

## Features

- 40V/9A,  
 $R_{DS(ON)} = 15m\Omega(Typ.)@V_{GS}=10V$   
 $R_{DS(ON)} = 22m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent  $Q_G \times R_{DS(on)}$  product(FOM)
- SGT Technology
- Fast Switching Speed
- Low Capacitance to Minimize Driver Losses

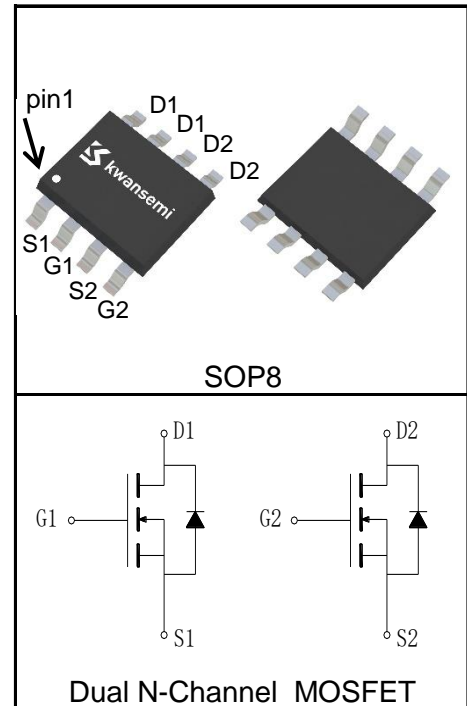
## Applications

- Switch Mode Power Supply



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	40	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	
$T_{Jmax}$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_A=25^\circ\text{C}$ 2.4	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_A=25^\circ\text{C}$ 36	A
$I_D^{②}$	Continuous Drain Current( $V_{GS}=10V$ )	$T_A=25^\circ\text{C}$ 9	A
		$T_A=70^\circ\text{C}$ 7.2	
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2	W
		$T_A=70^\circ\text{C}$ 1.3	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	40	$^\circ\text{C/W}$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62.5	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	16	mJ

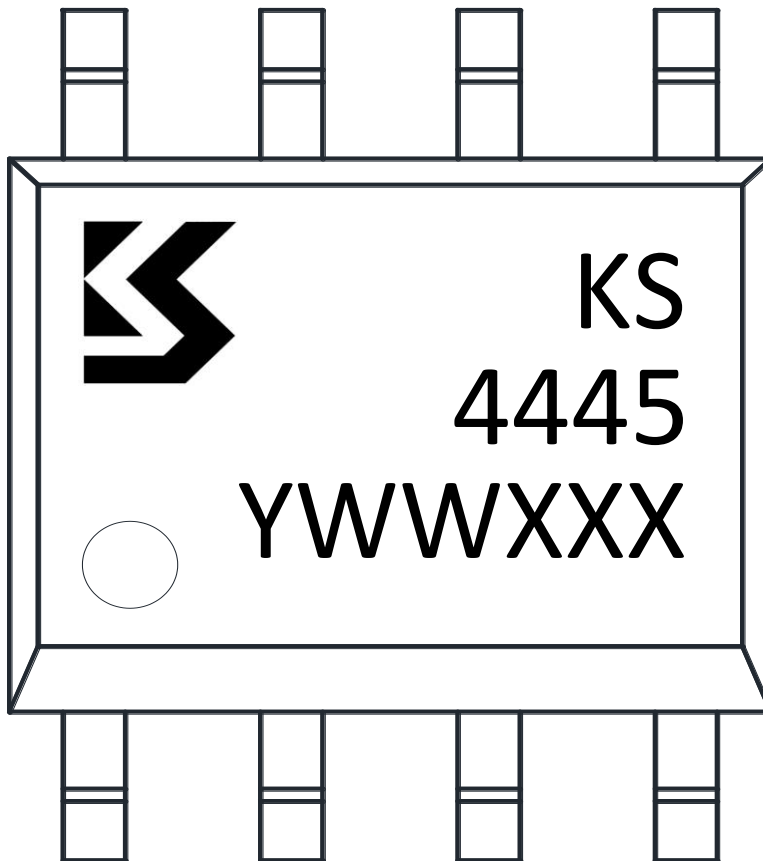
**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Condition	KS4445HAT			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	$\mu A$
		$T_J=125^\circ\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.2	1.7	2.3	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	$V_{GS}=10V, I_{DS}=8A$		15	18	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=6A$		22	29	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=8A, V_{GS}=0V$		0.86	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=8A, di_{SD}/dt=100A/\mu s$		13		ns
$Q_{rr}$	Reverse Recovery Charge			23		nC
<b>Dynamic Characteristics<sup>(6)</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		5		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=1.0MHz		340		pF
$C_{oss}$	Output Capacitance			70		
$C_{rss}$	Reverse Transfer Capacitance			60		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=8A,$ $V_{GEN}=10V, R_G=6\Omega$		7		ns
$t_r$	Turn-on Rise Time			9		
$t_{d(OFF)}$	Turn-off Delay Time			16		
$t_f$	Turn-off Fall Time			10		
<b>Gate Charge Characteristics<sup>(6)</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V,$ $I_{DS}=8A$		9.2		nC
$Q_{gs}$	Gate-Source Charge			1.1		
$Q_{gd}$	Gate-Drain Charge			3.2		

- 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  $T_J = 25^\circ\text{C}$ ,  $I_{ASmax} = 8A$ ,  $L=0.5\text{mH}$ ,  $V_{DD} = 24V$ ,  $R_G = 25\Omega$ ,  $V_{GS}=10V$ . Part not recommended for use above this value.
  - 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
KS4445HAT	SOP8	Tape&Reel	3000	13"	12mm

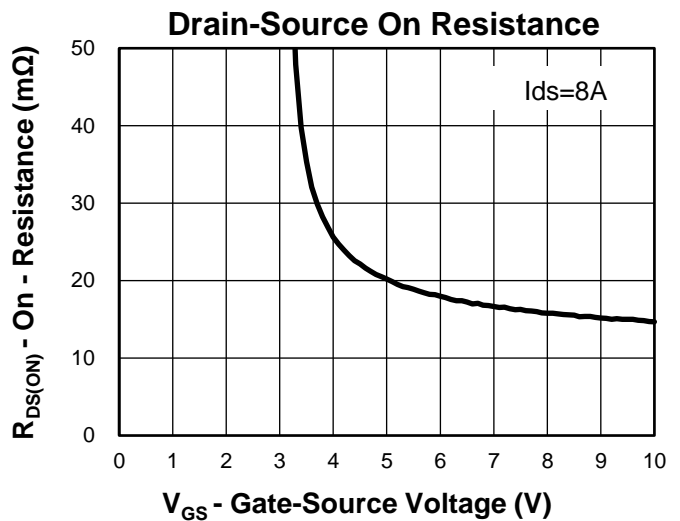
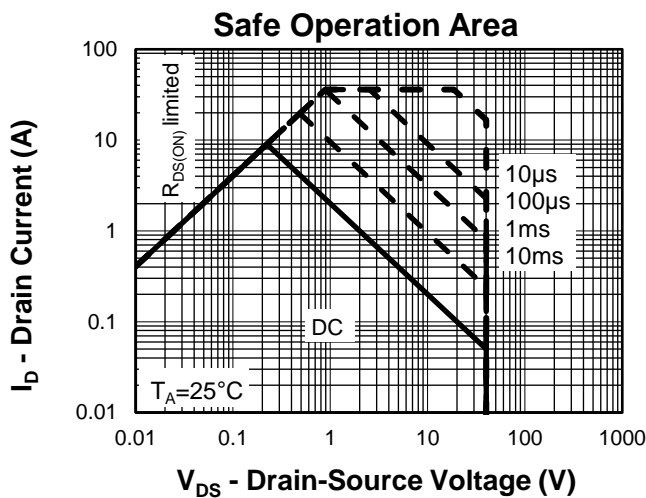
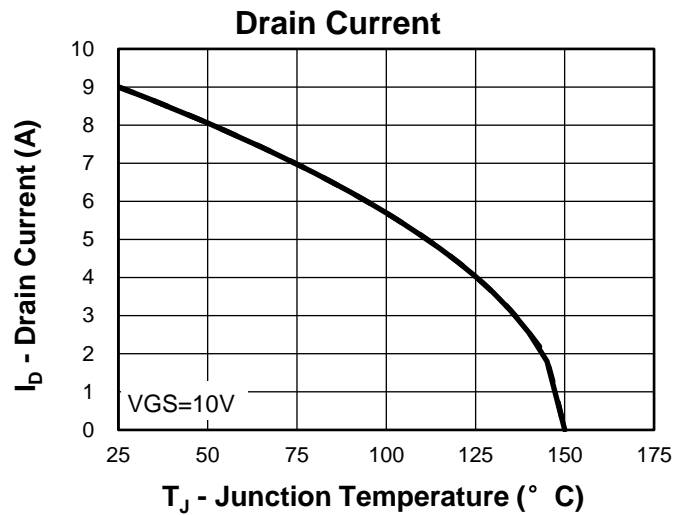
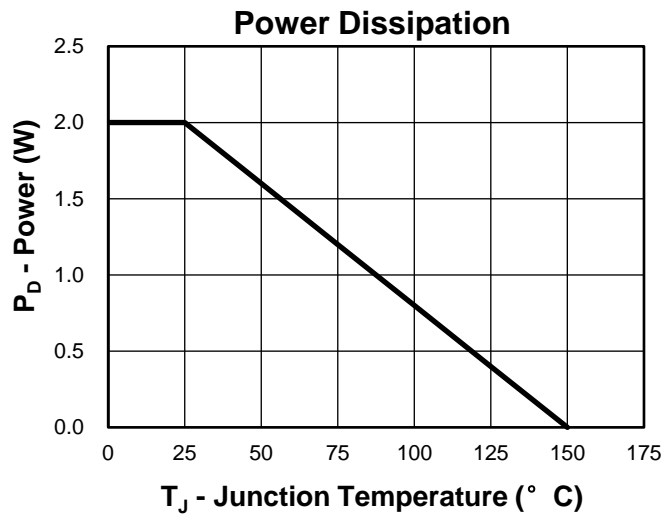


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

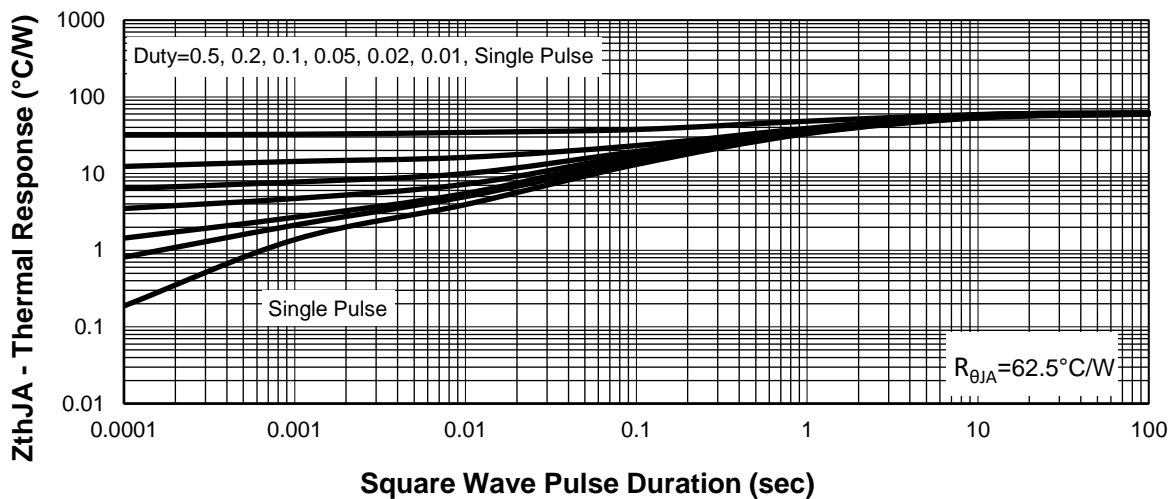
2nd Line: Part Number(4445T)

3rd Line: Lot Number(YWWXXX)

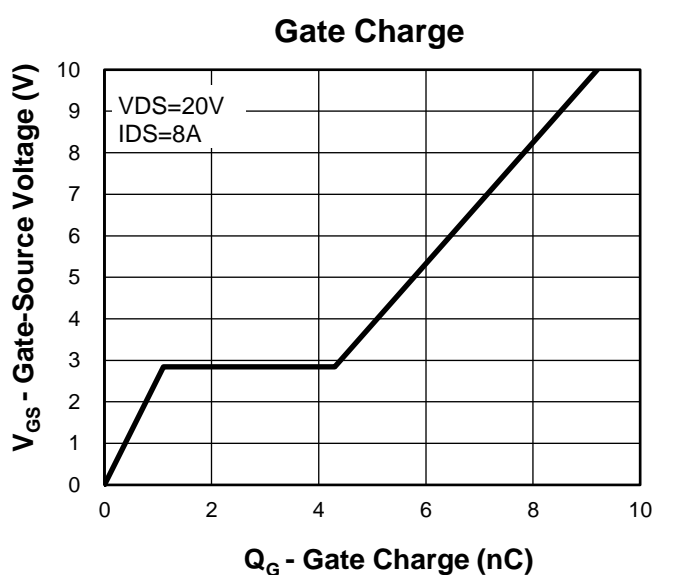
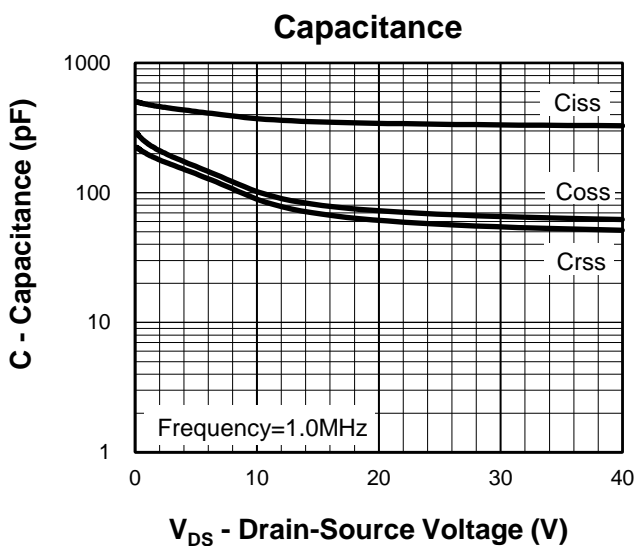
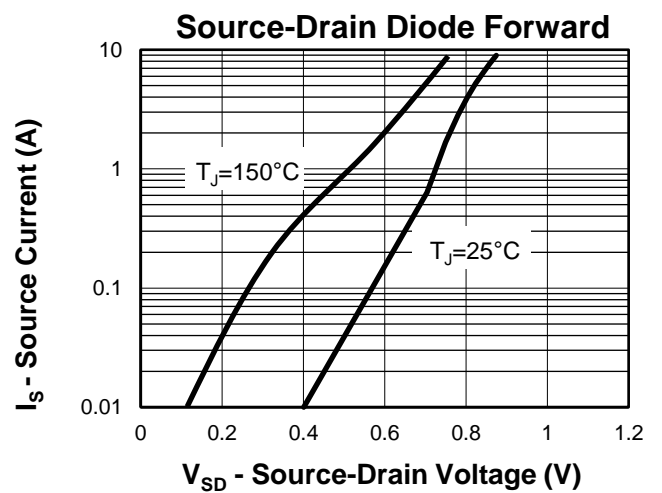
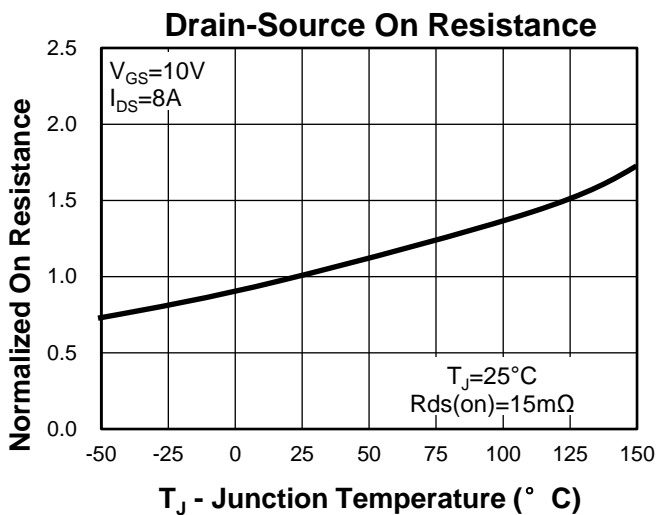
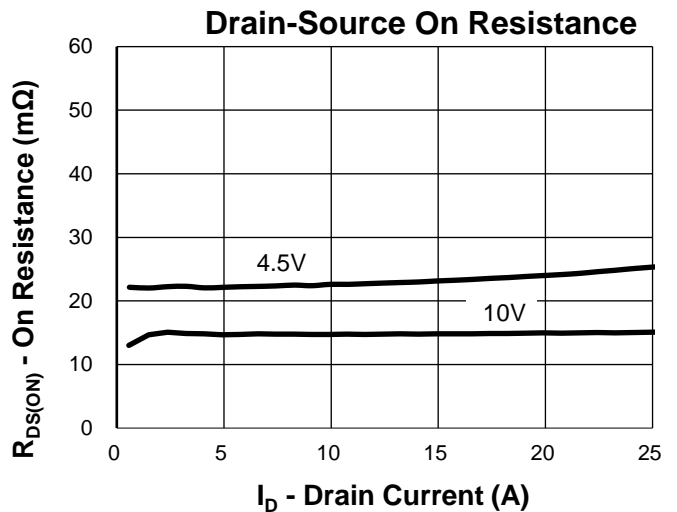
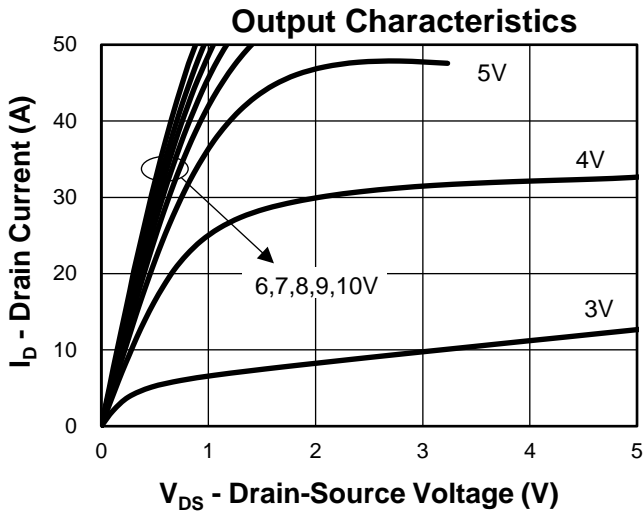
### Typical Characteristics

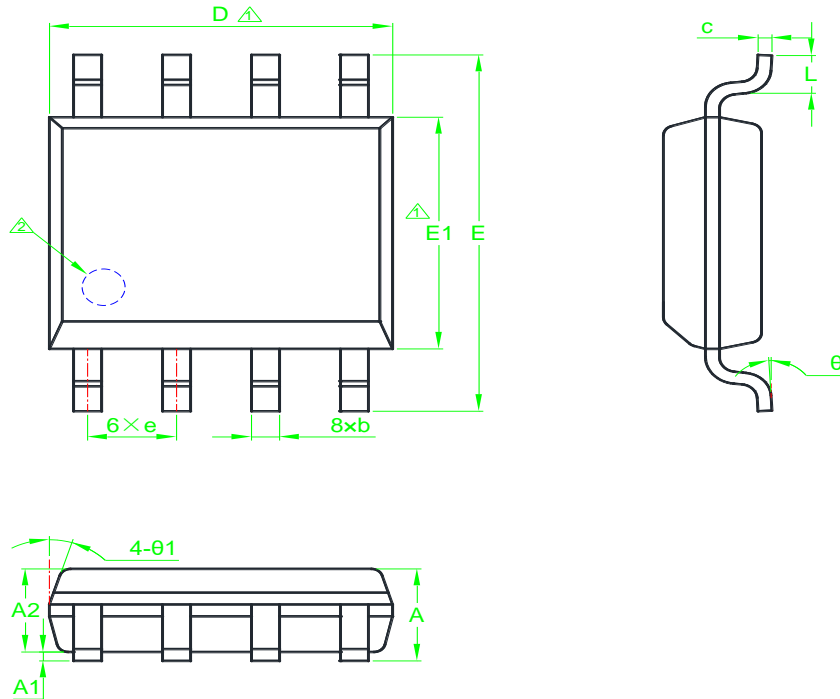


### Thermal Transient Impedance



Typical Characteristics



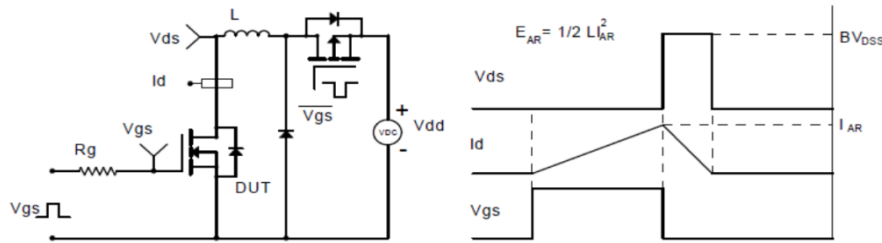
**Package Information**
**SOP8**


SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	*	1.75	0.053	*	0.069
A1	0.10	*	0.25	0.004	*	0.010
A2	1.25	1.45	1.65	0.049	0.057	0.065
b	0.33	*	0.51	0.013	*	0.020
c	0.15	*	0.25	0.006	*	0.010
D	4.70	4.90	5.10	0.185	0.193	0.201
E	5.80	6.00	6.30	0.228	0.236	0.248
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	1.27BSC			0.050BSC		
L	0.40	*	1.27	0.016	*	0.050
$\theta$	0°	*	8°	0°	*	8°
$\theta 1$	5°	*	15°	5°	*	15°

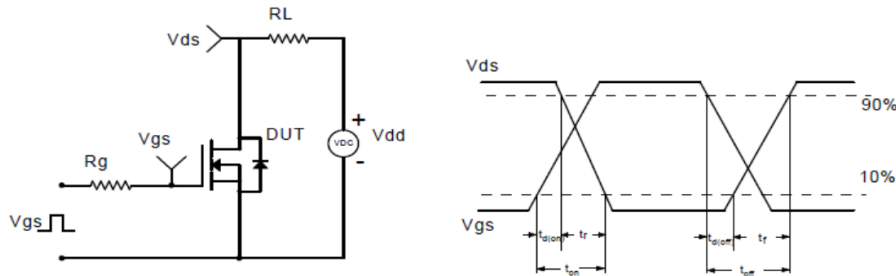
① Dimensions D and E1 do not include mold flash protrusions or gate burrs.

② The existence and size of demolding hole are variable depending on mold.

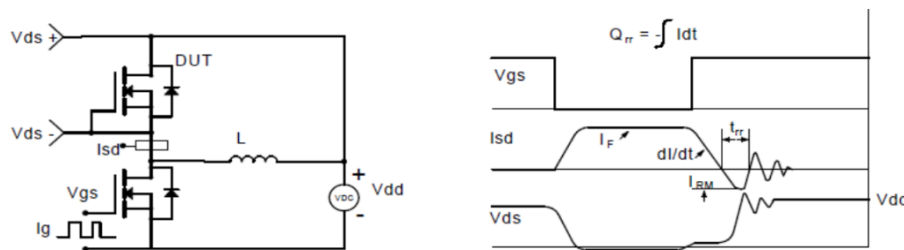
### Avalanche Test Circuit and Waveforms



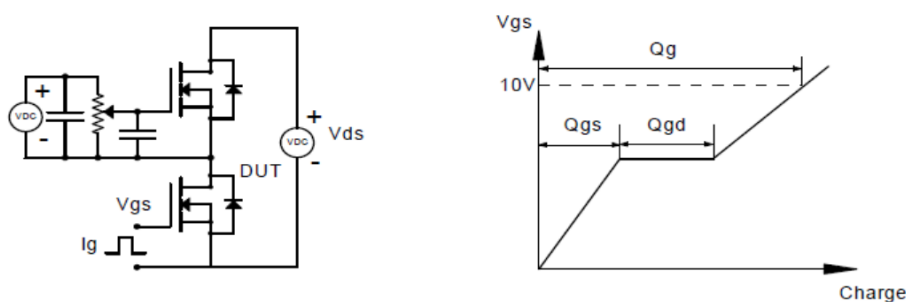
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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