

Features

- 40V/135A,
 $R_{DS(ON)} = 2.5m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 3.5m\Omega(Typ.)@V_{GS}=4.5V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- 100% Avalanche Tested

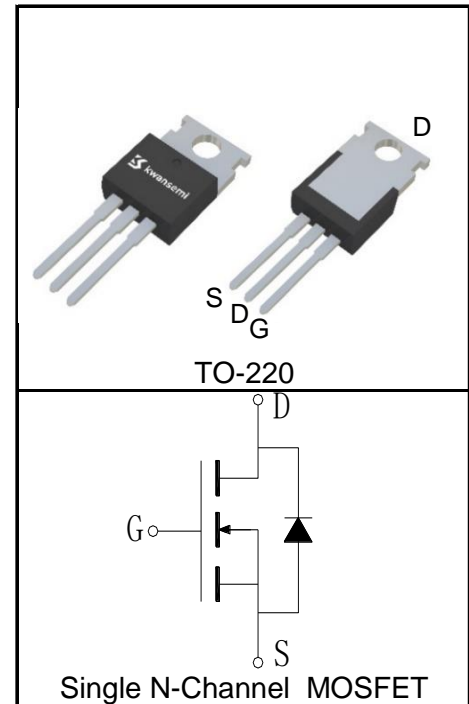
Applications

- Power Switching Application
- Load Switching



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	40	V	
V_{GSS}	Gate-Source Voltage	± 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	$T_C=25^\circ\text{C}$	135	A
Mounted on Large Heat Sink				
$I_{DP}^{(1)}$	Pulse Drain Current	$T_C=25^\circ\text{C}$	540	A
$I_D^{(2)}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$	135	A
		$T_C=100^\circ\text{C}$	95	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	125	W
		$T_C=100^\circ\text{C}$	62	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.2	$^\circ\text{C}/\text{W}$	
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C}/\text{W}$	
Drain-Source Avalanche Ratings				
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	441	mJ	

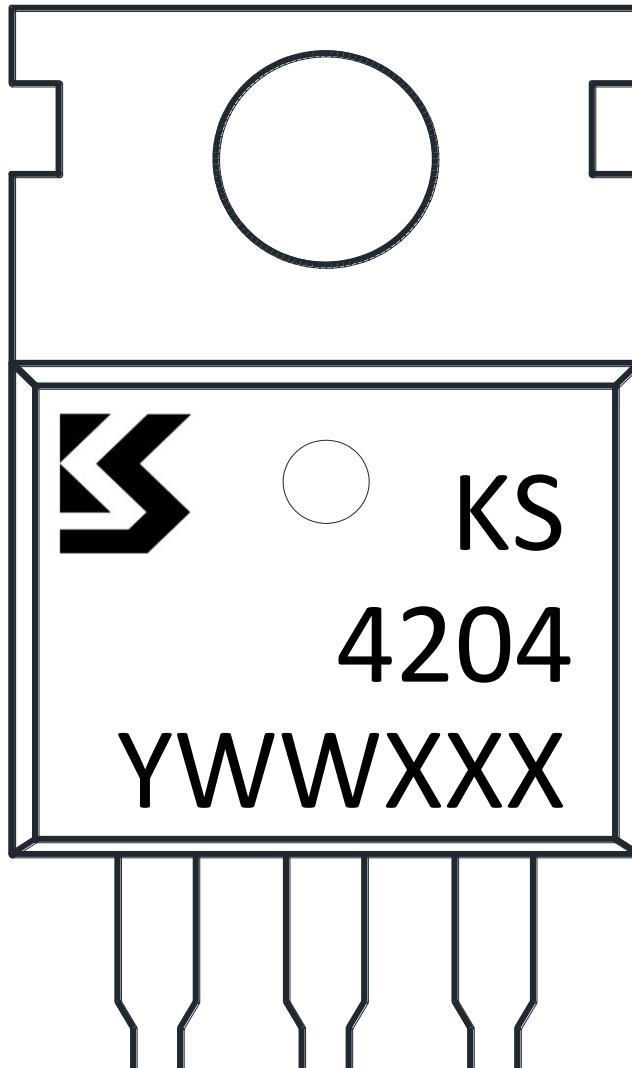
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS4204CC			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	μA
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.2	1.6	2.3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		2.5	3.5	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=20A$		3.5	5	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.84	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		41		ns
Q_{rr}	Reverse Recovery Charge			88		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=200kHz		6455		pF
C_{oss}	Output Capacitance			480		
C_{rss}	Reverse Transfer Capacitance			395		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=3\Omega$		19		ns
t_r	Turn-on Rise Time			26		
$t_{d(OFF)}$	Turn-off Delay Time			67		
t_f	Turn-off Fall Time			32		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V,$ $I_{DS}=40A$		122		nC
Q_{gs}	Gate-Source Charge			20		
Q_{gd}	Gate-Drain Charge			27		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.
 - 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 $T_J = 25^\circ\text{C}$, $I_{ASmax} = 42A$, $L = 0.5\text{mH}$, $V_{DD} = 40V$, $R_G = 25\Omega$, $V_{GS} = 10V$. Part not recommended for use above this value. 100% Final Test at $I_{AS} = 31A$, $L = 0.5\text{mH}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

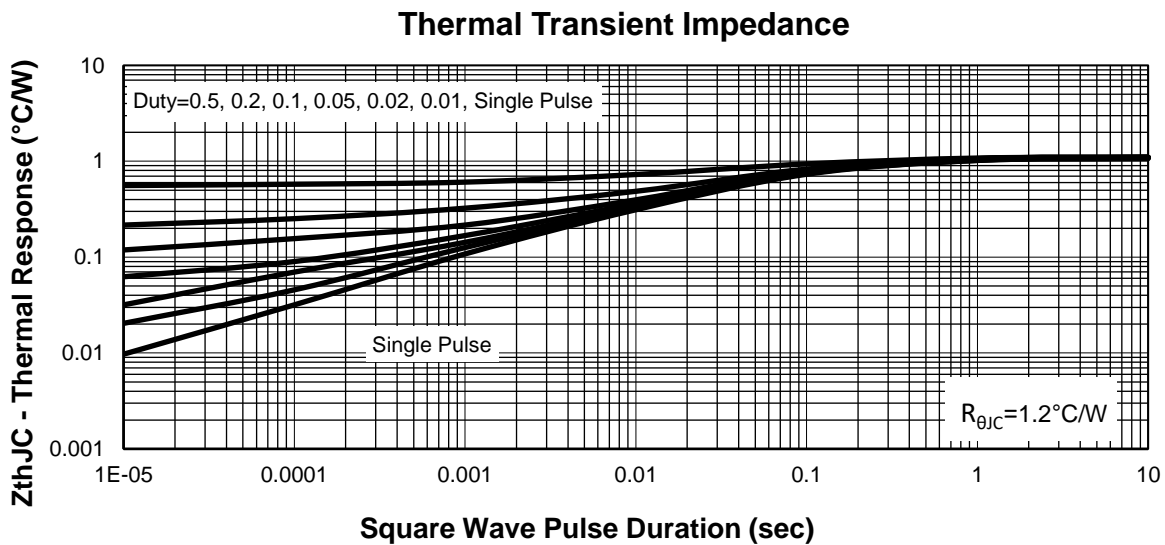
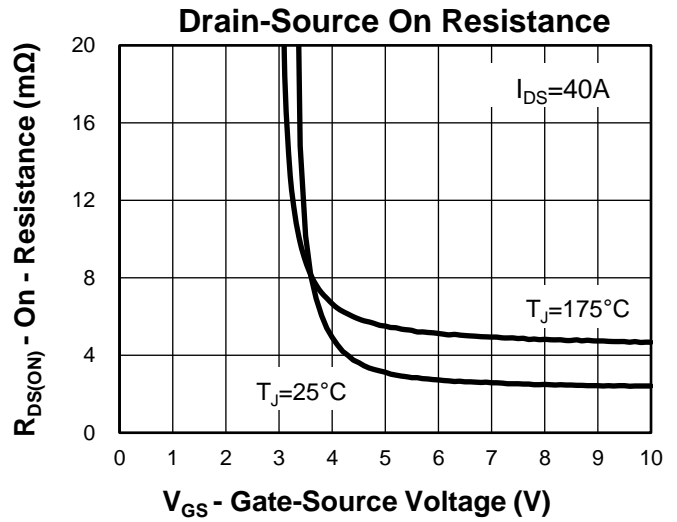
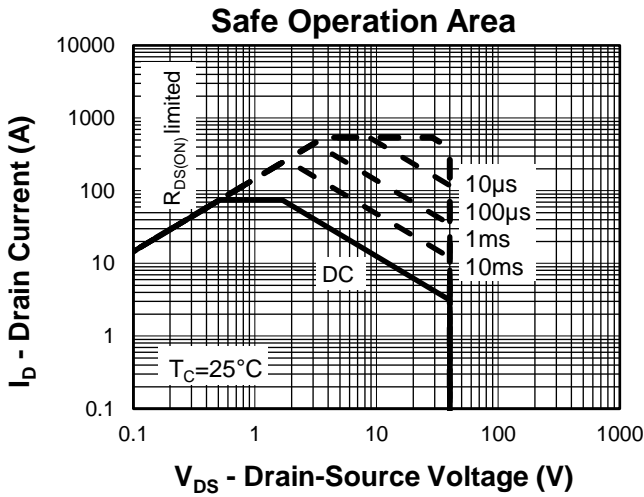
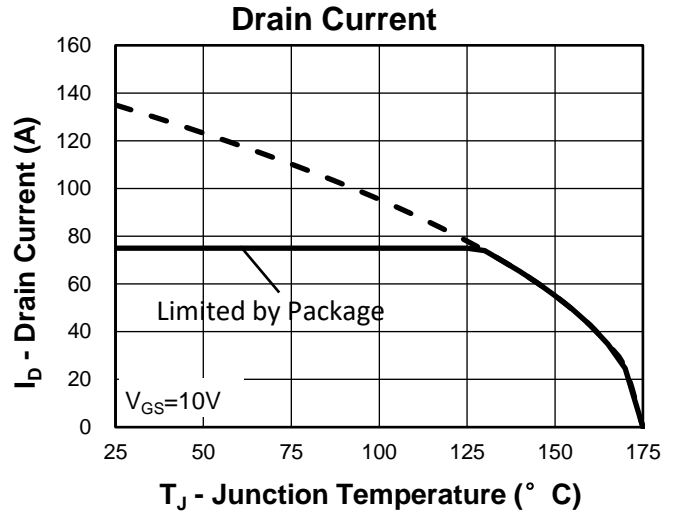
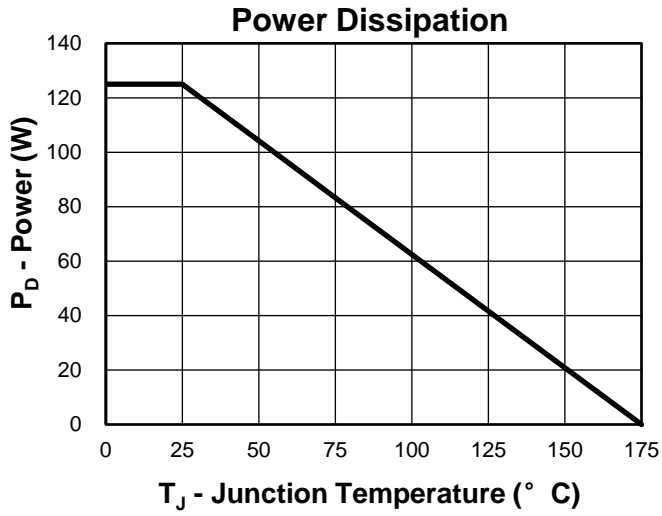
Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS4204CC	TO-220	Tube	50	-	-

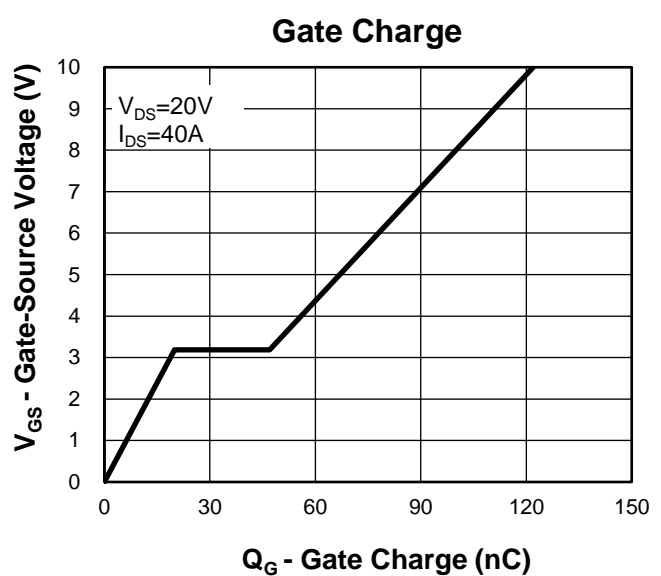
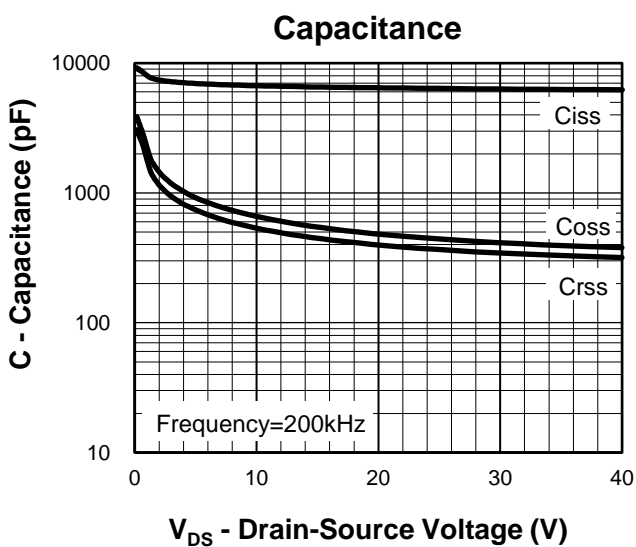
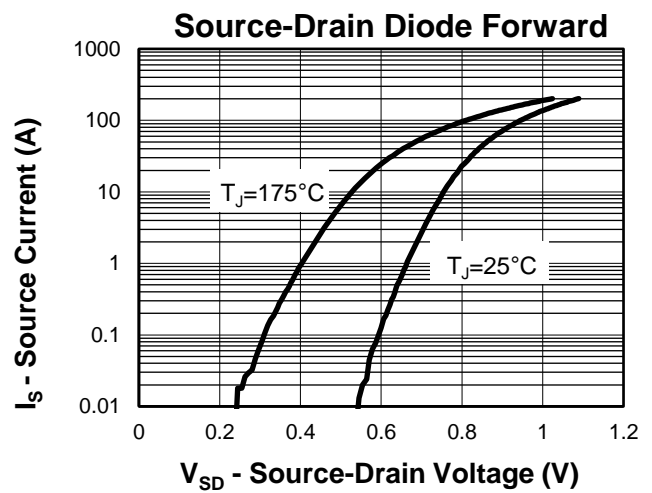
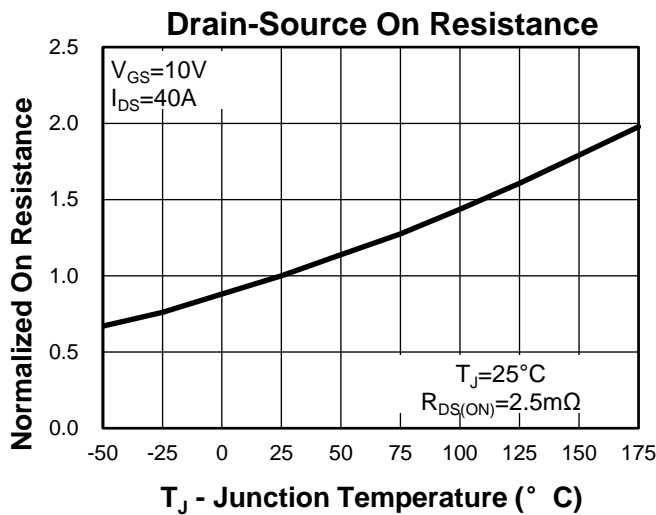
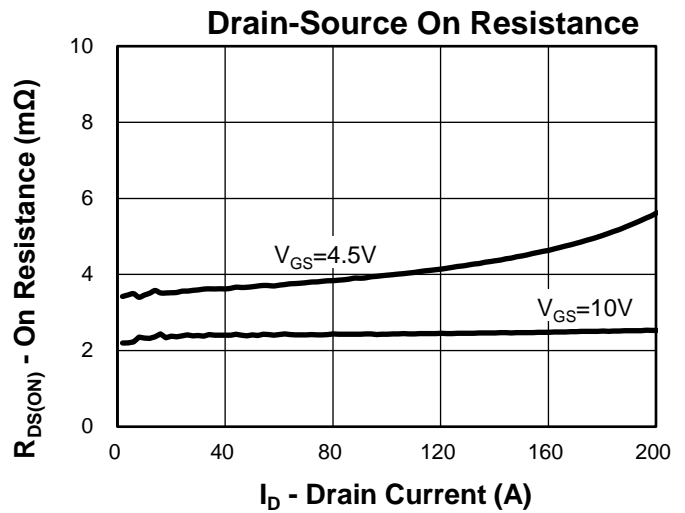
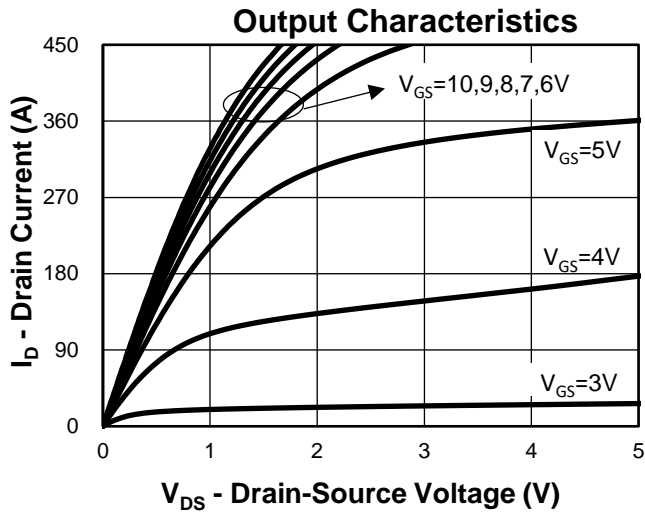


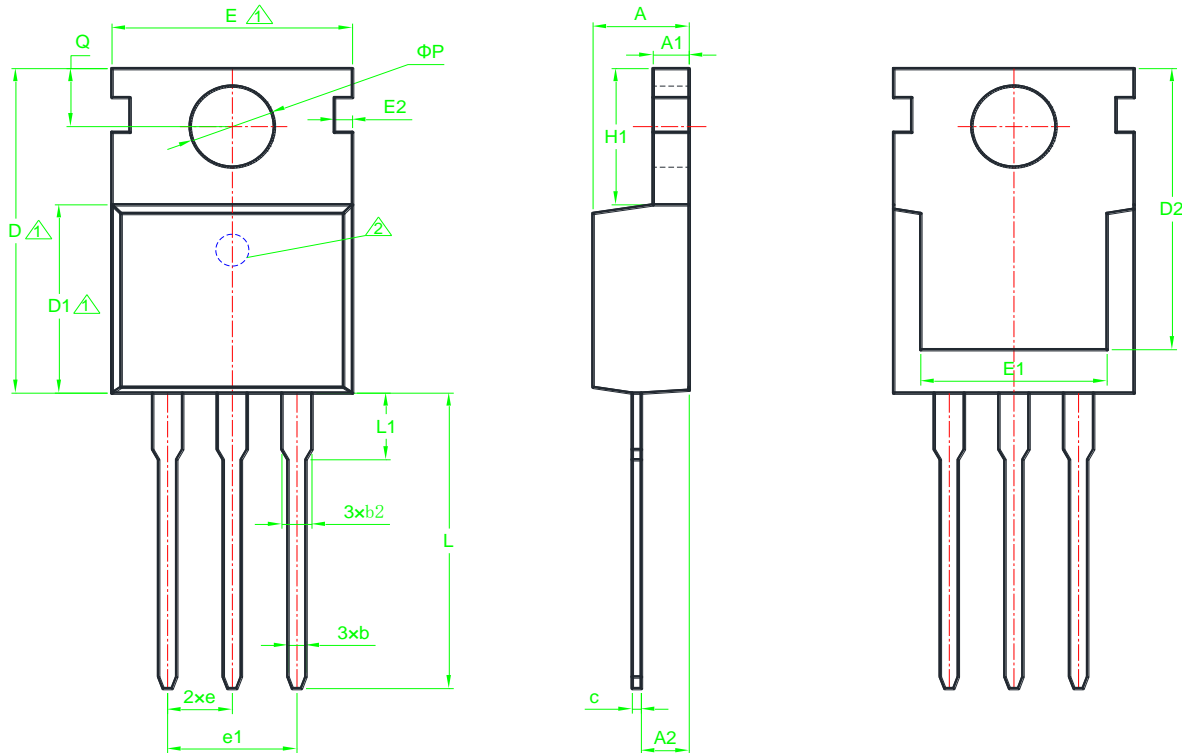
- 1st Line: Kwansemi LOGO, Kwansemi Code(KS)
- 2nd Line: Part Number(4204)
- 3rd Line: Lot Number(YWWXXX)

Typical Characteristics



Typical Characteristics



Package Information
TO-220


SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.55	4.80	0.169	0.179	0.189	E1	7.00	*	8.40	0.276	*	0.331
A1	1.20	1.30	1.45	0.047	0.051	0.057	E2	*	*	0.75	*	*	0.030
A2	2.20	2.40	2.70	0.087	0.094	0.106	e	2.54BSC			0.100BSC		
b	0.70	0.80	0.95	0.028	0.031	0.037	e1	5.08BSC			0.200BSC		
b2	1.15	1.35	1.50	0.045	0.053	0.059	H1	6.30	6.50	6.80	0.248	0.256	0.268
c	0.40	0.50	0.60	0.016	0.020	0.024	L	12.70	13.20	13.90	0.500	0.520	0.547
D	15.10	15.60	16.10	0.594	0.614	0.634	L1	2.85	*	3.50	0.112	*	0.138
D1	8.75	9.20	9.65	0.344	0.362	0.380	ØP	3.50	3.65	3.80	0.138	0.144	0.150
D2	12.20	12.50	12.80	0.480	0.492	0.504	Q	2.70	*	2.90	0.106	*	0.114
E	9.70	10.00	10.30	0.382	0.394	0.406							

① Dimensions D and D1 and E do not include mold flash protrusions or gate burrs.

② The existence and size of demolding hole are variable depending on mold.

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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