DESCRIPTION

The AM7520 is available in DFN8(3.3x3.3) package.

ORDERING INFORMATION

Package Type	Part Number	
DFN8 (3.3x3.3)	J8	AM7520J8R
		AM7520J8VR
Note	V: Halogen free Package R: Tape & Reel SPQ: 3,000pcs/ Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

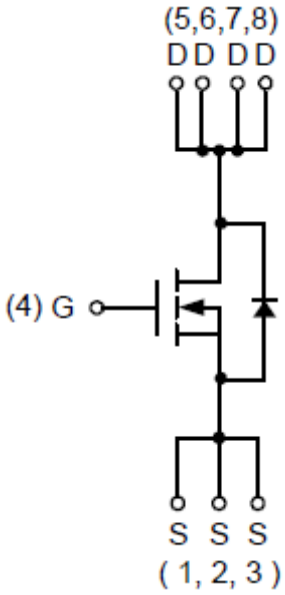
FEATURES

- 30V/50A,
  $R_{DS(ON)}$ = 1.8mΩ(max.) @ V_{GS} =10V
  $R_{DS(ON)}$ = 3.1mΩ(max.) @ V_{GS} =4.5V
- 100% UIS + R_G Tested
- Avalanche Rated
- Reliable and Rugged
- Available in DFN8(3.3x3.3) package.

APPLICATION

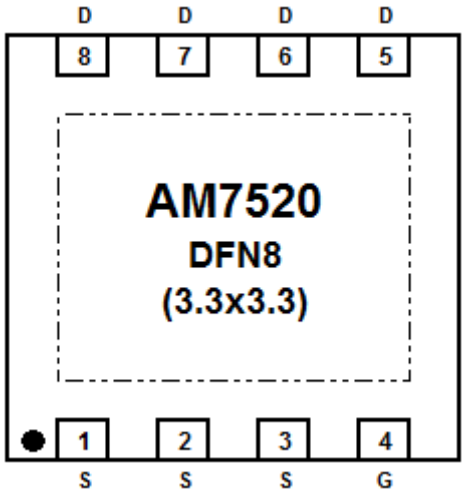
- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

PIN DESCRIPTION



N-Channel MOSFET

PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless Otherwise Noted

V_{DSS}, Drain-Source Voltage		30V
V_{GSS}, Gate-Source Voltage		±20V
T_J, Maximum Junction Temperature		150°C
T_{STG}, Storage Temperature Range		-55°C~ 150°C
I_S, Diode Continuous Forward Current	T_C=25°C	50A NOTE1
I_D, Continuous Drain Current	T_C=25°C	50A NOTE1
	T_C=100°C	50A
I_{DM}, Pulsed Drain Current	T_C=25°C	200A NOTE2
P_D, Maximum Power Dissipation	T_C=25°C	62.5W
	T_C=100°C	25W
$R_{\theta JC}$, Thermal Resistance-Junction to Case	Steady State	2°C/W
I_D, Continuous Drain Current	T_A=25°C	24A
	T_A=70°C	19A
P_D, Maximum Power Dissipation	T_A=25°C	1.78W
	T_A=70°C	1.14W
$R_{\theta JA}$, Thermal Resistance-Junction to Ambient	t ≤ 10s	35°C/W
	Steady State NOTE3	70°C/W
I_{AS} NOTE4, Avalanche Current, Single Pulse	L=0.1mH	50A
E_{AS} NOTE4, Avalanche Energy, Single Pulse	L=0.1mH	125mJ

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: Package is limited by 50A.

NOTE2: Pulse width is limited by maximum junction temperature.

NOTE3: Surface Mounted on 1in^2 pad area, t ≤ 999s.

NOTE4: UIS tested and pulse width is limited by maximum junction temperature 150°C (initial temperature T_J = 25°C).

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless Otherwise Noted

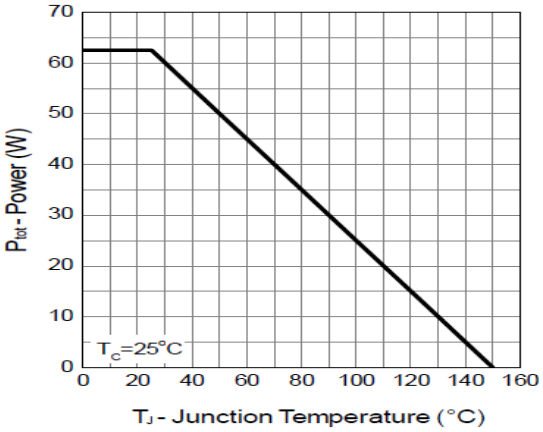
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.4	1.7	2.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-Source On-state Resistance	$R_{DS(ON)}$ NOTE5	V_{GS}=10V, I_{DS}=20A	-	1.5	1.8	mΩ
		T_J=125°C	-	2.3	-	
		V_{GS}=4.5V, I_{DS}=20A	-	2.3	3.1	
Forward Transconductance	Gfs	V_{DS}=5V, I_{DS}=20A	-	25	-	S
Diode Characteristics						
Diode Forward Voltage	V_{SD}NOTE5	I_{SD}=20A, V_{GS}=0V	-	0.8	1.1	V
Reverse Recovery Time	t_{rr}	I_F=20A, dI_{SD}/dt=100A/μs	-	48.9	-	ns
Charge Time	t_a		-	24.4	-	
Discharge Time	t_b		-	24.5	-	
Reverse Recovery Charge	Q_{rr}		-	42.8	-	nC
Dynamic CharacteristicsNOTE6						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,F=1MHz	-	1	-	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	2883	-	pF
Output Capacitance	C_{oss}		-	1857	-	
Reverse Transfer Capacitance	C_{rss}		-	125	-	
Turn-on Delay Time	$t_{d(ON)}$	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	18	33	ns
Turn-on Rise Time	t_r		-	10.7	20	
Turn-off Delay Time	$t_{d(OFF)}$		-	48.3	88	
Turn-off Fall Time	t_f		-	71.2	129	
Gate Charge CharacteristicsNOTE6						
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=20A	-	22	30.8	nC
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=10V,I_{DS}=20A	-	42.5	59.5	
Threshold Gate Charge	Q_{gth}		-	6.4	9.0	
Gate-Source Charge	Q_{gs}		-	10.6	14.8	
Gate-Drain Charge	Q_{gd}		-	5.1	7.1	

NOTE5: Pulse test; pulse width≤300μs, duty cycle≤2%.

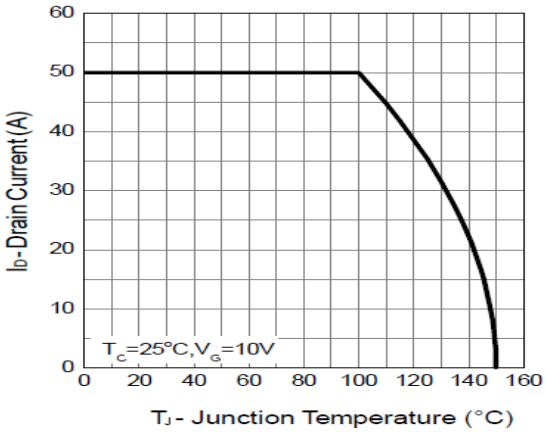
NOTE 6: Guaranteed by design, not subject to production testing.

TYPICAL PERFORMANCE CHARACTERISTICS

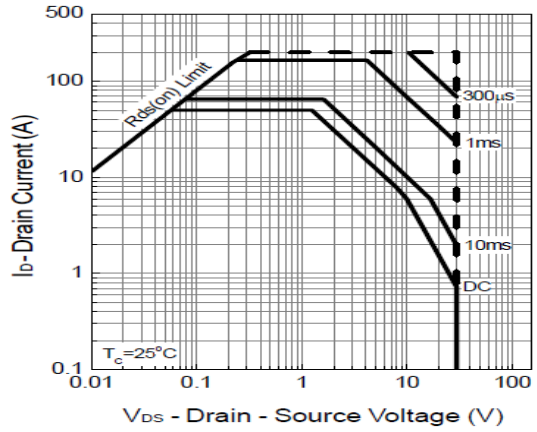
1. Power Dissipation



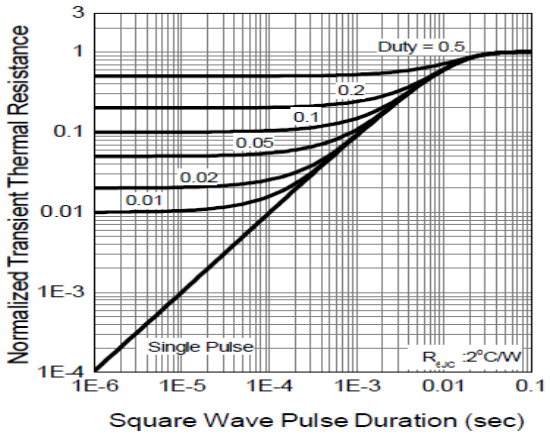
2. Drain Current



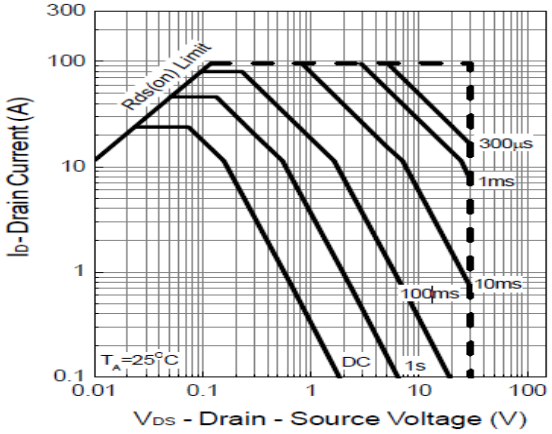
3. Safe Operation Area



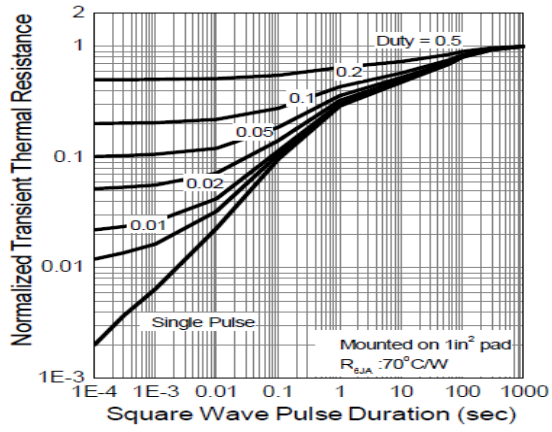
4. Thermal Transient Impedance



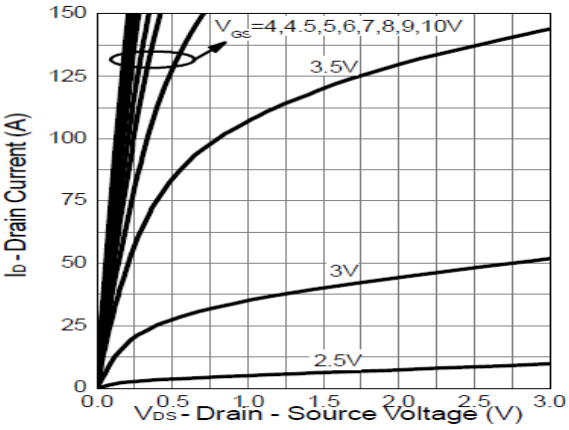
5. Safe Operation Area



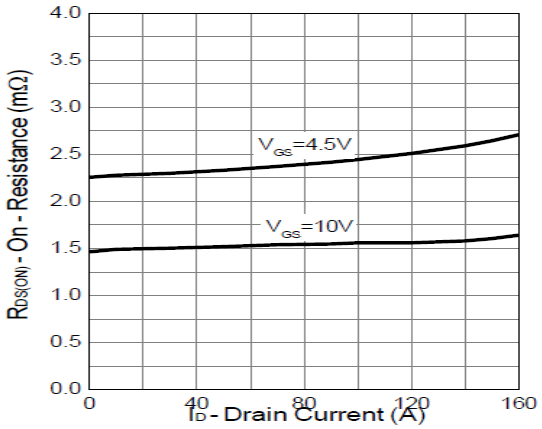
6. Thermal Transient Impedance



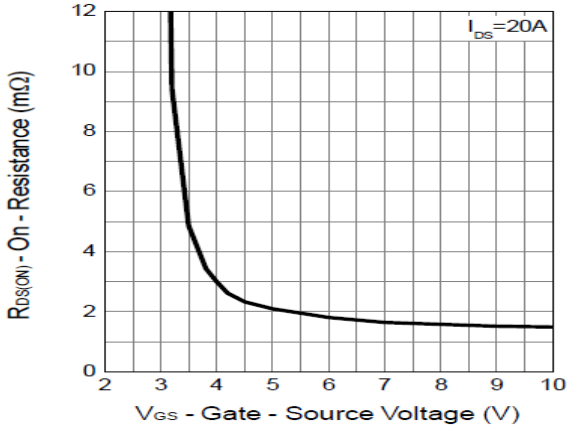
7. Output Characteristics



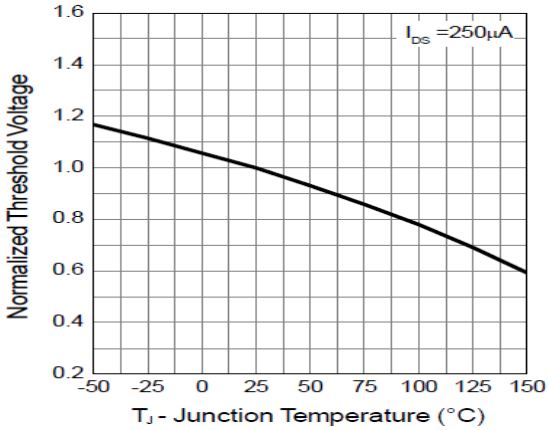
8. Drain-Source On Resistance



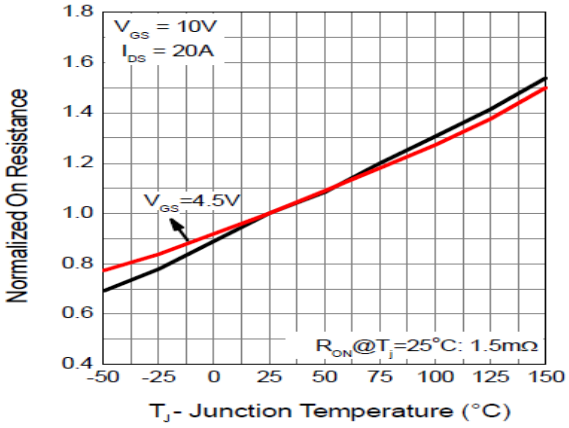
9. Gate-Source On Resistance



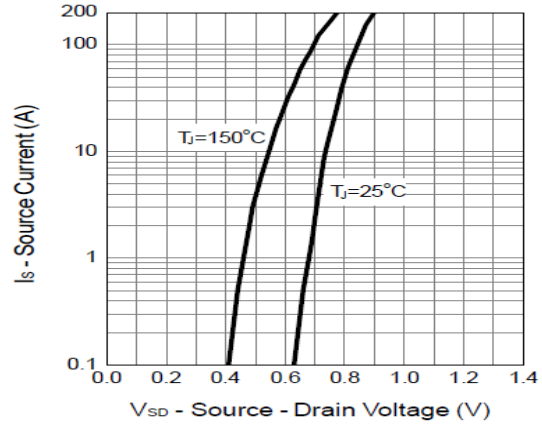
10. Gate Threshold Voltage



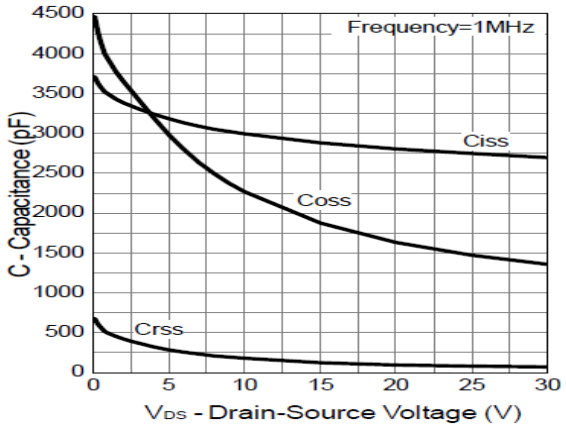
11. Drain-Source On Resistance



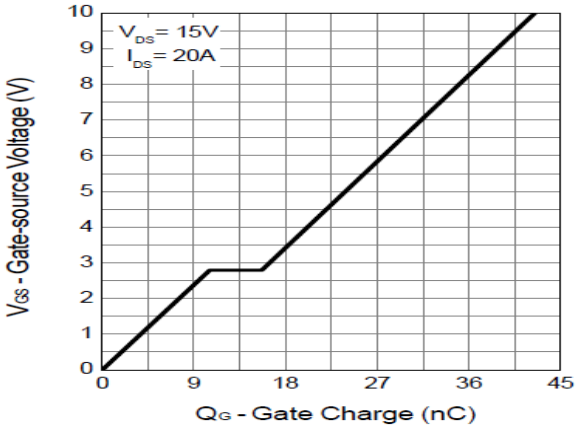
12. Source-Drain Diode Forward



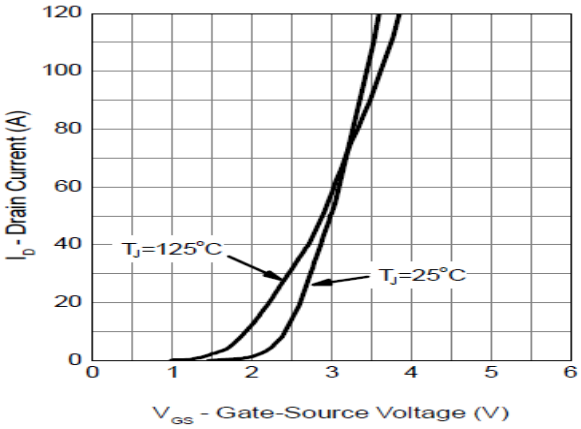
13. Capacitance



14. Gate Charge

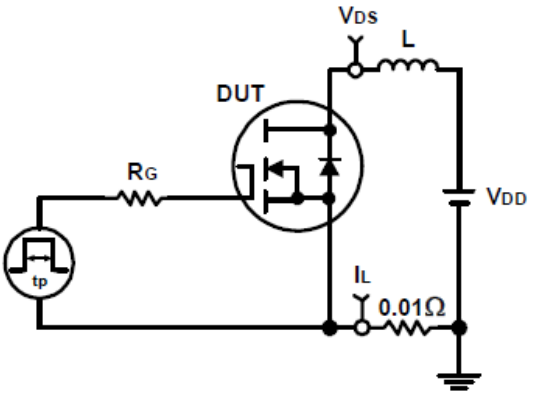


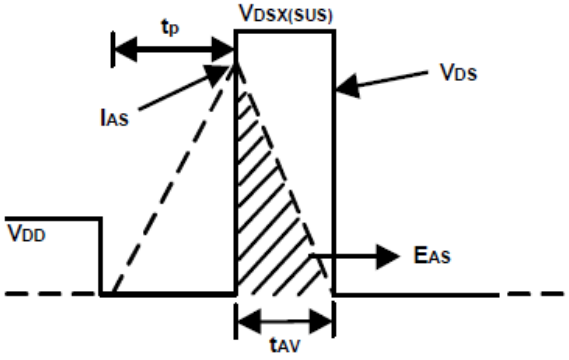
15. Transfer Characteristics



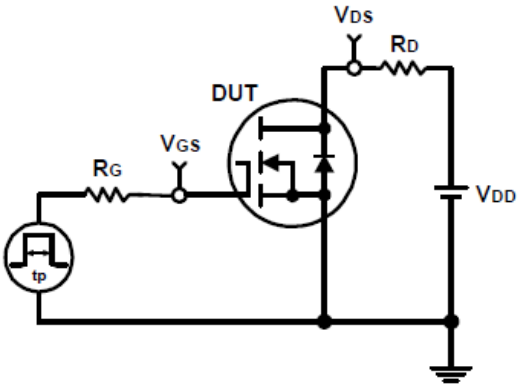
DETAILED INFORMATION

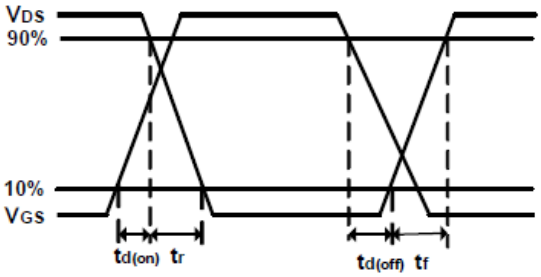
Avalanche Test Circuit and Waveforms





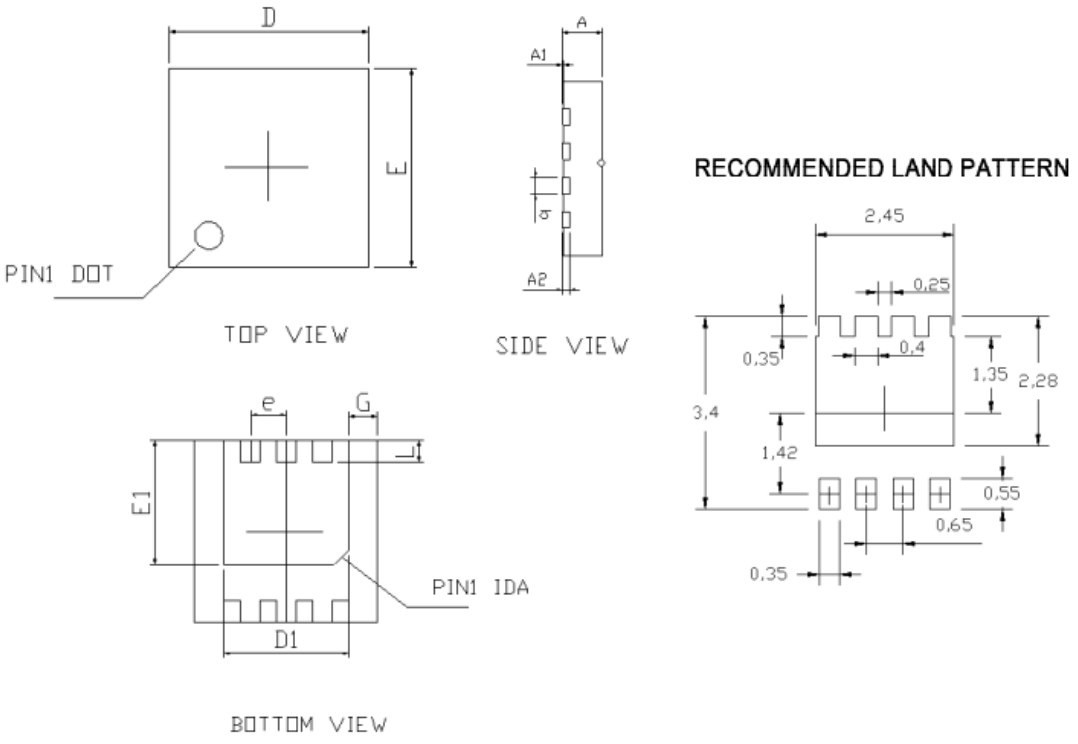
Switching Time Test Circuit and Waveforms





PACKAGE INFORMATION

Dimension in DFN8 (Unit: mm)



Symbol	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.032
A1	0.000	0.050	0.000	0.002
A2	0.100	0.250	0.004	0.010
b	0.240	0.350	0.009	0.014
D	3.150	3.400	0.124	0.134
D1	2.100	2.350	0.083	0.093
E	3.150	3.400	0.124	0.134
E1	2.150	2.350	0.850	0.093
e	0.600	0.700	0.024	0.028
G	0.475	0.575	0.019	0.023
L	0.350	0.450	0.014	0.018

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