DESCRIPTION

The AM7414 is available in DFN8(3x3) Package

FEATURES

- 60V/23A,
  $R_{DS(ON)}$= 25mΩ (Max.) @ V_{GS}=10V
  $R_{DS(ON)}$= 28.5mΩ (Max.) @ V_{GS}=4.5V
- Reliable and Rugged
- ESD Protection
- 100% UIS + R_g Tested
- Available in DFN8(3x3) Package

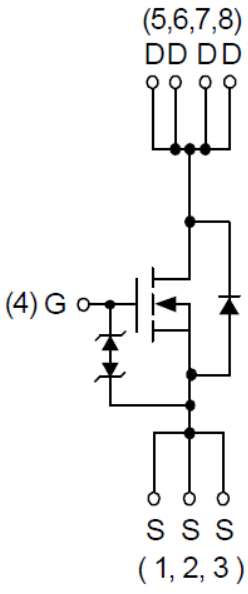
ORDERING INFORMATION

Package Type	Part Number	
DFN8(3x3) SPQ: 5,000pcs/Reel	J8	AM7414J8R
		AM7414J8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

APPLICATION

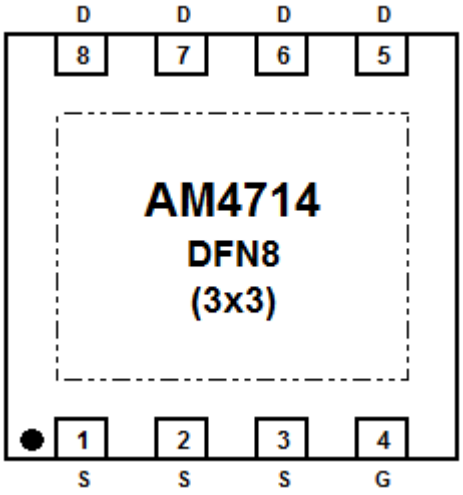
- DC-DC Converter.
- Motor Control
- Power Tools.
- Load Switching.

N-CHANNEL MOSFET



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℃, unless otherwise specified

V_{DSS}, Drain-Source Voltage		60V
V_{GSS}, Gate-Source Voltage		±16V
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	11A
I_D, Continuous Drain Current	T_C=25°C	23A
	T_C=100°C	14.8A
I_{DM}[NOTE1], Pulsed Drain Current	T_C=25°C	92A
P_D, Maximum Power Dissipation	T_C=25°C	27.7W
	T_C=100°C	11.1W
$R_{\theta JC}$, Thermal Resistance-Junction to Case		4.5°C/W
I_D, Continuous Drain Current	T_A=25°C	5.4A
	T_A=70°C	4.4A
P_D, Maximum Power Dissipation	T_A=25°C	1.5W
	T_A=70°C	1W
$R_{\theta JA}$[NOTE3], Thermal Resistance-Junction to Ambient	Steady State	80°C/W
I_{AS}[NOTE2], Avalanche Current, Single pulse	L=0.5mH	13A
E_{AS}[NOTE2], Avalanche Energy, Single pulse	L=0.5mH	42mJ

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: Pulse width is limited by max. junction temperature.

NOTE2: UIS tested and pulse width limited by maximum junction temperature 150℃ (initial temperature T_J=25℃).

NOTE3: Surface Mounted on 1in² pad area.

ELECTRICAL CHARACTERISTICS

T_A=25℃, unless otherwise noted

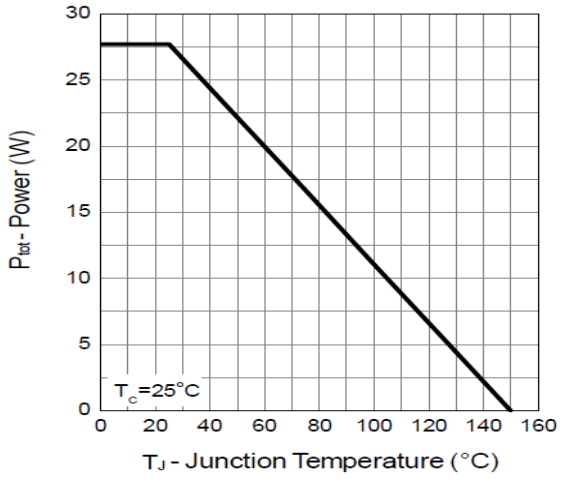
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.7	1.3	1.9	V
Gate Leakage Current	I_{GSS}	V_{GS}=±16V,V_{DS}=0V	-	-	±100	nA
Drain-Source On-State Resistance	$R_{DS(ON)}$ NOTE4	V_{GS}=10V,I_D=15A	-	21	25	mΩ
		V_{GS}=4.5V,I_D=10A	-	22	28.5	
Diode Characteristics						
Diode Forward Voltage	V_{SD} NOTE4	I_{SD}=8A, V_{GS}=0V	-	0.8	1.3	V
Reverse Recovery Time	t_{rr}	I_{SD}=10A, dI$_{SD}$/dt=100A/μs	-	24	-	ns
Reverse Recovery Charge	Q_{rr}		-	28	-	nC
Dynamic Characteristics NOTE 5						
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=0V, f=1MHz	-	1	-	Ω
Input Capacitance	C_{lss}	V_{GS}=0V,V_{DS}=30V, Frequency=1.0MHz	-	1180	1535	pF
Output Capacitance	C_{oss}		-	98	-	
Reverse Transfer Capacitance	C_{rss}		-	48	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V, R_L=30Ω, I_{DS}=1A, V_{GEN}=10V R_G=6Ω	-	12	22	ns
Turn-on Rise Time	t_r		-	6	11	
Turn-off Delay Time	$t_{d(off)}$		-	33	60	
Turn-off Fall Time	t_f		-	9	16	
Gate Charge Characteristics NOTE 5						
Total Gate Charge	Q_g	V_{DS}=30V , V_{GS}=4.5V I_D=10A	-	11	-	nC
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V, I_D=10A	-	24	33.5	
Gate-Source Charge	Q_{gs}		-	2.5	-	
Gate-Drain Charge	Q_{gd}		-	4	-	

NOTE4: Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

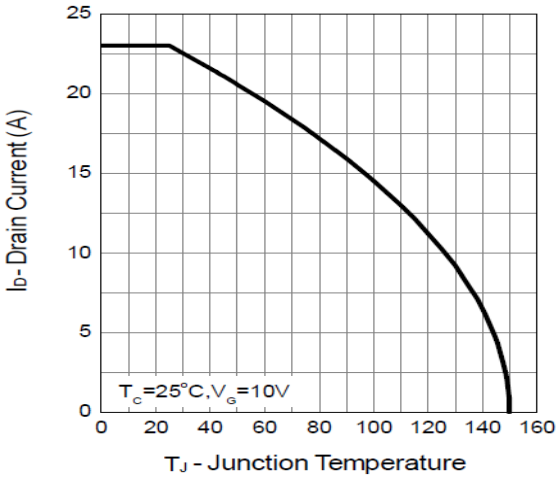
NOTE5: Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS

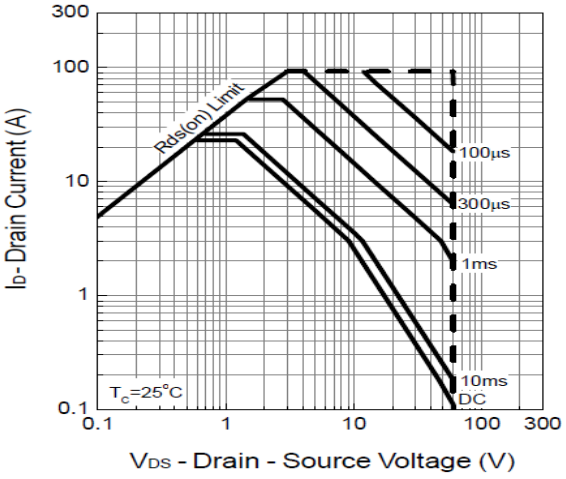
1. Power Dissipation



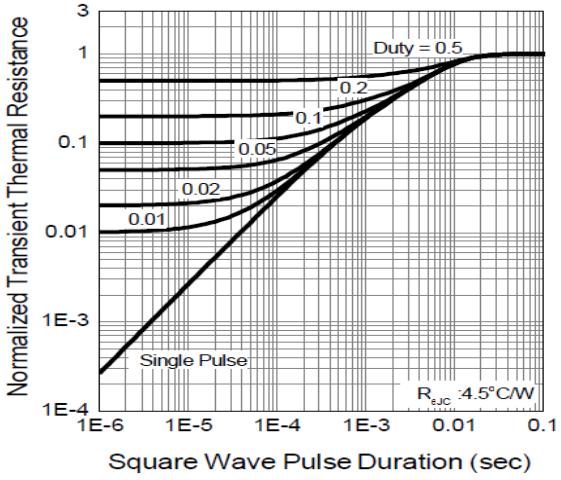
2. Drain Current



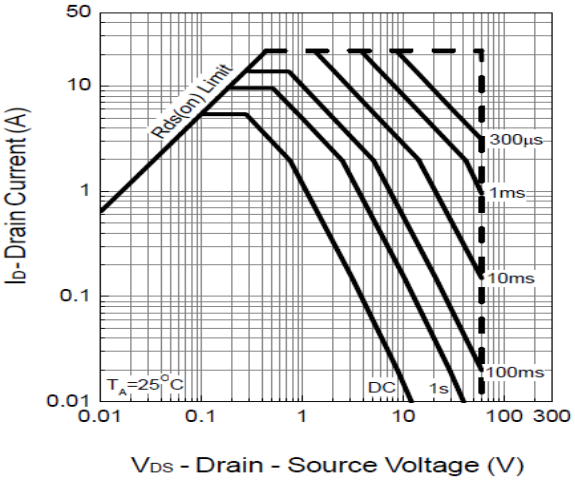
3. Safe Operation Area



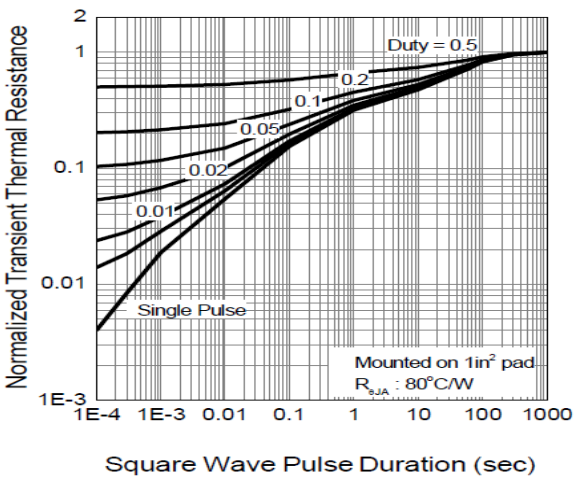
4. Thermal Transient Impedance



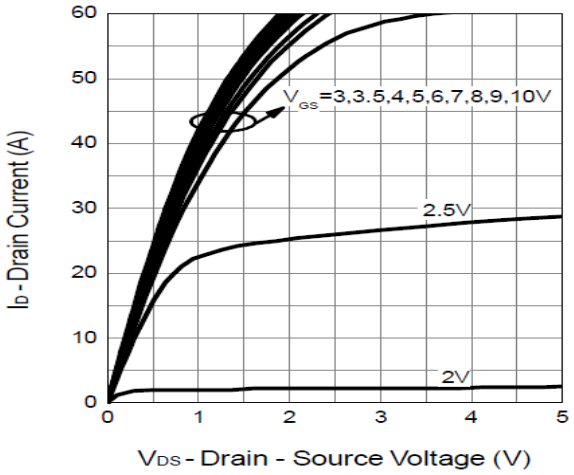
5. Safe Operation Area



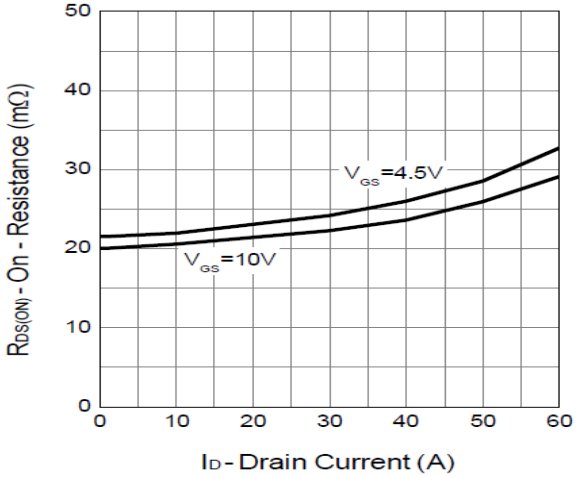
6. Thermal Transient Impedance



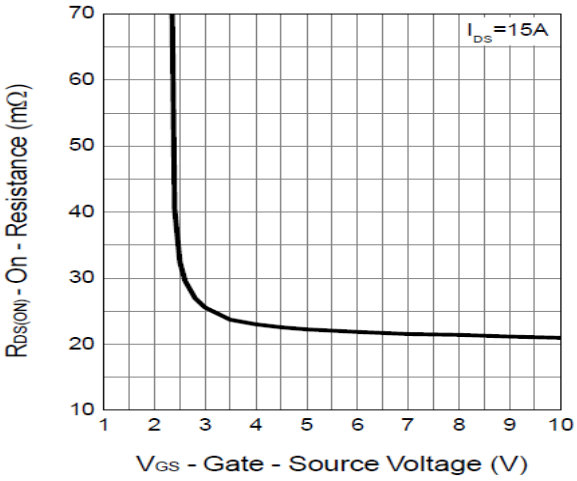
7. Output Characteristics



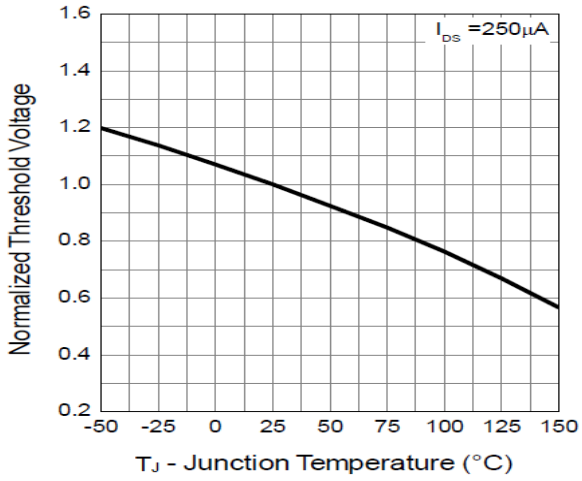
8. Drain-Source On-Resistance



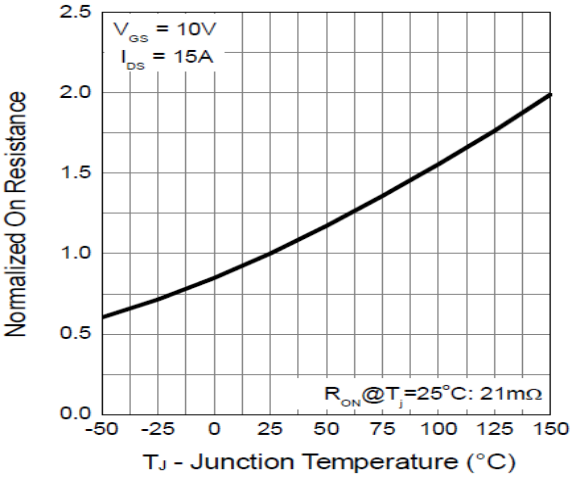
9. Gate-Source On Resistance



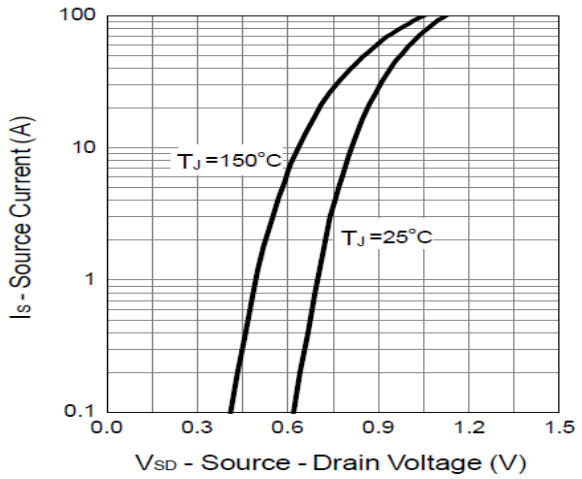
10. Gate Threshold Voltage



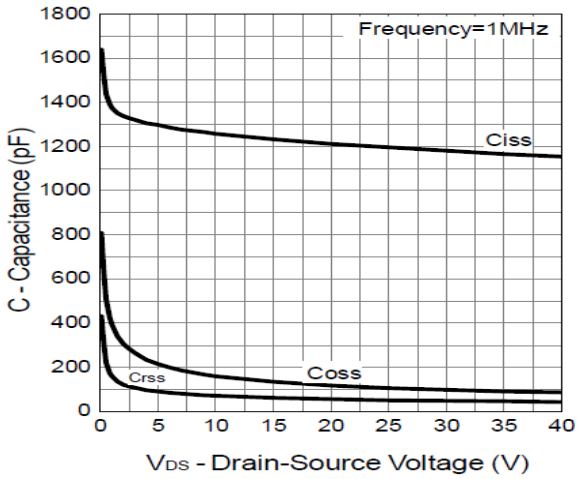
11. Drain-Source On Resistance



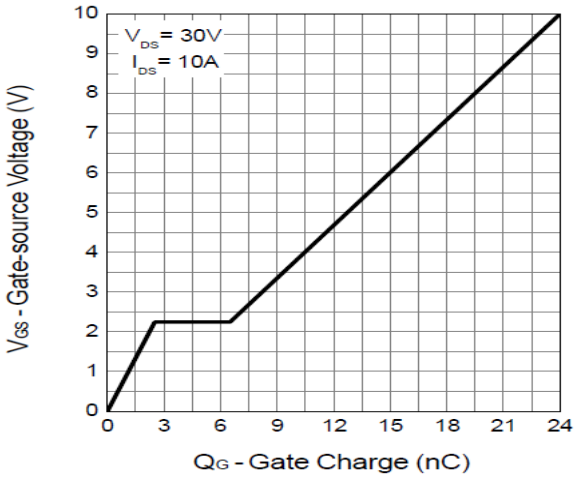
12. Source-Drain Diode Forward



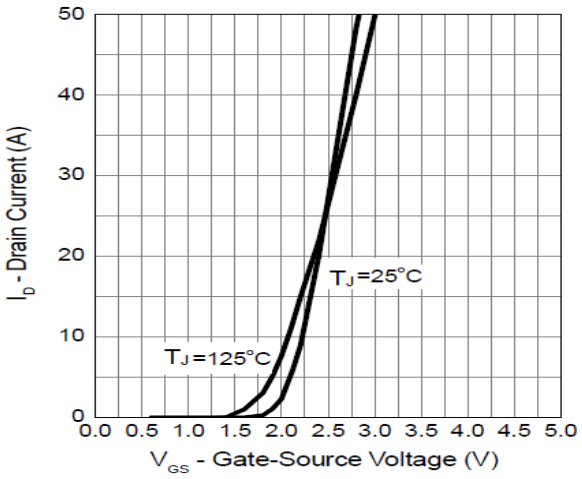
13. Capacitance



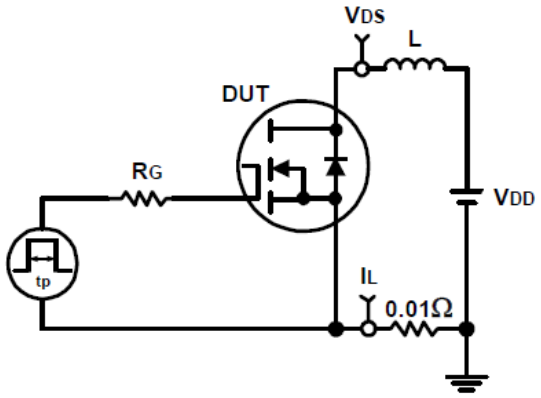
14. Gate Charge

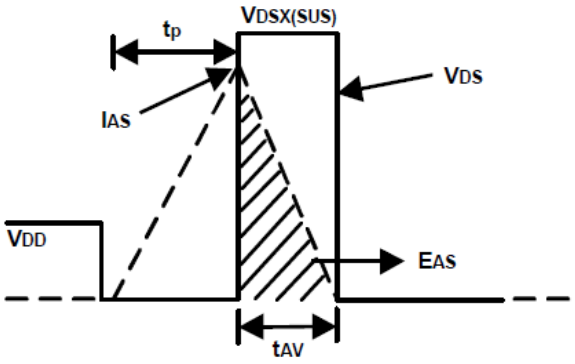


15. Transfer Characteristics

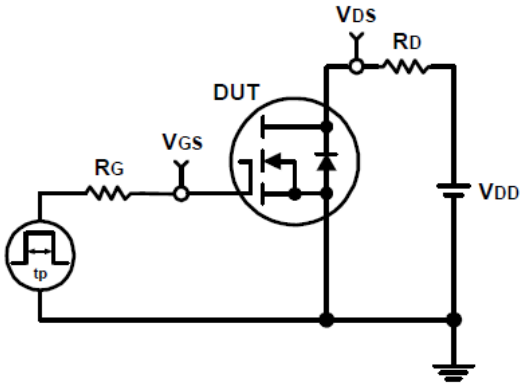


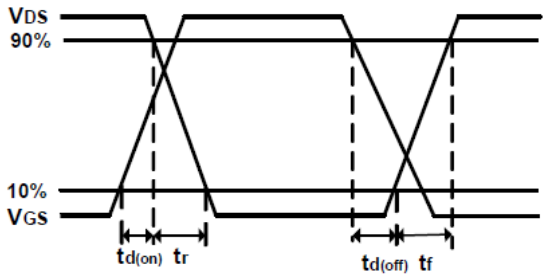
Avalanche Test Circuit and Waveforms





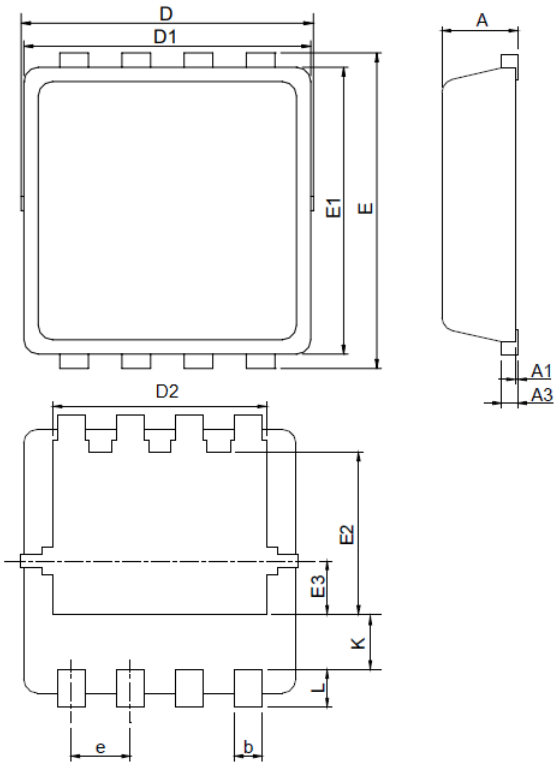
Switching Time Test Circuit and Waveforms

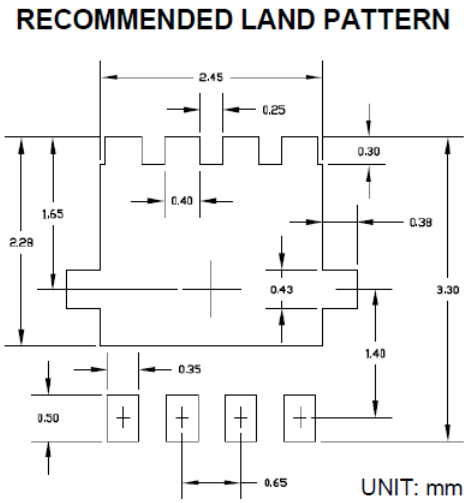




PACKAGE INFORMATION

Dimension in DFN8(3x3) Package (Unit: mm)





Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.80	1.00	0.031	0.039
A1	0.00	0.05	0.000	0.002
A3	0.10	0.25	0.004	0.010
b	0.24	0.35	0.009	0.014
D	2.90	3.30	0.114	0.130
D1	2.90	3.10	0.114	0.122
D2	2.25	2.45	0.089	0.096
E	3.10	3.30	0.122	0.130
E1	2.90	3.10	0.114	0.122
E2	1.65	1.85	0.065	0.073
E3	0.56	0.58	0.022	0.023
e	0.65 BSC		0.026 BSC	
K	0.475	0.775	0.019	0.031
L	0.30	0.50	0.012	0.020

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