

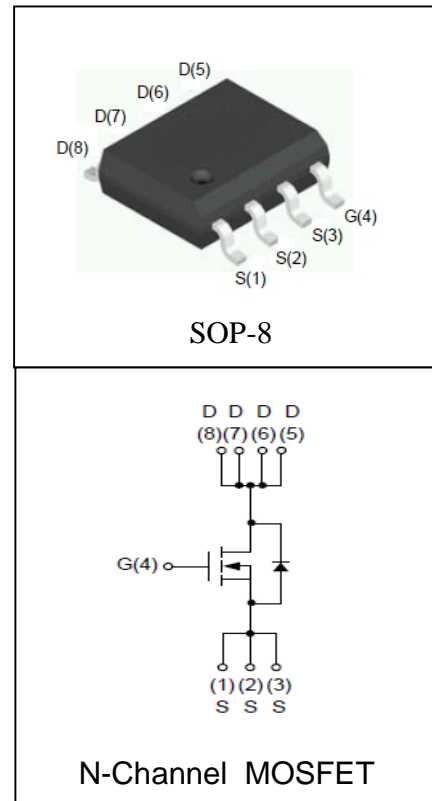
Features

- 30V/12A,
 $R_{DS(ON)} = 9.5m\Omega$ (Type) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 15m\Omega$ (Type) @ $V_{GS} = 4.5V$
- 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

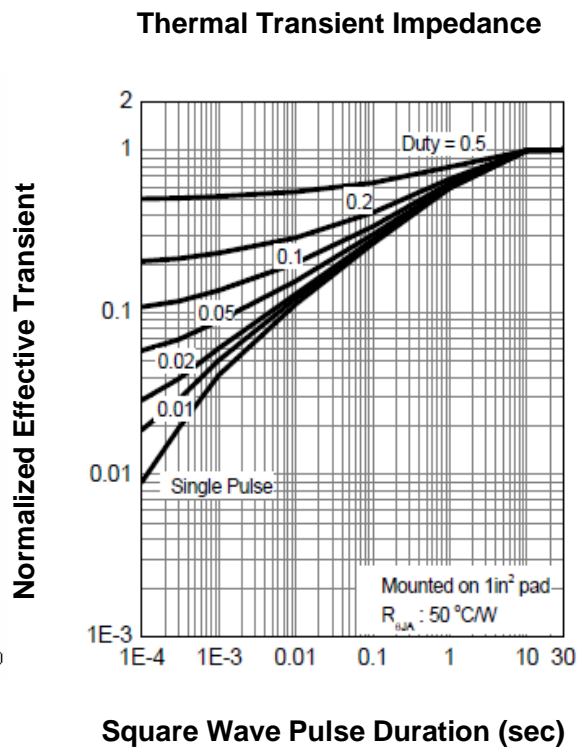
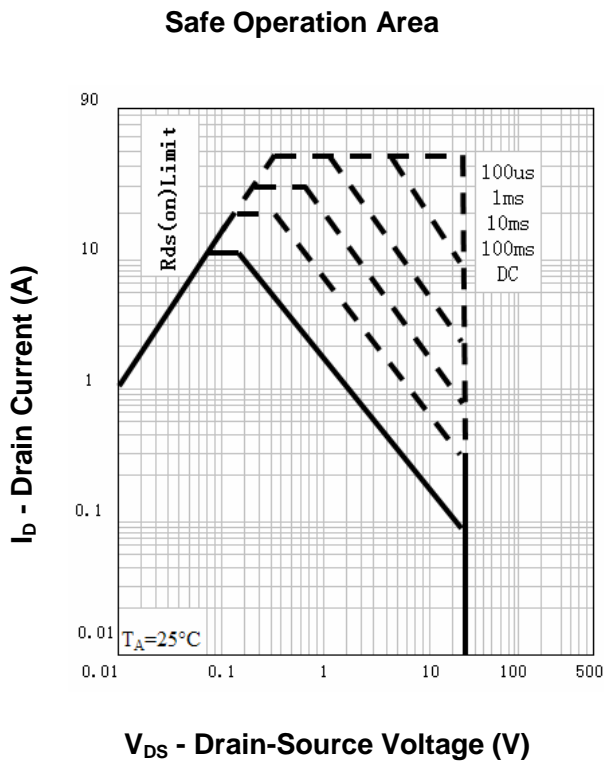
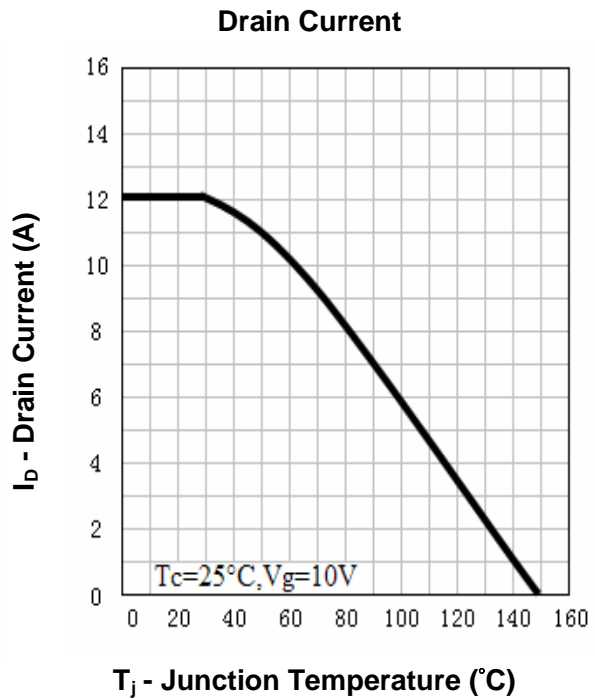
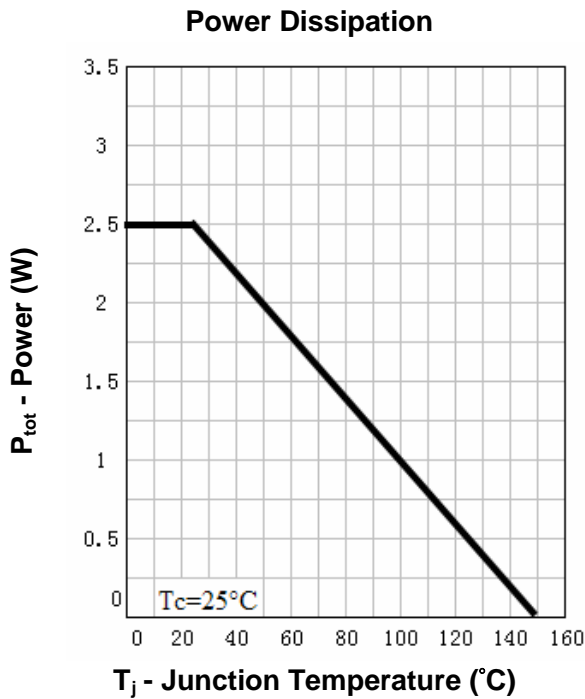
Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_C = 25^\circ C$ 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	$T_C = 25^\circ C$ 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	$V_{DS}=30V, V_{GS}=0V$			1	μA
		$T_J=85^{\circ}\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.5	2	2.7	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	12	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=8A$		15	17	$m\Omega$
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	$V_{GS}=0V,$		980		pF
C_{oss}	Output Capacitance	$V_{DS}=15V,$		160		
C_{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz		120		
$t_{d(ON)}$	Turn-on Delay Time			12		ns
t_r	Turn-on Rise Time	$V_{DD}=15V, R_L=30\Omega,$		19		
$t_{d(OFF)}$	Turn-off Delay Time	$I_{DS}=12A, V_{GEN}=10V,$		34		
t_f	Turn-off Fall Time	$R_G=6\Omega$		16		
Gate Charge Characteristics ⁽⁵⁾						
Q_g	Total Gate Charge			19	25	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=15V, V_{GS}=10V,$		3		
Q_{gd}	Gate-Drain Charge	$I_{DS}=12A$		7		

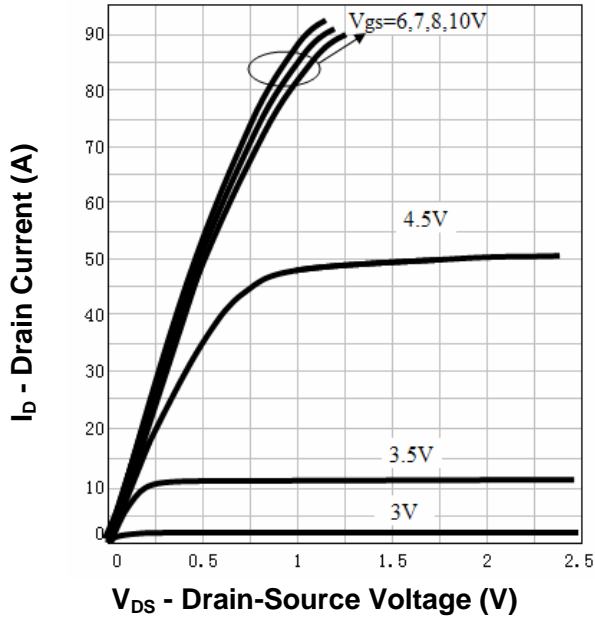
- Notes: ① Pulse width limited by safe operating area.
 ② When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 ③ Limited by $T_{Jmax}, I_{AS}=20A, V_{DD}=48V, R_G=50\Omega$, Starting $T_J=25^{\circ}\text{C}$.
 ④ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 ⑤ Guaranteed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

Typical Characteristics

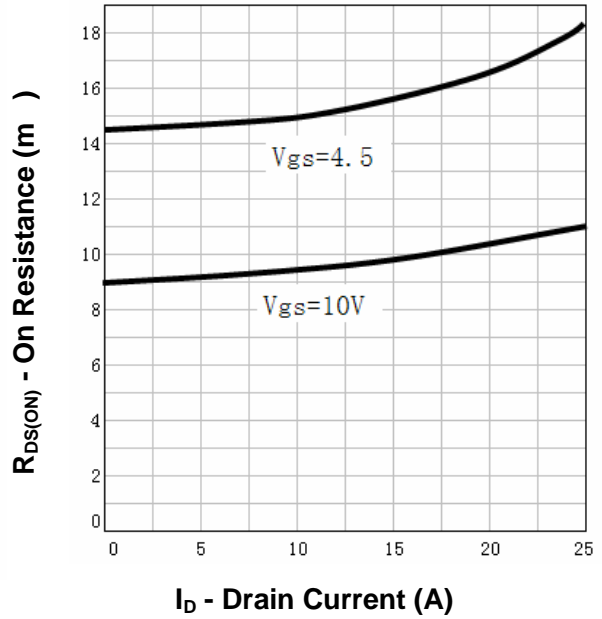


Typical Characteristics

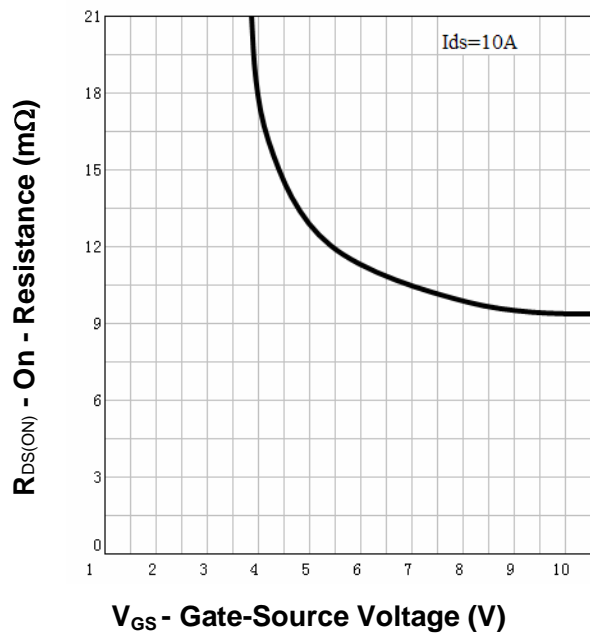
Output Characteristics



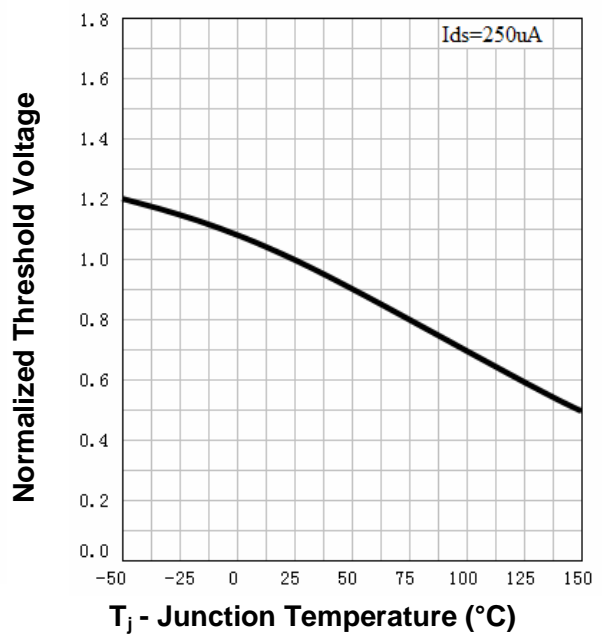
Drain-Source On Resistance



Drain-Source On Resistance

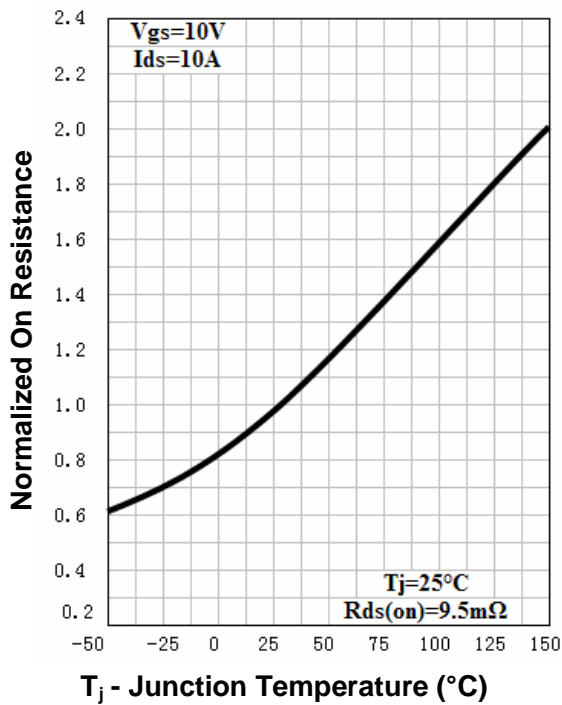


Gate Threshold Voltage

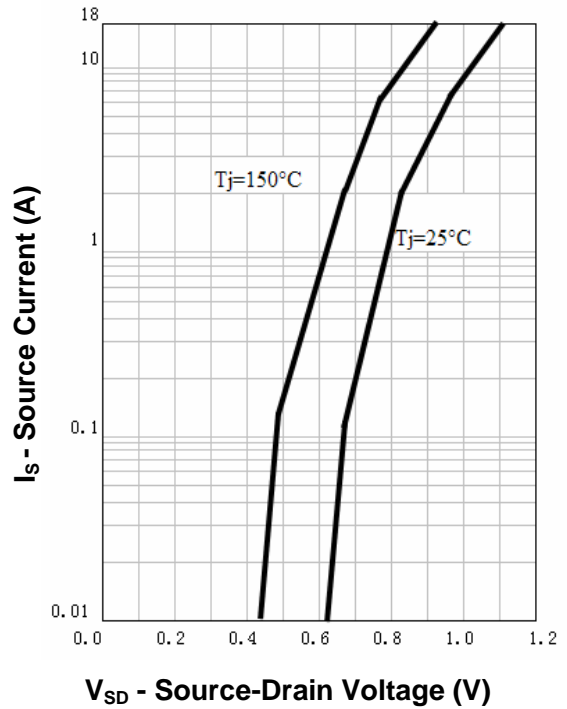


Typical Characteristics

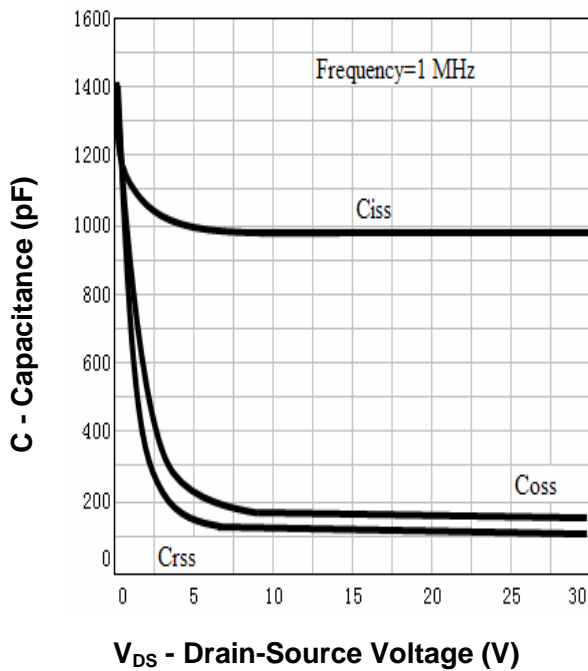
Drain-Source On Resistance



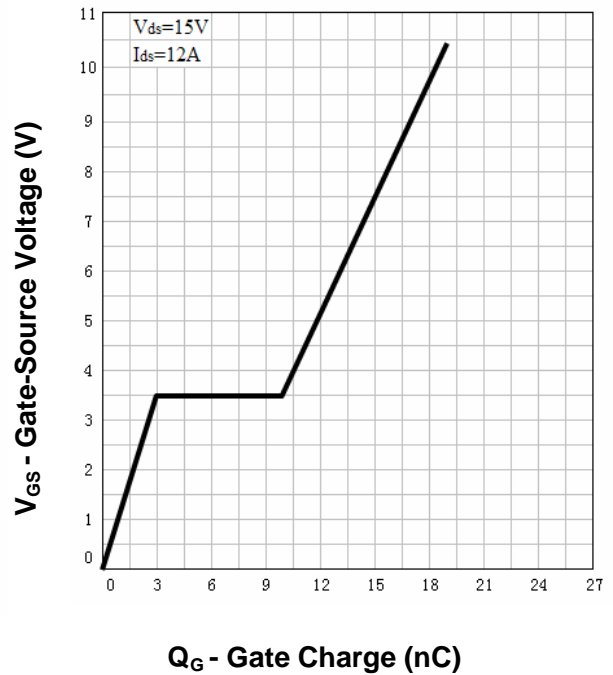
Source-Drain Diode Forward



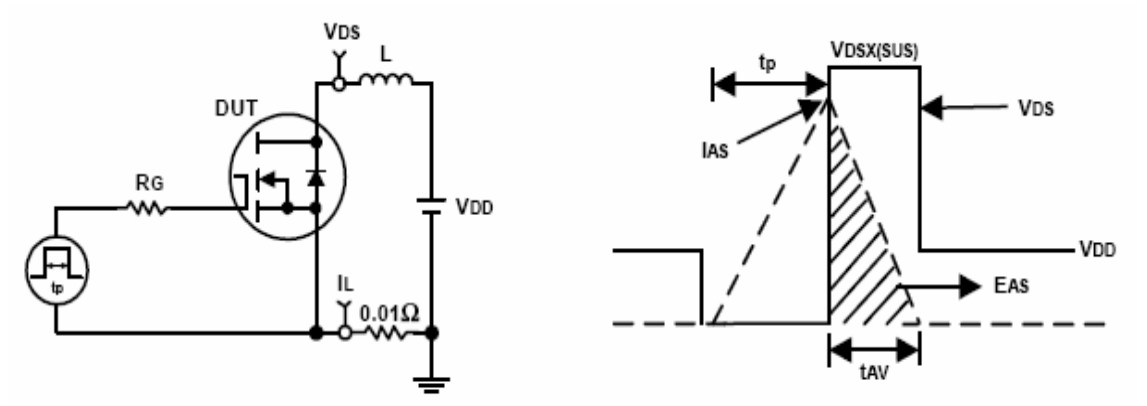
Capacitance



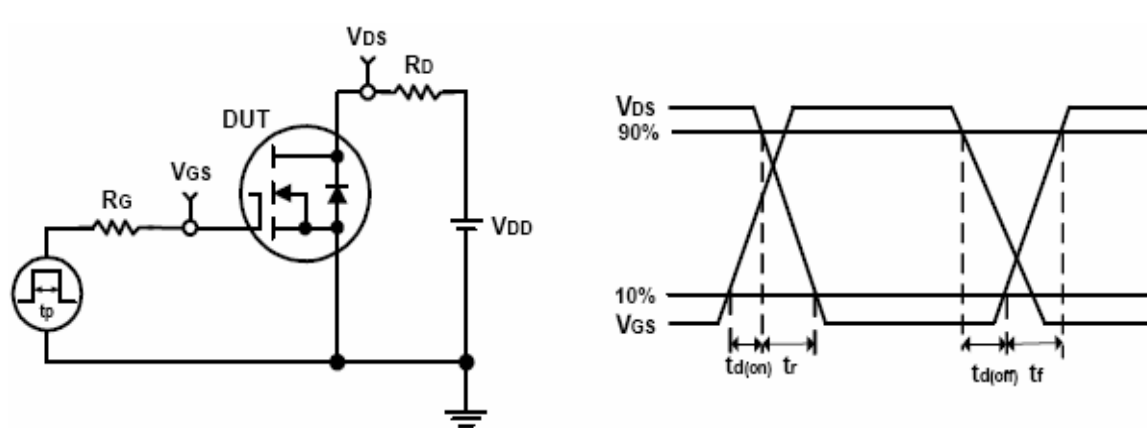
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information**RU3020****Package (Available)**

H : SOP-8

Operating Temperature Range

C : -55 to 150 °C

Assembly Material

G : Green & Lead Free

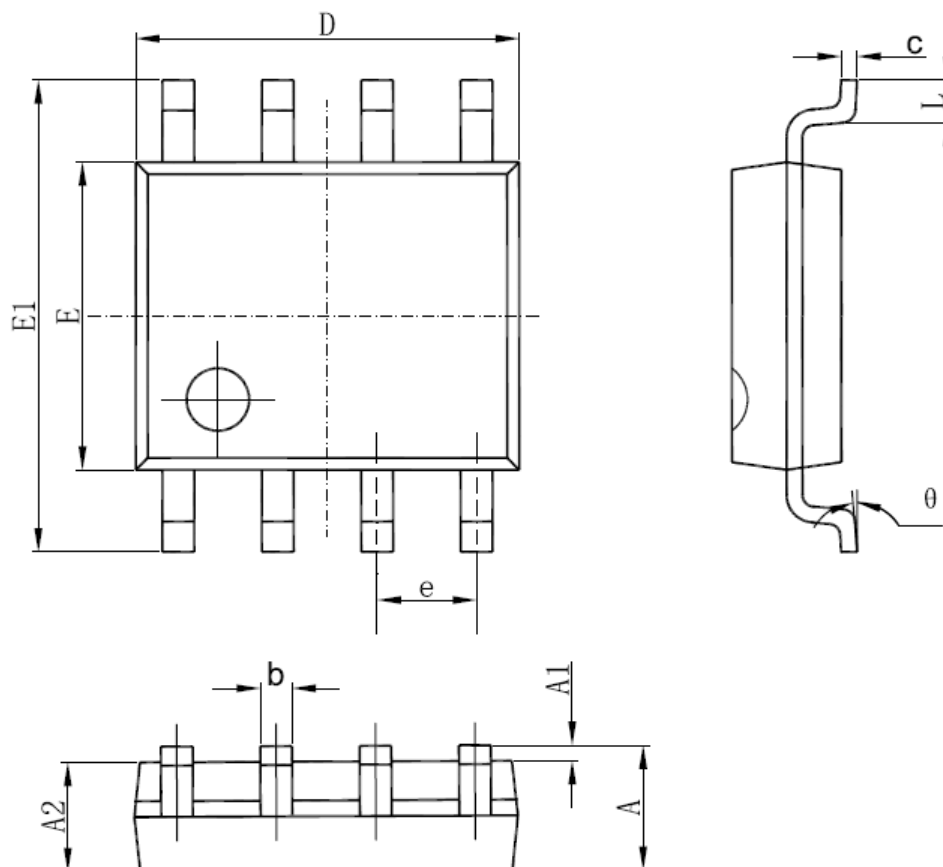
Packaging

T : TUBE

TR : Tape & Reel

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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