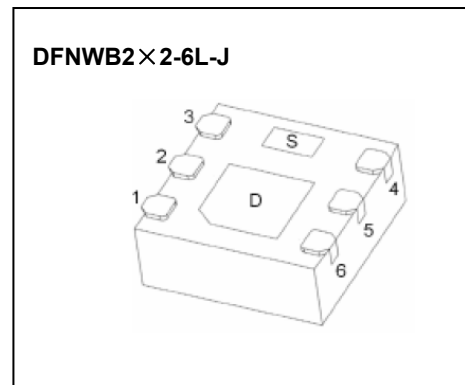


## HM12N02D N-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
20V	11mΩ@4.5V	12A
	13mΩ@2.5V	
	16mΩ@1.8V	
	22mΩ@1.5V	
	41mΩ@1.2V	



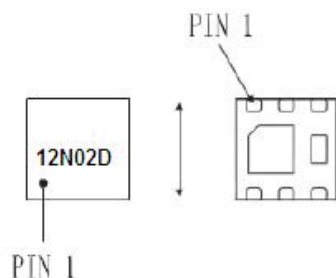
### FEATURES

- TrenchFET Power MOSFET
- Small package DFNWB2 × 2-6L-J

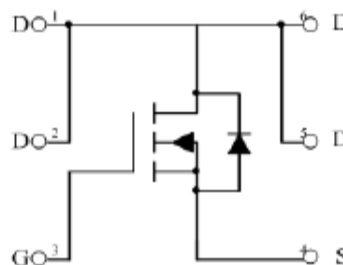
### APPLICATION

- Load Switch for Portable Applications

### MARKING:



### Equivalent Circuit



### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^{\circ}C$ unless otherwise noted)

Symbol Para	meter	Value	Unit
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	±10	V
$I_D$	Continuous Drain Current (note 1)	12	A
$I_{DM}$	Collector Current-Pulse(Note3)	40	A
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient (note 2)	167	$^{\circ}C/W$
$T_j$	Junction Temperature	150	$^{\circ}C$
$T_{stg}$	Storage Temperature	-55~+150	$^{\circ}C$
$T_L$	Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	260	$^{\circ}C$

## MOSFET ELECTRICAL CHARACTERISTICS

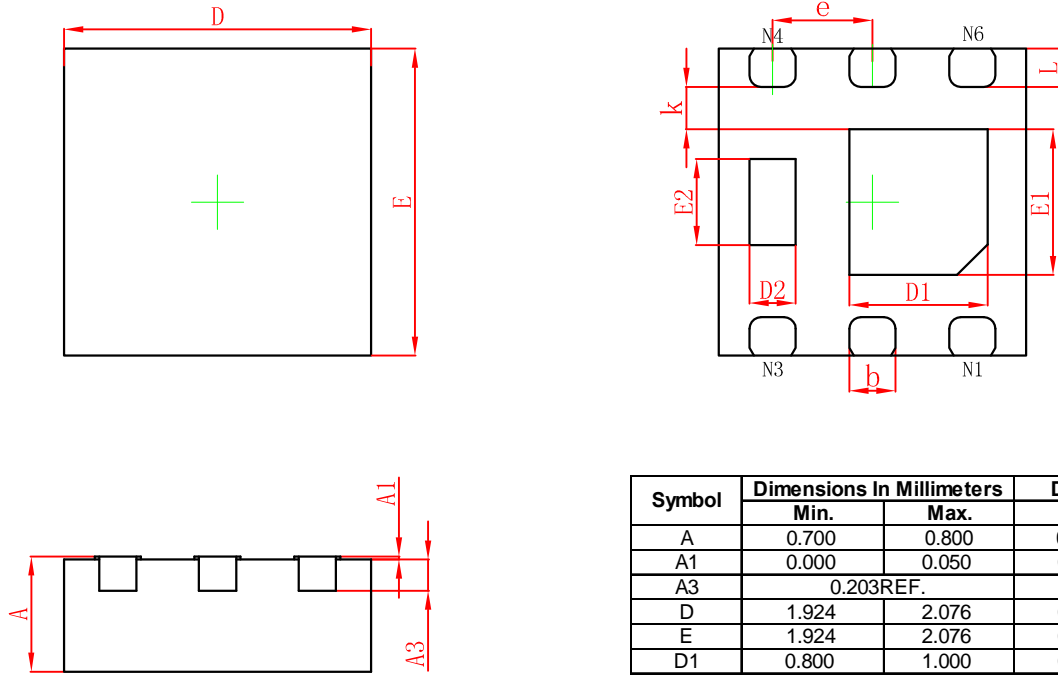
$T_a=25\text{ }^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 20V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage (note 3)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.35		1	V
Drain-source on-resistance(note 3)	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 9.7A$			11	m $\Omega$
		$V_{GS} = 2.5V, I_D = 9A$			13	m $\Omega$
		$V_{GS} = 1.8V, I_D = 8.1A$			16	m $\Omega$
		$V_{GS} = 1.5V, I_D = 4.5A$			22	m $\Omega$
		$V_{GS} = 1.2V, I_D = 2.4A$			41	m $\Omega$
Forward tranconductance(note 3)	$g_{FS}$	$V_{DS} = 4V, I_D = 9.7A$	20			S
Diode forward voltage (note 3)	$V_{SD}$	$I_S = 10A, V_{GS} = 0V$			1.2	V
<b>DYNAMIC PARAMETERS (note 4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 4V, V_{GS} = 0V, f = 1MHz$		1800		pF
Output Capacitance	$C_{oss}$			650		pF
Reverse Transfer Capacitance	$C_{rss}$			450		pF
Gate Resistance	$R_g$	$f = 1MHz$		2.5		$\Omega$
<b>SWITCHING PARAMETERS (note 4)</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GEN} = 4.5V, V_{DD} = 4V,$ $I_D = 10A, R_g = 1\Omega$ $R_L = 0.4\Omega$		12	20	ns
Turn-on rise time	$t_r$			10	15	ns
Turn-off delay time	$t_{d(off)}$			65	100	ns
Turn-off fall time	$t_f$			20	30	ns
Total Gate Charge	$Q_g$	$V_{DS} = 4V, V_{GS} = 5V$ $I_D = 10A$			32	nC
Gate-Source Chage	$Q_{gs}$			2.5		nC
Gage-Drain Charge	$Q_{gd}$			6.5		nC

### Notes :

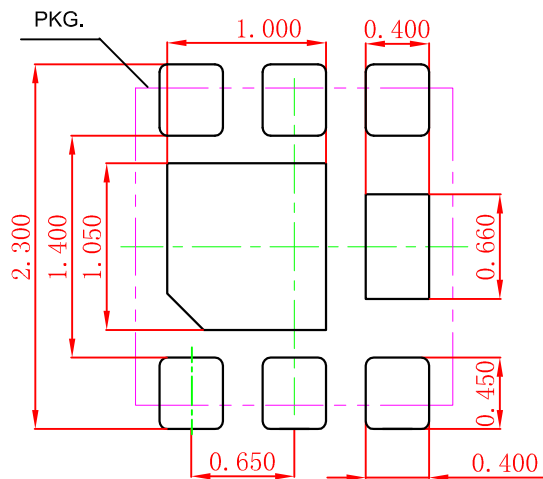
- 1.Surface mounted on FR4 board using 1 square inch pad size, 1oz copper.
- 2.Surface mounted on FR4 board using the minimum pad size, 1oz copper.
3. Pulse test : Pulse width=300 $\mu s$ , duty cycle $\leq 2\%$ .
4. These parameters have no way to verify.

## DFNWB2X2-6L-J Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.032
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013

## DFNWB2X2-6L-J Suggested Pad Layout

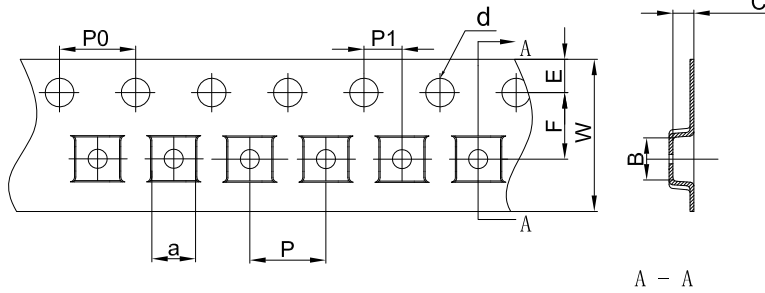


**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050$ mm.
3. The pad layout is for reference purposes only.

# DFNWB2X2-6L Tape and Reel

## DFNWB2×2-6L Embossed Carrier Tape



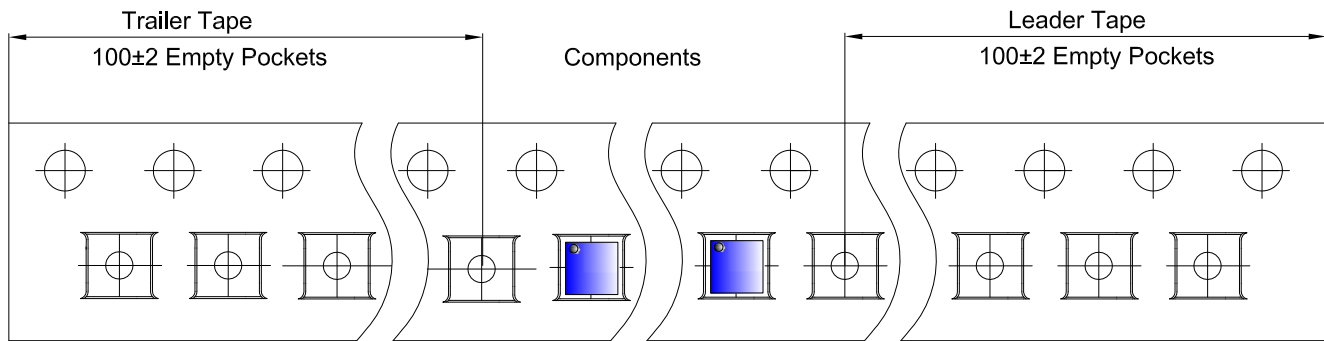
### Packaging Description:

DFNWB2×2-6L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 18.0cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

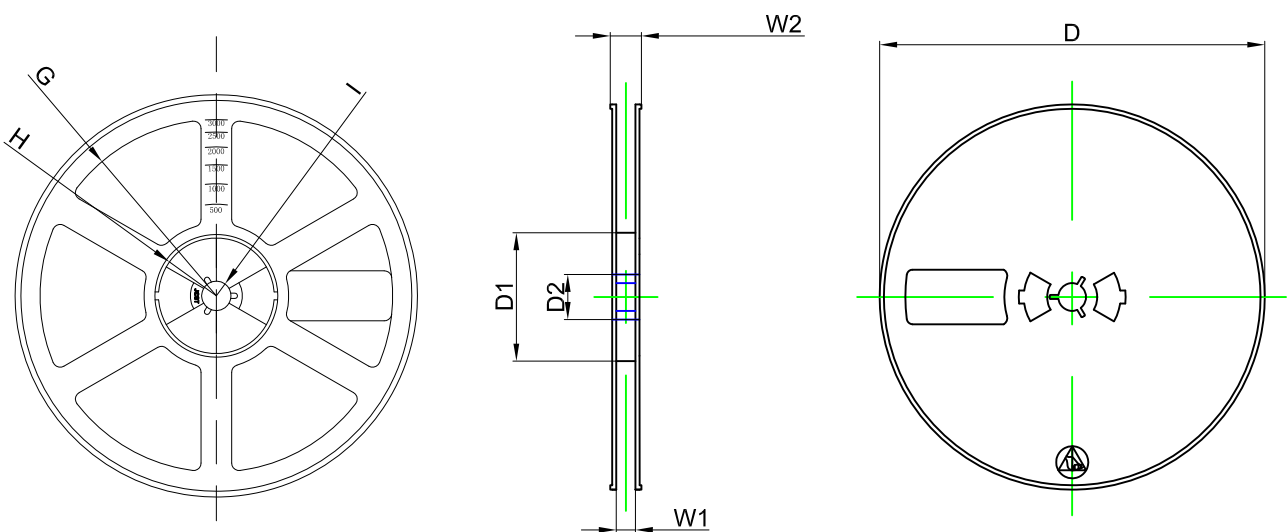
Dimensions are in millimeter

Pkg type	a	B	C	d	E	F	P0	P	P1	W
DFNWB2×2-6L	2.30	2.30	1.10	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

## DFNWB2×2-6L Tape Leader and Trailer



## DFNWB2×2-6L Reel



Dimensions are in millimeter

Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø180.00	60.00	13.00	R78.00	R25.60	R6.50	9.50	13.10

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	