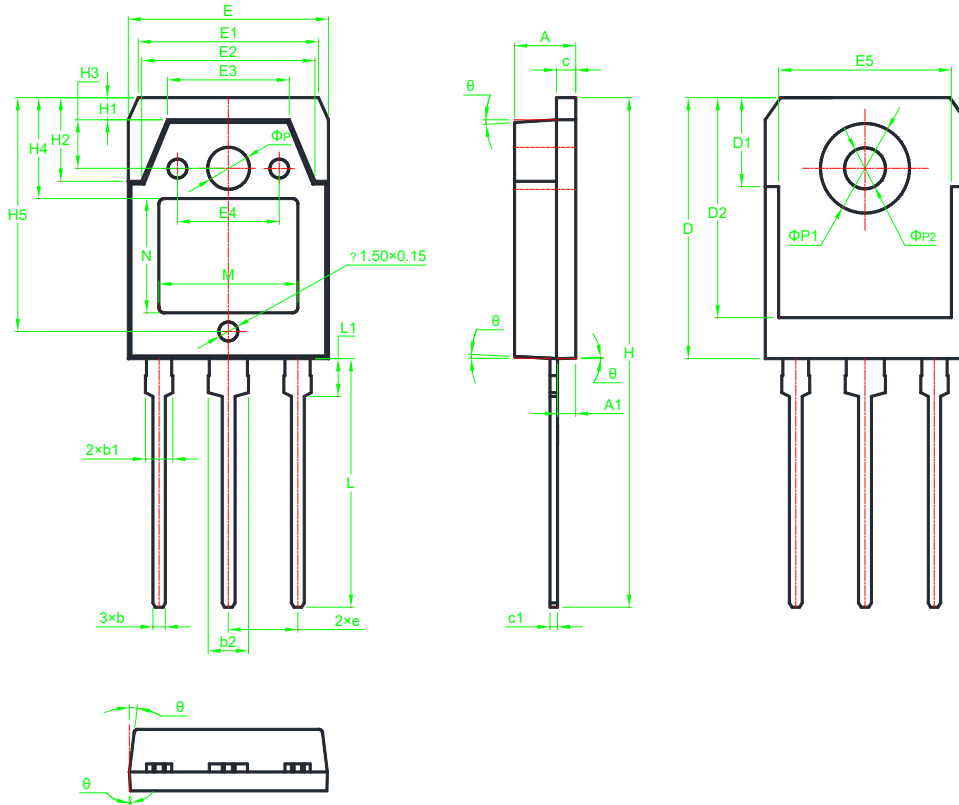
2nd Line: Part Number(12008P)

3rd Line: Lot Number(YWWXXX)

## Typical Characteristics



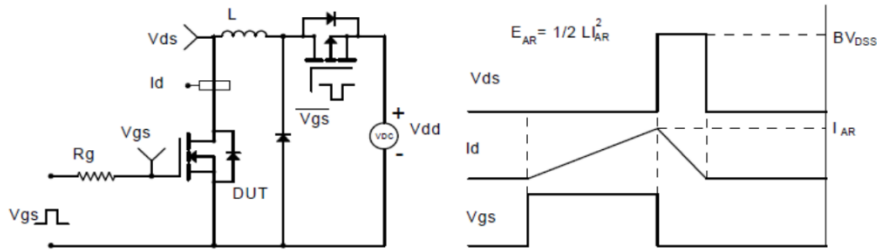
**Typical Characteristics**


**Package Information**
**TO-3P**


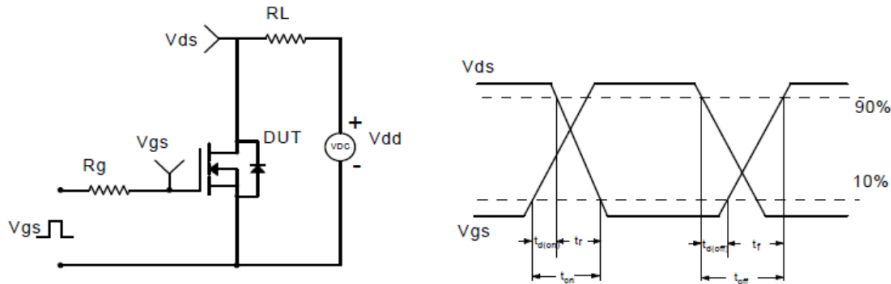
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.65	4.80	4.95	0.183	0.189	0.195	H	39.80	40.00	40.20	1.567	1.575	1.583
A1	1.40	1.50	1.60	0.055	0.059	0.063	H1	0.90	1.10	1.30	0.035	0.043	0.051
b	0.80	1.00	1.20	0.031	0.039	0.047	H2	5.80	6.00	6.20	0.228	0.236	0.244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

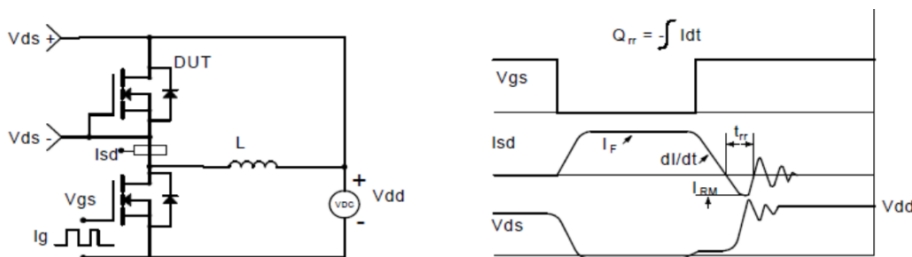
### Avalanche Test Circuit and Waveforms



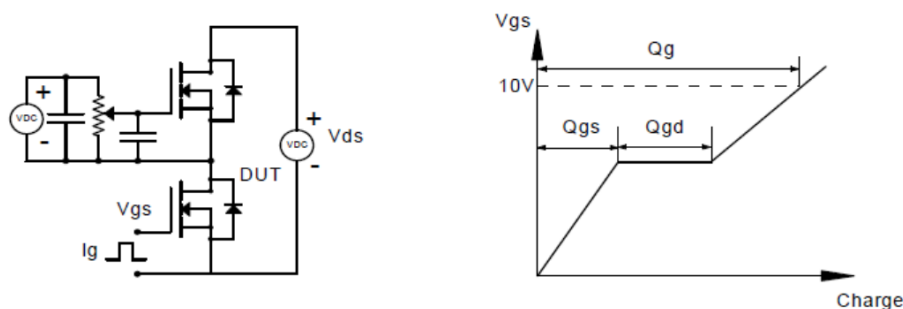
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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