

## SMD POWER INDUCTORS / MCSMN Series



### Feature

1. Lowest height(3.0mm/max)in this package footprint.
2. Lowest DCR/uH, inthis package size.
3. Ultra low buzz noise,due to composite construction.
4. Frequency up to 1MHz

### Application

1. PDA/notebook/desktop/server applications
2. High current POL converters
3. Battery powered devices
4. DC/DC converter in distributed power systems or VRM applications.

### Product Identification

**MC SMN 63 - 3R3 M**  
**A B C D E**

A. company logo .

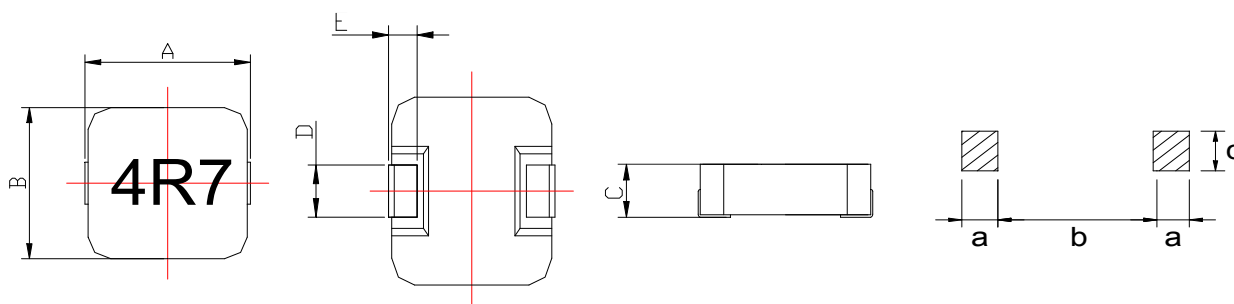
C.Dimension.

E. Tolerance. ( N=±30% M=±20% K=±10% )

B. Series name.

D. Inductance. ( See Details )

### Shape & Dimensions



Unit: mm

Series	A	B	C	D	E	a	b	c
MCSMN52	5.5±0.5	5.0±0.5	2.0 Max	1.7±0.5	1.2±0.5	2.0 ref	3.0 ref	2.5 ref
MCSMN53	5.5±0.5	5.0±0.5	3.0 Max	1.7±0.5	1.2±0.5	2.0 ref	3.0 ref	2.5 ref
MCSMN615	7.6 Max	6.8 Max	1.5 Max	2.9±0.5	1.6±0.5	2.5 ref	3.7 ref	3.5 ref
MCSMN618	7.6 Max	6.8 Max	1.8 Max	2.9±0.5	1.6±0.5	2.5 ref	3.7 ref	3.5 ref
MCSMN624	7.6 Max	6.8 Max	2.4 Max	2.9±0.5	1.6±0.5	2.5 ref	3.7 ref	3.5 ref
MCSMN63	7.6 Max	6.8 Max	3.0 Max	2.9±0.5	1.6±0.5	2.5 ref	3.7 ref	3.5 ref
MCSMN103	11.5 Max	10.3Max	3.0 Max	2.9±0.5	2.2±0.5	3.5 ref	6.0 ref	4.0 ref
MCSMN104	11.5 Max	10.3Max	4.0 Max	2.9±0.5	2.2±0.5	3.5 ref	6.0 ref	4.0 ref
MCSMN142	11.5 Max	10.3Max	4.2 Max	2.9±0.5	2.2±0.5	3.5 ref	6.0 ref	4.0 ref

■ Electrical characteristics (MCSMN52 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN52ZR47M	0.47	9.00	10.50	15.50
MCSMN52ZR56M	0.56	10.00	9.50	15.00
MCSMN52Z1R0M	1.00	17.00	8.00	9.00
MCSMN52Z2R2M	2.20	35.00	5.00	6.50
MCSMN52Z3R3M	3.30	58.00	4.50	5.00
MCSMN52Z4R7M	4.70	85.00	3.50	4.00
MCSMN52Z6R8M	6.80	120.00	2.80	3.40
MCSMN52Z100M	10.00	155.00	2.50	3.00

■ Electrical characteristics (MCSMN53 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN53ZR10M	0.10	2.50	32.00	34.00
MCSMN53ZR12M	0.12	2.60	30.00	32.00
MCSMN53ZR20M	0.20	3.90	21.00	14.50
MCSMN53ZR35M	0.35	5.00	16.50	9.00
MCSMN53ZR68M	0.68	12.00	8.50	14.00
MCSMN53Z1R0M	1.00	14.00	7.00	11.00
MCSMN53Z1R5M	1.50	25.00	6.00	10.00
MCSMN53Z2R2M	2.20	35.00	5.50	9.00
MCSMN53Z3R3M	3.30	38.00	5.00	7.00
MCSMN53Z4R7M	4.70	60.00	4.00	5.00
MCSMN53Z6R8M	6.80	110.00	3.00	3.50

NOTES:

Operating: -25°C ~ +120°C ( Including self-temperature rise)

Test Frequency:100KHZ/0.25V

Saturation Rated Current that will cause initial inductance value approximately 25% rolloff. (Ta=25±5°C)

Temperature Rise Current that will cause temperature rise approximate 40°C without core loss. (Ta=25±5°C)

■ Electrical characteristics (MCSMN615 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN615ZR33M	0.33	7.80	10.00	19.50
MCSMN615ZR56M	0.56	11.00	9.00	14.00
MCSMN615ZR68M	0.68	12.00	8.50	12.00
MCSMN615ZR82M	0.82	17.00	7.00	10.00
MCSMN615Z1R0M	1.00	21.00	5.50	9.00
MCSMN615Z2R2M	2.20	54.00	3.50	6.00
MCSMN615Z3R3M	3.30	63.00	3.30	5.50
MCSMN615Z4R7M	4.70	85.00	3.20	5.00
MCSMN615Z6R8M	6.80	135.00	2.50	4.00
MCSMN615Z100M	10.00	175.00	2.00	3.00

■ Electrical characteristics (MCSMN618 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN618ZR22M	0.22	5.20	14.00	29.00
MCSMN618ZR33M	0.33	6.80	12.00	22.00
MCSMN618ZR47M	0.47	8.40	11.00	18.00
MCSMN618ZR68M	0.68	12.70	9.00	17.00
MCSMN618Z1R0M	1.00	17.00	7.00	14.00
MCSMN618Z1R5M	1.50	26.00	6.50	12.00
MCSMN618Z2R2M	2.20	35.00	6.00	13.00
MCSMN618Z3R3M	3.30	60.00	3.50	10.00
MCSMN618Z4R7M	4.70	70.00	3.50	5.00
MCSMN618Z6R8M	6.80	110.00	2.80	3.50
MCSMN618Z8R2M	8.20	135.00	2.50	3.00
MCSMN618Z100M	10.00	155.00	2.30	2.50
MCSMN618Z150M	15.00	250.00	1.80	2.20

NOTES:

Operating: -25°C ~ +120°C ( Including self-temperature rise)

Test Frequency:100KHZ/0.25V

Saturation Rated Current that will cause initial inductance value approximately 25% rolloff. (Ta=25±5°C)

Temperature Rise Current that will cause temperature rise approximate 40°C without core loss. (Ta=25±5°C)

■ Electrical characteristics (MCSMN624 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN624ZR33M	0.33	4.10	18.00	24.50
MCSMN624ZR47M	0.47	5.10	15.00	22.00
MCSMN624ZR56M	0.56	6.50	13.00	17.00
MCSMN624ZR68M	0.68	7.20	12.00	16.00
MCSMN624Z1R0M	1.00	13.50	9.00	15.00
MCSMN624Z1R5M	1.50	20.00	8.00	15.00
MCSMN624Z2R2M	2.20	28.00	7.00	14.00
MCSMN624Z3R3M	3.30	39.00	5.50	13.00
MCSMN624Z4R7M	4.70	50.00	5.00	10.00
MCSMN624Z5R6M	5.60	60.00	4.50	6.50
MCSMN624Z6R8M	6.80	70.00	4.00	6.00
MCSMN624Z8R2M	8.20	90.00	3.50	5.00
MCSMN624Z100M	10.00	101.00	3.10	4.00

■ Electrical characteristics (MCSMN63 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN63ZR33M	0.33	3.50	21.00	25.00
MCSMN63ZR47M	0.47	4.10	18.00	20.00
MCSMN63ZR56M	0.56	4.50	16.50	18.00
MCSMN63ZR68M	0.68	5.30	16.00	17.00
MCSMN63ZR82M	0.82	6.00	14.00	16.00
MCSMN63Z1R0M	1.00	7.40	12.00	15.00
MCSMN63Z1R5M	1.50	10.00	10.00	14.00
MCSMN63Z2R2M	2.20	15.00	8.00	10.00
MCSMN63Z3R3M	3.30	22.00	6.50	9.50
MCSMN63Z4R7M	4.70	33.00	5.50	6.50
MCSMN63Z5R6M	5.60	42.00	5.50	6.00
MCSMN63Z6R8M	6.80	50.00	4.50	6.00
MCSMN63Z8R2M	8.20	60.00	4.30	5.80
MCSMN63Z100M	10.00	68.00	4.00	5.50

NOTES:

Operating: -25°C ~ +120°C ( Including self-temperature rise)

Test Frequency:100KHZ/0.25V

Saturation Rated Current that will cause initial inductance value approximately 25% rolloff. (Ta=25±5°C)

Temperature Rise Current that will cause temperature rise approximate 40°C without core loss. (Ta=25±5°C)

■ Electrical characteristics (MCSMN103 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN103ZR33M	0.33	1.60	23.00	32.00
MCSMN103ZR36M	0.36	1.60	23.00	28.00
MCSMN103ZR47M	0.47	2.50	23.00	26.00
MCSMN103ZR56M	0.56	3.00	22.00	24.00
MCSMN103ZR68M	0.68	3.40	21.00	23.00
MCSMN103Z1R0M	1.00	6.00	15.00	21.00
MCSMN103Z1R5M	1.50	7.50	13.50	20.00
MCSMN103Z2R2M	2.20	9.00	13.00	16.00
MCSMN103Z3R3M	3.30	16.00	9.00	14.00
MCSMN103Z4R7M	4.70	22.50	7.00	13.00
MCSMN103Z8R2M	8.20	45.00	5.00	8.50
MCSMN103Z100M	10.00	55.00	5.00	7.50
MCSMN103Z150M	15.00	65.00	4.00	6.00
MCSMN103Z220M	22.00	99.00	3.00	5.00

■ Electrical characteristics (MCSMN104 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	ΔT≤40°C
MCSMN104ZR22M	0.22	1.00	35.00	60.00
MCSMN104ZR36M	0.36	1.20	30.00	50.00
MCSMN104ZR45M	0.45	1.30	29.00	45.00
MCSMN104ZR47M	0.47	1.68	28.00	40.00
MCSMN104ZR56M	0.56	1.80	25.00	33.00
MCSMN104ZR68M	0.68	2.40	23.00	32.00
MCSMN104Z1R0M	1.00	3.30	18.00	28.00
MCSMN104Z1R5M	1.50	4.20	16.00	23.00
MCSMN104Z2R2M	2.20	7.00	12.00	18.00
MCSMN104Z3R3M	3.30	11.80	10.00	16.00
MCSMN104Z4R7M	4.70	20.00	8.50	15.00
MCSMN104Z5R6M	5.60	23.00	8.00	14.00
MCSMN104Z6R8M	6.80	25.00	7.50	12.00

NOTES:

Operating: -25°C ~ +120°C ( Including self-temperature rise)

Test Frequency:100KHZ/0.25V

Saturation Rated Current that will cause initial inductance value approximately 25% rolloff. (Ta=25±5°C)

Temperature Rise Current that will cause temperature rise approximate 40°C without core loss. (Ta=25±5°C)

■ Electrical characteristics (MCSMN142 Series)

Part Number	Inductance L0(uH)	DCR(mΩ)±20%.	I-sat (Amps)	I-rms (Amps)
	100KHz/0.25V	@ 25°C	70%L0	$\Delta T \leq 40^\circ\text{C}$
MCSMN142Z8R2M	8.20	27.00	7.00	9.00
MCSMN142Z100M	10.00	30.00	6.25	8.50
MCSMN142Z150M	15.00	45.00	6.00	7.00
MCSMN142Z220M	22.00	66.00	5.00	5.50
MCSMN142Z330M	33.00	92.00	4.40	5.00
MCSMN142Z470M	47.00	145.00	3.30	3.50
MCSMN142Z680M	68.00	195.00	2.30	3.00

NOTES:

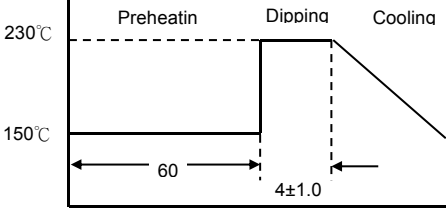
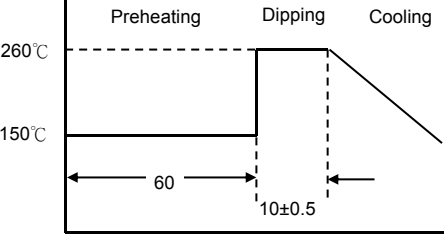
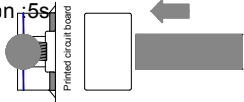
Operating: -25°C ~ +120°C ( Including self-temperature rise)

Test Frequency:100KHZ/0.25V

Saturation Rated Current that will cause initial inductance value approximately 25% rolloff. (Ta=25±5°C)

Temperature Rise Current that will cause temperature rise approximate 40°C without core loss. (Ta=25±5°C)

## ■ Reliability and Testing Conditions / Pin Type Power Inductors

Item	Specification	Conditions															
Operating temperature range	-25°C ~ +120°C ( Including self-temperature rise)																
Storage temperature and humidity range	-40°C ~ +85°C , 70% RH Max																
Solderability	More than 90% of the terminal electrode should be covered with solder.	 <p>Unit: Second</p>															
Solder Heat Resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	 <p>Unit: Second</p>															
Heat resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 96 hours in 85±5°C and 2 hour drying under normal condition.															
Cold resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 96 hours in -40±5°C and 2 hour drying under normal condition.															
Thermal shock	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	<p>After 100 cycles of following condition.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Times (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±5°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>85±5°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Times (min.)	1	-40±5°C	30	2	Room Temperature	Within 3	3	85±5°C	30	4	Room Temperature	Within 3
Step	Temperature (°C)	Times (min.)															
1	-40±5°C	30															
2	Room Temperature	Within 3															
3	85±5°C	30															
4	Room Temperature	Within 3															
Humidity Resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 96 hours in 40±2°C and 90 to 95% humidity , and 2 hour drying under normal condition.															
Vibration Test	Inductance within ±5% of initial value and appearance shall not break.	After vibration for 1hour, In each of three orientations at sweep vibration (10~55~10Hz) with 1.52mm P-P Amplitudes.															
Terminal strength	The terminal electrode and the ferrite must not be damaged	<p>Solder a chip to test substrate, and then laterally apply a load 10N in the arrow direction, Duration : 5s</p> 															

## ■ Recommended Soldering Conditions

Figure 1. Re-flow Soldering

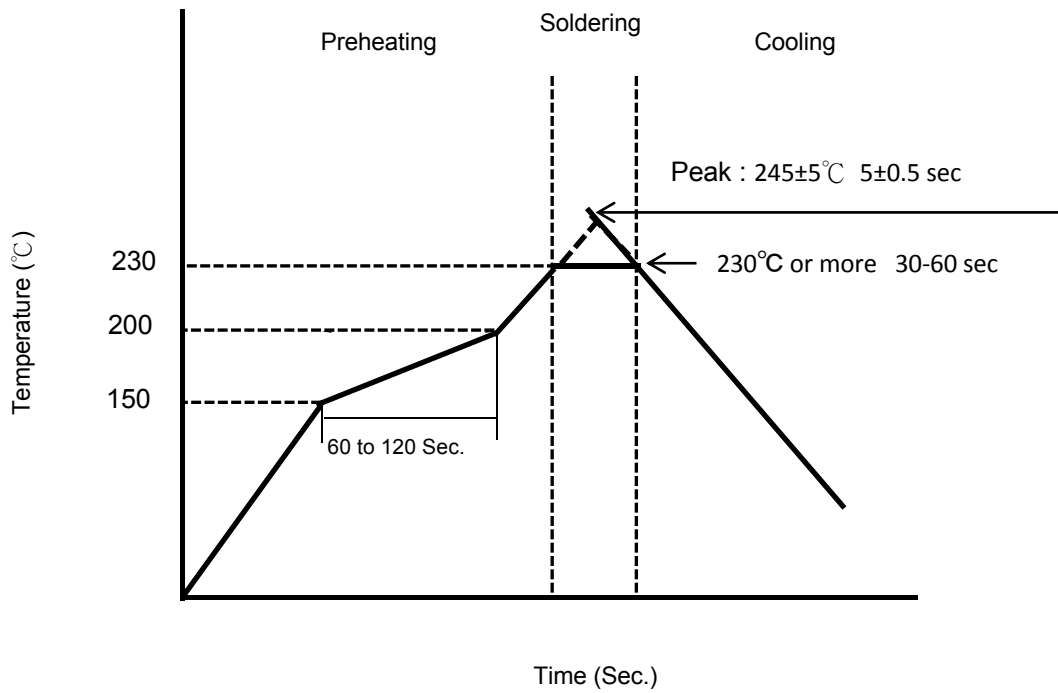
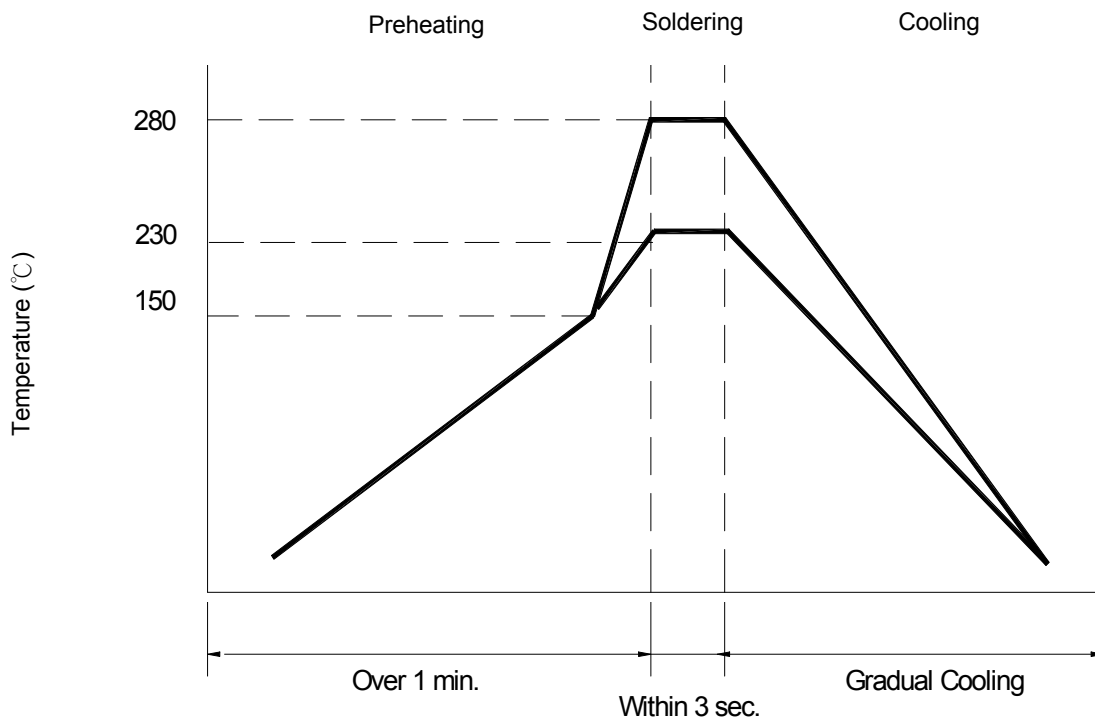


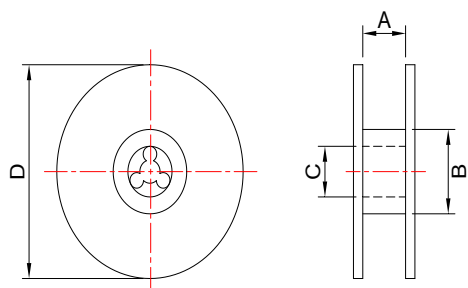
Figure 2. Hand Soldering





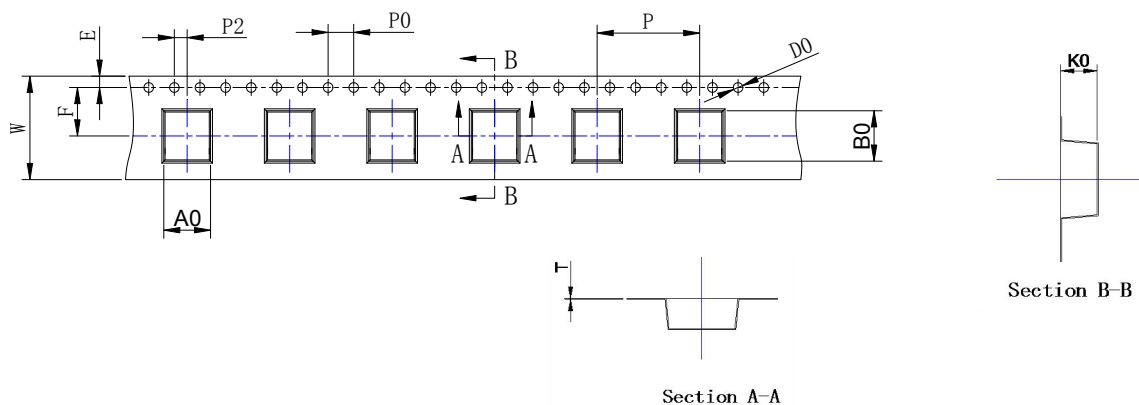
## ■ PACKAGING

### 一、Reel Dimension



P/N	Type	A(mm)	B(mm)	C(mm)	D(mm)
MCSMN52	13' x 16	16 ± 0.5	100 ± 2	13.5 ± 0.5	330
MCSMN53	13' x 16	16 ± 0.5	100 ± 2	13.5 ± 0.5	330
MCSMN615	13'x16	16±0.5	100 ± 2	13.5±0.5	330
MCSMN624	13'x16	16±0.5	100 ± 2	13.5±0.5	330
MCSMN63	13'x16	16±0.5	100 ± 2	13.5±0.5	330
MCSMN103	13'x24	24±0.5	100 ± 2	13.5±0.5	330
MCSMN104	13'x24	24±0.5	100 ± 2	13.5±0.5	330
MCSMN142	13'x24	24±0.5	100 ± 2	13.5±0.5	330

### 二、Tape Dimension



P/N	W	AO	BO	KO	P	F	E	PO	P2	T	Quantity (PCS/REEL)
MCSMN52	12±0.3	5.4±0.1	6.1±0.1	2.1±0.1	8.0±0.3	5.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	3000
MCSMN53	12±0.3	5.4±0.1	6.1±0.1	3.1±0.1	8.0±0.3	5.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	2500
MCSMN615	16±0.3	6.9±0.1	7.7±0.1	1.6±0.1	12±0.3	7.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	3000
MCSMN624	16±0.3	6.9±0.1	7.7±0.1	2.5±0.1	12±0.3	7.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	2000
MCSMN63	16±0.3	6.9±0.1	7.7±0.1	3.1±0.1	12±0.3	7.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	1500
MCSMN103	24±0.3	10.3±0.1	11.2±0.1	3.1±0.1	16±0.3	11.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	1500
MCSMN104	24±0.3	10.3±0.1	11.2±0.1	4.1±0.1	16±0.3	11.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	1000
MCSMN142	24±0.3	10.3±0.1	11.2±0.1	4.1±0.1	16±0.3	11.5±0.1	1.75±0.1	4±0.1	2±0.1	0.35±0.05	1000