

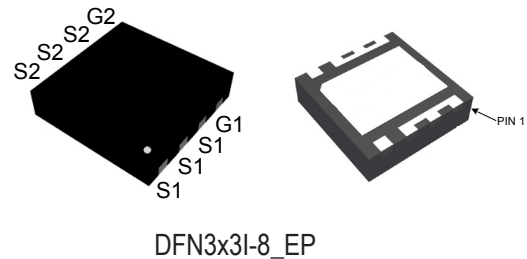
Features

- 20V/65A
 $R_{DS(ON)} = 2.9m\Omega (typ.) @ V_{GS} = 4.5V$
 $R_{DS(ON)} = 3.8m\Omega (typ.) @ V_{GS} = 2.5V$
- 100% UIS + R_g Tested
- ESD Protection
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

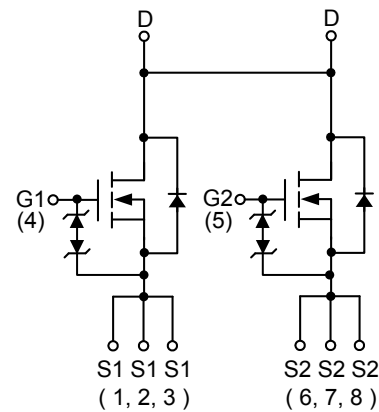
Applications

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

Pin Description



DFN3x3l-8_EP



N-Channel MOSFET

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	65	A
I _D	Continuous Drain Current	T _A =25°C	65	A
		T _A =70°C	49	
I _{DM} ^b	Pulsed Drain Current	T _A =25°C	195	
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)

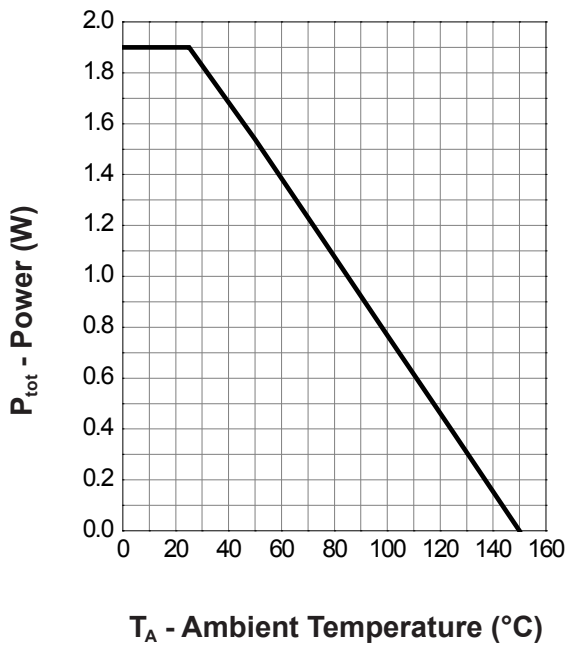
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.4	0.75	1.1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±10	uA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =3A	-	2.9	3.6	mΩ
		V _{GS} =2.5V, I _{DS} =3A	-	3.8	4.5	
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	-	1580	2054	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 $\leq 2\%$.

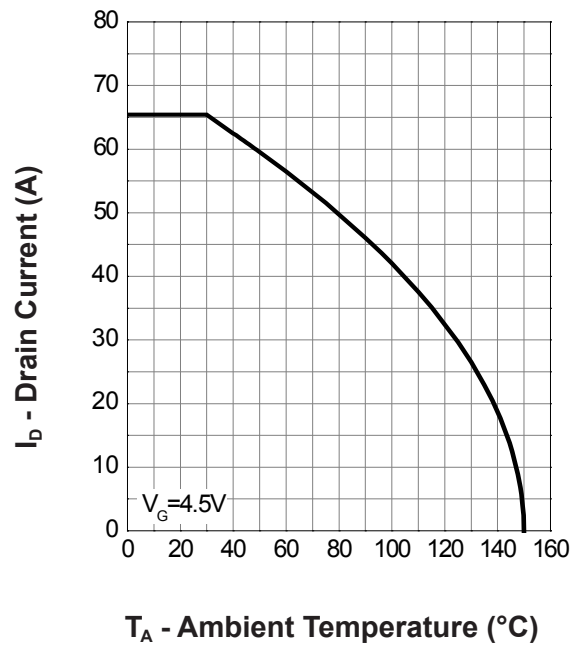
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

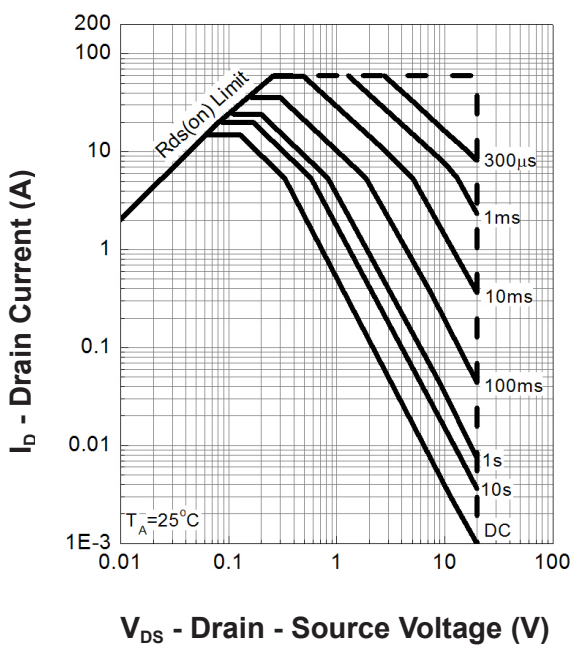
Power Dissipation



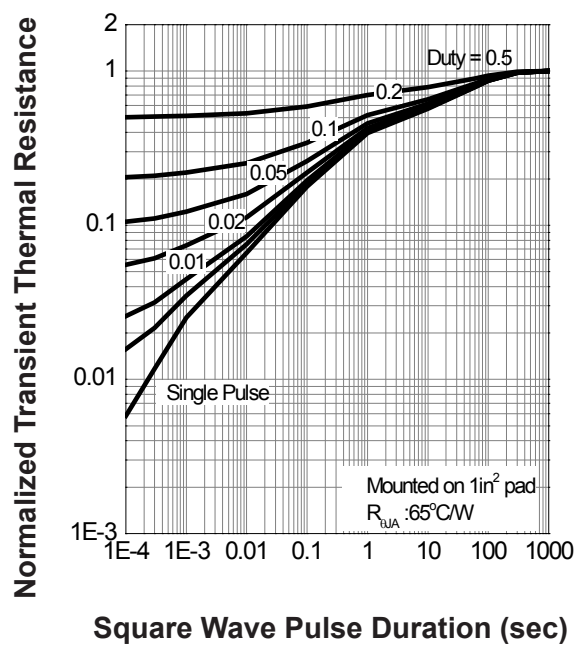
Drain Current



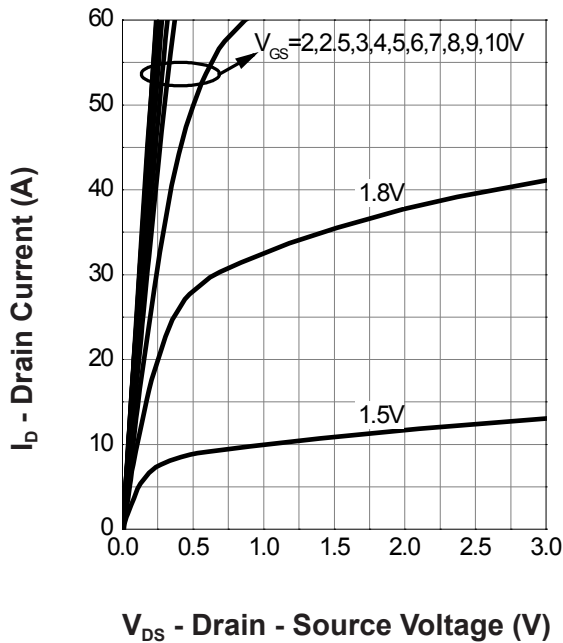
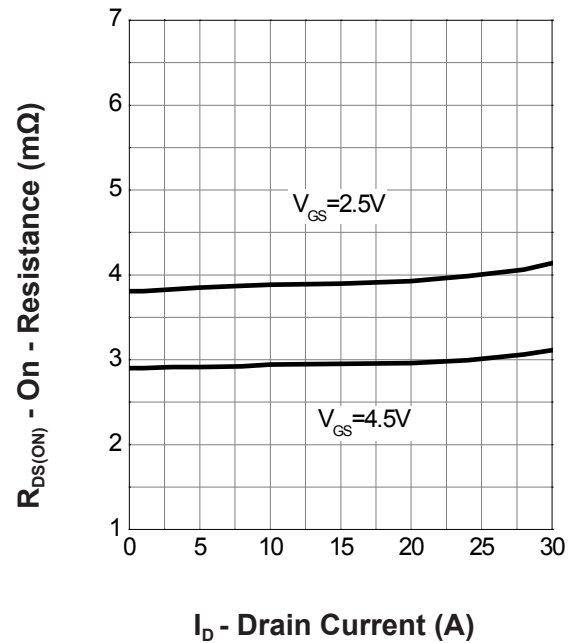
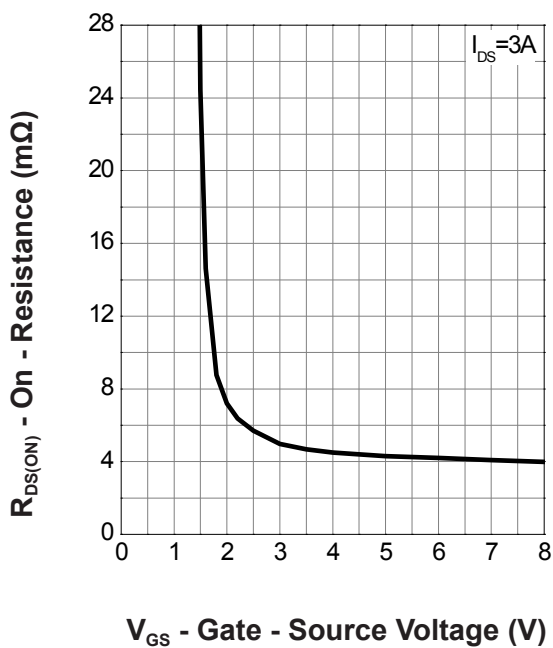
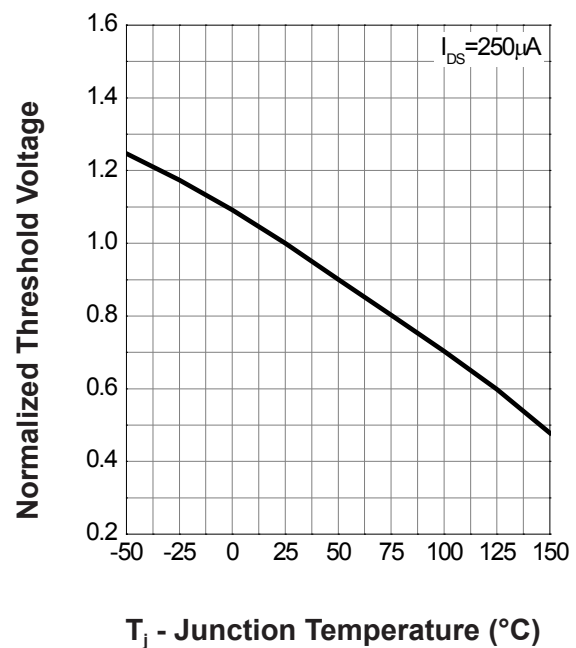
Safe Operation Area



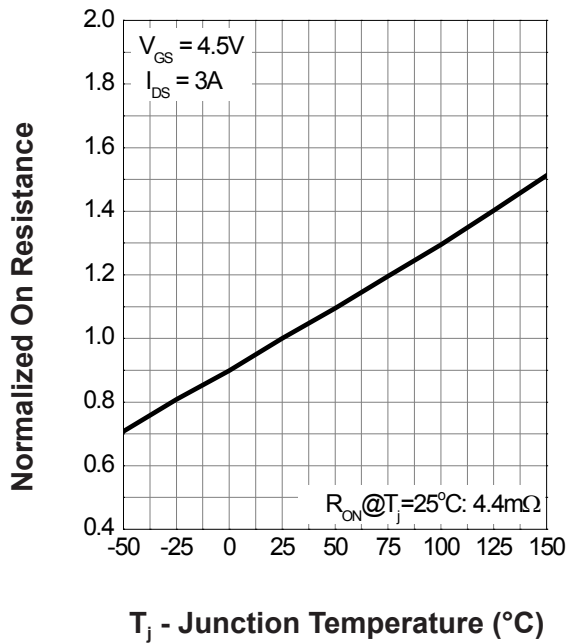
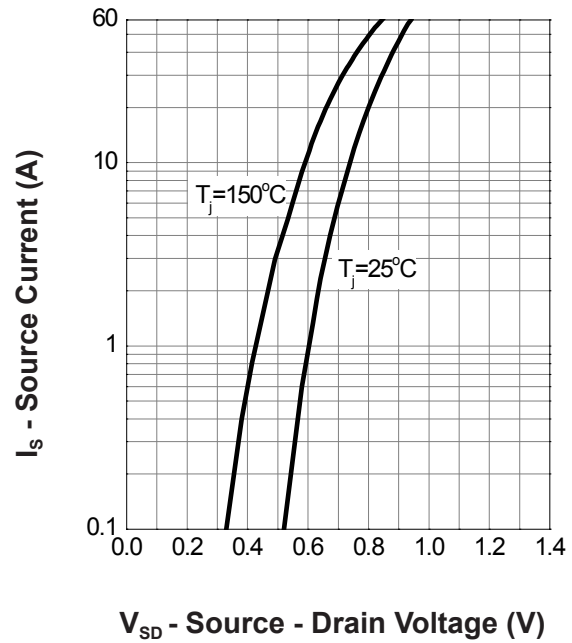
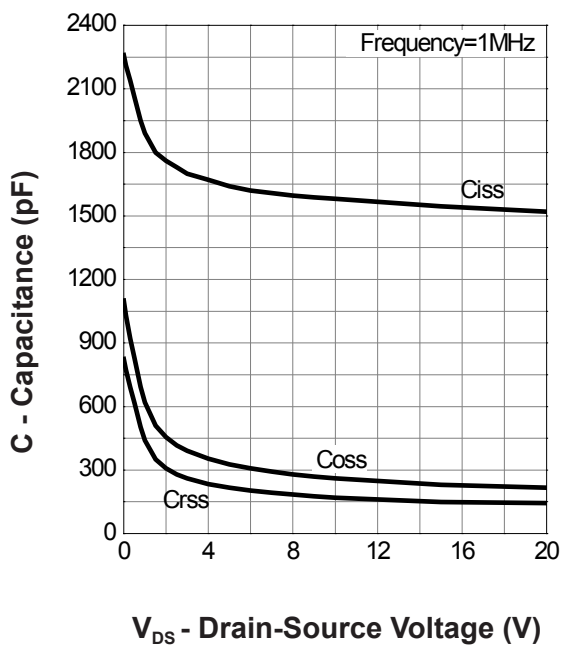
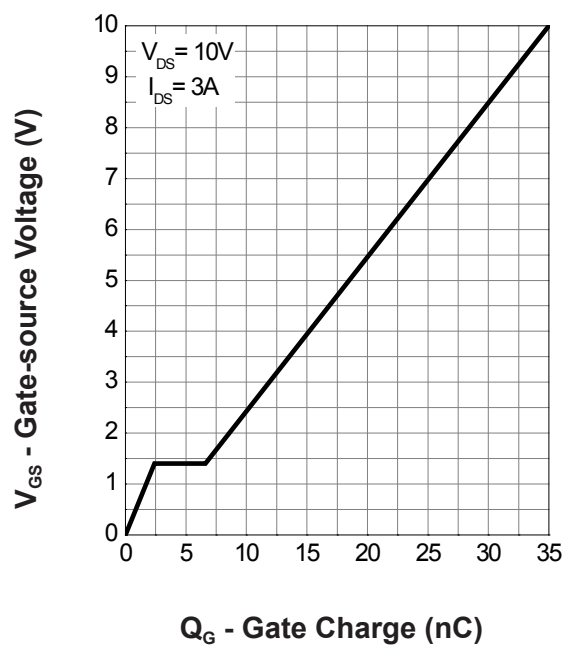
Thermal Transient Impedance



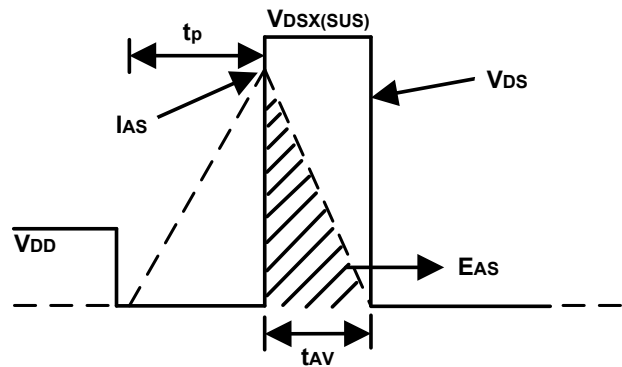
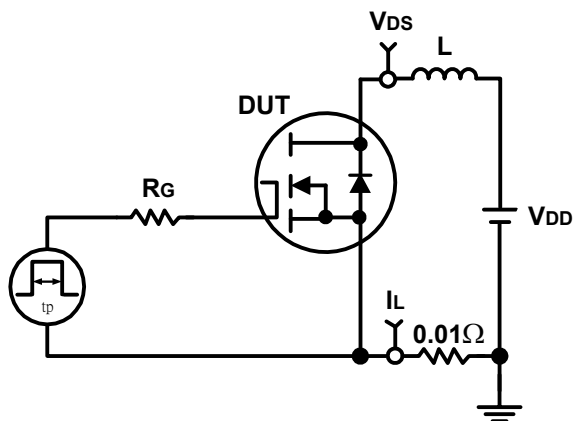
Typical Operating Characteristics(Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


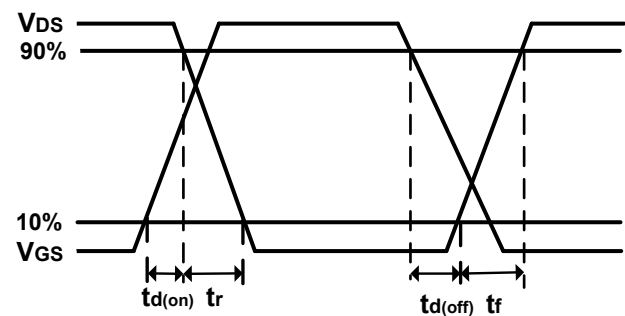
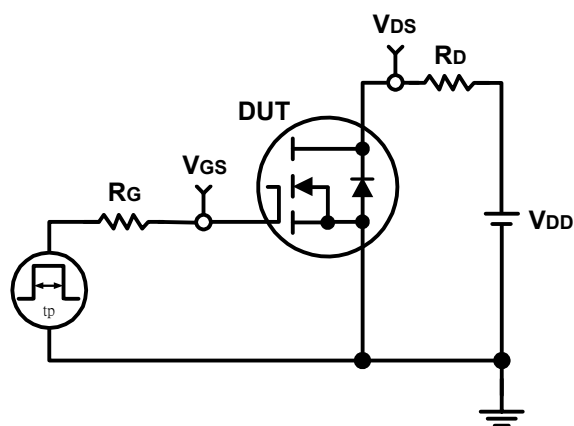
Typical Operating Characteristics(Cont.)

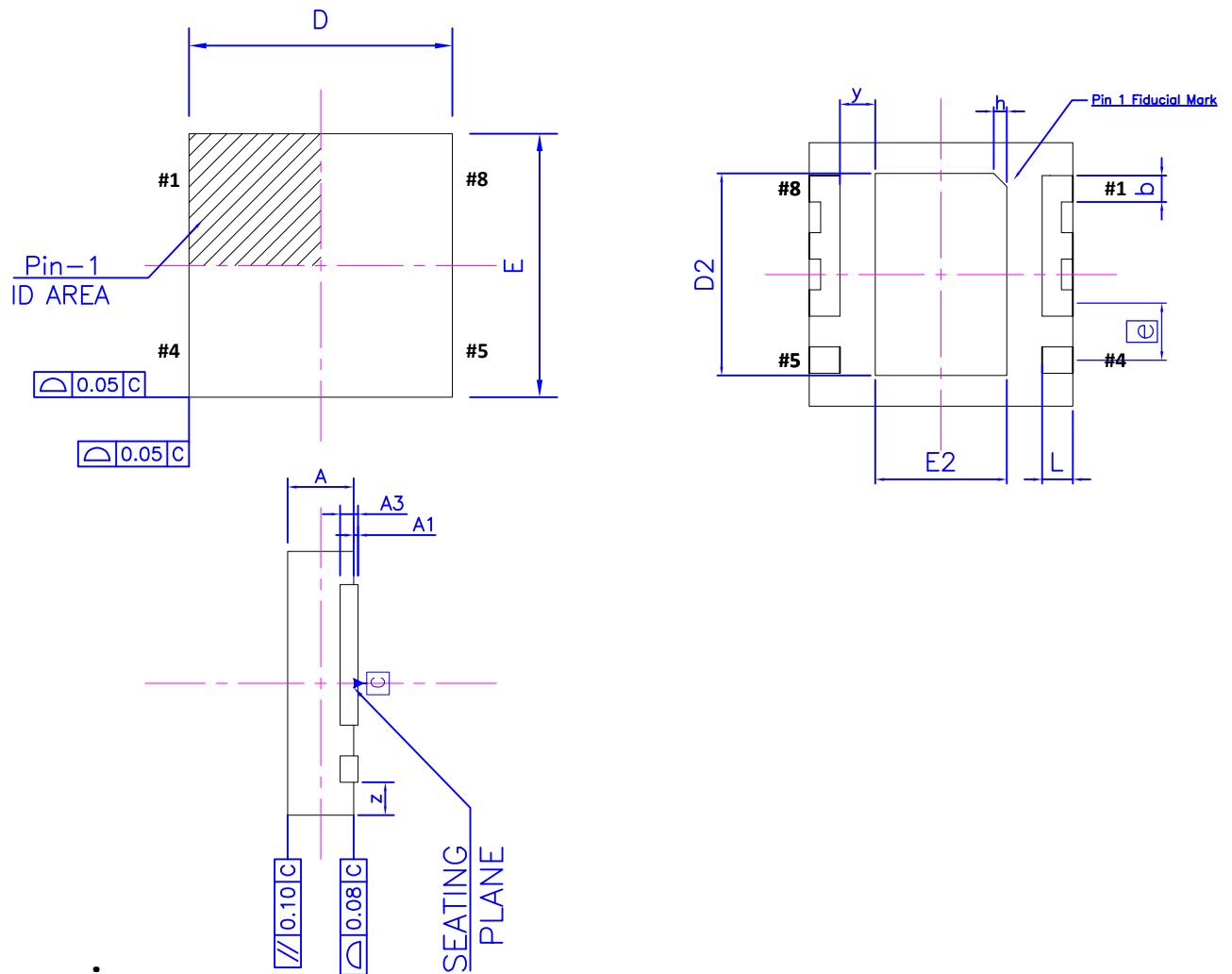
Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms





Dimensions

Unit	D	E	D2	E2	A	A1	A3	b	e	h	L	y	z
mm	3.07 (3.00) 2.95	3.07 (3.00) 2.95	2.35 (2.30) 2.25	1.60 (1.50) 1.40	0.80 (0.75) 0.70	0.05 (0.02) 0.00	0.203 REF	0.35 (0.30) 0.25	0.65 BSC	0.15 REF	0.45 (0.35) 0.25	0.400 REF	0.375 REF