

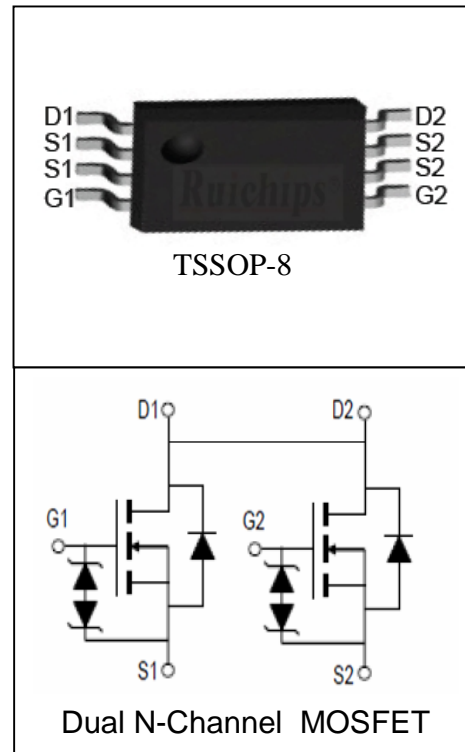
Features

- 20V/7A,
 $R_{DS(ON)} = 12m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
 $R_{DS(ON)} = 18m\Omega$ (Typ.) @ $V_{GS} = 2.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- ESD Protected
- Lead Free and Green Available

Applications

- PWM Applications

Pin Description



Absolute Maximum Ratings

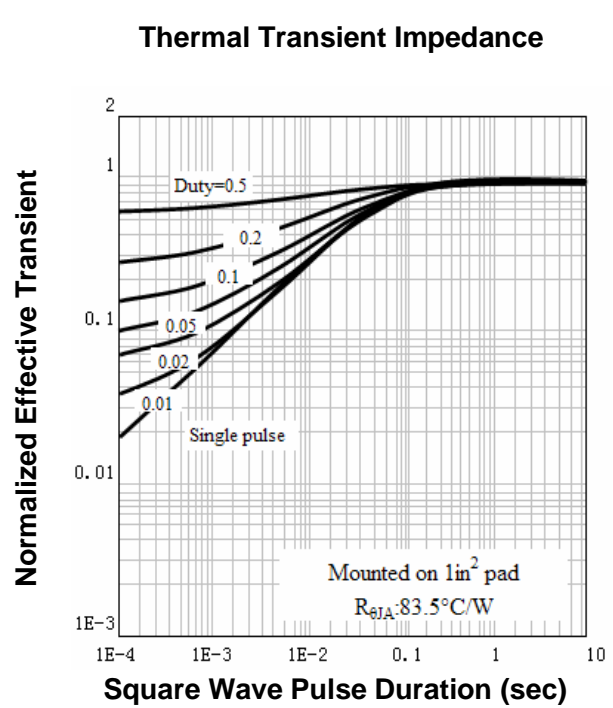
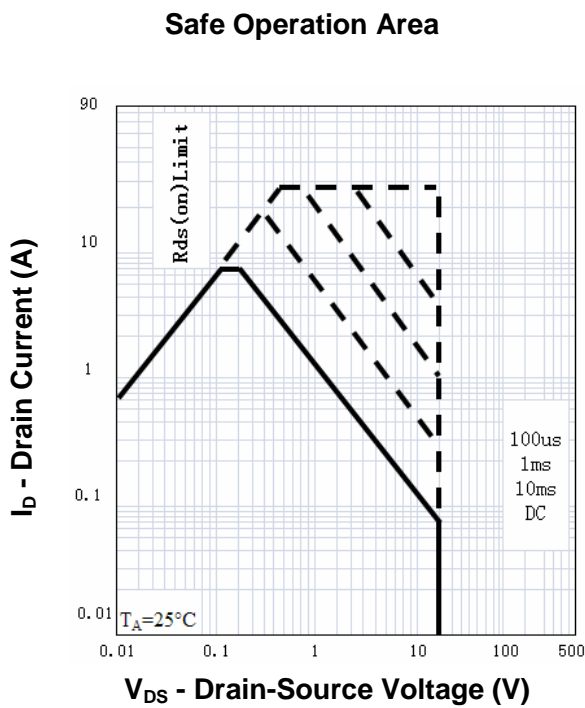
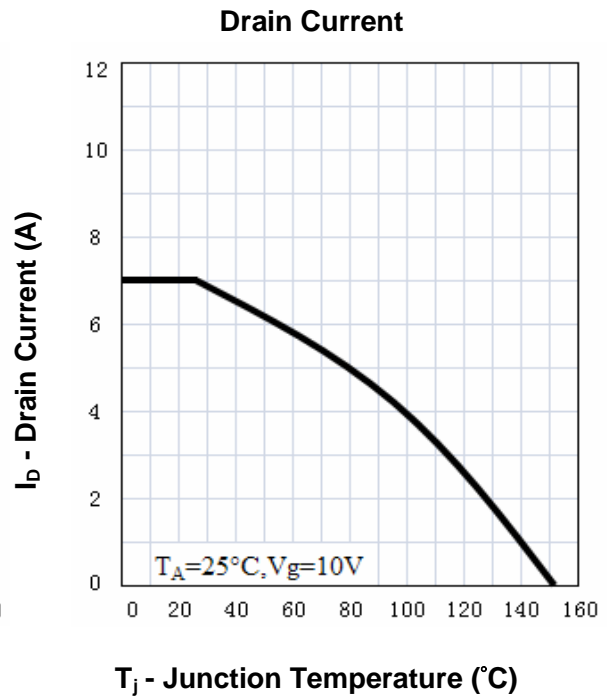
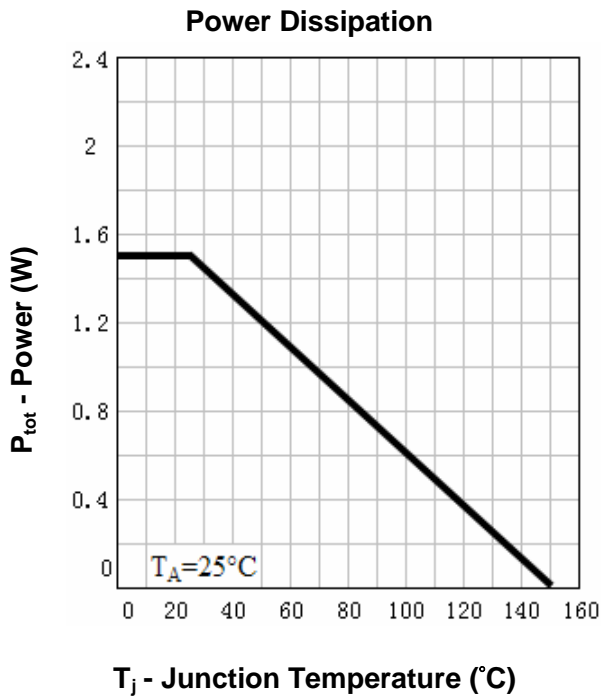
Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 8	
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_A = 25^\circ C$ 2	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulse Drain Current Tested	$T_A = 25^\circ C$ 28 ^①	A
I_D	Continuous Drain Current ($V_{GS} = 4.5V$)	$T_A = 25^\circ C$ 7	A
		$T_A = 70^\circ C$ 5.5	
P_D	Maximum Power Dissipation	$T_A = 25^\circ C$ 1.5	W
		$T_A = 70^\circ C$ 0.96	
$R_{\theta JA}$ ^②	Thermal Resistance-Junction to Ambient	83.5	$^\circ C/W$

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

Symbol	Parameter	Test Condition	RU20T7G			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
		$T_J=85^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	0.7	1.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 8V, V_{DS}=0V$			± 10	μA
$R_{DS(ON)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=7A$		12	16	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=5.5A$		18	25	$m\Omega$
Diode Characteristics						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$			1	V
t_{rr}	Reverse Recovery Time	$I_{SD}=1A, di_{SD}/dt=100A/\mu s$		18		ns
Q_{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ⁽⁴⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1.5		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=10V, Frequency=1.0MHz$		1155		pF
C_{oss}	Output Capacitance			180		
C_{rss}	Reverse Transfer Capacitance			140		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, R_L=1.4\Omega, I_{DS}=7A, V_{GEN}=4.5V, R_G=3\Omega$		6		ns
t_r	Turn-on Rise Time			12		
$t_{d(OFF)}$	Turn-off Delay Time			50		
t_f	Turn-off Fall Time			14		
Gate Charge Characteristics ⁽⁴⁾						
Q_g	Total Gate Charge	$V_{DS}=16V, V_{GS}=4.5V, I_{DS}=7A$		13		nC
Q_{gs}	Gate-Source Charge			1		
Q_{gd}	Gate-Drain Charge			3.5		

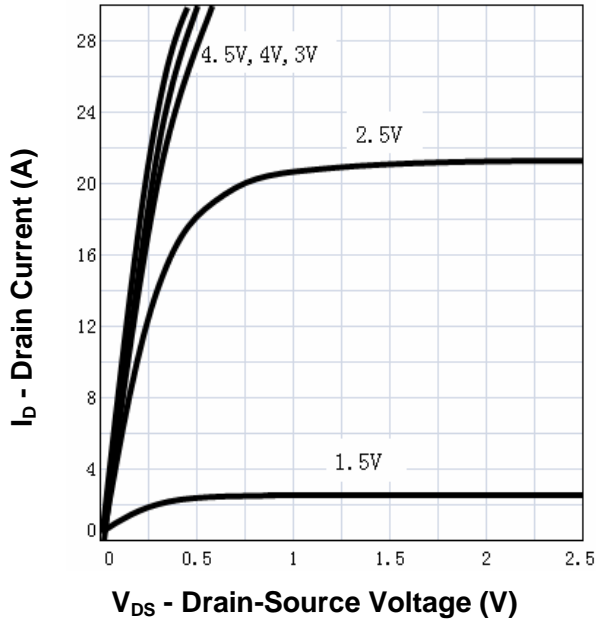
- Notes: ① Pulse width limited by safe operating area.
 ② When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
 ③ Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 ④ Guaranteed by design, not subject to production testing.

Typical Characteristics

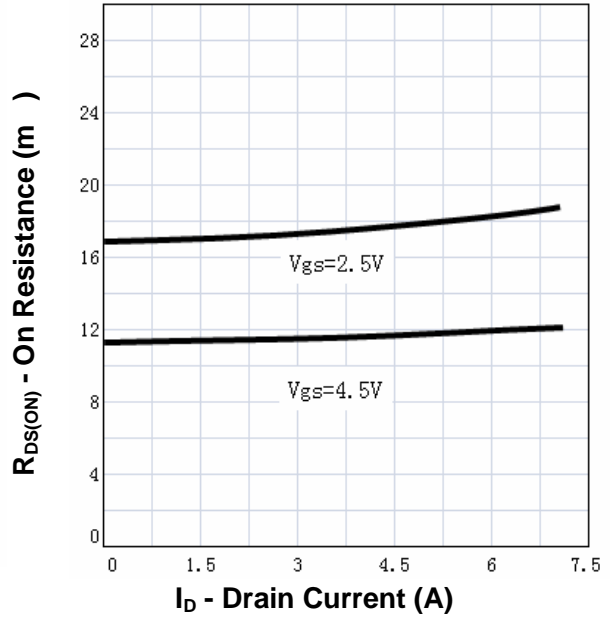


Typical Characteristics

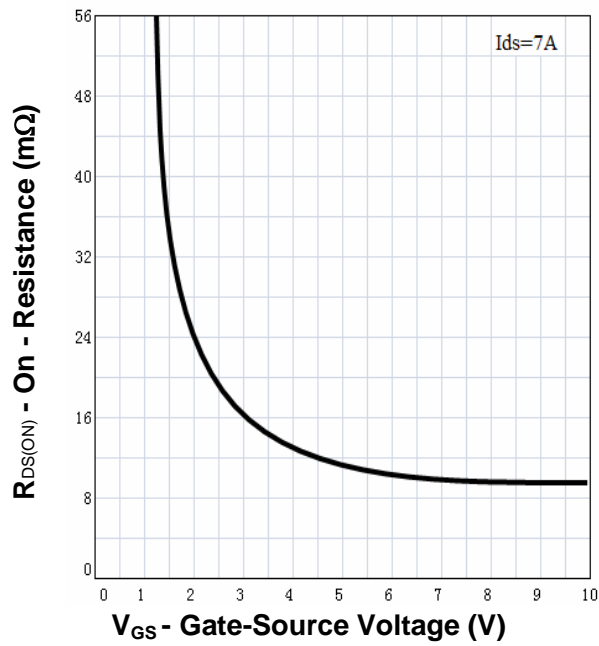
Output Characteristics



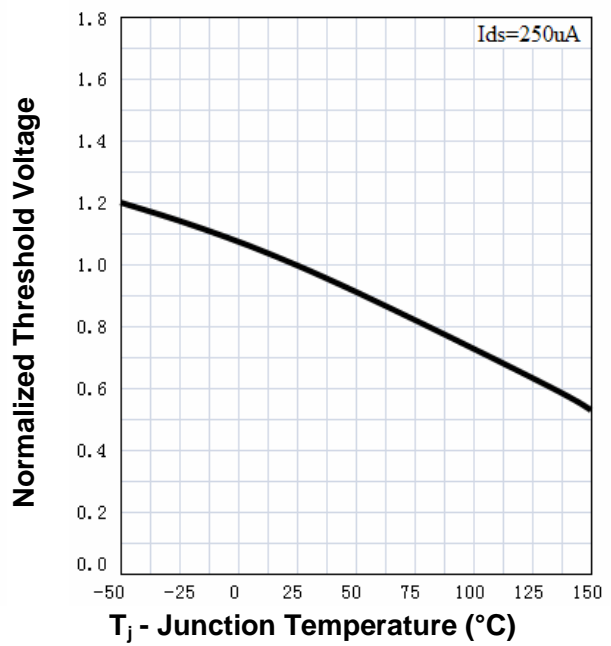
Drain-Source On Resistance



Drain-Source On Resistance

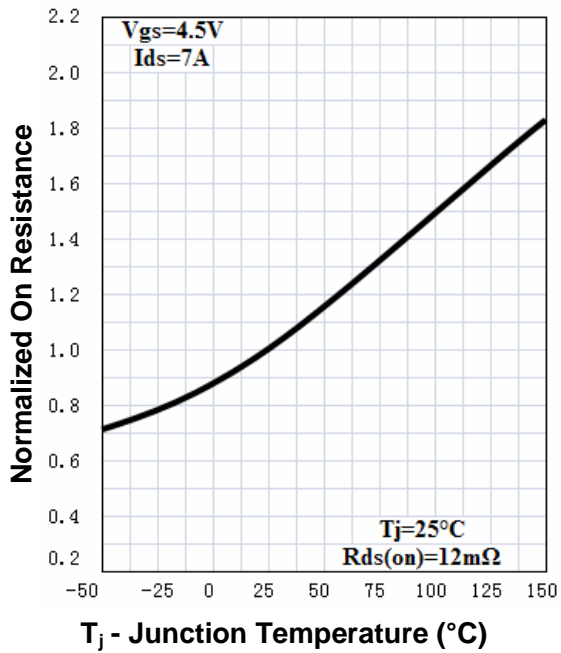


Gate Threshold Voltage

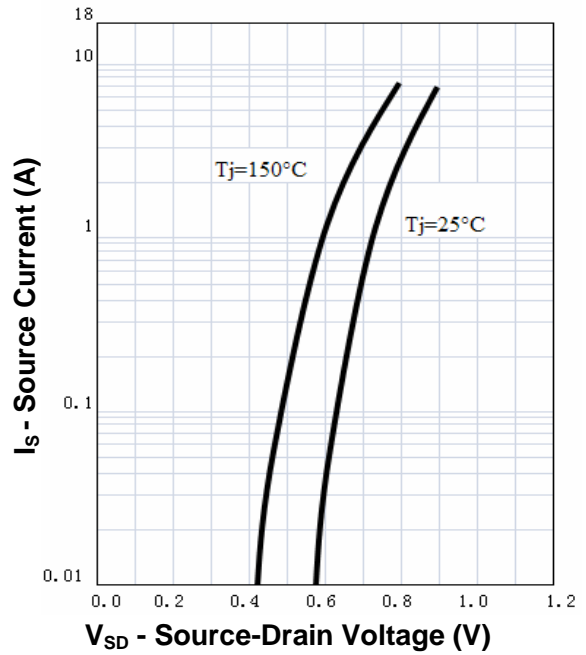


Typical Characteristics

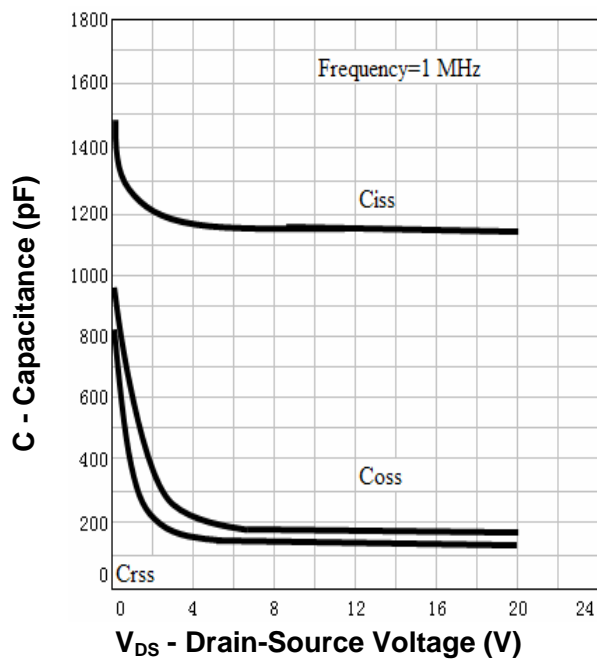
Drain-Source On Resistance



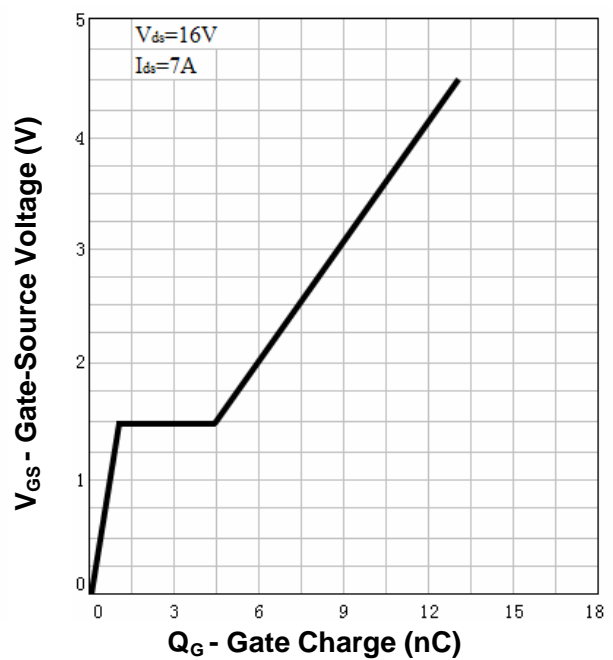
Source-Drain Diode Forward



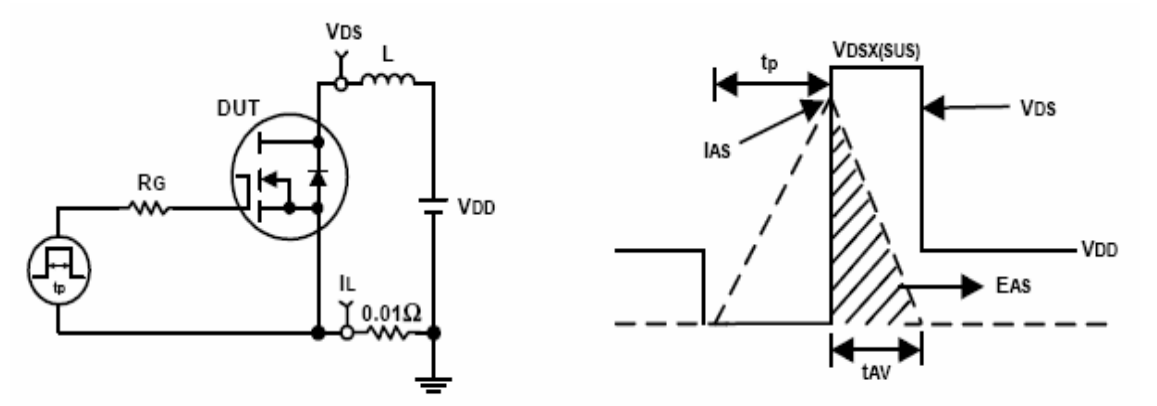
Capacitance



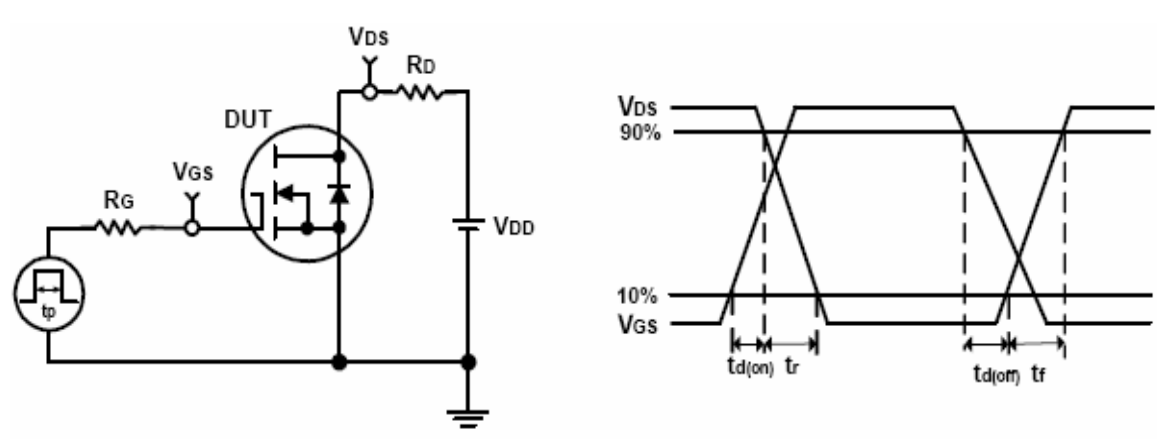
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

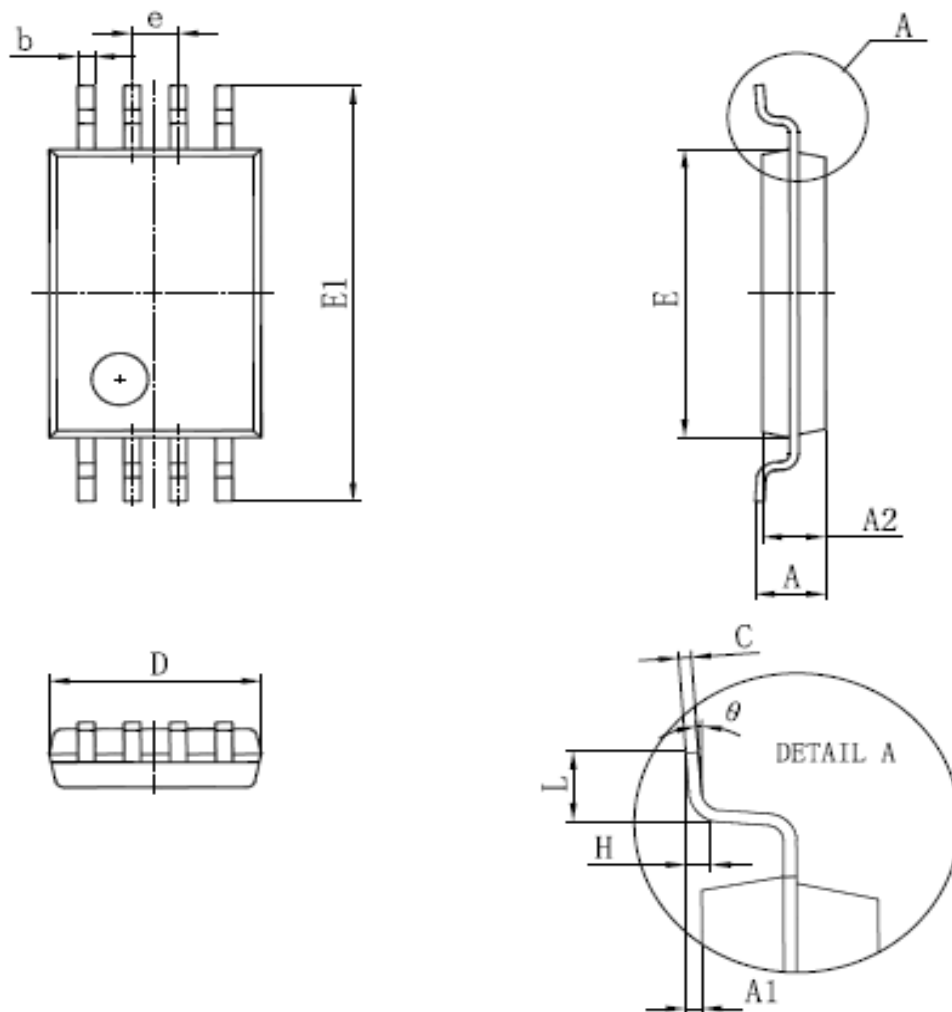


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU20T7G	RU20T7G	TSSOP8	Tape&Reel	3000	13''	12mm

Package Information

TSSOP-8



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
D	2.900	3.100	0.114	0.122	A2	0.800	1.050	0.031	0.041
E	4.300	4.500	0.169	0.177	A1	0.050	0.150	0.002	0.006
b	0.190	0.300	0.007	0.012	e	0.65 (BSC)		0.026 (BSC)	
c	0.090	0.200	0.004	0.008	L	0.500	0.700	0.020	0.028
E1	6.250	6.550	0.246	0.258	H	0.25(TYP)		0.01(TYP)	
A		1.200		0.047	θ	0°	8°	0°	8°

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

Customer Service

Worldwide Sales and Service:

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.com

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com