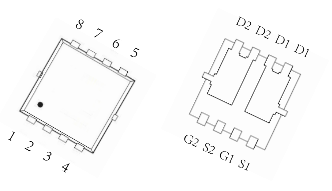
PDFNWB3.3×3.3-8L-B Plastic-Encapsulate MOSFETS

AB2003 N-Channel + P-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D
30V	10mΩ@10V	30A
	17mΩ@4.5V	
-30V	26mΩ@-10V	-20A
	40mΩ@-4.5V	

PDFNWB3.3×3.3-8L-B



DESCRIPTION

The AB2003 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications

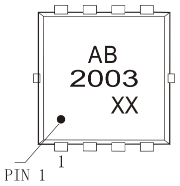
FEATURES

- Battery switch
- Load switch
- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

APPLICATIONS

- SMPS and general purpose applications
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

MARKING

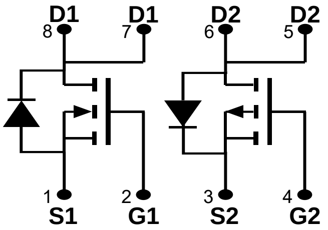


AB2003=Part No.

Solid dot=Pin1 indicator

XX=Date Code

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
N-MOSFET				
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	Ñ20	V
Continuous Drain Current		I_D ①	30	A
Pulsed Drain Current		I_{DM} ②	100	A
Single Pulsed Avalanche Energy		E_{AS} ③	80	mJ
P-MOSFET				
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	Ñ20	V
Continuous Drain Current		I_D ①	-20	A
Pulsed Drain Current		I_{DM} ②	-80	A
Single Pulsed Avalanche Energy		E_{AS} ④	45	mJ
Temperature and Thermal Resistance				
Thermal Resistance from Junction to Ambient	N-Ch	$R_{ɗJA}$ ⑦	83.3	℃/W
Thermal Resistance from Junction to Ambient	P-Ch	$R_{ɗJA}$ ⑦	83.3	℃/W
Thermal Resistance from Junction to Case	N-Ch	$R_{ɗJC}$ ①	4.17	℃/W
Thermal Resistance from Junction to Case	P-Ch	$R_{ɗJC}$ ①	5.0	℃/W
Power Dissipation	N-Ch	P_D ①	30	W
Power Dissipation	P-Ch	P_D ①	25	W
Operating Junction and Storage Temperature Range		T_J ,T_{stg}	-55~+150	℃

MOSFET ELECTRICAL CHARACTERISTICS

N-Channel MOSFET ELECTRICAL CHARACTERISTICS, T_a=25 ℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250ÕA	30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =24V, V_{GS} =0V, T_J =25℃			1.0	ÕA
		V_{DS} =24V, V_{GS} =0V, T_J =125℃			100	
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =Ñ20V			Ñ100	nA
On characteristics ⑤						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250ÕA	1.0	1.8	2.5	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =8A		10	13	mÝ
		V_{GS} =4.5V, I_D =6A		17	22	mÝ
Dynamic characteristics ⑤⑥						
Input capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V, f =1MHz		1000		pF
Output capacitance	C_{oss}			143		
Reverse transfer capacitance	C_{rss}			130		
Gate resistance	R_g	f =1MHz		6.0		Ω
Switching characteristics ⑤⑥						
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=15V, I_D=8A		22		nC
Gate-source charge	Q_{gs}			2.8		
Gate-drain charge	Q_{gd}			5.2		
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, R_L=5q , V_{GS}=10V, R_{GEN}=10q		25		ns
Turn-on rise time	t_r			40		
Turn-off delay time	$t_{d(off)}$			140		
Turn-off fall time	t_f			80		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ⑤	V_{GS} =0V, I_S=8A			1.2	V
Continuous drain-source diode forward current	I_S ①				30	A
Pulsed drain-source diode forward current	I_{SM} ②				100	A

MOSFET ELECTRICAL CHARACTERISTICS

P-Channel MOSFET ELECTRICAL CHARACTERISTICS, T_a=25 ℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250ÕA	-30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-24V, V_{GS} =0V, T_J =25℃			-1.0	ÕA
		T_J =125℃			-100	
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =Ñ20V			Ñ100	nA
On characteristics ⑤						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250ÕA	-1.0	-1.5	-2.5	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-8A		26	34	mÝ
		V_{GS} =-4.5V, I_D =-6A		40	52	
Dynamic characteristics ⑤⑥						
Input capacitance	C_{iss}	V_{DS} =-15V,V_{GS} =0V, f =1MHz		943		pF
Output capacitance	C_{oss}			107		
Reverse transfer capacitance	C_{rss}			90		
Gate resistance	R_g	f =1MHz		22		Ω
Switching characteristics ⑤⑥						
Total gate charge	Q_g	V_{GS}=-10V,V_{DS}=-15V, I_D=-8A		28		nC
Gate-source charge	Q_{gs}			3.2		
Gate-drain charge	Q_{gd}			8.5		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-15V,R_L=5q, V_{GS}=-10V, R_{GEN}=10q		32		ns
Turn-on rise time	t_r			55		
Turn-off delay time	$t_{d(off)}$			150		
Turn-off fall time	t_f			60		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ⑤	V_{GS} =0V, I_S=-5A			-1.2	V
Continuous drain-source diode forward current	I_S ①				-20	A
Pulsed drain-source diode forward current	I_{SM} ②				-80	A

Notes:

1.T_C=25℃ Limited only by maximum temperature allowed.

2.P_W≤10µs, Duty cycle≤1%.

3.EAS condition: VDD=15V,VGS=10V, L=0.5mH, Rg=25Ω Starting T_J = 25℃.

4.EAS condition: VDD=-15V,VGS=-10V, L=0.5mH, Rg=25Ω Starting T_J = 25℃.

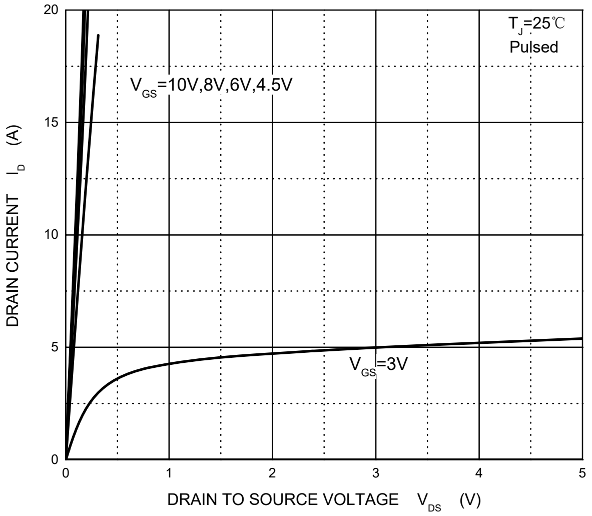
5.Pulse Test : Pulse Width≤300µs, duty cycle ≤2%.

6.Guaranteed by design, not subject to production.

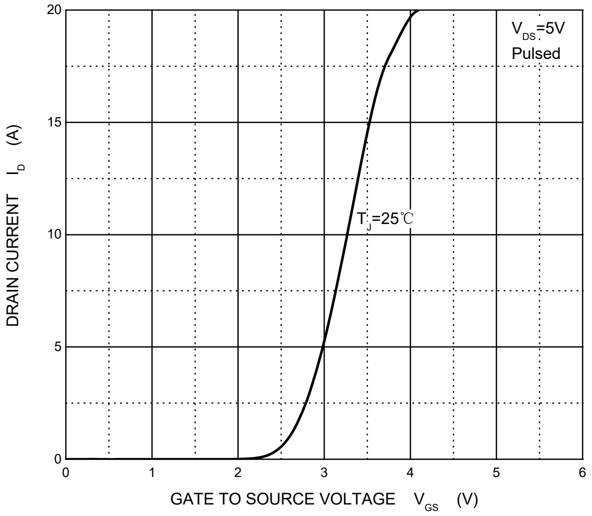
7.The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25℃.t ≤10sec.

Typical Electrical and Thermal Characteristics

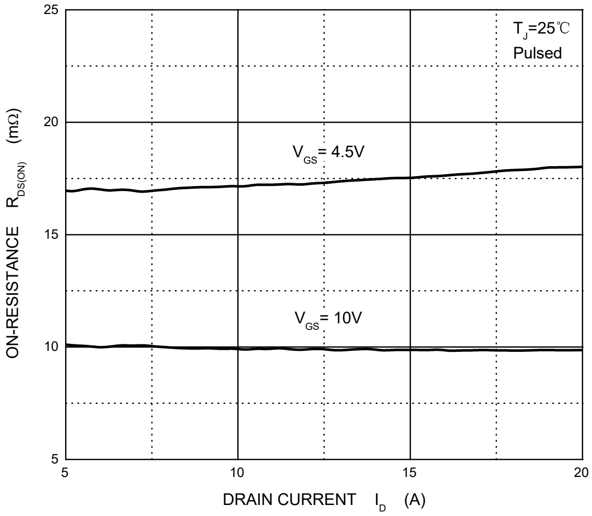
N-Channel MOS



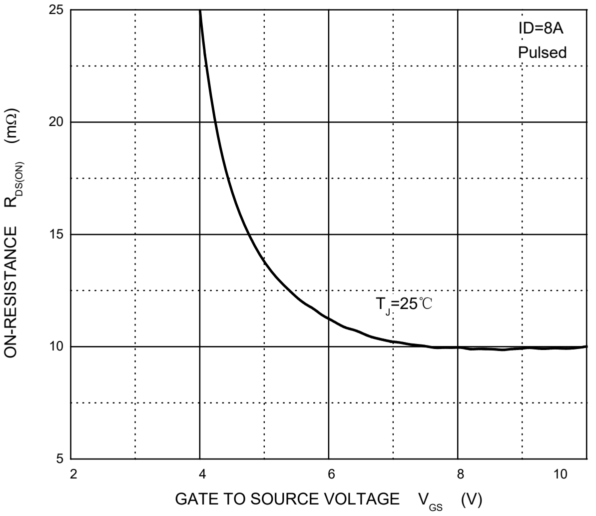
Output Characteristics



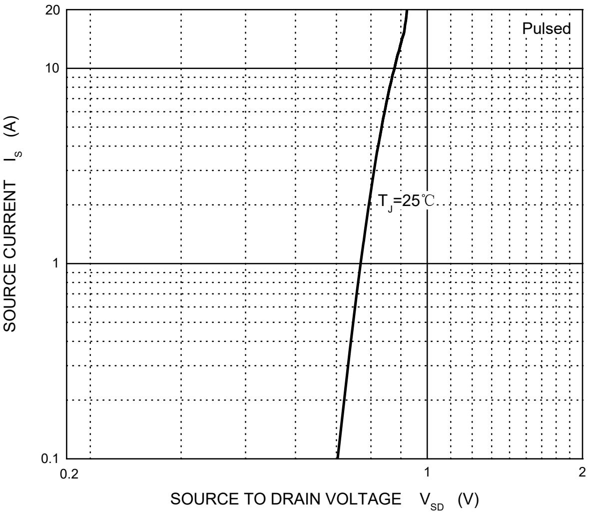
Transfer Characteristics



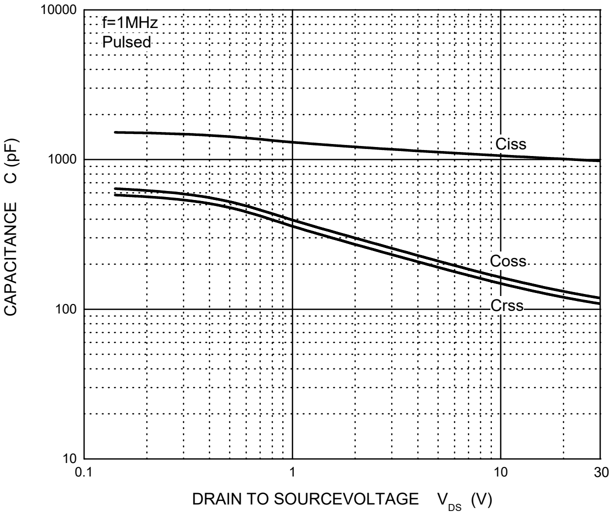
$R_{DS(ON)}$ —— I_D



$R_{DS(ON)}$—— V_{GS}

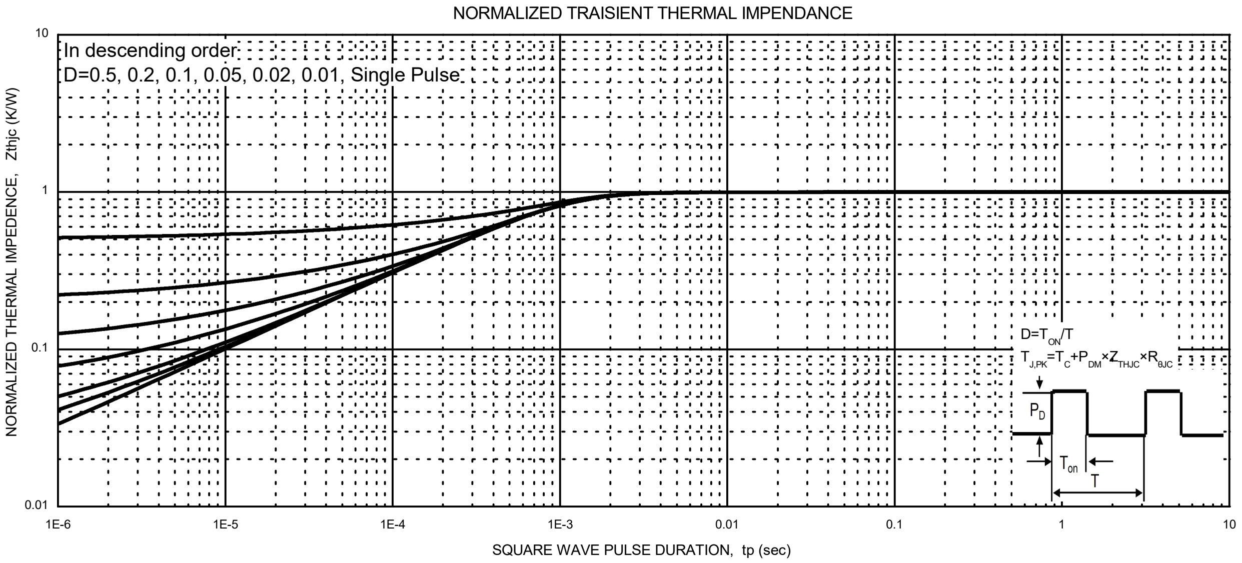


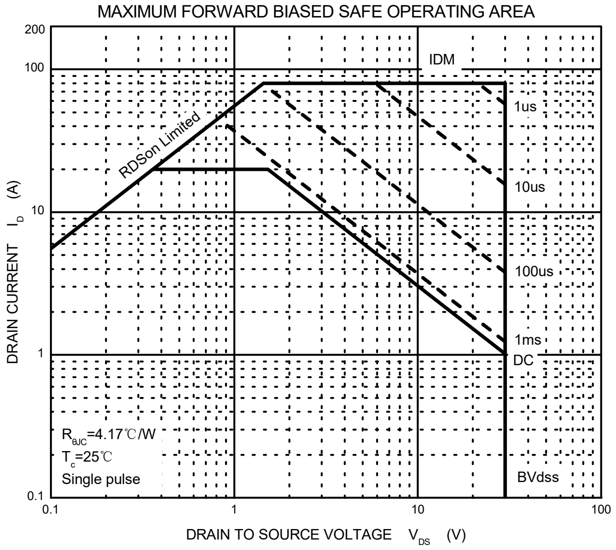
I_S —— V_{SD}



Capacitances

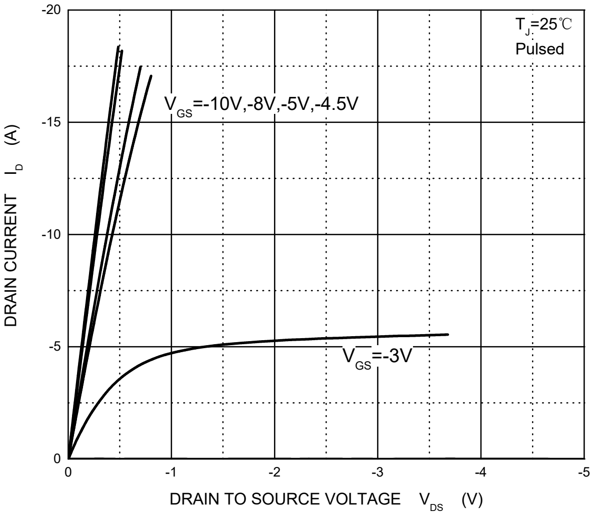
Typical Characteristics

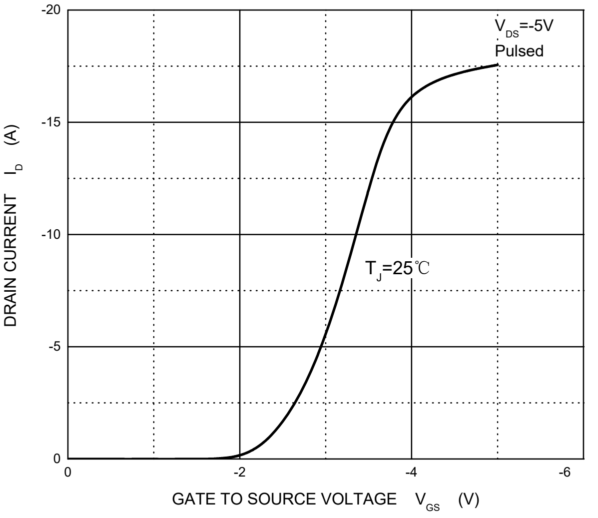


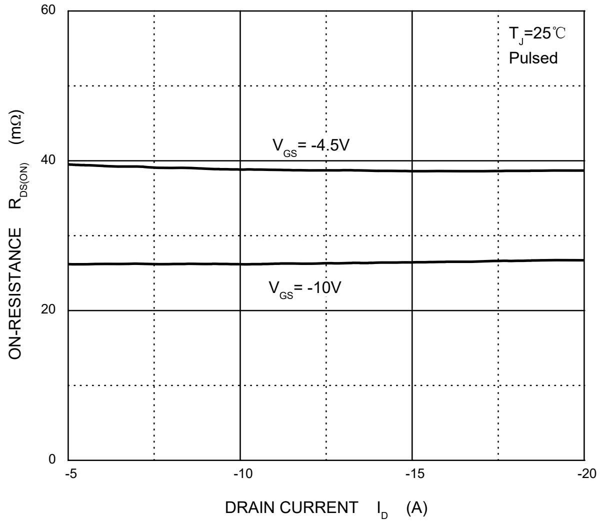


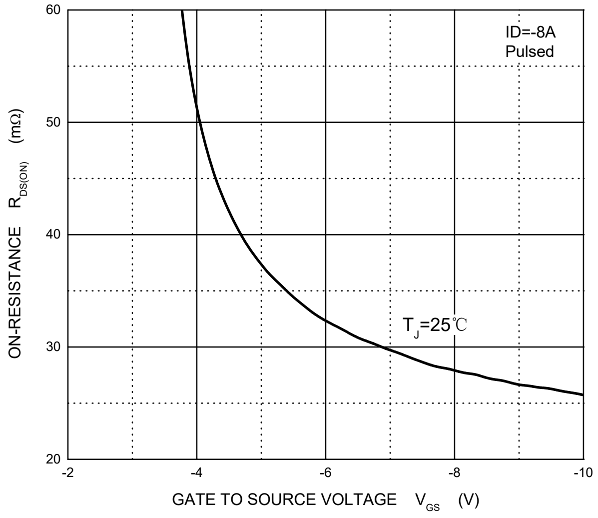
Typical Electrical and Thermal Characteristics

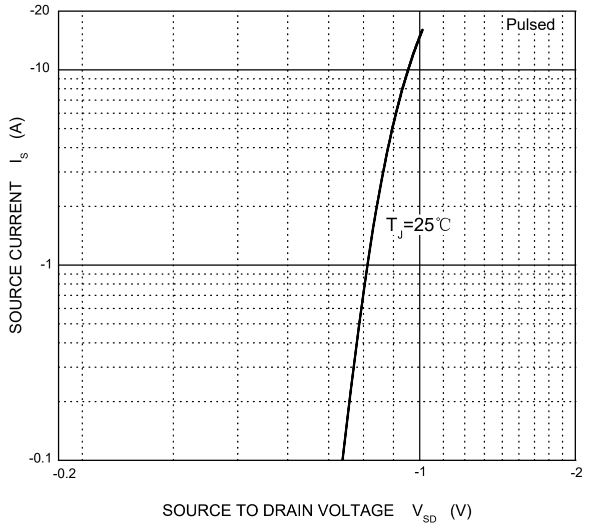
P-Channel MOS

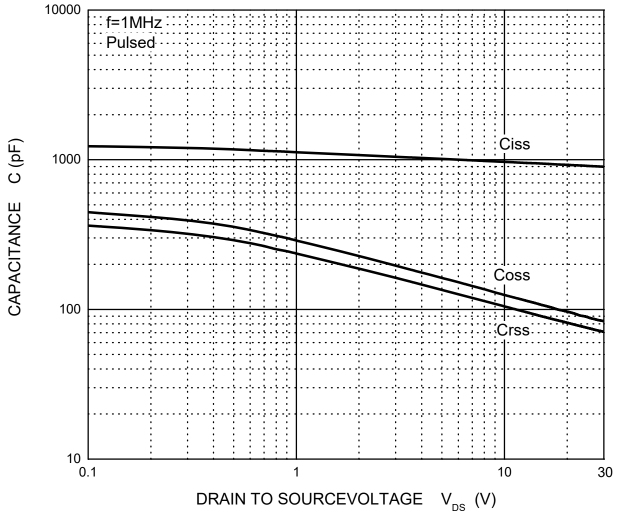

Output Characteristics


Transfer Characteristics

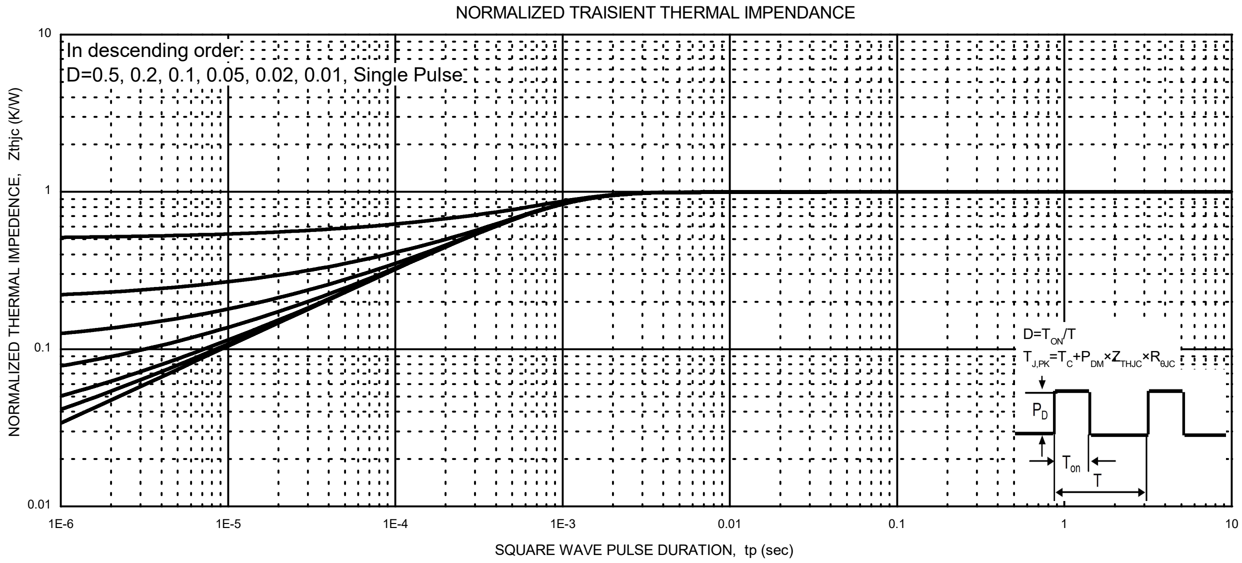

R$_{DS(ON)}$ —— I$_D$

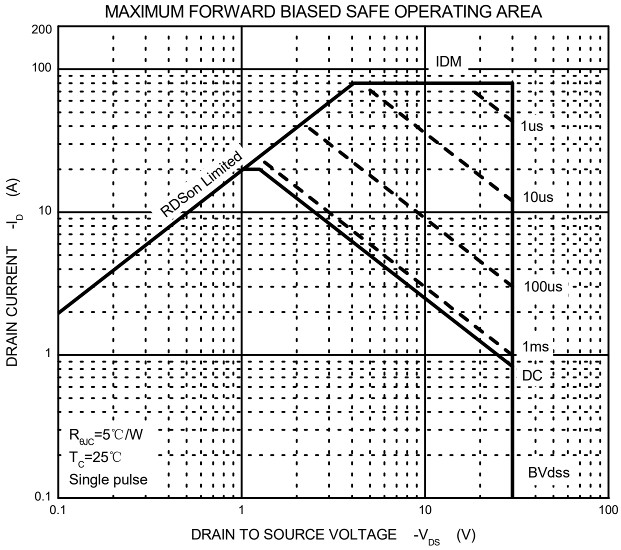

R$_{DS(ON)}$—— V$_{GS}$


I$_S$ —— V$_{SD}$

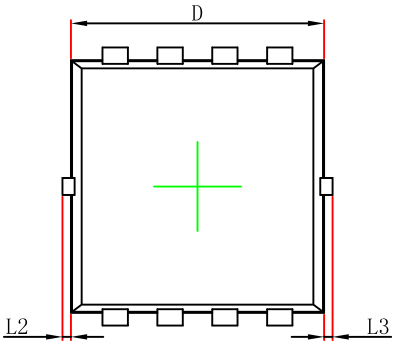

Capacitances

Typical Characteristics

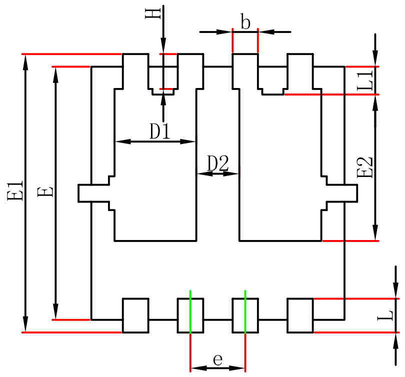




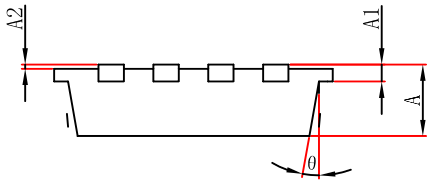
PDFNWB3.3×3.3-8L-B Package Outline Dimensions



Top View
[顶视图]



Bottom View
[背视图]



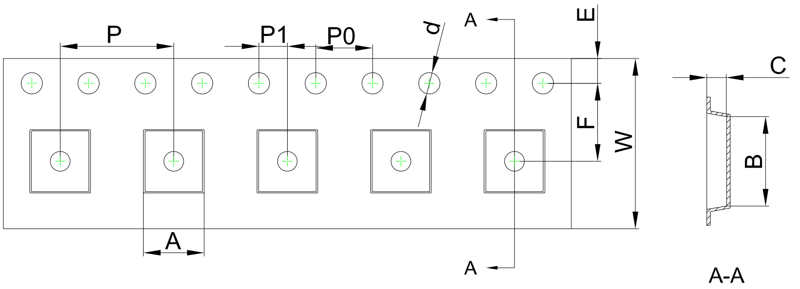
Side View
[侧视图]

Symbol	**Dimensions In Millimeters**		**Dimensions In Inches**	
	Min.	**Max.**	**Min.**	**Max.**
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

PDFNWB3.3×3.3-8L-B Embossed Carrier Tape

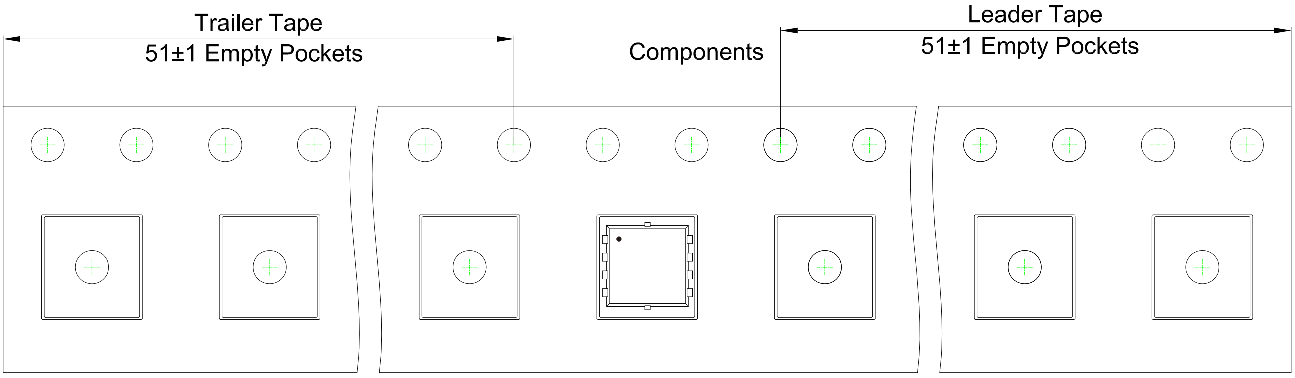
Packaging Description:

PDFNWB3.3×3.3-8L-B 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 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

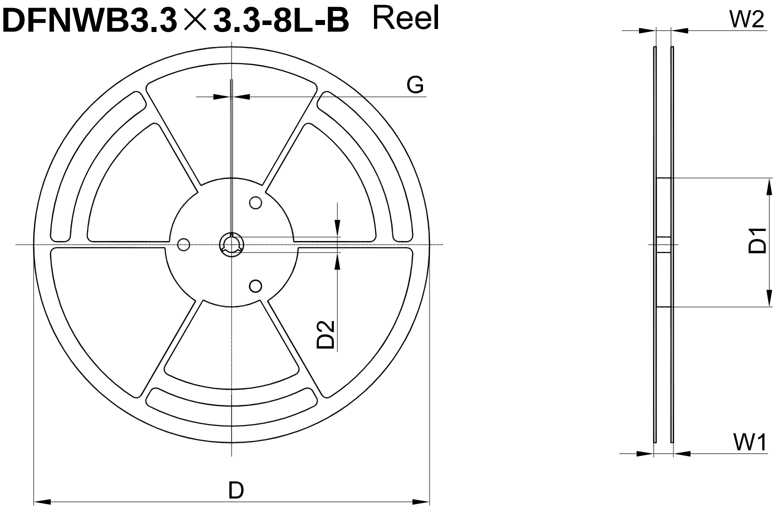


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
PDFNWB3.3×3.3-8L-B	3.55	3.55	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFNWB3.3×3.3-8L-B Tape Leader and Trailer



PDFNWB3.3×3.3-8L-B Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"Dia	Ø330.00	100.00	13.00	1.90	17.60	12.40

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
5,000 pcs	13 inch	5,000 pcs	340×336×29	50,000 pcs	353×346×365