

Features

- 100V/350A,
 $R_{DS(ON)} = 1.6m\Omega(Typ.)@V_{GS}=10V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- 100% Avalanche Tested
- Good Thermal Performance

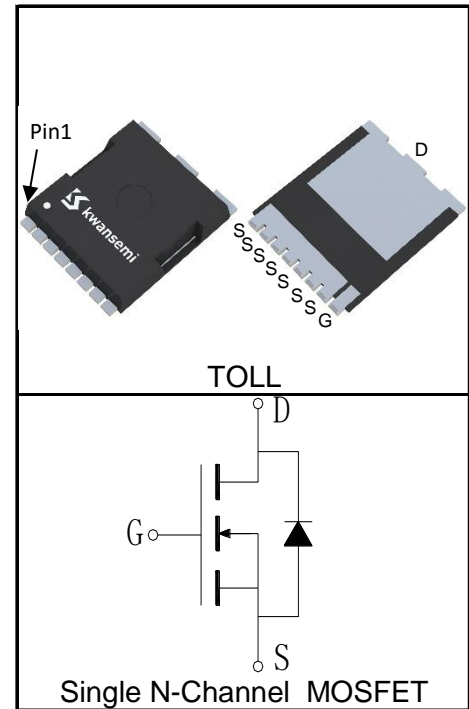
Applications

- Motor Control
- Battery Power Management



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 350	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 1400	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$ 350	A
		$T_C=100^\circ\text{C}$ 248	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 500	W
		$T_C=100^\circ\text{C}$ 250	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.3	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	40	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	625	mJ

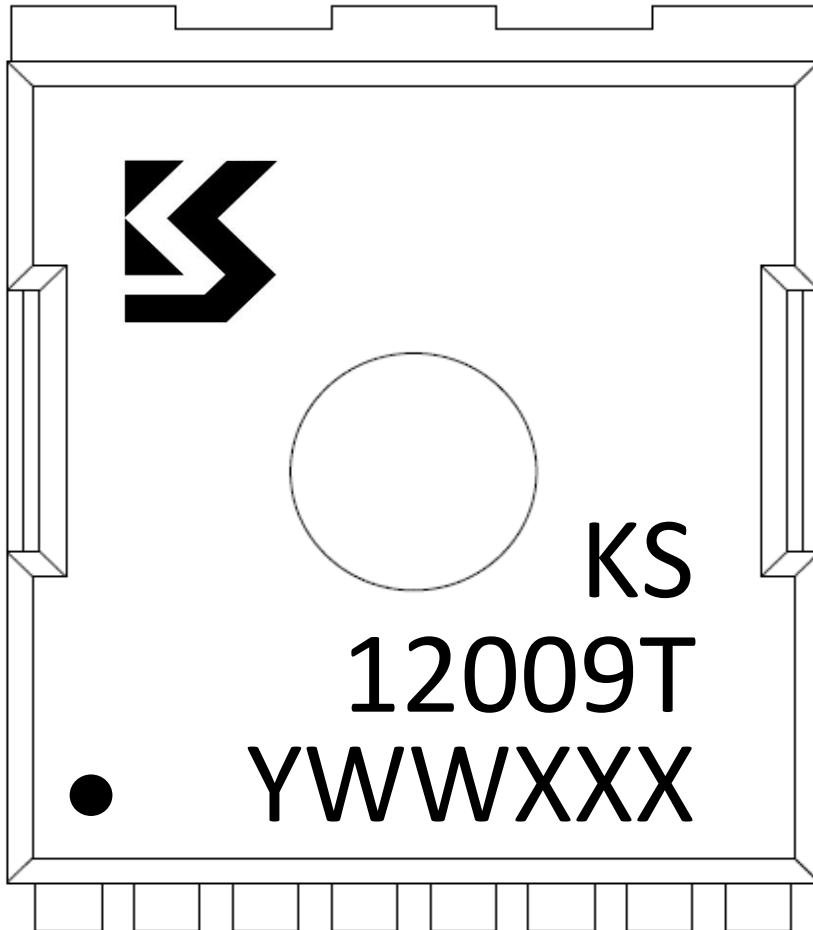
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS12009LAT			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$			1	μA
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		1.6	2.1	m Ω
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$		0.79	1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		80		ns
Q_{rr}	Reverse Recovery Charge			177		nC
Dynamic Characteristics ⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.9		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=50V,$ Frequency=1.0MHz		12210		pF
C_{oss}	Output Capacitance			2100		
C_{riss}	Reverse Transfer Capacitance			135		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=50V, I_{DS}=40A,$ $V_{GEN}=10V, R_G=3\Omega$		32		ns
t_r	Turn-on Rise Time			44		
$t_{d(OFF)}$	Turn-off Delay Time			118		
t_f	Turn-off Fall Time			53		
Gate Charge Characteristics ⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V,$ $I_{DS}=40A$		172		nC
Q_{gs}	Gate-Source Charge			48		
Q_{gd}	Gate-Drain Charge			39		

- 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 $T_{Jmax}, I_{AS}=50A, L=0.5mH, V_{DD}=48V, R_G=25\Omega$, Starting $T_J=25^\circ C$, 100% tested and guaranteed.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

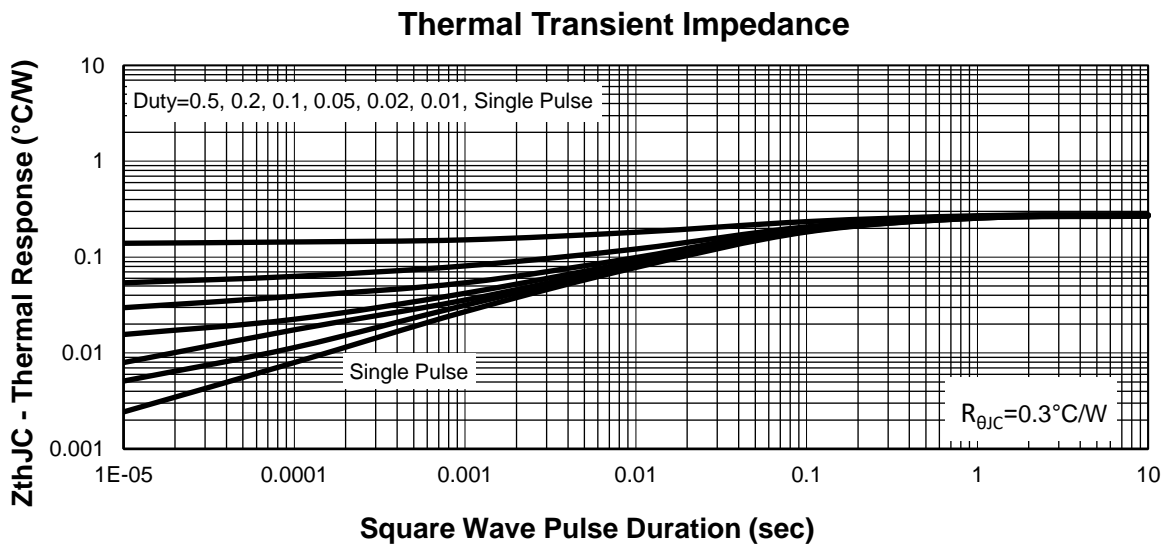
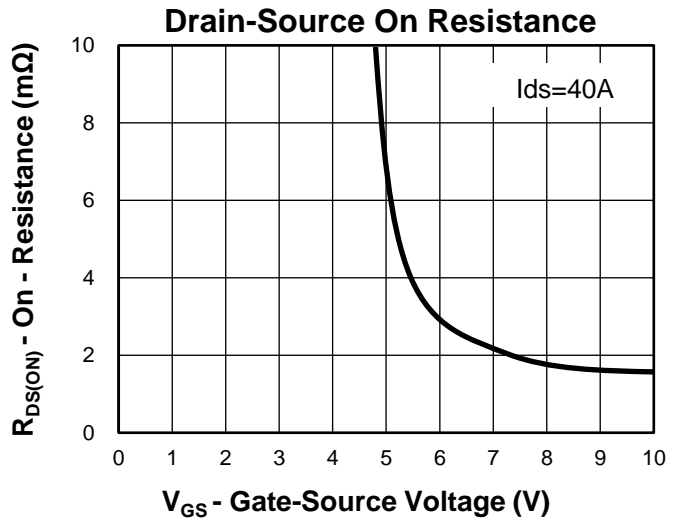
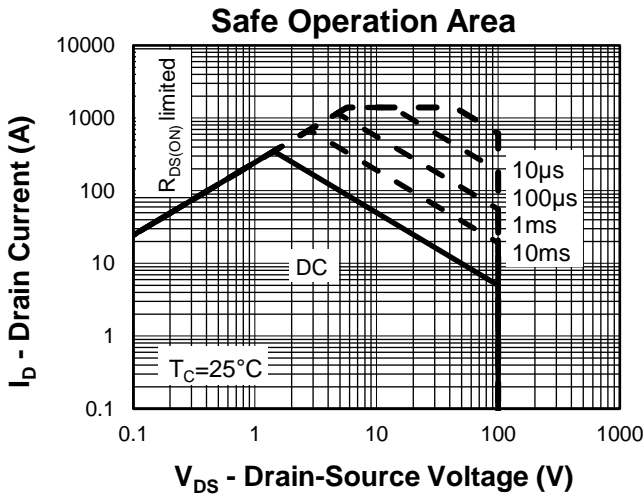
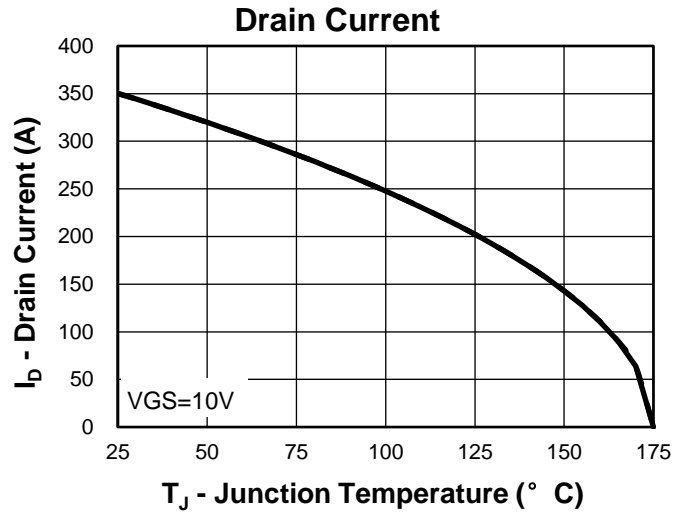
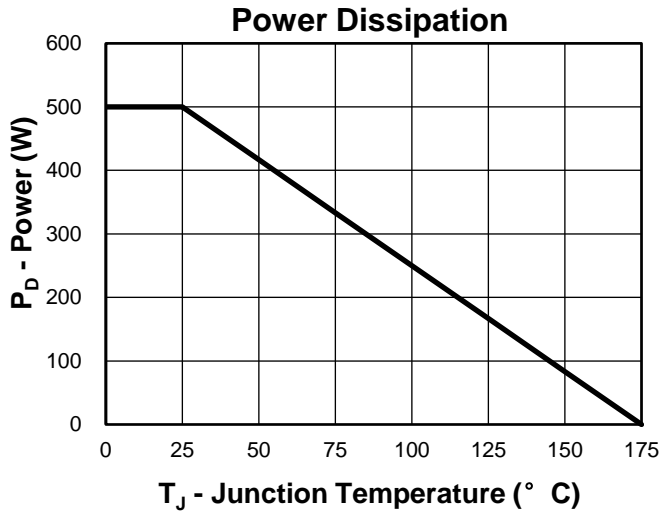
Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS12009LAT	TOLL	Tape&Reel	2000	13"	24mm

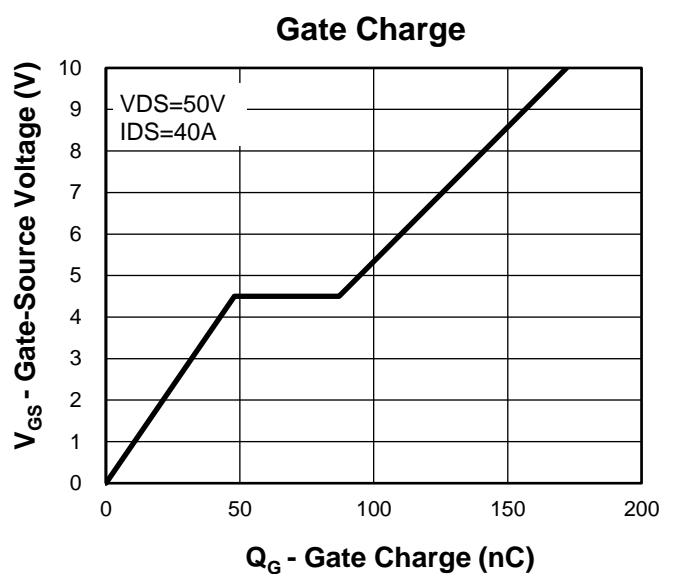
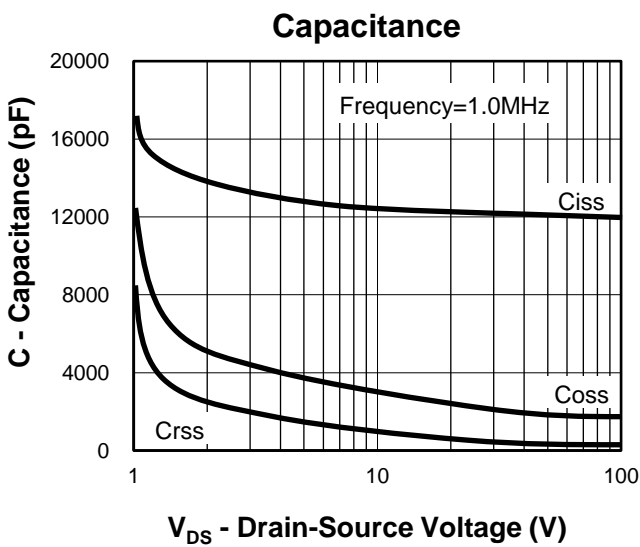
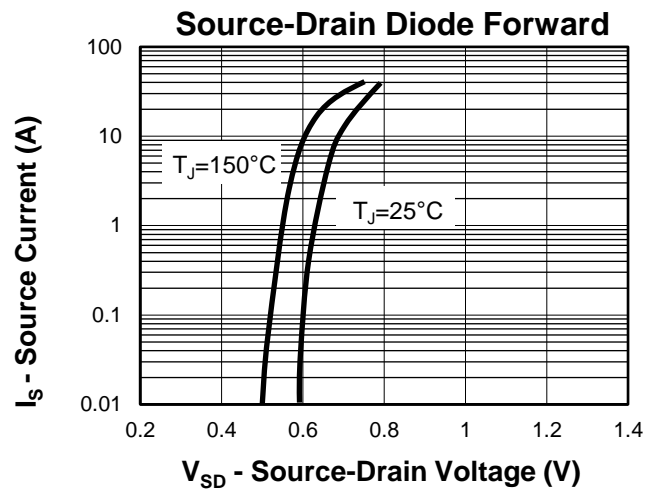
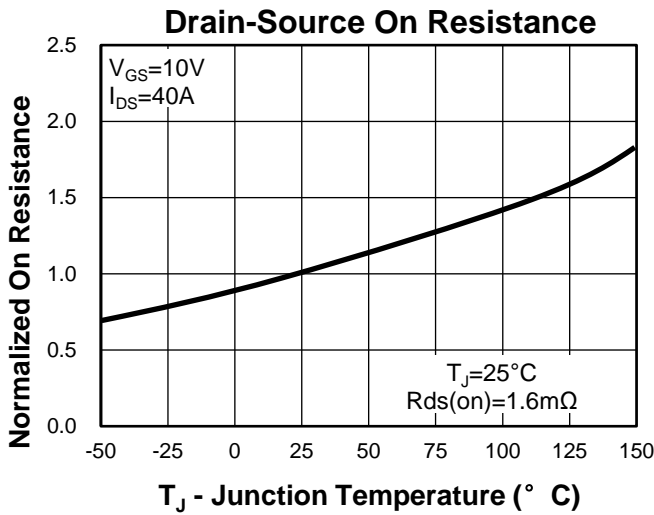
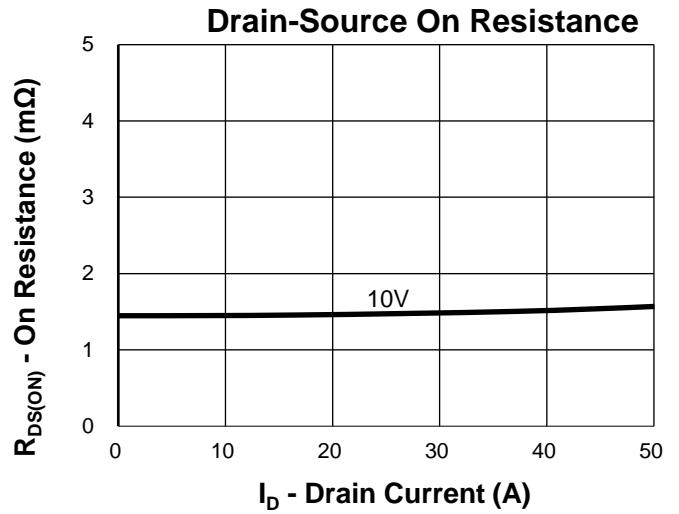
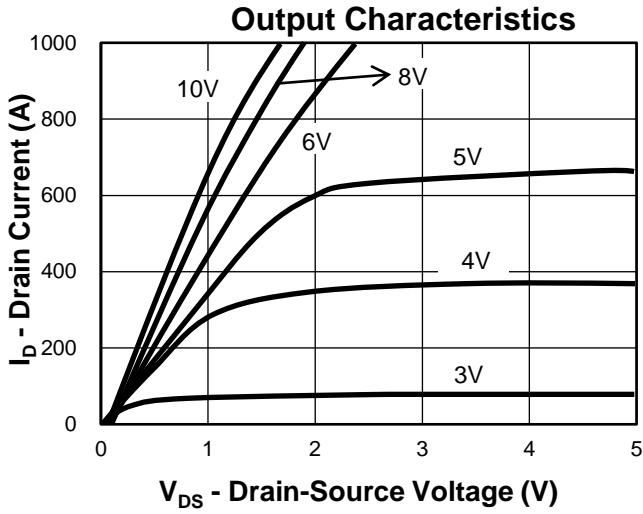


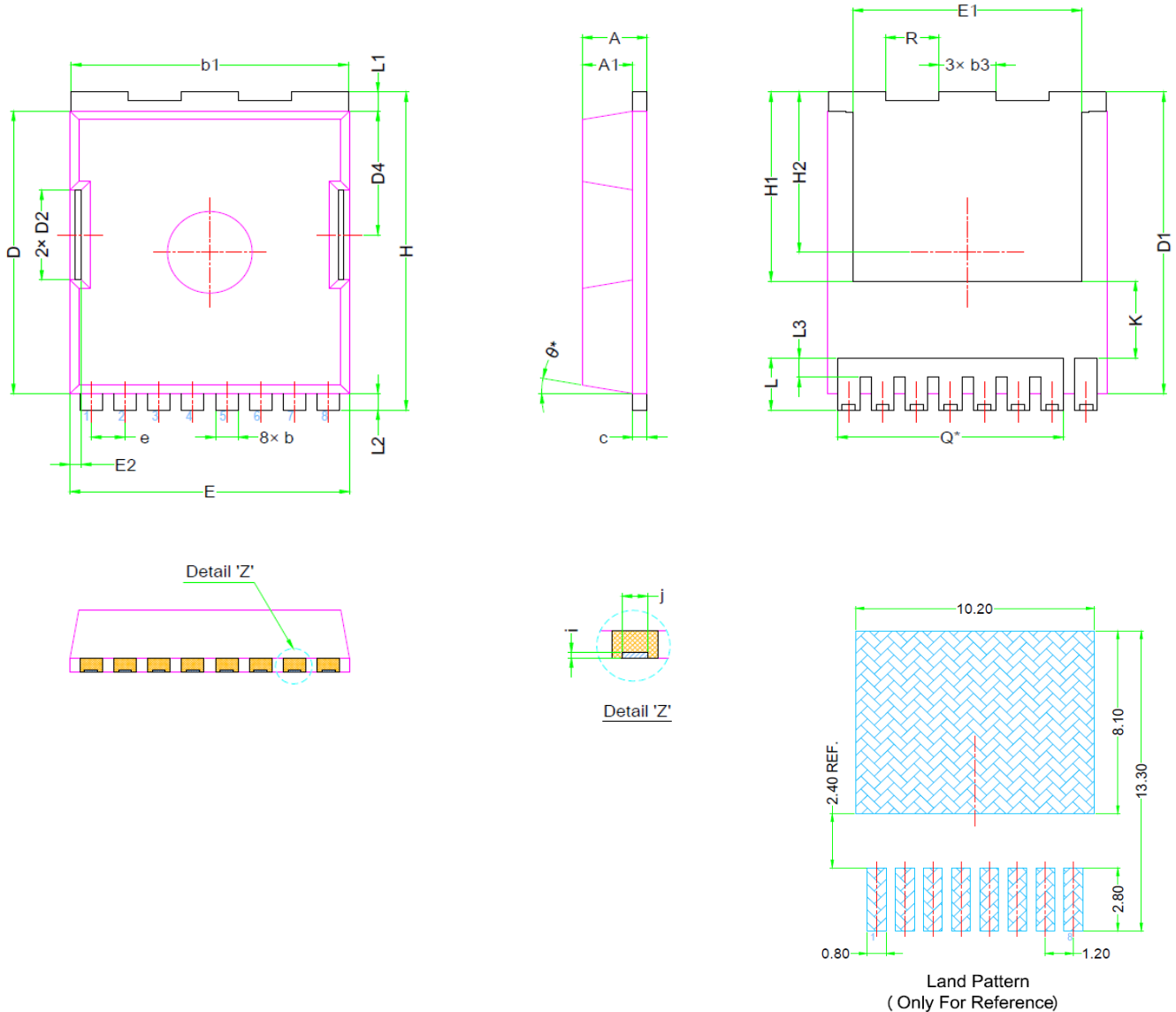
- 1st Line: Kwansemi LOGO
- 2nd Line: Kwansemi Code(KS)
- 3rd Line: Part Number(12009T)
- 4th Line: Lot Number(YWWXXX)

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	H	11.58	11.68	11.80	0.456	0.460	0.465
A1	1.70	1.80	1.90	0.067	0.071	0.075	H1	6.95BSC			0.274BSC		
b	0.65	0.80	0.90	0.026	0.031	0.035	H2	5.89BSC			0.232BSC		
b1	9.70	9.80	9.90	0.382	0.386	0.390	i	0.10REF			0.004REF		
b3	1.15	*	2.10	0.05	*	0.08	j	0.46REF			0.018REF		
c	0.40	0.50	0.60	0.016	0.020	0.024	K	3.10REF			0.122REF		
D	10.28	10.38	10.48	0.405	0.409	0.413	L	1.55	*	2.10	0.061	*	0.083
D1	10.98	11.08	11.20	0.432	0.436	0.441	L1	0.60	0.70	0.80	0.024	0.028	0.031
D2	3.20	3.30	3.40	0.126	0.130	0.134	L2	0.50	0.60	0.70	0.020	0.024	0.028
D4	4.45	4.55	4.65	0.175	0.179	0.183	L3	0.40	*	0.80	0.016	*	0.031
E	9.80	9.90	10.00	0.386	0.390	0.394	Q	6.80REF			0.268REF		
E1	8.00	8.10	8.20	0.315	0.319	0.323	R	1.80	*	3.15	0.07	*	0.12
E2	0.30	*	0.80	0.012	*	0.031	θ	10°REF			10°REF		
e	1.20BSC			0.047BSC									

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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