

Features

- 60V/80A,
- $R_{DS(ON)} = 5.3m\Omega(Typ.)@V_{GS}=10V$
- $R_{DS(ON)} = 6.5m\Omega(Typ.)@V_{GS}=4.5V$
- Uses Ruichips Advanced RUISGT™ Technology
- Low Gate Charge Minimizing Switching Loss
- Ultra Low On-Resistance
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- 100% Avalanche Tested
- Lead Free and Green Devices (RoHS Compliant)

Applications

- DC/DC Converters
- PD Wireless Charging
- On Board Power for Server
- Synchronous Rectification

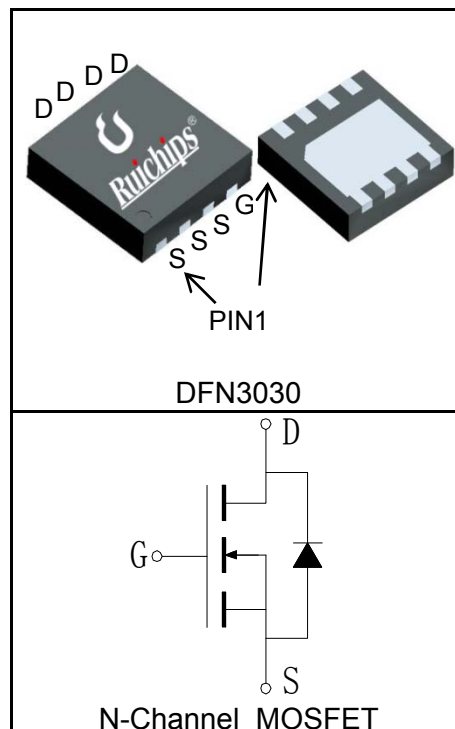


RoHS



Halogen-Free

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		60	V
V _{GSS}	Gate-Source Voltage		±20	
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	80	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	300	A
I _D ^②	Continuous Drain Current@T _C (V _{GS} =10V)	T _C =25°C	80	A
		T _C =100°C	50	
	Continuous Drain Current@T _A (V _{GS} =10V) ^③	T _A =25°C	20	
		T _A =70°C	16	
P _D	Maximum Power Dissipation@T _C	T _C =25°C	87	W
		T _C =100°C	35	
	Maximum Power Dissipation@T _A ^③	T _A =25°C	3	
		T _A =70°C	1.9	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.43	$^{\circ}\text{C/W}$
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	42	$^{\circ}\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	169	mJ

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

Symbol	Parameter	Test Condition	RUH6080M3-C			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V			1	μA
		T _J =125°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1		2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ⑤	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =30A		6.5	9	mΩ
		V _{GS} =10V, I _{DS} =40A		5.3	7	mΩ
		T _J =150°C		9.5	12.5	mΩ
Diode Characteristics						
V _{SD} ⑤	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V		0.8	1.2	V
g _{fs}	Transconductance	V _{DS} =5V, I _{DS} =40A		60	100	S
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs		32	50	ns
Q _{rr}	Reverse Recovery Charge			21	35	nC
Dynamic Characteristics⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.5	3	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz		1550	2500	pF
C _{oss}	Output Capacitance			380	550	
C _{rss}	Reverse Transfer Capacitance			8	20	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, I _{DS} =40A, V _{GEN} =10V, R _G =4.7Ω		5	10	ns
t _r	Turn-on Rise Time			25	40	
t _{d(OFF)}	Turn-off Delay Time			11	20	
t _f	Turn-off Fall Time			9.5	20	
Gate Charge Characteristics⑧						
Q _g	Total Gate Charge	V _{DS} =48V, V _{GS} =10V, I _{DS} =40A		26	40	nC
Q _{gs}	Gate-Source Charge			4.8	10	
Q _{gd}	Gate-Drain Charge			5.2	10	

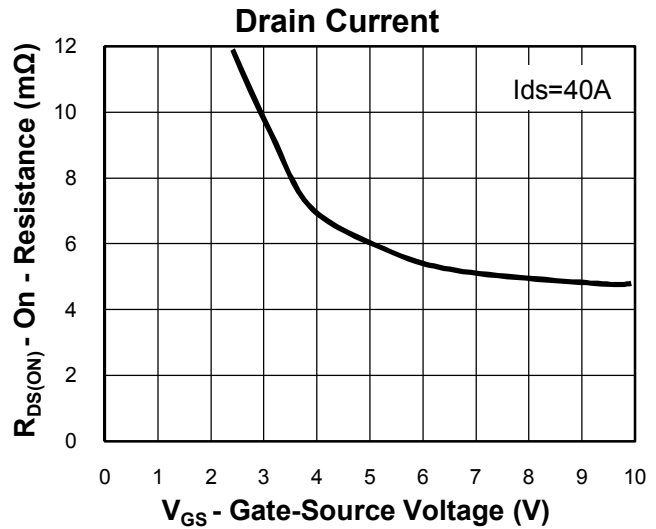
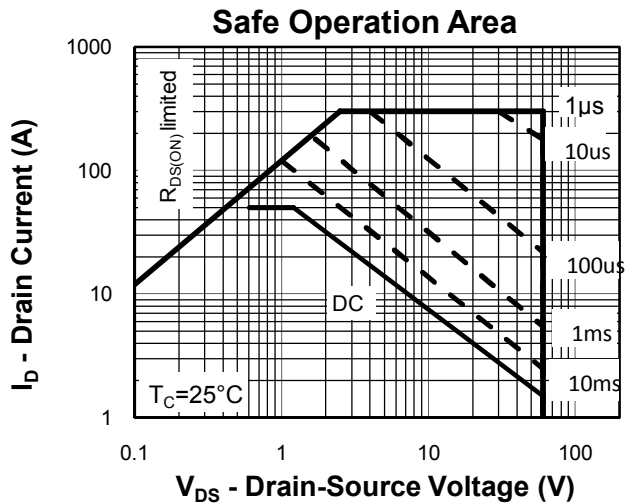
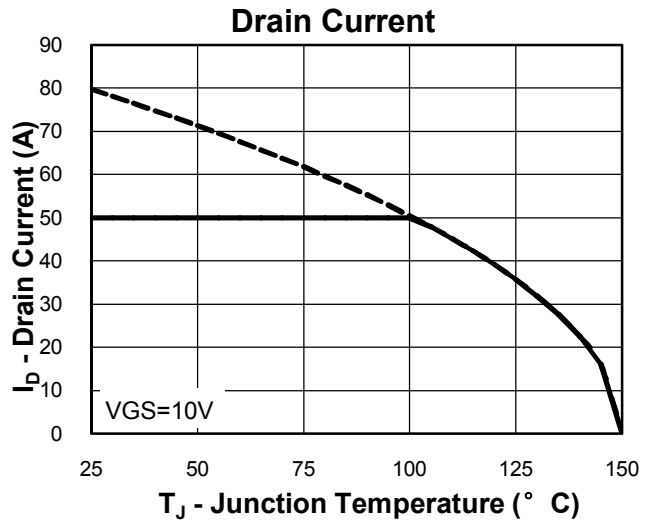
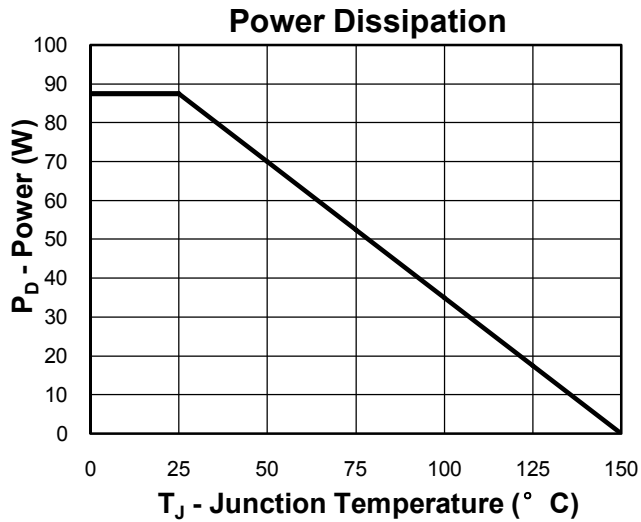
Notes:

- ① Max current is limited by the source bonding.
- ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 50A.
- ③ When mounted on 1 inch square copper board, t 10sec.
- ④ This value is based on starting TJ=25° C, L=0.5mH, RG=50Ω, IAS=26A, VDD =48V; 100% FT tested at L = 0.5mH, IAS = 13A.
- ⑤ Pulse test ; Pulse width300s, duty cycle2%.
- ⑥ Guaranteed by design, not subject to production testing.

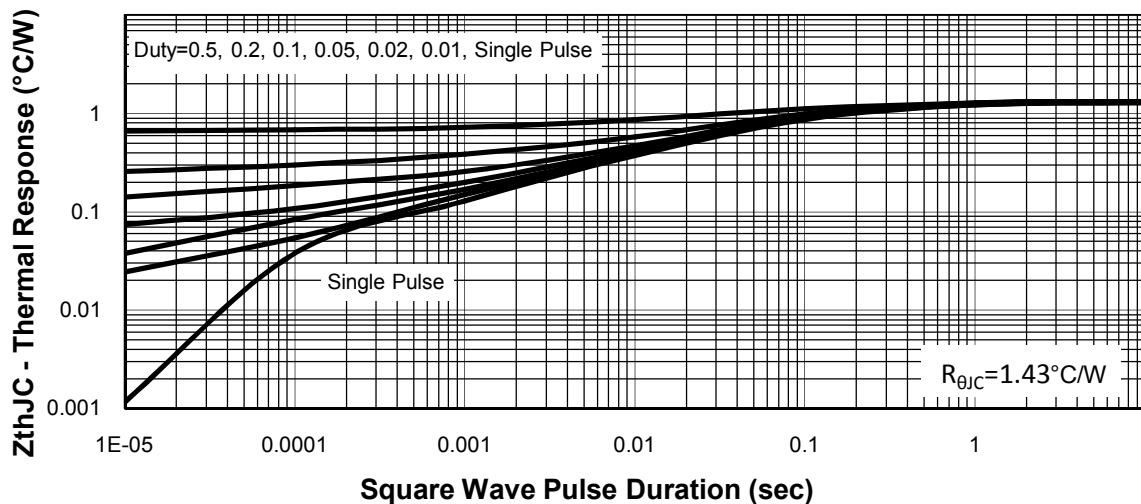
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH6080M3-C	RUH6080	DFN3030	Tape&Reel	5000	13"	12mm

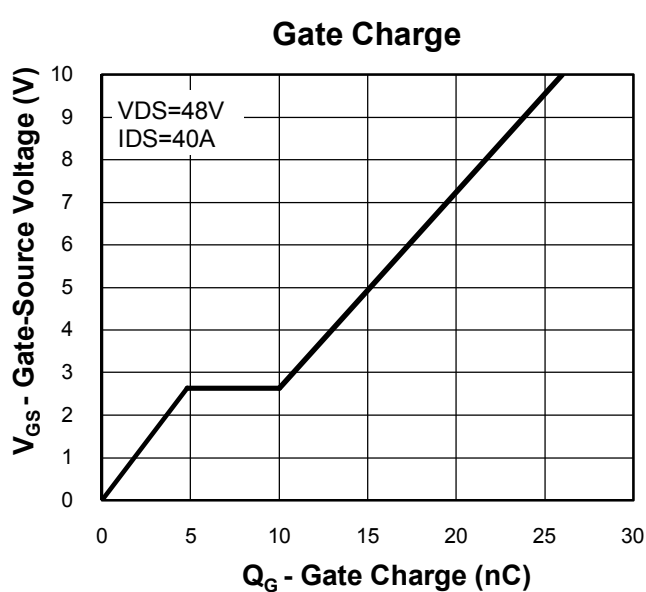
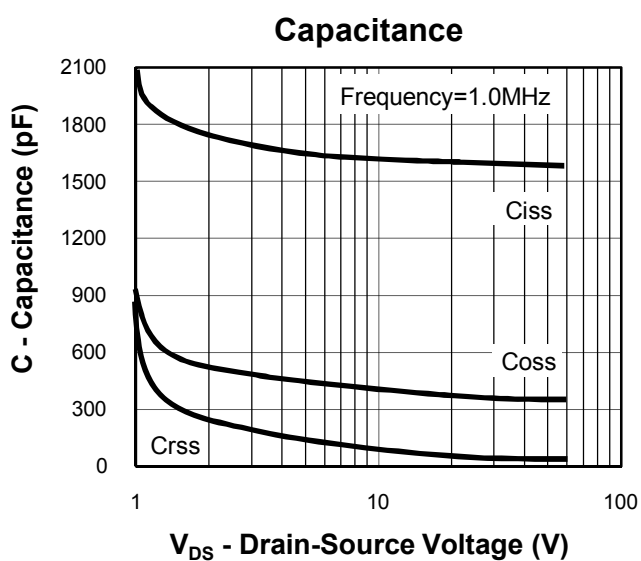
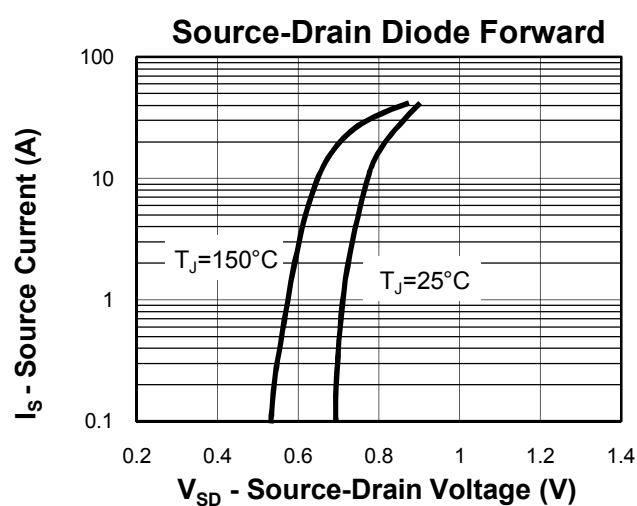
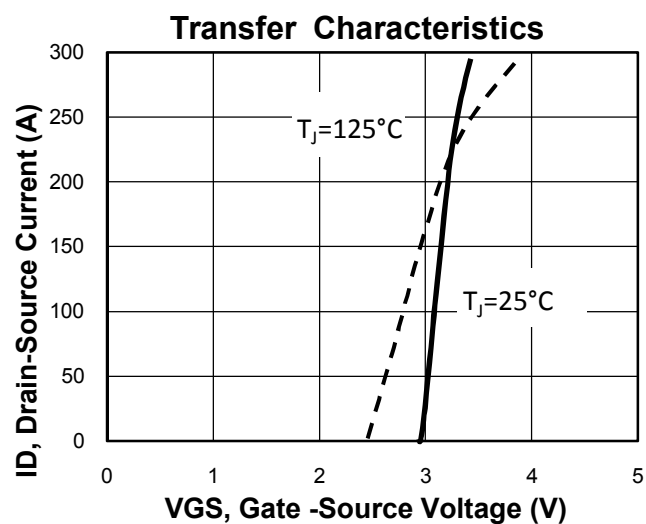
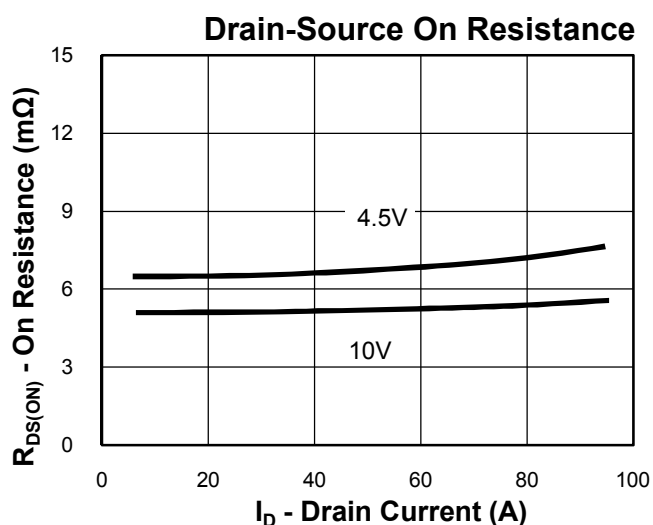
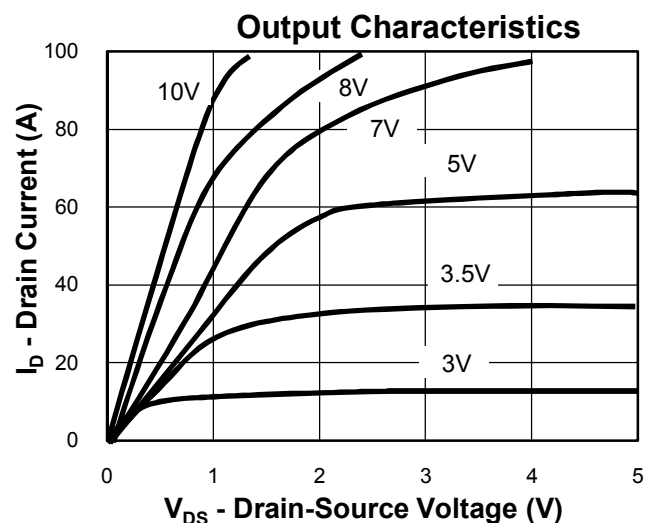
Typical Characteristics



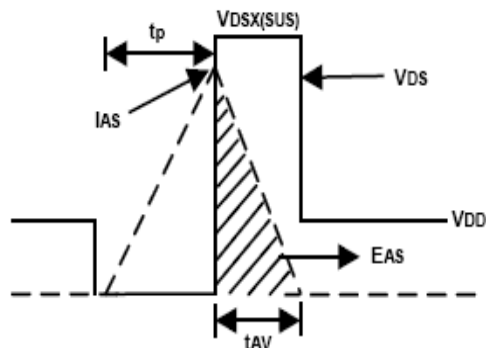
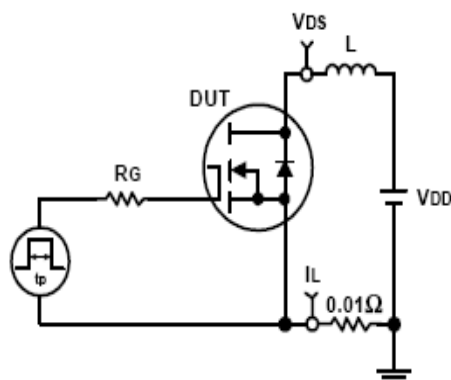
Thermal Transient Impedance



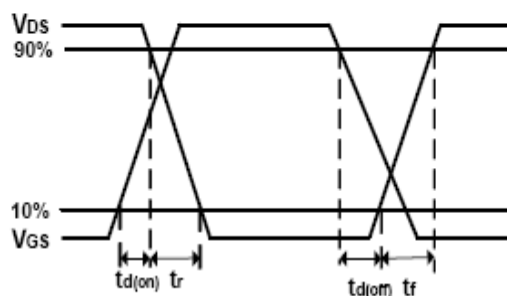
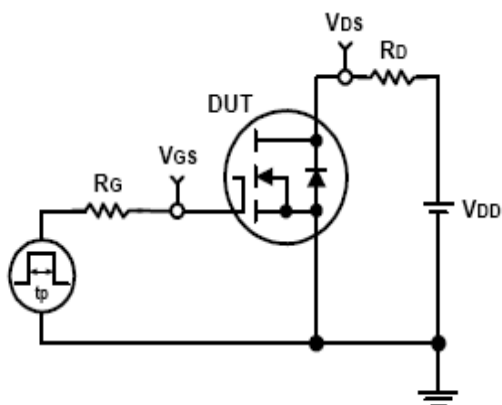
Typical Characteristics



Avalanche Test Circuit and Waveforms

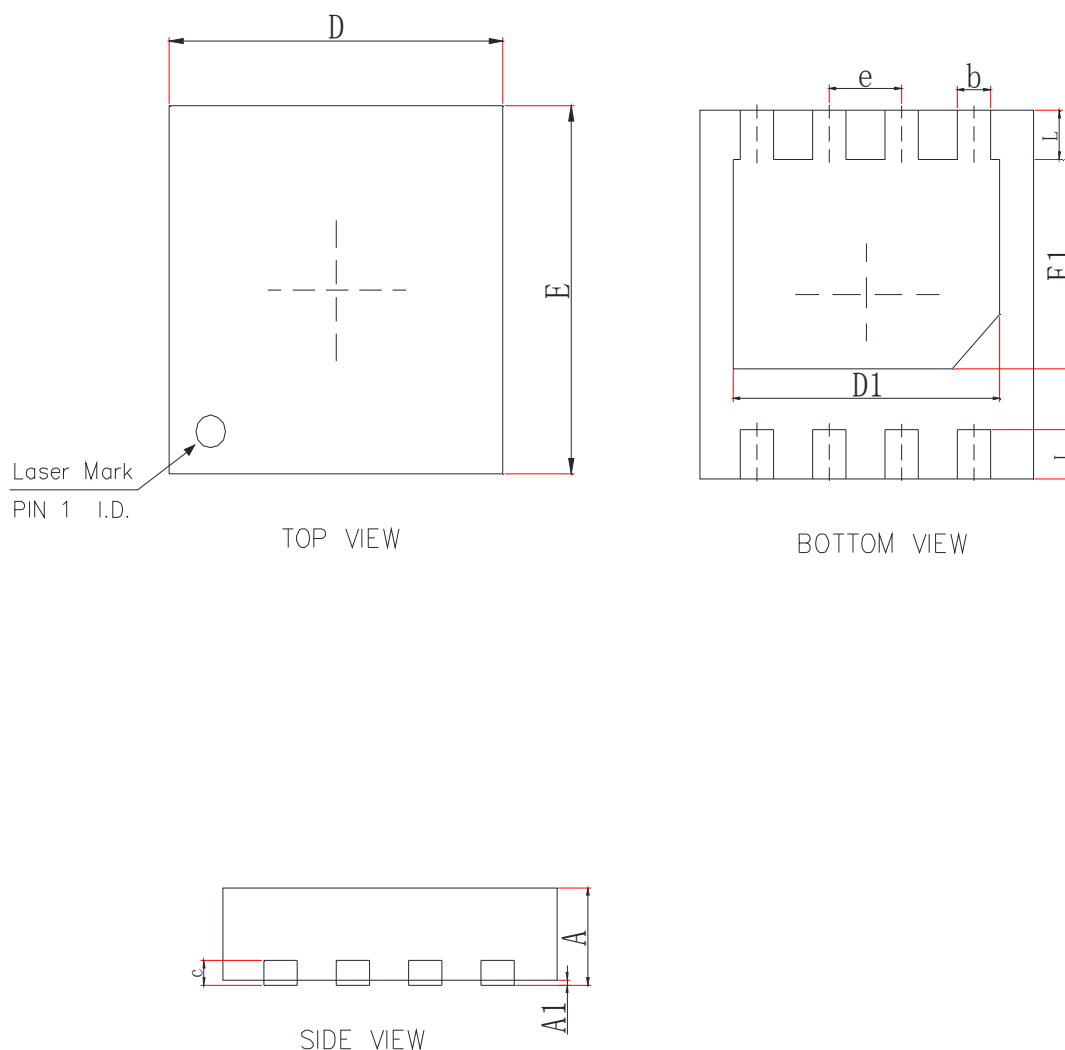


Switching Time Test Circuit and Waveforms



Package Information

DFN3030



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A1			0.05			0.002
b	0.25	0.30	0.35	0.010	0.012	0.014
c	0.18	0.20	0.30	0.007	0.008	0.012
D	2.95	3.00	3.15	0.116	0.118	0.124
E	2.95	3.00	3.15	0.116	0.118	0.124
D1	2.30	2.40	2.50	0.091	0.094	0.098
E1	1.70	1.80	1.90	0.067	0.071	0.075
L	0.30	0.40	0.50	0.012	0.016	0.020
e	0.65 BSC			0.026 BSC		