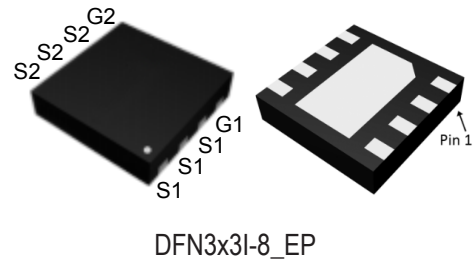


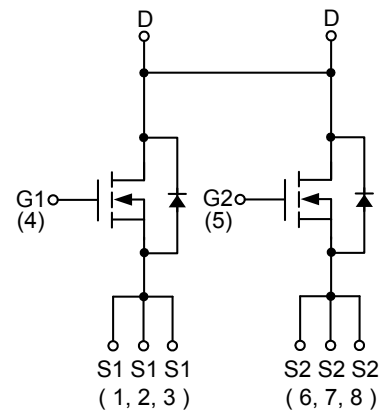
Features

- 20V/13A
 $R_{DS(ON)} = 5.2m\Omega (typ.) @ V_{GS} = 4.5V$
 $R_{DS(ON)} = 6.7m\Omega (typ.) @ V_{GS} = 2.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

Pin Description



DFN3x3I-8_EP



N-Channel MOSFET

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.
- One Cell Li-ion Battery Pack.

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		20	V
V _{GSS}	Gate-Source Voltage		±12	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _A =25°C	13	A
I _D	Continuous Drain Current	T _A =25°C	13	A
		T _A =70°C	7.8	
I _{DM} ^b	Pulsed Drain Current	T _A =25°C	39	
P _D	Maximum Power Dissipation	T _A =25°C	1.9	W
		T _A =70°C	1.2	
R _{θJA} ^a	Thermal Resistance-Junction to Ambient	t ≤ 10s	35	°C/W
		Steady state	65	
I _{AS} ^c	Avalanche Current, Single pulse	L=0.1mH	21	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.1mH	22	mJ

Note a : Surface mounted on 1in^2 pad area, steady state $t = 999\text{s}$.

Note b : Pulse width limited by max. junction temperature.

Note c : UIS tested and pulse width limited by maximum junction temperature (initial temperature $T_J=25^{\circ}\text{C}$).

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

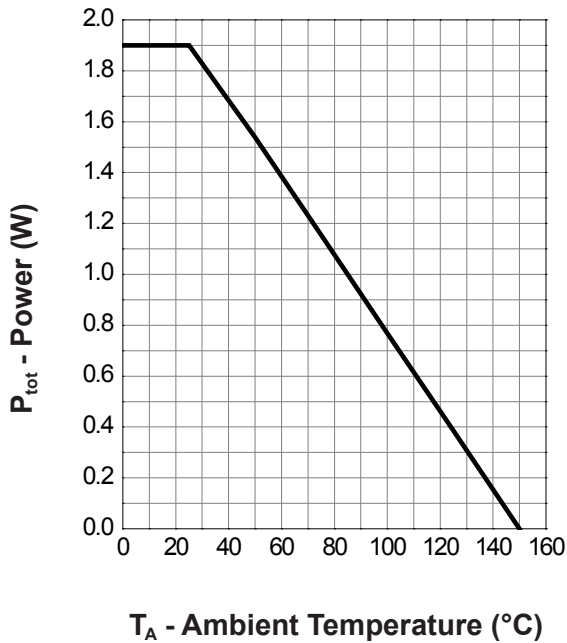
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.4	0.75	1.1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =3A V _{GS} =2.5V, I _{DS} =3A	- -	5.2 6.7	7 8	mΩ
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =3A	-	18.5	-	S
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =3A, dI _{SD} /dt=100A/μs	-	300	-	ns
t _a	Charge Time		-	110	-	
t _b	Discharge Time		-	190	-	
Q _{rr}	Reverse Recovery Charge		-	930	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	9	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	900	-	pF
C _{oss}	Output Capacitance		-	260	-	
C _{rss}	Reverse Transfer Capacitance		-	170	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	10.6	20	ns
t _r	Turn-on Rise Time		-	16.3	30	
t _{d(OFF)}	Turn-off Delay Time		-	850	1530	
t _f	Turn-off Fall Time		-	355	639	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =10V, I _{DS} =3A	-	35	49	nC
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =3A	-	17	23.8	
Q _{gth}	Threshold Gate Charge		-	1.3	-	
Q _{gs}	Gate-Source Charge		-	2.4	-	
Q _{gd}	Gate-Drain Charge		-	4.2	-	

Note d : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

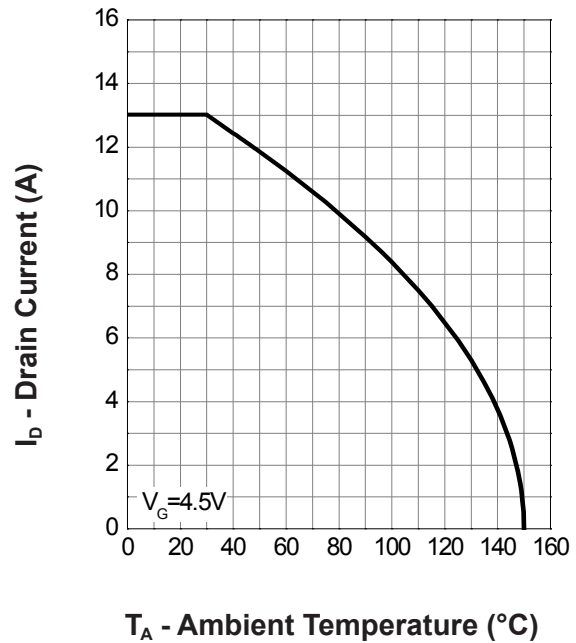
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

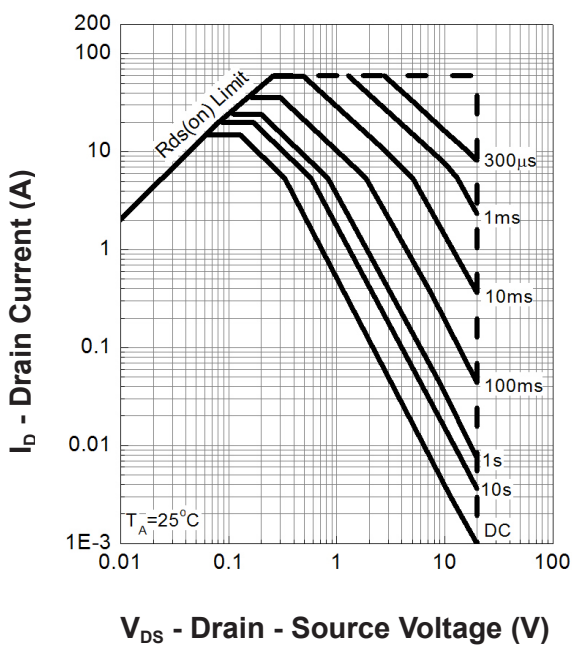
Power Dissipation



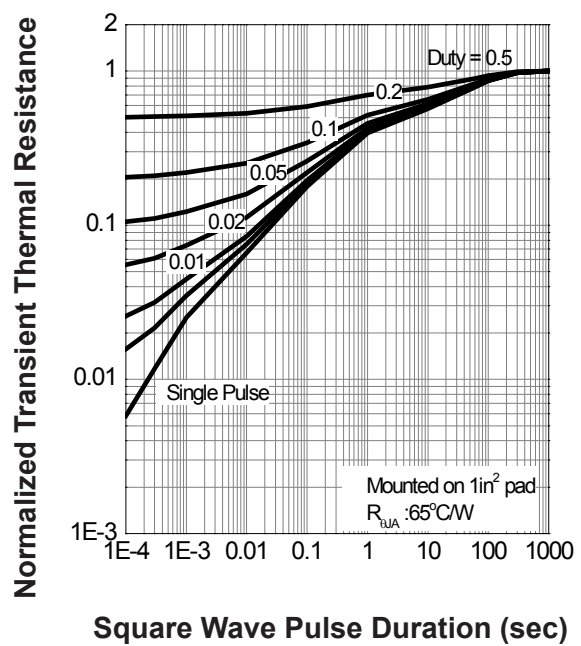
Drain Current



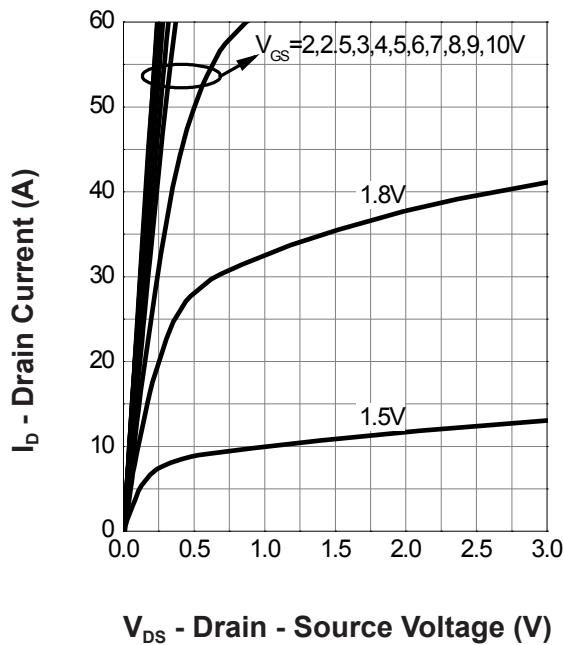
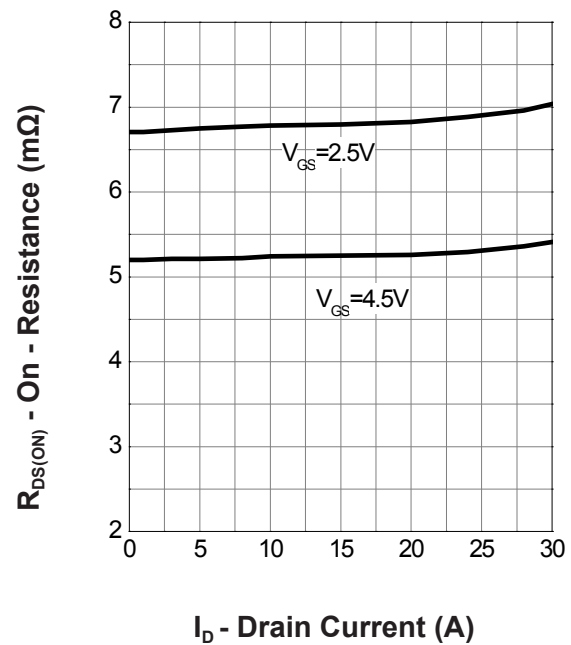
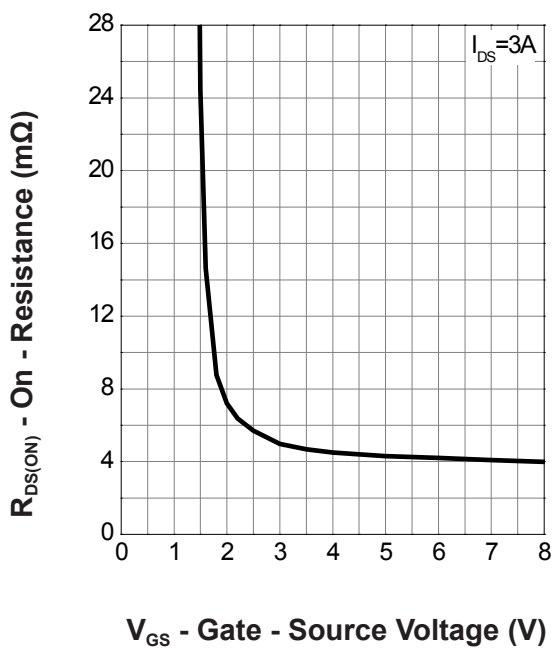
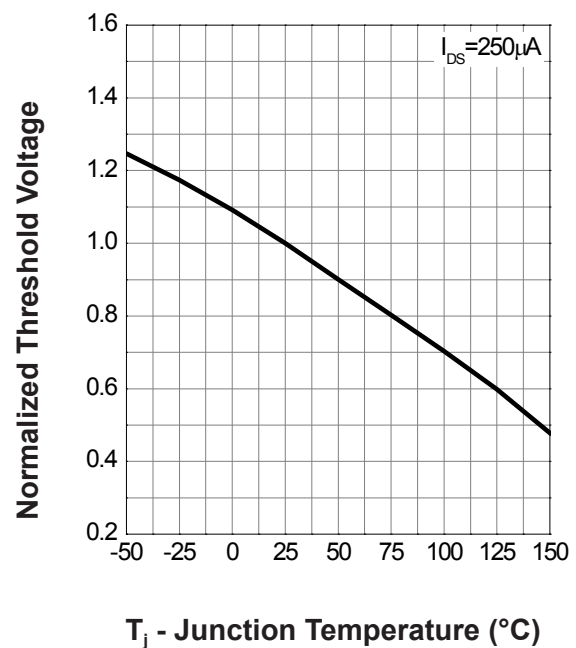
Safe Operation Area



Thermal Transient Impedance

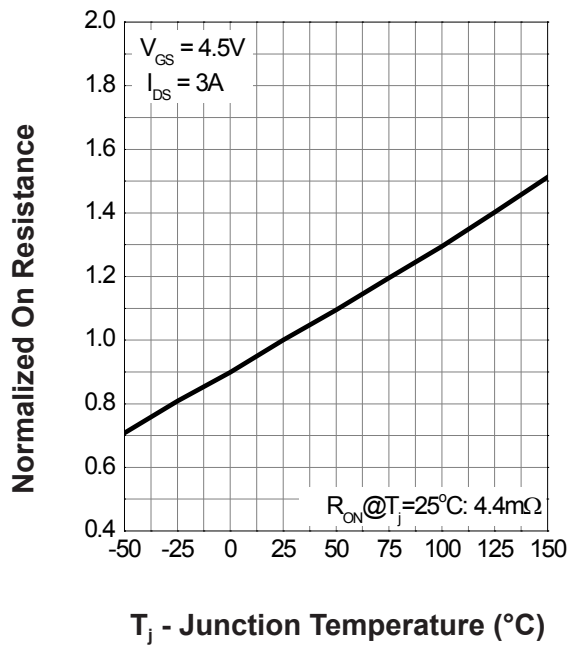


Typical Operating Characteristics(Cont.)

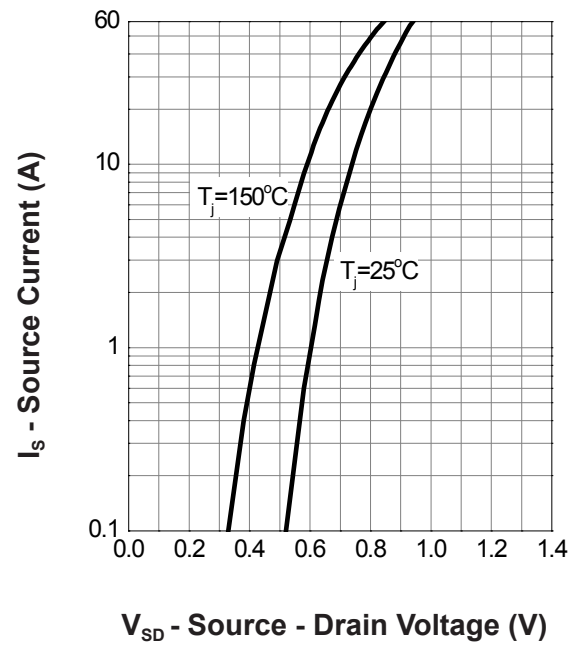
Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


Typical Operating Characteristics(Cont.)

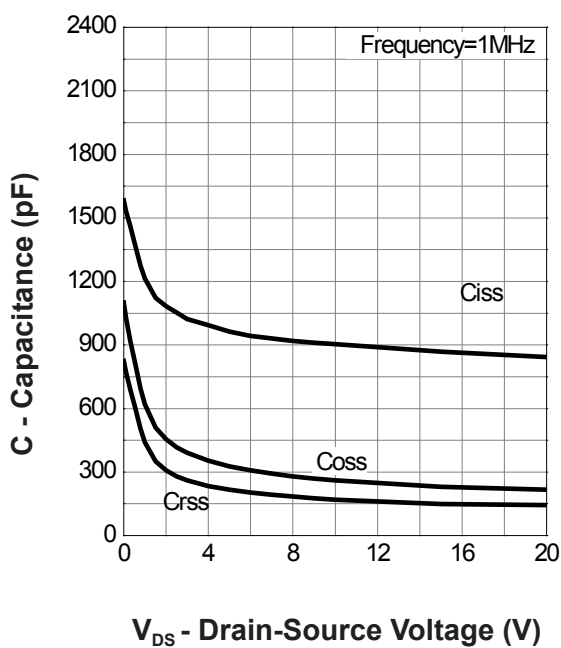
Drain-Source On Resistance



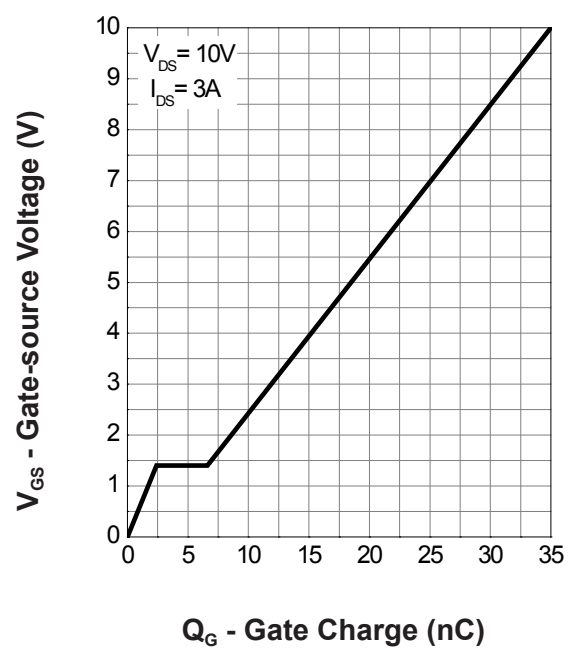
Source-Drain Diode Forward



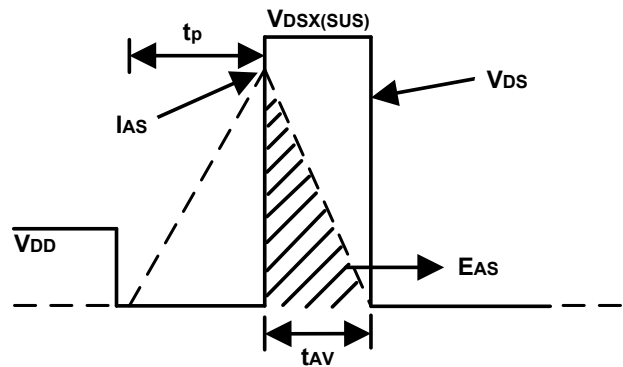
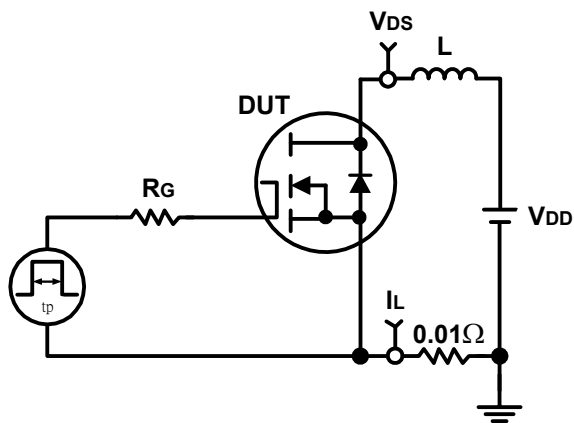
Capacitance



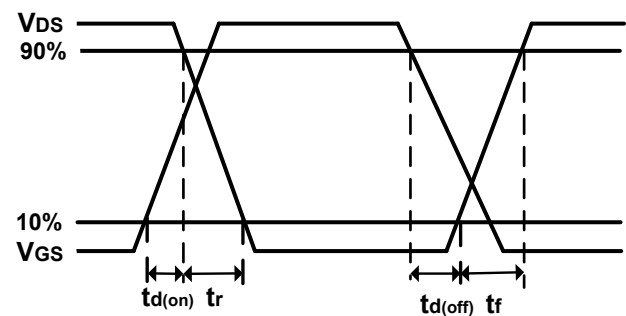
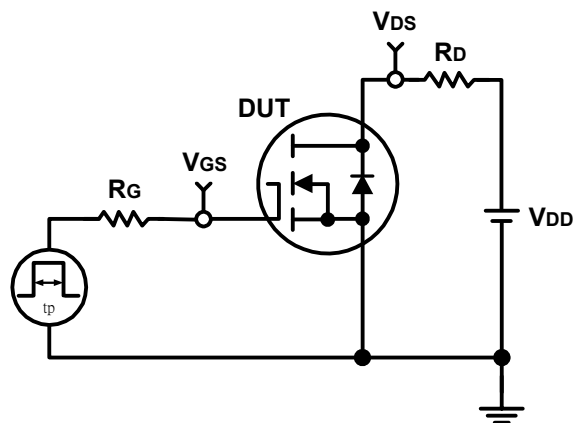
Gate Charge



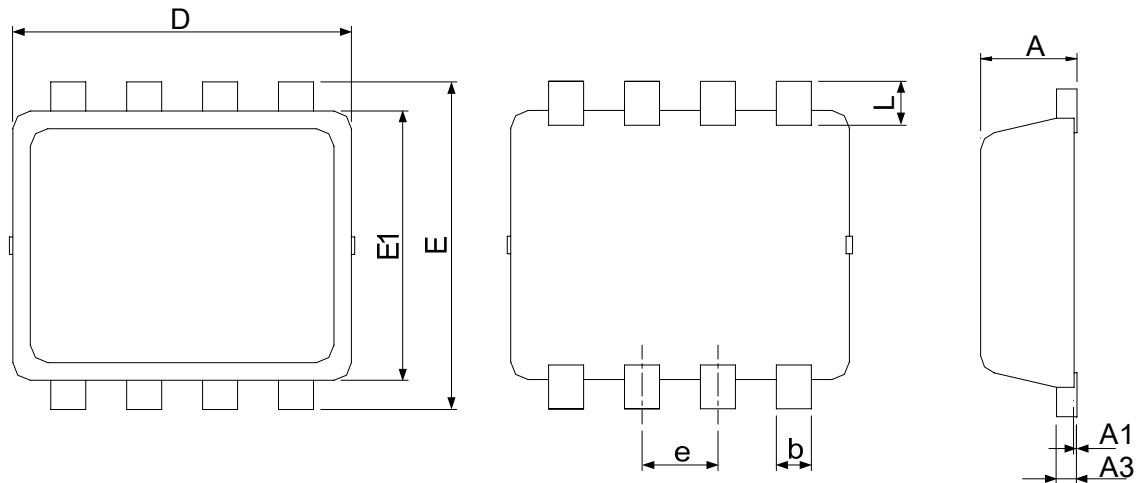
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

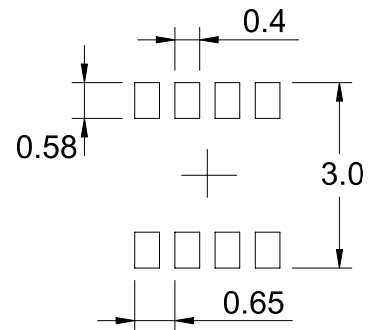


Package Information



SYMBOL	DFN3x3C-8_NEP_P			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.80	1.00	0.032	0.039
A1	0.00	0.05	0.000	0.002
A3	0.08	0.25	0.003	0.010
b	0.24	0.35	0.009	0.014
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	2.20	2.40	0.087	0.095
e	0.65 BSC		0.026 BSC	
L	0.20	0.45	0.008	0.018

RECOMMENDED LAND PATTERN



UNIT: mm