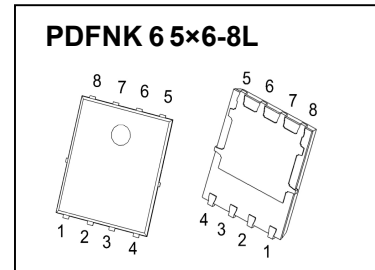




PDFNK 6 5×6-8L Plastic-Encapsulate MOSFETS

AC50SN03 N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D
30 V	3.8mΩ@10V	50A
	5.5mΩ@4.5V	



DESCRIPTION

These N-Channel enhancement mode power field effect transistors are 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.

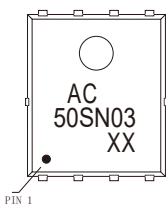
FEATURES

- Battery switch
- Load switch
- High density cell design for ultra low $R_{DS(ON)}$
- Excellent package for good heat dissipation

APPLICATIONS

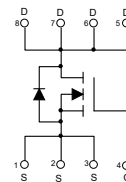
- Networking
- Load Switch
- LED applications

MARKING



AC50SN03 = Part No.
Solid dot=Pin1 indicator.
XX=Code.

EQUIVALENT CIRCUIT



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D ①	50	A
Pulsed Drain Current	I_{DM} ②	180	A
Single Pulsed Avalanche Energy	E_{AS} ③	100	mJ
Power Dissipation	P_D ①	36	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑥	62.5	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$ ①	3.47	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 1mA$	30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 24V, V_{GS} = 0V$	$T_J = 25\text{ }^\circ\text{C}$		1.0	μA
			$T_J = 125\text{ }^\circ\text{C}$		100	
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics ^④						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.6	2.5	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		3.8	4.95	m Ω
		$V_{GS} = 4.5V, I_D = 20A$		5.5	7.2	m Ω
Dynamic characteristics ^{④ ⑤}						
Input capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$		1220		pF
Output capacitance	C_{oss}			1065		
Reverse transfer capacitance	C_{rss}			58		
Gate resistance	R_g	$f = 1\text{MHz}$		2.0		Ω
Switching characteristics ^{④ ⑤}						
Total gate charge	Q_g	$V_{GS} = 10V, V_{DS} = 20V, I_D = 20A$		24		nC
Gate-source charge	Q_{gs}			2.0		
Gate-drain charge	Q_{gd}			6.1		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 15V, R_L = 1.5\Omega, V_{GS} = 10V, R_{GEN} = 10\Omega$		30		ns
Turn-on rise time	t_r			31		
Turn-off delay time	$t_{d(off)}$			44		
Turn-off fall time	t_f			20		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ^④	$V_{GS} = 0V, I_S = 10A$			1.2	V
Continuous drain-source diode forward current	I_S ^①				50	A
Pulsed drain-source diode forward current	I_{SM} ^②				180	A

Notes:

1. $T_C = 25\text{ }^\circ\text{C}$ Limited only by maximum temperature allowed.

2. $PW \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$.

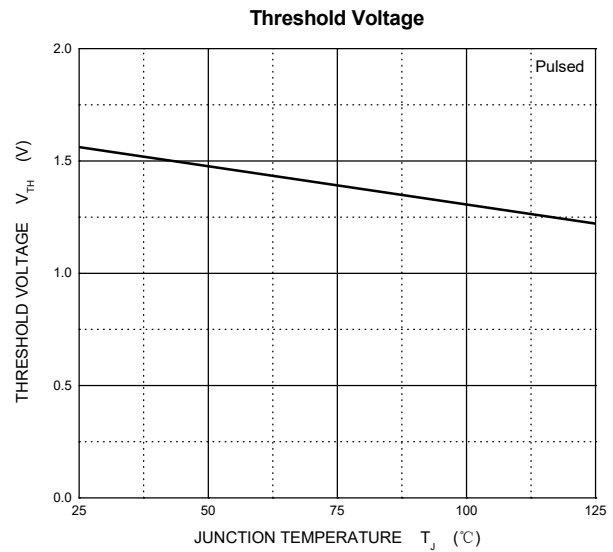
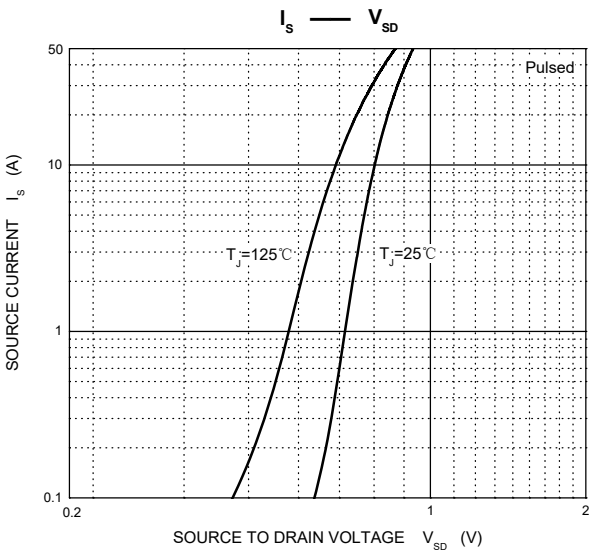
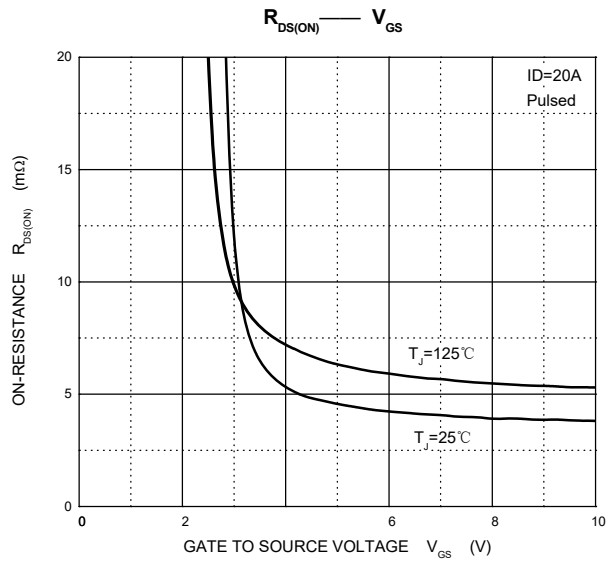
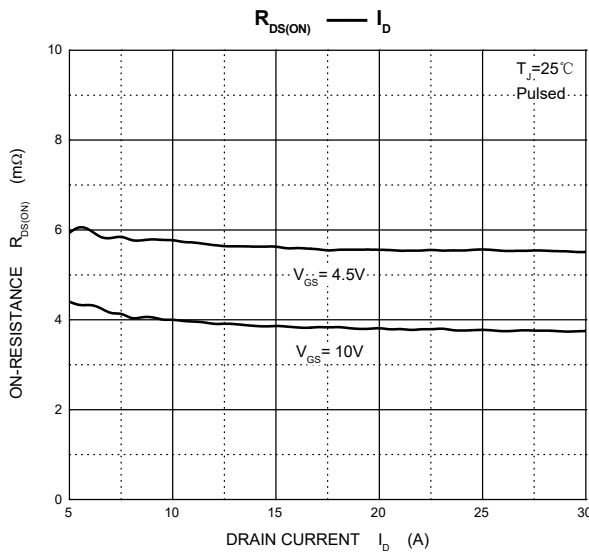
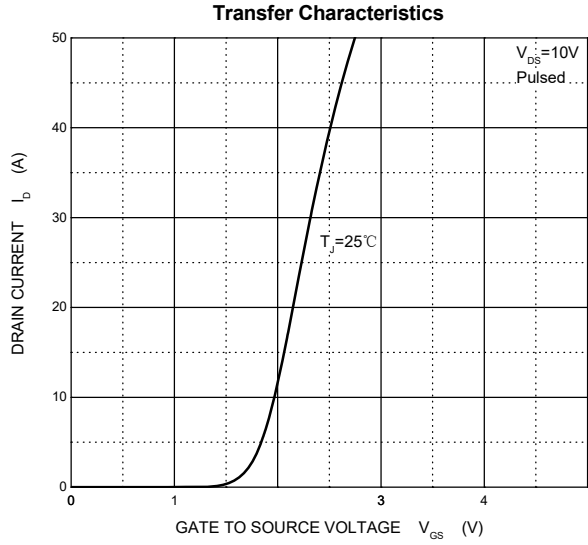
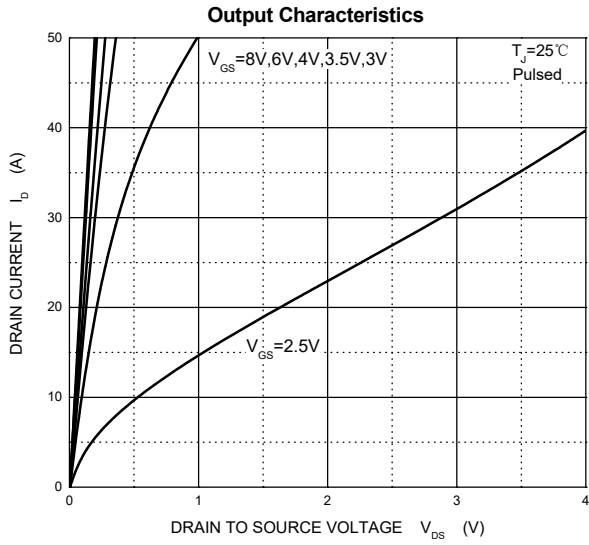
3. EAS condition: $V_{DD} = 15V, V_{GS} = 10V, L = 0.5\text{mH}, R_g = 25\Omega$ Starting $T_J = 25\text{ }^\circ\text{C}$.

4. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

5. Guaranteed by design, not subject to production.

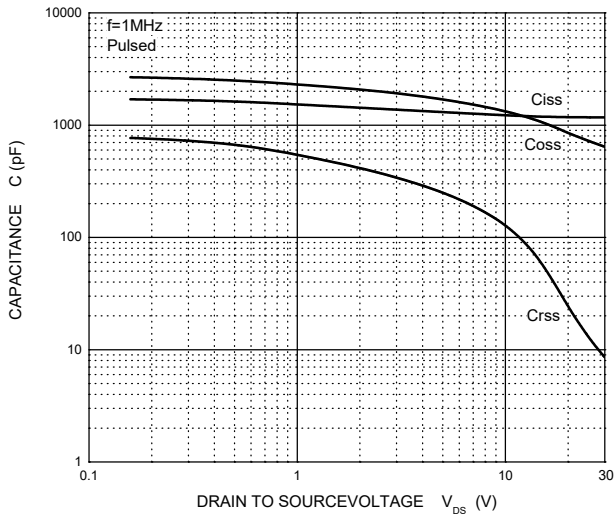
6. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25\text{ }^\circ\text{C}$.

Typical Characteristics

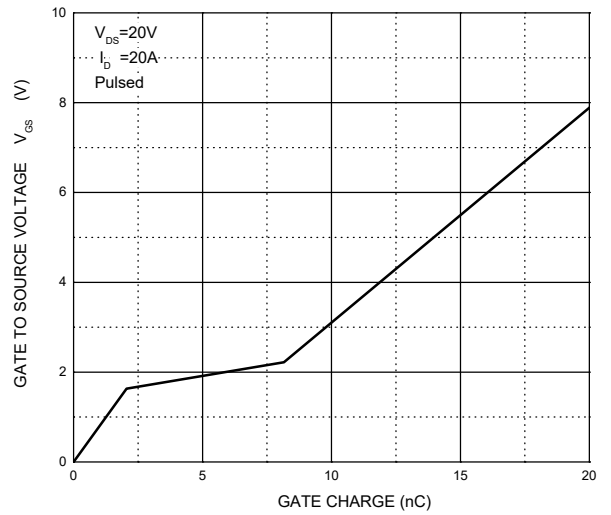


Typical Characteristics

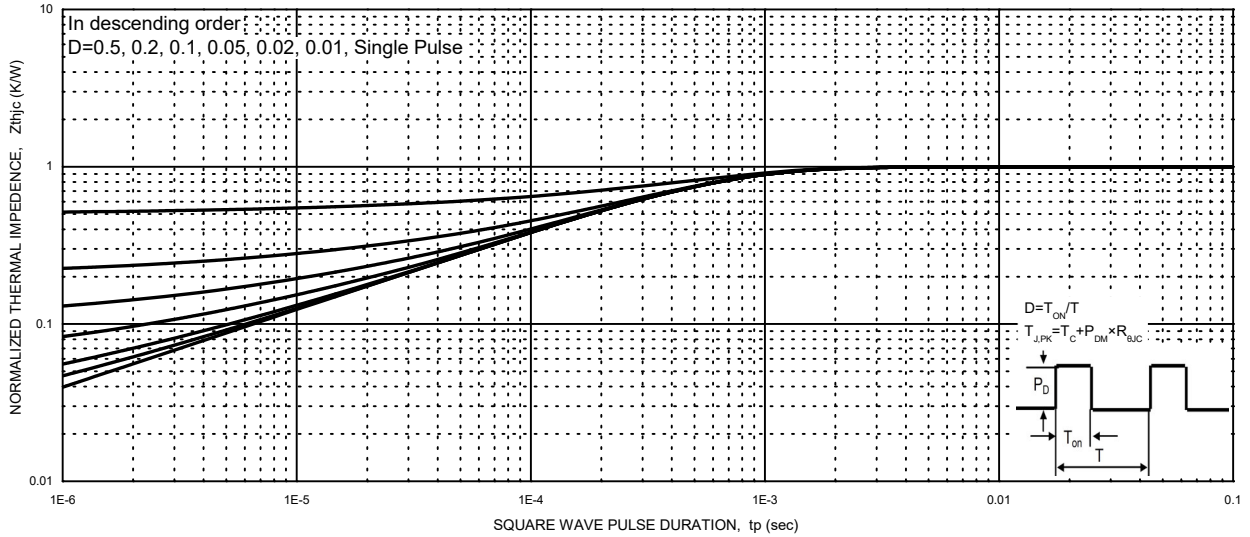
Capacitances



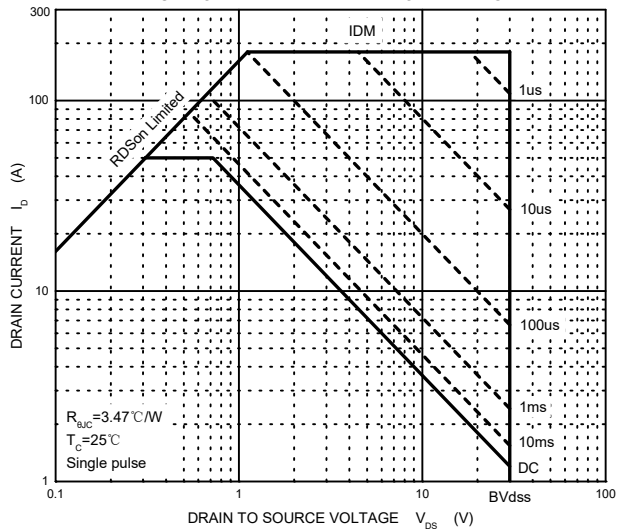
Gate Charge



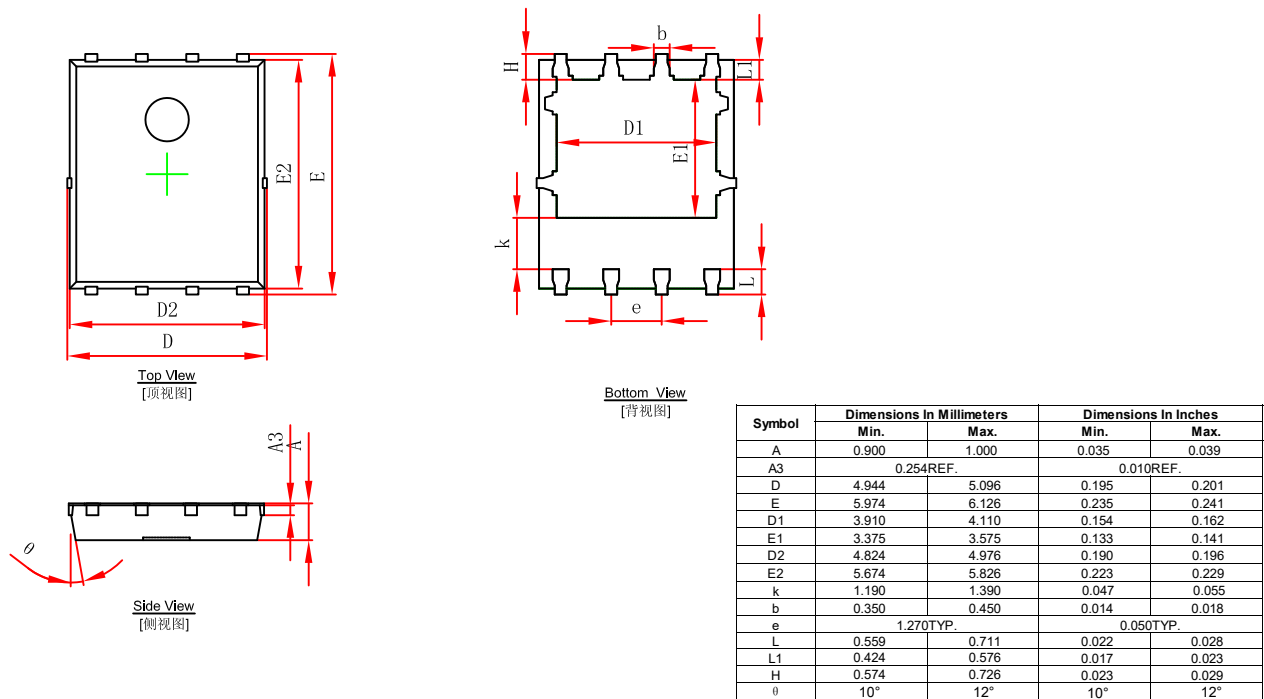
NORMALIZED TRANSIENT THERMAL IMPEDANCE



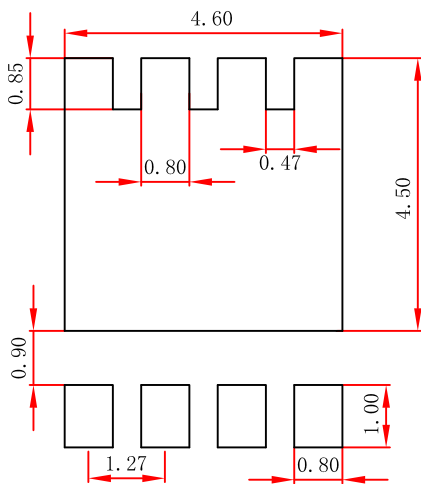
MAXIMUM FORWARD BIASED SAFE OPERATING AREA



PDFNWB5x6-8L Package Outline Dimensions



PDFNWB5x6-8L Suggested Pad Layout

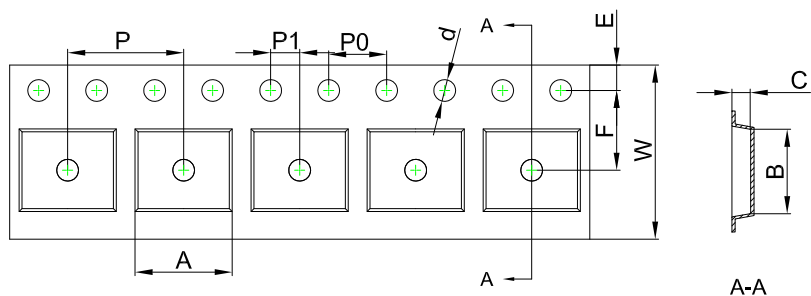


Note:

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

PDFNWB5×6 Tape and Reel

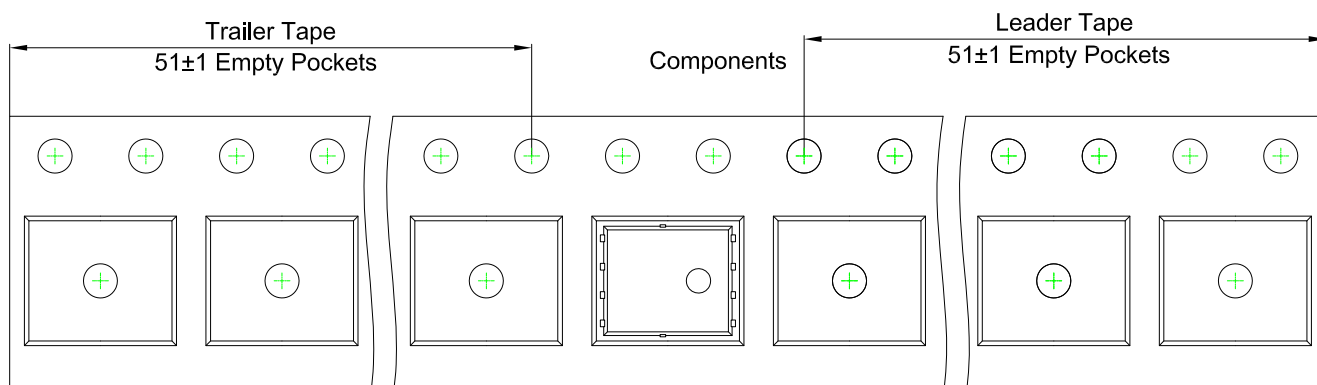
PDFNWB5×6-8L Embossed Carrier Tape



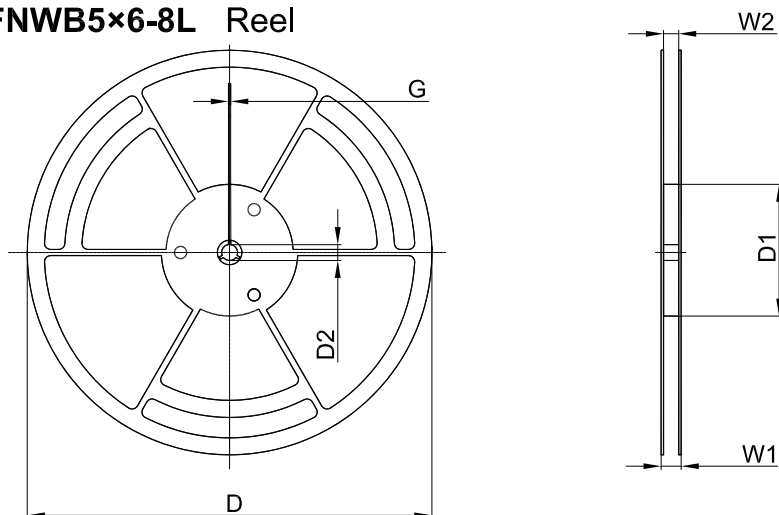
Packaging Description:
PDFNWB5×6-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed 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