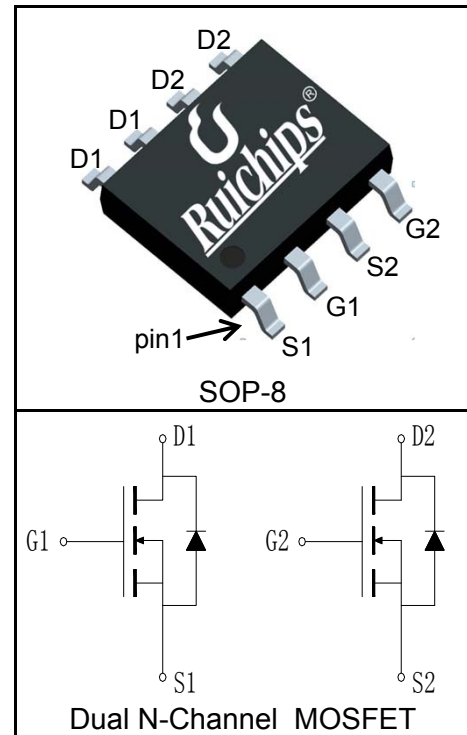


Features

- 20V/12A,
 $R_{DS(ON)} = 26m\Omega(Typ.)@V_{GS}=4.5V$
 $R_{DS(ON)} = 38m\Omega(Typ.)@V_{GS}=2.5V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description

Applications

- Power Management

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A=25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 12	
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_A=25^\circ C$ 12	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_A=25^\circ C$ 48	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=4.5V$)	$T_A=25^\circ C$ 12	A
		$T_A=70^\circ C$ 9.5	
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	-	mJ

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

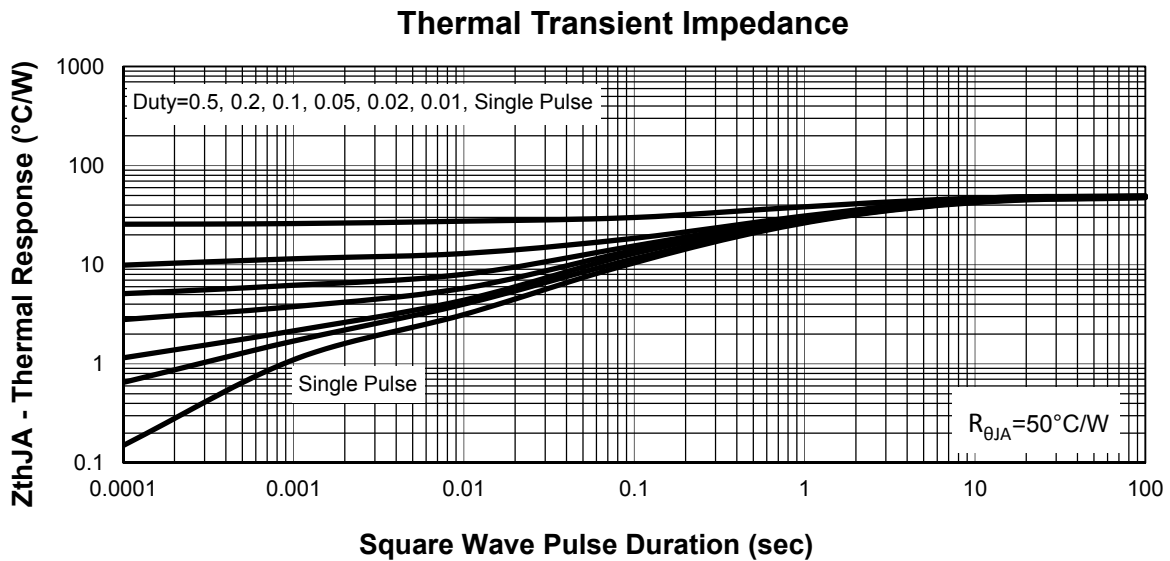
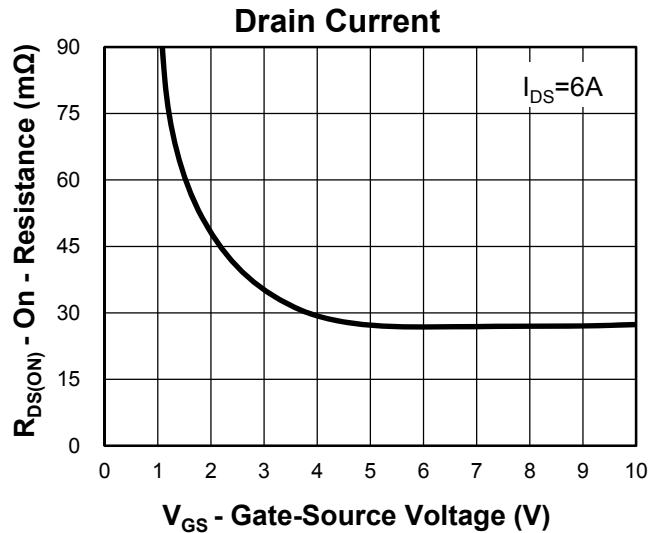
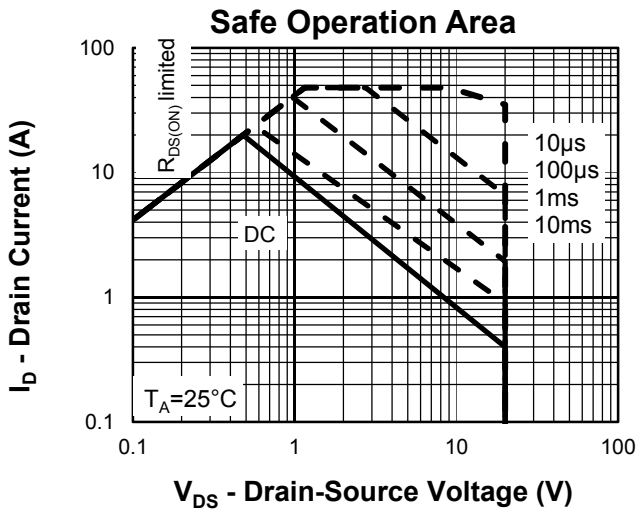
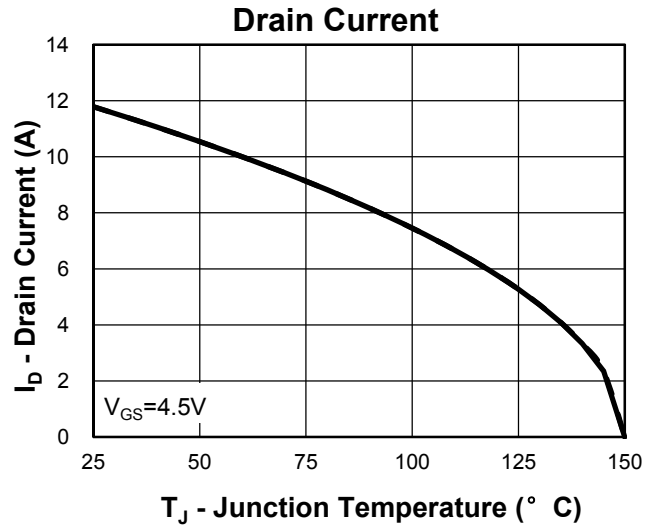
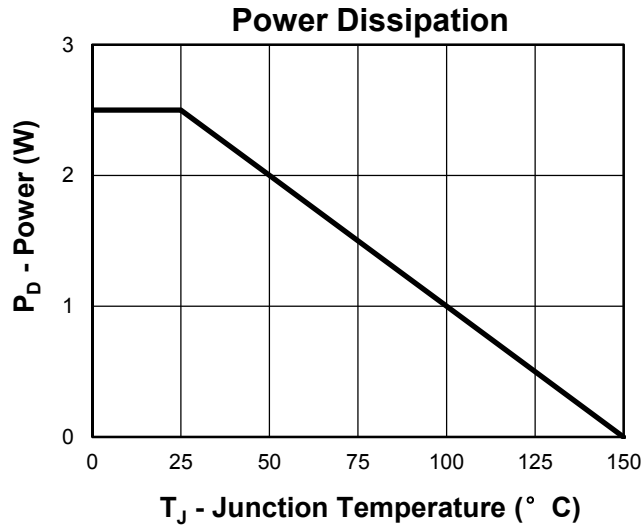
Symbol	Parameter	Test Condition	RU20D12H			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$			1	μA
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5		1.1	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=6A$		26	30	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=5A$		38	45	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$			1	V
t_{rr}	Reverse Recovery Time	$I_{SD}=12A, di_{SD}/dt=100A/\mu s$		15		ns
Q_{rr}	Reverse Recovery Charge			7		nC
Dynamic Characteristics ^⑥						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz		590		pF
C_{oss}	Output Capacitance			105		
C_{rss}	Reverse Transfer Capacitance			85		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, I_{DS}=12A,$ $V_{GEN}=4.5V, R_G=4.7\Omega$		4		ns
t_r	Turn-on Rise Time			9		
$t_{d(OFF)}$	Turn-off Delay Time			23		
t_f	Turn-off Fall Time			7		
Gate Charge Characteristics ^⑥						
Q_g	Total Gate Charge	$V_{DS}=16V, V_{GS}=4.5V,$ $I_{DS}=12A$		9		nC
Q_{gs}	Gate-Source Charge			2		
Q_{gd}	Gate-Drain Charge			3		

- 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, $t \leq 10$ sec. The value in any given application depends on the user's specific board design.
 - ④ Limited by T_{Jmax} . Starting $T_J = 25^\circ C$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

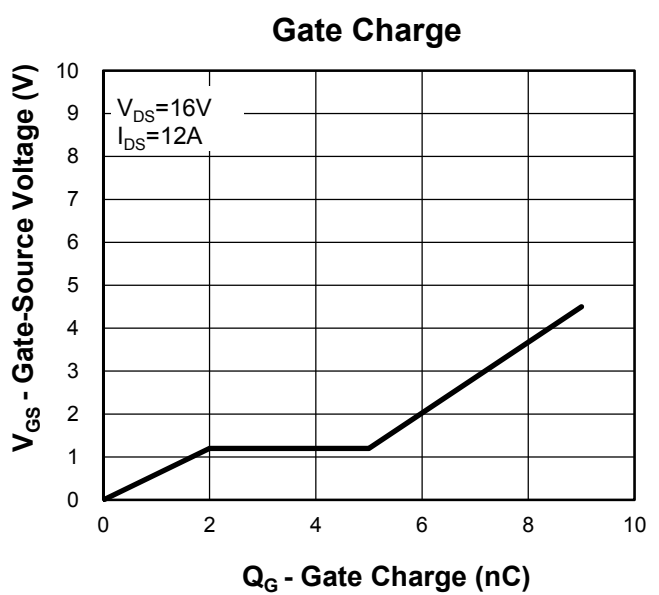
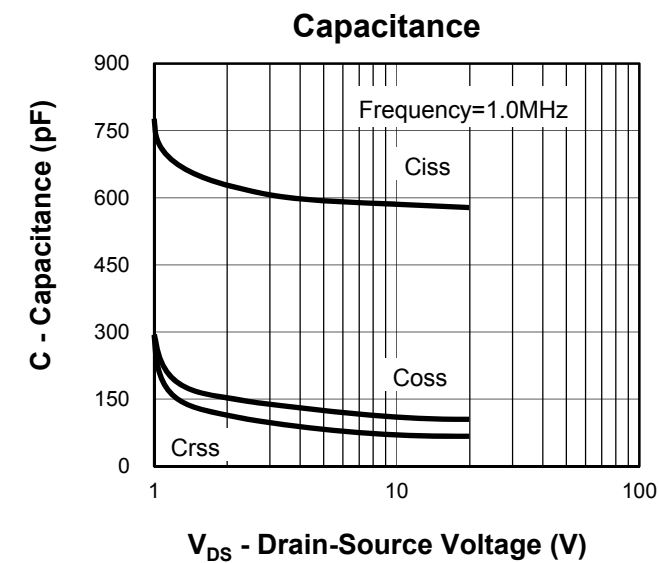
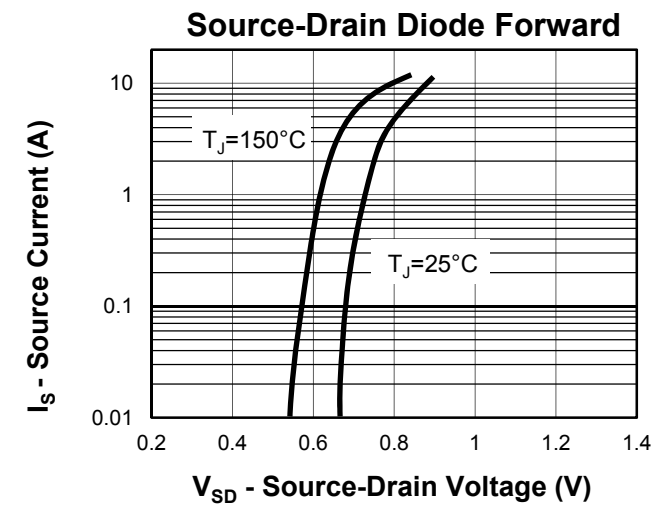
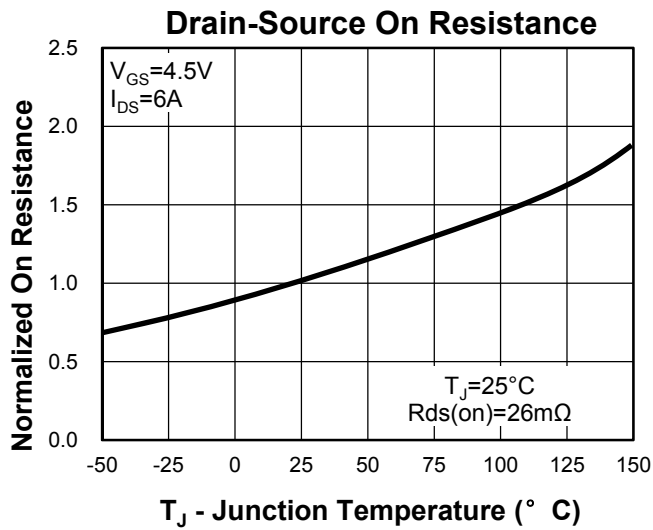
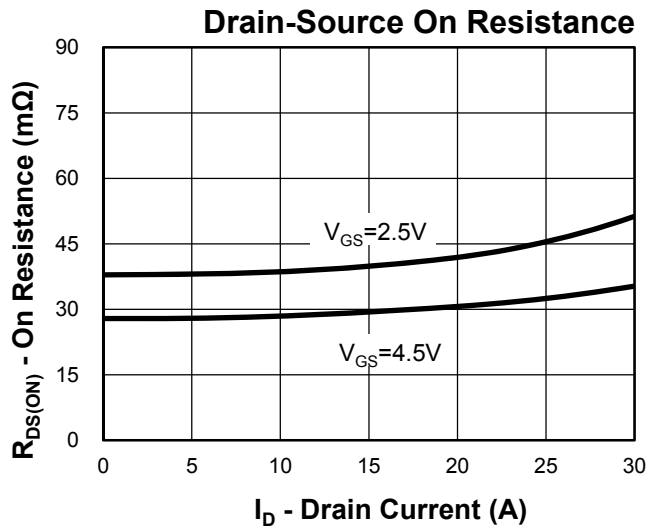
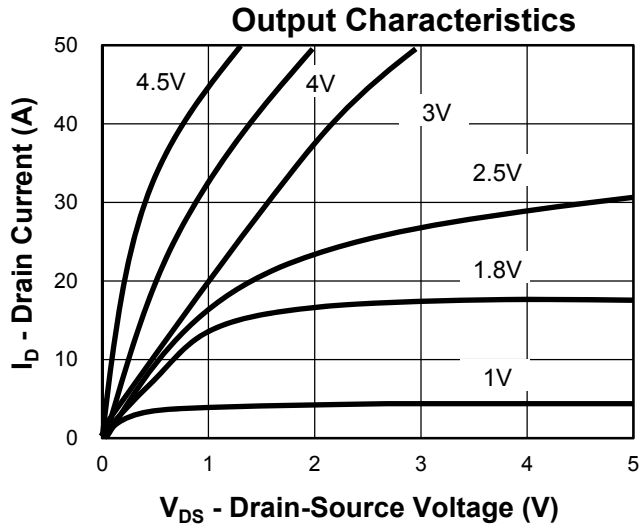
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU20D12H	RU20D12H	SOP-8	Tape&Reel	2500	13"	12mm

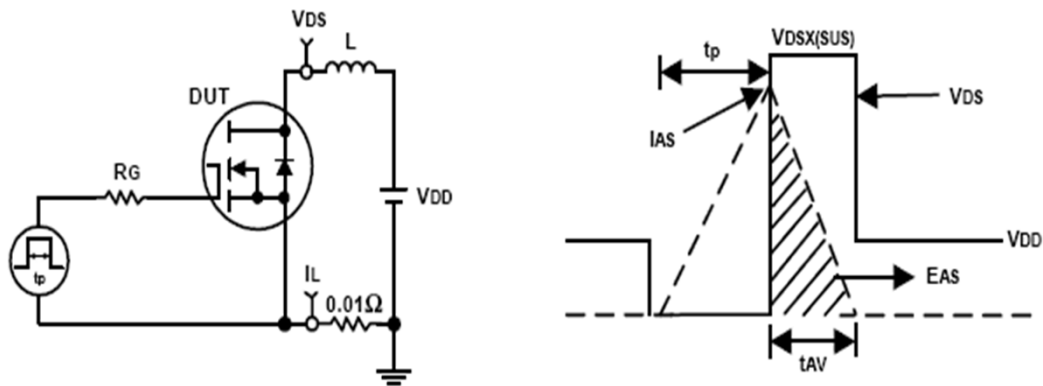
Typical Characteristics



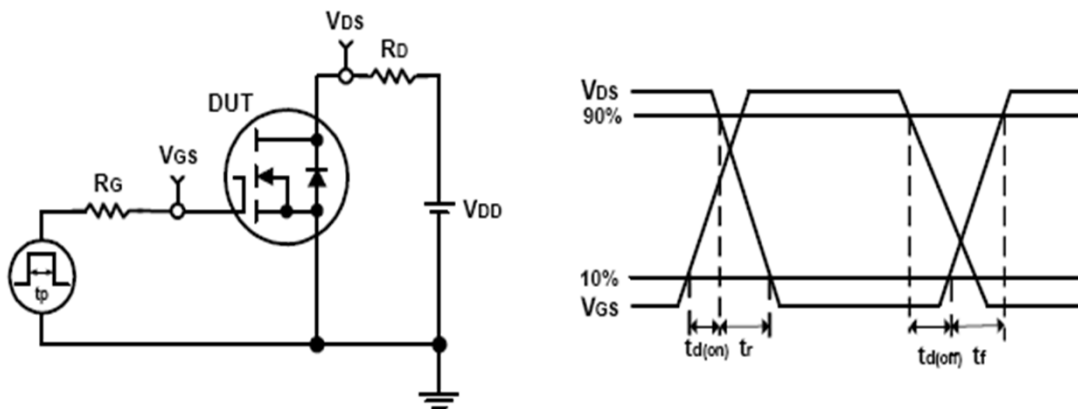
Typical Characteristics



Avalanche Test Circuit and Waveforms

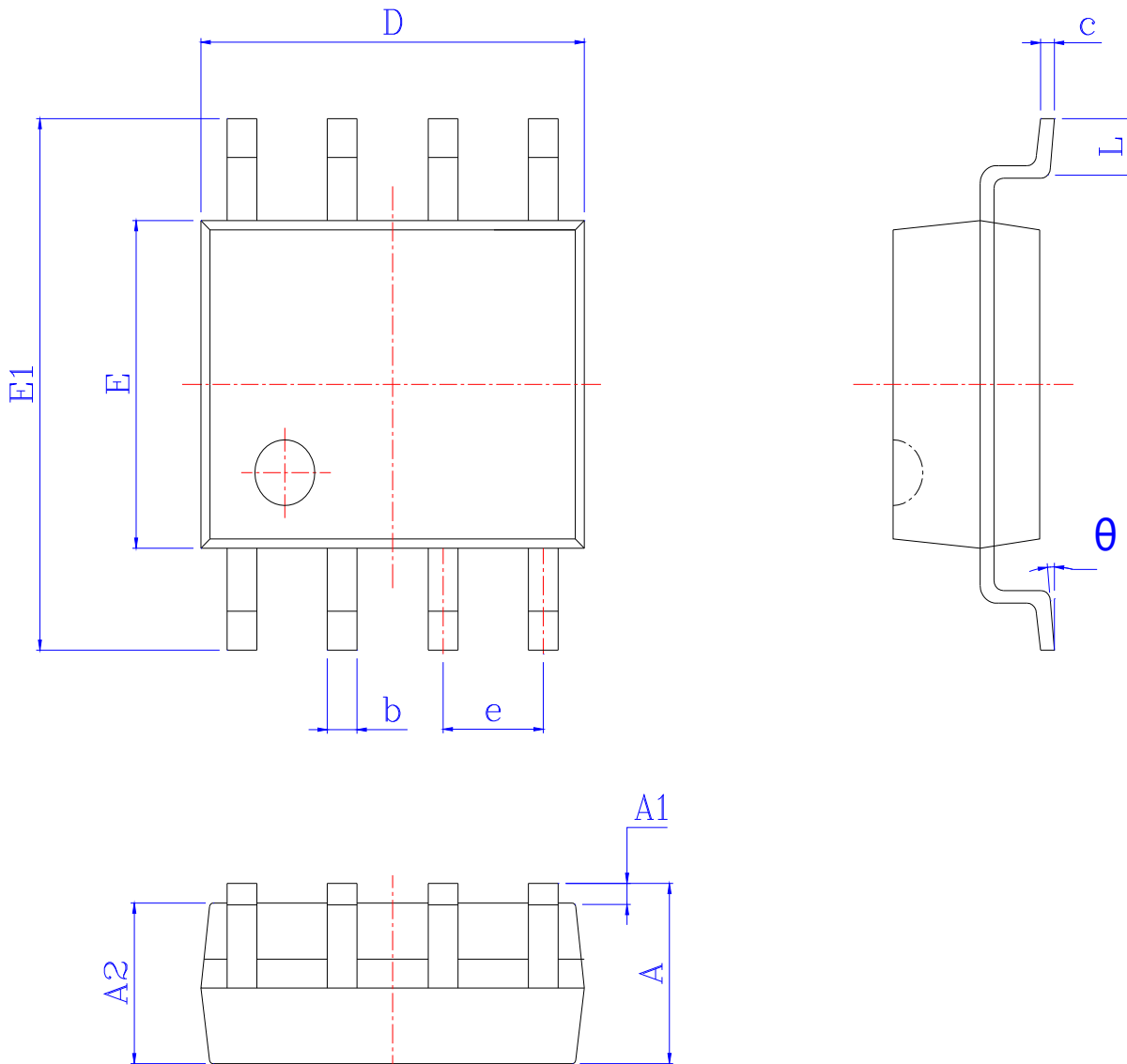


Switching Time Test Circuit and Waveforms



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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