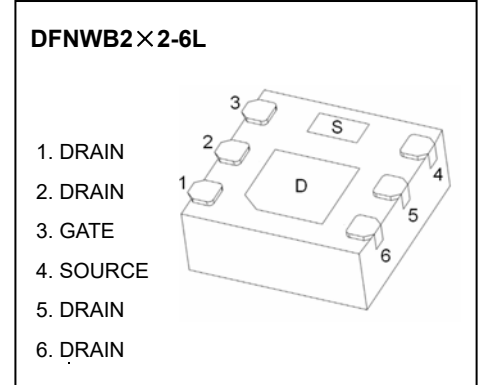




# DFNWB2×2-6L Plastic-Encapsulate MOSFETS

## MP2011 P-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
-20 V	15mΩ@-4.5V	-11A
	22mΩ@-2.5V	



### DESCRIPTION

The MP2011 uses advanced trench technology to provide excellent  $R_{DS(on)}$ , low gate charge and operation with low gate voltage. This device is suitable for use as a load switching application and a wide variety of other applications.

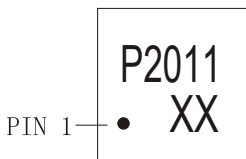
### FEATURES

- Advanced trench MOSFET process technology
- Ultra low on-resistance with low gate charge

### APPLICATIONS

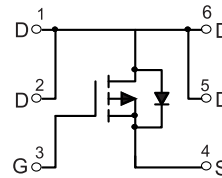
- PWM application
- Load switch
- Battery charge in cellular handset

### MARKING



P2011 = Part No.  
 Solid dot = Pin1 indicator.  
 XX = Code.

### Equivalent Circuit



### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	-20	V
Gate-Source Voltage	$V_{GS}$	±12	
Drain Current-Continuous	$I_D$	-11	A
Drain Current-Pulsed (note 1)	$I_{DM}$	-44	
Power Dissipation (note 4)	$P_D$	4	W
Thermal Resistance from Junction to Ambient(note 4)	$R_{\theta JA}$	31	°C
Operation Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 ~+150	

# MOSFET ELECTRICAL CHARACTERISTICS

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

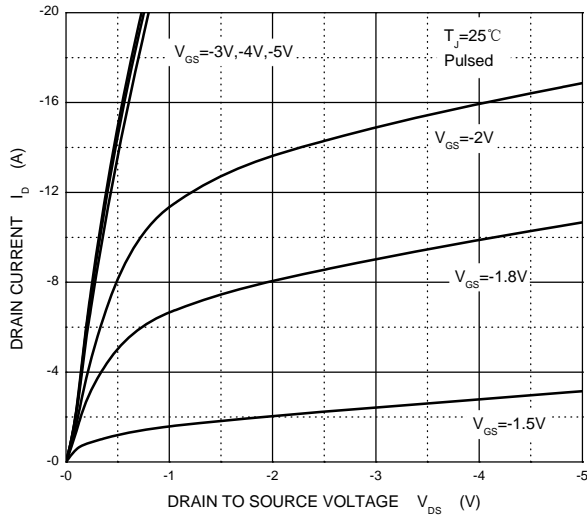
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1	$\mu A$
<b>On Characteristics (note 2)</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45	-0.85	-1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -7.2A$		15	23.5	m $\Omega$
		$V_{GS} = -2.5V, I_D = -6.4A$		22	40	
Forward Transconductance	$g_{FS}$	$V_{DS} = -10V, I_D = -7.2A$		16		S
<b>Dynamic Characteristics (note 3)</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$		2700		pF
Output Capacitance	$C_{oss}$			680		
Reverse Transfer Capacitance	$C_{rss}$			590		
Total Gate Charge	$Q_g$	$V_{DS} = -6V, V_{GS} = -4.5V, I_D = -10A$		35	48	nC
Gate-Source Charge	$Q_{gs}$			5		
Gate-Drain Charge	$Q_{gd}$			10		
<b>SWITCHING CHARACTERISTICS (note 3)</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GEN} = -4.5V, V_{DD} = -10V, I_D = -1A, R_g = 10\Omega$		11		ns
Turn-on rise time	$t_r$			35		ns
Turn-off delay time	$t_{d(off)}$			30		ns
Turn-off fall time	$t_f$			10		ns
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Current	$I_S$				-11	A
Diode Forward Voltage(note 2)	$V_{SD}$	$V_{GS} = 0V, I_{SD} = -1.9A$			-1.2	V

## Notes:

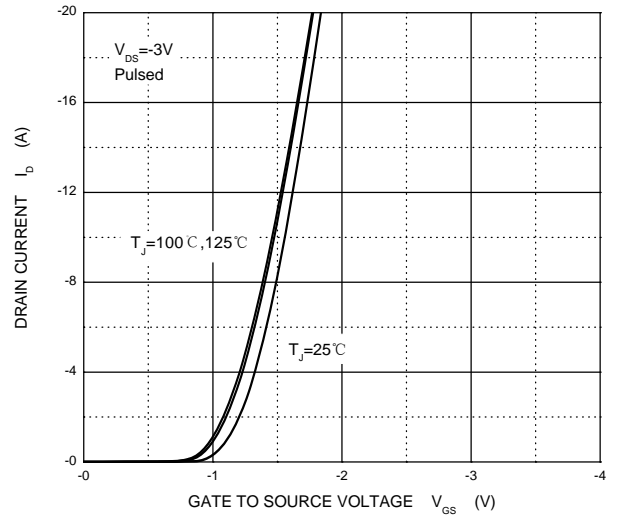
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse With  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
3. Guaranteed by design, not subject to production testing.
4. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, double sides, in a still air environment with  $T_A = 25\text{ }^\circ\text{C}$ .

# Typical Characteristics

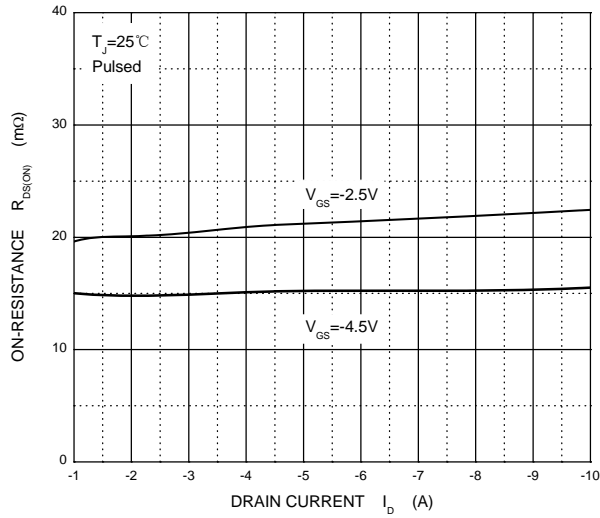
Output Characteristics



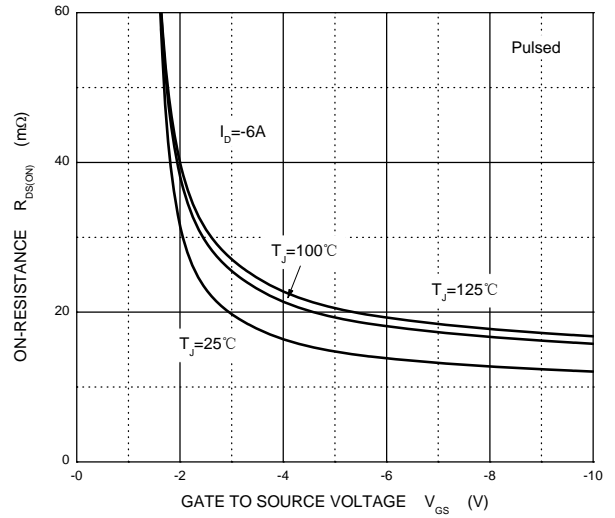
Transfer Characteristics



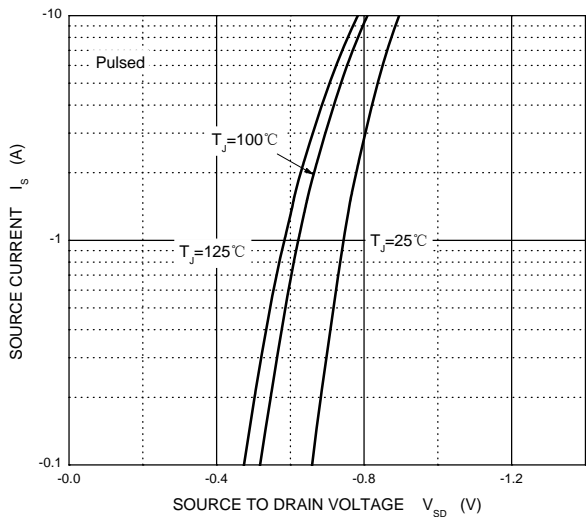
$R_{DS(ON)}$  —  $I_D$



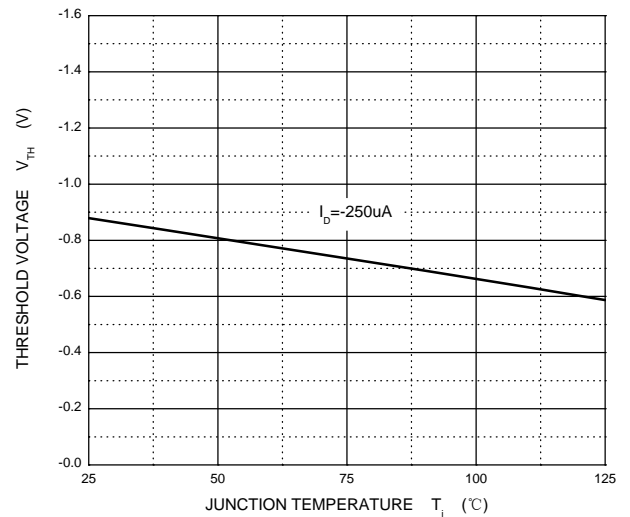
$R_{DS(ON)}$  —  $V_{GS}$



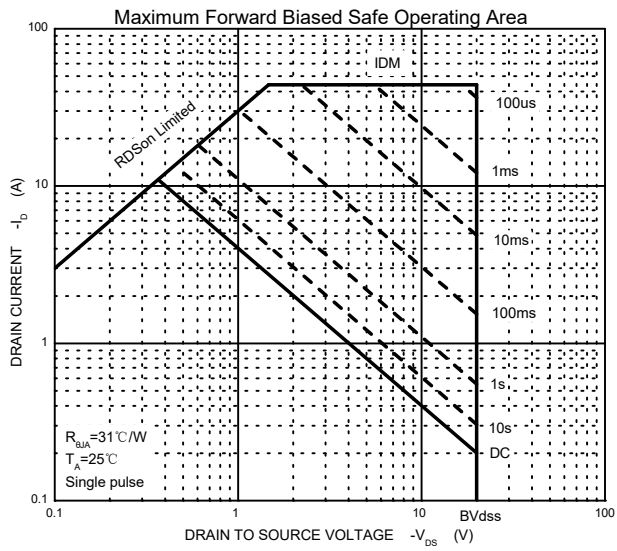
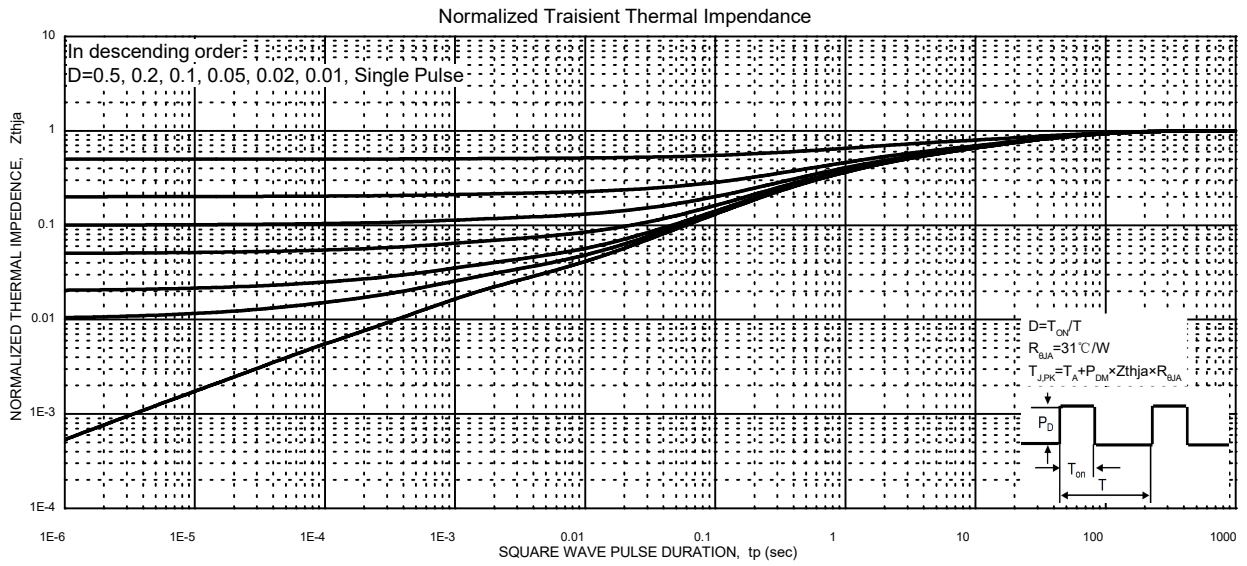
$I_S$  —  $V_{SD}$



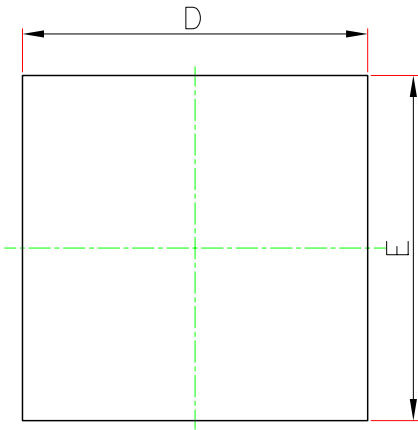
Threshold Voltage



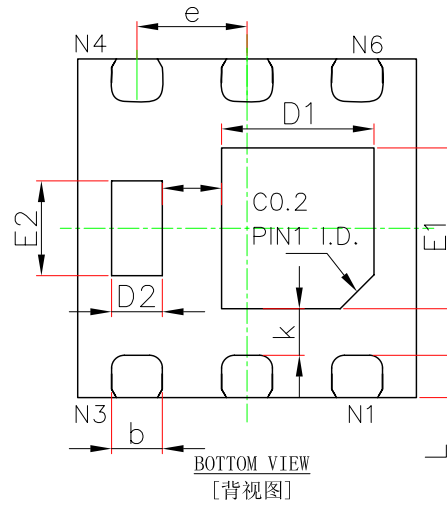
# Typical Characteristics



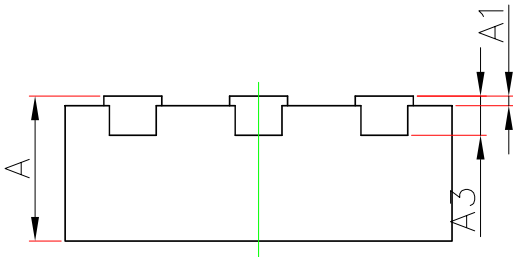
## DFNWB2×2-6L-J Package Outline Dimensions



TOP VIEW  
[顶视图]



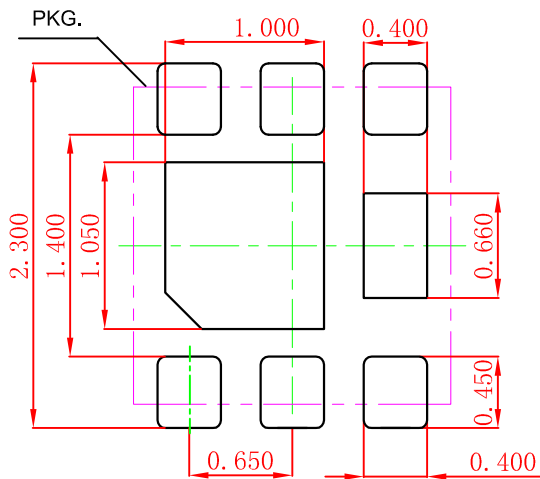
BOTTOM VIEW  
[背视图]



SIDE VIEW  
[侧视图]

Symbols	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
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
b	0.250	0.350	0.010	0.014
e	0.650BSC.		0.026BSC.	
k	0.275REF.		0.011REF.	
k1	0.350REF.		0.014REF.	
L	0.174	0.326	0.007	0.013

## DFNWB2×2-6L-J Suggested Pad Layout

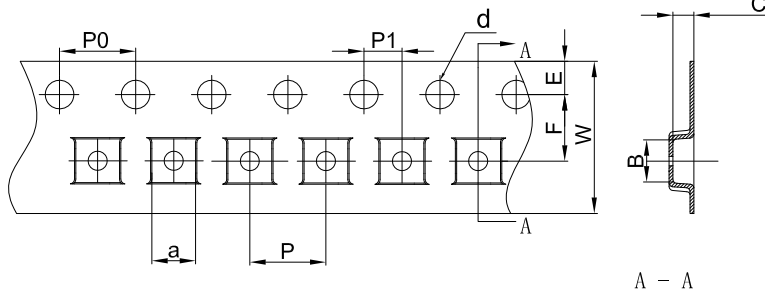


Note:

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

# DFNWB2×2-6L Tape and Reel

## DFNWB2×2-6L Embossed Carrier Tape



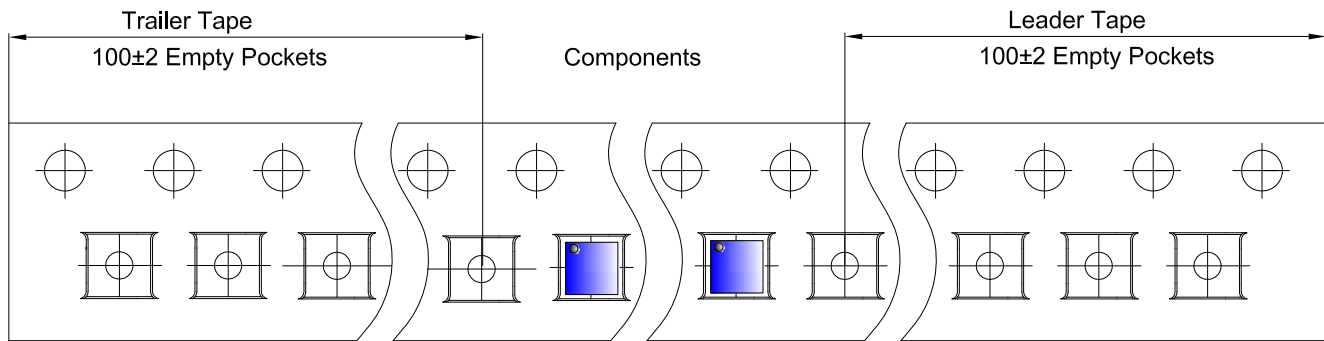
### Packaging Description:

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).

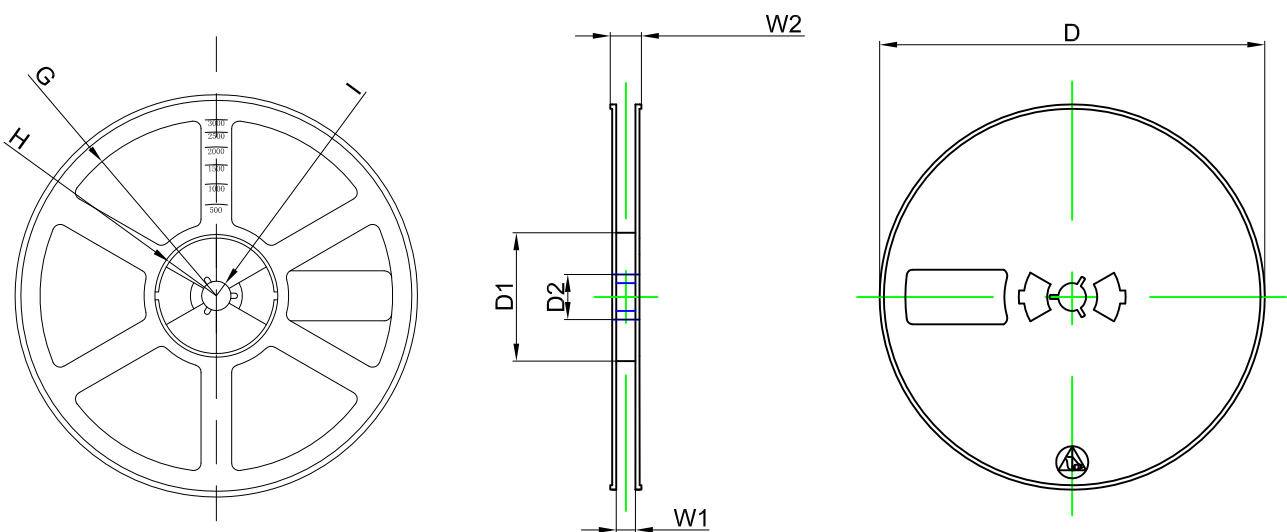
Dimensions are in millimeter

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	