

## Features

- 200V/14A,  
 $R_{DS(ON)} = 145m\Omega(Typ.)@V_{GS}=10V$
- Low  $R_{DS(ON)}$
- Planar Technology
- Reliable and Rugged
- 100% Avalanche Tested
- 100% Rg Tested

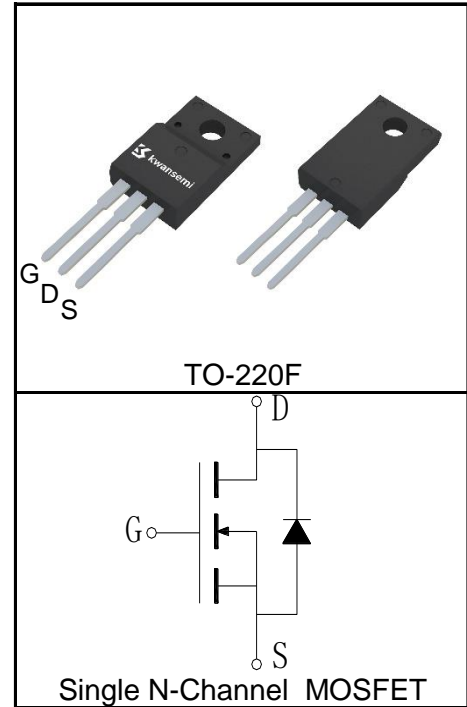
## Applications

- Inverter
- Motor Control



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	200	V
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	
$T_J$	Maximum Junction Temperature	175	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 14	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 56	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$ 14	A
		$T_C=100^\circ\text{C}$ 10	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 56	W
		$T_C=100^\circ\text{C}$ 28	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.7	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	90	mJ

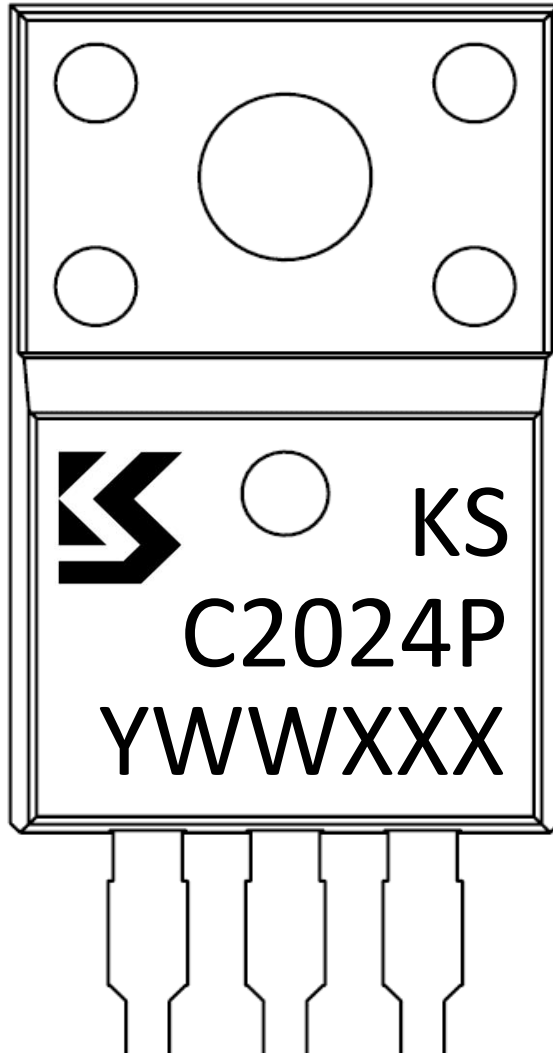
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KSC2024FAP			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	200			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ\text{C}$			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	$V_{GS}=\pm 30V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=9A$		145	180	$m\Omega$
		$V_{GS}=6V, I_{DS}=4A$		160	210	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=9A, V_{GS}=0V$		0.82	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=9A, di_{SD}/dt=100A/\mu s$		55		ns
$Q_{rr}$	Reverse Recovery Charge			131		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	0.5	1.3	2	$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=100V,$ Frequency=1.0MHz		2230		pF
$C_{oss}$	Output Capacitance			205		
$C_{rss}$	Reverse Transfer Capacitance			50		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=100V, I_{DS}=9A,$ $V_{GEN}=10V, R_G=3\Omega$		14		ns
$t_r$	Turn-on Rise Time			48		
$t_{d(OFF)}$	Turn-off Delay Time			89		
$t_f$	Turn-off Fall Time			30		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=100V, V_{GS}=10V,$ $I_{DS}=9A$		55		nC
$Q_{gs}$	Gate-Source Charge			17		
$Q_{gd}$	Gate-Drain Charge			16		

- 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  $T_{Jmax}, I_{AS} = 19A, L=0.5\text{mH}, V_{DD} = 48V, R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ , 100% tested and guaranteed.
  - 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
KSC2024FAP	TO-220F	Tube	50	-	-

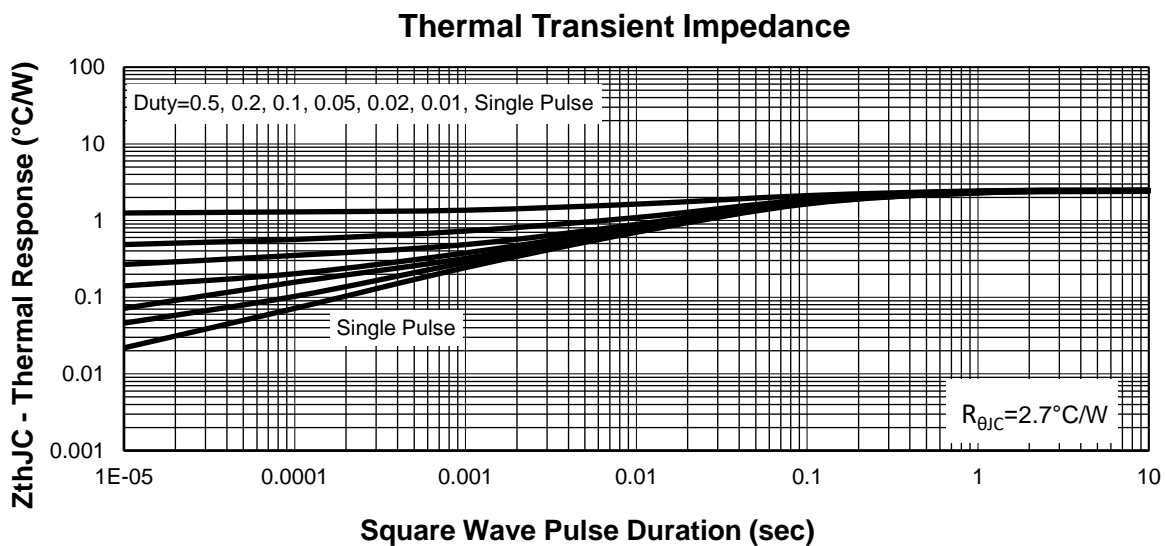
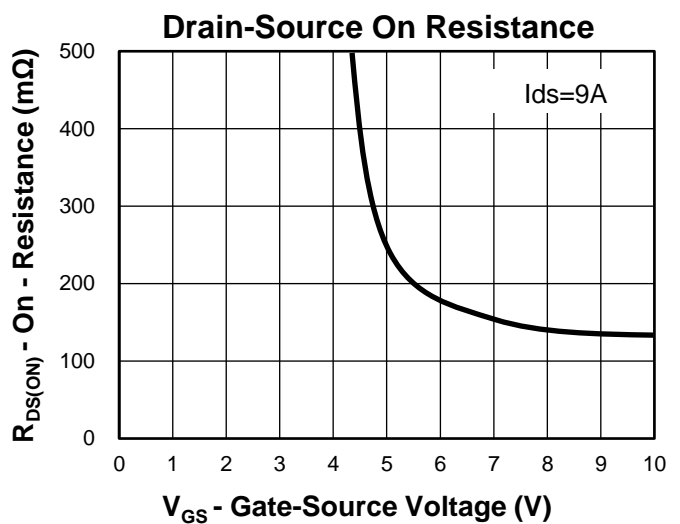
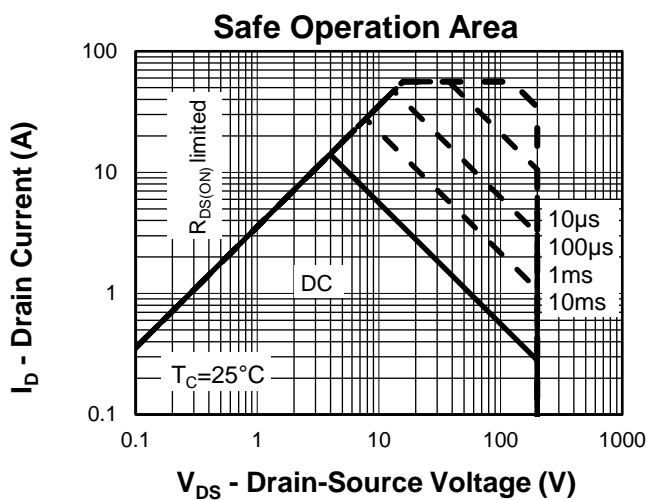
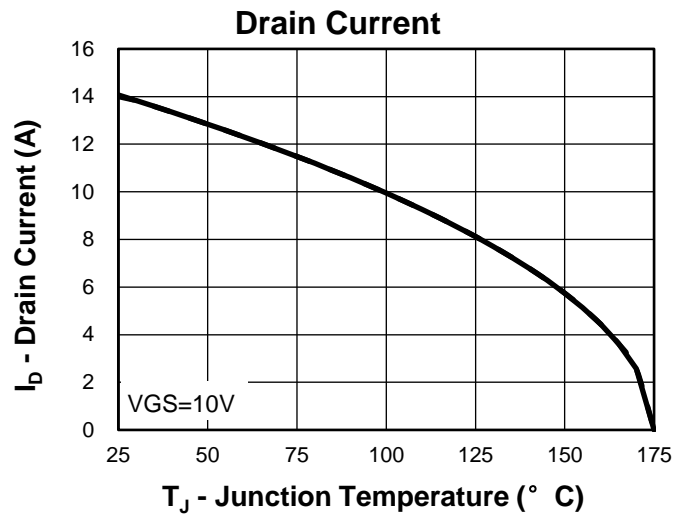
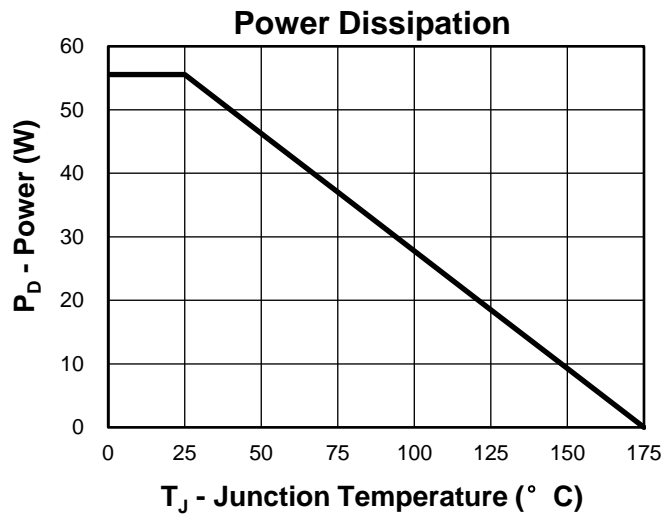


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

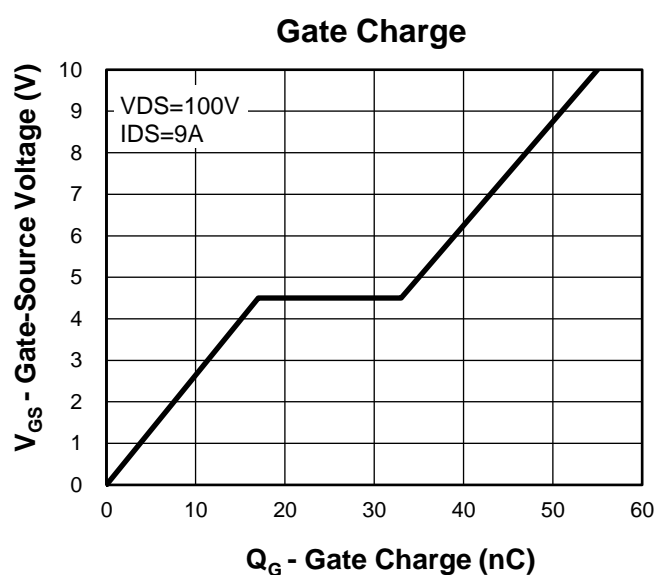
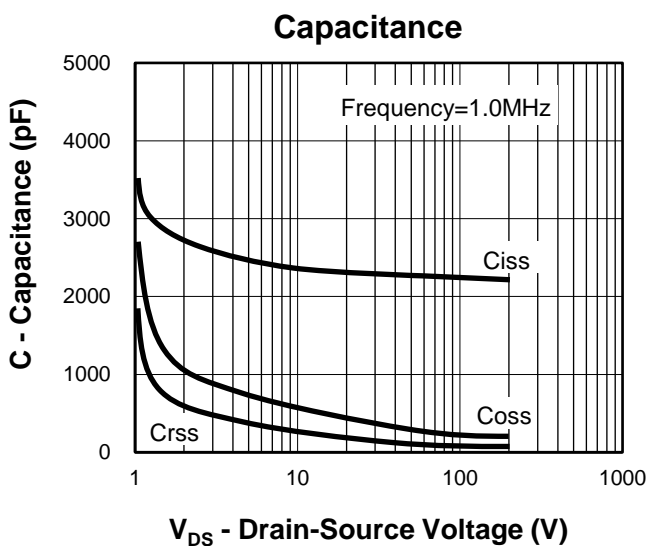
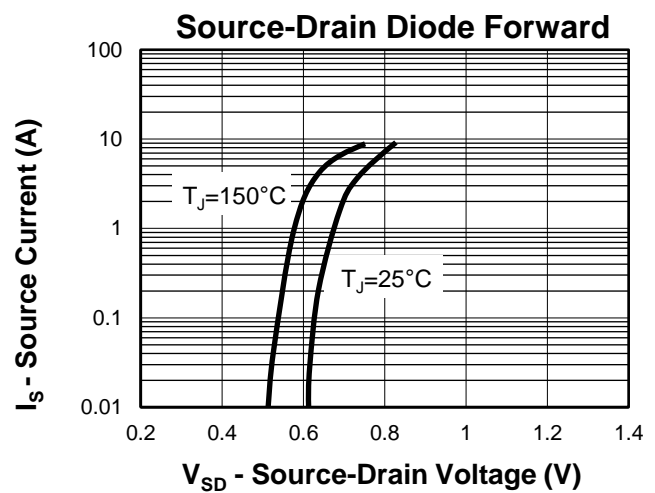
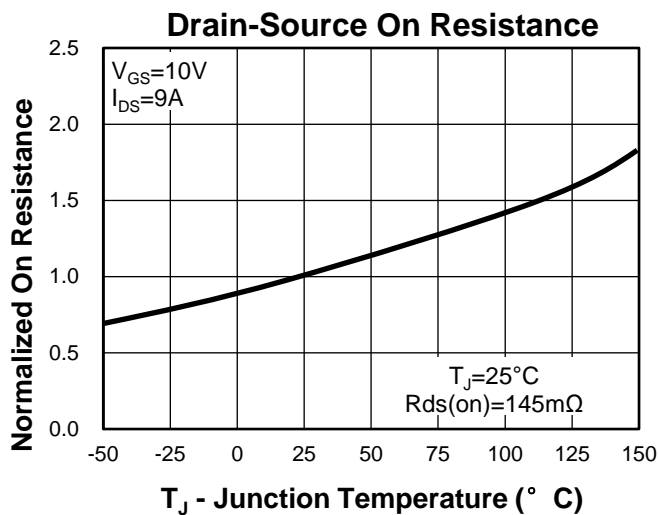
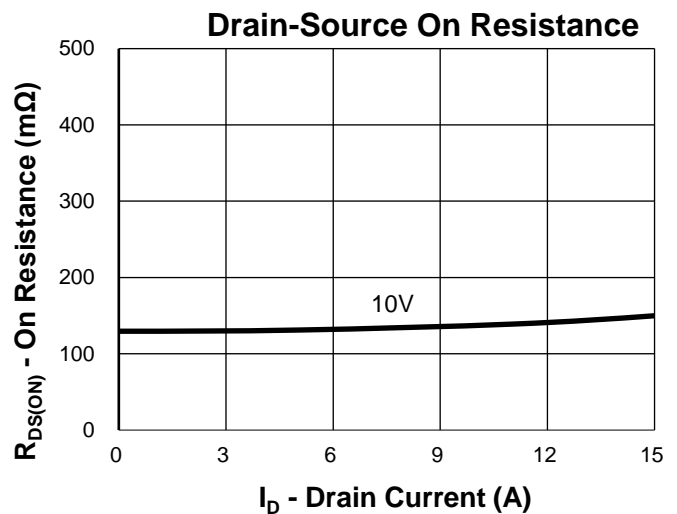
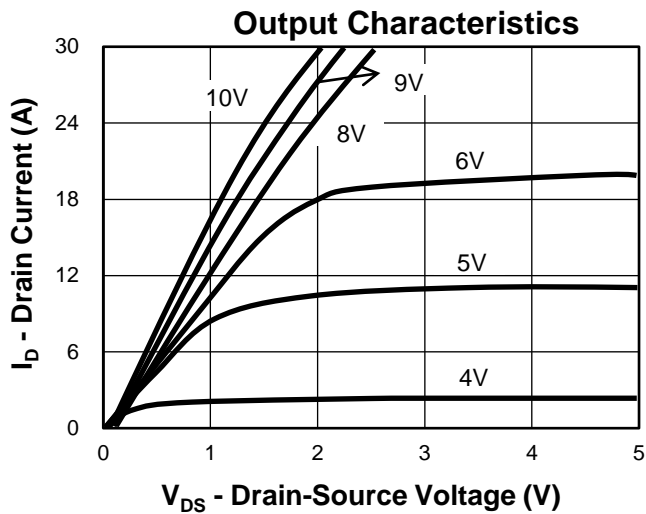
2nd Line: Part Number(C2024P)

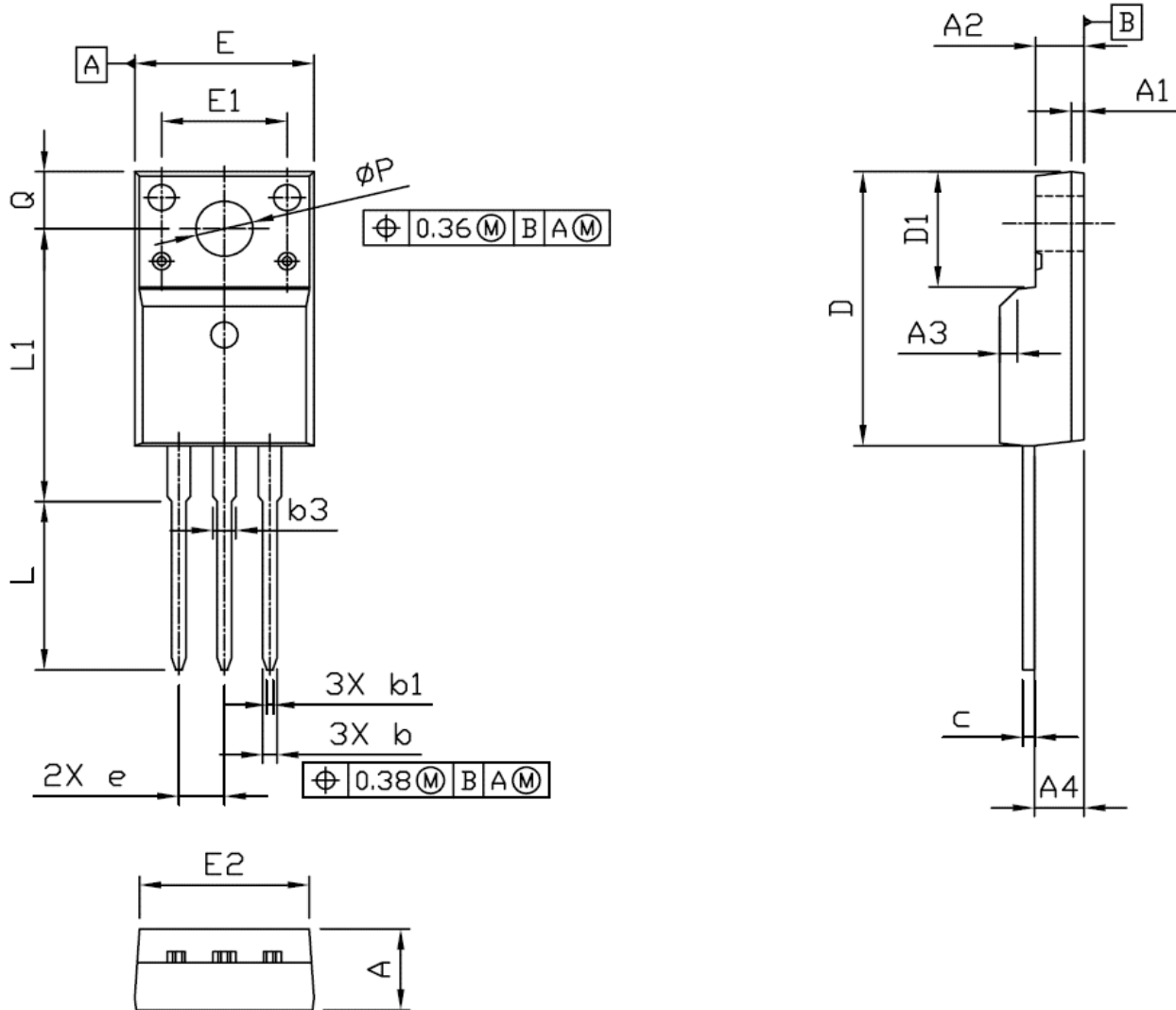
3rd Line: Lot Number(YWWXXX)

### Typical Characteristics



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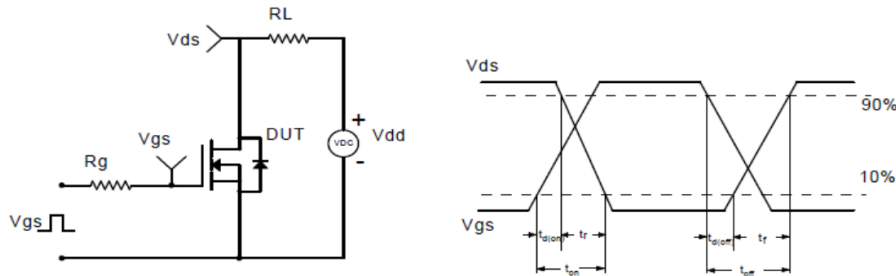
**Package Information**
**TO-220F**


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.50	4.70	4.90	0.177	0.185	0.193	D1	6.48	6.68	6.88	0.255	0.263	0.271
A1	*	0.70	*	*	0.028	*	E	9.96	10.16	10.36	0.392	0.400	0.408
A2	2.34	2.54	2.74	0.092	0.100	0.108	E1	*	7.00	*	*	0.276	*
A3	1X45°			1X45°			E2	9.26	9.46	9.66	0.365	0.372	0.380
A4	2.56	2.76	2.96	0.101	0.109	0.117	e	2.54 BSC			0.10 BSC		
b	0.70	0.80	0.90	0.028	0.031	0.035	L	9.55	9.75	9.95	0.376	0.384	0.392
b1	0.25	0.35	0.45	0.010	0.014	0.018	L1	15.60	15.80	16.00	0.614	0.622	0.630
b3	1.18	1.28	1.47	0.046	0.050	0.058	Q	3.20	3.30	3.40	0.126	0.130	0.134
c	0.45	0.50	0.60	0.018	0.020	0.024	$\Phi P$	3.08	3.18	3.28	0.121	0.125	0.129
D	15.67	15.87	16.07	0.617	0.625	0.633							

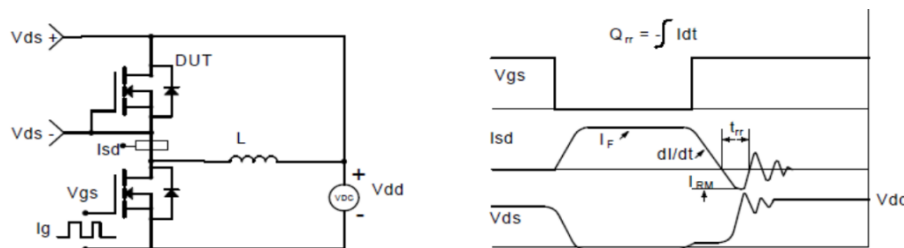
### Avalanche Test Circuit and Waveforms



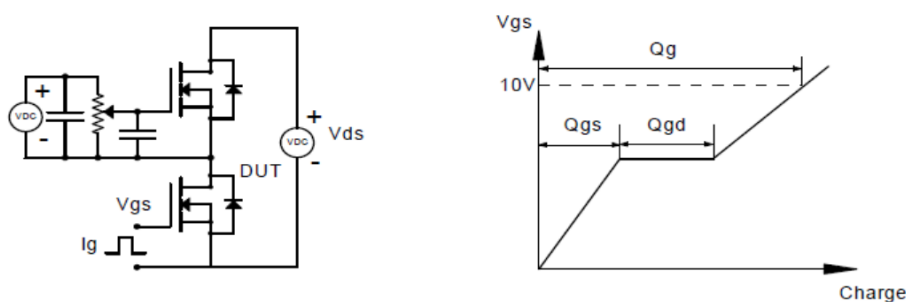
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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