BORN SEMICONDUCTOR

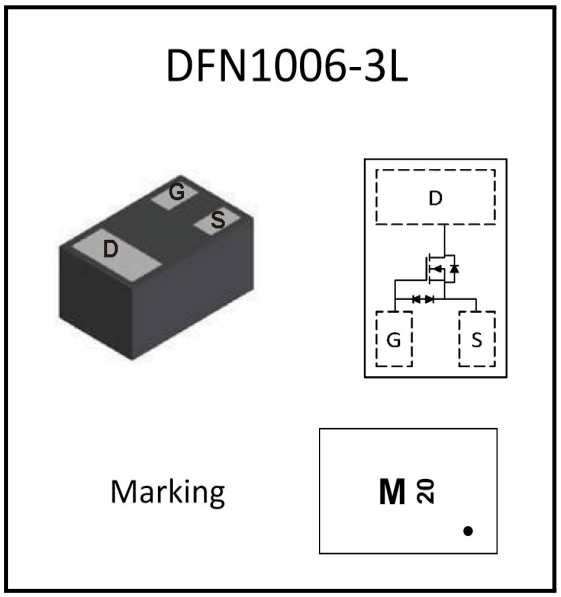
BMDFN2302

N-Channel MOSFET

Features

- V_{DS}=20V
- I_D=0.75A
- $R_{DS(ON)}$ @V_{GS}=4.5V, TYP=130mΩ
- $R_{DS(ON)}$ @V_{GS}=2.5V, TYP=200mΩ
- $R_{DS(ON)}$ @V_{GS}=1.8V, TYP=280mΩ

Package



General Description

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package DFN1006-3L
- Small Signal Switching
- Small Moto Driver

Ordering information

Order code	Package	Marking	Base qty	Delivery mode
BMDFN2302	DFN1006-3L	M20	10K	Tape and reel

Absolute Maximum Ratings (@T_A=25°C unless otherwise noted)

Symbol	Parameter		10 S	Steady State	Unit
V_{DS}	Drain-Source Voltage		20		V
V_{GS}	Gate-Source Voltage		±10		V
I_D	Continuous Drain Current(1,3)	T_A = 25°C	0.75	0.66	A
		T_A = 70°C	0.57	0.52	
P_D	Maximum Power Dissipation(1,3)	T_A = 25°C	0.32	0.27	W
		T_A = 70°C	0.20	0.17	
I_D	Continuous Drain Current(2,4)	T_A = 25°C	0.67	0.62	A
		T_A = 70°C	0.54	0.50	
P_D	Maximum Power Dissipation(2,4)	T_A = 25°C	0.28	0.24	W
		T_A = 70°C	0.18	0.15	
I_{DM}	Pulsed Drain Current(3)		1.4		A
T_J	Operating Junction Temperature		150		°C
T_L	Lead Temperature		260		
T_{stg}	Storage Temperature Range		-55 to + 150		

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Revision: 2022-Jan-1-A

BMDFN2302

N-Channel MOSFET

Thermal Characteristics

Symbol	Parameter		typ.	Max.	Unit
$R_{\theta JA}$	Maximum junction-to-ambient(1)	≤10s	350	390	°C/W
		Steady-State	395	455	
$R_{\theta JA}$	Maximum junction-to-ambient(2)	≤10s	397	435	
		Steady-State	445	505	
$R_{\theta JC}$	Maximum junction-to-foot	Steady-State	240	280	

Notes:(1)Surface mounted on FR4 Board using 1 square inch pad size,1oz copper.
(2) Surface mounted on FR4 board using minimum pad size,1oz copper.
(3) Pulse width<380μs, Single pulse.
(4) Maximum junction temperature T_J=150°C.

Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
BV_{DS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D =250uA	20	–	–	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	–	–	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±10V, V_{DS} = 0V	–	–	±10	uA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	0.4	0.7	1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS} = 4.5V, I_D = 0.5 A	–	130	180	mΩ
		V_{GS} = 2.5V, I_D = 0.4A	–	200	300	
		V_{GS} = 1.8V, I_D = 0.3A	–	280	420	
g_{fs}	Forward Transconductance	V_{DS} =5V, I_D = 0.5A	–	2.0	–	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
C_{iss}	Input Capacitance	V_{DS} = 10V,	–	50.6	–	pF
C_{oss}	Output Capacitance	V_{GS} = 0V,	–	13.2	–	
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHZ	–	8.3	–	
$Q_{G(TOT)}$	Total Gate Charge	V_{DS} = 10V	–	0.87	–	nC
$Q_{G(TH)}$	Threshold Gate Charge	I_D = 0.5A,	–	0.06	–	
Q_{GS}	Gate-to-Source Charge	V_{GS} = 4.5V	–	0.15	–	
Q_{GD}	Gate-to-Drain Charge		–	0.27	–	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 10V,	–	16	–	ns
t_r	Turn-On Rise Time	I_D = 0.5A,	–	11.6	–	
$t_{d(off)}$	Turn-Off Delay Time	R_G = 6Ω,	–	36	–	
t_f	Turn-Off Fall Time	V_{GS} = 4.5V	–	11	–	
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_S = 0.5A,V_{GS} = 0V	0.5	0.7	1.2	V

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N-Channel MOSFET

Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 1 :Output characteristics

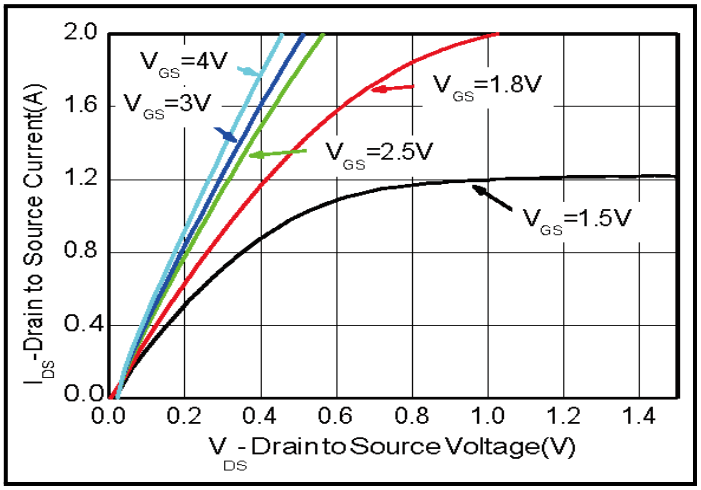


Figure 2 :Transfer characteristics

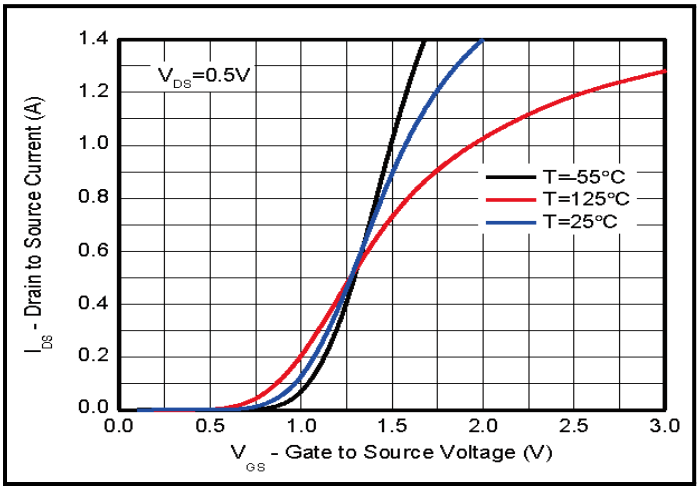


Figure 3 :On-Resistance vs.Draincurrent

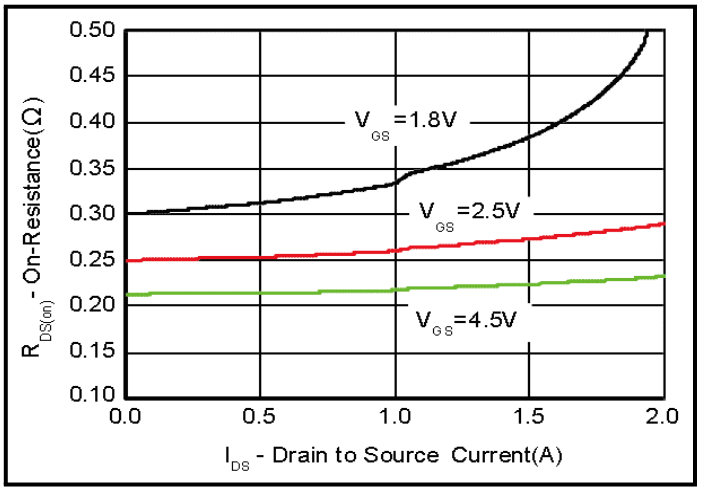


Figure 4 :On-Resistance vs. Gate-to-Source voltage

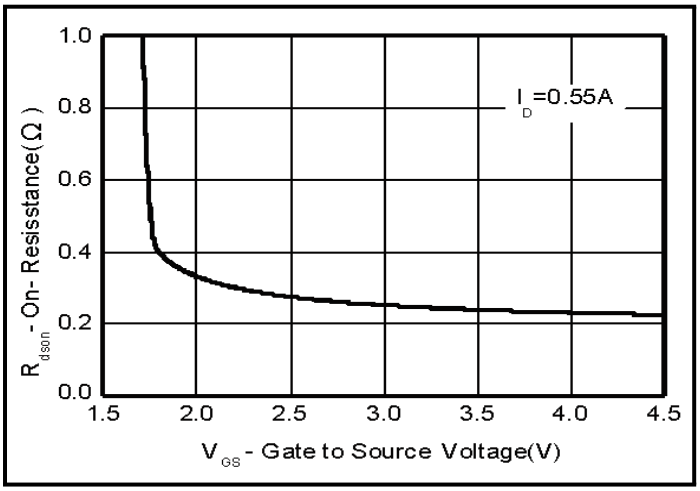


Figure 5 :On-Resistance vs. Junction temperature

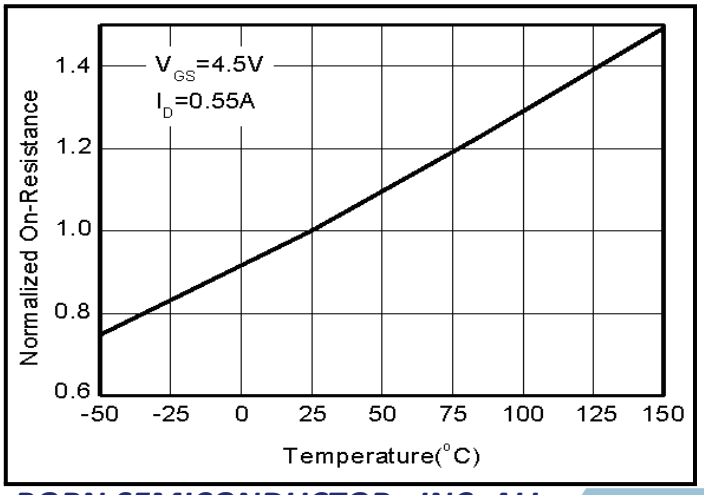
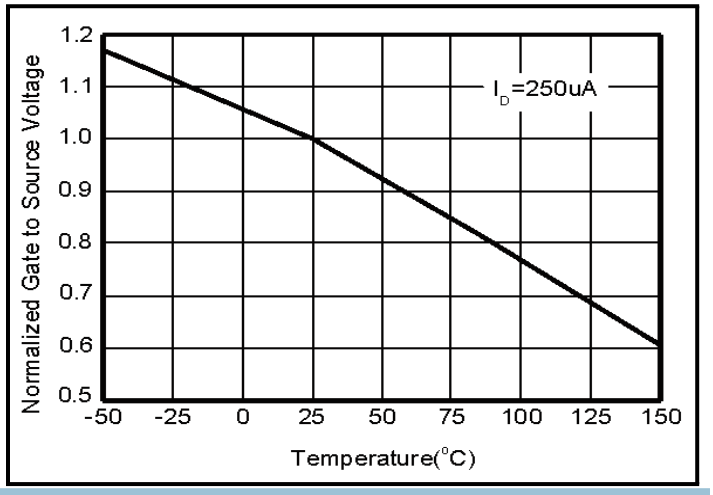


Figure 6 :Threshold voltage vs. Temperature



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N-Channel MOSFET

Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 7 :Capacitance

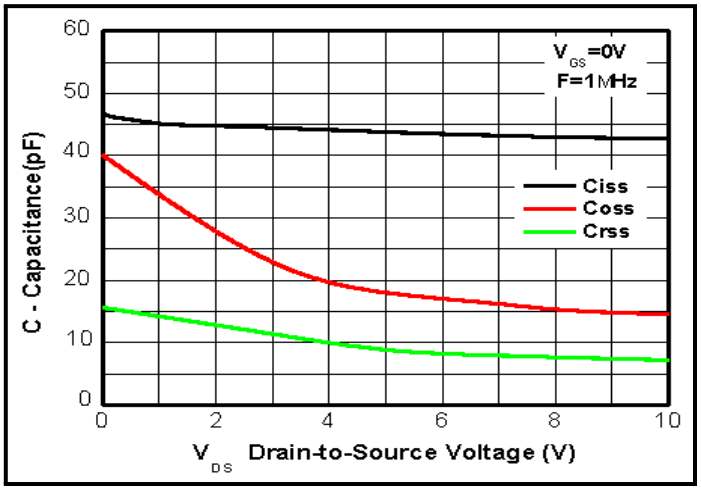


Figure 8 :Body diode forward voltage

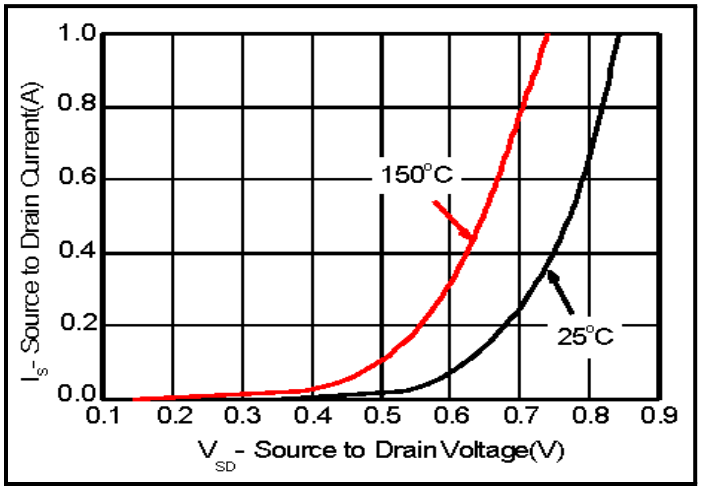


Figure 9 :Single pulse power

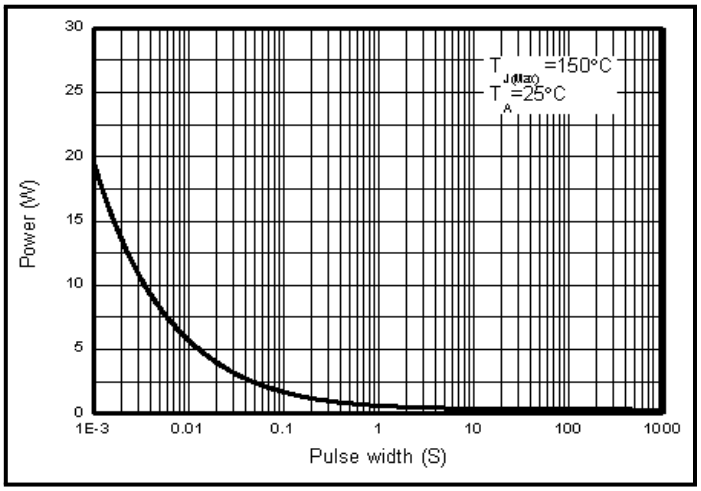


Figure 10 : Safe operating power

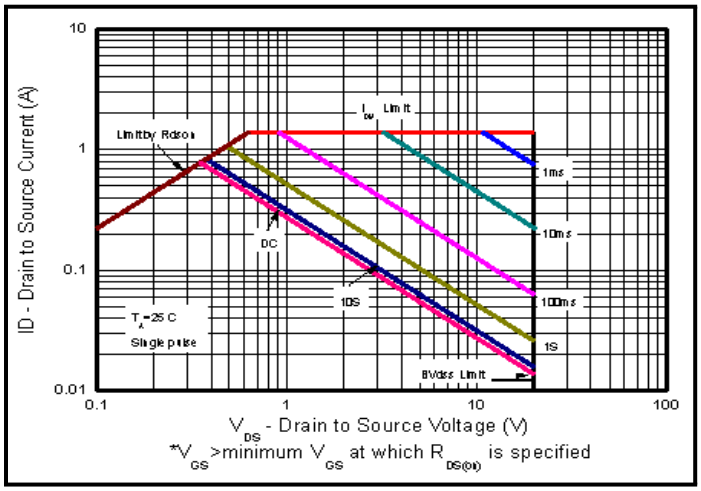
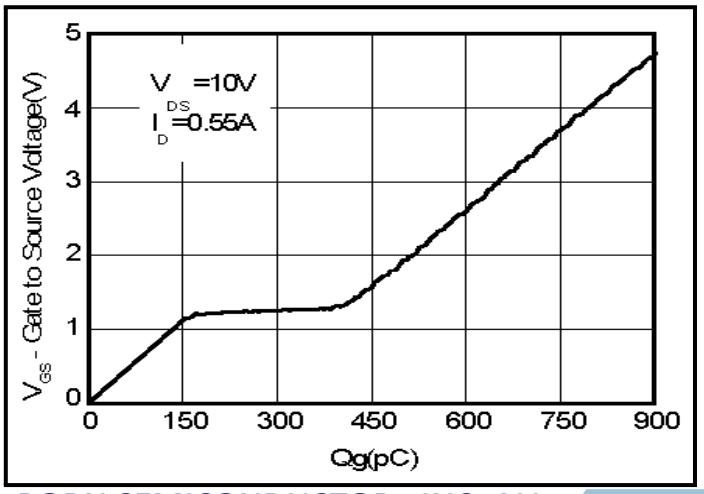
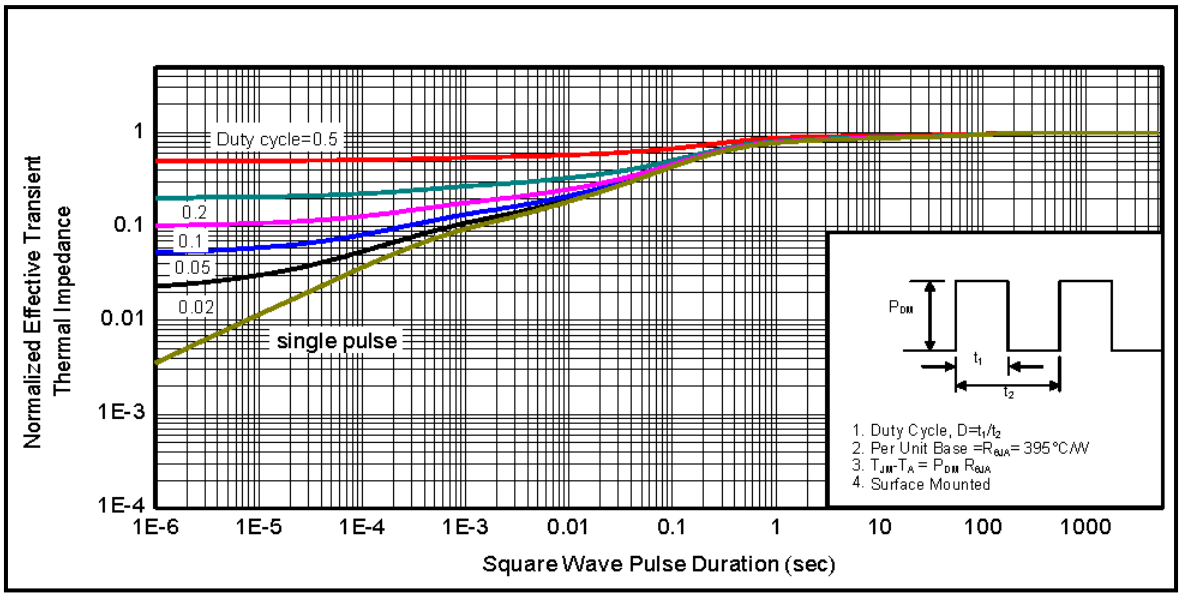


Figure 11 :Q_g(pC)



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Figure 12 :Transient thermal response (Junction-to-Ambient)



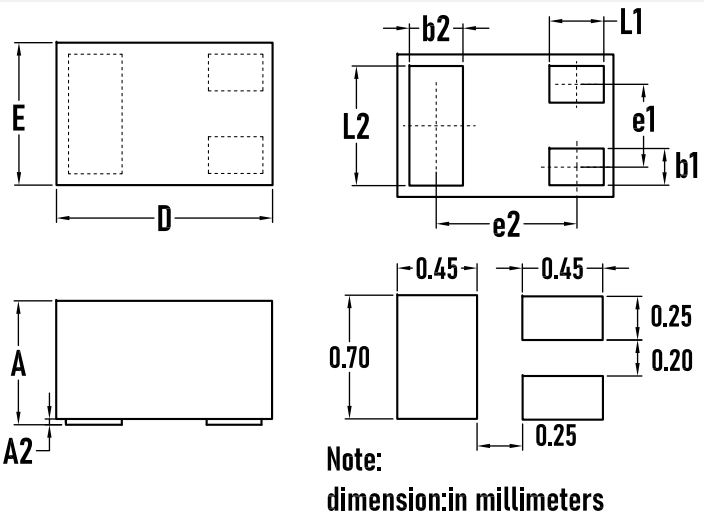
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BMDFN2302

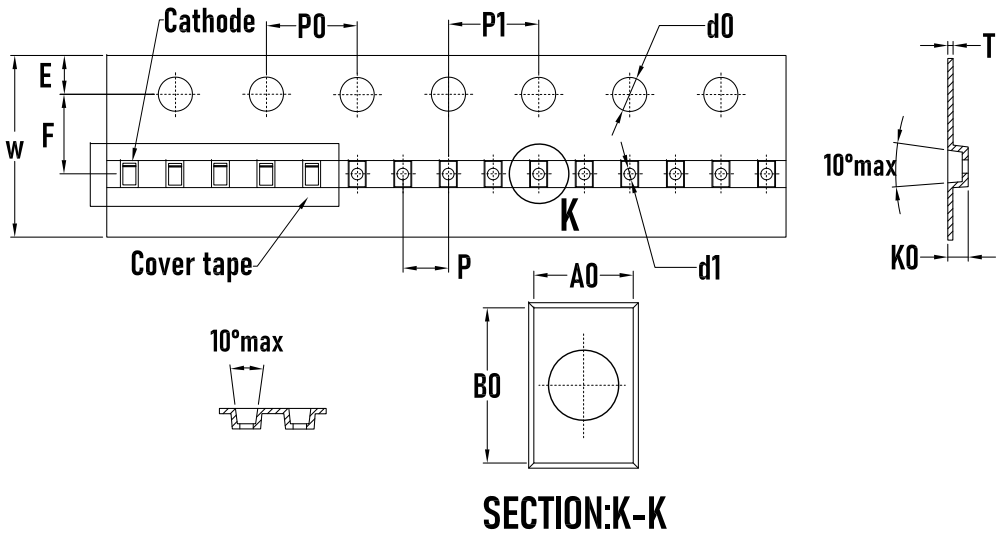
N-Channel MOSFET

Outline Drawing –DFN1006-3L



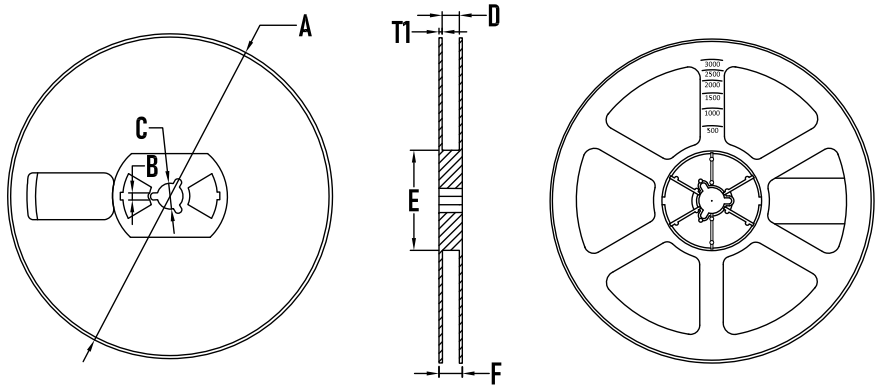
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.40	–	050
A2	0.00	–	.05
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e1	0.350BSC		
e2	0.675BSC		
L1	0.20	0.30	0.40
L2	0.40	0.50	0.60

Packaging Tape - DFN1006



SYMBOL	MILLIMETER
A0	0.71±0.05
B0	1.11±0.05
d0	$1.5^{+0.1}_{-0}$
d1	0.50±0.05
E	1.75±0.10
F	3.50±0.05
K0	0.56±0.05
P	2.00±0.05
P0	4.00±0.10
P1	2.00±0.05
W	$8.00^{+0.03}_{-0.01}$
T	0.2±0.015

Packaging Reel



SYMBOL	MILLIMETER
A	178±1
B	3.5±0.2
C	14.3±0.2
D	9.8^{+2}_{-1}
E	54.5±0.5
F	12.4±0.2
T1	1.0±0.2
Quantity	10000PCS

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