

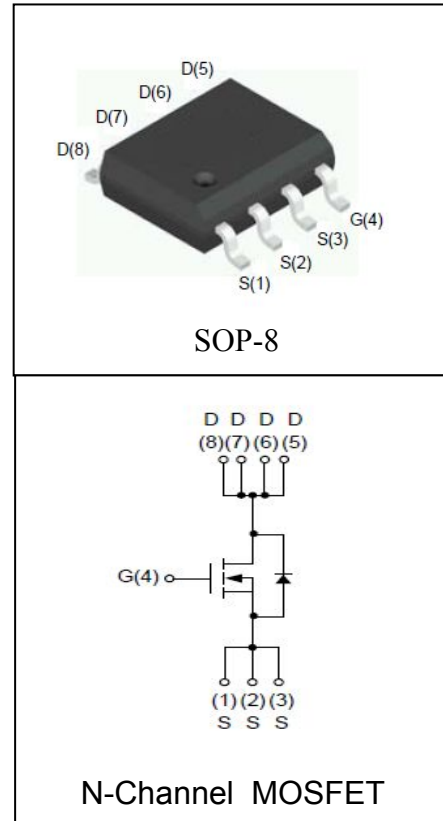
Features

- 30V/12A,
 $R_{DS(ON)} = 9.5m\Omega$ (Typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 15m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- 100% avalanche tested
- Lead Free and Green Available

Applications

- Power Management in Notebook Computer, and DC-DC Converters in Networking Systems.

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage	30	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	$T_C = 25^\circ C$	12	A
Mounted on Large Heat Sink				
I_{DP}	300 μs Pulse Drain Current Tested	$T_C = 25^\circ C$	48 ^①	A
I_D	Continuous Drain Current ($V_{GS} = 10V$)	$T_C = 25^\circ C$	12	A
		$T_C = 70^\circ C$	9.6	
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$	2.5	W
		$T_C = 70^\circ C$	1.6	
$R_{\theta JA}$ ^②	Thermal Resistance-Junction to Ambient		50	$^\circ C/W$
Drain-Source Avalanche Ratings				
E_{AS} ^③	Avalanche Energy, Single Pulsed		105	mJ

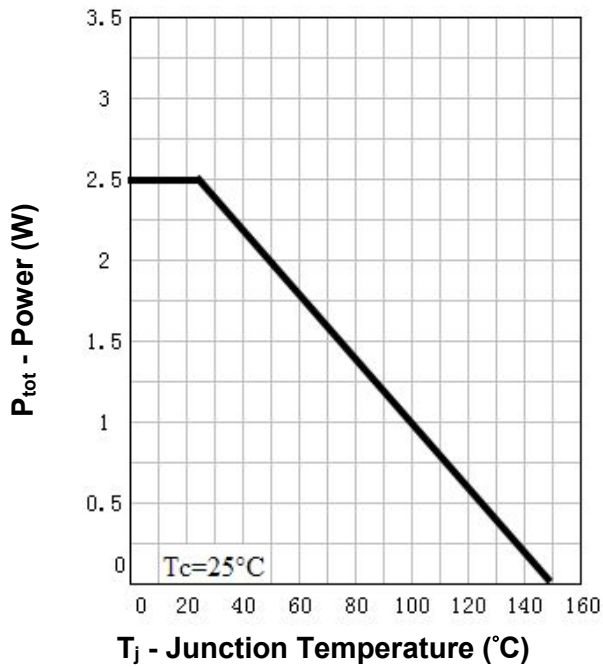
Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU3020H			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1 30	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.0		2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=10A$		9.5	15	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=8A$		15	21	$m\Omega$
Diode Characteristics						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=12A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=12A, di_{SD}/dt=100A/\mu s$		20		ns
Q_{rr}	Reverse Recovery Charge			12		nC
Dynamic Characteristics ⁽⁵⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.2		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz		980		pF
C_{oss}	Output Capacitance			160		
C_{rss}	Reverse Transfer Capacitance			120		
$t_{d(ON)}$	Turn-on Delay Time		$V_{DD}=15V, R_L=30\Omega,$ $I_{DS}=12A, V_{GEN}=10V,$ $R_G=6\Omega$		12	
t_r	Turn-on Rise Time			19		
$t_{d(OFF)}$	Turn-off Delay Time			34		
t_f	Turn-off Fall Time			16		
Gate Charge Characteristics ⁽⁵⁾						
Q_g	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V,$ $I_{DS}=12A$		19	25	nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			7		

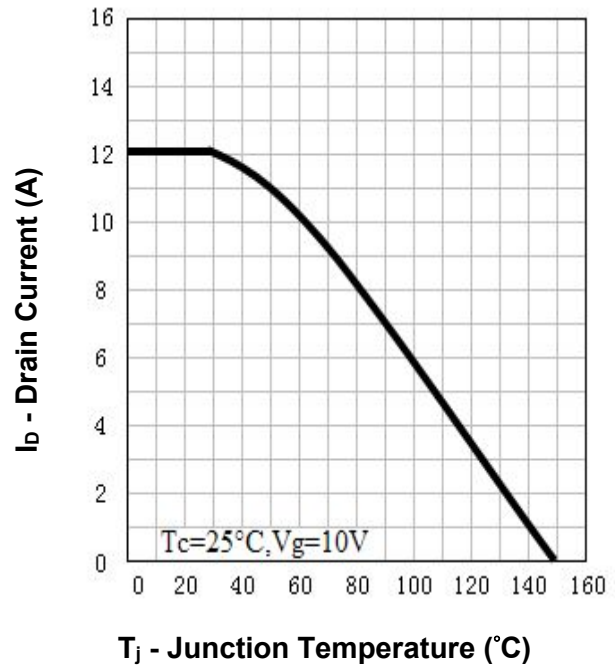
- Notes: ①Pulse width limited by safe operating area.
 ②When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 ③Limited by $T_{Jmax}, I_{AS}=20A, V_{DD}=48V, R_G=50\Omega$, Starting $T_J=25^\circ\text{C}$.
 ④Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 ⑤Guaranteed by design, not subject to production testing.

Typical Characteristics

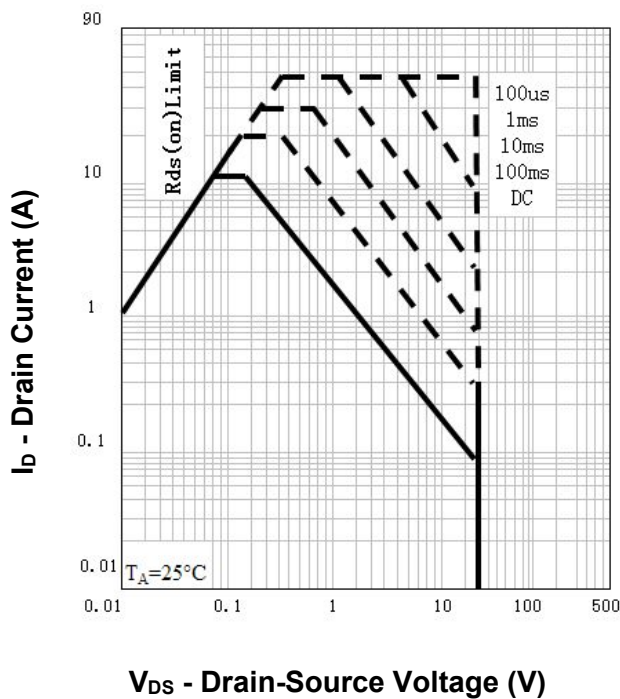
Power Dissipation



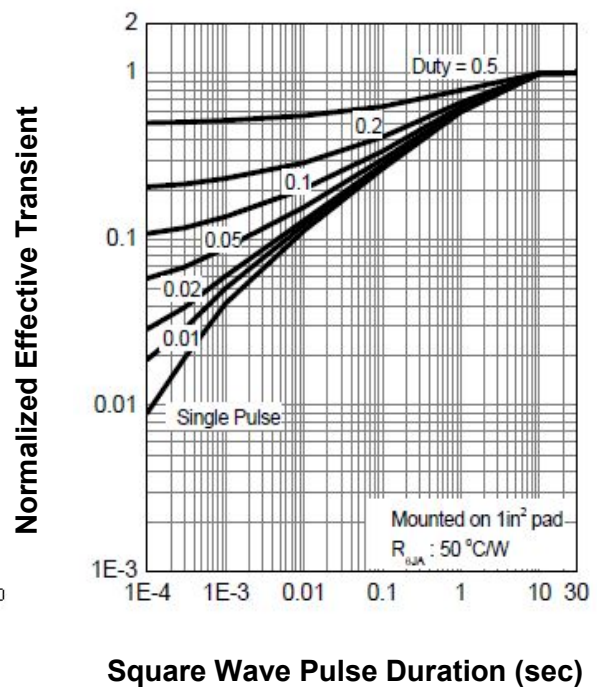
Drain Current



Safe Operation Area

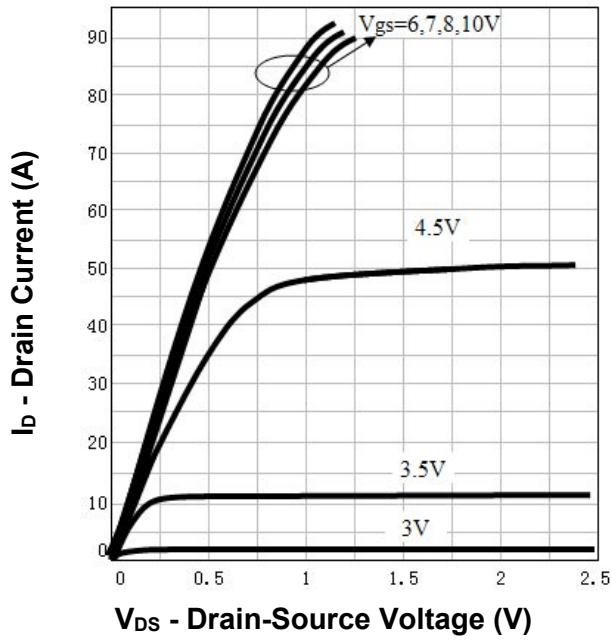


Thermal Transient Impedance

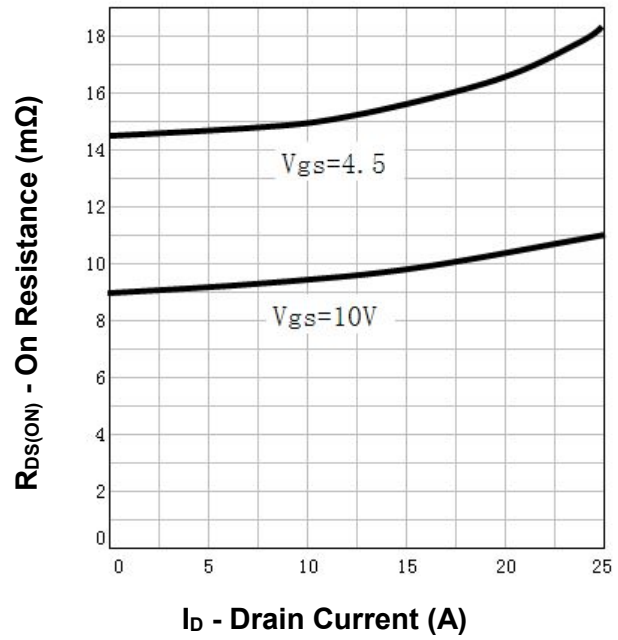


Typical Characteristics

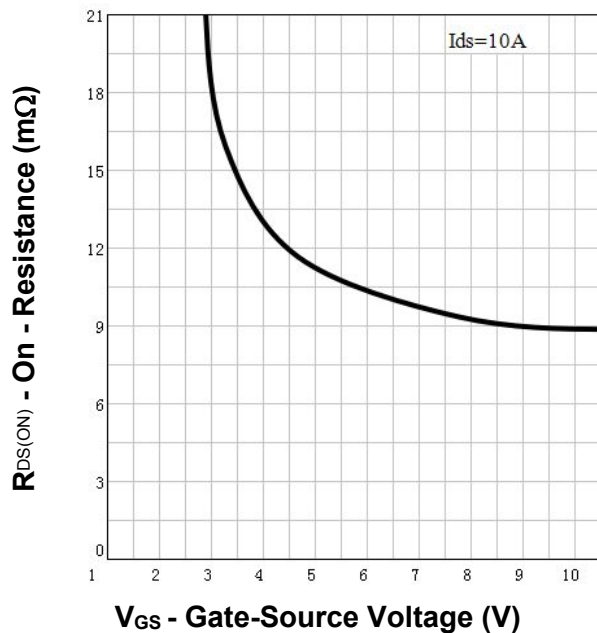
Output Characteristics



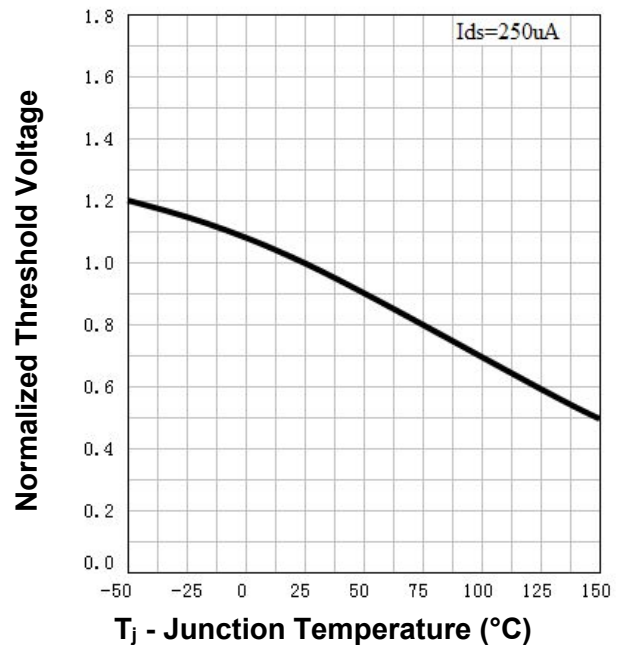
Drain-Source On Resistance



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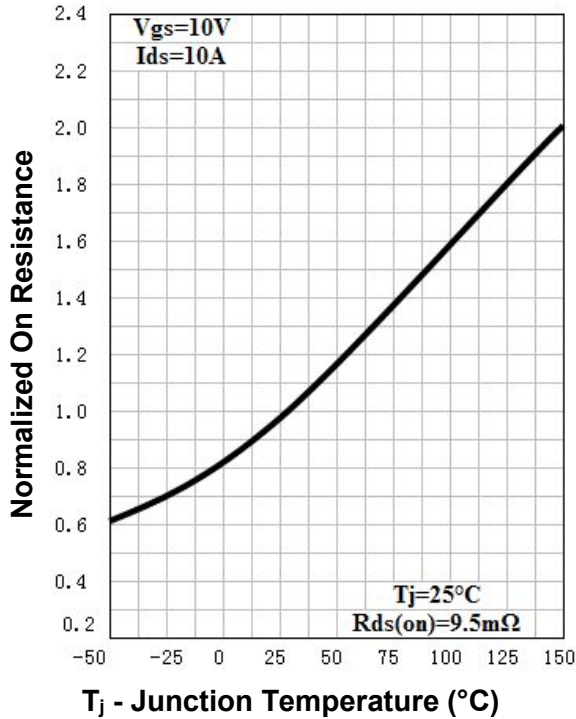


Gate Threshold Voltage

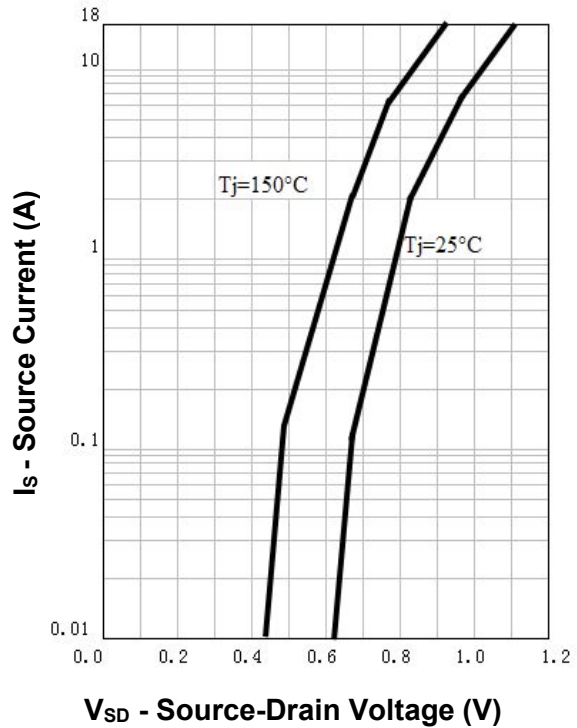


Typical Characteristics

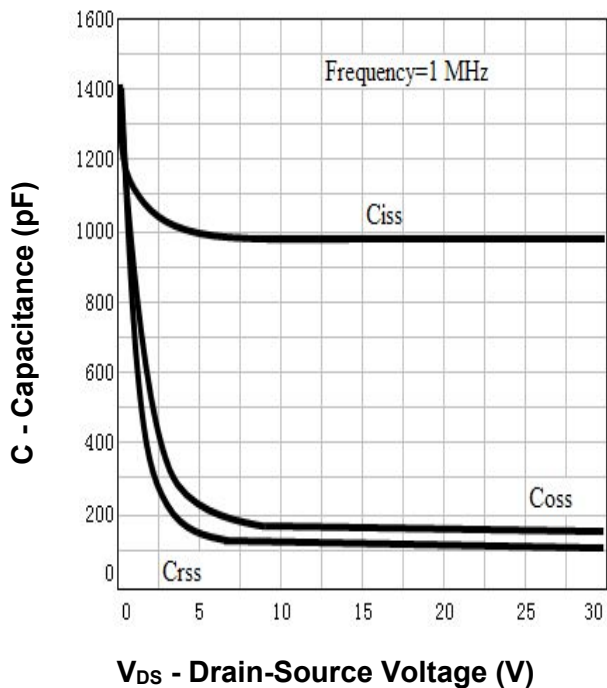
Drain-Source On Resistance



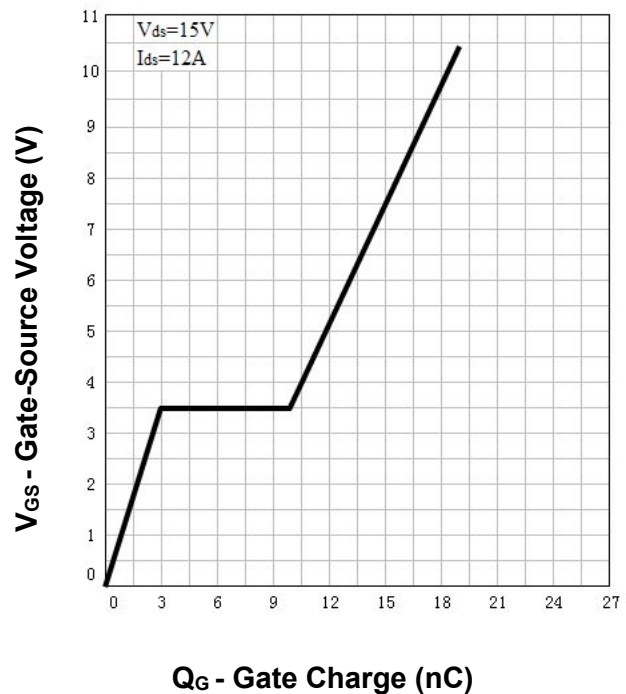
Source-Drain Diode Forward



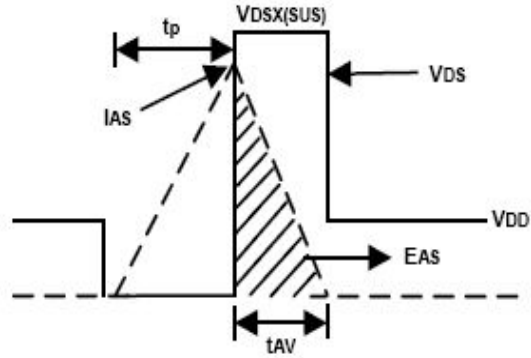
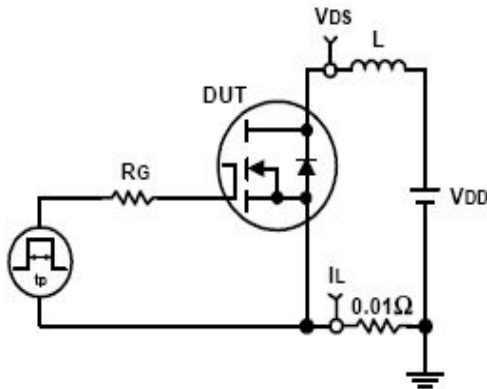
Capacitance



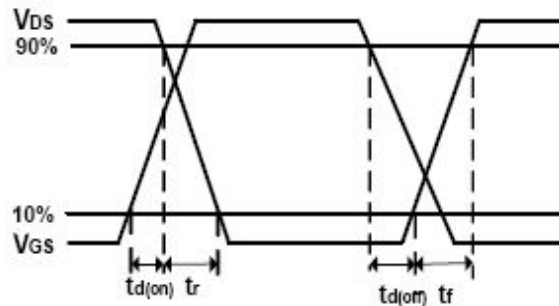
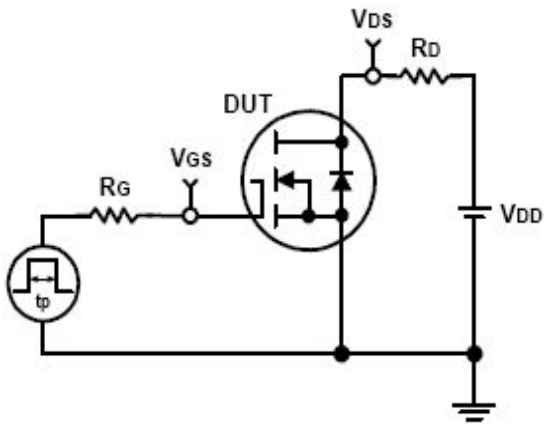
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

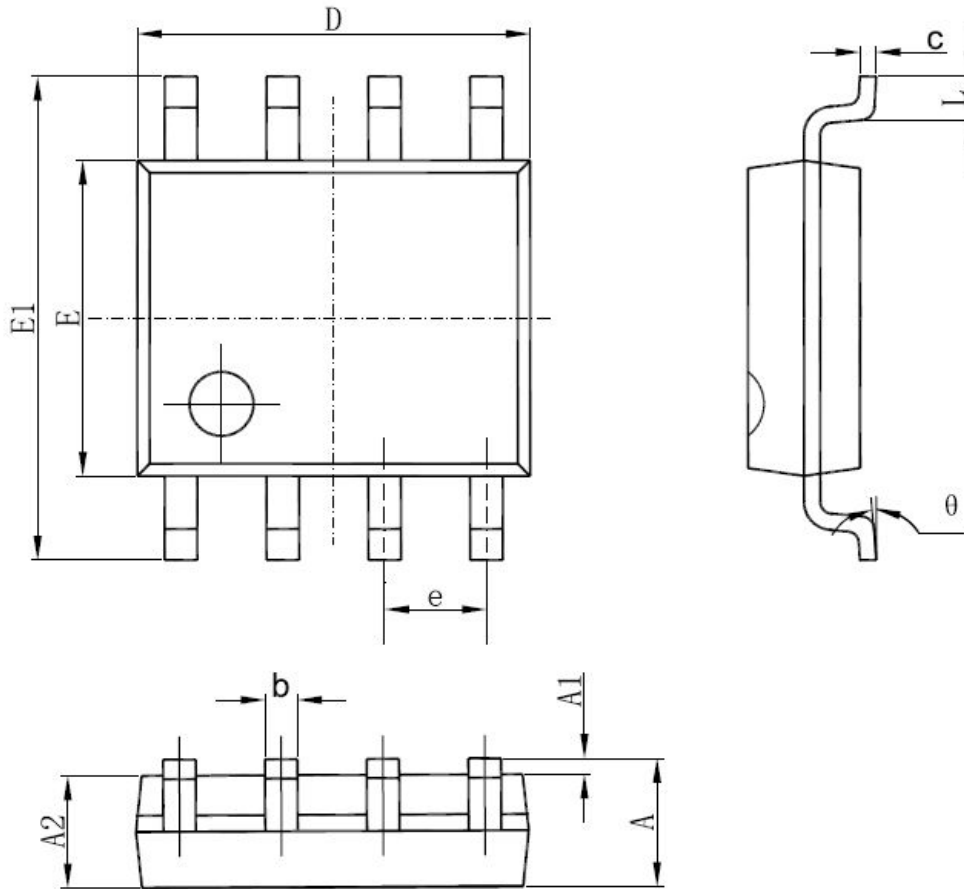


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU3020H	RU3020H	SOP-8	Tape&Reel	2500	13''	12mm

Package Information

SOP-8



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069	E	3.800	4.000	0.150	0.157
A1	0.100	0.250	0.004	0.010	E1	5.800	6.200	0.228	0.244
A2	1.350	1.550	0.053	0.061	e	1.270 (BSC)		0.050 (BSC)	
b	0.330	0.510	0.013	0.020	L	0.400	1.270	0.016	0.050
c	0.170	0.250	0.006	0.010	θ	0°	8°	0°	8°
D	4.700	5.100	0.185	0.200					

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

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