

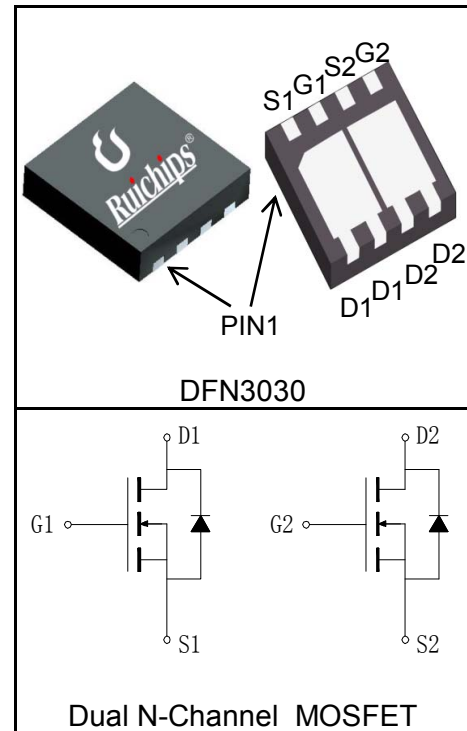
Features

- 30V/20A,
 $R_{DS(ON)} = 8.5m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 11.5m\Omega(Typ.)@V_{GS}=4.5V$
- Uses Ruichips advanced Trench™ technology
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Reliable and Rugged
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Switching Application Systems
- On Board power for server
- Synchronous rectification

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^\circ C$ 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	$T_C=25^\circ C$	20	A
Mounted on Large Heat Sink				
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ C$	80	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ C$	20	A
		$T_C=100^\circ C$	13	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ C$	10.8	
		$T_A=70^\circ C$	8.7	
P_D	Maximum Power Dissipation@ T_C	$T_C=25^\circ C$	16	W
		$T_C=100^\circ C$	6	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ C$	3.5	
		$T_A=70^\circ C$	2.3	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	8	°C/W
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	35	°C/W
Drain-Source Avalanche Ratings			
$E_{AS}^{(4)}$	Avalanche Energy, Single Pulsed	42	mJ

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

Symbol	Parameter	Test Condition	RU30D20M3			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
		$T_J=125^\circ C$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1		2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(5)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=10A$		8.5	10	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=8A$		11.5	14	$m\Omega$
Diode Characteristics						
$V_{SD}^{(5)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$			1.3	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, di_{SD}/dt=100A/\mu s$		24		ns
Q_{rr}	Reverse Recovery Charge			13		nC
Dynamic Characteristics ⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		1		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz		930		pF
C_{oss}	Output Capacitance			230		
C_{rss}	Reverse Transfer Capacitance			90		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=0.75\Omega,$ $I_{DS}=20A, V_{GEN}=10V,$ $R_G=3\Omega$		8		ns
t_r	Turn-on Rise Time			11		
$t_{d(OFF)}$	Turn-off Delay Time			17		
t_f	Turn-off Fall Time			6		
Gate Charge Characteristics ⁽⁶⁾						
Q_g	Total Gate Charge	$V_{DS}=24V, V_{GS}=10V,$ $I_{DS}=20A$		18		nC
Q_{gs}	Gate-Source Charge			5		
Q_{gd}	Gate-Drain Charge			7		

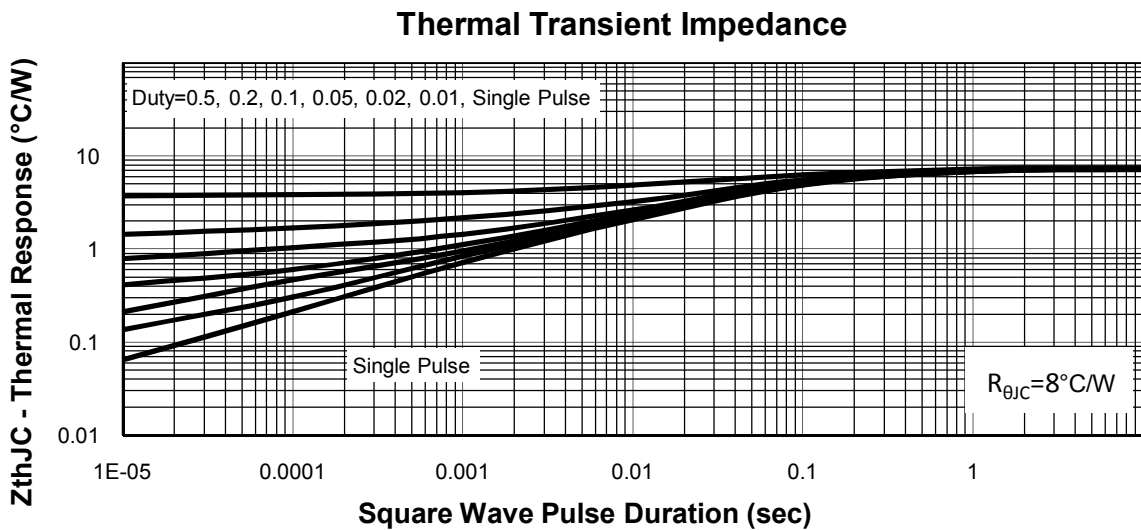
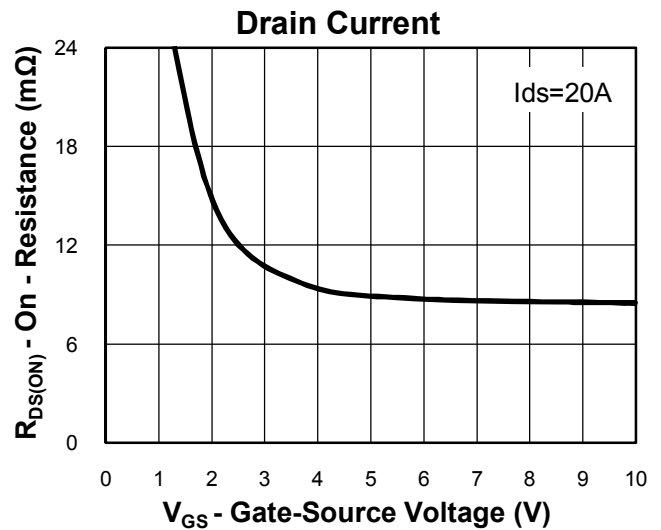
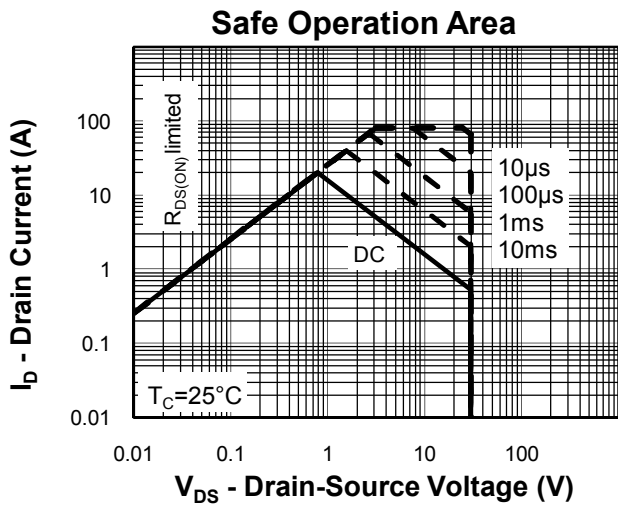
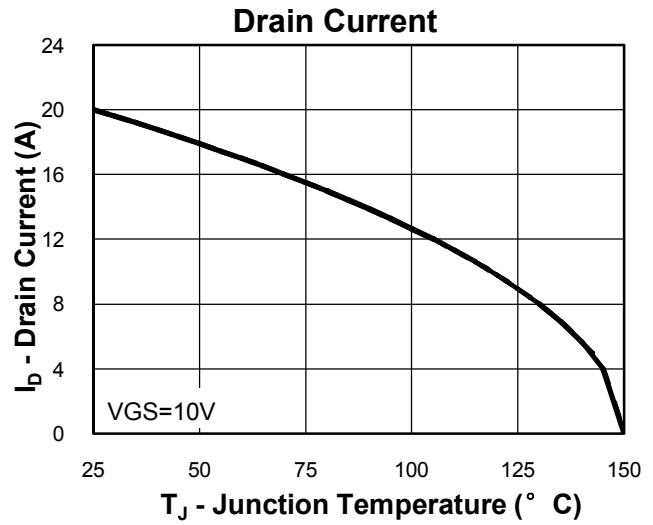
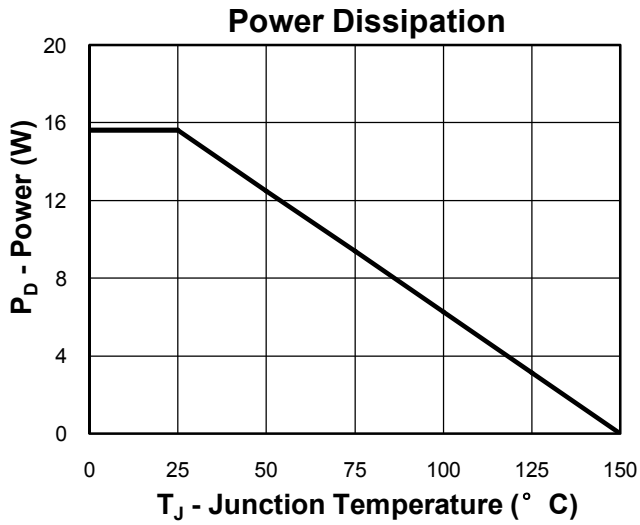
Notes:

- 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_{Jmax} , $I_{AS} = 13\text{A}$, $V_{DD} = 24\text{V}$, $R_G = 50\Omega$, 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.

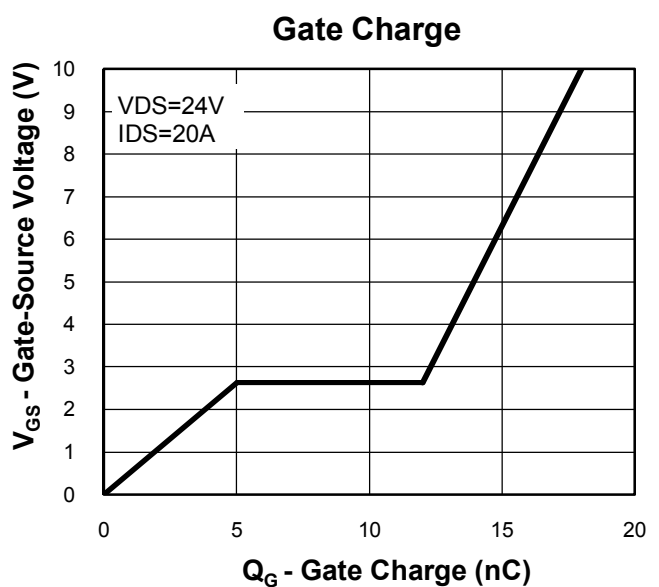
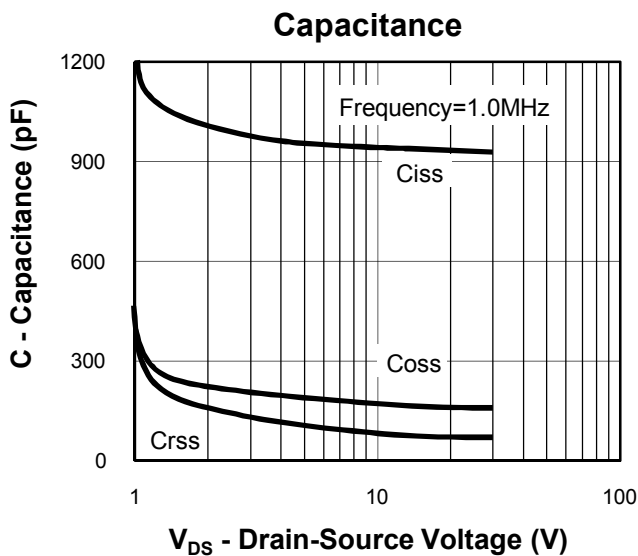
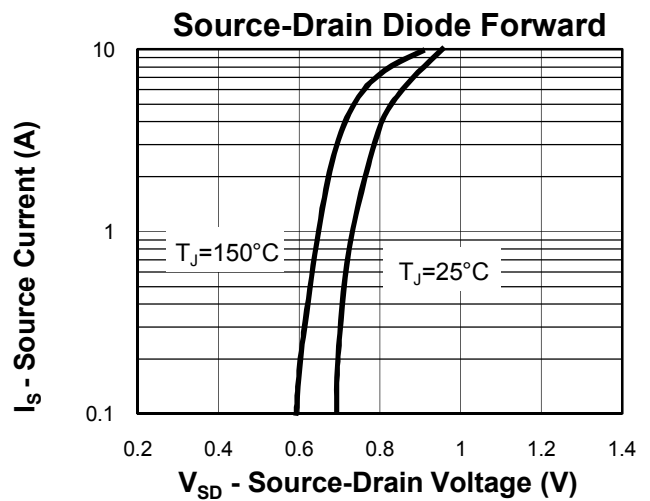
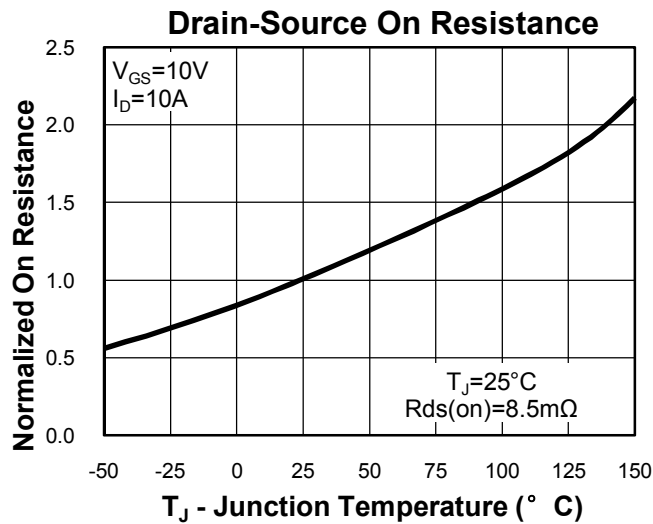
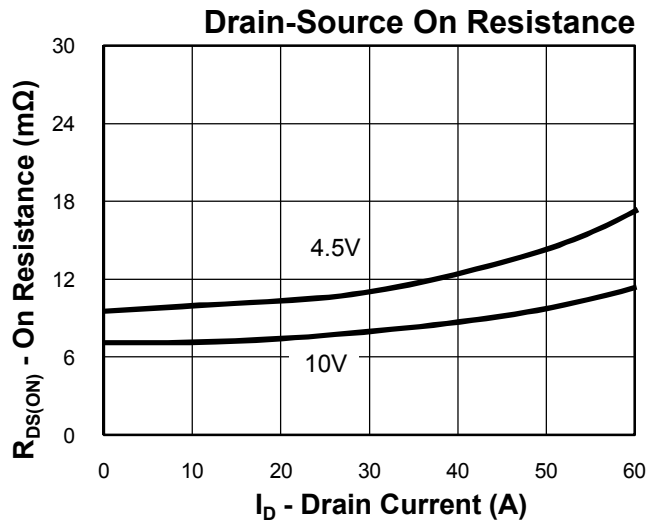
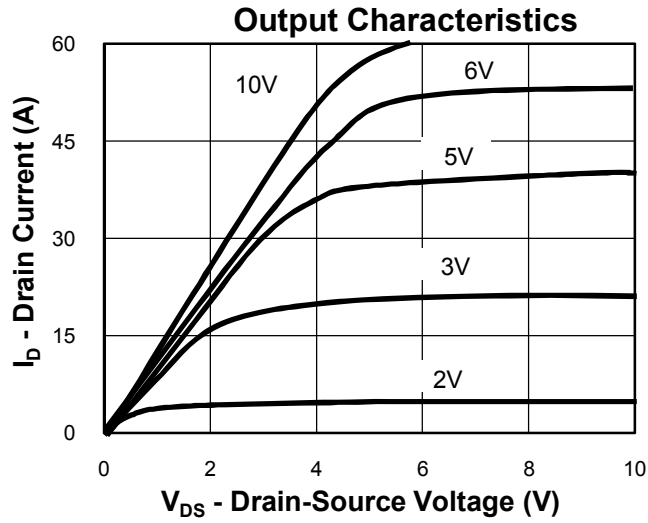
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU30D20M3	RU30D20	DFN3030	Tape&Reel	5000	13"	12mm

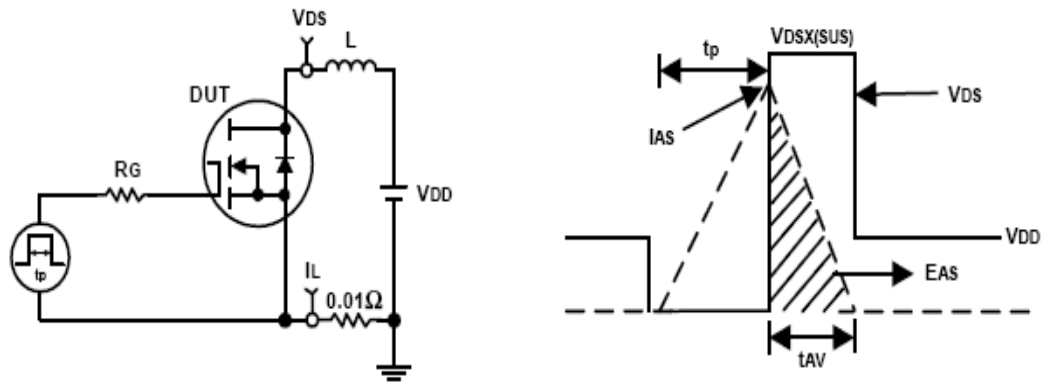
Typical Characteristics



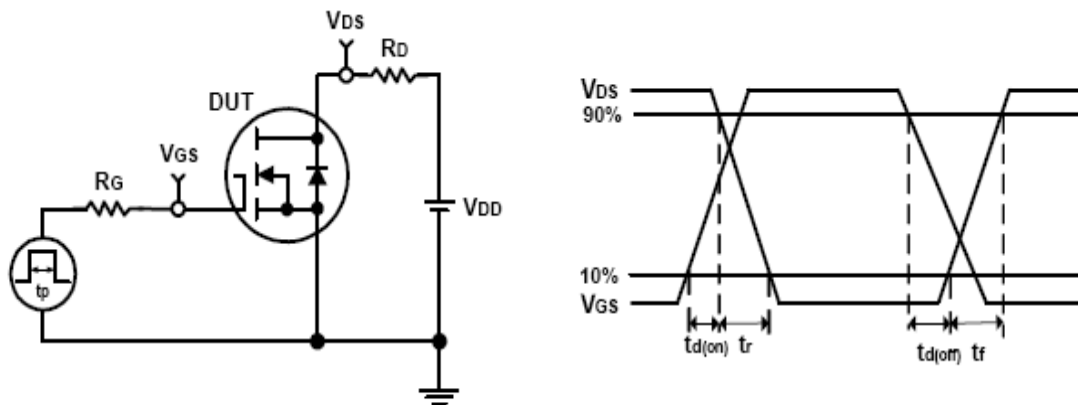
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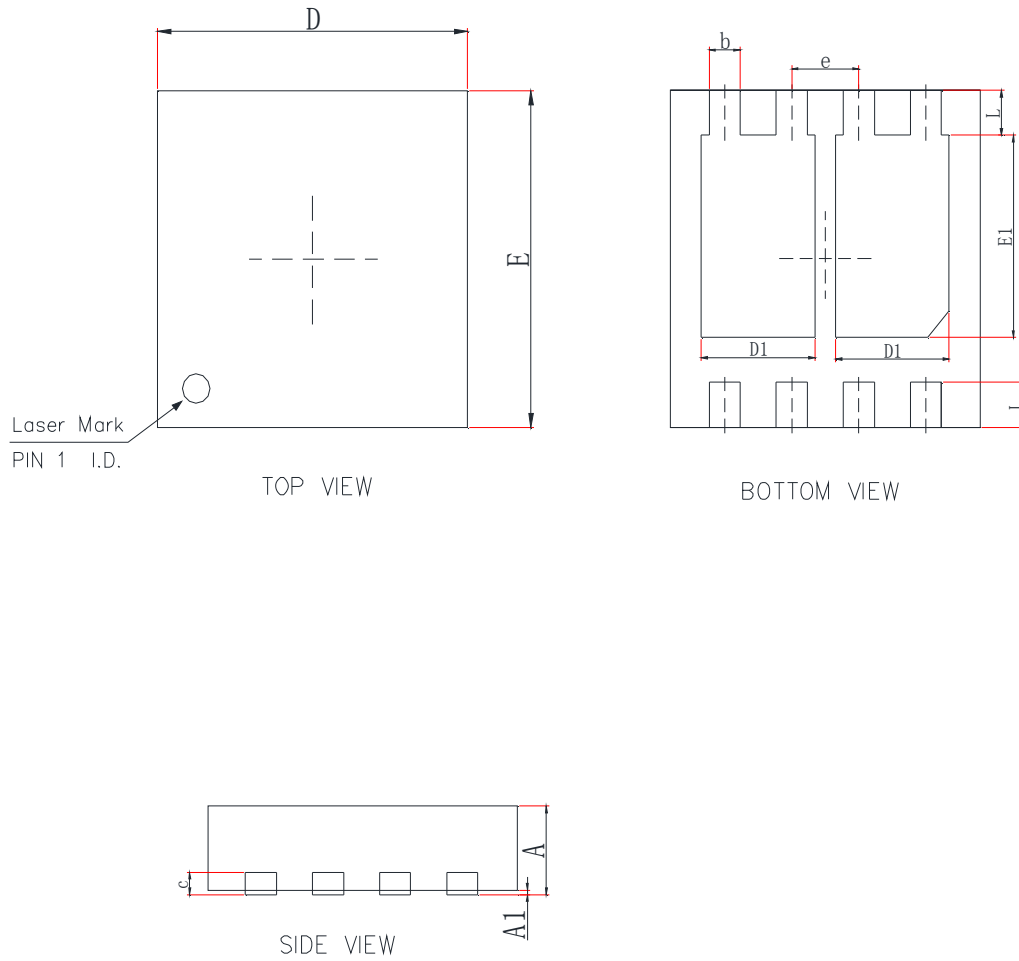
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



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	1.05	1.10	1.15	0.041	0.043	0.045
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		