

Features

- -60V/-35A,
 $R_{DS(ON)} = 23m\Omega(Typ.)@V_{GS}=-10V$
 $R_{DS(ON)} = 30m\Omega(Typ.)@V_{GS}=-4.5V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

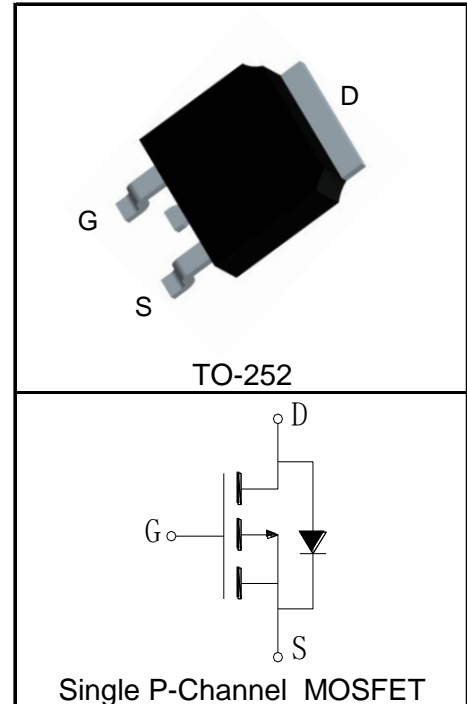
Applications

- Power Switching Appliaction
- Load Switching



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	-60	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	$T_C=25^\circ\text{C}$ -35	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ -140	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=-10V$)	$T_C=25^\circ\text{C}$ -35	A
		$T_C=100^\circ\text{C}$ -25	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 63	W
		$T_C=100^\circ\text{C}$ 31	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.4	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	90	mJ

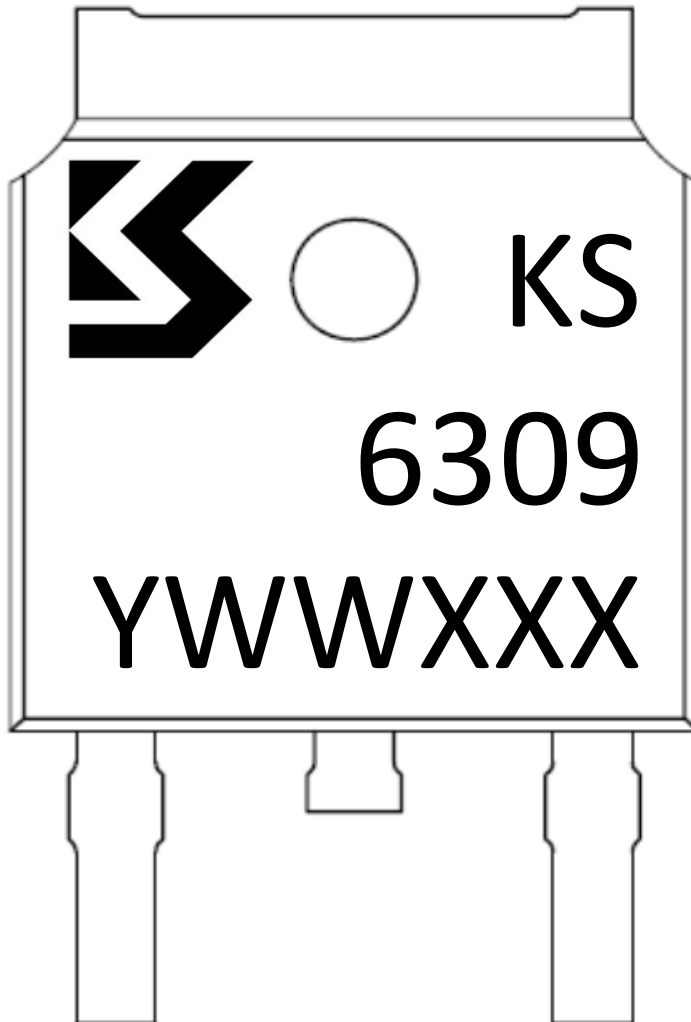
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS6309DA			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-60			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-60V, V_{GS}=0V$			-1	μA
		$T_J=125^\circ\text{C}$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1.2	-1.8	-2.4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-15A$		23	27	$m\Omega$
		$V_{GS}=-4.5V, I_{DS}=-10A$		30	40	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=-15A, V_{GS}=0V$		-0.86	-1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=-15A, dI_{SD}/dt=-100A/\mu s$		53		ns
Q_{rr}	Reverse Recovery Charge			94		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		6.4		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-30V,$ Frequency=1.0MHz		2215		pF
C_{oss}	Output Capacitance			145		
C_{rss}	Reverse Transfer Capacitance			80		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-30V, I_{DS}=-15A,$ $V_{GEN}=-10V, R_G=3\Omega$		30		ns
t_r	Turn-on Rise Time			38		
$t_{d(OFF)}$	Turn-off Delay Time			54		
t_f	Turn-off Fall Time			23		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=-30V, V_{GS}=-10V,$ $I_{DS}=-15A$		48		nC
Q_{gs}	Gate-Source Charge			9		
Q_{gd}	Gate-Drain Charge			12		

- 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} , $I_{AS} = -19A$, $L=0.5\text{mH}$, $V_{DD} = -30V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

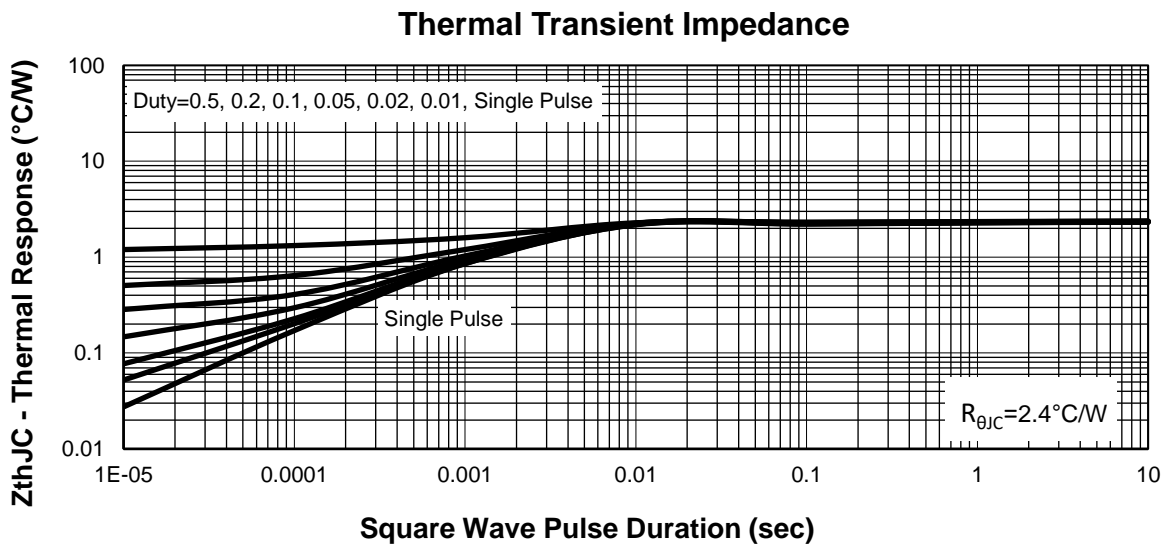
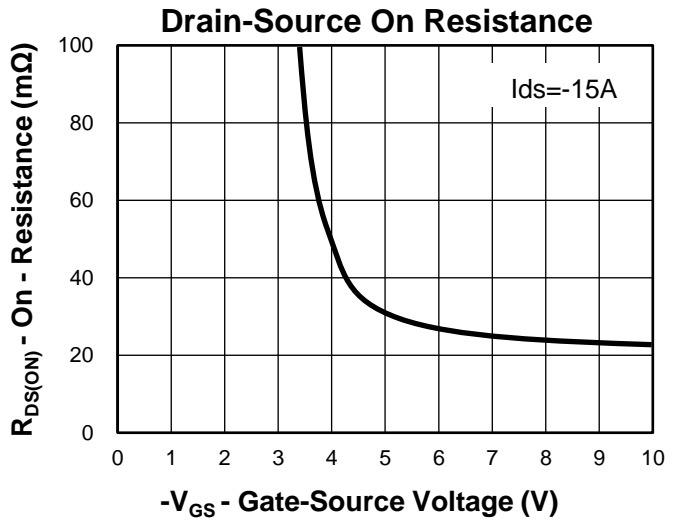
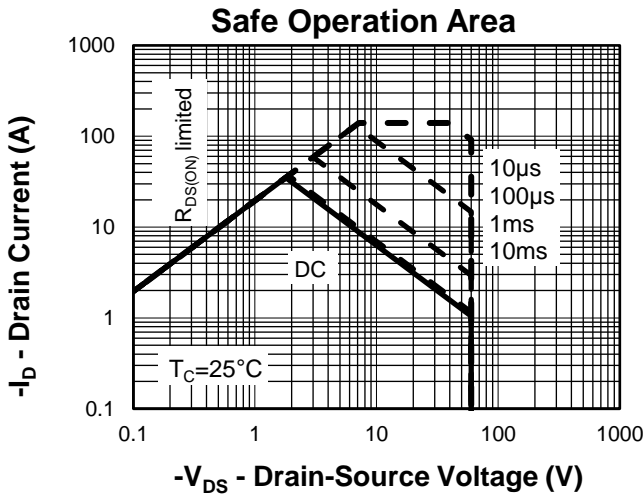
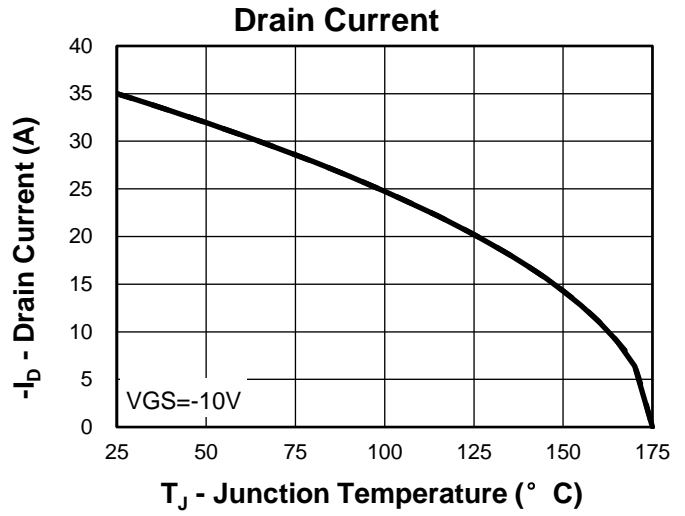
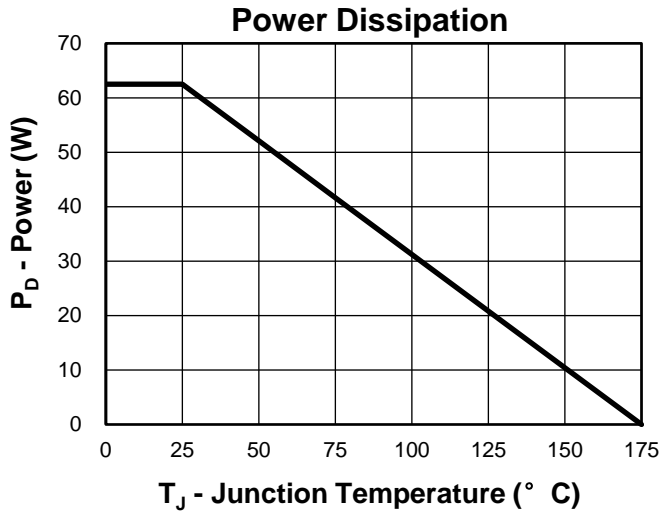
Ordering and Marking Information

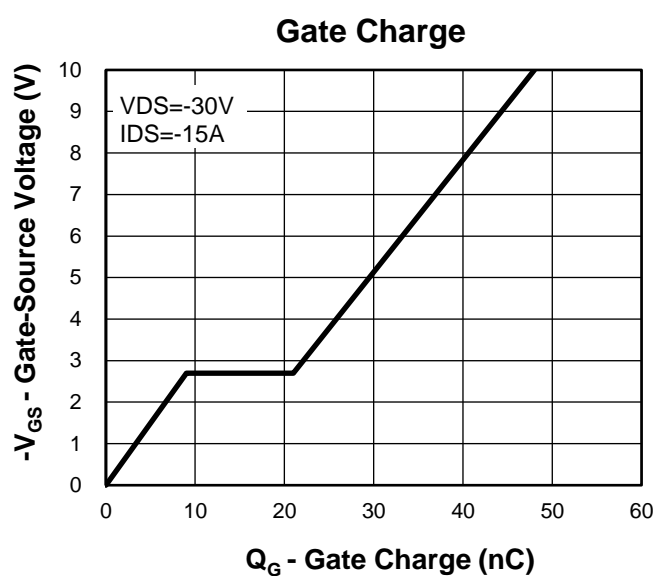
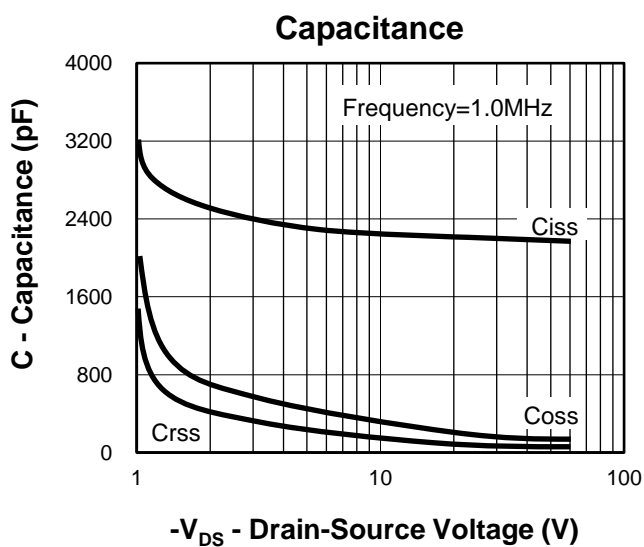
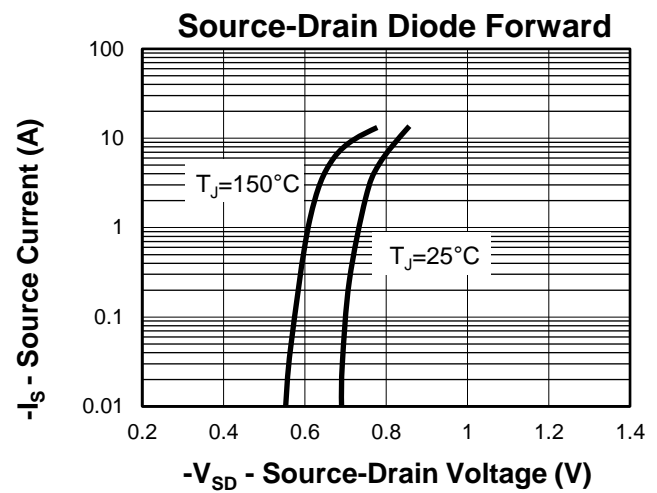
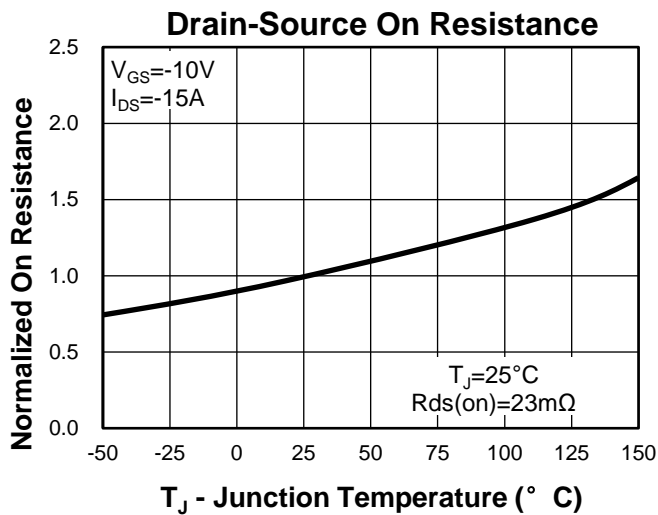
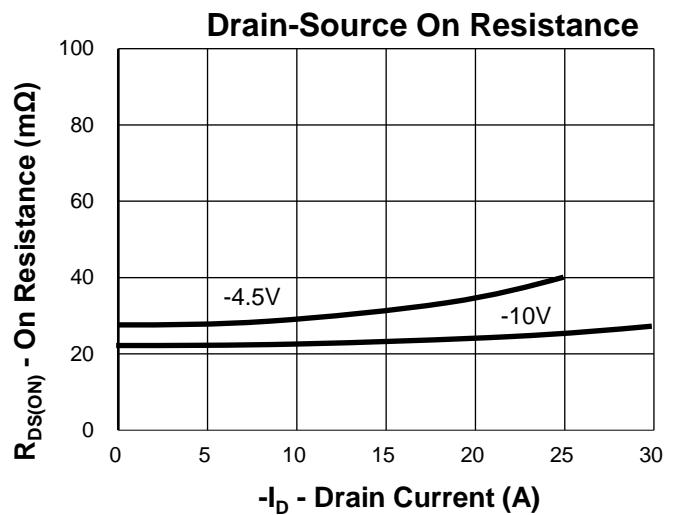
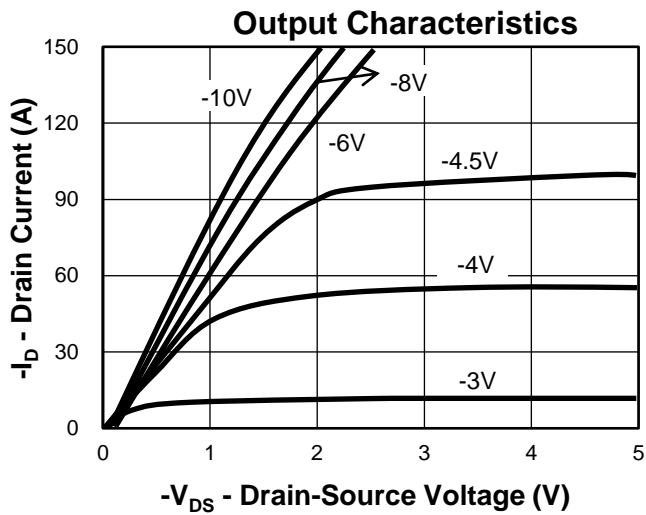
Device	Package	Packaging	Quantity	Reel Size	Tape width
KS6309DA	TO-252	Tape&Reel	2500	13"	16mm

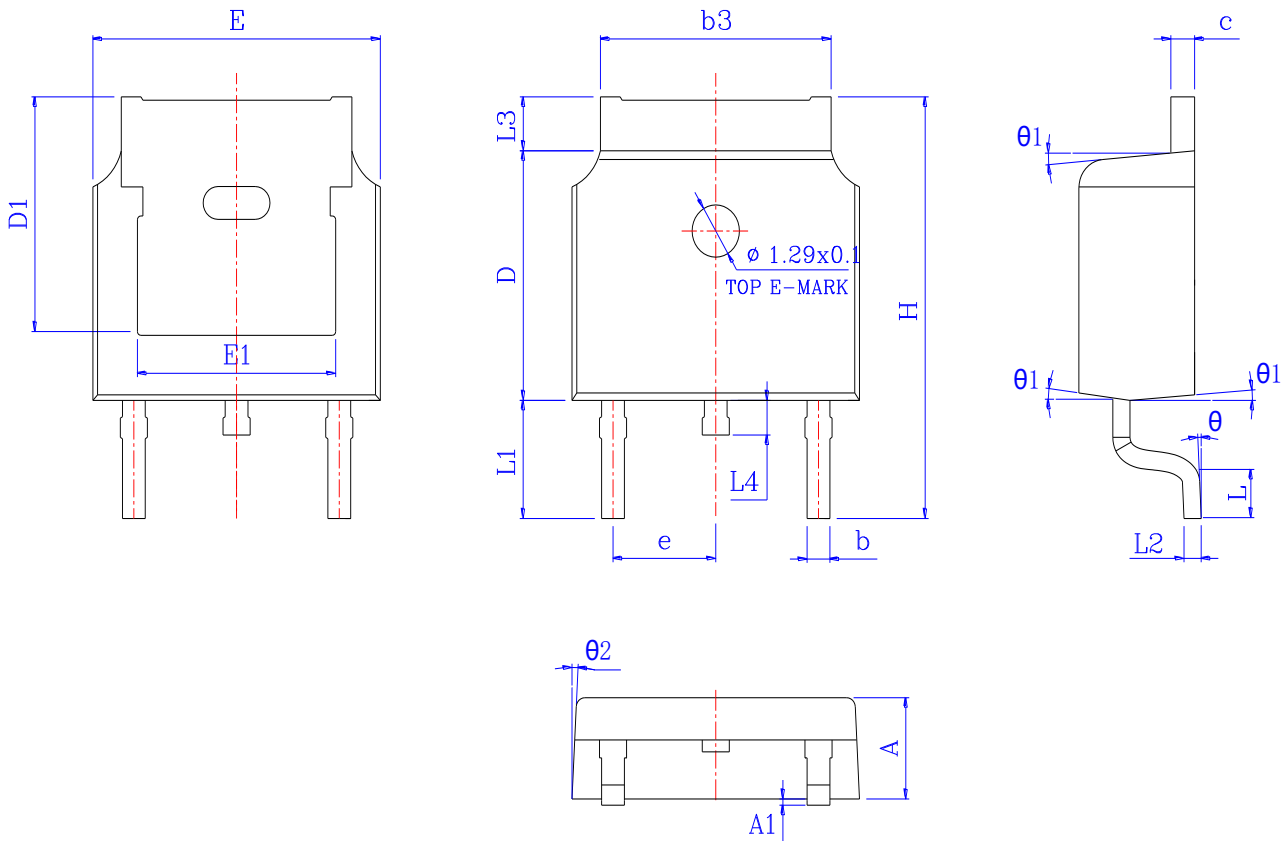


1st Line: Kwansemi LOGO, Kwansemi Code(KS)
2nd Line: Part Number(6309)
3rd Line: Lot Number(YWWXXX)

Typical Characteristics

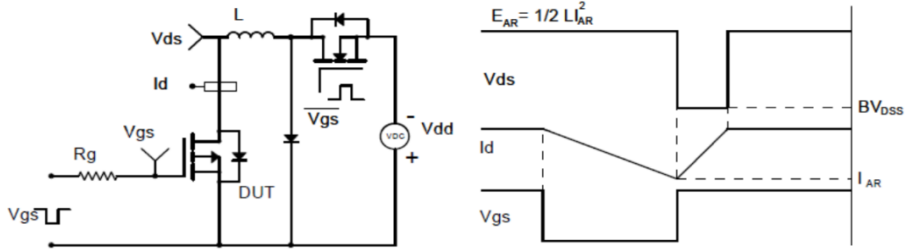


Typical Characteristics


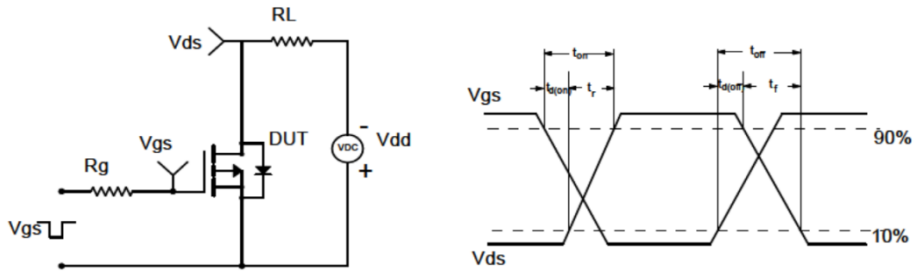
Package Information
TO-252


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.200	2.300	2.400	0.087	0.091	0.094
A1	*	*	0.100	*	*	0.004
b	0.660	0.760	0.860	0.026	0.030	0.034
b3	5.130	5.295	5.460	0.202	0.208	0.215
c	0.470	0.535	0.600	0.019	0.021	0.024
D	6.000	6.100	6.200	0.236	0.240	0.244
D1	5.30 REF			0.20 REF		
E	6.500	6.600	6.700	0.256	0.260	0.264
E1	4.700	*	*	0.185	*	*
e	2.28 REF			0.09 REF		
H	9.800	10.100	10.400	0.386	0.398	0.409
L	1.400	1.550	1.700	0.055	0.061	0.067
L1	2.743 REF			0.108 REF		
L2	0.510 BSC			0.020 BSC		
L3	0.900	1.075	1.250	0.035	0.042	0.049
L4	0.600	0.800	1.000	0.024	0.031	0.039
θ	0°	*	8°	0°	*	8°
θ_1	5°	7°	9°	5°	7°	9°
θ_2	5°	7°	9°	5°	7°	9°

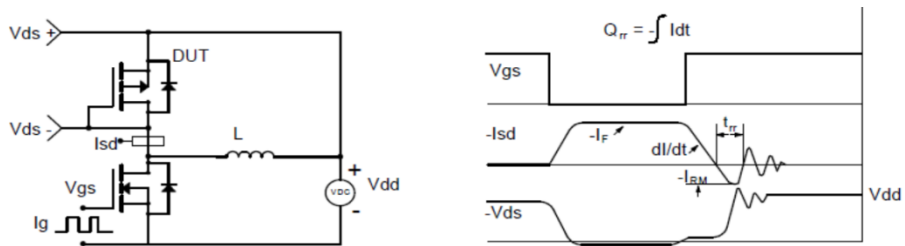
Avalanche Test Circuit and Waveforms



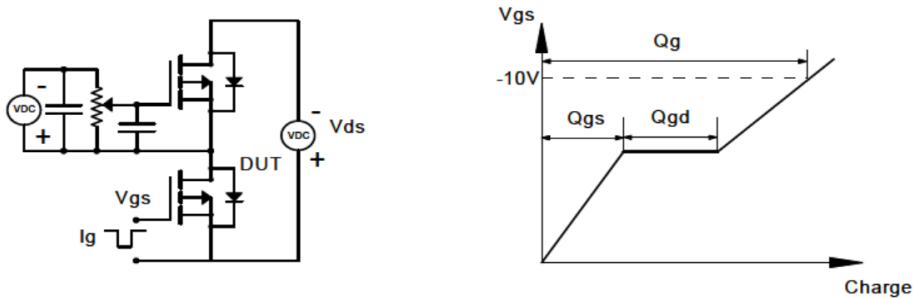
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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