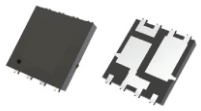
MOSFET

ACMS111NN04HB8-HF

Dual N-Channel
RoHS Device
Halogen Free



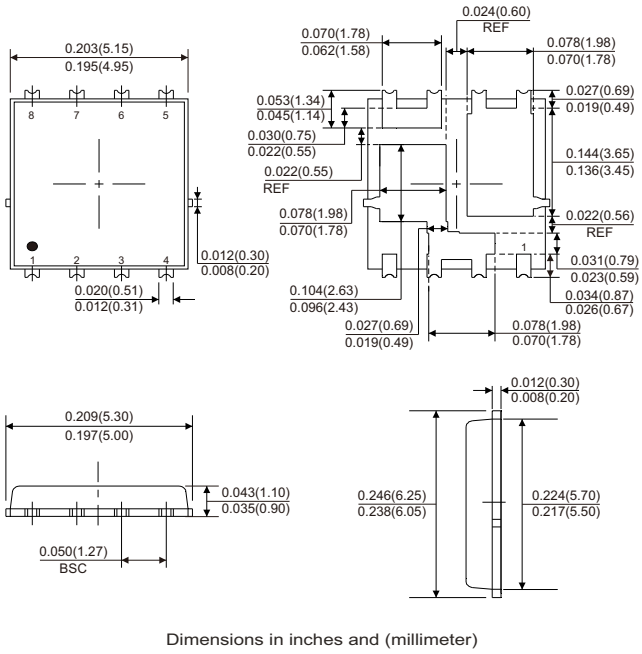
Features

- Enhanced routing to reduce PCB layout complexit.
- AEC-Q101 Qualified.

Mechanical data

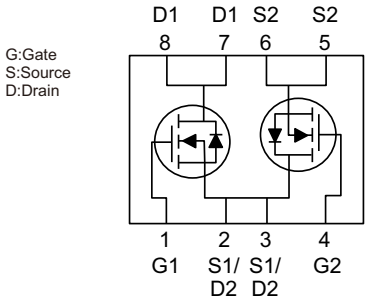
- Case: PDFN5x6-8L-B, molded plastic.
- Terminals: Solderability per MIL-STD-202, method 208.
- Mounting position: Any.

PDFN5x6-8L-B



Dimensions in inches and (millimeter)

Circuit Diagram



Maximum Ratings (at TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	40	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current (TC=25°C) (Note 1)	I_D	111	A
Continuous drain current (TC=100°C) (Note 1)	I_D	78	
Pulsed drain current (Note 2)	I_{DM}	340	A
Avalanche energy (Note 3)	E_{AS}	182	mJ
Power dissipation (TC=25°C) (Note 4)	P_D	75	W
Power dissipation (TC=100°C) (Note 4)	P_D	37	W
Junction and storage temperature range	T_J, T_{STG}	-55 to +175	°C

Thermal Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Thermal resistance junction to ambient	$R_{\theta JA}$		40	46	°C/W
Thermal resistance junction to case	$R_{\theta JC}$		2	2.3	°C/W

Electrical Characteristics (at T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 32V, V_{GS} = 0V			1	μA
		V_{DS} = 32V, V_{GS} = 0V, T_J = 55°C			5	
Gate-body leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.2	2.8	3.4	V
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		2.7	3.3	mΩ
Forward transconductance	g_{FS}	V_{DS} = 5V, I_D = 20A		27		S
Diode forward voltage	V_{SD}	I_S = 1A, V_{GS} = 0V		0.7	1.0	V
Diode continuous current	I_S	T_C = 25°C			75	A
Dynamic Characteristics (Note 5)						
Input capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz		1715		pF
Output capacitance	C_{oss}			894		
Reverse transfer capacitance	C_{rss}			54		
Gate resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		3.5		Ω
Switching Characteristics (Note 5)						
Total gate charge (@V_{GS} = 10V)	Q_g	V_{GS} = 0 to 10V, V_{DS} = 20V, I_D = 20A		25		nC
Total gate charge (@V_{GS} = 6V)	Q_g			15.3		
Gate to source charge	Q_{gs}			7.5		
Gate to drain (miller) charge	Q_{gd}			4.7		
Turn-on delay time	$t_{d(on)}$	V_{GS} = 10V, V_{DS} = 20V, R_L = 1Ω R_{GEN} = 3Ω		9.5		ns
Turn-on rise time	t_r			24		
Turn-off delay time	$t_{d(off)}$			25		
Turn-off fall time	t_f			30		
Reverse recovery time	t_{rr}	I_F = 20A, di_F/dt = 100A/μs		37		ns
Reverse recovery change	Q_{rr}			23		nC

Notes: 1. Computed continuous current assumes the condition of T_J max while the actual continuous current depends on the thermal & electro-mechanical application board design.

2. The single-pulse measurement was taken under T_J max = 175°C.

3. E_{AS} of 182 mJ is based on starting T_J=25°C, L=3mH, I_{AS}=11A, V_{GS}=10V, V_{DD}=20V; 100% test at L=0.3mH, I_{AS}=23A.T_J max = 175°C.

4. The power dissipation P_D is based on T_J max = 175°C.

5. The value is guaranteed by design hence it is not included in the production test.

Typical Rating and Characteristic Curves (ACMS111NN04HB8-HF)

Fig.1 - Saturation Characteristics

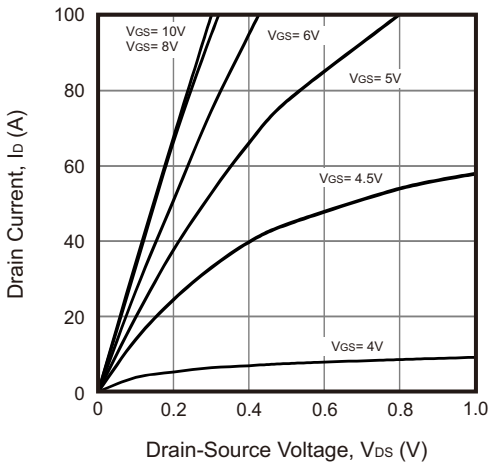


Fig.2 - Transfer Characteristics

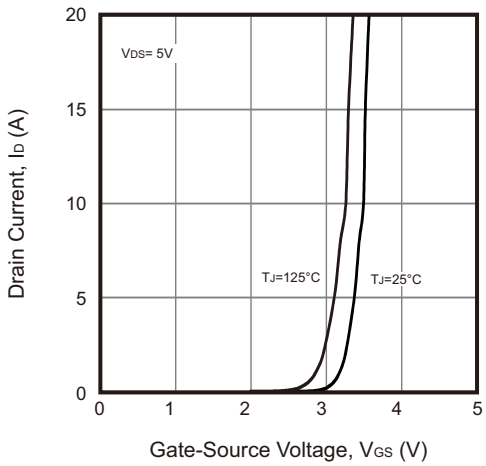


Fig.3 - On-Resistance vs. Drain Current

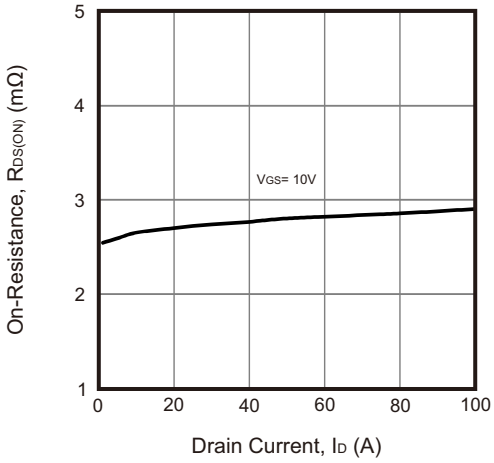


Fig.4 - $R_{DS(ON)}$ vs. Junction Temperature

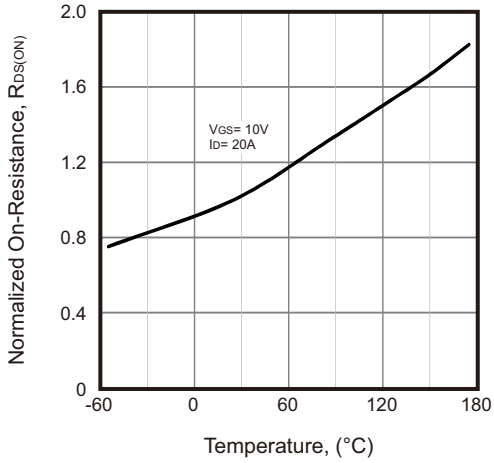


Fig.5 - $V_{GS(th)}$ vs. Junction Temperature

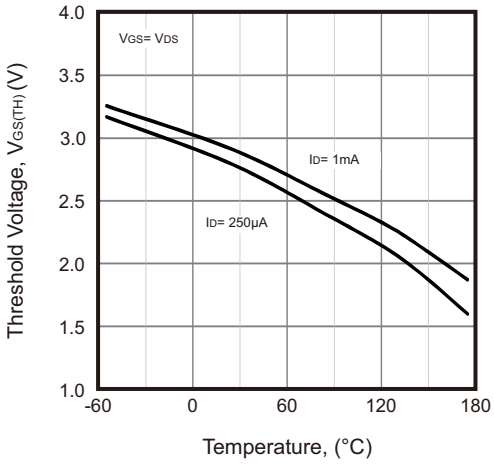
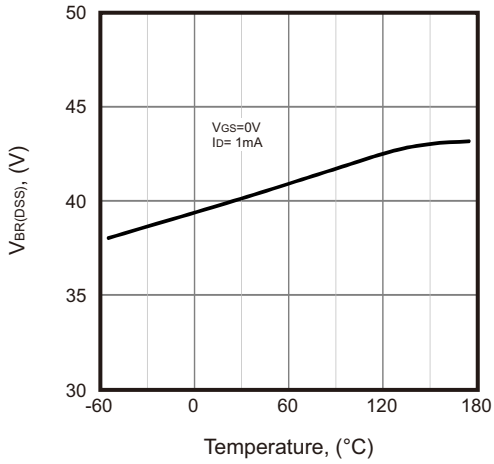


Fig.6 - $V_{BR(DSS)}$ vs. Junction Temperature



Typical Rating and Characteristic Curves (ACMS111NN04HB8-HF)

Fig.7 - Body-Diode Characteristics

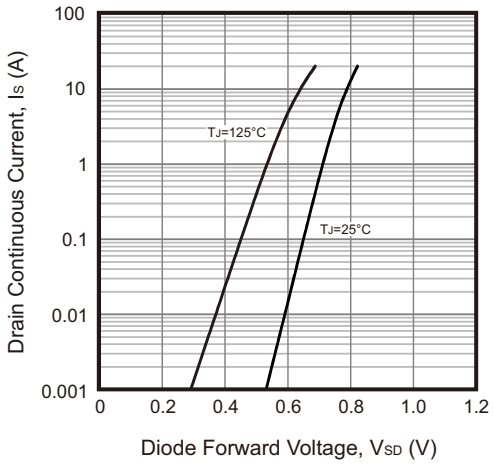


Fig.8 - Capacitance Characteristics

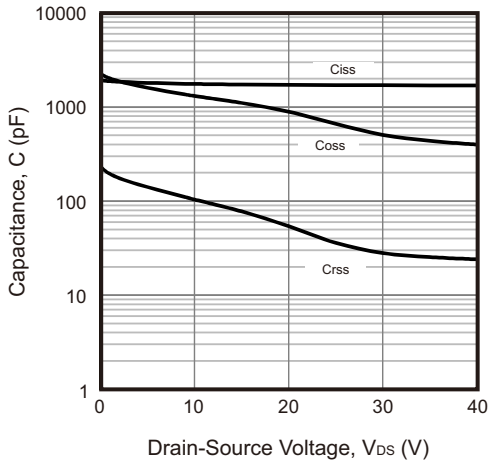


Fig.9 - Current Derating

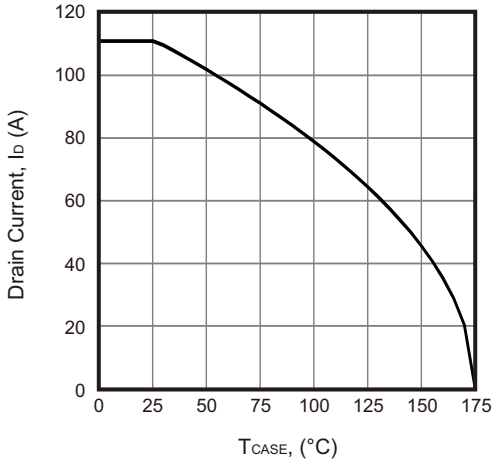


Fig.10 - Power Derating

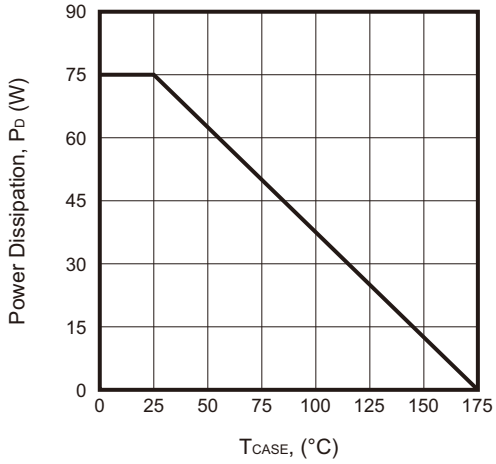


Fig.11 - Maximum Safe Operating Area

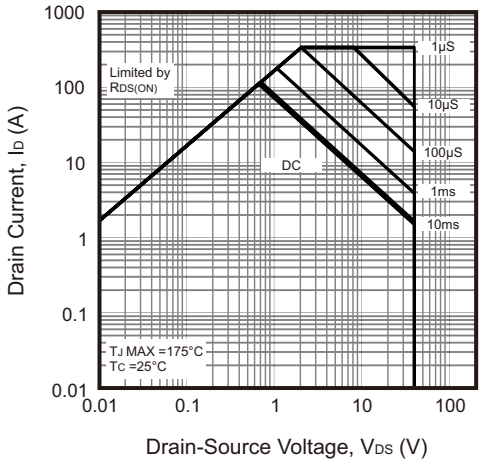
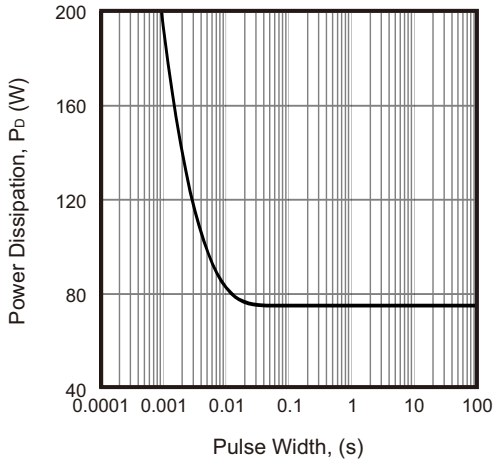


Fig.12 - Single Pulse Power Rating, Junction to Case



Typical Rating and Characteristic Curves (ACMS111NN04HB8-HF)

Fig.13 - $R_{DS(ON)}$ vs. V_{GS}

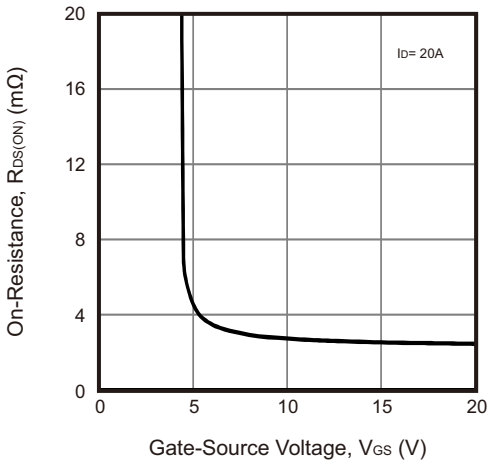
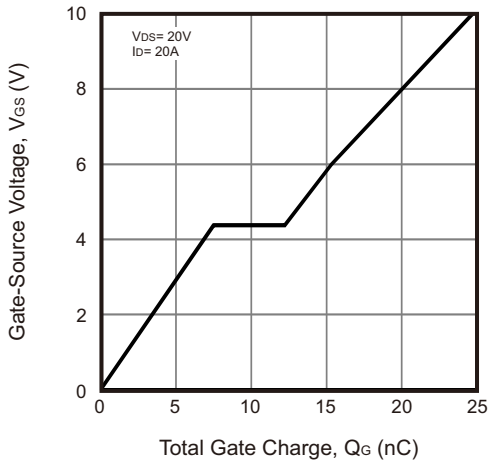
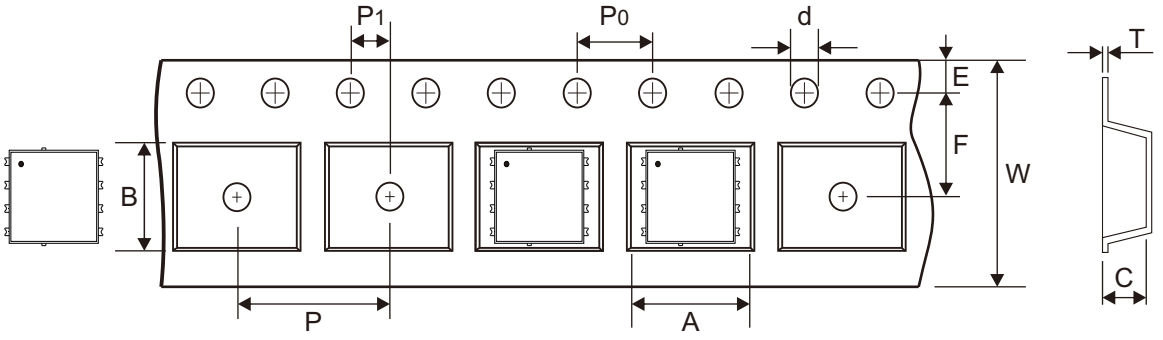
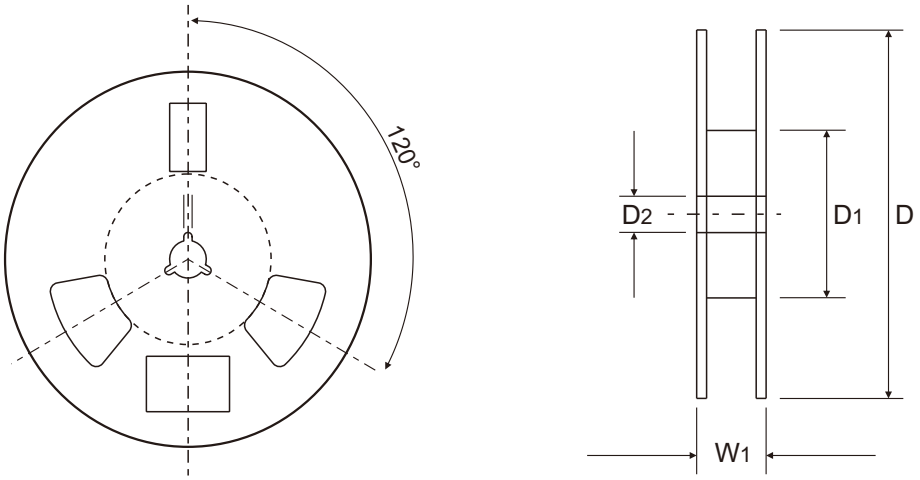


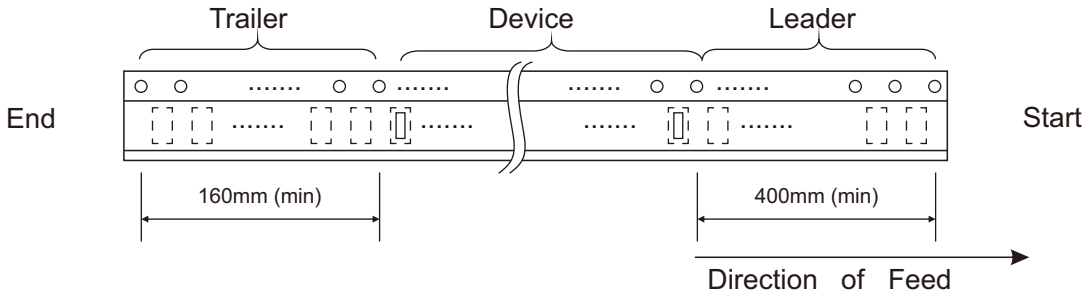
Fig.14 - Gate Charge



Reel Taping Specification





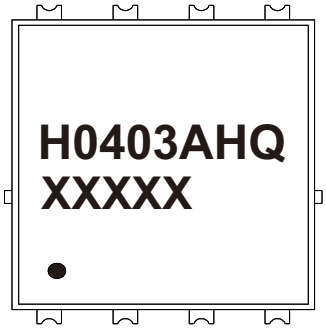


	SYMBOL	A	B	C	d	D	D1	D2
PDFN5x6 -8L-B	(mm)	6.60 ± 0.10	5.50 ± 0.10	1.30 ± 0.10	1.55 ± 0.05	330.00 ± 2.00	100.00 ± 2.00	13.00 + 0.50 − 0.20
	(inch)	0.260 ± 0.004	0.217 ± 0.004	0.051 ± 0.004	0.061 ± 0.002	12.992 ± 0.079	3.937 ± 0.079	0.512 + 0.020 − 0.008

	SYMBOL	E	F	P	P0	P1	T	W	W1
PDFN5x6 -8L-B	(mm)	1.75 ± 0.10	5.50 ± 0.10	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.25 ± 0.03	12.00 + 0.30 − 0.10	18.40 Max
	(inch)	0.069 ± 0.004	0.217 ± 0.004	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.001	0.472 + 0.012 − 0.004	0.724 Max

Marking Code

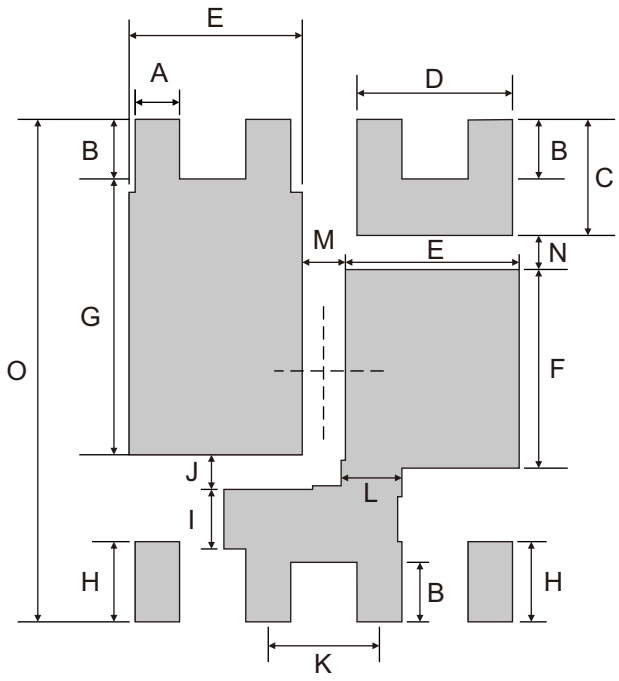
Part Number	Marking Code
ACMS111NN04HB8-HF	H0403AHQ



XXXXX = Control code

Suggested P.C.B. PAD Layout

SIZE	PDFN5x6-8L-B	
	(mm)	(inch)
A	0.51	0.020
B	0.785	0.031
C	1.535	0.060
D	1.78	0.070
E	1.98	0.078
F	2.63	0.104
G	3.65	0.144
H	1.065	0.042
I	0.79	0.031
J	0.46	0.018
K	1.27	0.050
L	0.69	0.027
M	0.50	0.020
N	0.45	0.018
O	6.65	0.262



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
PDFN5x6-8L-B	5,000	13