

Dual N-Channel Enhancement Mode MOSFET

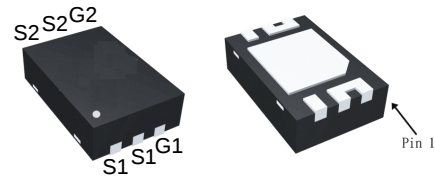
Features

- 20V/9.7A,
 $R_{DS(ON)} = 7.5m\Omega$ (Max.) @ $V_{GS} = 4.5V$
 $R_{DS(ON)} = 7.9m\Omega$ (Max.) @ $V_{GS} = 4V$
 $R_{DS(ON)} = 8.2m\Omega$ (Max.) @ $V_{GS} = 3.7V$
 $R_{DS(ON)} = 8.7m\Omega$ (Max.) @ $V_{GS} = 3.1V$
 $R_{DS(ON)} = 9.9m\Omega$ (Max.) @ $V_{GS} = 2.5V$
- ESD protection
- 100% UIS Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

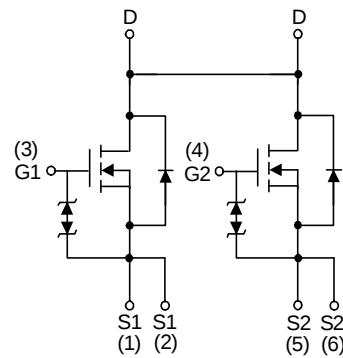
Applications

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

Pin Description



DFN2x3A-6_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	2	A
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	38	A
I _D ^b	Continuous Drain Current	T _A =25°C	9.7	A
		T _A =70°C	7.5	
P _D ^b	Maximum Power Dissipation	T _A =25°C	1.0	W
		T _A =70°C	0.6	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	80	°C/W
		Steady State	127	°C/W
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	22	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	24.2	mJ

Note a : Pulse width is limited by max. junction temperature.

Note b : $t = 999\text{sec}$.

Note c : $R_{\theta JA}$ steady state $t = 999\text{s}$. $R_{\theta JA}$ is measured with the device mounted on 1in^2 , FR-4 board with 2oz. Copper.

Note d : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

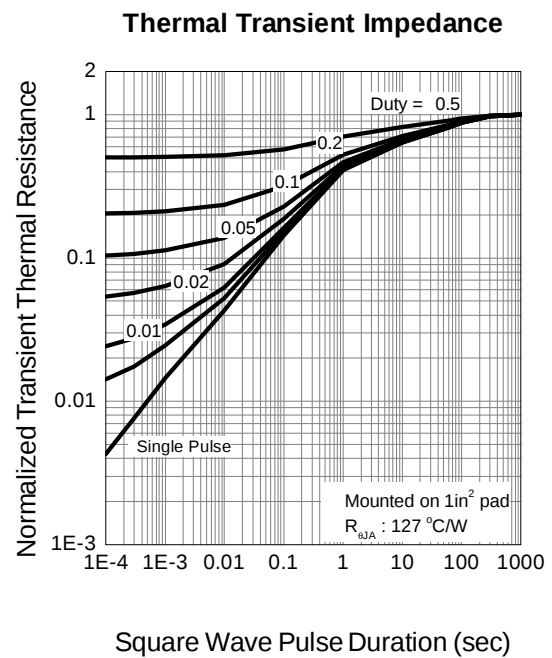
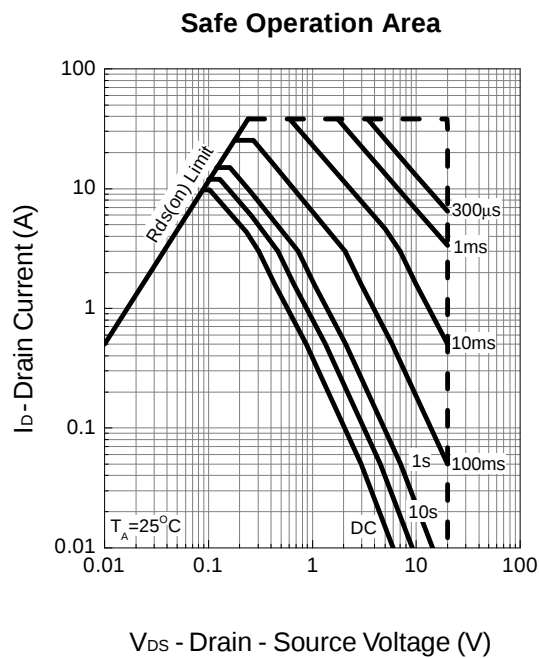
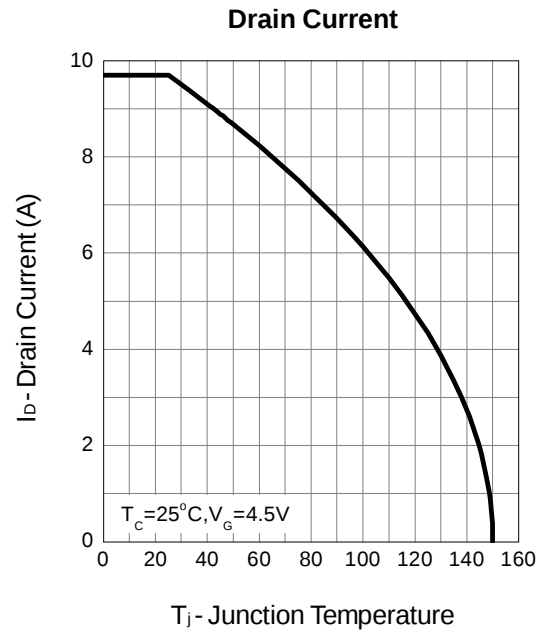
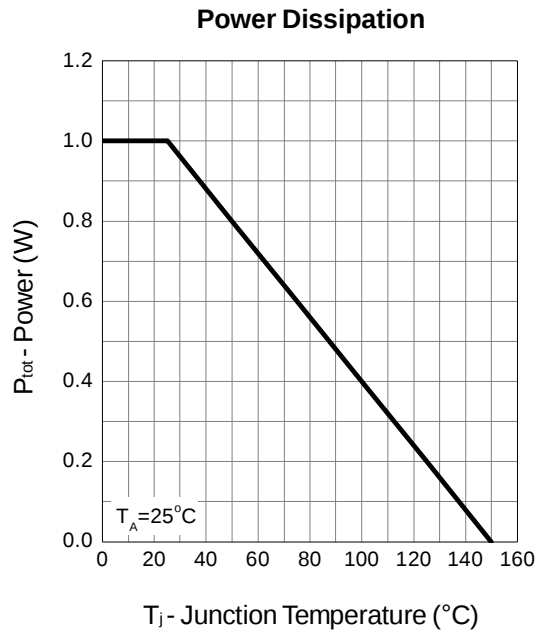
Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

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	0.5	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±10	μA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =5.5A	-	6	7.5	mΩ
		V _{GS} =4.0V, I _{DS} =5.5A	-	6.2	7.9	
		V _{GS} =3.7V, I _{DS} =5.5A	-	6.3	8.2	
		V _{GS} =3.1V, I _{DS} =5.5A	-	6.6	8.7	
		V _{GS} =2.5V, I _{DS} =5.5A	-	7.3	9.9	
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.7	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =5.5A, dI _{SD} /dt=100A/μs	-	445	-	ns
Q _{rr}	Reverse Recovery Charge		-	2175	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	11	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	1470	1920	pF
C _{oss}	Output Capacitance		-	258	-	
C _{rss}	Reverse Transfer Capacitance		-	202	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =10V, R _G =1Ω	-	8	15	ns
t _r	Turn-on Rise Time		-	20	36	
t _{d(OFF)}	Turn-off Delay Time		-	935	1683	
t _f	Turn-off Fall Time		-	410	738	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =5.5A	-	23.2	33	nC
Q _{gs}	Gate-Source Charge		-	1.9	-	
Q _{gd}	Gate-Drain Charge		-	4.8	-	

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

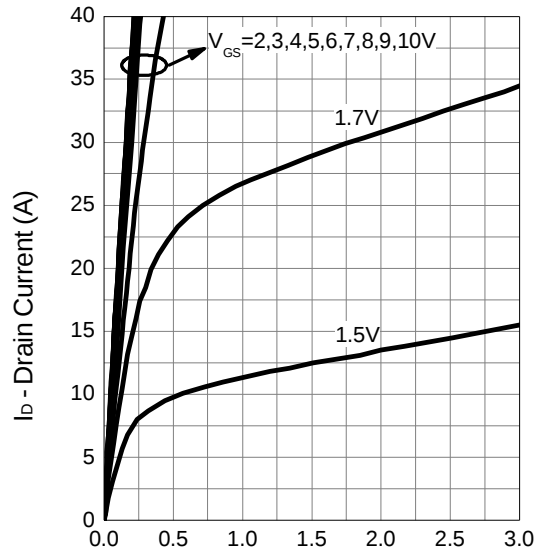
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics



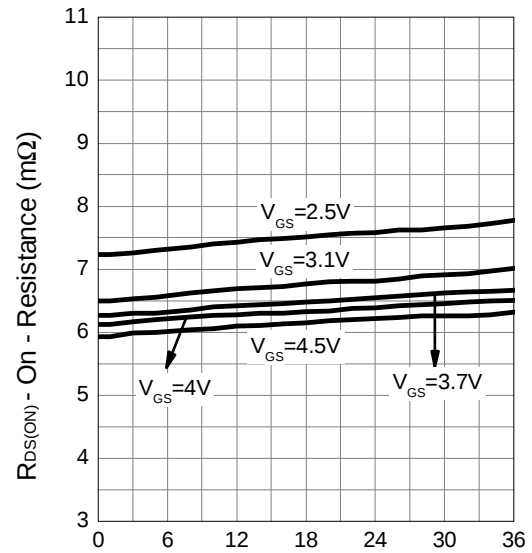
Typical Operating Characteristics (Cont.)

Output Characteristics



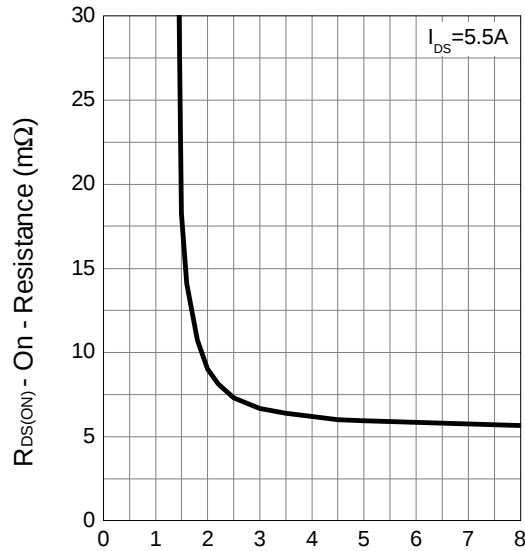
V_{DS} - Drain - Source Voltage (V)

Drain-Source On Resistance



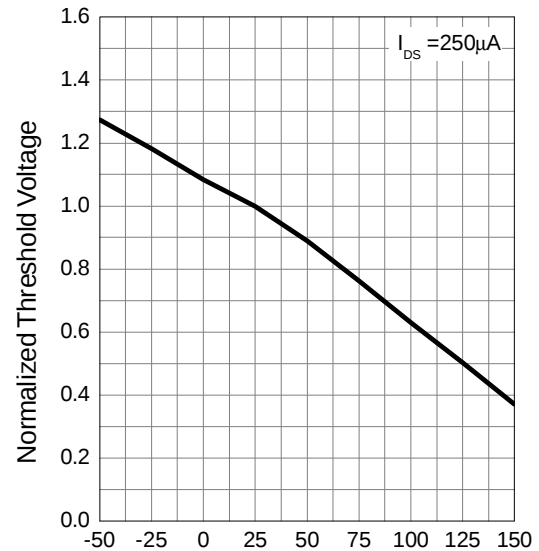
I_D - Drain Current (A)

Gate-Source On Resistance



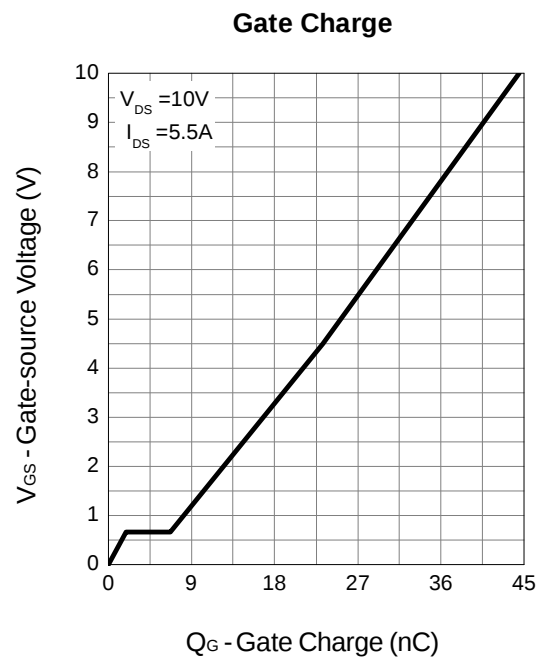
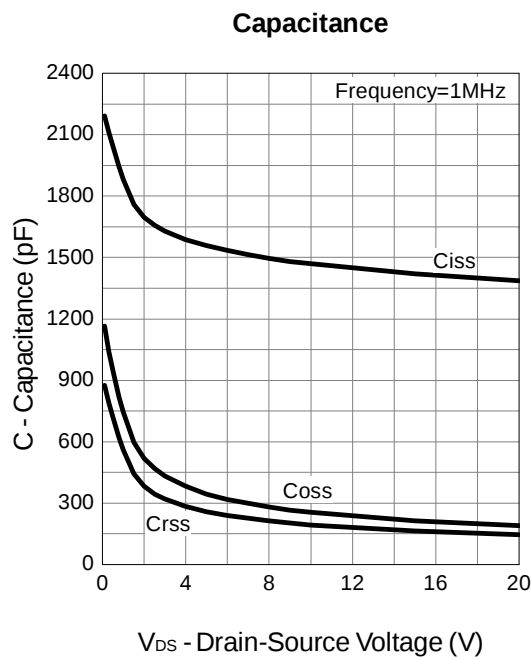
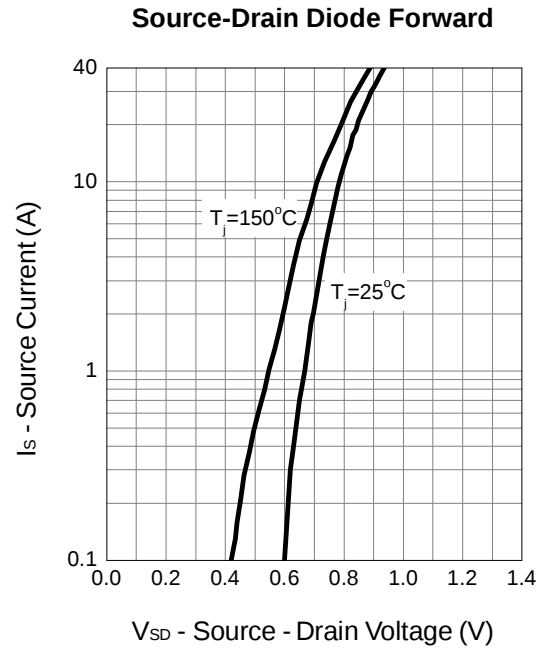
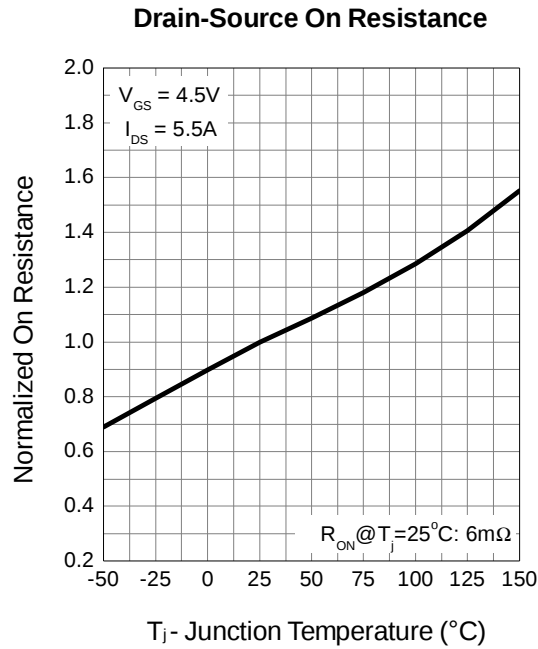
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage

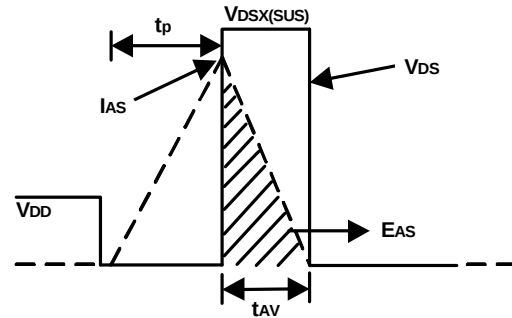
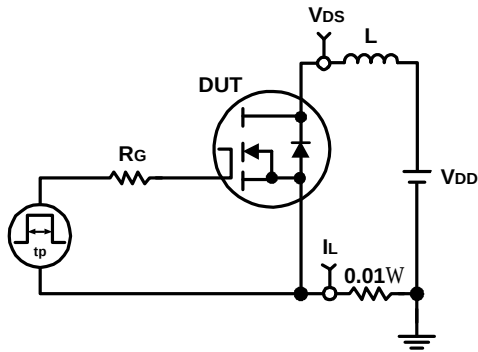


T_J - Junction Temperature ($^{\circ}C$)

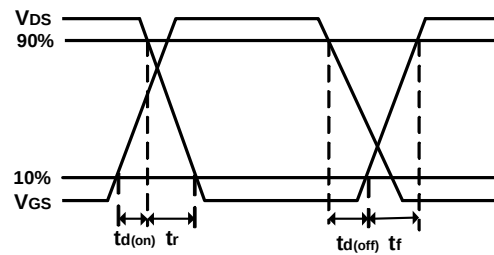
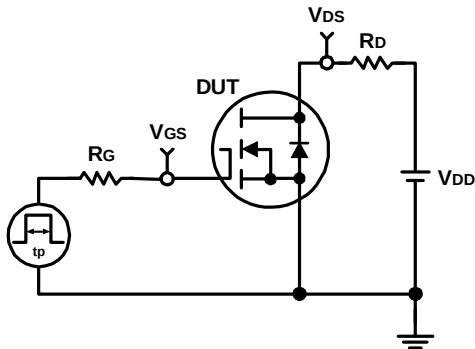
Typical Operating Characteristics (Cont.)



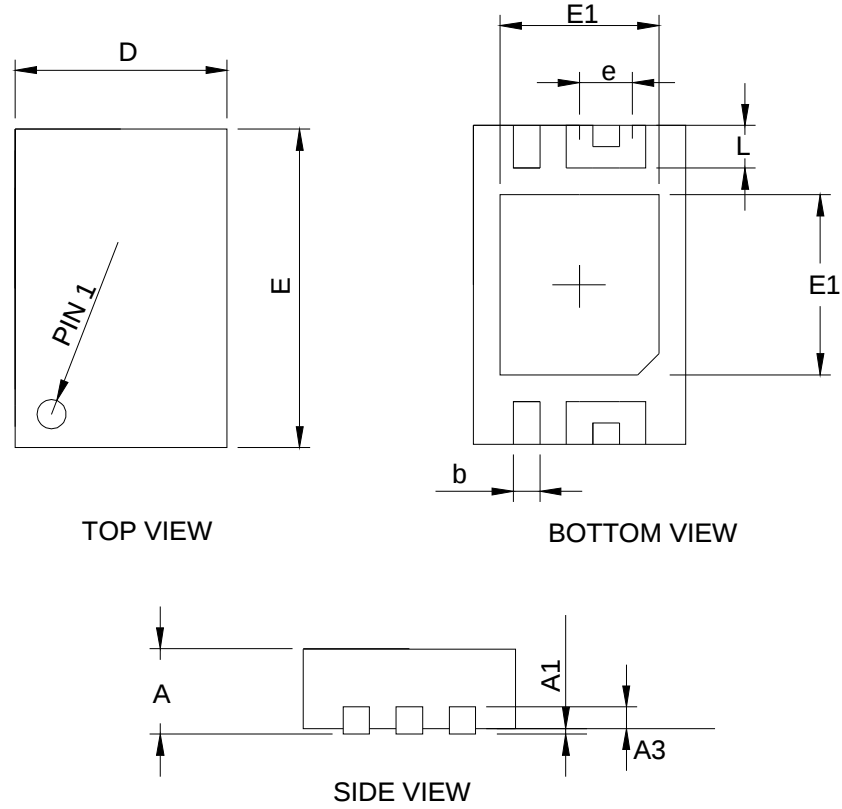
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

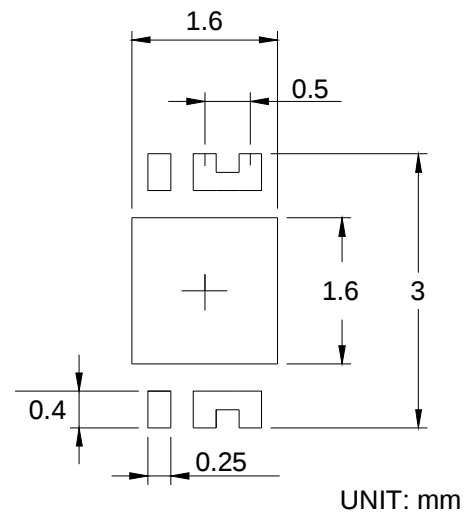


Package Information

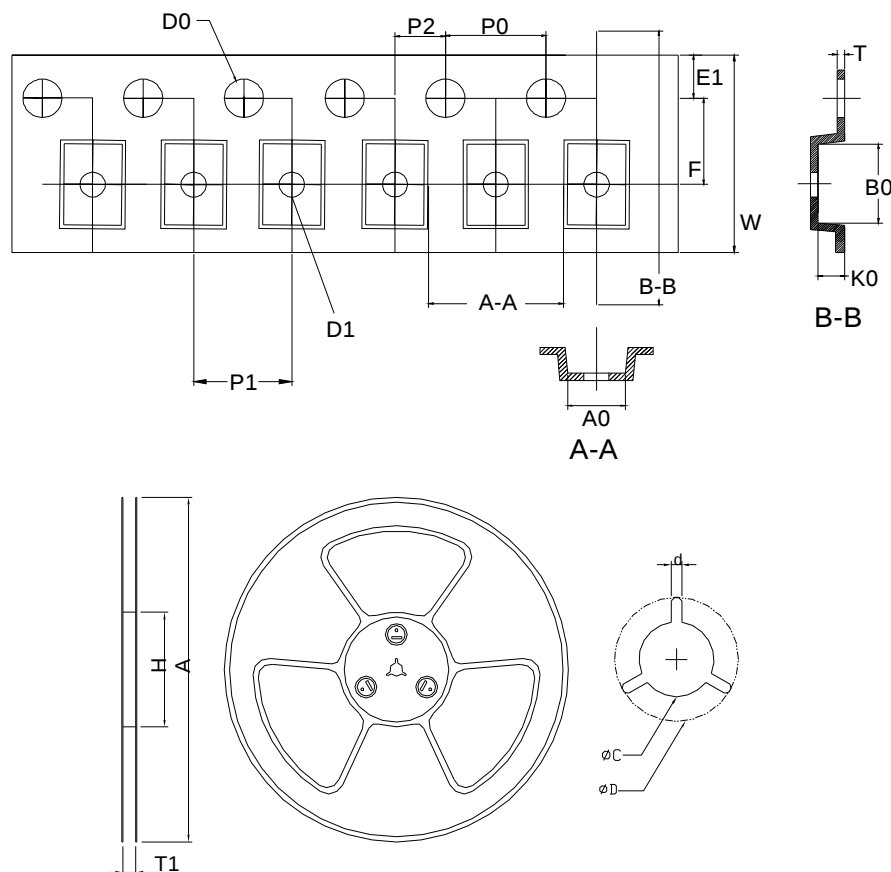


SYMBOL	DFN2x3A-6_EP1_S			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.50	0.70	0.028	0.039
A1	0.00	0.05	0.000	0.002
A3	0.203 REF		0.008 REF	
b	0.20	0.30	0.008	0.012
D	1.90	2.10	0.075	0.083
E1	1.60	1.80	0.063	0.071
E	2.90	3.10	0.114	0.122
D1	1.40	1.60	0.055	0.063
e	0.50 BSC		0.02 BSC	
L	0.30	0.50	0.012	0.020

RECOMMENDED LAND PATTERN



Carrier Tape & Reel Dimensions

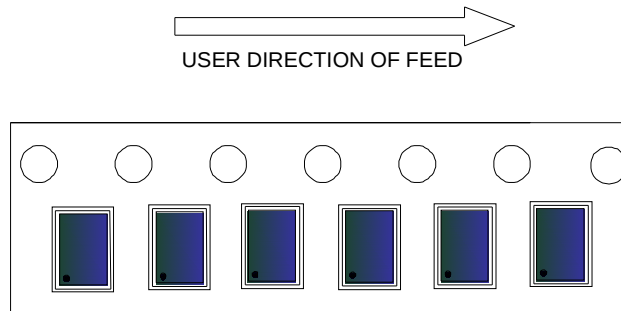


Application	A	H	T1	C	d	D	W	E1	F
DFN2x3A-6 EP1_S	178.0±2.00	50 MIN.	8.4+2.50 -0.00	13.5±0.20	1.5 MIN.	20.2 MIN.	8.0±0.30	1.75±0.10	3.5±0.05
	P0	P1	P2	D0	D1	T	A0	B0	K0
	4.0±0.10	4.0±0.10	2.0±0.1	1.5+0.10 -0.00	1.0±0.10	0.3±0.10	2.3±0.10	3.2±0.10	1.0±0.10

(mm)

Taping Direction Information

DFN2x3A-6_EP1_S



Classification Profile

