

## Features

- 200V/140A,  
 $R_{DS(on)} = 9.2m\Omega(Typ.)@V_{GS}=10V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- High Ruggedness
- 100% Avalanche Tested
- 100% Rg Tested

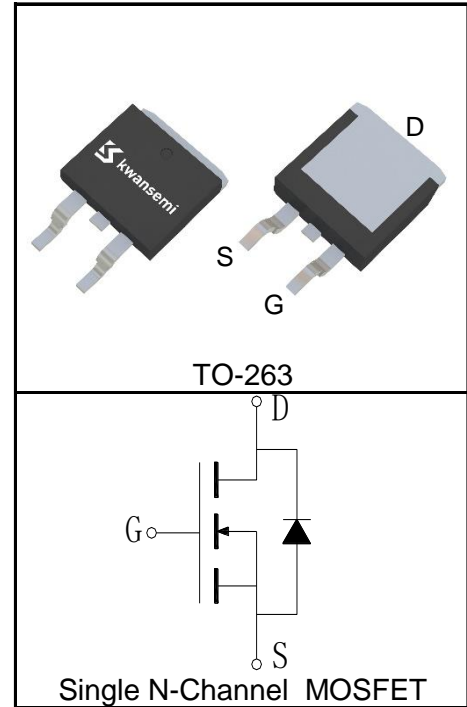
## Applications

- Motor Control
- Battery Power Management
- 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	200	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	$T_C=25^\circ\text{C}$	140 A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	560 A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$	140 A
		$T_C=100^\circ\text{C}$	99 A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	385 W
		$T_C=100^\circ\text{C}$	192 W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.39	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	1024	mJ

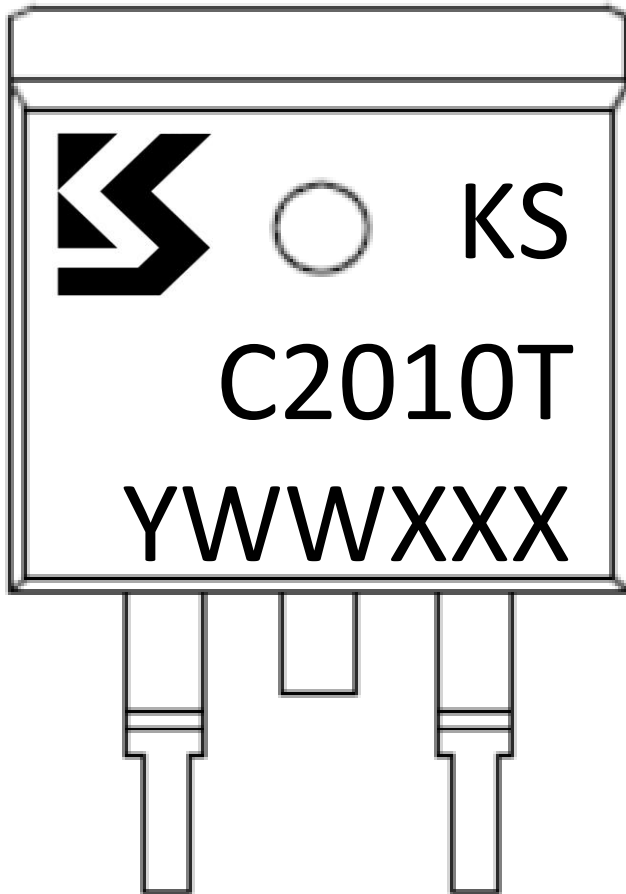
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KSC2010GAT			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	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2.5	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	$V_{GS}=10V, I_{DS}=40A$		9.2	11.5	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.82	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		53		ns
$Q_{rr}$	Reverse Recovery Charge			130		nC
<b>Dynamic Characteristics</b> <sup>(6)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.2		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=100V,$ Frequency=1.0MHz		10565		pF
$C_{oss}$	Output Capacitance			375		
$C_{rss}$	Reverse Transfer Capacitance			25		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=100V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=3\Omega$		16		ns
$t_r$	Turn-on Rise Time			28		
$t_{d(OFF)}$	Turn-off Delay Time			85		
$t_f$	Turn-off Fall Time			21		
<b>Gate Charge Characteristics</b> <sup>(6)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=100V, V_{GS}=10V,$ $I_{DS}=40A$		145		nC
$Q_{gs}$	Gate-Source Charge			49		
$Q_{gd}$	Gate-Drain Charge			30		

- 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  $T_J = 25^\circ\text{C}$ ,  $I_{ASmax} = 64A$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 48V$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 10V$ . Part not recommended for use above this value. 100% Final Test at  $I_{AS} = 45A$ ,  $L = 0.5\text{mH}$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

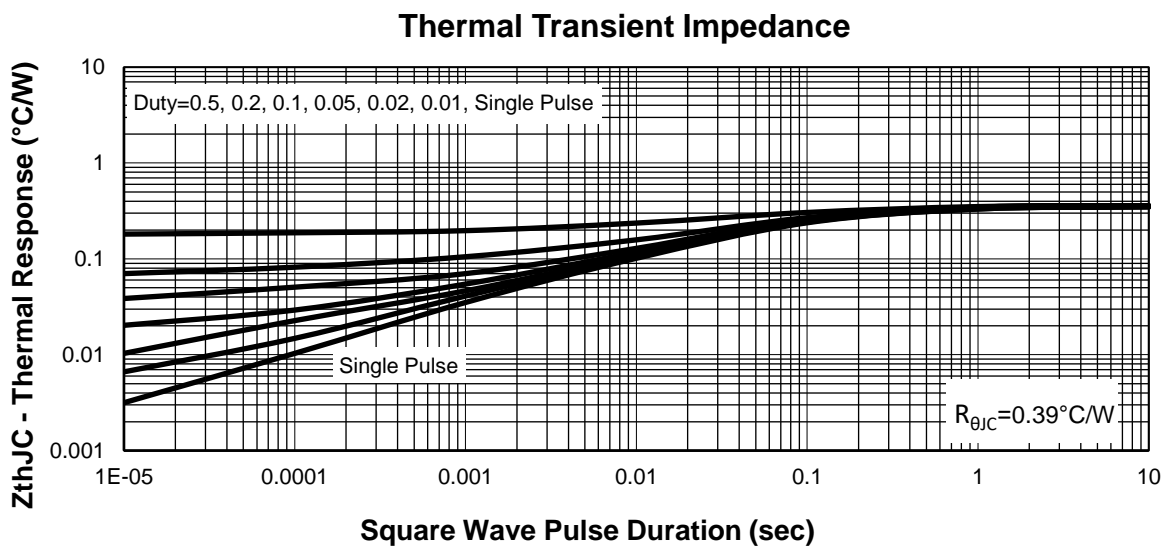
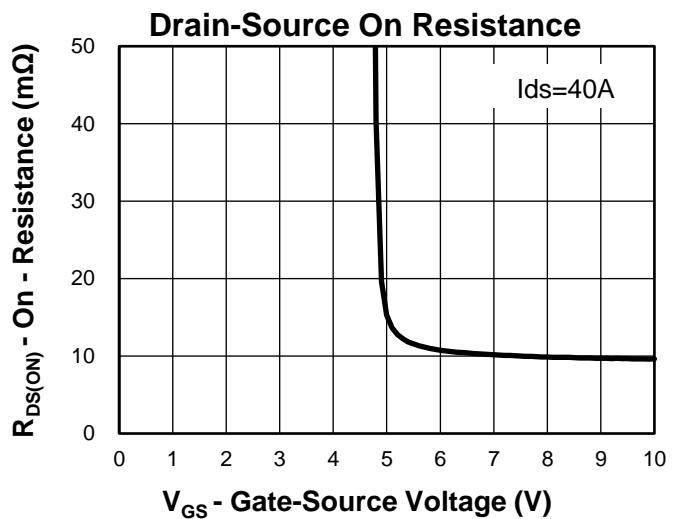
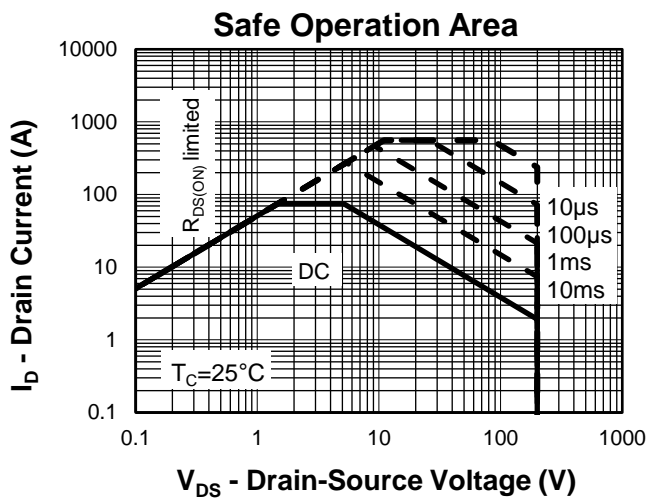
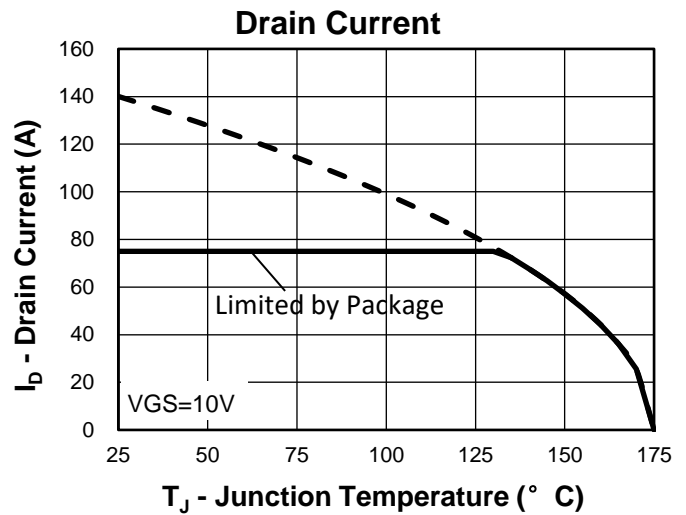
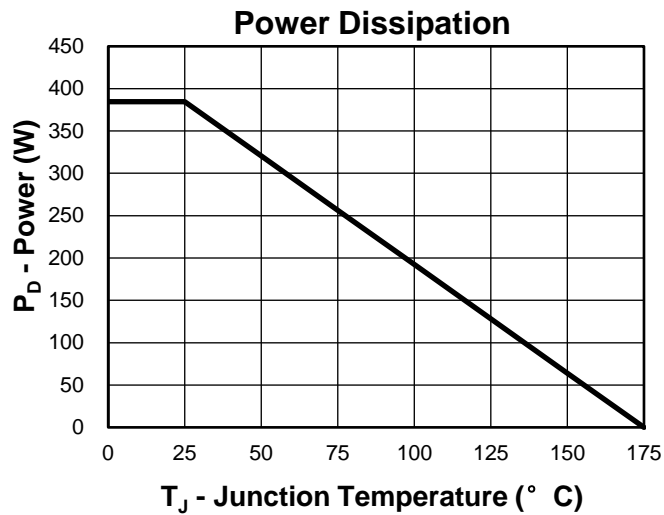
**Ordering and Marking Information**

Device	Package	Packaging	Quantity	Reel Size	Tape width
KSC2010GAT	TO-263	Tape&Reel	800	13"	24mm

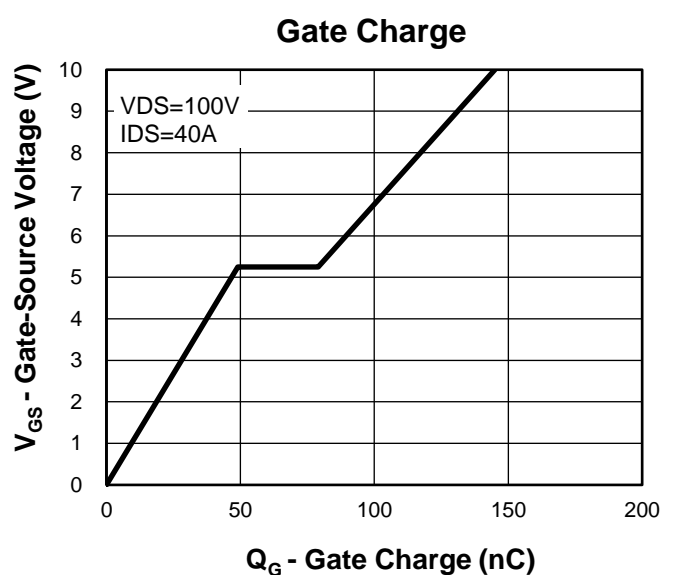
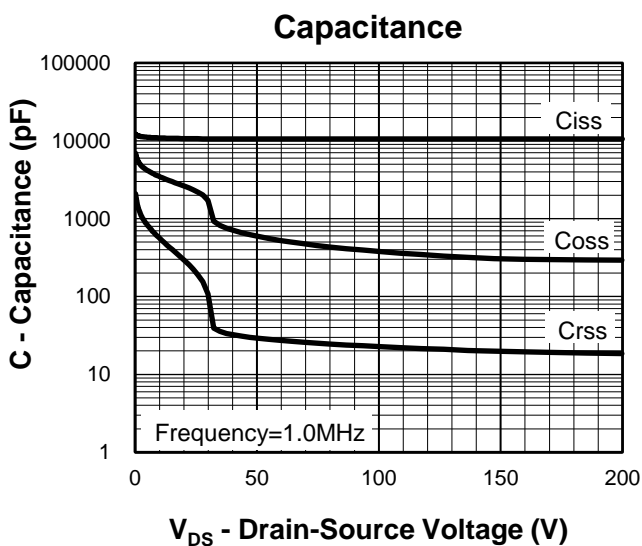
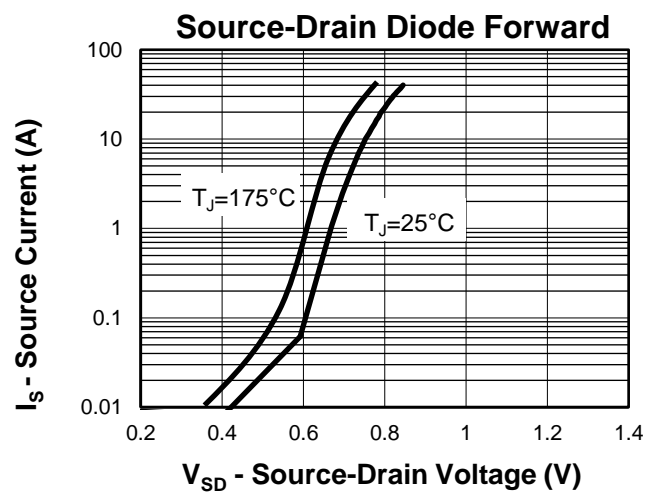
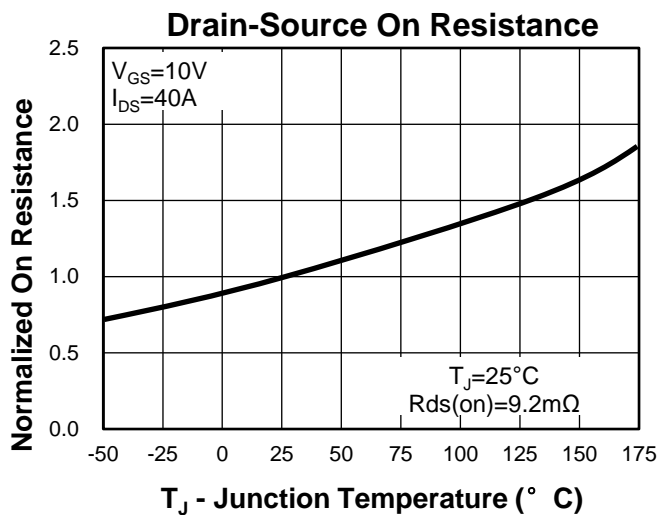
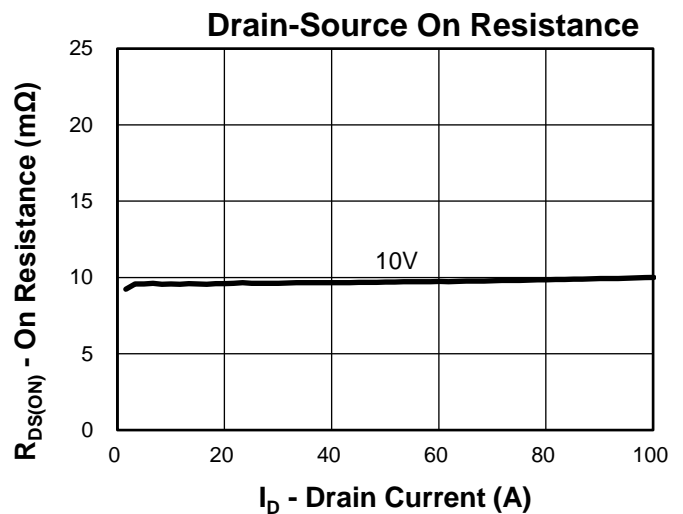
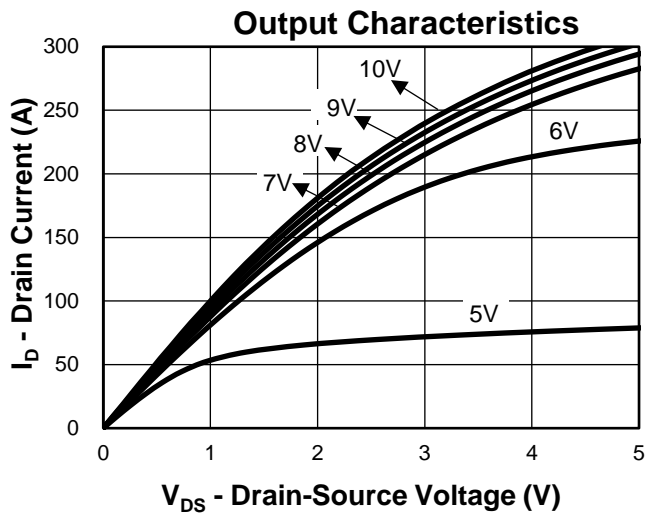


1st Line: Kwansemi LOGO, Kwansemi Code(KS)  
2nd Line: Part Number(C2010T)  
3rd Line: Lot Number(YWWXXX)

### Typical Characteristics

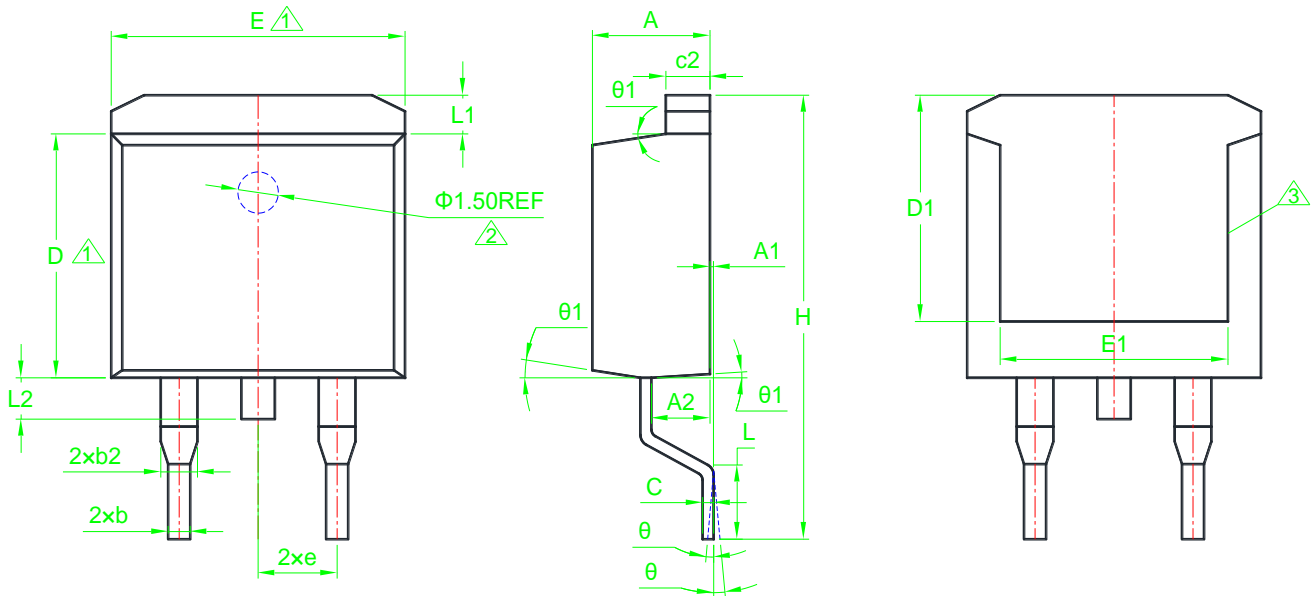


### Typical Characteristics



Package Information

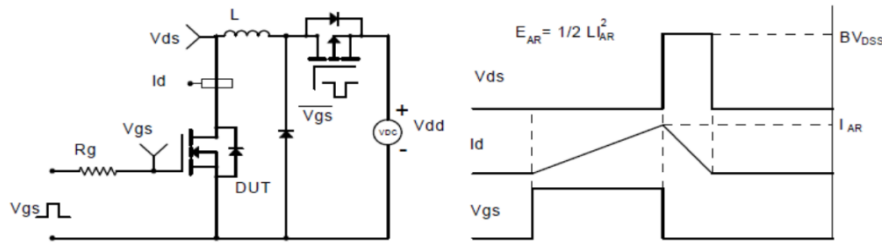
TO-263



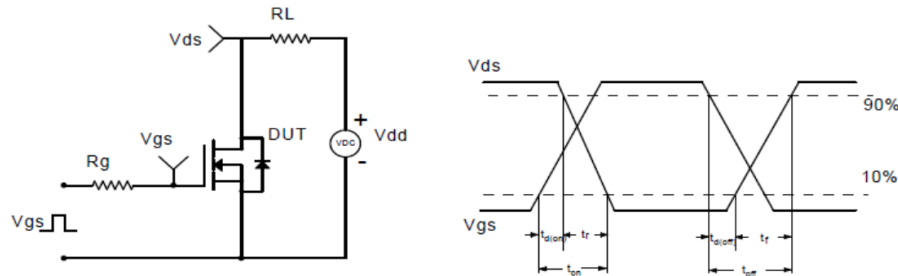
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.50	4.80	0.169	0.177	0.189	e	2.54BSC			0.100BSC		
A1	0.00	0.10	0.25	0.000	0.004	0.010	E	9.90	10.10	10.30	0.390	0.398	0.406
A2	2.20	*	2.80	0.087	*	0.110	E1	7.00	*	8.50	0.276	*	0.335
b	0.70	0.85	0.95	0.028	0.033	0.037	H	14.80	*	15.70	0.583	*	0.618
b2	1.15	*	1.47	0.045	*	0.058	L	2.10	*	2.79	0.083	*	0.110
c	0.38	*	0.65	0.015	*	0.026	L1	1.10	*	1.42	0.043	*	0.056
c2	1.20	1.30	1.40	0.047	0.051	0.055	L2	1.00	*	1.70	0.039	*	0.067
D	8.40	8.90	9.40	0.331	0.350	0.370	theta	0°	*	8°	0°	*	8°
D1	7.10	*	8.20	0.280	*	0.323	theta 1	3°	*	9°	3°	*	9°

- ① Dimensions D and E do not include mold flash protrusions or gate burrs.
- ② The existence and size of demolding hole are variable depending on mold.
- ③ The size and shape of exposed pad are variable depending on mold.

### Avalanche Test Circuit and Waveforms



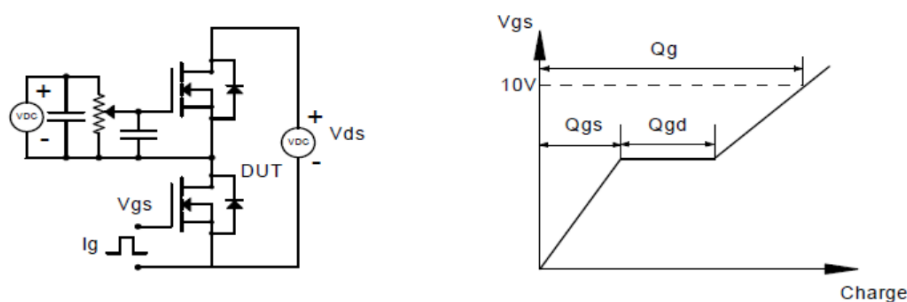
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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