

### Features

- 250V/90A,  
 $R_{DS(on)} = 18m\Omega(Typ.)@V_{GS}=10V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- 100% Avalanche Tested
- Good Thermal Performance

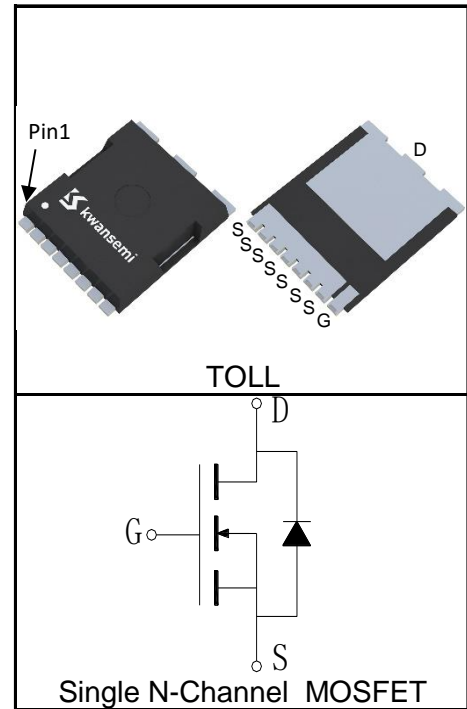
### Applications

- Motor Control
- Battery Power Management



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	250	V
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	
$T_{Jmax}$	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	$T_C=25^\circ\text{C}$ 90	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 360	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_C=25^\circ\text{C}$ 90	A
		$T_C=100^\circ\text{C}$ 63	
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 468	W
		$T_C=100^\circ\text{C}$ 234	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.32	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	40	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	900	mJ

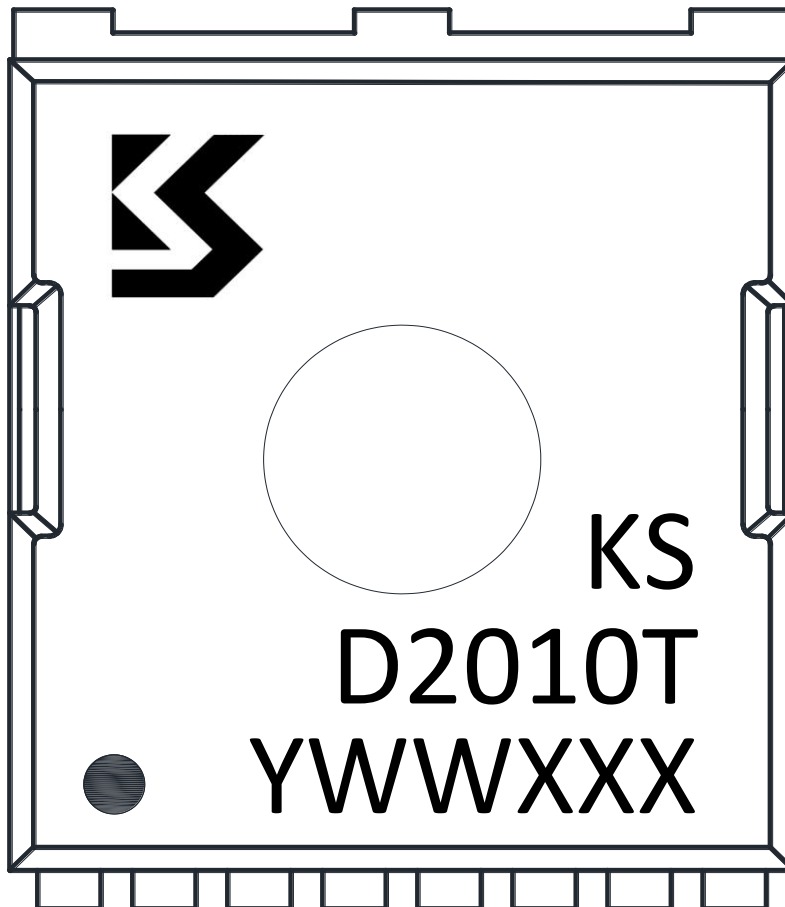
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KSD2010LAT			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	250			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=250V, V_{GS}=0V$			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	$V_{GS}=\pm 30V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		18	22	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.75	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		55		ns
$Q_{rr}$	Reverse Recovery Charge			138		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.2		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=125V,$ Frequency=1.0MHz		10315		pF
$C_{oss}$	Output Capacitance			270		
$C_{rss}$	Reverse Transfer Capacitance			20		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=125V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=3\Omega$		15		ns
$t_r$	Turn-on Rise Time			39		
$t_{d(OFF)}$	Turn-off Delay Time			54		
$t_f$	Turn-off Fall Time			28		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=125V, V_{GS}=10V,$ $I_{DS}=40A$		139		nC
$Q_{gs}$	Gate-Source Charge			52		
$Q_{gd}$	Gate-Drain Charge			27		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - 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  $T_J = 25^\circ\text{C}$ ,  $I_{ASmax} = 60A$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 48V$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 10V$ . Part not recommended for use above this value. 100% Final Test at  $I_{AS} = 42A$ ,  $L = 0.5\text{mH}$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

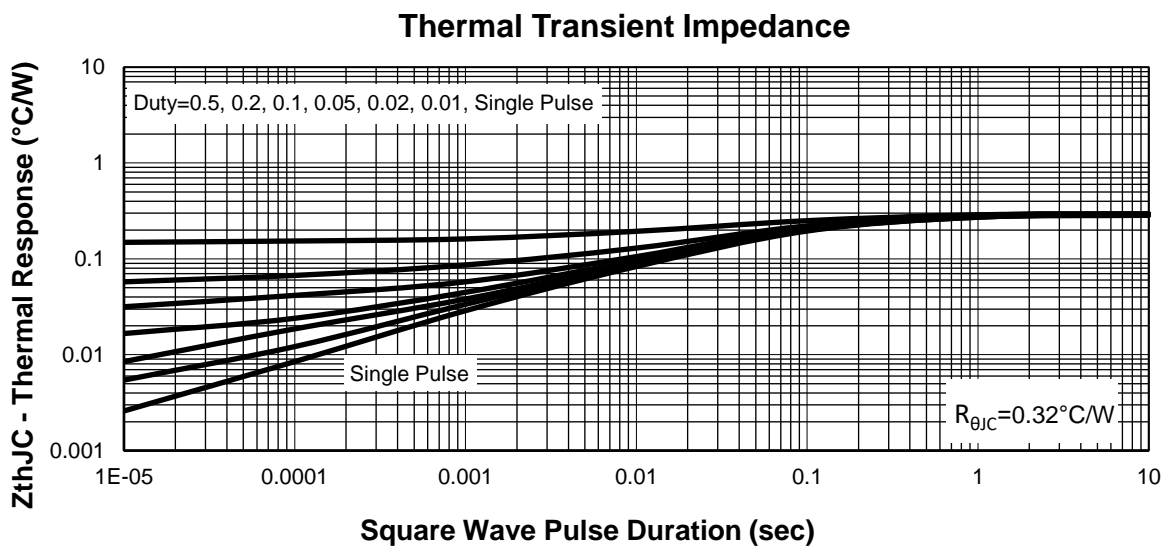
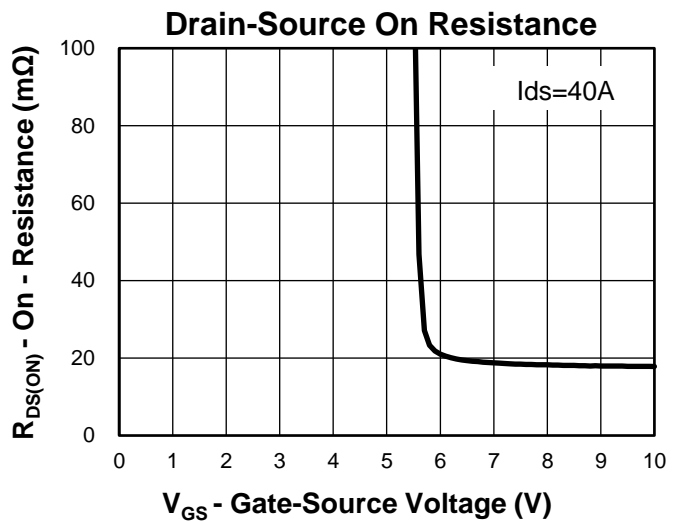
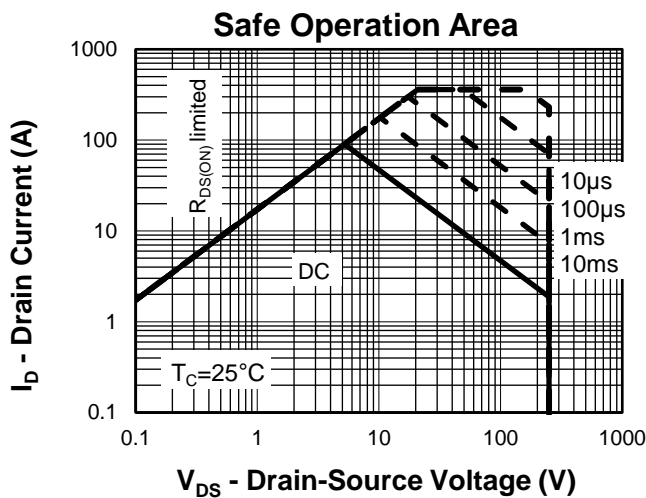
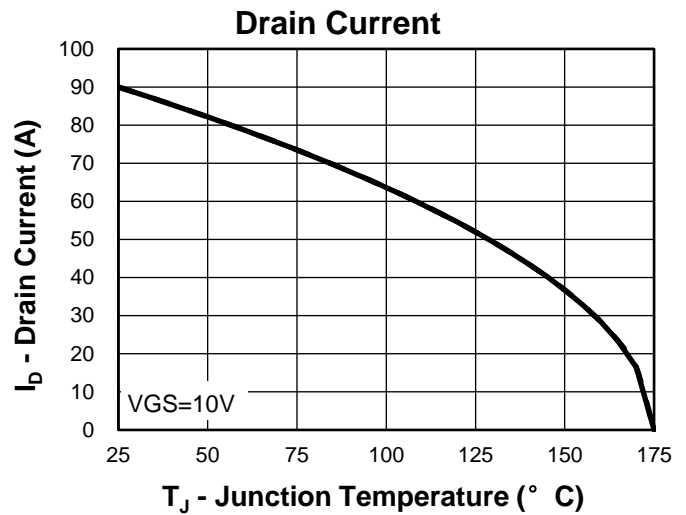
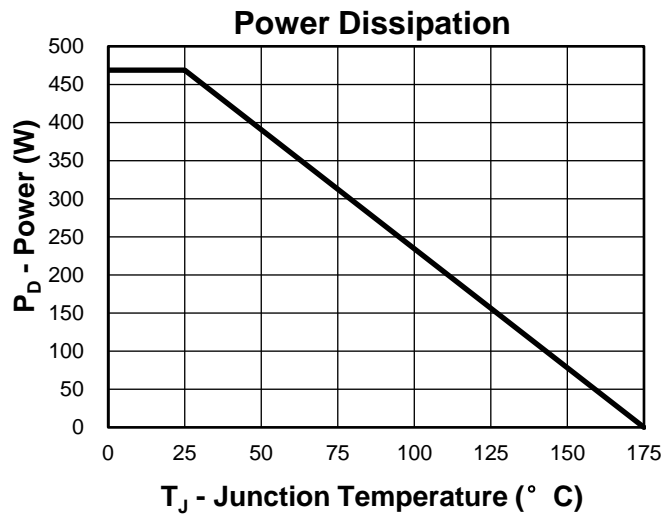
**Ordering and Marking Information**

Device	Package	Packaging	Quantity	Reel Size	Tape width
KSD2010LAT	TOLL	Tape&Reel	2000	13"	24mm

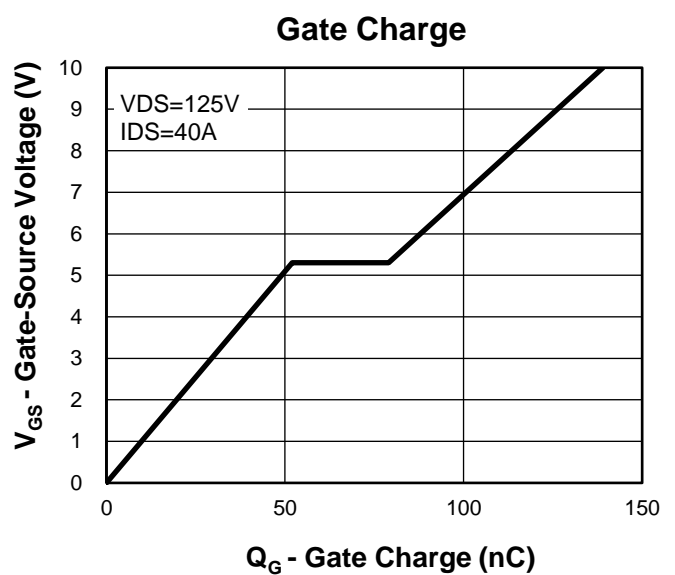
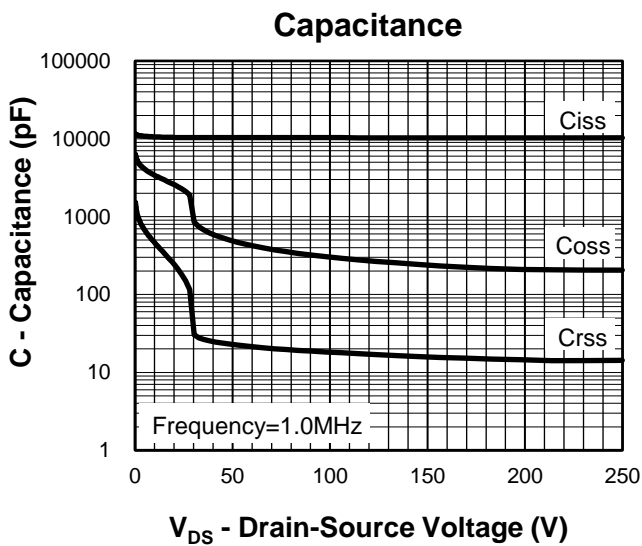
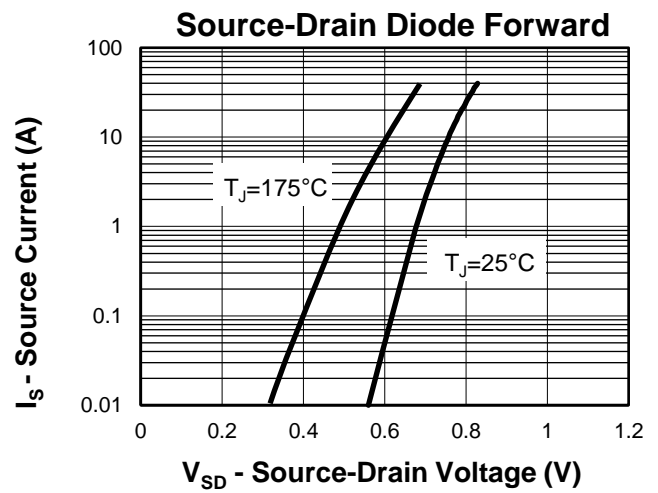
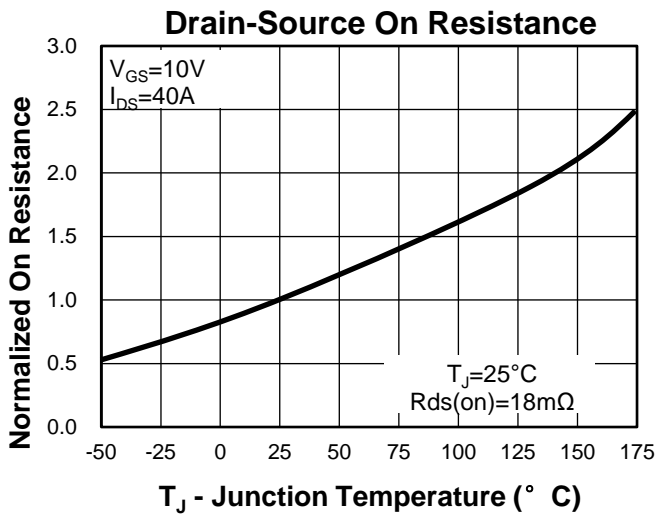
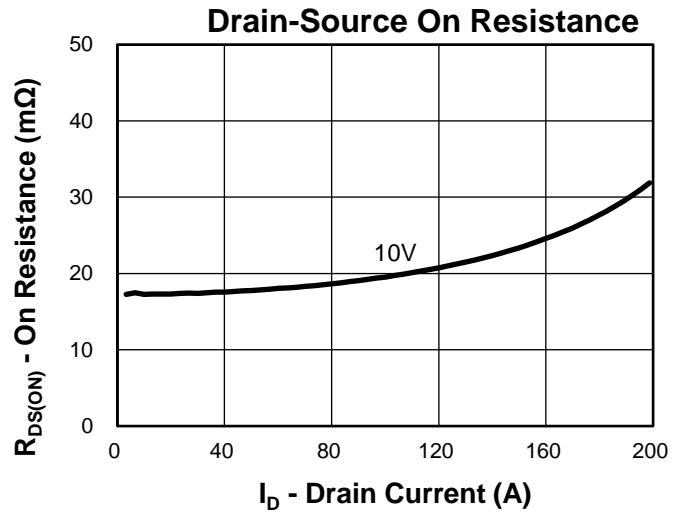
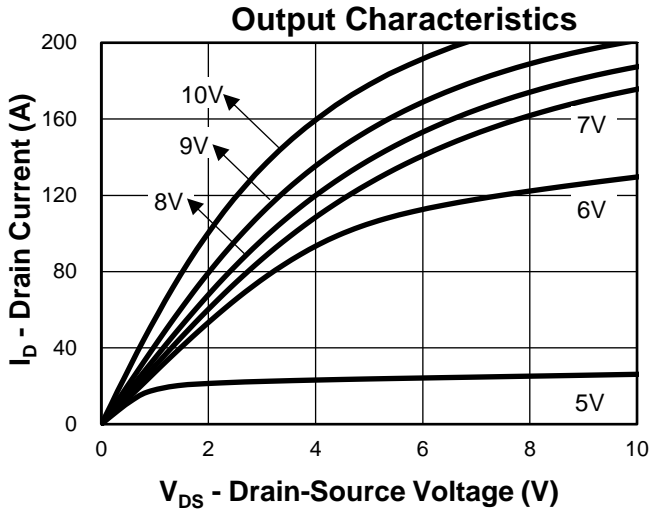


- 1st Line: Kwansemi LOGO
- 2nd Line: Kwansemi Code(KS)
- 3rd Line: Part Number(D2010T)
- 4th Line: Lot Number(YWWXXX)

### Typical Characteristics

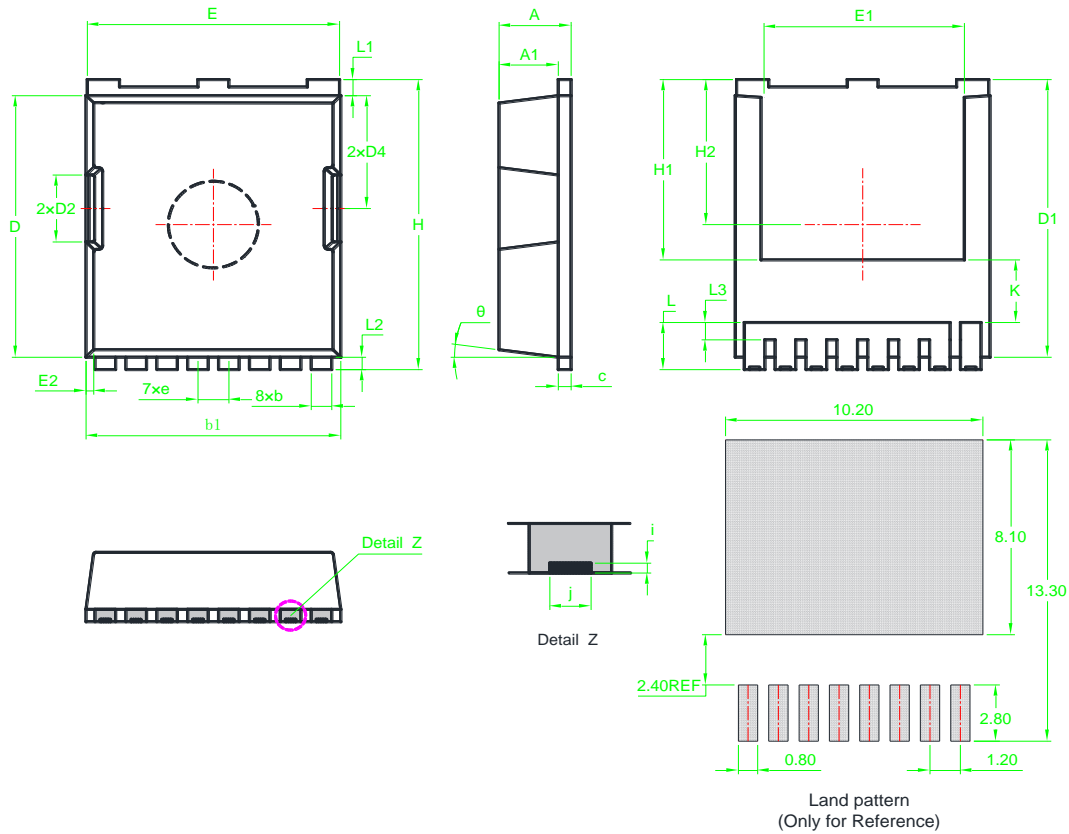


### Typical Characteristics



Package Information

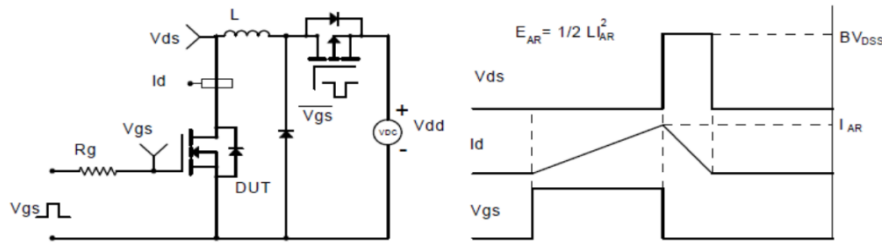
TOLL



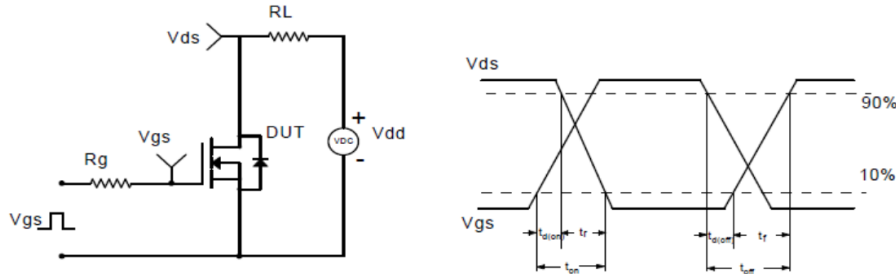
SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	2.20	2.30	2.40	0.087	0.091	0.094	e	1.20BSC			0.047REF		
A1	1.70	1.80	1.90	0.067	0.071	0.075	H	11.58	11.68	11.78	0.455906	0.459843	0.46378
b	0.65	*	0.90	0.026	*	0.035	H1	6.95BSC			0.274BSC		
b1	9.80	9.90	10.00	0.386	0.390	0.394	H2	5.90BSC			0.232BSC		
c	0.40	0.50	0.60	0.016	0.020	0.024	i	0.10REF			0.004REF		
D	10.28	10.38	10.48	0.405	0.409	0.413	j	0.40REF			0.016REF		
D1	10.98	11.08	11.28	0.432	0.436	0.444	K	3.0REF			0.118REF		
D2	3.20	3.30	3.40	0.126	0.130	0.134	L	1.60	*	2.10	0.063	*	0.083
D4	4.45	4.55	4.65	0.175	0.179	0.183	L1	0.60	0.70	0.80	0.024	0.028	0.031
E	9.80	9.90	10.00	0.386	0.390	0.394	L2	0.50	0.60	0.70	0.020	0.024	0.028
E1	8.00	8.10	8.20	0.315	0.319	0.323	L3	0.40	*	0.80	0.016	*	0.031
E2	0.30	*	0.80	0.012	*	0.031	θ	10° REF			10° REF		

Note: Dimensions do not inclusive burrs and mold flash.

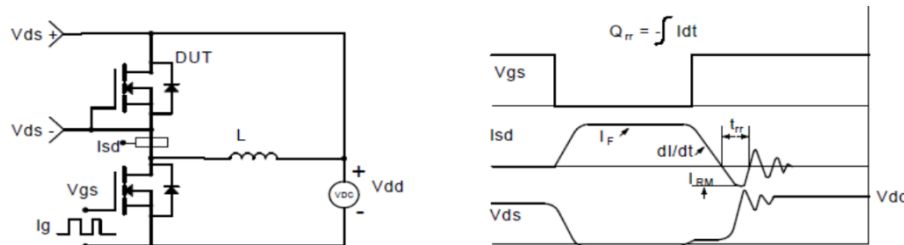
### Avalanche Test Circuit and Waveforms



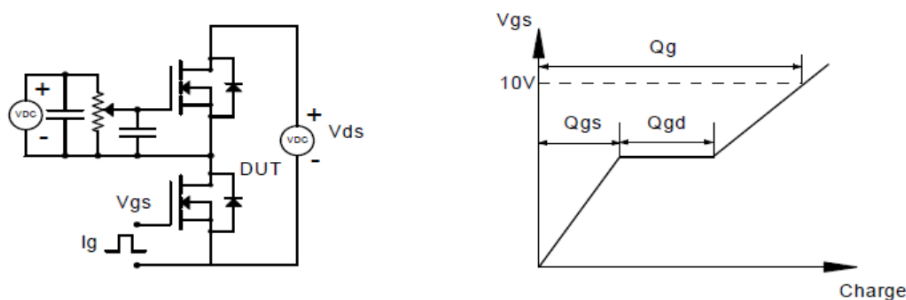
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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