

## Features

- 40V/225A,  
 $R_{DS(on)} = 1\text{m}\Omega(\text{Typ.})@V_{GS}=10\text{V}$   
 $R_{DS(on)} = 1.3\text{m}\Omega(\text{Typ.})@V_{GS}=4.5\text{V}$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- High Ruggedness
- 100% avalanche tested

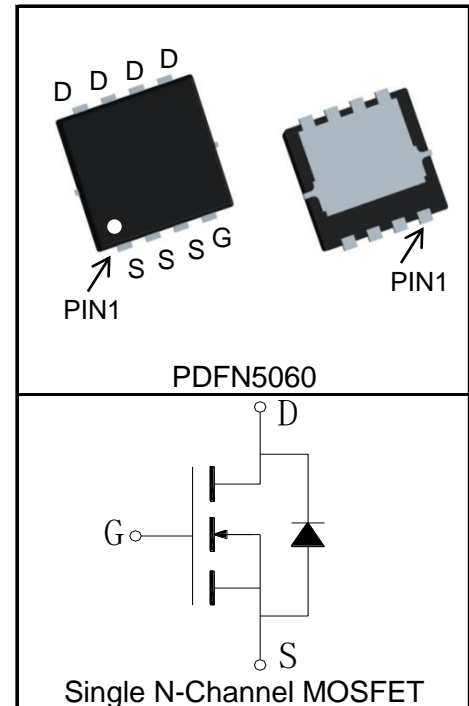
## Applications

- Battery Power Management
- Energy Storage
- High Frequency Switching and Synchronous Rectification



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	40	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	225	A
<b>Mounted on Large Heat Sink</b>				
$I_{DP}^{(1)}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	900	A
$I_D^{(2)}$	Continuous Drain Current@ $T_C(V_{GS}=10\text{V})$	$T_C=25^\circ\text{C}$	225	A
		$T_C=100^\circ\text{C}$	142	
	Continuous Drain Current@ $T_A(V_{GS}=10\text{V})^{(3)}$	$T_A=25^\circ\text{C}$	44	
		$T_A=70^\circ\text{C}$	35	
$P_D$	Maximum Power Dissipation@ $T_C$	$T_C=25^\circ\text{C}$	108	W
		$T_C=100^\circ\text{C}$	43	
	Maximum Power Dissipation@ $T_A^{(3)}$	$T_A=25^\circ\text{C}$	4.2	
		$T_A=70^\circ\text{C}$	2.7	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.16	°C/W
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	30	°C/W
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}$ ④	Avalanche Energy, Single Pulsed	210	mJ

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

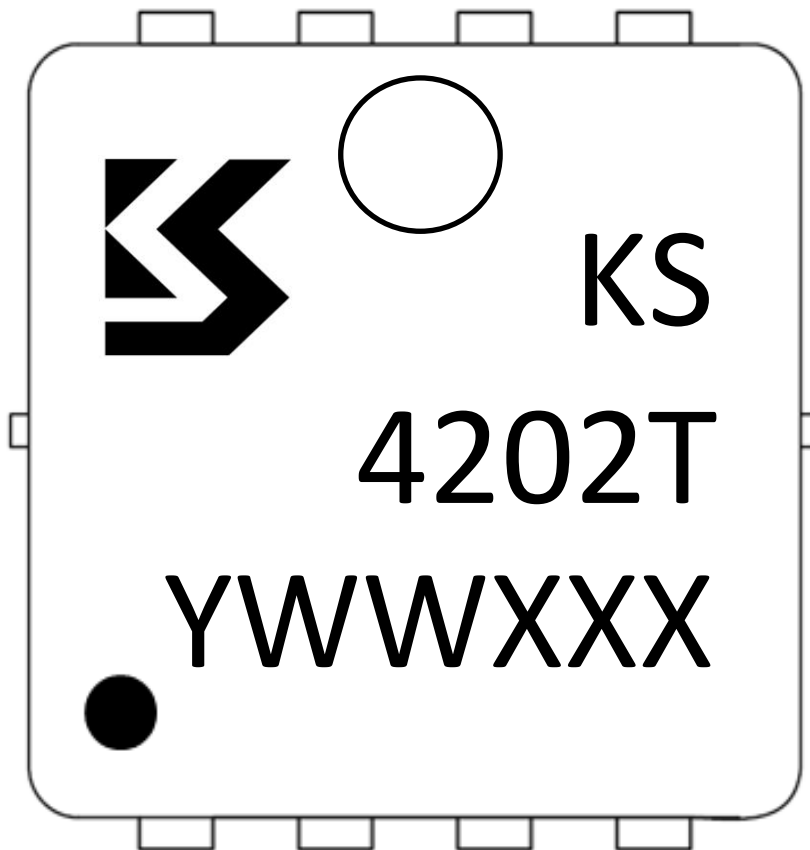
Symbol	Parameter	Test Condition	KS4202NAT			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.1	1.7	2.3	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	$V_{GS}=10V, I_{DS}=20A$		1	1.4	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=16A$		1.3	1.9	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}$ ⑤	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.76	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=20A, dI_{SD}/dt=100A/\mu s$		35		ns
$Q_{rr}$	Reverse Recovery Charge			86		nC
<b>Dynamic Characteristics</b> ⑥						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.4		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=1.0MHz		6750		$\mu F$
$C_{oss}$	Output Capacitance			2085		
$C_{riss}$	Reverse Transfer Capacitance			125		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=20A,$ $V_{GS}=10V, R_G=3\Omega$		16		ns
$t_r$	Turn-on Rise Time			45		
$t_{d(OFF)}$	Turn-off Delay Time			86		
$t_f$	Turn-off Fall Time			38		
<b>Gate Charge Characteristics</b> ⑥						
$Q_g$	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V,$ $I_{DS}=20A$		90		nC
$Q_{gs}$	Gate-Source Charge			19		
$Q_{gd}$	Gate-Drain Charge			25		

**Notes:**

- ① Pulse width limited by safe operating area.
- ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 50A.
- ③ When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ .
- ④ Limited by  $T_{Jmax}$ ,  $I_{AS} = 29\text{A}$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 24\text{V}$ ,  $R_G = 25\Omega$ , Starting  $T_J = 25^\circ\text{C}$ , 100% tested and guaranteed.
- ⑤ Pulse test; Pulse width  $\leq 300\mu\text{s}$ , 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
KS4202NAT	PDFN5060	Tape&Reel	5000	13"	12mm

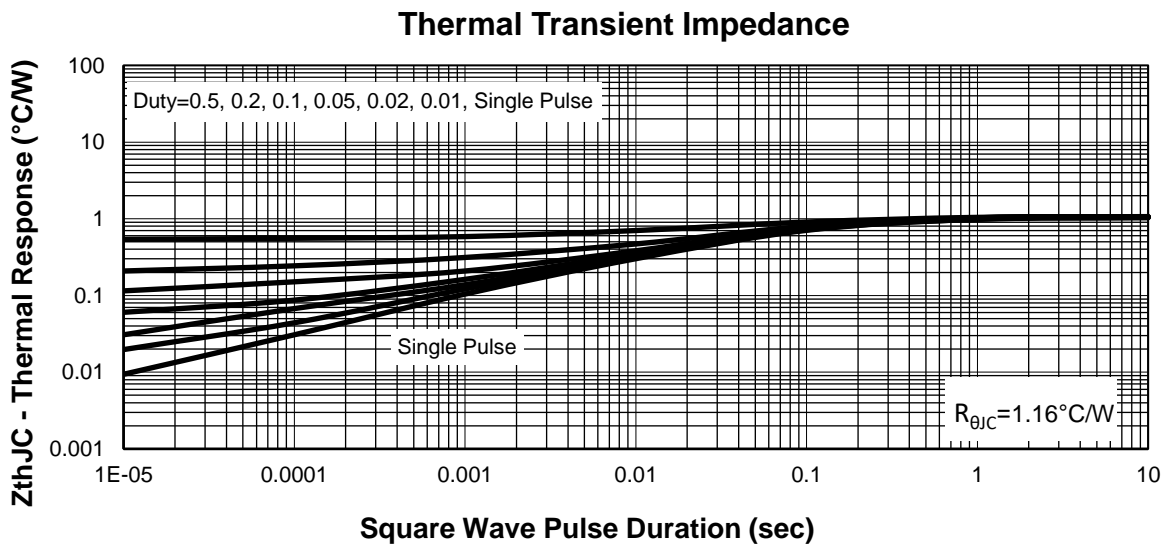
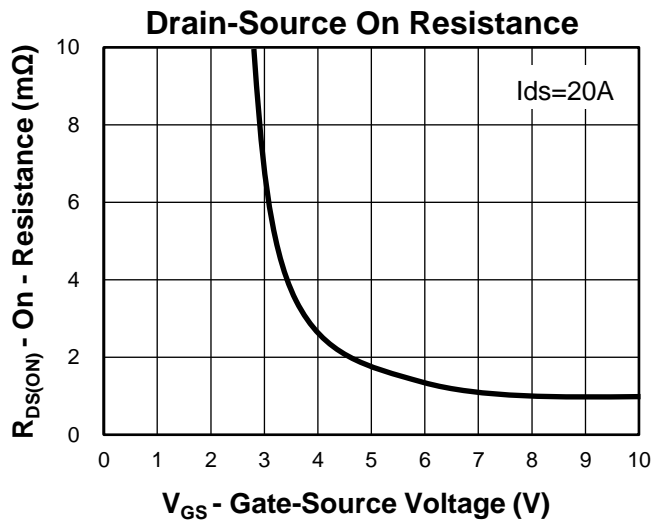
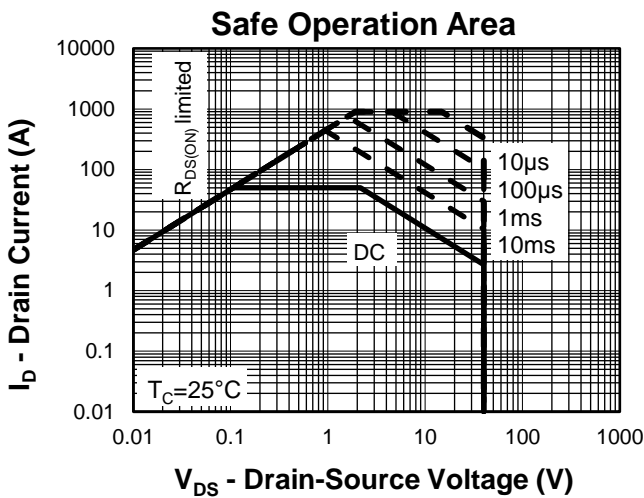
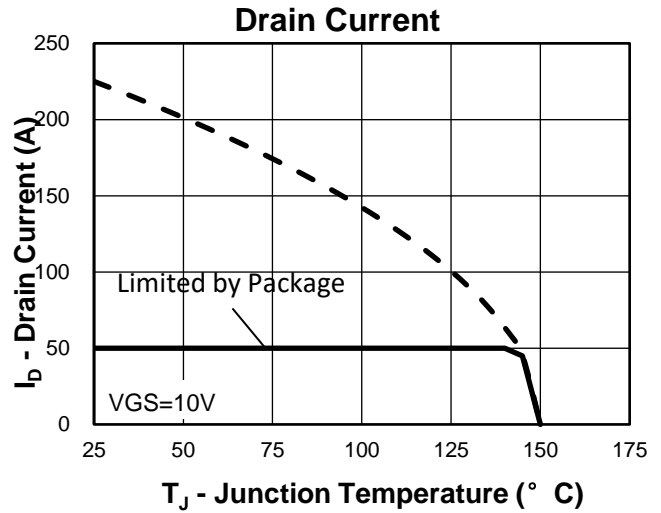
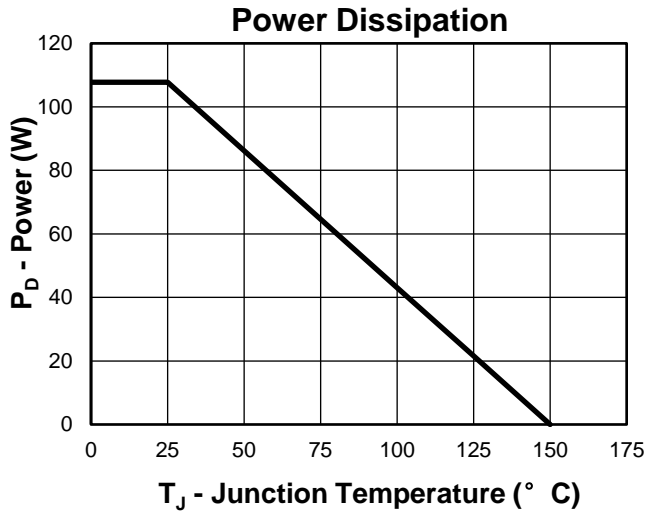


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

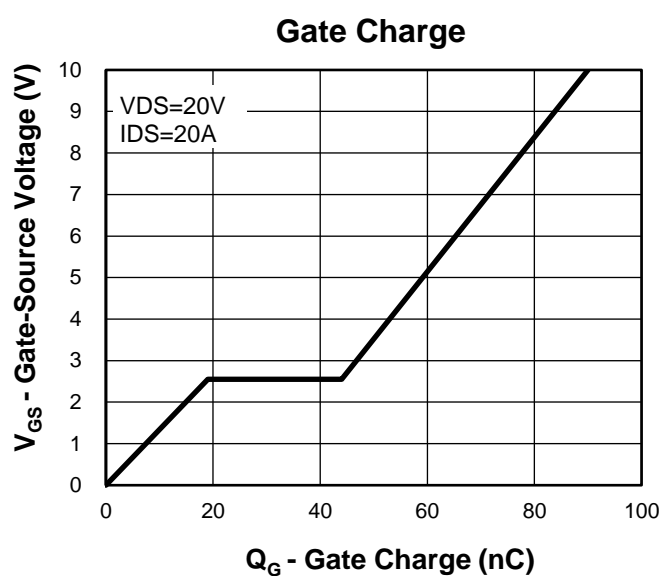
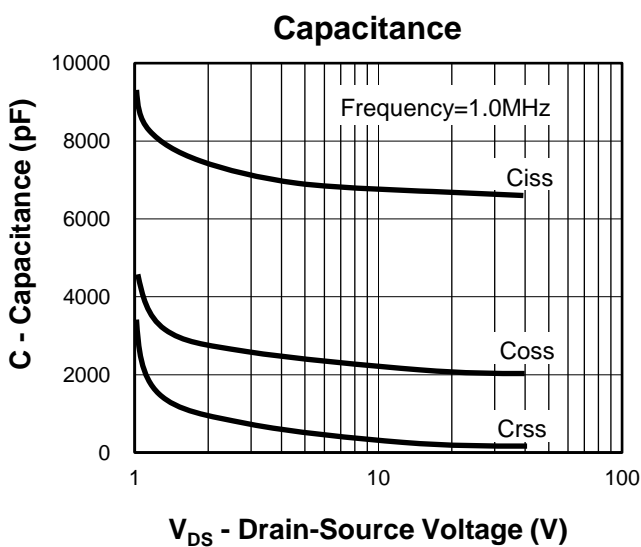
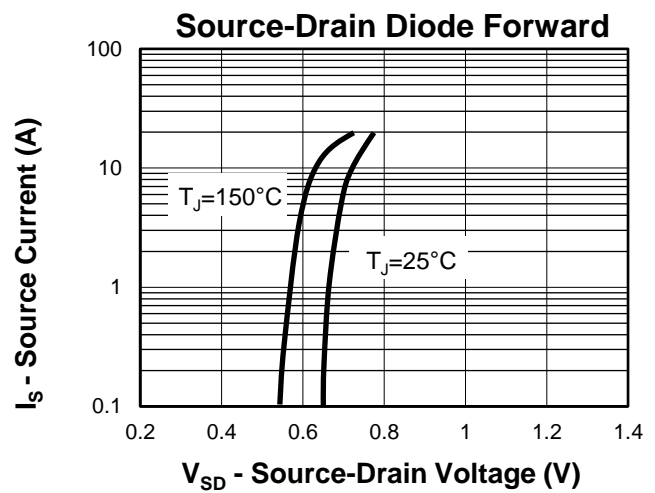
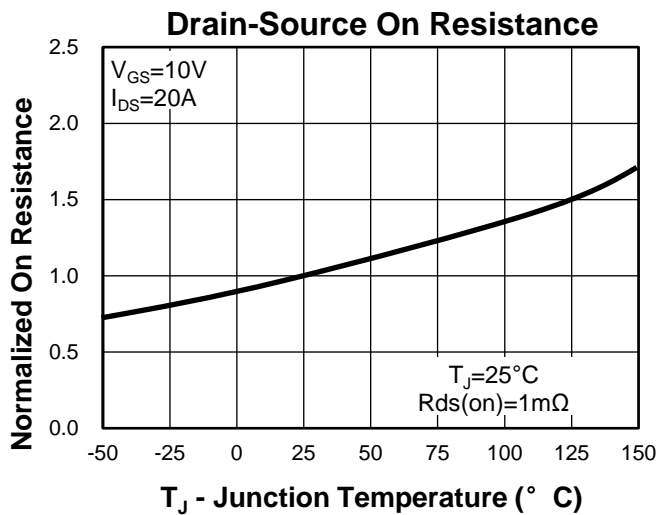
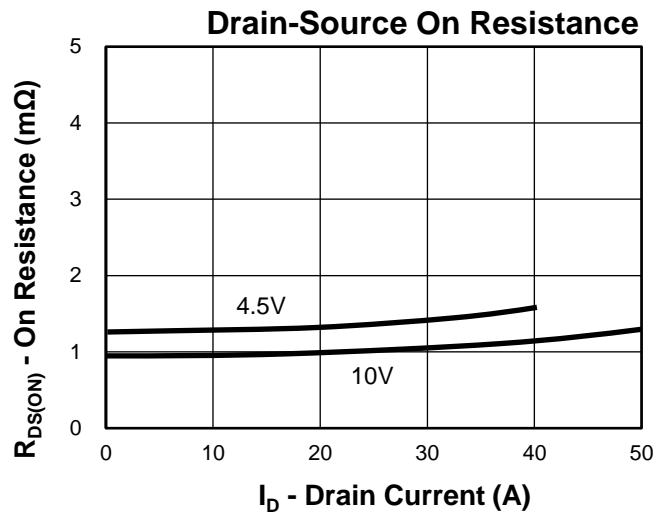
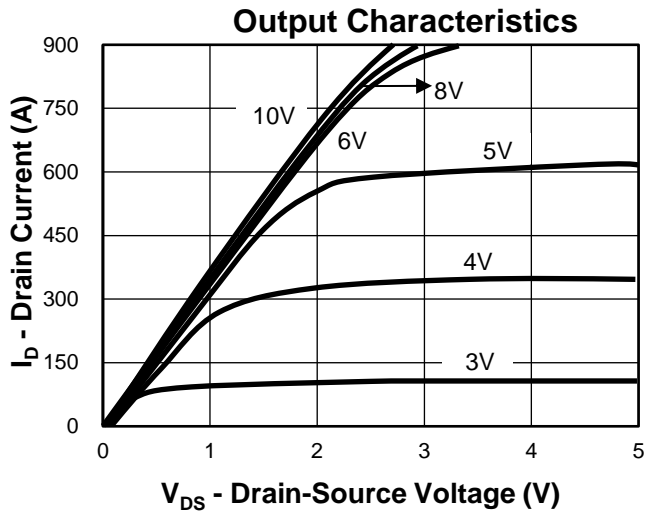
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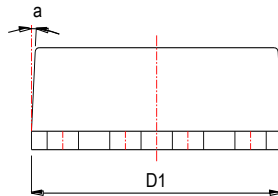
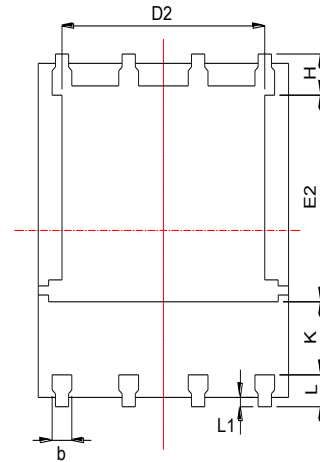
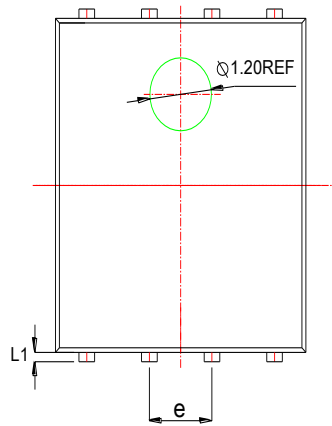
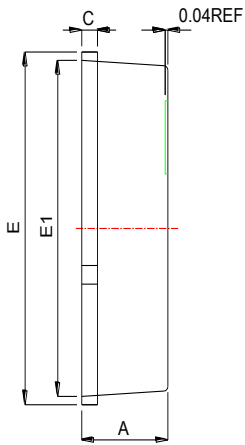
3rd Line: Lot Number(YWWXXX)

Typical Characteristics

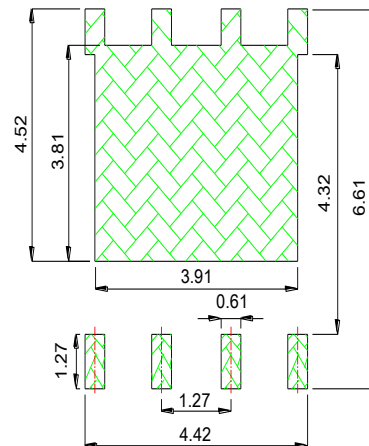


### Typical Characteristics



**Package Information**
**PDFN5060**


Land Pattern  
(Only for Reference)



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
b	0.33	0.42	0.51	0.013	0.017	0.020
c	0.20	0.25	0.30	0.008	0.010	0.012
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.61	3.79	3.96	0.142	0.149	0.156
E	5.90	6.00	6.10	0.232	0.236	0.240
E1	5.65	5.75	5.85	0.222	0.226	0.230
E2	3.38	3.58	3.78	0.133	0.141	0.149
e	1.27 BSC			0.050 BSC		
H	0.41	0.51	0.61	0.016	0.020	0.024
k	1.10			0.043		
L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008
a	0°		12°	0°		12°

### 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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