

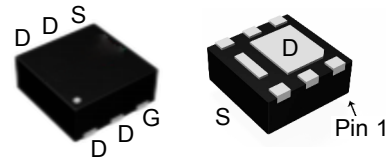
Features

- 30V/11A,
 $R_{DS(ON)} = 9\text{ m}\Omega(\text{typ.}) @ V_{GS} = 4.5\text{V}$
 $R_{DS(ON)} = 13\text{ m}\Omega(\text{typ.}) @ V_{GS} = 2.5\text{V}$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- ESD Protection
- Quantity:5K/reel

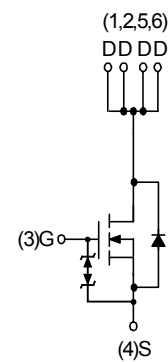
Applications

- Li-Ion Battery Pack.
- DC-DC Buck Converters.

Pin Description



DFN2x2A-6_EP



N-Channel MOSFET

Marking Information

RSTN30N09A5 QG :



XXXXXX - Lot Code

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		30	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	11	A
I _D	Continuous Drain Current	T _A =25°C	11	A
		T _A =70°C	4.4	
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	33	A
P _D ^b	Maximum Power Dissipation	T _A =25°C	1.32	W
		T _A =70°C	0.8	
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	t ≤ 10s	54	°C/W
		Steady State	95	°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.1mH	16	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.1mH	13	mJ

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

Note b : $R_{\theta JA}$ steady state $t=999\text{s}$.

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

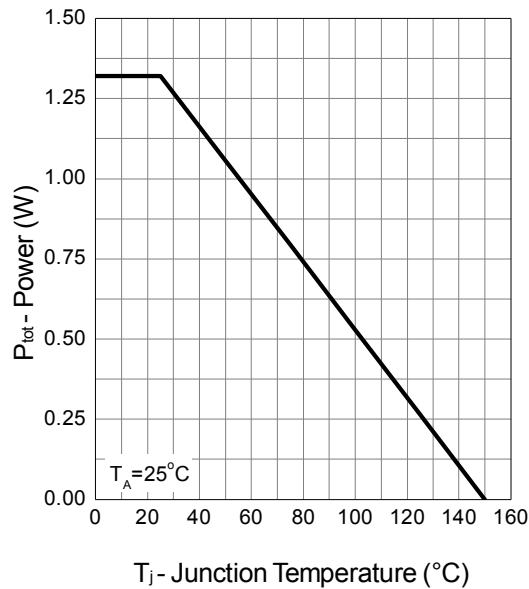
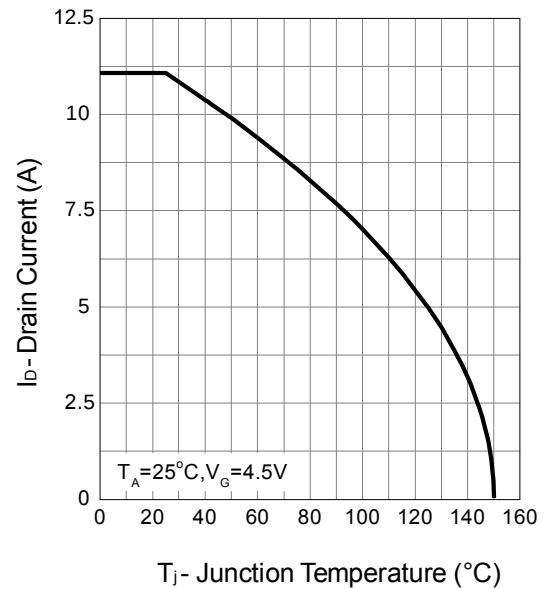
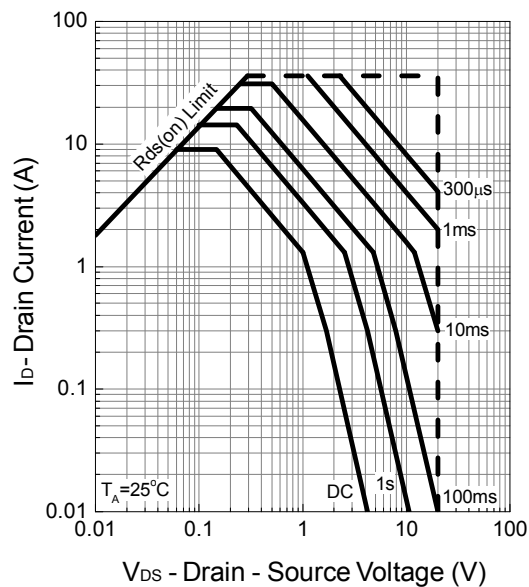
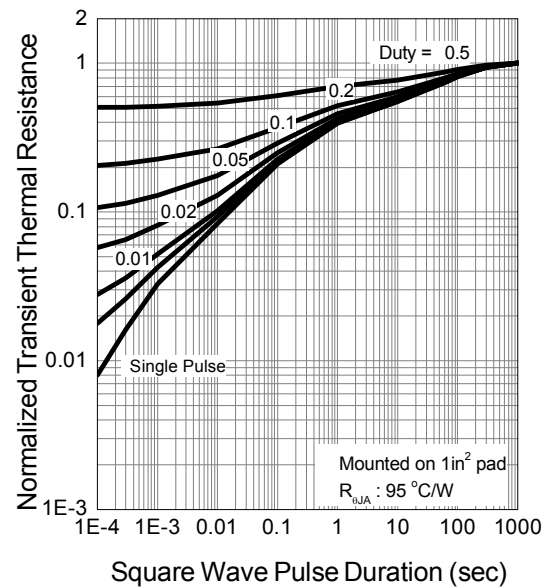
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, 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	0.75	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} =9A T _J =125°C	- -	9 14	13 -	mΩ
		V _{GS} =2.5V, I _{DS} =8A	-	13	17	
		Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =8A	-	
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =1.5A, V _{GS} =0V	-	0.72	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =8A, dI _{SD} /dt=100A/μs	-	10.2	-	ns
Q _{rr}	Reverse Recovery Charge		-	4.1	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.5	2.7	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	2180	2415	pF
C _{oss}	Output Capacitance		-	170	-	
C _{rss}	Reverse Transfer Capacitance		-	120	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =4.5V, R _G =1Ω	-	10.6	-	ns
t _r	Turn-on Rise Time		-	15	-	
t _{d(OFF)}	Turn-off Delay Time		-	17.2	-	
t _f	Turn-off Fall Time		-	4	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	Vds=10V, Vgs=4.5V, Ids=9A	-	8.9	11.5	nC
Q _{gs}	Gate-Source Charge		-	0.52	-	
Q _{gd}	Gate-Drain Charge		-	3.8	-	

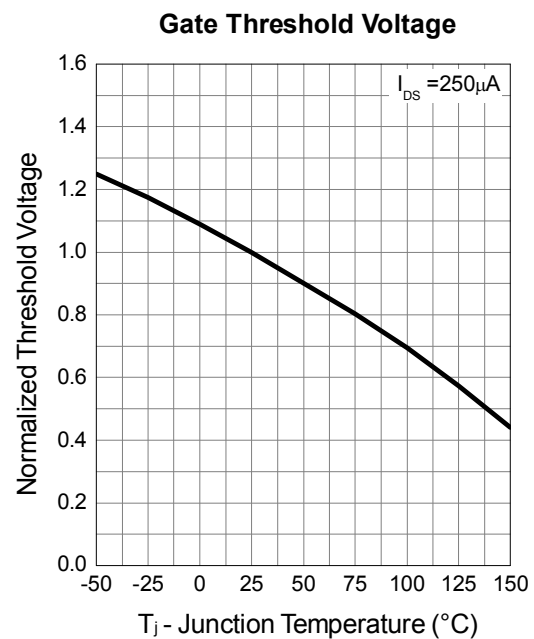
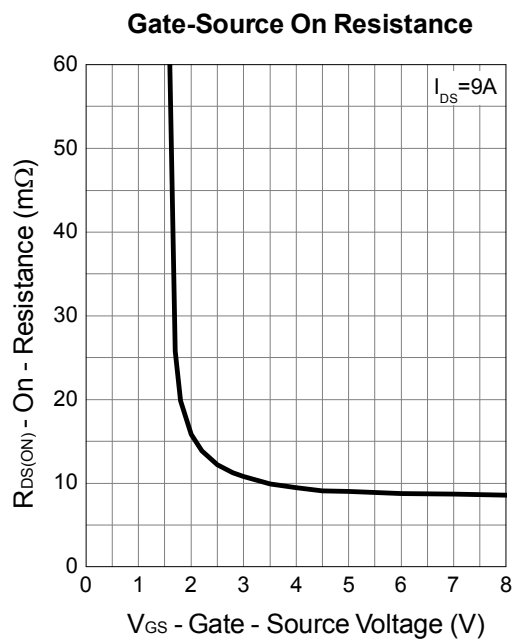
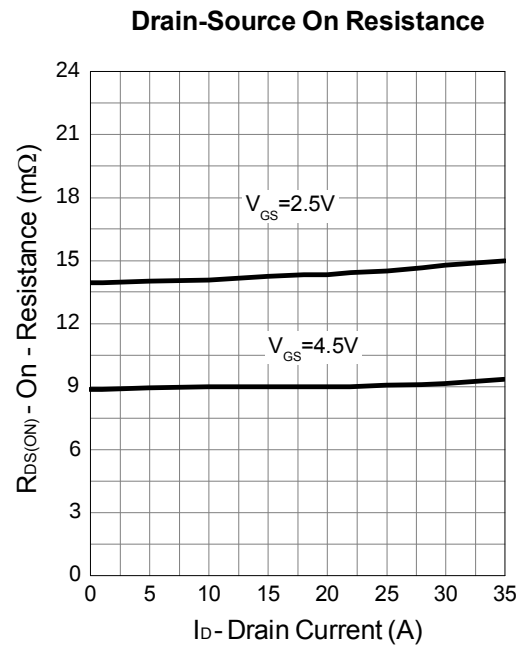
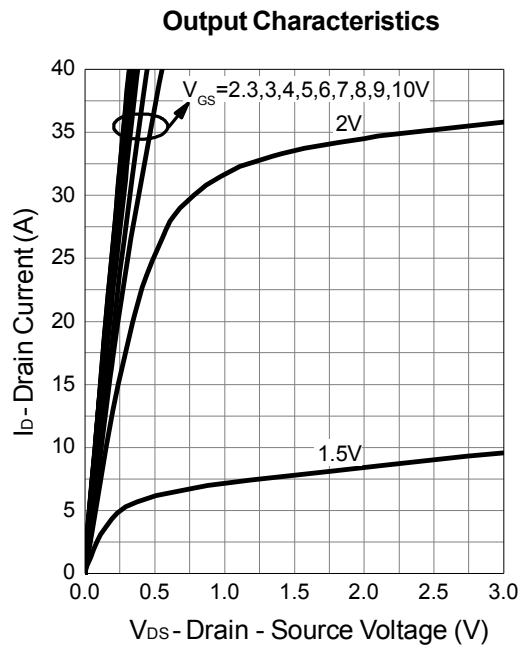
Note d Pulse test ; pulse width≤300μs, duty cycle≤2%.

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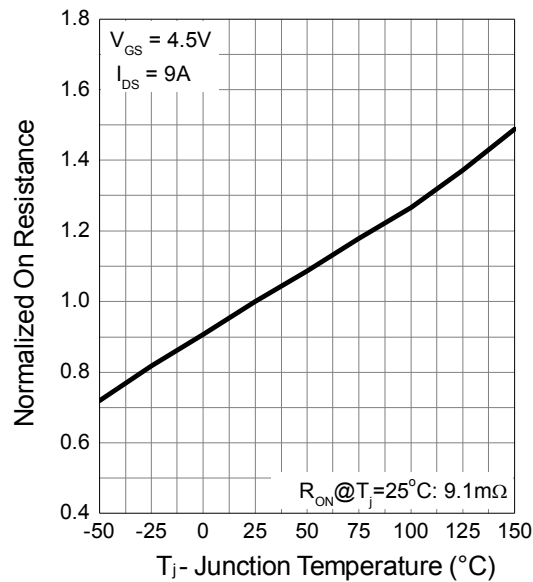
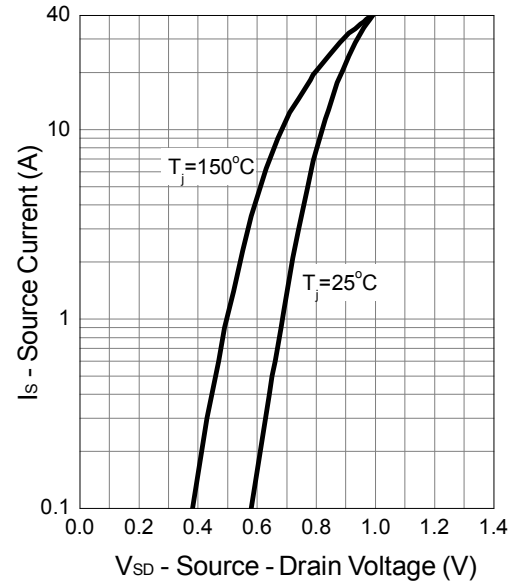
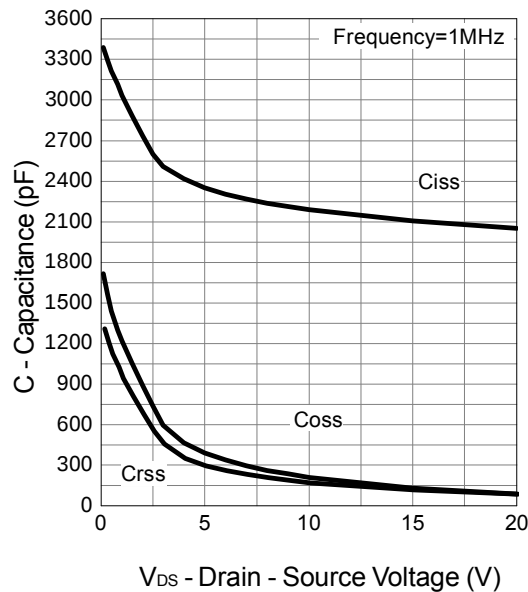
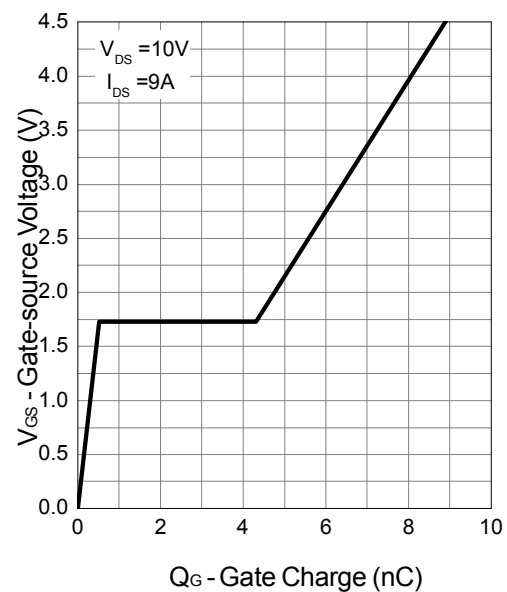
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


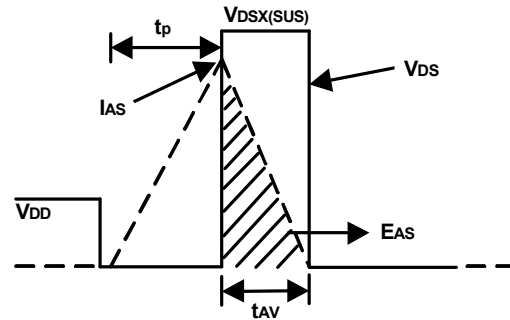
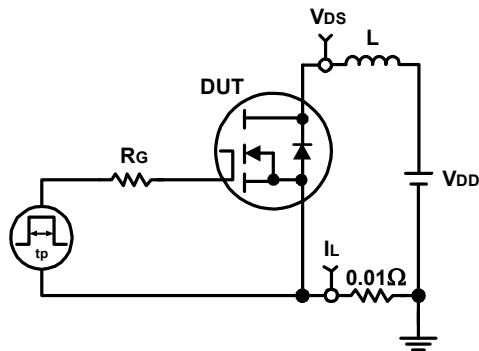
Typical Operating Characteristics (Cont.)



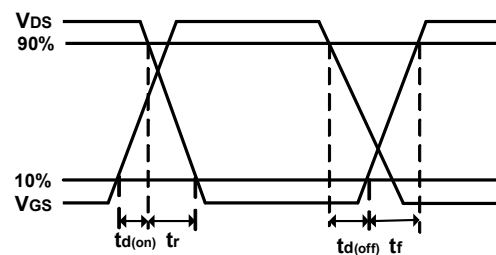
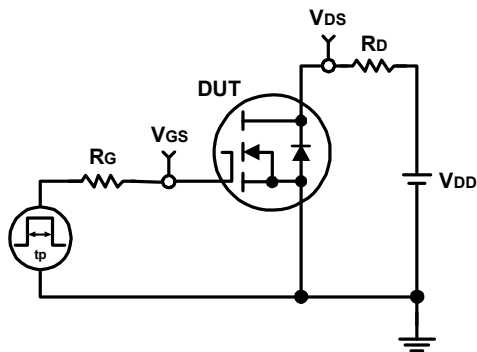
Typical Operating Characteristics (Cont.)

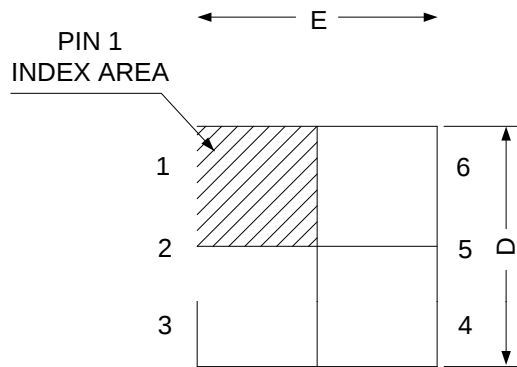
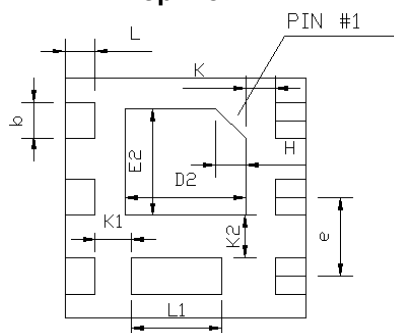
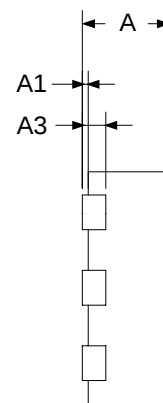
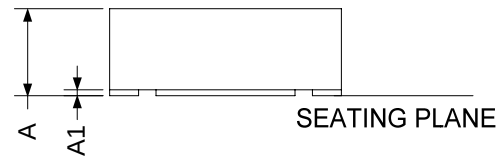
Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

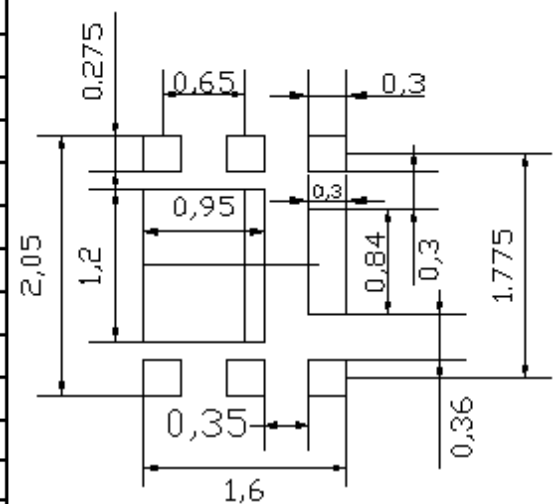


Switching Time Test Circuit and Waveforms



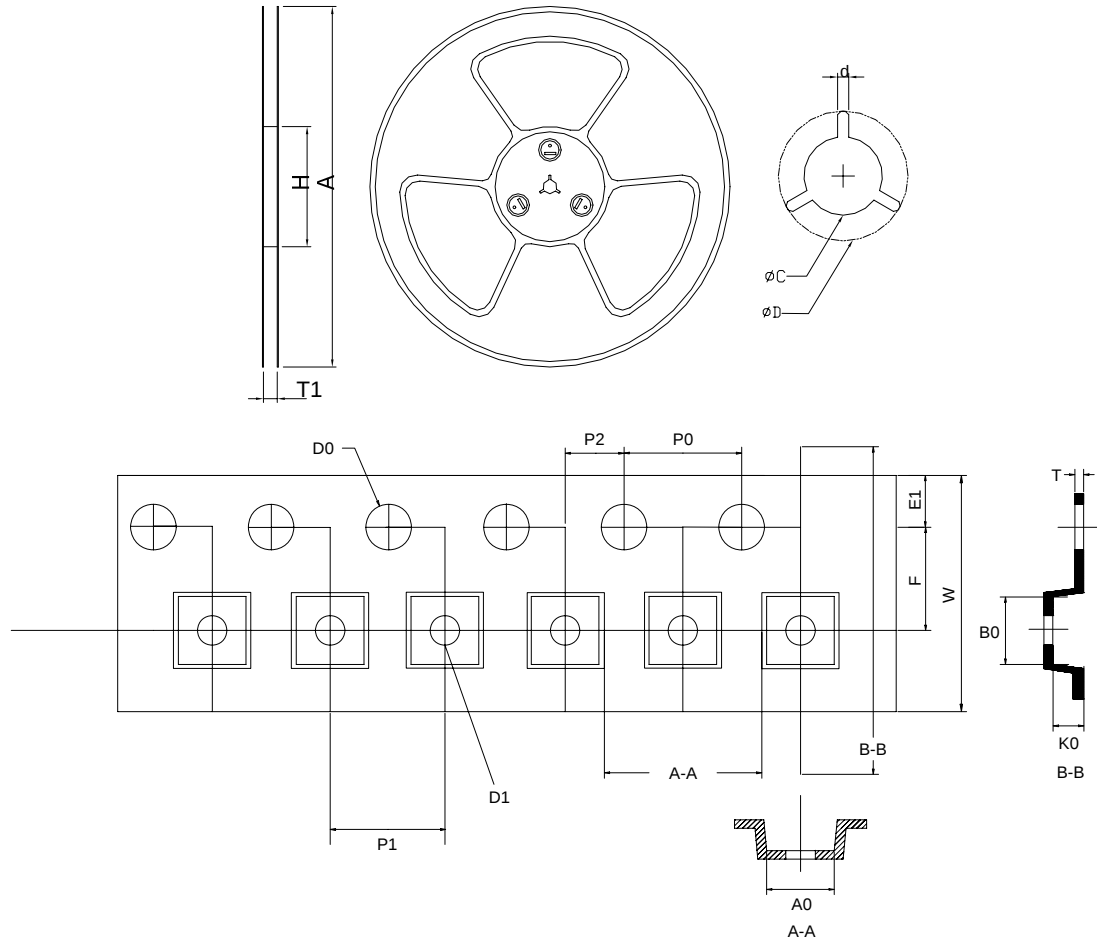

Top View

Bottom View

Side View

SYMBOLS	DFN2x2A-6_EP1_S			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	0.80	0.028	0.031
A1	0.00	0.05	0.000	0.002
A3	0.2 REF		0.008 REF	
b	0.25	0.35	0.010	0.014
D	1.90	2.10	0.075	0.083
D2	0.90	1.10	0.035	0.043
E	1.90	2.10	0.075	0.083
E2	0.80	1.00	0.031	0.039
e	0.55	0.75	0.022	0.030
H	0.25 REF		0.01 REF	
K	0.15		0.006	
K1	0.20		0.008	
K2	0.25		0.010	
L	0.20	0.30	0.008	0.012
L1	0.65	0.85	0.026	0.033

RECOMMENDED LAND PATTERN


UNIT: mm

A. Reel & Carrier spec. :



Application	A	H	T1	C	d	D	W	E1	F
DFN2x2A-6_EP	178.0±2.00	60.0±0.50	9.0±2.00	13.0+0.50 -0.20	2.0±0.20	21.0±0.50	8.0+0.30 -0.10	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±0.05	1.5+0.10 -0.00	1.0 MIN.	0.3±0.05	2.3±0.10	2.3±0.10	1.05±0.10