

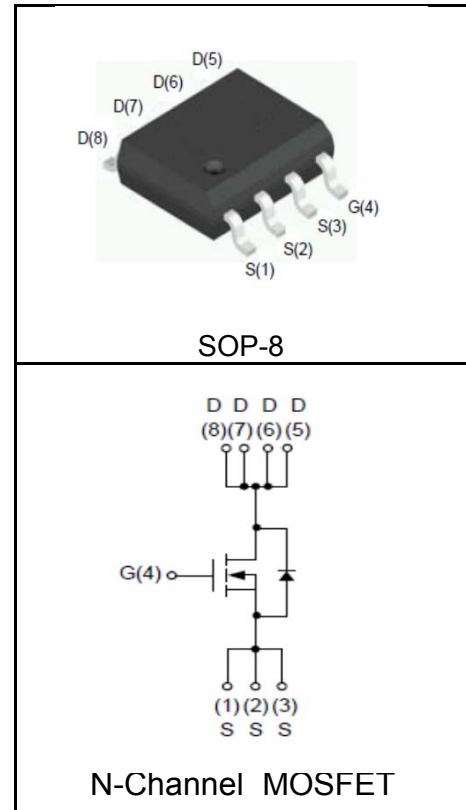
Features

- 40V/20A,
- $R_{DS(ON)} = 6.5m\Omega(Typ.)@V_{GS}=10V$
- $R_{DS(ON)} = 10m\Omega(Typ.)@V_{GS}=4.5V$
- Ultra Low On-Resistance
- High Switching Speed
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Power Management.
- Switch Applications.
- Load switch

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_A=25^\circ C$ Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage	40	V	
V_{GSS}	Gate-Source Voltage	± 20		
T_J	Maximum Junction Temperature	150	$^\circ C$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$	
I_S	Diode Continuous Forward Current	$T_A=25^\circ C$	20	A
Mounted on Large Heat Sink				
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_A=25^\circ C$	80	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=10V$)	$T_A=25^\circ C$	20	A
		$T_A=70^\circ C$	13	
P_D	Maximum Power Dissipation	$T_A=25^\circ C$	2.5	W
		$T_A=70^\circ C$	1.6	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	-	$^\circ C/W$	
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	50	$^\circ C/W$	
Drain-Source Avalanche Ratings				
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	TBD	mJ	

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

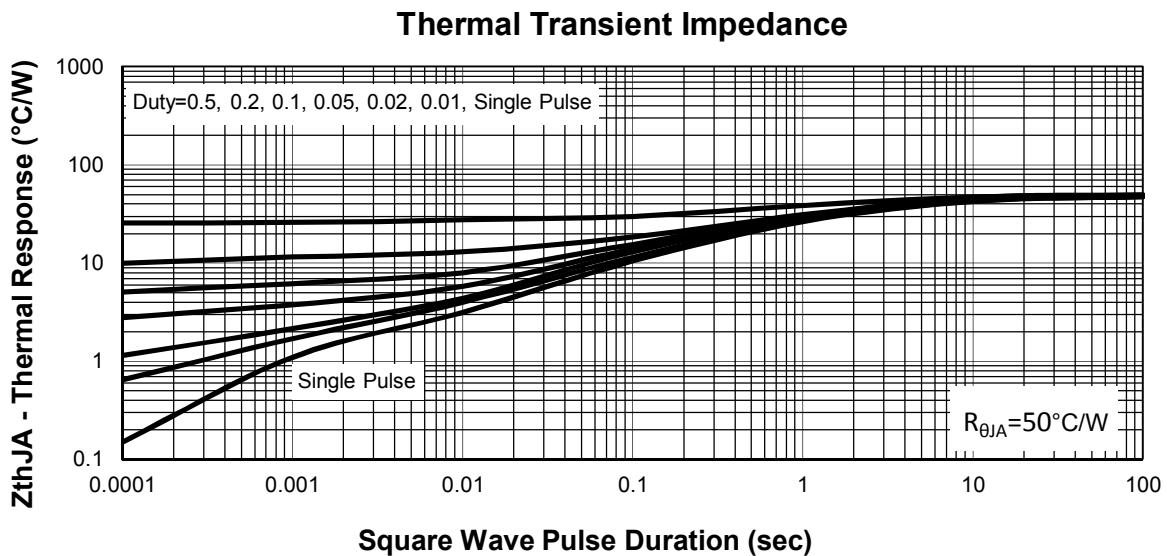
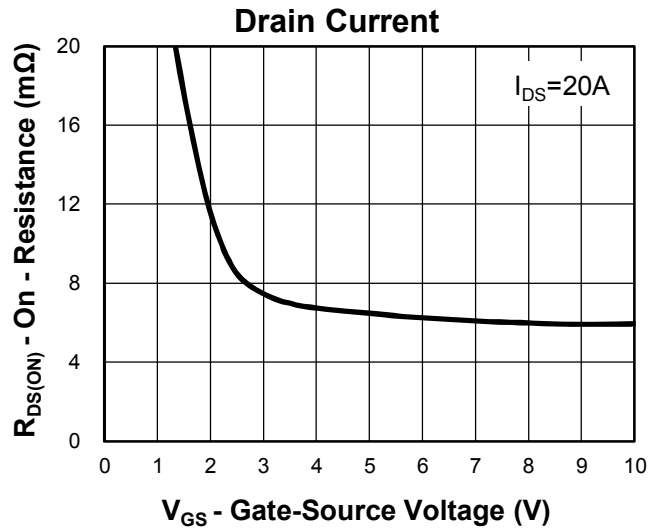
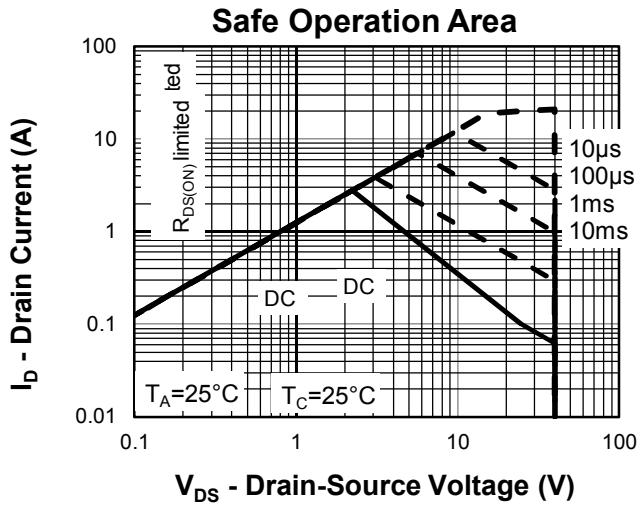
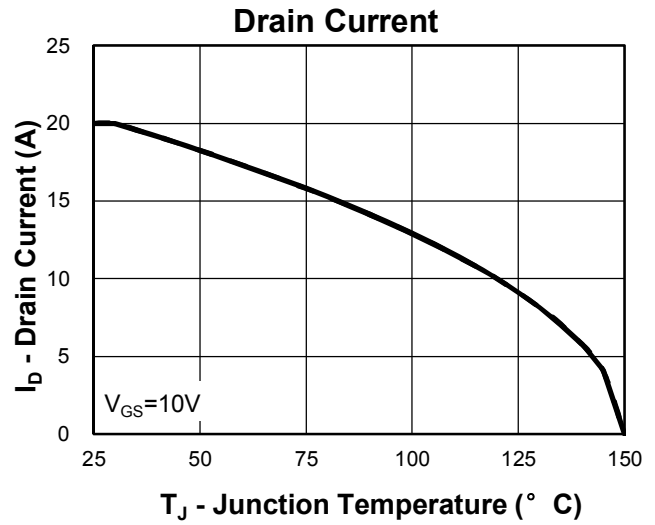
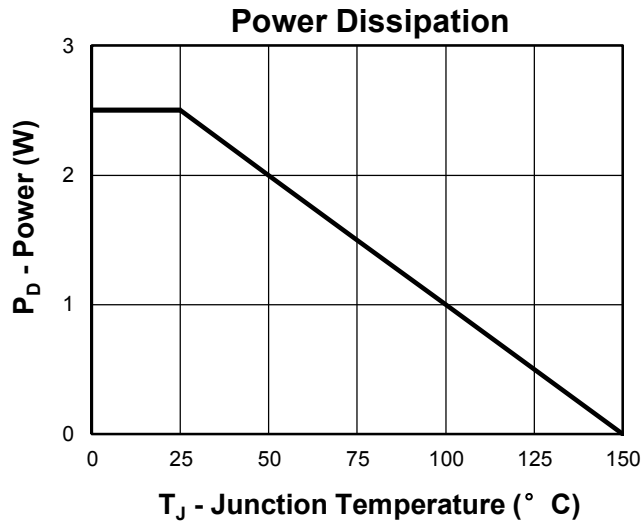
Symbol	Parameter	Test Condition	RUH4020H			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	μA
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1		3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$		6.5	7.5	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=16A$		10	15	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, di_{SD}/dt=100A/\mu s$		10		ns
Q_{rr}	Reverse Recovery Charge			16		nC
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.3		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=1.0MHz		590		pF
C_{oss}	Output Capacitance			135		
C_{rss}	Reverse Transfer Capacitance			68		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=4.7\Omega$		7		ns
t_r	Turn-on Rise Time			14		
$t_{d(OFF)}$	Turn-off Delay Time			18		
t_f	Turn-off Fall Time			6		
Gate Charge Characteristics⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=32V, V_{GS}=10V,$ $I_{DS}=20A$		68		nC
Q_{gs}	Gate-Source Charge			21		
Q_{gd}	Gate-Drain Charge			16		

- 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, $t \leq 10\text{sec}$.
 - 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.

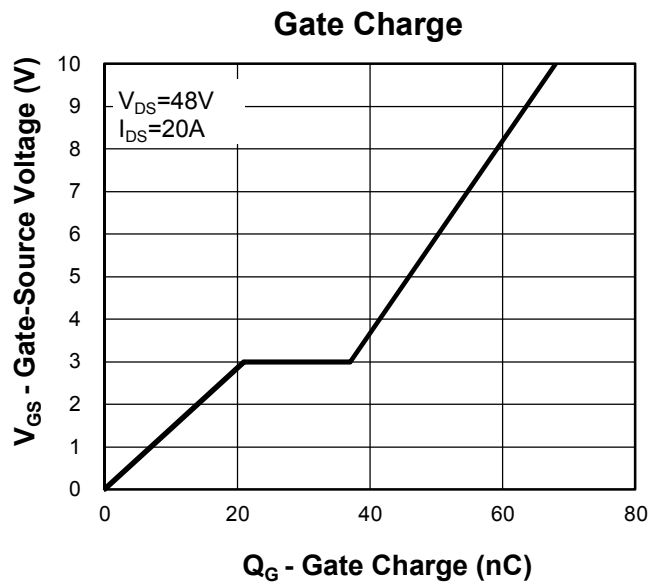
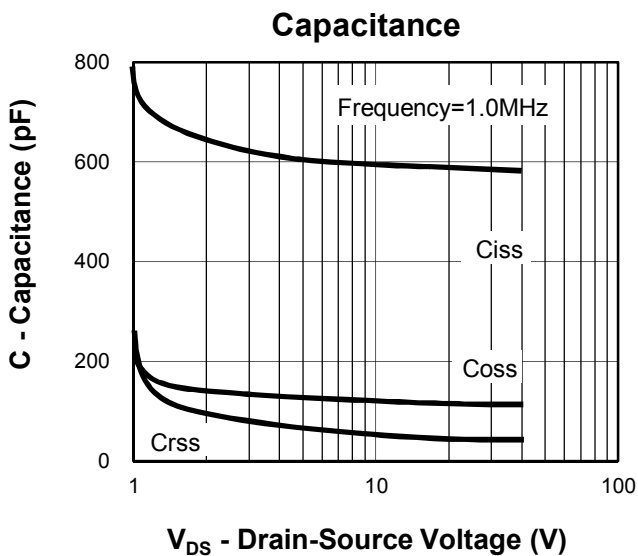
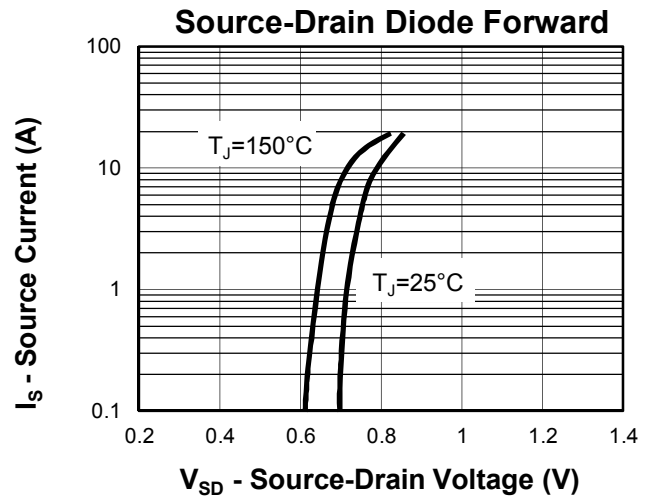
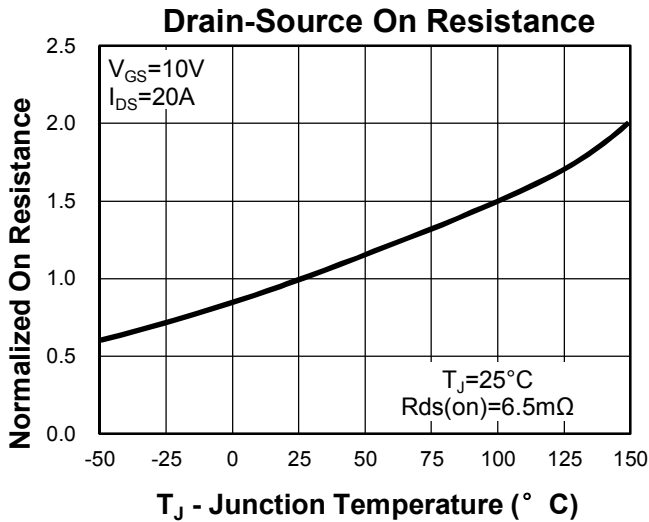
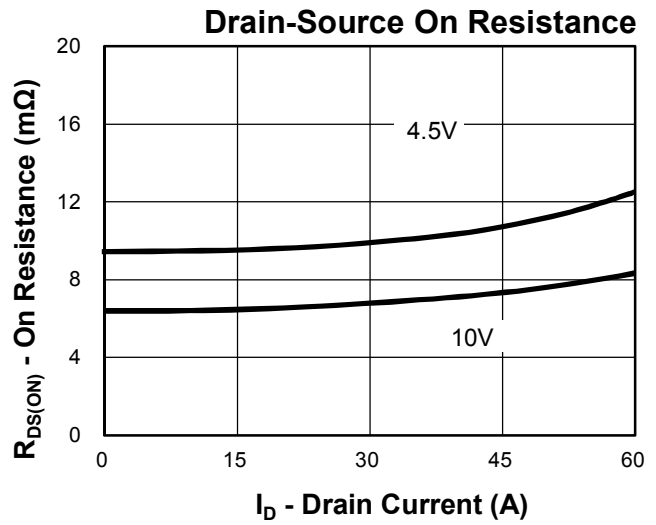
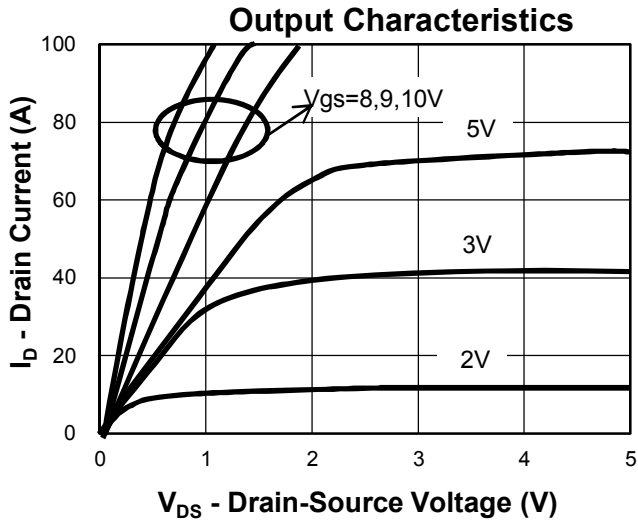
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH4020H	RUH4020H	SOP-8	Tape&Reel	2500	13"	12mm

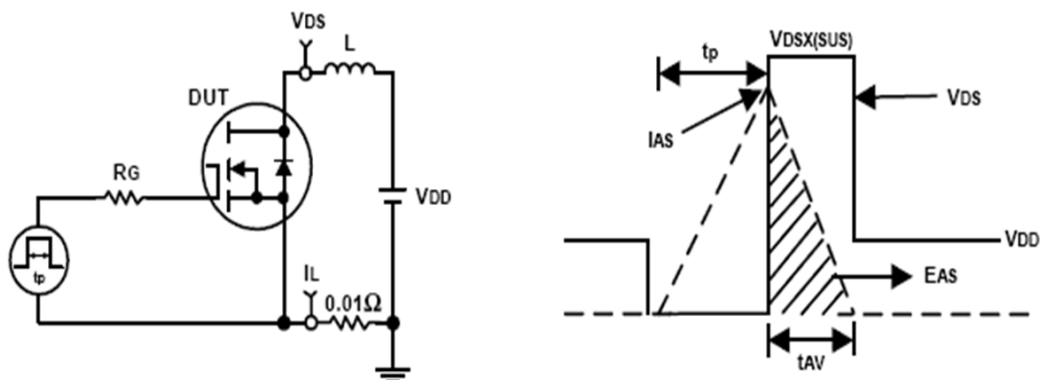
Typical Characteristics



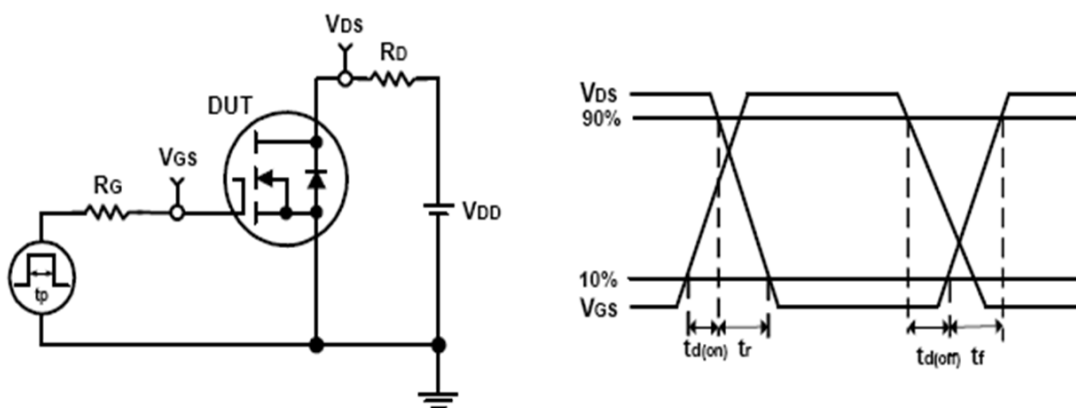
Typical Characteristics



Avalanche Test Circuit and Waveforms

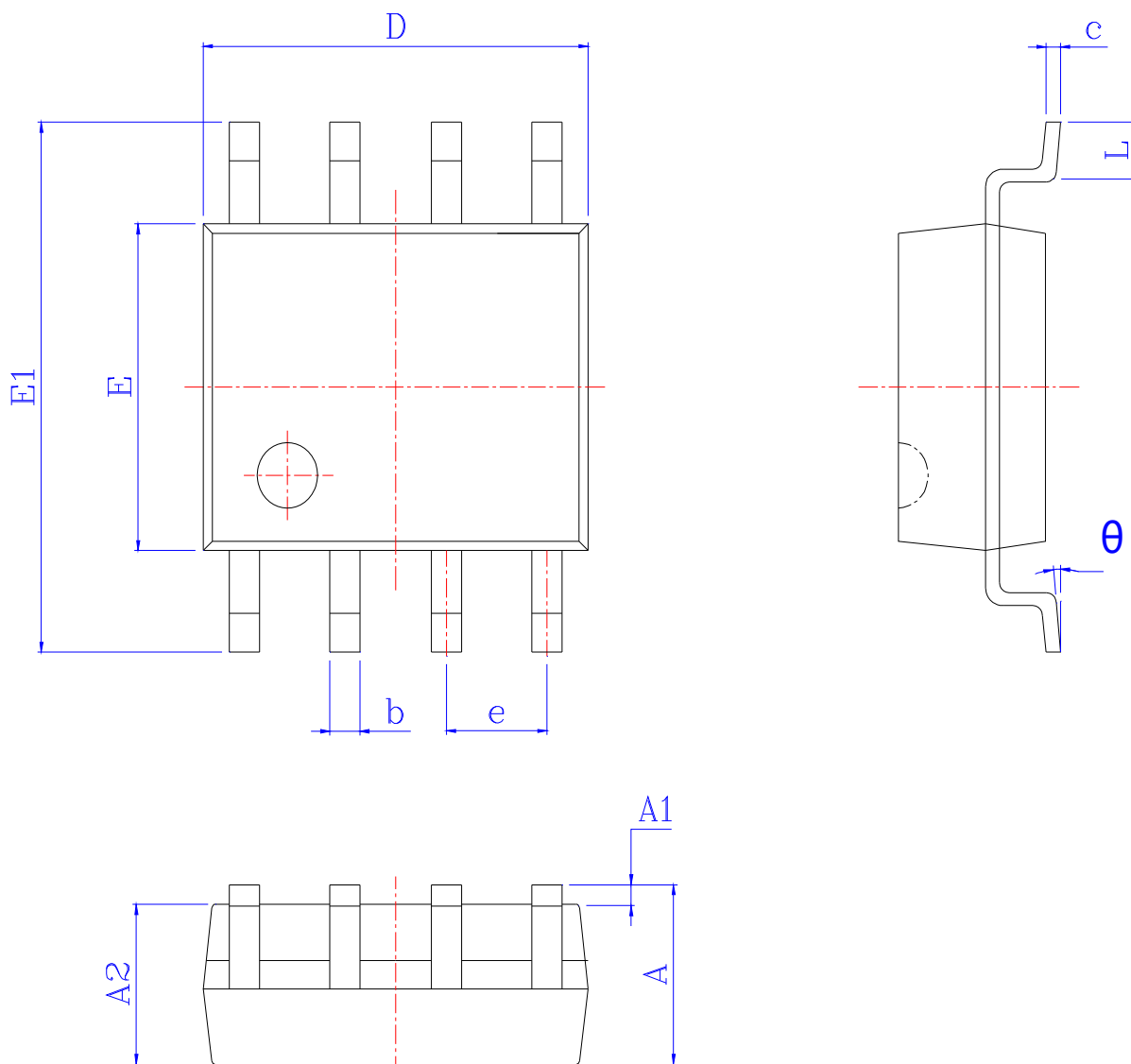


Switching Time Test Circuit and Waveforms



Package Information

SOP-8



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	1.300	1.450	1.550	0.051	0.057	0.061
b	0.330	0.420	0.510	0.013	0.017	0.020
c	0.170	*	0.260	0.007	*	0.010
D	4.700	4.900	5.100	0.185	0.193	0.201
E	3.700	3.900	4.100	0.146	0.154	0.161
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
θ	0°	*	8°	0°	*	8°

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