

Features

- Epoxy meets UL-94 V-0 flammability rating
- Moisture Sensitivity Level 3
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses

General Description

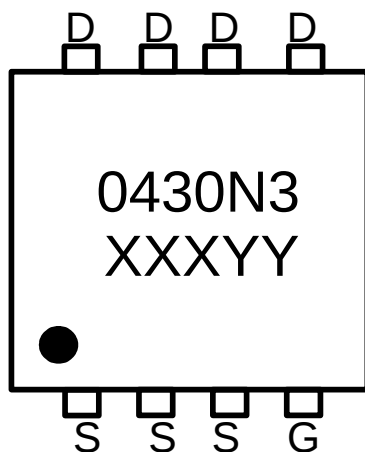
The TNM0430N3 is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The TNM0430N3X meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Mechanical Characteristics

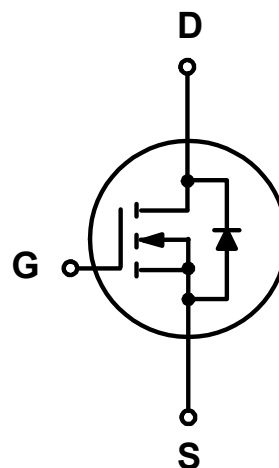
- Package: PDFN3X3-8L
- Marking: Part number
- Packaging: Tape and Reel

MARKING



- (1) "0430N3" is part number, fixed.
- (2) "XXXYY" is the internal code.

Equivalent Circuit





N-Channel Enhancement Mode Power MOSFET

● Absolute Maximum Ratings (@TA=25°C unless otherwise noted)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate Source Voltage		V_{GS}	± 20	V
Drain Current (Continuous) *AC	TC=25°C	I_D	65	A
	TC=100°C		30	
Drain Current (Pulse) *B		I_{DM}	245	A
Power Dissipation	TC=25°C	P_D	32	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~175	°C

● Thermal Characteristics

Parameter	Symbol	Ratings	Unit
Thermal Resistance ,Junction-to-Ambient	$R_{\theta JA}$	75	°C/W
Thermal resistance, junction-case max	$R_{\theta JC}$	4.3	°C/W

● Electrical Characteristics (@TA=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.2	--	2.5	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	--	3.3	4.5	m Ω
		$V_{GS}=4.5V, I_D=15A$	--	5.5	7.3	m Ω
Forward Transconductance	g_{fs}	$I_{SD}=30A, V_{DS}=5V$	--	26.5	--	S
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=15V, I_D=15A$	--	31.6	--	nC
Gate- Source Charge	Q_{gs}		--	8.6	--	nC
Gate- Drain Charge	Q_{gd}		--	11.7	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=15V, I_D=15A, R_{GEN}=3.3\Omega$	--	9	--	ns
Turn-on Rise Time	t_r		--	19	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	58	--	ns
Turn-off Fall Time	t_f		--	15.2	--	ns
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=15V, f=1MHz$	--	3075	--	pF
Output Capacitance	C_{oss}		--	400	--	pF
Reverse Transfer Capacitance	C_{rss}		--	315	--	pF

N-Channel Enhancement Mode Power MOSFET

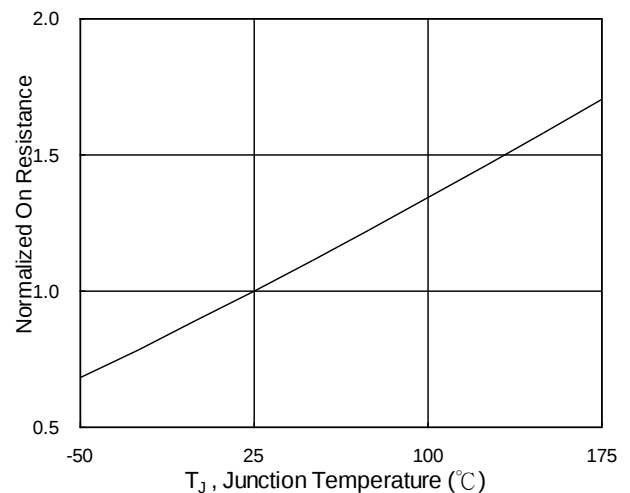
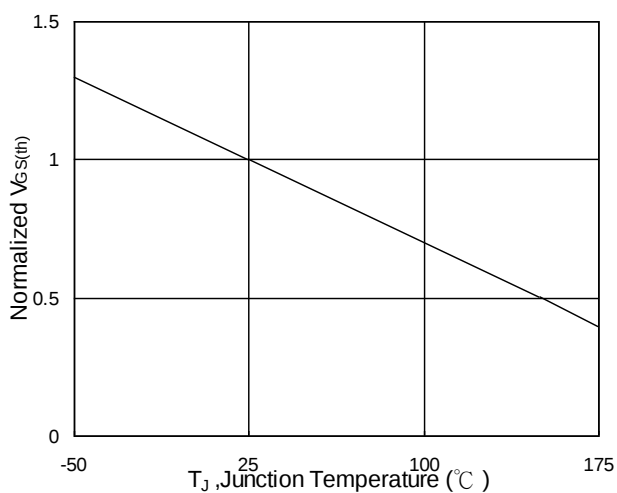
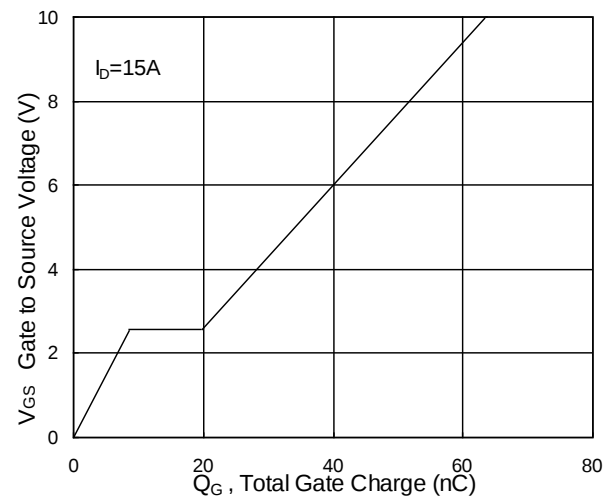
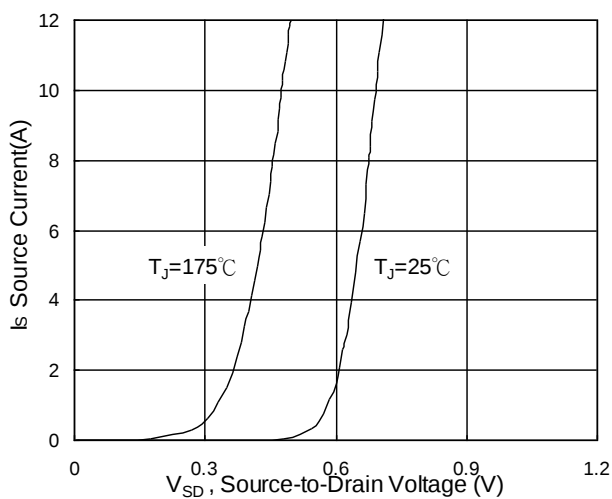
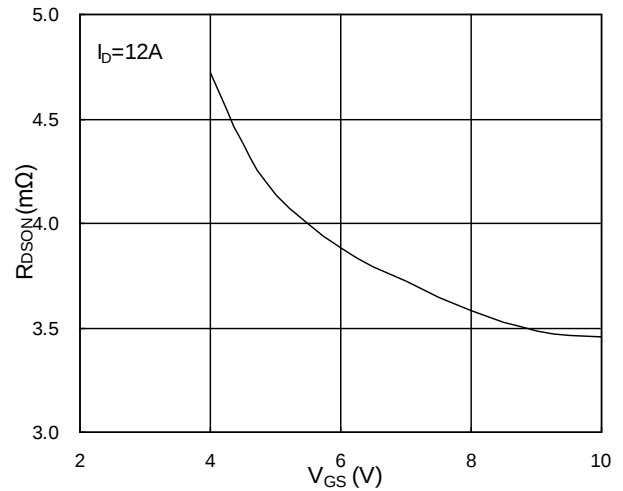
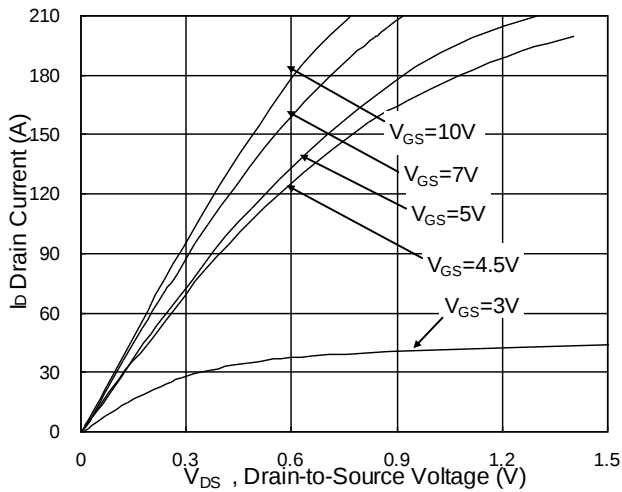
● Reverse Diode Characteristics (@TA=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_S	$V_G=V_D=0V$, Force Current	--	--	65	A
Diode Forward Voltage	V_{SD}	$I_{SD}=1A$, $V_{GS}=0V$	--	--	1	V

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}C$. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature .

C: The current rating is based on the $t < 10s$ junction to ambient thermal resistance rating.

N-Channel Enhancement Mode Power MOSFET
● TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


N-Channel Enhancement Mode Power MOSFET

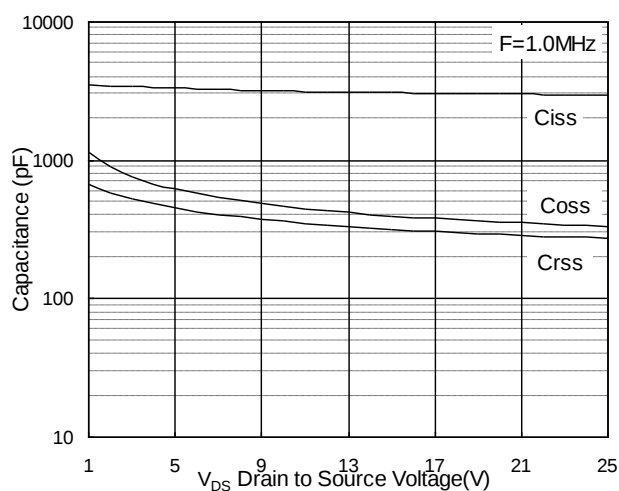


Fig.7 Capacitance

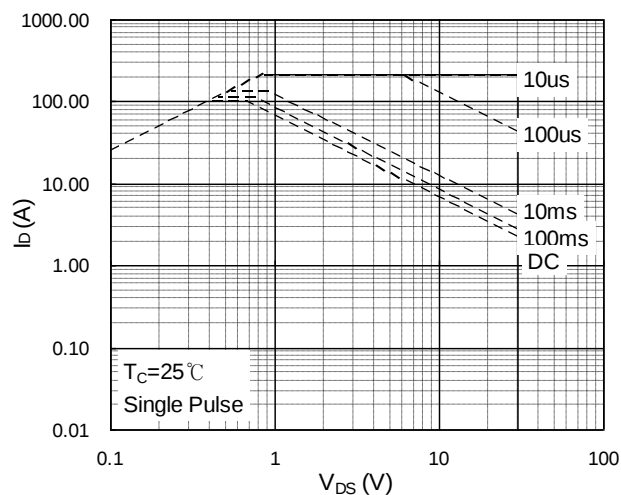


Fig.8 Safe Operating Area

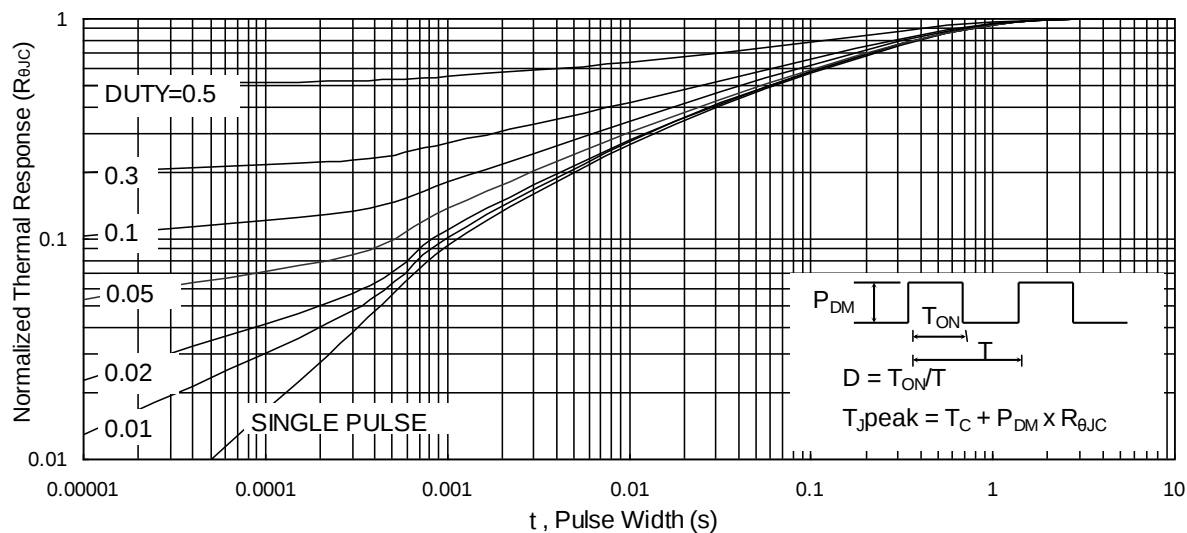


Fig.9 Normalized Maximum Transient Thermal Impedance

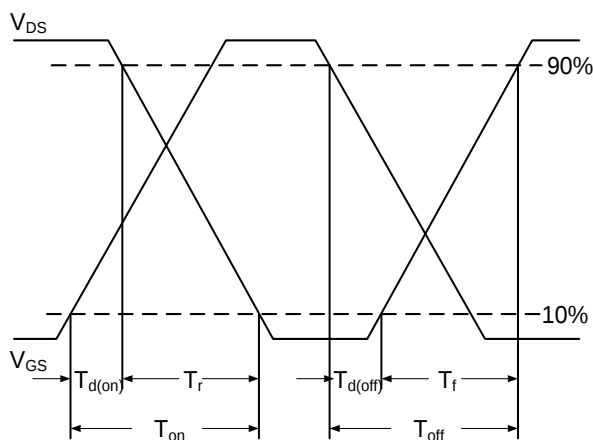


Fig.10 Switching Time Waveform

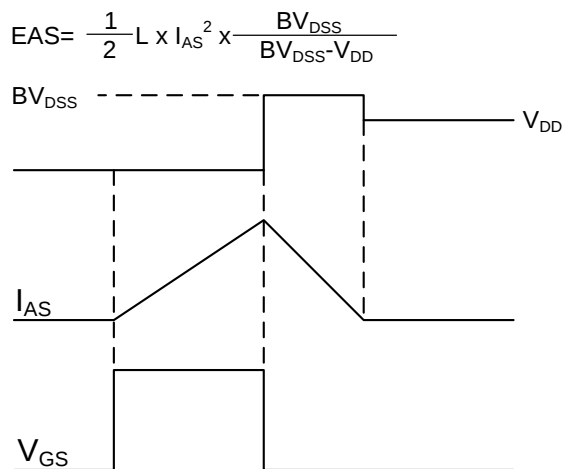
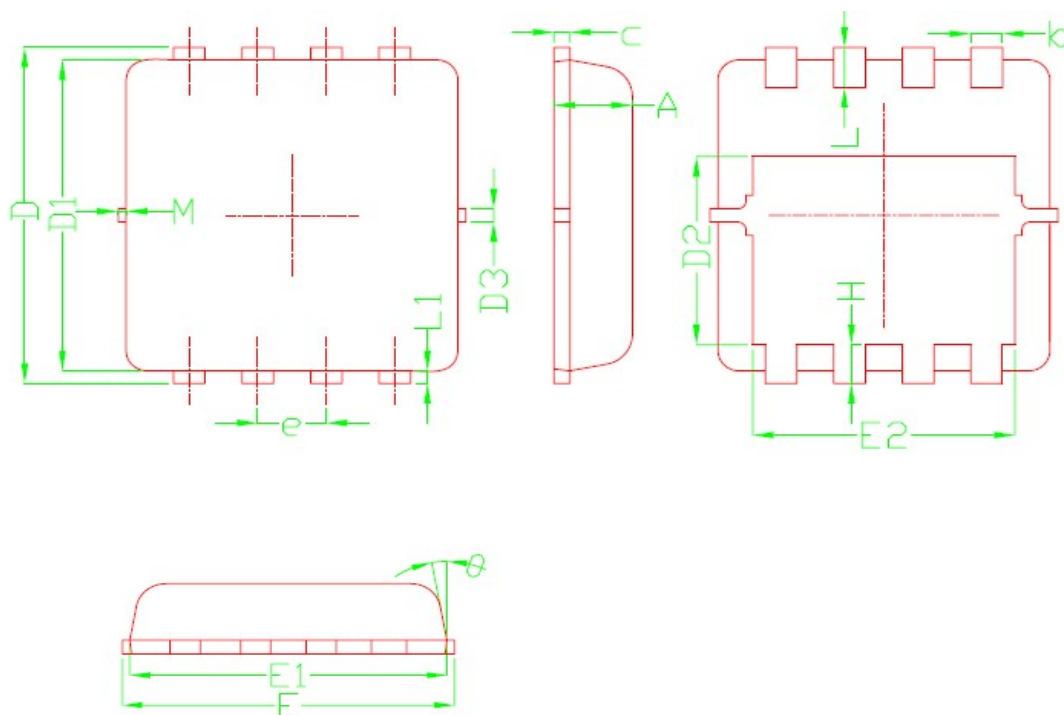


Fig.11 Unclamped Inductive Switching Waveform

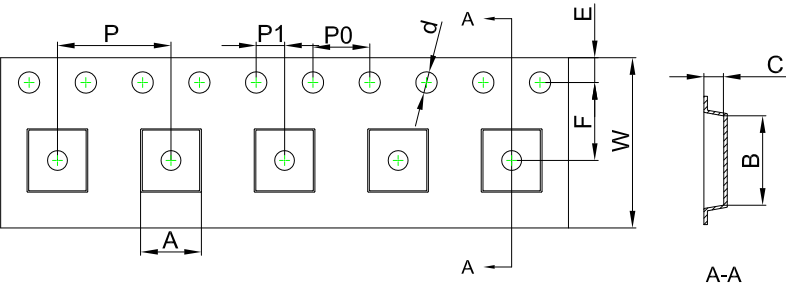
PDFN3X3-8L Package Dimensions



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.85	0.027	0.034
b	0.20	0.40	0.007	0.016
c	0.10	0.25	0.004	0.010
D	3.15	3.45	0.124	0.136
D1	2.90	3.20	0.114	0.126
D2	1.54	1.98	0.060	0.080
D3	0.10	0.30	0.004	0.012
E	3.15	3.45	0.124	0.136
E1	3.00	3.25	0.118	0.128
E2	2.29	2.65	0.090	0.104
e	0.65 BSC		0.025 BSC	
H	0.28	0.65	0.011	0.026
Θ	0°	14°	0°	14°
L	0.30	0.50	0.012	0.020
L1	0.13		0.005	
M	---	0.15	---	0.006

N-Channel Enhancement Mode Power MOSFET

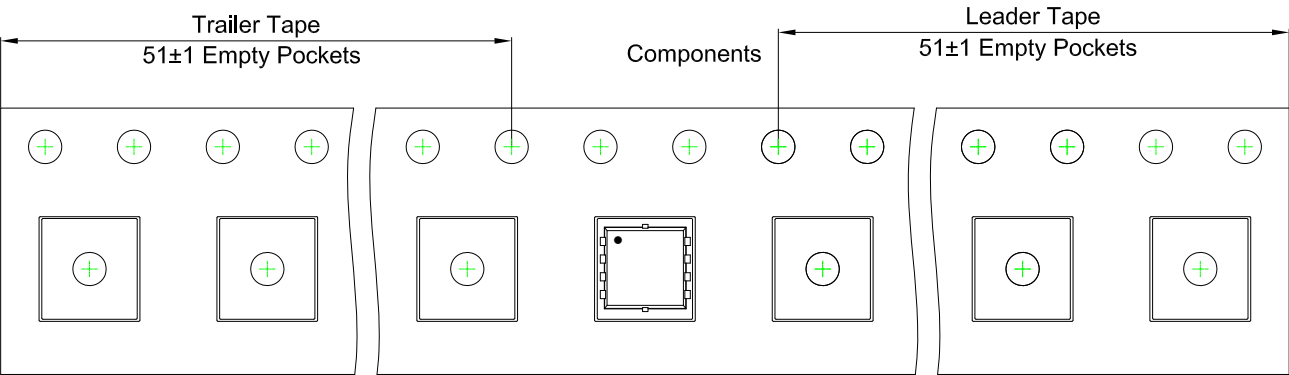
PDFN3×3-8L Embossed Carrier Tape



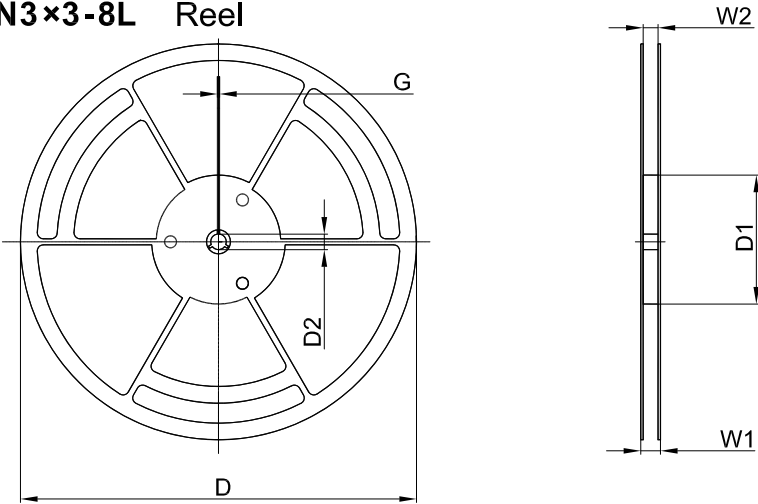
Packaging Description:
PDFN 3×3-8L parts are shipped in tape.
The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed 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
PDFN3×3-8L	3.55	3.55	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN3×3-8L Tape Leader and Trailer



PDFN3×3-8L 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