

## Features

- -16V/-12A,  
 $R_{DS(ON)} = 10\text{m}\Omega(\text{Typ.})@V_{GS}=-4.5\text{V}$   
 $R_{DS(ON)} = 14\text{m}\Omega(\text{Typ.})@V_{GS}=-2.5\text{V}$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

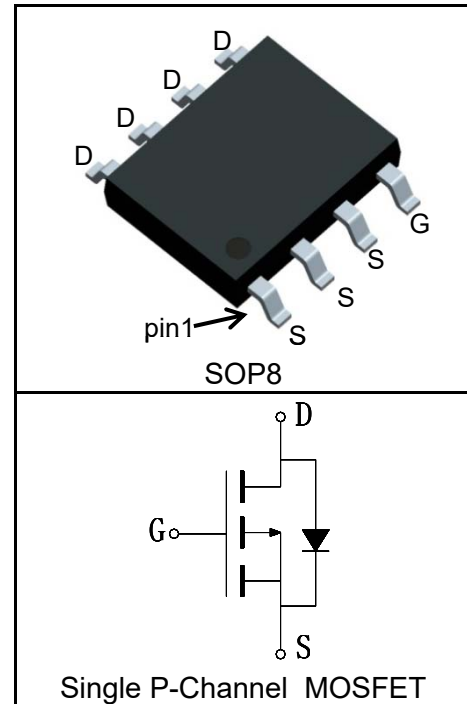
## Applications

- Load Switch
- PWM Applications
- Power Management



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_A=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	-16	V
$V_{GSS}$	Gate-Source Voltage	$\pm 10$	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_A=25^\circ\text{C}$ -2.6	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{(1)}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ -48	A
$I_D^{(2)}$	Continuous Drain Current( $V_{GS}=-4.5\text{V}$ )	$T_A=25^\circ\text{C}$ -12	A
		$T_A=70^\circ\text{C}$ -9.6	
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2.5	W
		$T_A=70^\circ\text{C}$ 1.6	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	25	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	TBD	mJ

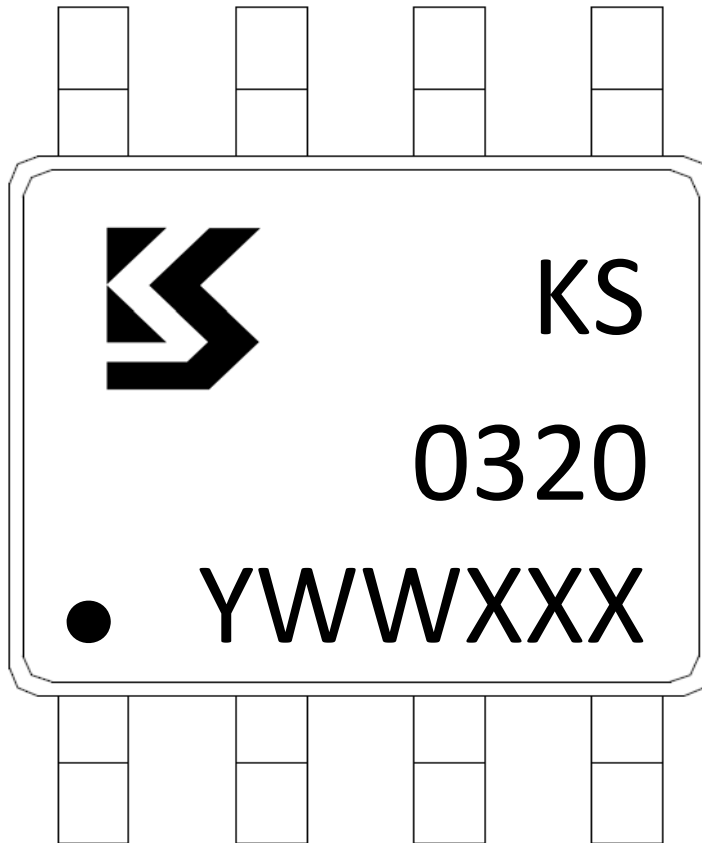
**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS0320HA			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-16	-18		V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-12V, V_{GS}=0V$			-1	$\mu A$
		$T_J=125^{\circ}\text{C}$			-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.4	-0.7	-1.1	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_{DS}=-10A$		10	16	$m\Omega$
		$V_{GS}=-2.5V, I_{DS}=-5A$		14	22	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=-8A, V_{GS}=0V$		-0.85	-1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-8A, di_{SD}/dt=-100A/\mu s$		15		ns
$Q_{rr}$	Reverse Recovery Charge			36		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	$V_{GS}=0V,$ $V_{DS}=-8V,$ Frequency=1.0MHz		1890		pF
$C_{oss}$	Output Capacitance			265		
$C_{rss}$	Reverse Transfer Capacitance			180		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-8V, I_{DS}=-8A,$ $V_{GEN}=-4.5V, R_G=3\Omega$		11		ns
$t_r$	Turn-on Rise Time			18		
$t_{d(OFF)}$	Turn-off Delay Time			32		
$t_f$	Turn-off Fall Time			25		
<b>Gate Charge Characteristics</b> <sup>(6)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=-8V, V_{GS}=-4.5V,$ $I_{DS}=-8A$		18		nC
$Q_{gs}$	Gate-Source Charge			3		
$Q_{gd}$	Gate-Drain Charge			6		

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - 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  $T_J = 25^{\circ}\text{C}$ .
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

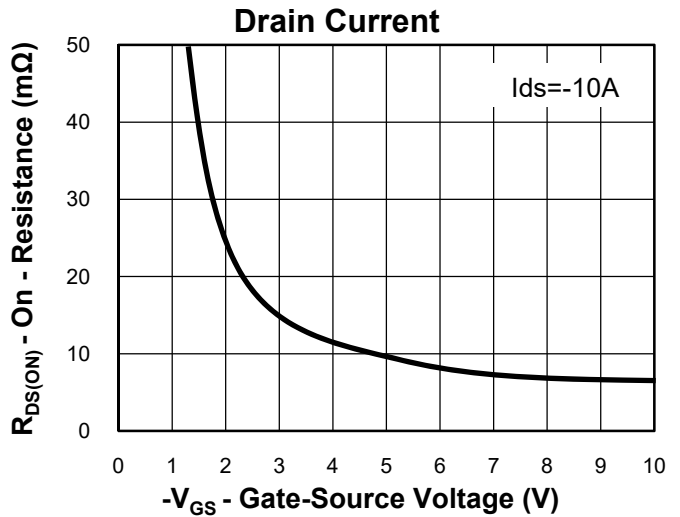
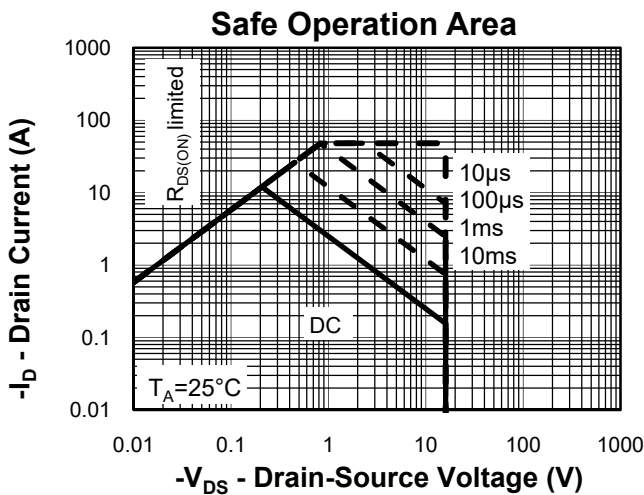
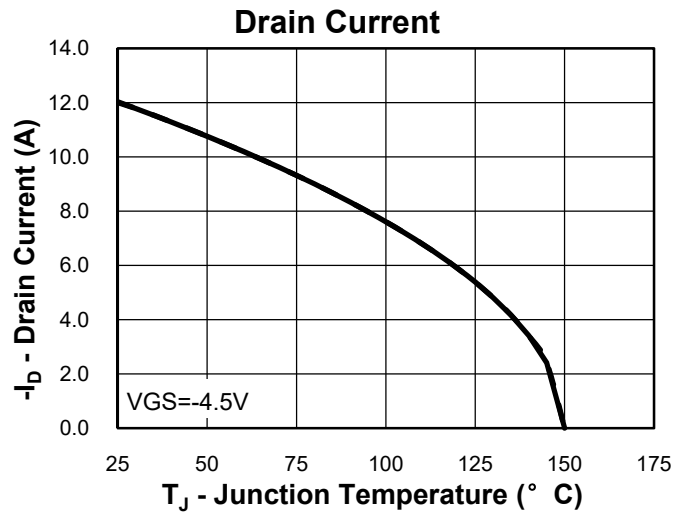
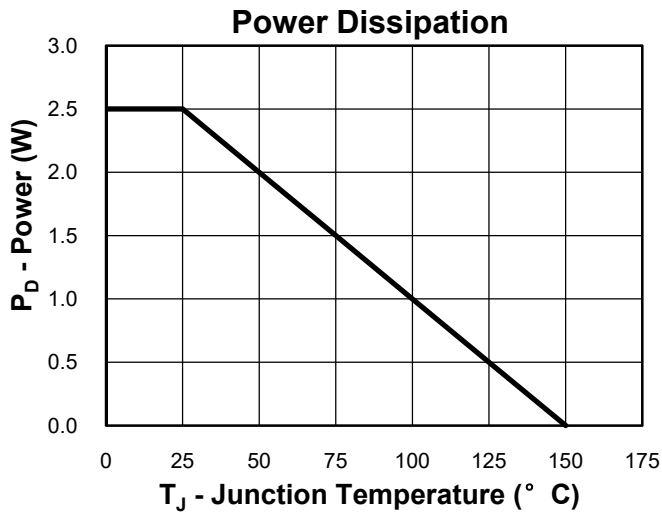
## Ordering and Marking Information

Device	Package	Packaging	Quantity	Reel Size	Tape width
KS0320HA	SOP8	Tape&Reel	3000	13"	12mm

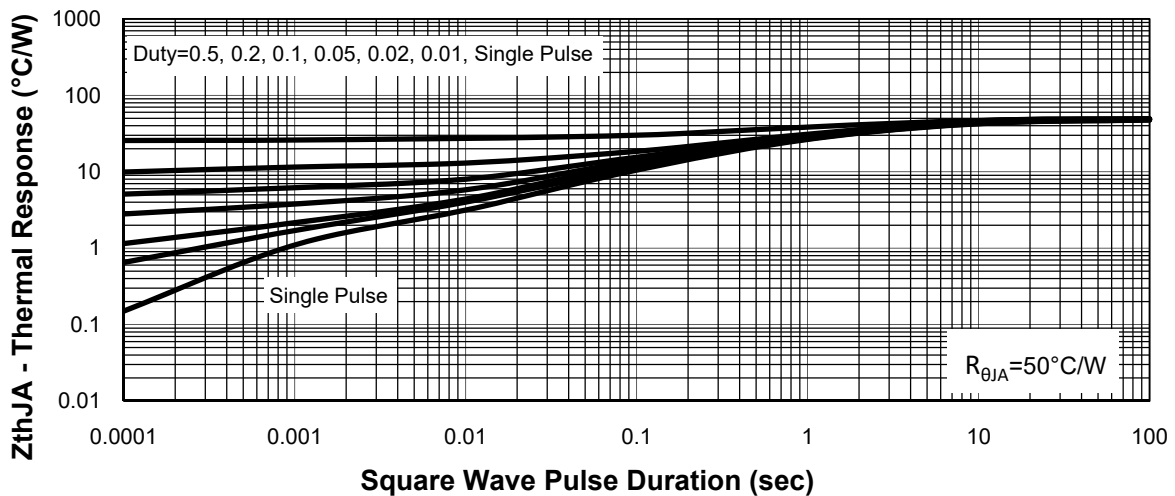


Y =Year,2017-A,2018-B,etc.  
WW =Week.  
XXX =Lot number.

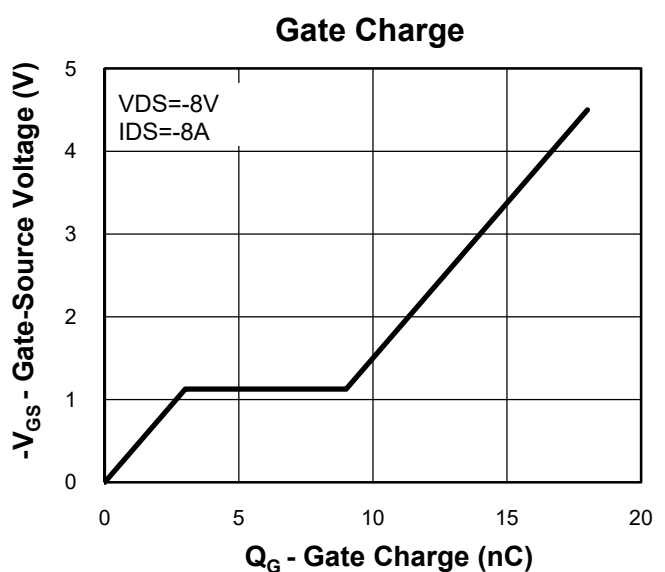
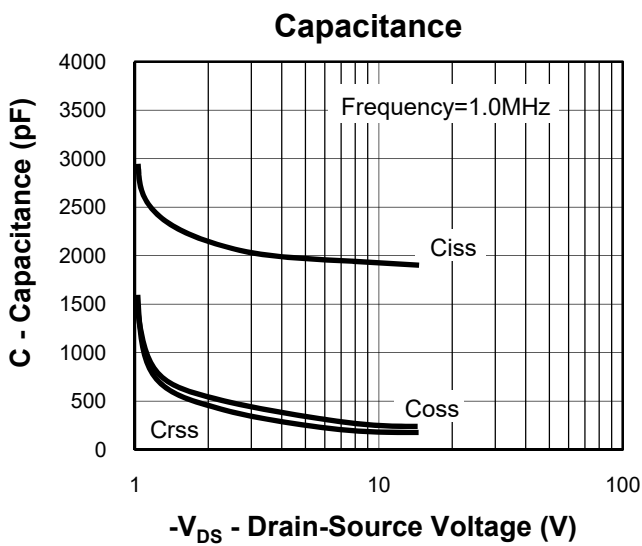
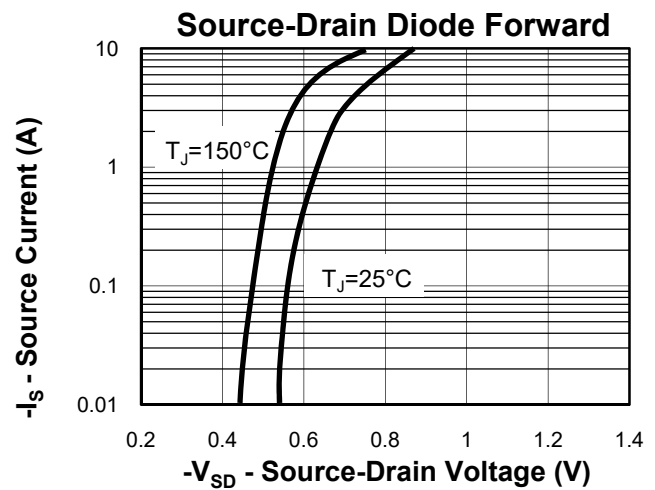
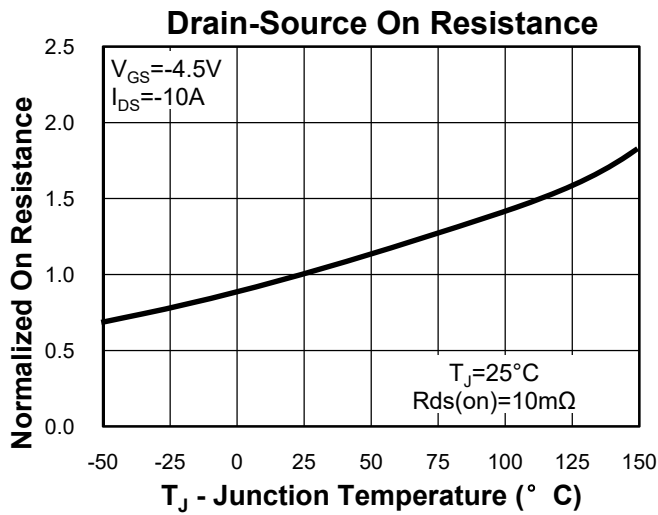
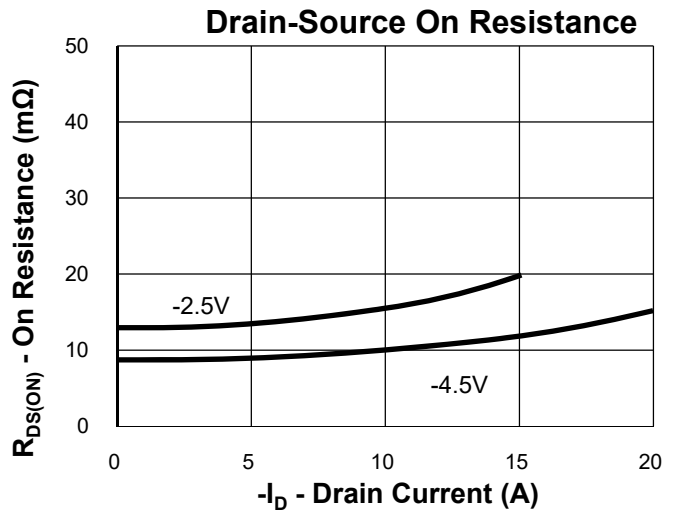
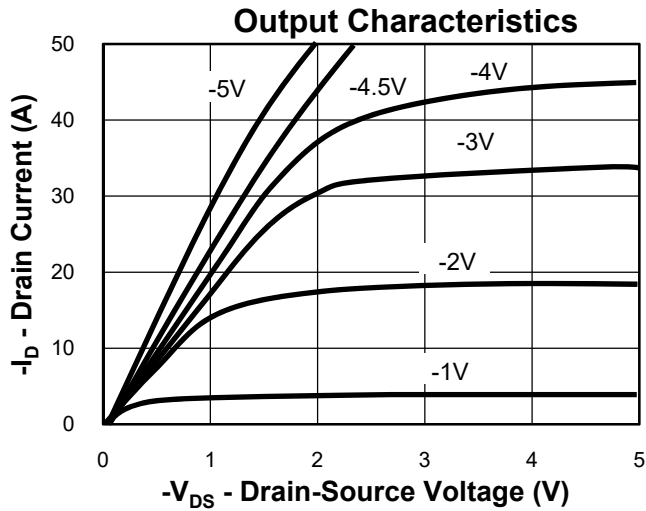
**Typical Characteristics**

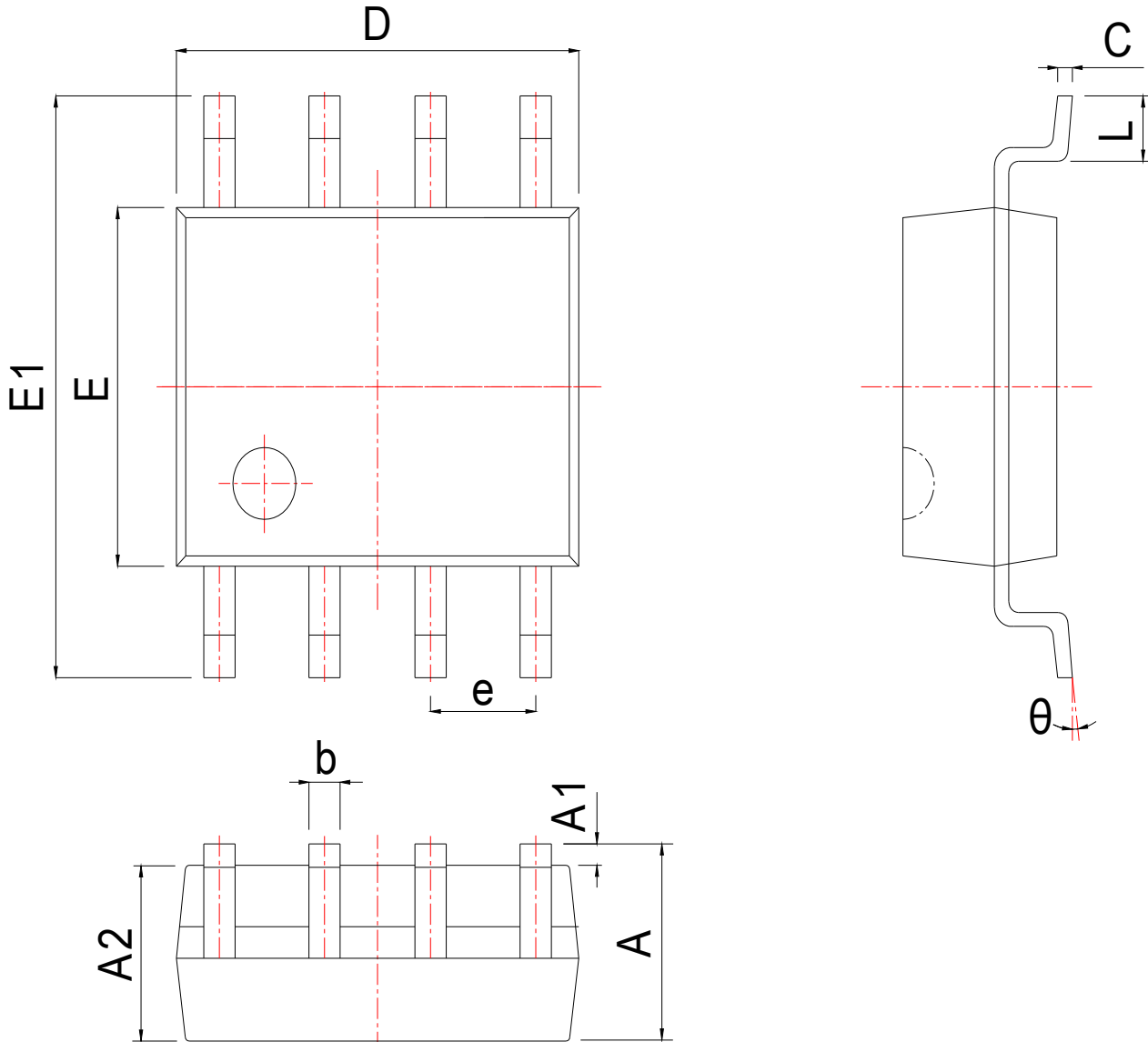


**Thermal Transient Impedance**



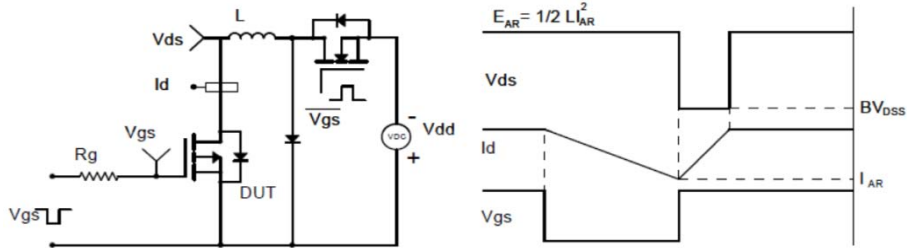
### Typical Characteristics



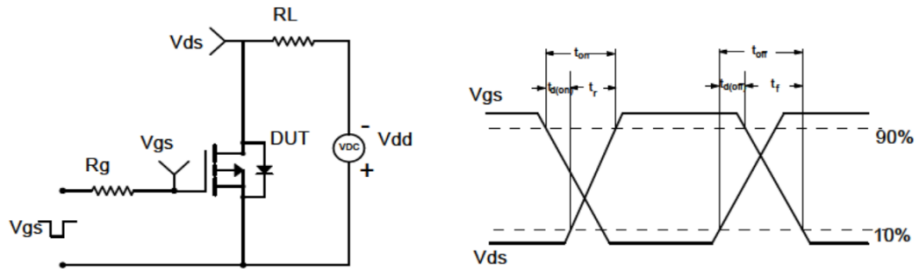
**Package Information**
**SOP8**


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.300	1.525	1.750	0.051	0.060	0.069
A1	0.050	0.150	0.250	0.002	0.006	0.010
A2	1.350	1.450	1.550	0.053	0.057	0.061
b	0.330	0.420	0.510	0.013	0.017	0.020
c	0.170	0.210	0.250	0.007	0.008	0.010
D	4.700	4.900	5.100	0.185	0.193	0.201
E	3.800	3.900	4.000	0.150	0.154	0.157
E1	5.800	6.000	6.200	0.228	0.236	0.244
e	1.270 BSC			0.050 BSC		
L	0.400	0.835	1.270	0.016	0.033	0.050
theta	0°		8°	0°		8°

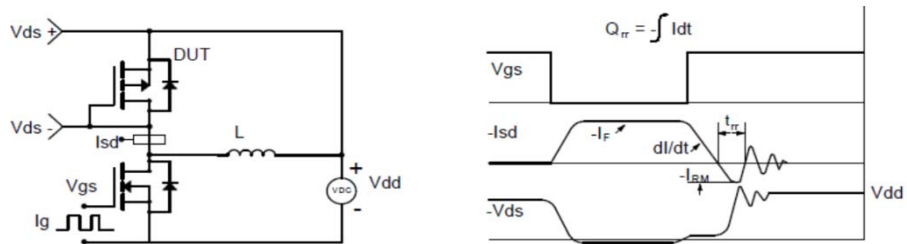
### Avalanche Test Circuit and Waveforms



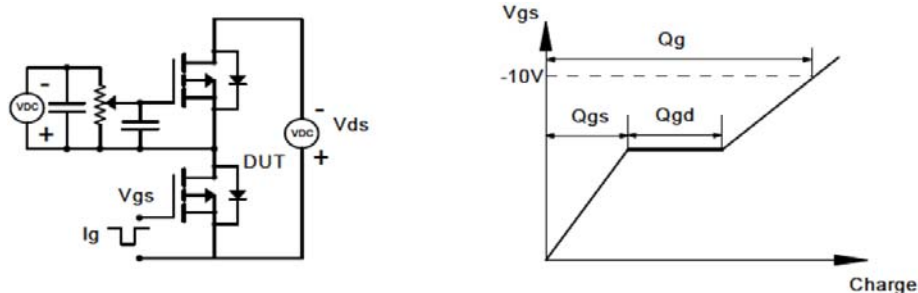
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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