

## Features

- 120V/100A,  
 $R_{DS(ON)} = 7m\Omega(Typ.)@V_{GS}=10V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- 100% Avalanche Tested

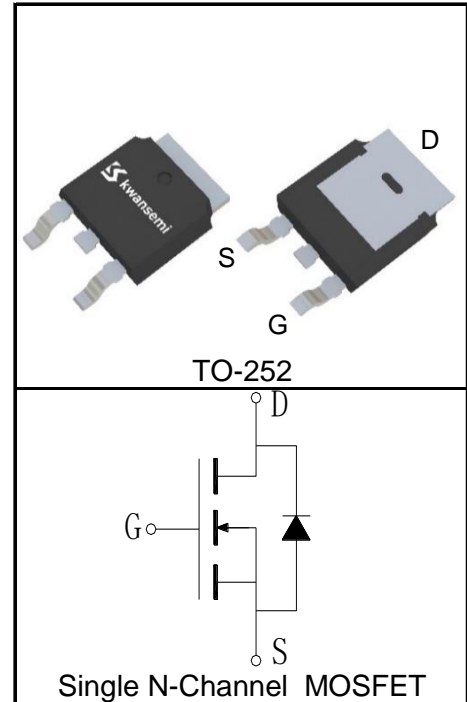
## Applications

- High Frequency Switching and Synchronous Rectification
- LED Backlighting



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	120	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	$T_C=25^\circ\text{C}$ 100	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	Pulse Drain Current	$T_C=25^\circ\text{C}$ 400	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$ 100	A
		$T_C=100^\circ\text{C}$ 71	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 157	W
		$T_C=100^\circ\text{C}$ 79	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.95	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	462	mJ

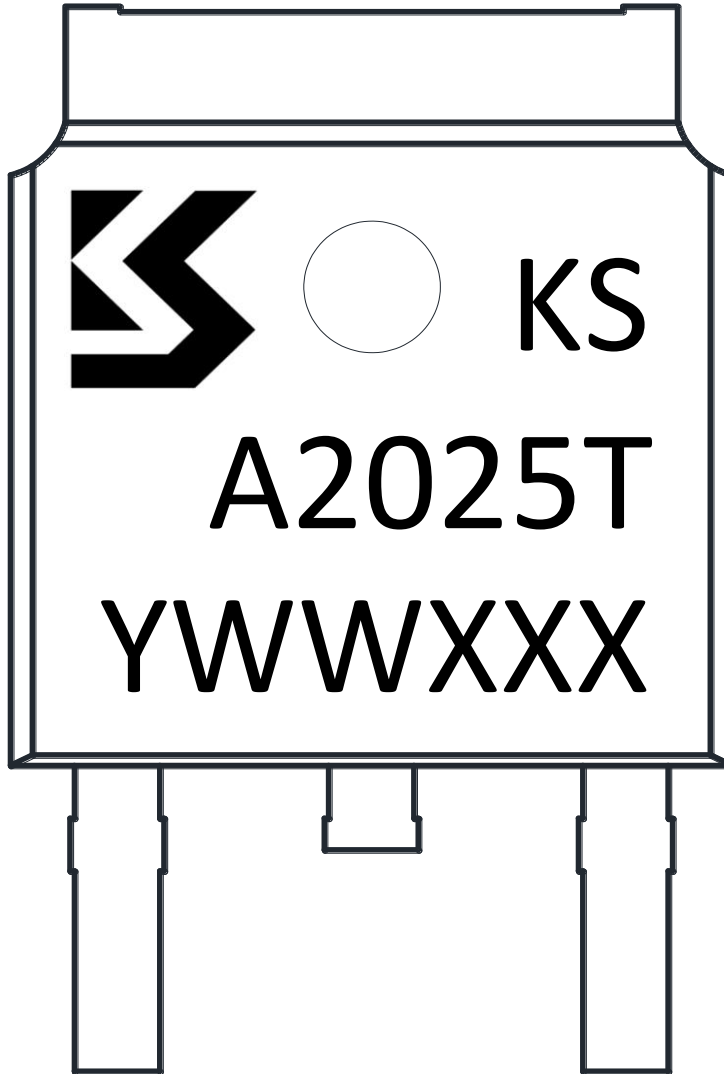
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KSA2025DAT			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	120			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=120V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2.5	3.5	4.5	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	$V_{GS}=10V, I_{DS}=20A$		7	8.5	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$		0.83	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=20A, dI_{SD}/dt=100A/\mu s$		32		ns
$Q_{rr}$	Reverse Recovery Charge			55		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.1		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=60V,$ Frequency=1.0MHz		2970		pF
$C_{oss}$	Output Capacitance			855		
$C_{riss}$	Reverse Transfer Capacitance			25		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=60V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=3\Omega$		10		ns
$t_r$	Turn-on Rise Time			19		
$t_{d(OFF)}$	Turn-off Delay Time			44		
$t_f$	Turn-off Fall Time			23		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=60V, V_{GS}=10V,$ $I_{DS}=20A$		39		nC
$Q_{gs}$	Gate-Source Charge			14		
$Q_{gd}$	Gate-Drain Charge			6		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 60A.
  - 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  $T_J = 25^\circ\text{C}$ ,  $I_{ASmax} = 43A$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 48V$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 10V$ . 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.

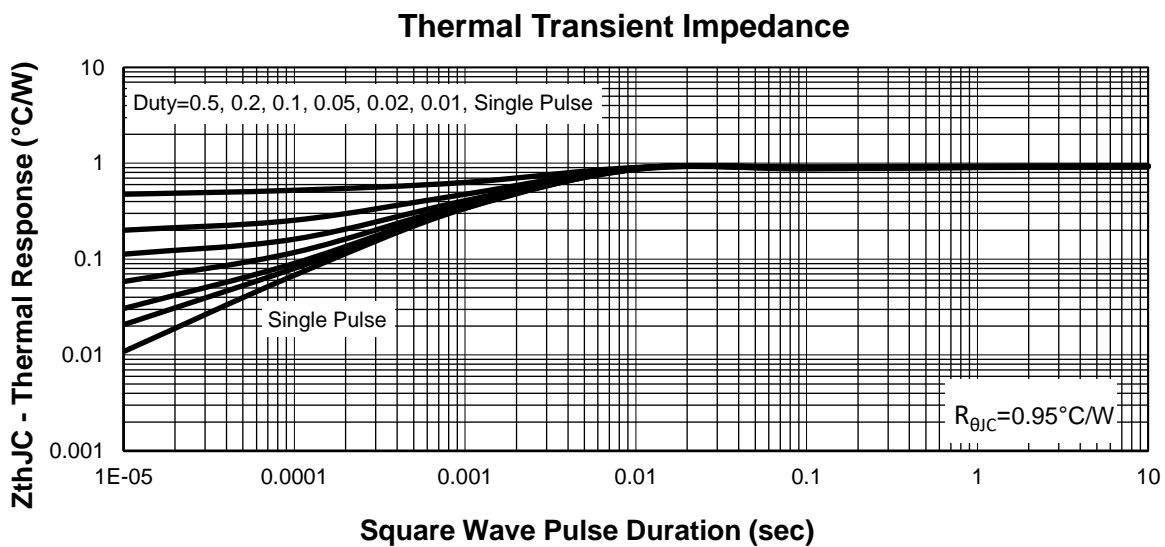
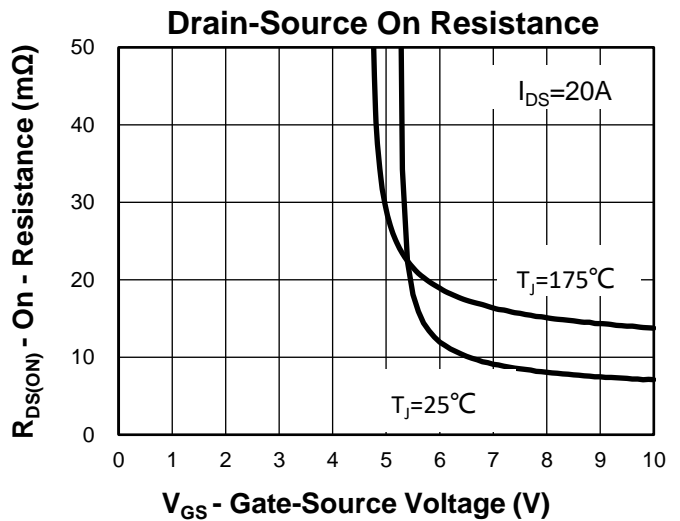
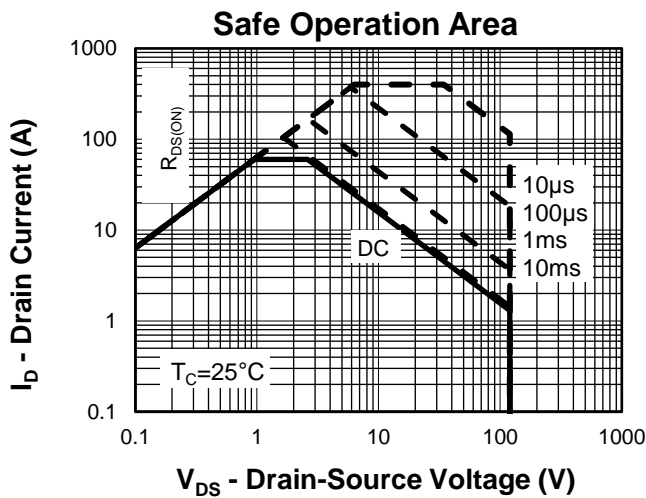
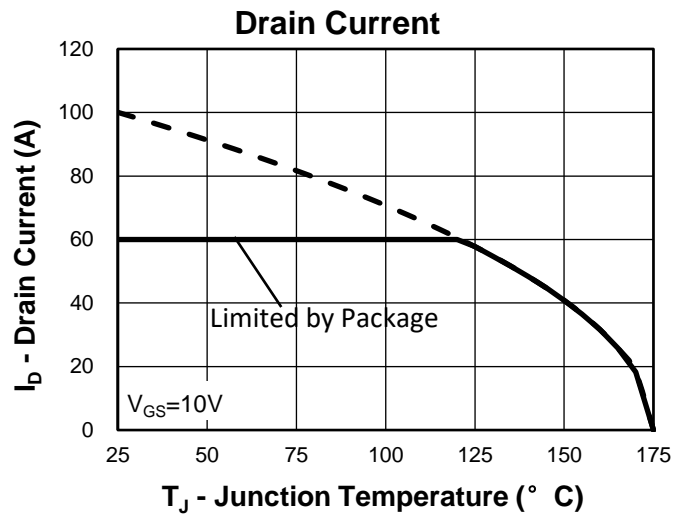
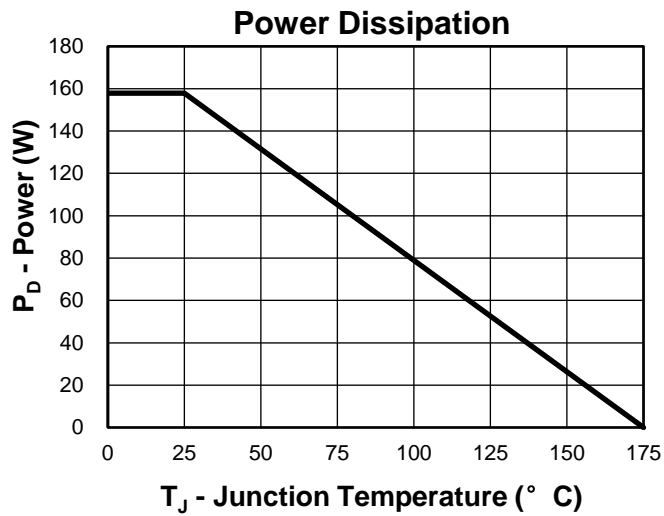
**Ordering and Marking Information**

Device	Package	Packaging	Quantity	Reel Size	Tape width
KSA2025DAT	TO-252	Tape&Reel	2500	13"	16mm

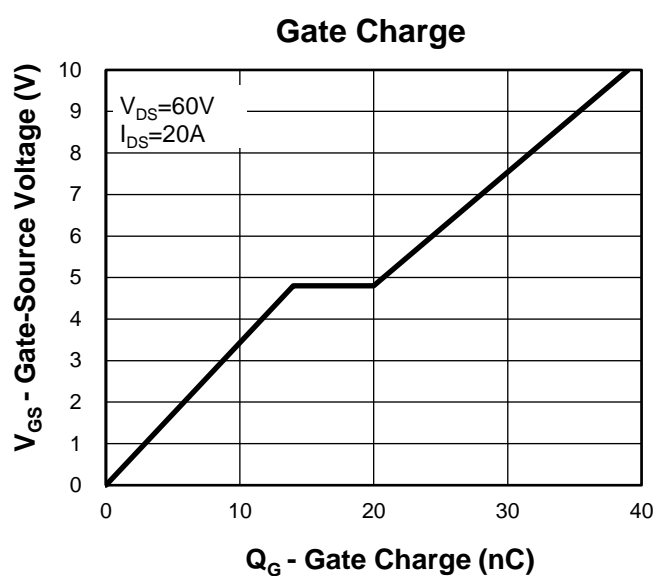
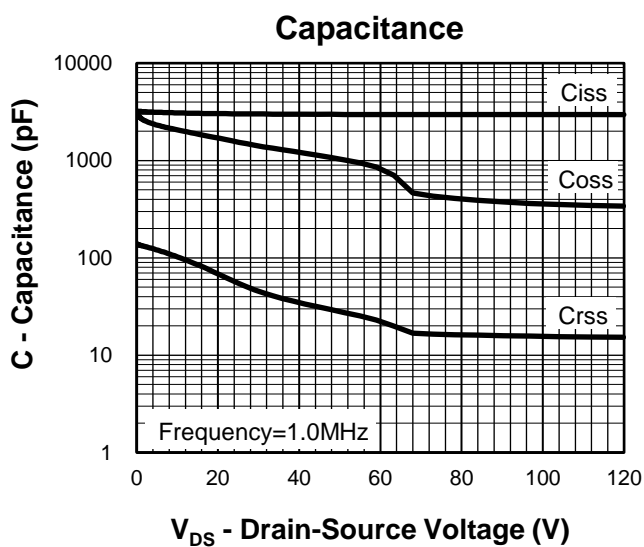
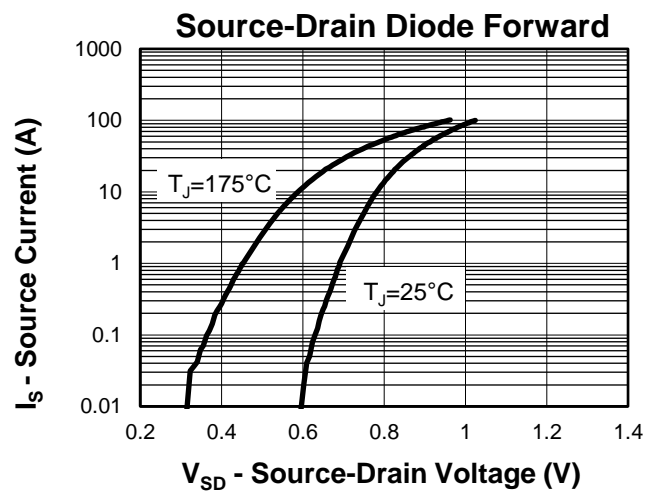
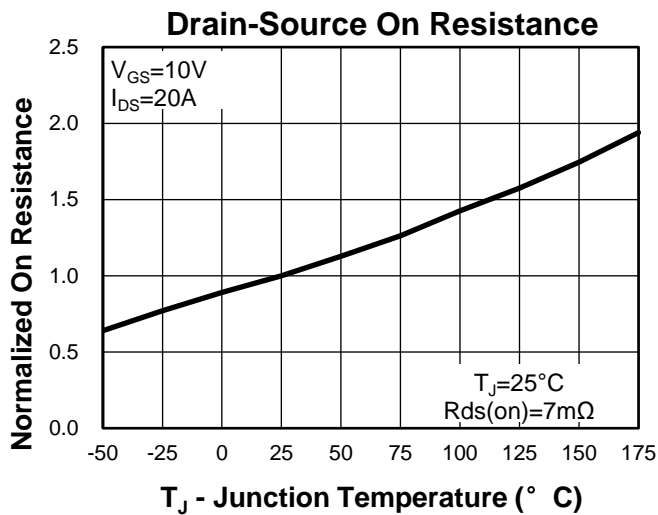
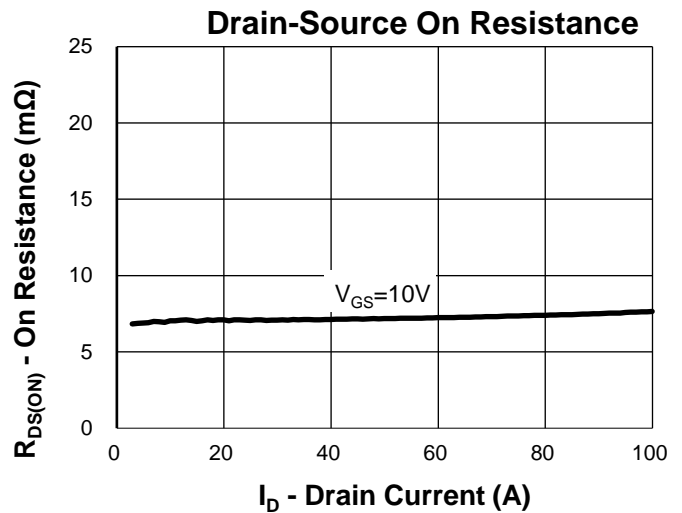
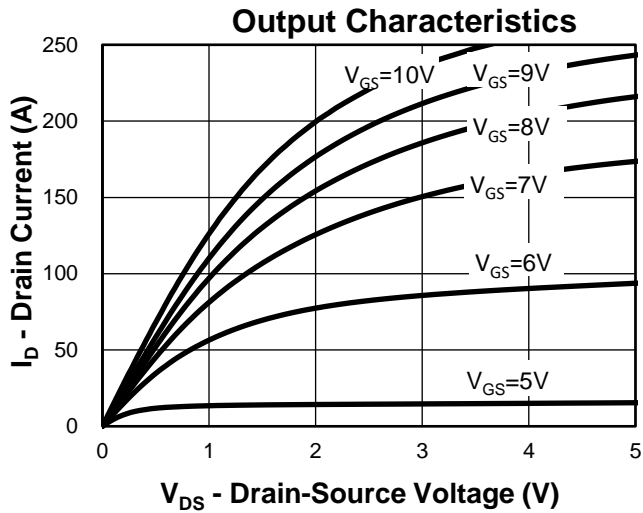


1st Line: Kwansemi LOGO, Kwansemi Code(KS)  
2nd Line: Part Number(A2025T)  
3rd Line: Lot Number(YWWXXX)

### Typical Characteristics

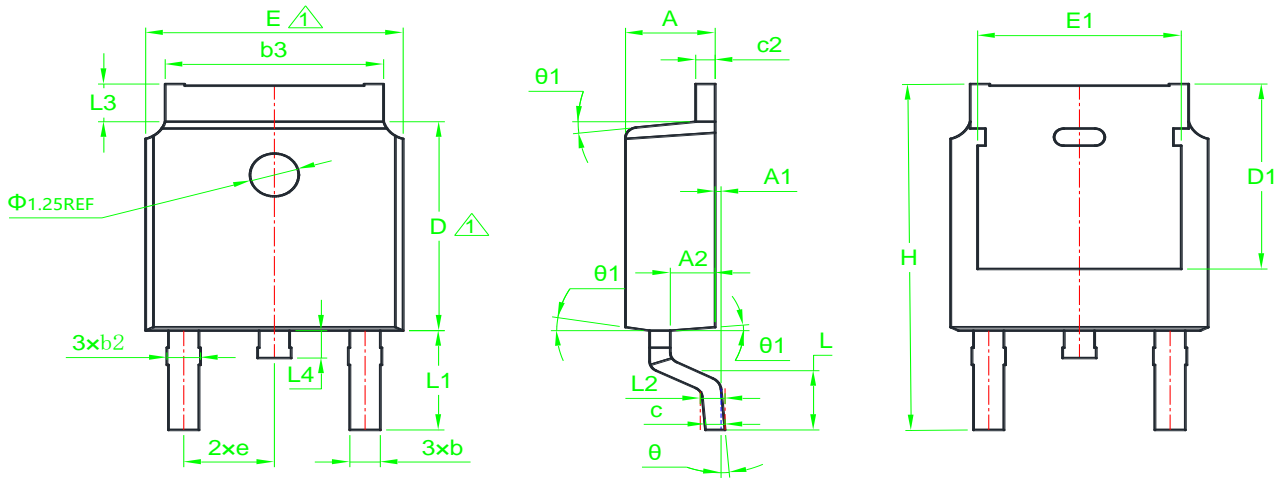


### Typical Characteristics



Package Information

TO-252



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.38	0.087	0.091	0.094	E	6.40	6.60	6.70	0.252	0.260	0.264
A1	0.00	*	0.15	0.000	*	0.006	E1	4.55	*	5.15	0.179	*	0.203
A2	0.90	1.00	1.10	0.035	0.039	0.043	H	9.60	10.10	10.40	0.378	0.398	0.409
b	0.65	0.75	0.85	0.026	0.030	0.033	L	1.40	1.50	1.70	0.055	0.059	0.067
b2	0.72	*	0.90	0.028	*	0.035	L1	2.90REF			0.114REF		
b3	5.13	5.33	5.46	0.202	0.210	0.215	L2	0.508BSC			0.020BSC		
c	0.47	0.51	0.54	0.019	0.020	0.021	L3	0.90	*	1.25	0.035	*	0.049
D	6.00	6.10	6.20	0.236	0.240	0.244	L4	0.60	*	1.00	0.024	*	0.039
D1	5.25	5.35	5.60	0.207	0.211	0.220	θ	0°	*	10°	0°	*	10°
e	2.286BSC			0.090BSC			θ1	5°	*	9°	5°	*	9°

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

### 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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