

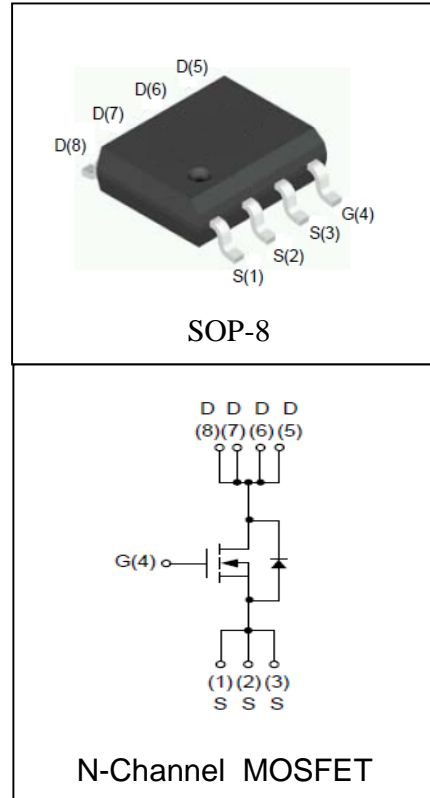
Features

- 20V/20A,
 $R_{DS(ON)} = 3.5m\Omega$ (Typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 3.8m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
 $R_{DS(ON)} = 5.6m\Omega$ (Typ.) @ $V_{GS} = 2.5V$
- Super High Dense Cell Design
- Low $R_{DS(ON)}$
- Reliable and Rugged
- Lead Free and Green Available

Applications

- DC/DC Converter

Pin Description



Absolute Maximum Ratings

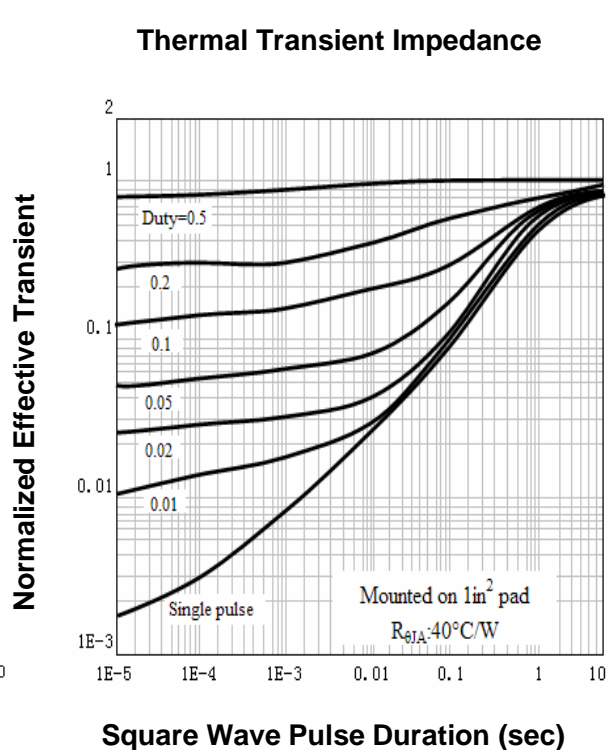
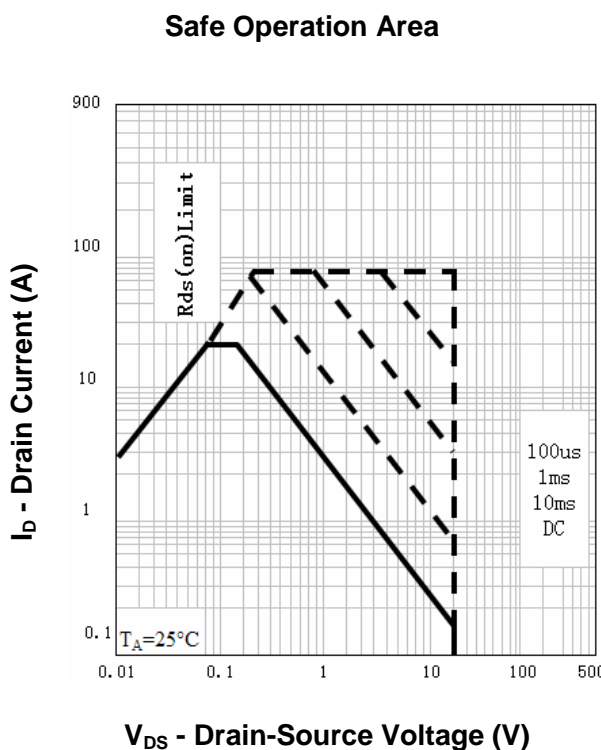
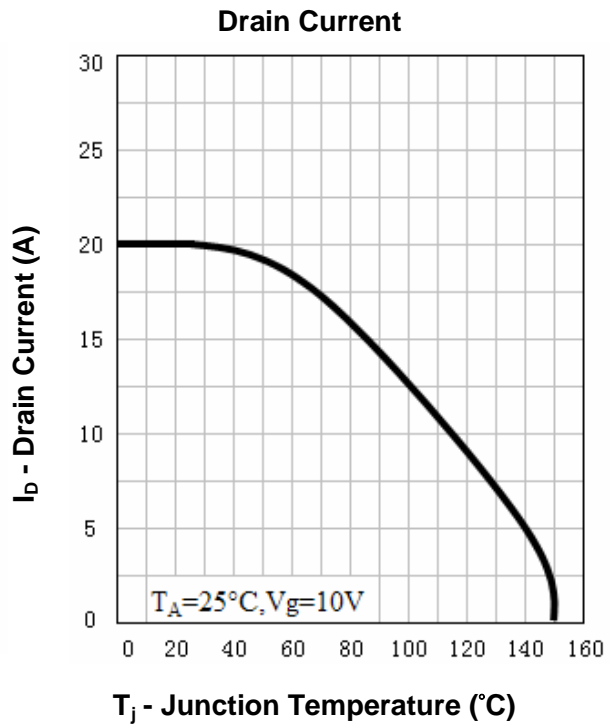
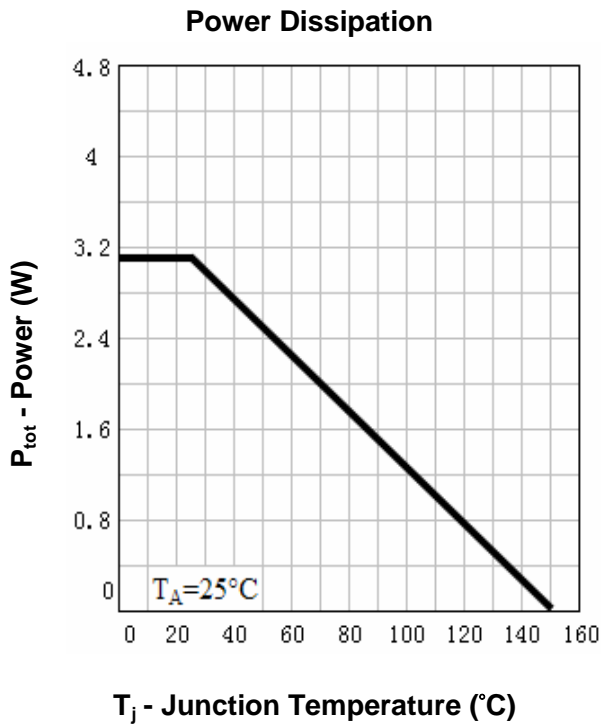
Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 12	
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_A = 25^\circ C$ 4.4	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulse Drain Current Tested	$T_A = 25^\circ C$ 70 ^①	A
I_D	Continuous Drain Current ($V_{GS} = 10V$)	$T_A = 25^\circ C$ 20	A
		$T_A = 70^\circ C$ 17	
P_D	Maximum Power Dissipation	$T_A = 25^\circ C$ 3.1	W
		$T_A = 70^\circ C$ 2	
$R_{\theta JA}$ ^②	Thermal Resistance-Junction to Ambient	40	$^\circ C/W$

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

Symbol	Parameter	Test Condition	RU2020H			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	$V_{DS}=20V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	1	1.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$		3.5	5.2	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=16A$		3.8	6.5	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=12A$		5.6	9	$m\Omega$
Diode Characteristics						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$			1	V
t_{rr}	Reverse Recovery Time	$I_{SD}=10A, di_{SD}/dt=100A/\mu s$		27		ns
Q_{rr}	Reverse Recovery Charge			39		nC
Dynamic Characteristics ⁽⁴⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		2		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz		3680		pF
C_{oss}	Output Capacitance			1530		
C_{riss}	Reverse Transfer Capacitance			370		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, R_L=1\Omega,$ $I_{DS}=10A, V_{GEN}=4.5V,$ $R_G=6\Omega$		20		ns
t_r	Turn-on Rise Time			25		
$t_{d(OFF)}$	Turn-off Delay Time			92		
t_f	Turn-off Fall Time			45		
Gate Charge Characteristics ⁽⁴⁾						
Q_g	Total Gate Charge	$V_{DS}=16V, V_{GS}=4.5V,$ $I_{DS}=10A$		53		nC
Q_{gs}	Gate-Source Charge			11		
Q_{gd}	Gate-Drain Charge			20		

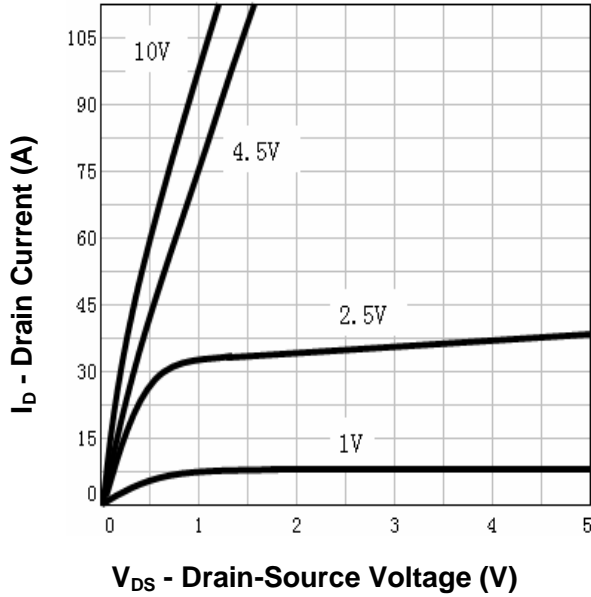
- Notes: ① Pulse width limited by safe operating area.
 ② When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 ③ Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 ④ Guaranteed by design, not subject to production testing.

Typical Characteristics

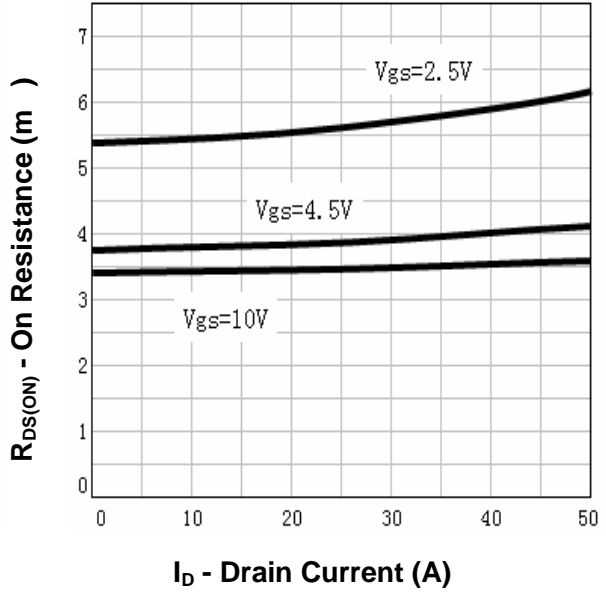


Typical Characteristics

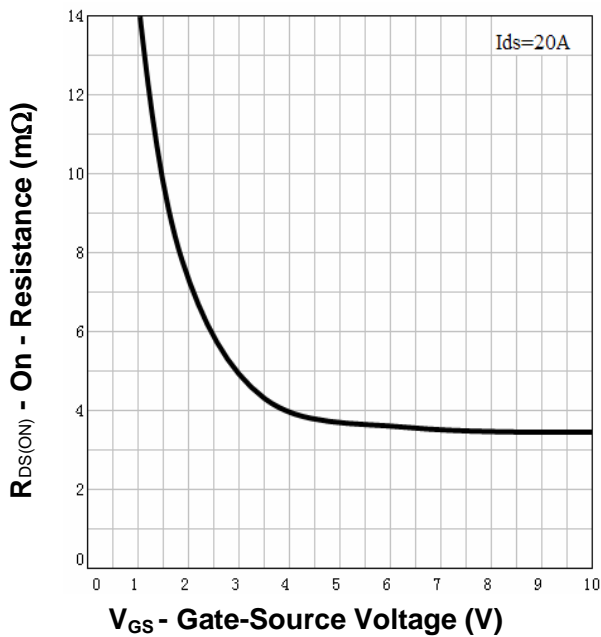
Output Characteristics



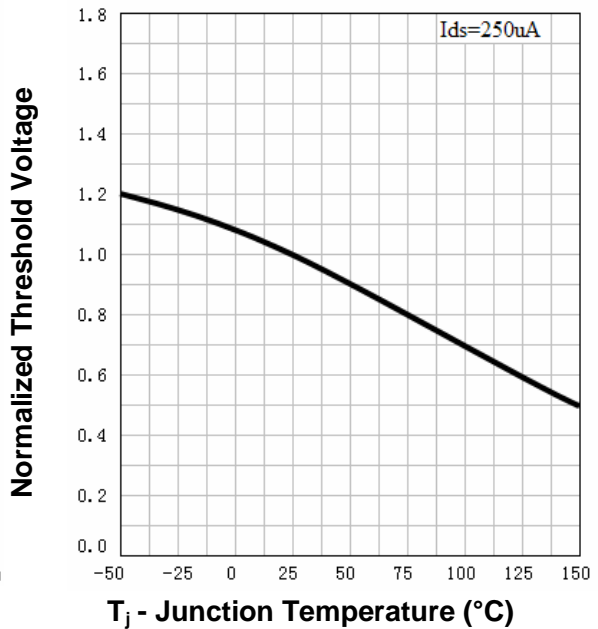
Drain-Source On Resistance



Drain-Source On Resistance

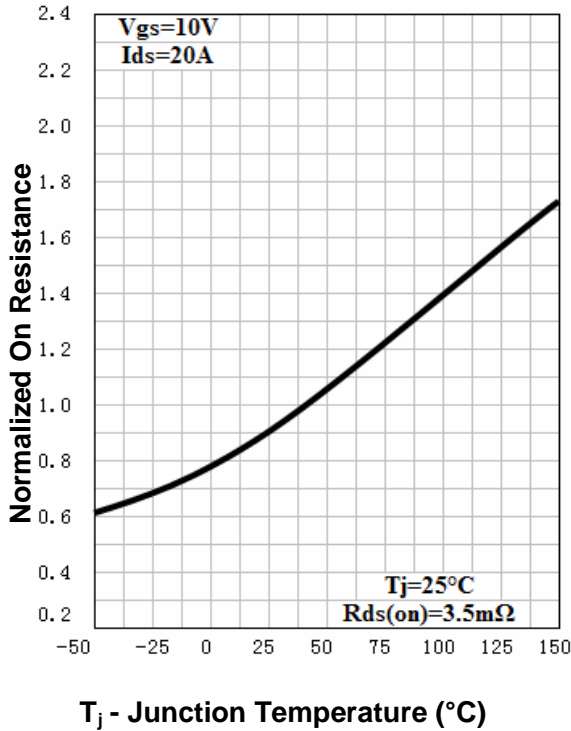


Gate Threshold Voltage

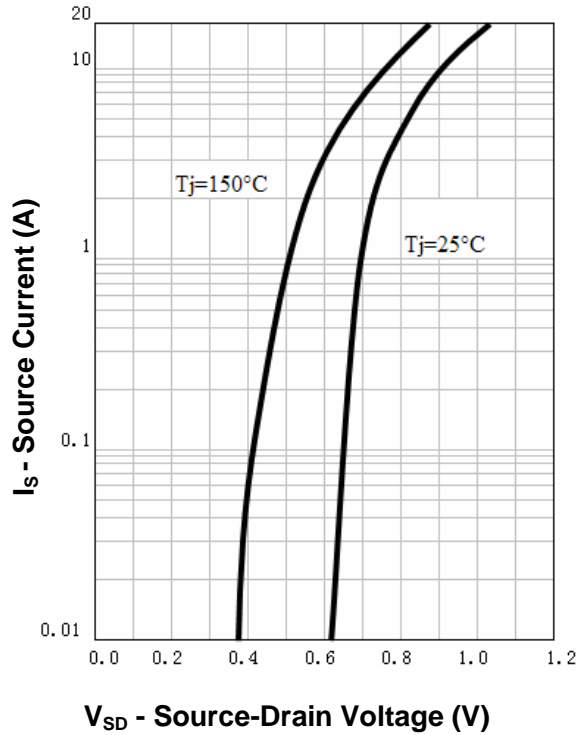


Typical Characteristics

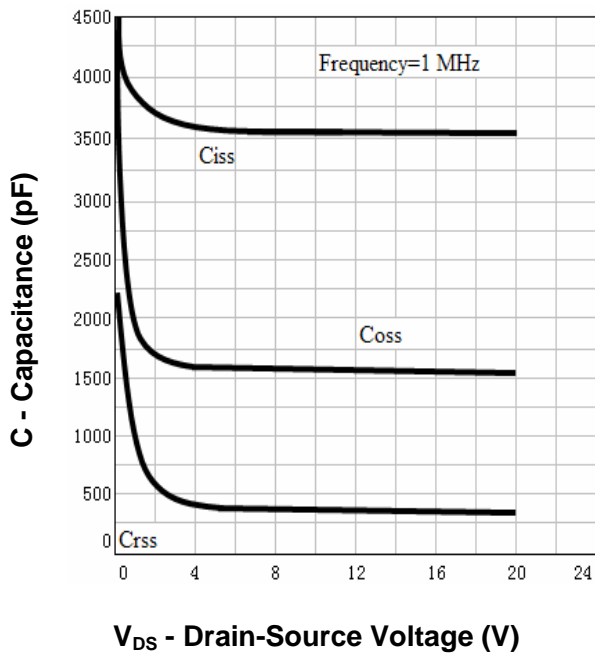
Drain-Source On Resistance



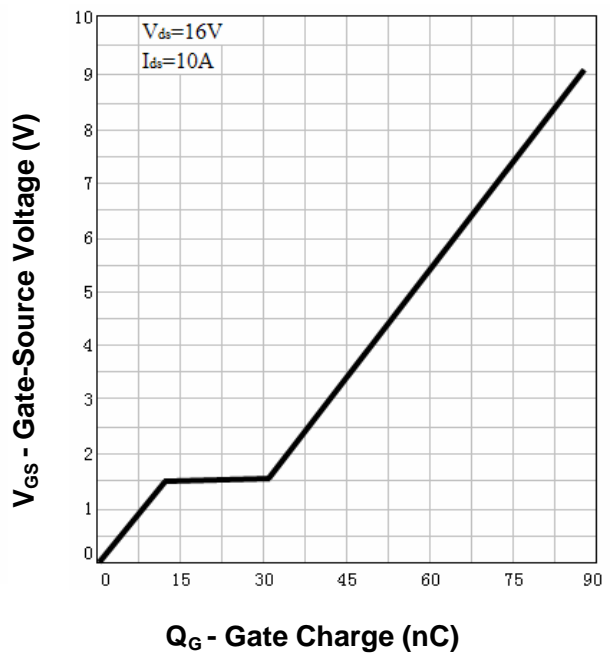
Source-Drain Diode Forward



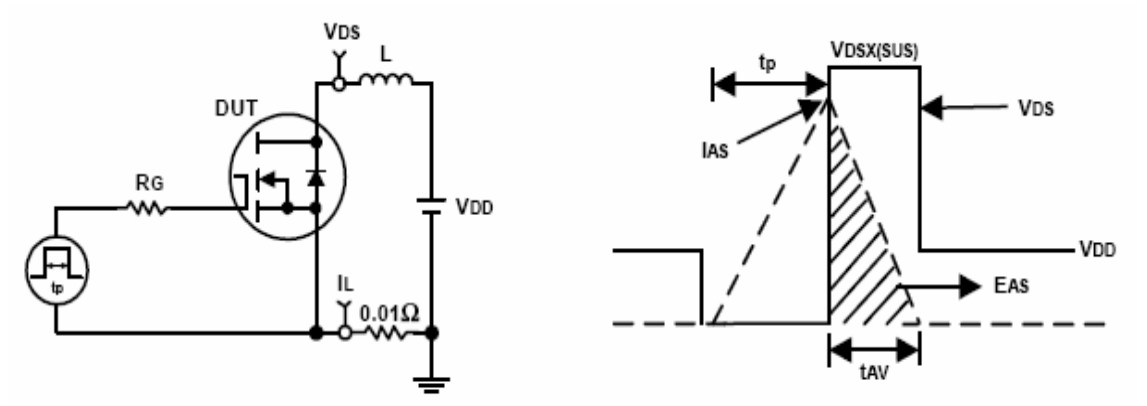
Capacitance



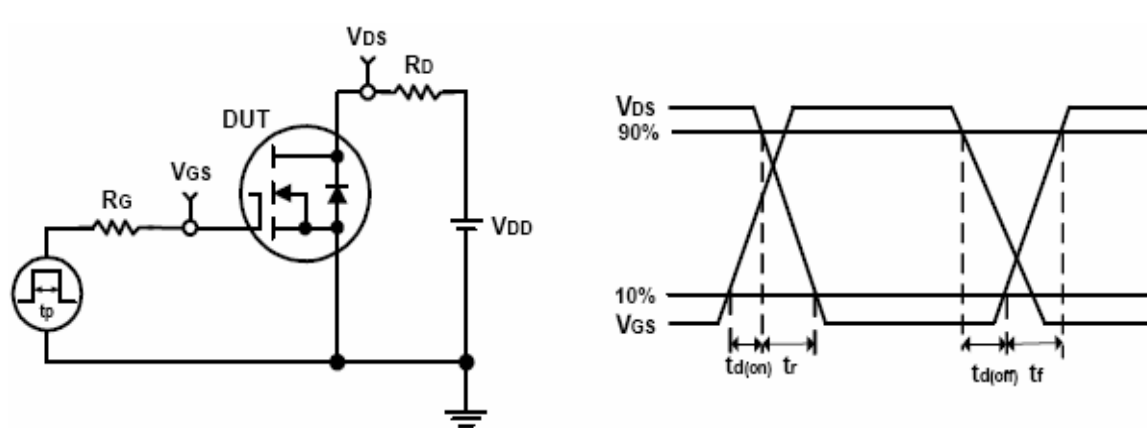
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

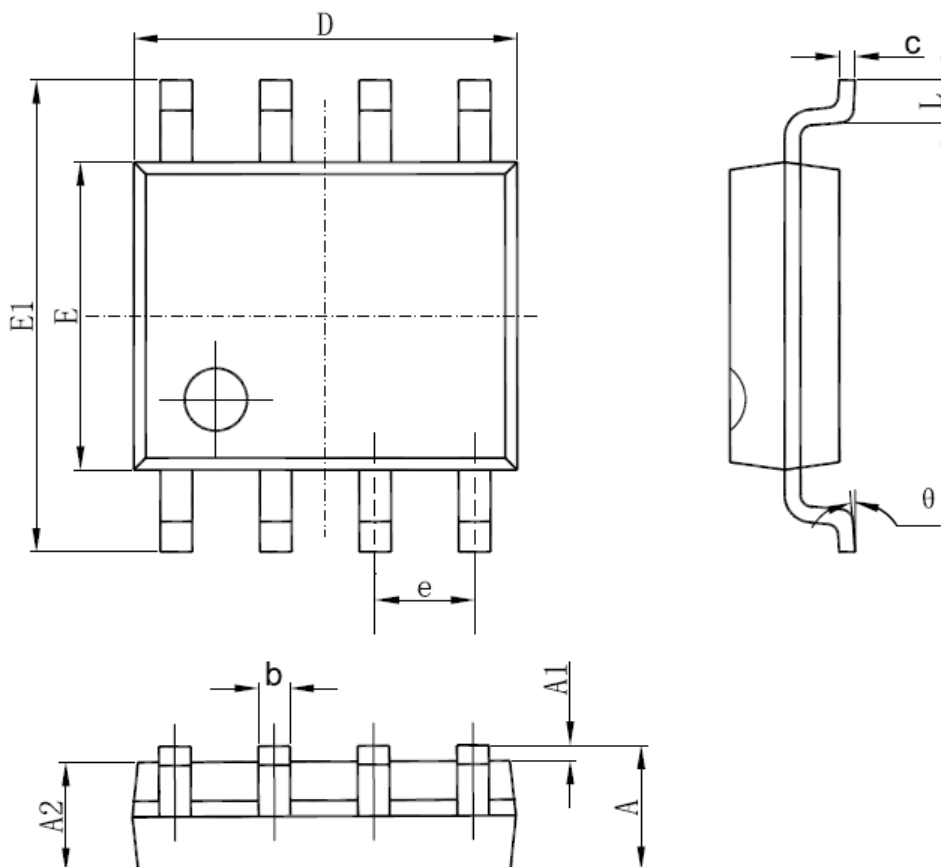


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU2020H	RU2020H	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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