

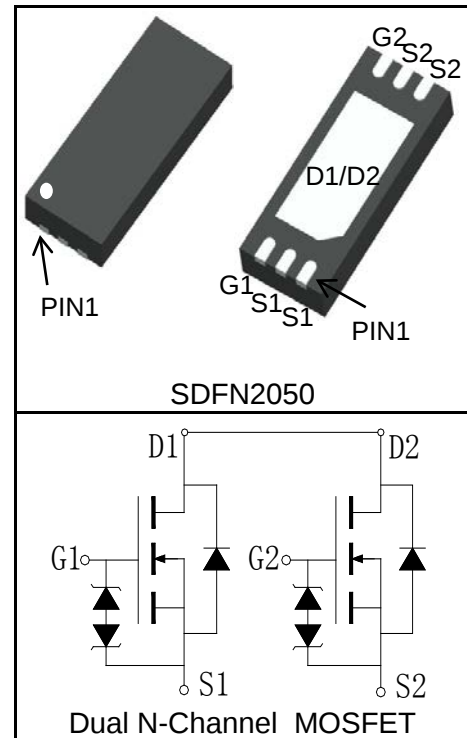
Features

- 20V/8A,
 $R_{DS(ON)} = 13m\Omega(Typ.)@V_{GS}=4.5V$
 $R_{DS(ON)} = 14m\Omega(Typ.)@V_{GS}=4V$
 $R_{DS(ON)} = 16m\Omega(Typ.)@V_{GS}=3.1V$
 $R_{DS(ON)} = 18m\Omega(Typ.)@V_{GS}=2.5V$
- Super High Dense Cell Design
- Fast Switching Speed
- ESD Protected
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- DC-DC Converters
- Power Management

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		20	V
V _{GSS}	Gate-Source Voltage		±10	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	28	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	60	A
I _D ^②	Continuous Drain Current@T _C (V _{GS} =4.5V)	T _C =25°C	28	A
		T _C =100°C	18	
	Continuous Drain Current@T _A (V _{GS} =4.5V) ^③	T _A =25°C	8	
		T _A =70°C	6.4	
P _D	Maximum Power Dissipation@T _C	T _C =25°C	25	W
		T _C =100°C	10	
	Maximum Power Dissipation@T _A ^③	T _A =25°C	1.7	
		T _A =70°C	1.1	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5	°C/W
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	75	°C/W
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	TBD	mJ

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

Symbol	Parameter	Test Condition	RU20T8M7			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20	24		V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5		1.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V			±10	μA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =8A		13	15	mΩ
		V _{GS} =4V, I _{DS} =7A		14	16	mΩ
		V _{GS} =3.1V, I _{DS} =6A		16	18	mΩ
		V _{GS} =2.5V, I _{DS} =5A		18	20	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =8A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =8A, dI _{SD} /dt=100A/μs		25		ns
Q _{rr}	Reverse Recovery Charge			13		nC
Dynamic Characteristics ^⑥						
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		1150		pF
C _{oss}	Output Capacitance			180		
C _{rss}	Reverse Transfer Capacitance			140		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, I _{DS} =8A, V _{GEN} =4.5V, R _G =2.5Ω		5		ns
t _r	Turn-on Rise Time			13		
t _{d(OFF)}	Turn-off Delay Time			34		
t _f	Turn-off Fall Time			17		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =16V, V _{GS} =4.5V, I _{DS} =8A		13		nC
Q _{gs}	Gate-Source Charge			1.2		
Q _{gd}	Gate-Drain Charge			3.9		

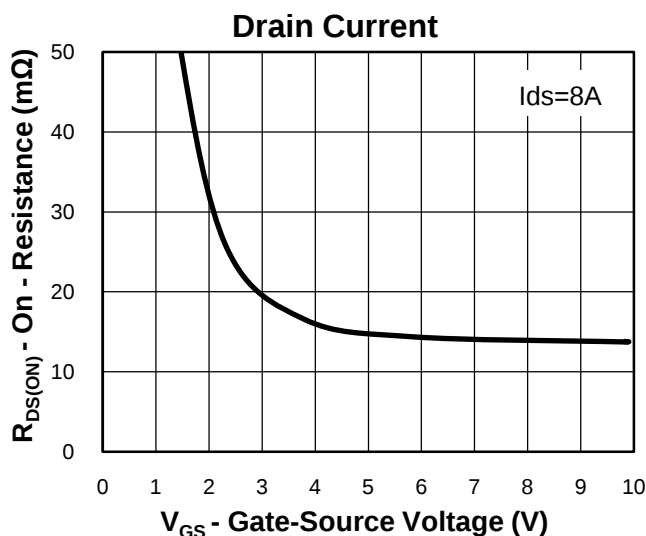
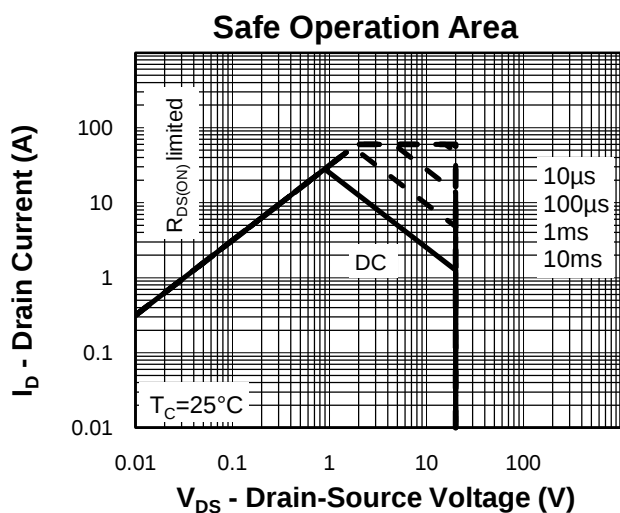
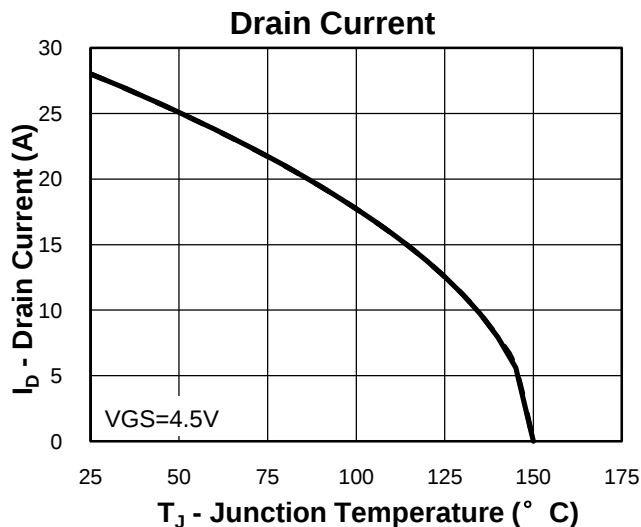
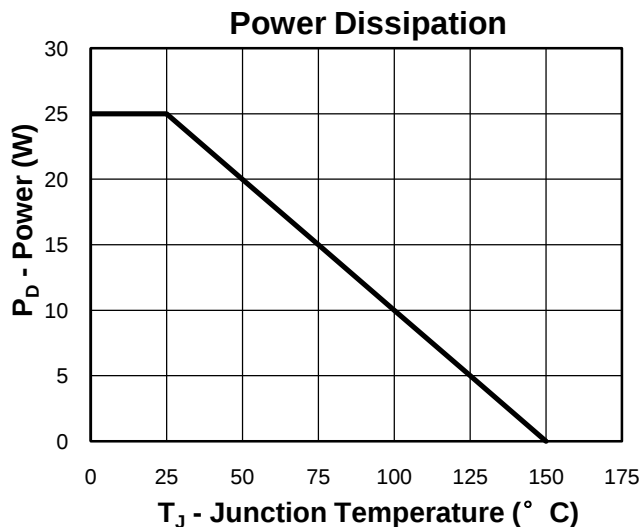
Notes:

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature.
- ③When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.
- ④Limited by $T_{J\max}$, $V_{DD} = 16\text{V}$, $R_G = 50\Omega$, Starting $T_J = 25^\circ\text{C}$.
- ⑤Pulse test;Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- ⑥Guaranteed by design, not subject to production testing.

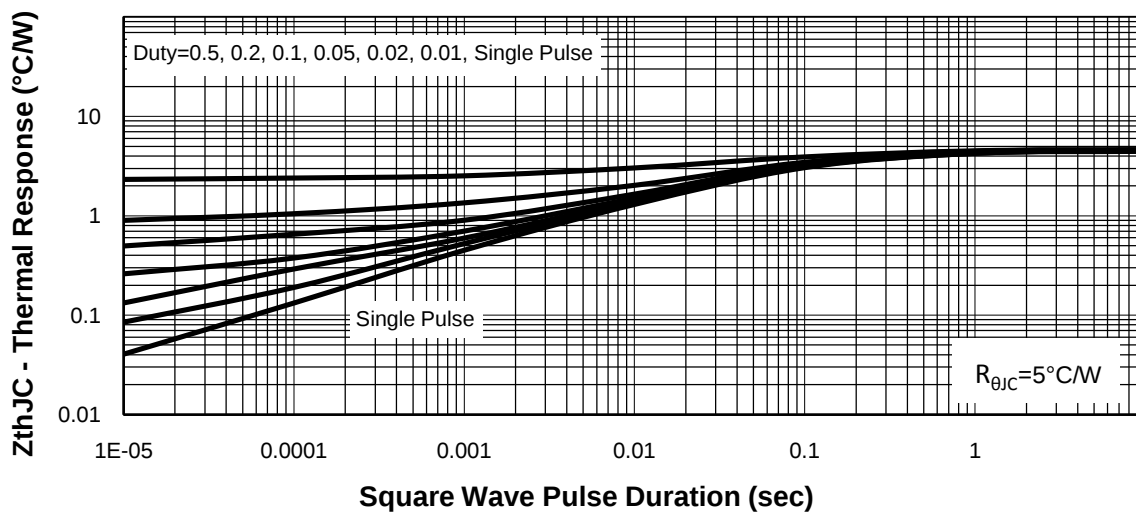
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU20T8M7	RU20T8M7	SDFN2050	Tape&Reel	2500	7"	12mm

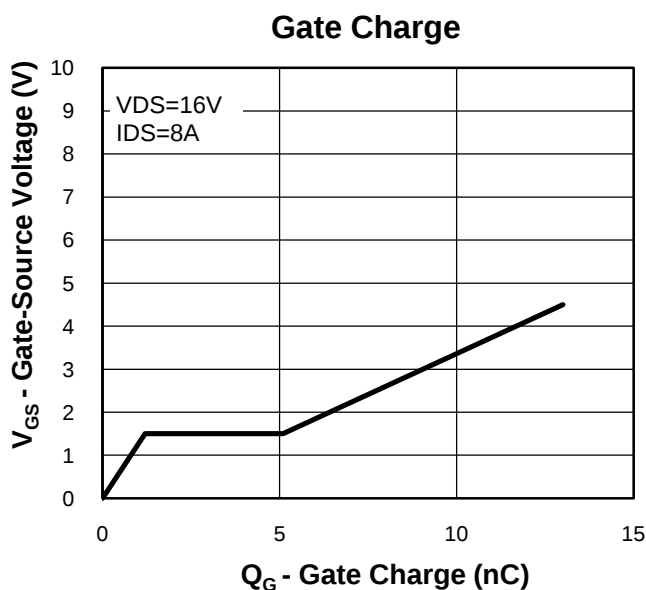
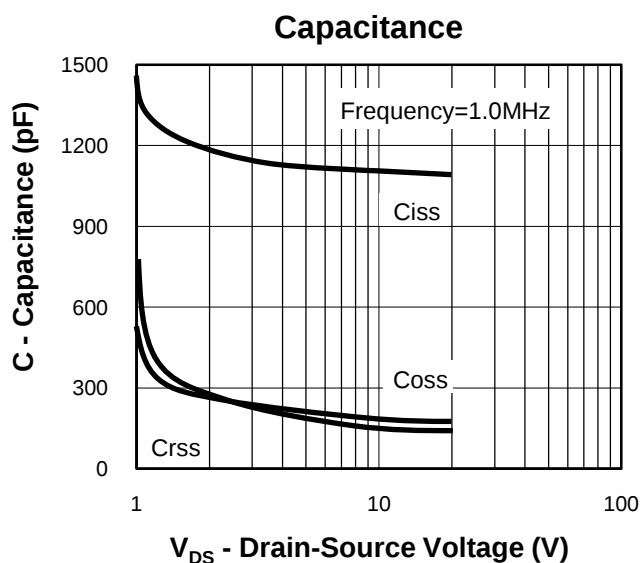
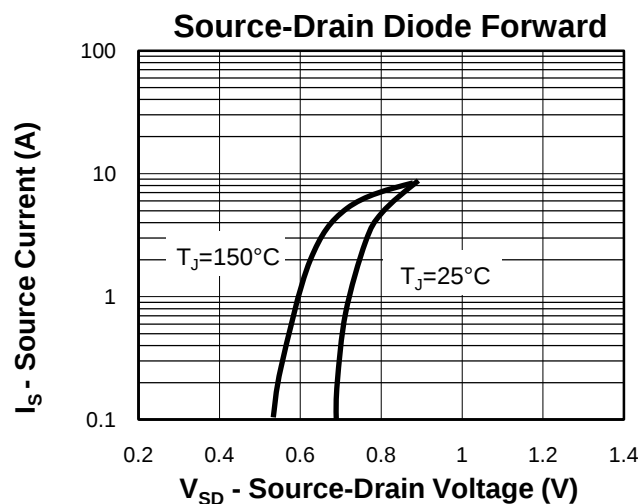
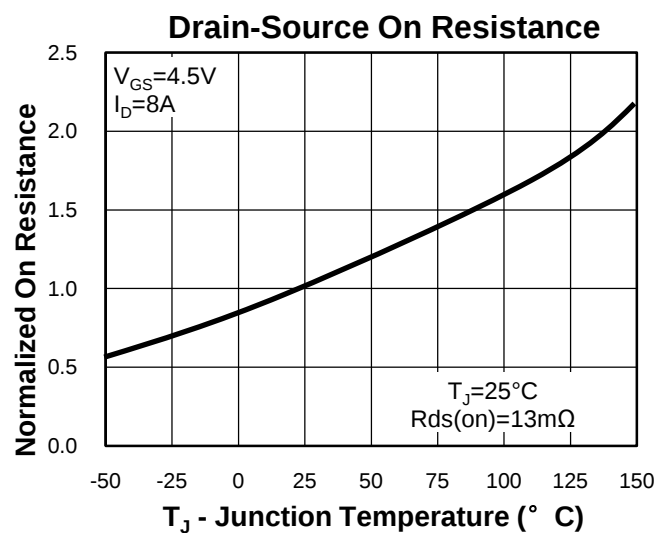
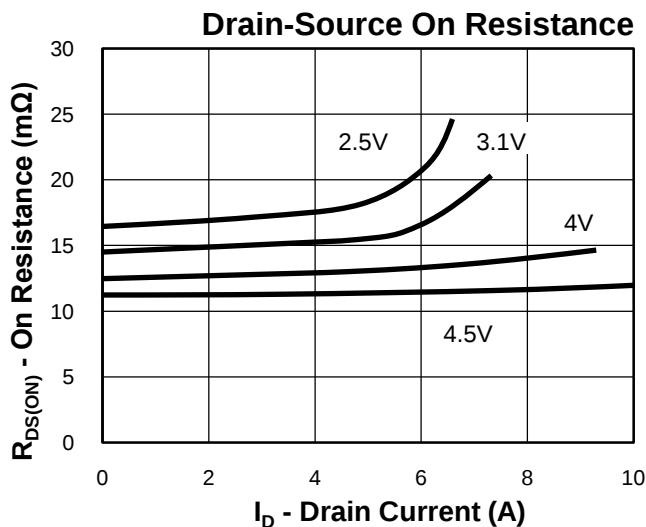
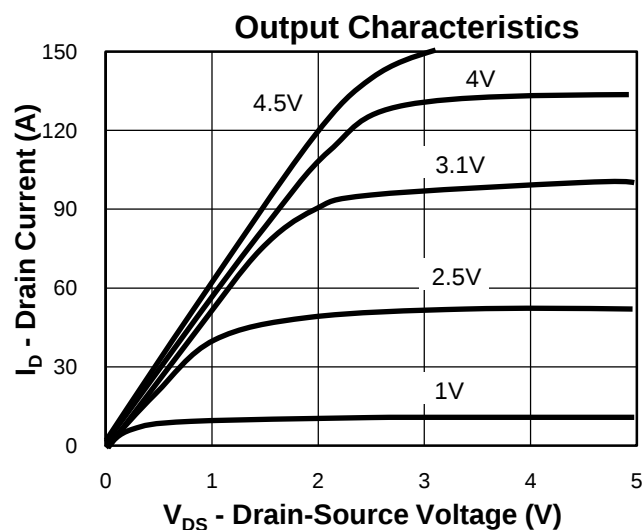
Typical Characteristics



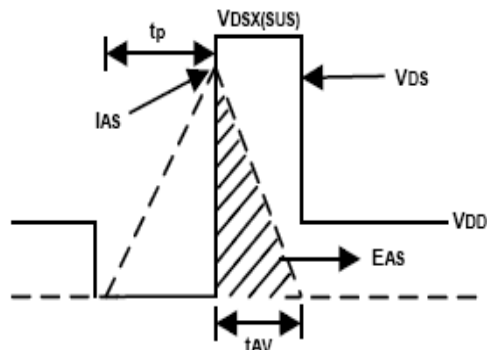
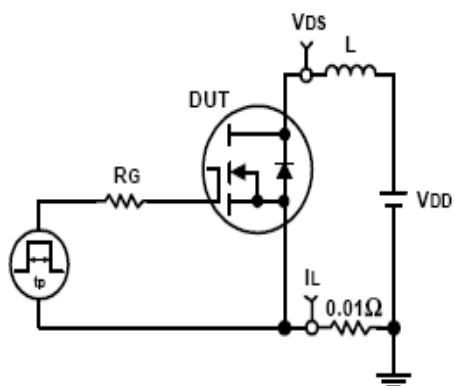
Thermal Transient Impedance



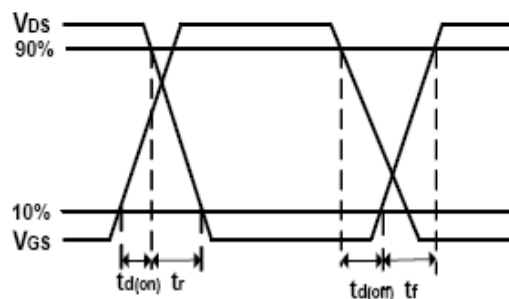
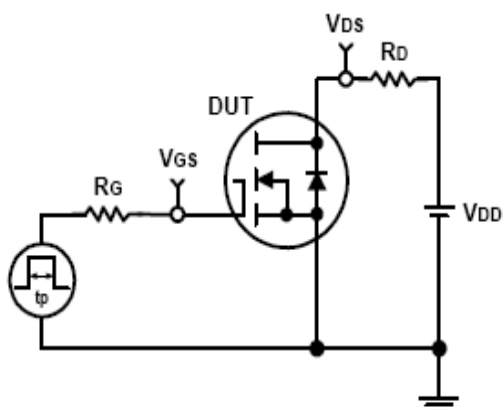
Typical Characteristics



Avalanche Test Circuit and Waveforms

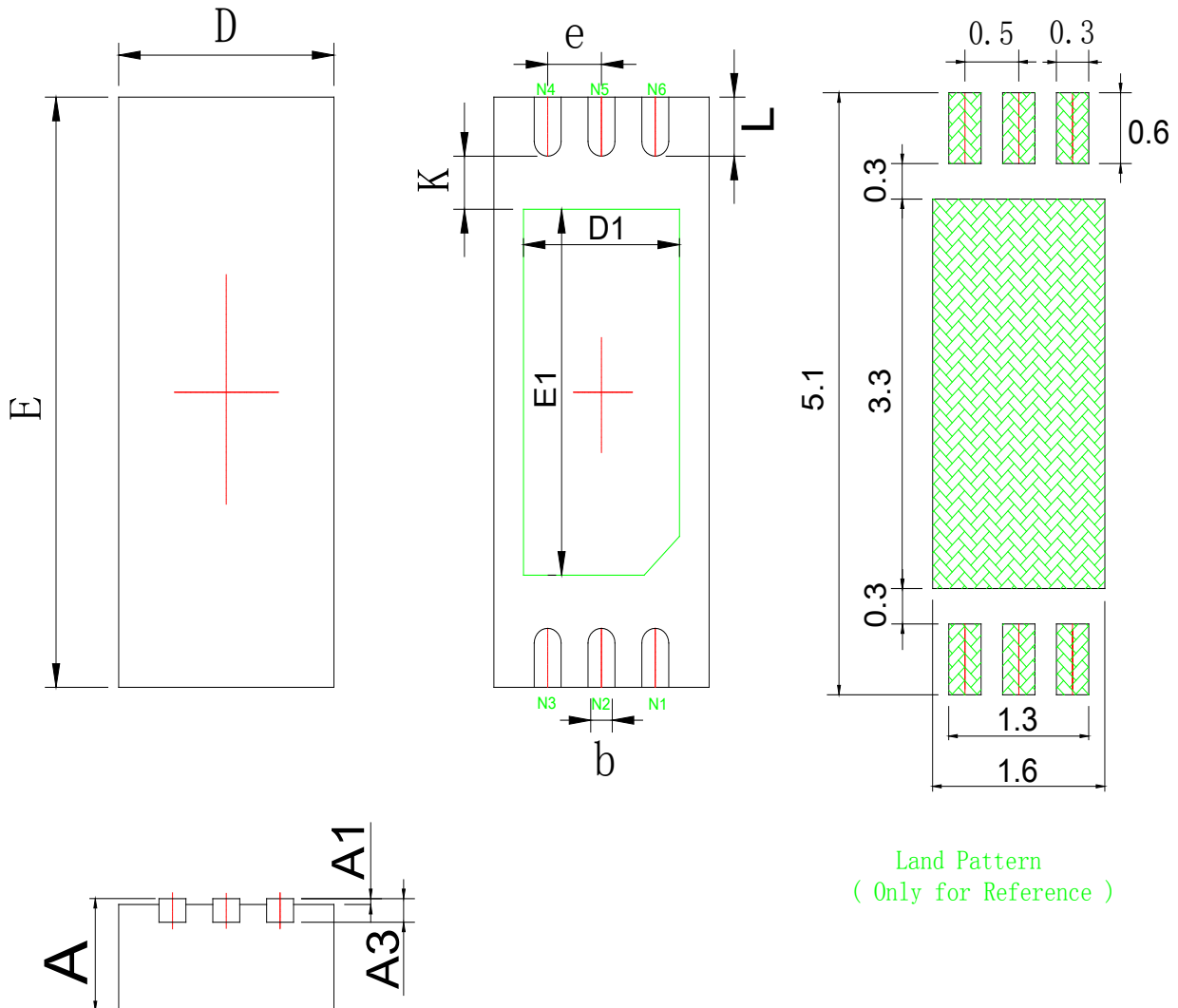


Switching Time Test Circuit and Waveforms



Package Information

SDFN2050



Land Pattern
(Only for Reference)

SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.800	0.900	0.028	0.031	0.035
A1	0.000	0.025	0.050	0.000	0.001	0.002
A3	0.203 REF.			0.008 REF.		
D	1.924	2.000	2.076	0.076	0.079	0.082
E	4.924	5.000	5.076	0.194	0.197	0.200
D1	1.350	1.450	1.550	0.053	0.057	0.061
E1	2.950	3.050	3.150	0.116	0.120	0.124
K	0.200 MIN.			0.008 MIN.		
b	0.200	0.250	0.300	0.008	0.010	0.012
e	0.500 TYP			0.020 TYP		
L	0.424	0.500	0.576	0.017	0.020	0.023

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.comm

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