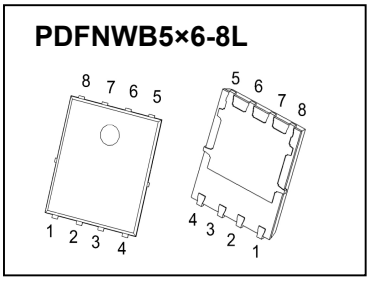
PDFNWB5×6-8L Plastic-Encapsulate MOSFET

AC200SN04U N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$TYP	I_D
40 V	0.67mΩ@10V	200A
	0.82mΩ@6V	
	1.05mΩ@4.5V	



DESCRIPTION

The N-Channel enhancement mode power field effect transistors is using SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.These devices are well suited for high efficiency fast switching applications.

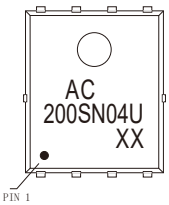
FEATURES

- Ultra low $R_{DS(on)}$
- Superior thermal resistance
- Excellent reliability and uniformity

APPLICATIONS

- Motor driver
- BMS
- PD charger
- DC/DC converter

MARKING

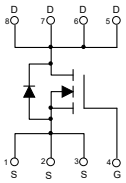


AC200SN04U = Part No.

Solid dot = Pin1 indicator

XX = Code

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D ①	200	A
Pulsed Drain Current	I_{DM} ①②	600	A
Single Pulsed Avalanche Energy	E_{AS} ③	760	mJ
Power Dissipation	P_D ①	104	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑤	62.5	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$ ①	1.2	℃/W
Operating Junction and Storage Temperature Range	T_J ,T_{STG}	-55~+150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_J=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 =10mA		40	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =32V, V_{GS} =0V	T_J =25℃	-	-	1.0	μA
			T_J =125℃	-	-	100	
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V		-	-	±100	nA
On characteristics ④							
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA		1.3	1.9	2.5	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =50A			0.67	0.90	mΩ
		V_{GS} =6V, I_D =50A			0.82	1.1	mΩ
		V_{GS} =4.5V, I_D =30A			1.05	1.4	mΩ
Dynamic characteristics							
Input capacitance	C_{iss}	V_{DS} =20V,V_{GS} =0V, f =100kHz		-	9107	-	pF
Output capacitance	C_{oss}			-	2083	-	
Reverse transfer capacitance	C_{rss}			-	89	-	
Gate resistance	R_g	f =1MHz		-	6.0	-	Ω
Switching characteristics							
Total gate charge	Q_g	V_{GS}=4.5V, V_{DS}=20V, I_D=50A		-	56	-	nC
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=50A		-	124	-	
Gate-source charge	Q_{gs}			-	24	-	
Gate-drain charge	Q_{gd}			-	17	-	
Turn-on delay time	$t_{d(on)}$	V_{DS}=20V, VGS=10V, R_L=2Ω , Rg=10Ω		-	114	-	ns
Turn-on rise time	t_r			-	110	-	
Turn-off delay time	$t_{d(off)}$			-	950	-	
Turn-off fall time	t_f			-	320	-	
Drain-Source Diode Characteristics							
Drain-source diode forward voltage	V_{SD} ④	V_{GS} =0V, I_S=50A		-	-	1.2	V
Continuous drain-source diode forward current	I_S ①			-	-	200	A
Pulsed drain-source diode forward current	I_{SM} ①②			-	-	600	A
Reverse recovery time	trr	di_S/dt = 100A/μs, I_S = 37.5A, V_{DD} = 30V		-	79	-	ns
Reverse recovery charge	Qrr			-	166	-	nC

Notes:

1.T_C=25°℃.

2.Limited only by maximum temperature allowed.

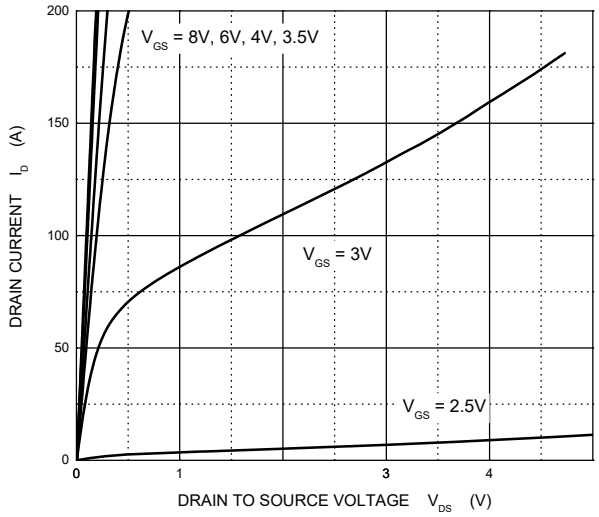
3.V_{DD}=40V,V_{GS}=10V, L=0.5mH, Rg=25Ω Starting T_J= 25°℃.

4.Pulse Test : Pulse Width≤380μs, duty cycle ≤2%.

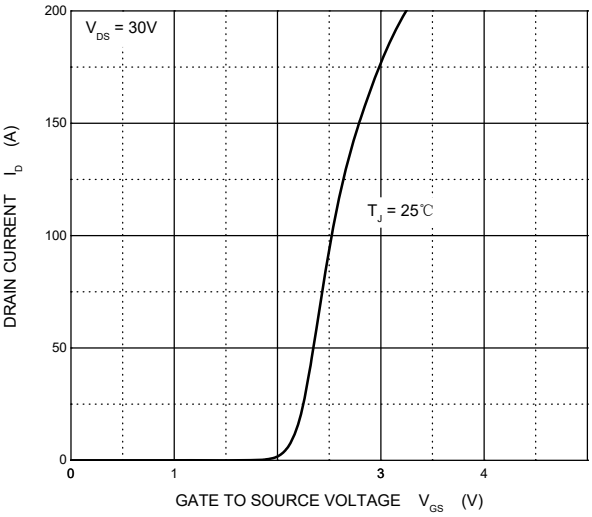
5.Device mounted on 1 in^2 FR-4 board with 2oz. single-sided Copper, in a still air environment with T_A=25 ℃.

Typical Characteristics (T_J = 25℃, unless otherwise specified)

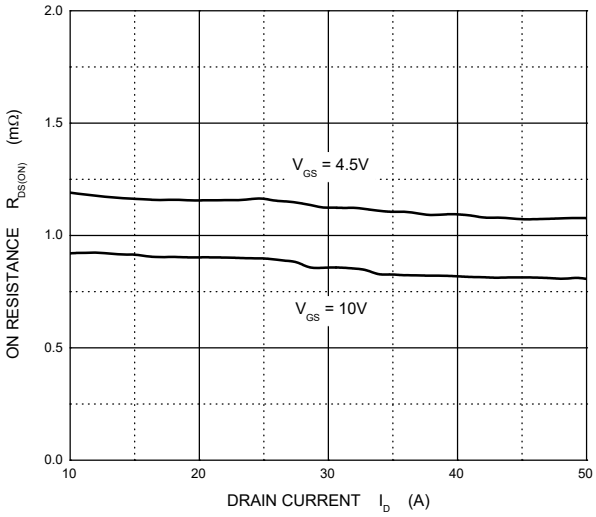
Output Characteristics



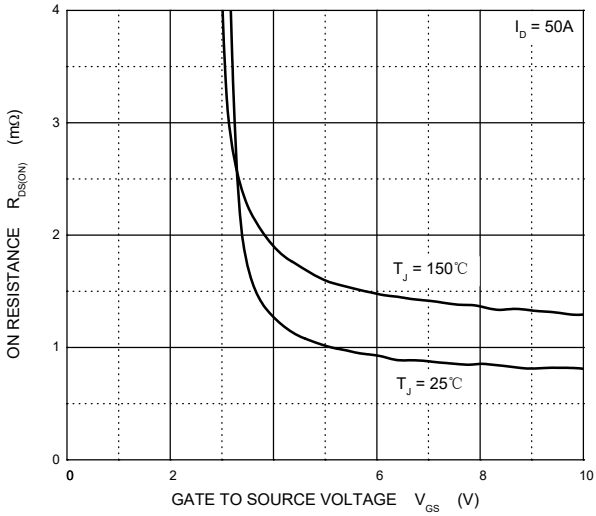
Transfer Characteristics



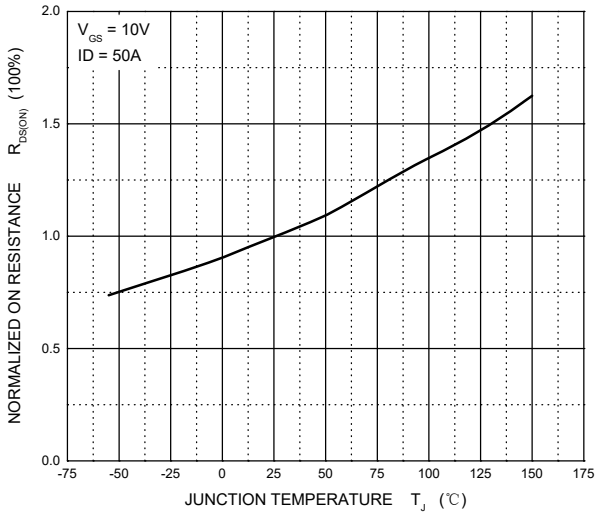
On Resistance vs. Drain Current



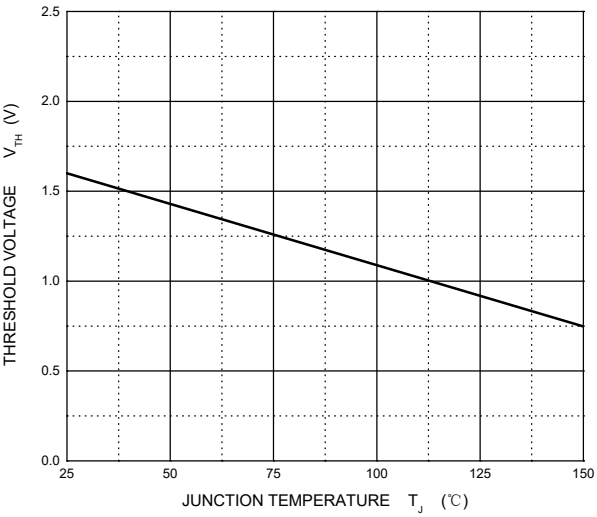
On Resistance vs. Gate-Source Bias



On Resistance vs. Junction Temperature

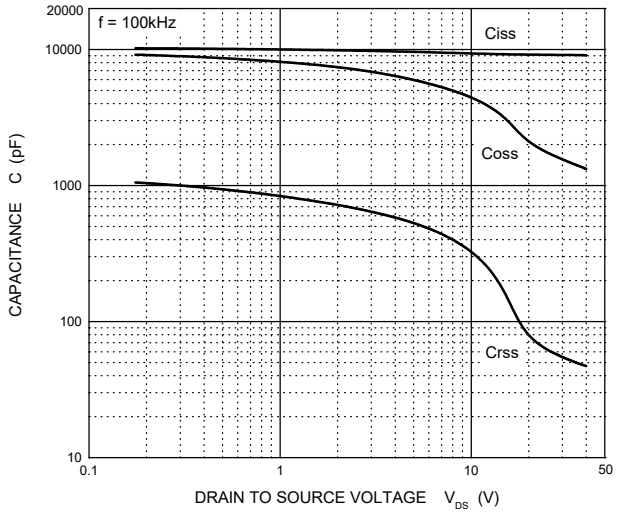


Gate-Source Threshold Voltage

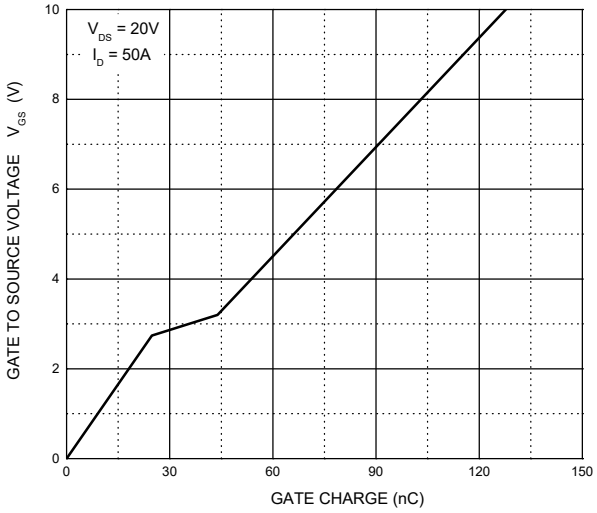


Typical Characteristics (T_J = 25℃, unless otherwise specified)

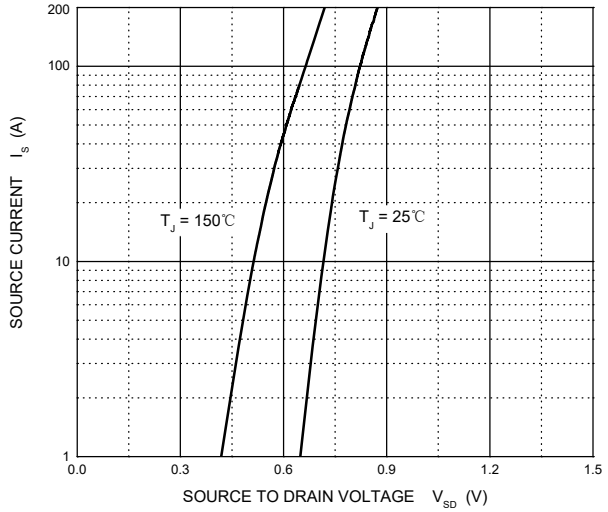
Typical Capacitances



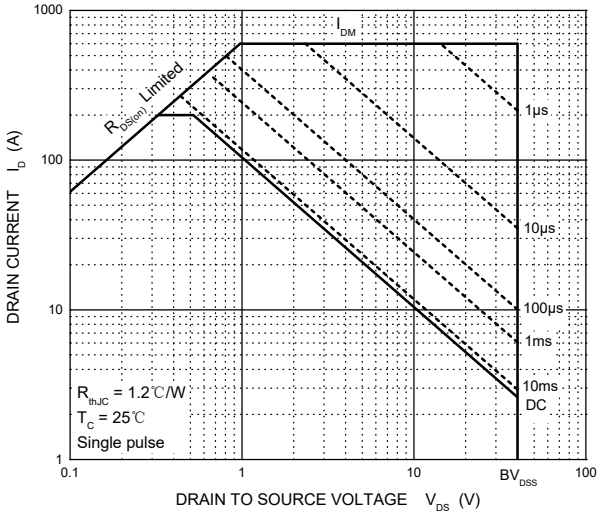
Gate Charge



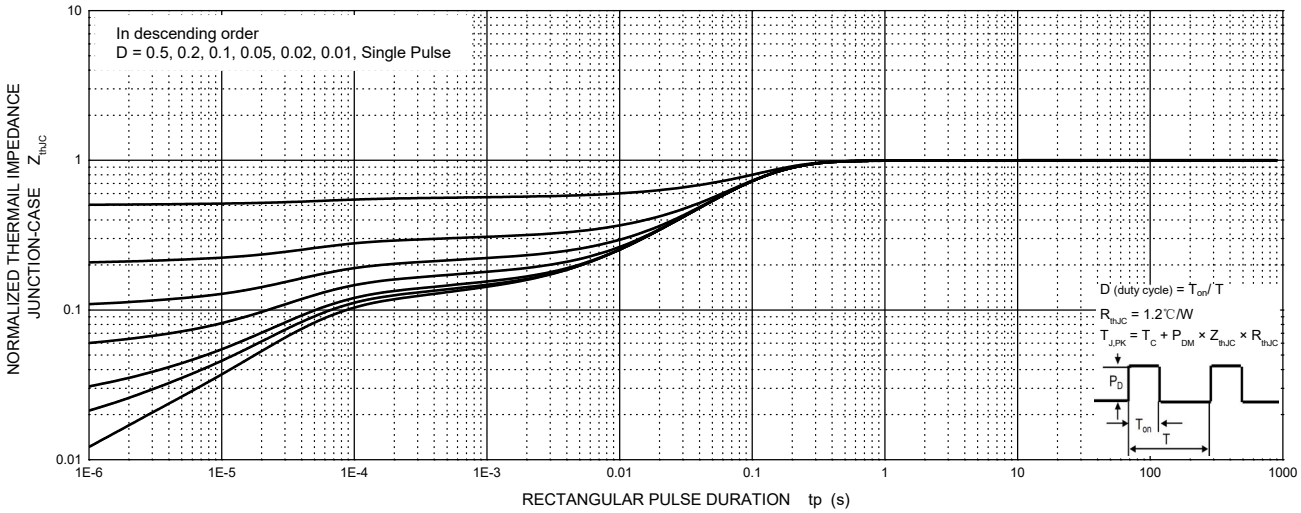
Source-Drain Diode Forward Characteristics



Maximum Safe Operating Area

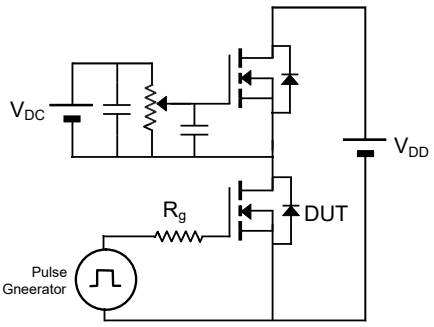


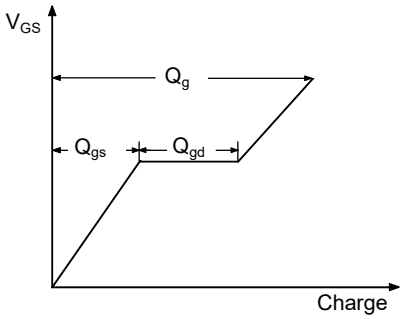
Transient Thermal Impedance, Junction-Case



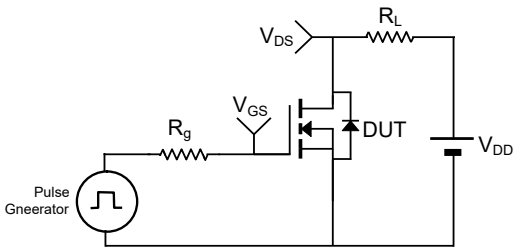
TEST CIRCUIT AND WAVEFOMRS

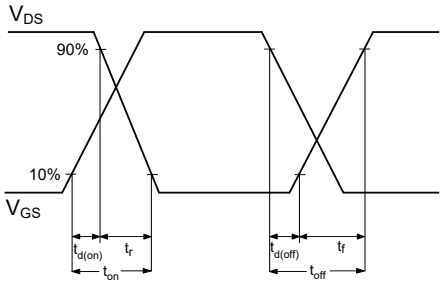
Gate Charge



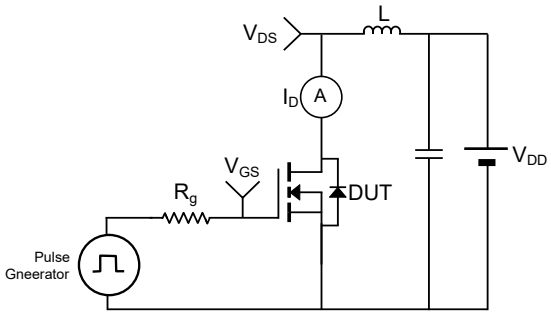


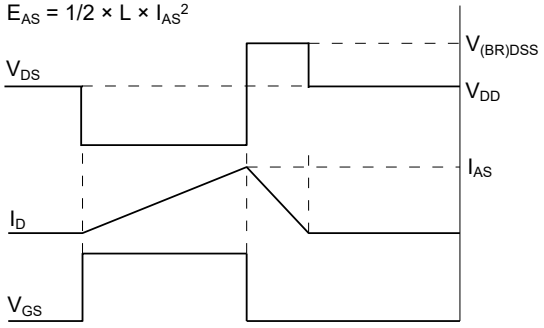
Resistive Load Switching Time



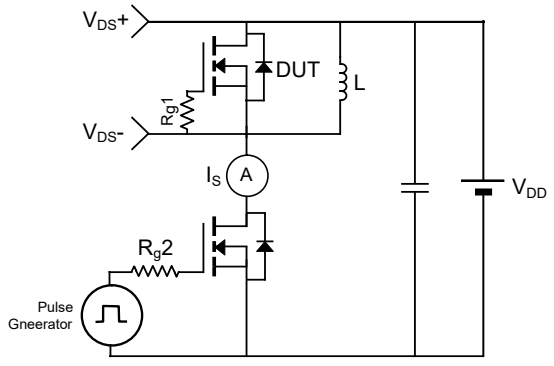


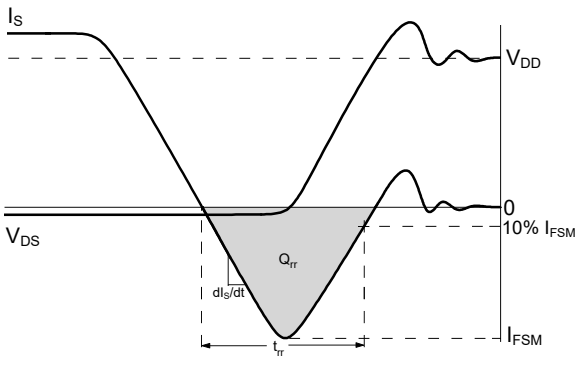
Un-clamped Inductive Load Switching



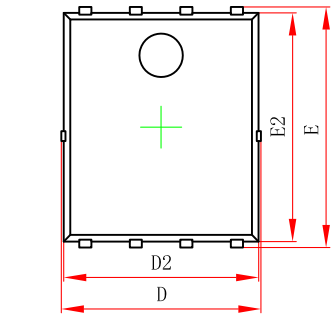


Drain-Source Body Diode Reverse Recovery

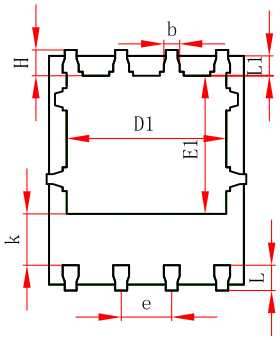




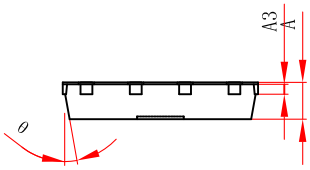
PDFNWB5x6-8L-B Package Outline Dimensions



Top View
[顶视图]



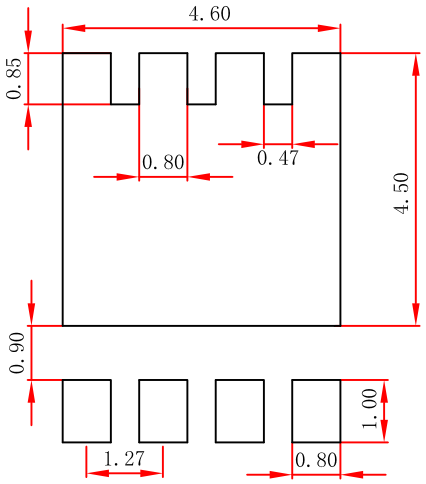
Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A3	0.254REF.		0.010REF.	
D	4.800	5.100	0.188	0.201
E	5.874	6.126	0.231	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.800	5.000	0.188	0.197
E2	5.674	5.826	0.223	0.229
k	1.190	1.625	0.047	0.064
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.550	0.750	0.022	0.030
L1	0.300	0.700	0.012	0.028
H	0.550	0.750	0.022	0.030
θ	8°	12°	8°	12°

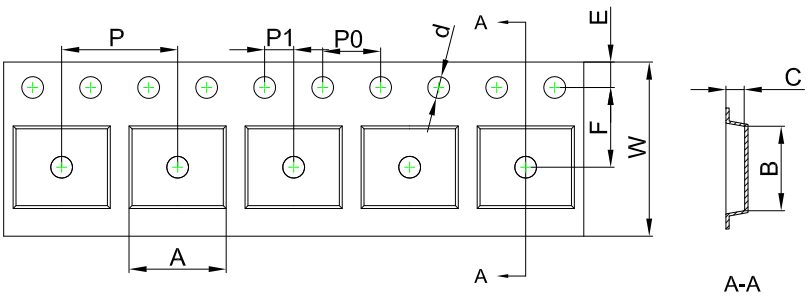
PDFNWB5x6-8L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

PDFNWB5×6 Tape and Reel

PDFNWB5×6-8L Embossed Carrier Tape

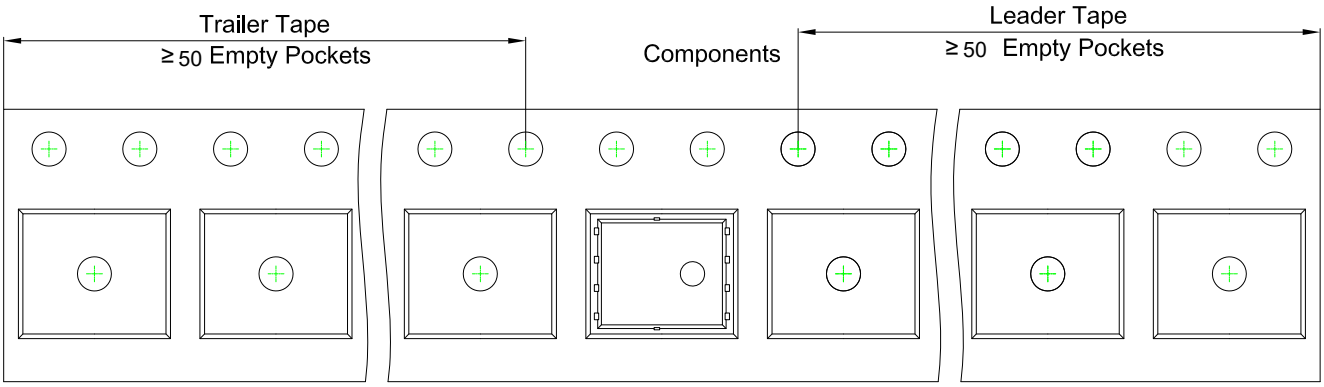


Packaging Description:

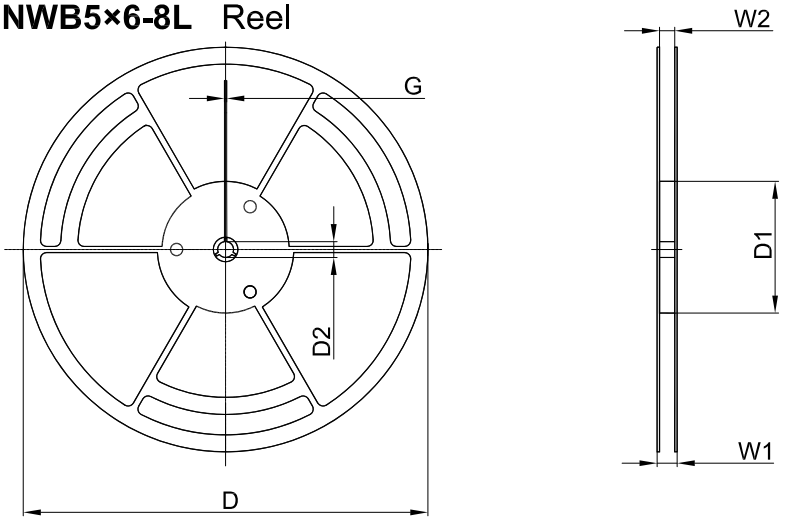
PDFNWB5×6-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts 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
PDFNWB5×6-8L	6.30	5.30	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFNWB5×6-8L Tape Leader and Trailer



PDFNWB5×6-8L 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