MetalLions

MNR50** Series

Wire Wound SMD Power Inductors

FEATURES

- Magnetic-resin shielded construction reduces buzz noise to ultra-low levels
- Metallization on ferrite core results in excellent shock resistance and damage-free durability
- Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
- 30% higher current rating than conventional inductors of equal size
- Takes up less PCB real estate and save more power
- Operate temperature range .... －40℃～＋125℃(Including self temp. rise)
- RoHS compliant

APPLICATIONS

- Smart phone, smart TV, set top box, notebook
- Car navigation systems, telecomm base stations
- VR, AR
- LED lighting

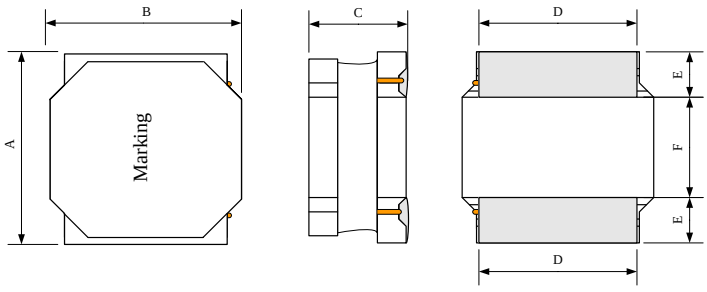
Explanation of Part Number

MNR 5040 T1R0 M T

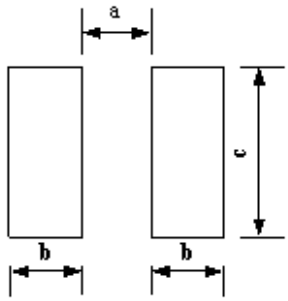
1 2 3 4 5 6

- 1:Product Series:Wire Wound SMD Power Inductors
- 2:Dimensions:
- 3: Feature Type:T Type
- 4: Initial inductance value: 1R0 = 1.0uH
- 5: Tolerance of Inductance:M:+/-20%， N:+/-30%
- 6:Packing:Tape Carrier Package

Dimensions: [mm]



Recommended Land Pattern



Unit: mm

Series	A	B	C	D	E	F	a Typ.	b Typ.	c Typ.
MNR5012	5.0±0.2	5.0±0.2	1.2 Max.	4.0±0.2	1.25±0.2	2.5±0.2	2.3	1.4	4.2
MNR5020	5.0±0.2	5.0±0.2	2.0 Max.	4.0±0.2	1.25±0.2	2.5±0.2	2.3	1.4	4.2
MNR5040	5.0±0.2	5.0±0.2	4.0 Max.	4.0±0.2	1.25±0.2	2.5±0.2	2.3	1.4	4.2

Electrical Characteristics List

MNR5012 Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current*3		Heat Rating Current *4	
	@100kHz,1V	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
MNR5012T1R0MT	1.0±20%	0.068	0.057	103	4.40	4.70	2.00	2.40
MNR5012T1R5MT	1.5±20%	0.086	0.072	68	3.70	3.80	1.90	2.20
MNR5012T2R2MT	2.2±20%	0.108	0.090	50	3.10	3.20	1.70	2.00
MNR5012T3R3MT	3.3±20%	0.151	0.126	34	2.40	2.60	1.40	1.70
MNR5012T4R7MT	4.7±20%	0.197	0.164	31	2.20	2.30	1.30	1.50
MNR5012T6R8MT	6.8±20%	0.294	0.245	22	1.70	1.90	1.00	1.20
MNR5012T100MT	10±20%	0.413	0.344	17	1.40	1.50	0.85	1.00
MNR5012T150MT	15±20%	0.523	0.436	13	1.20	1.30	0.80	0.92
MNR5012T220MT	22±20%	0.858	0.780	16	0.88	0.98	0.60	0.68

MNR5020 Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current*3		Heat Rating Current *4	
	@100kHz,1V	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
MNR5020TR22NT	0.22±30%	0.011	0.009	280	9.00	12.00	5.30	6.00
MNR5020TR24NT	0.24±30%	0.011	0.009	248	8.00	10.00	5.30	6.00
MNR5020TR47NT	0.47±30%	0.017	0.013	160	6.15	6.70	4.60	5.00
MNR5020TR56NT	0.56±30%	0.022	0.017	137	8.50	9.60	3.80	4.20
MNR5020TR68NT	0.68±30%	0.022	0.017	120	5.50	6.00	4.00	4.40
MNR5020TR82NT	0.82±30%	0.022	0.017	117	5.50	6.00	4.00	4.40
MNR5020T1R0MT	1.0±20%	0.026	0.020	114	4.10	5.00	3.80	4.10
MNR5020T1R2MT	1.2±20%	0.029	0.022	83	4.50	4.90	3.55	3.90
MNR5020T1R5MT	1.5±20%	0.034	0.026	68	4.10	4.50	3.20	3.50
MNR5020T2R2MT	2.2±20%	0.042	0.032	57	3.20	4.00	2.90	3.10
MNR5020T2R7MT	2.7±20%	0.049	0.038	52	2.90	3.50	2.70	2.90
MNR5020T3R0MT	3.0±20%	0.049	0.038	49	2.55	2.80	2.70	2.90
MNR5020T3R3MT	3.3±20%	0.056	0.043	46	2.55	3.00	2.50	2.70
MNR5020T3R6MT	3.6±20%	0.056	0.043	43	2.80	3.00	2.50	2.70
MNR5020T3R9MT	3.9±20%	0.056	0.043	40	2.30	2.80	2.50	2.70
MNR5020T4R3MT	4.3±20%	0.074	0.057	37	2.50	3.00	2.20	2.40
MNR5020T4R7MT	4.7±20%	0.074	0.057	37	2.50	2.70	2.20	2.40
MNR5020T5R1MT	5.1±20%	0.083	0.064	32	2.25	2.60	2.05	2.20
MNR5020T5R6MT	5.6±20%	0.083	0.064	32	2.30	2.50	2.05	2.20
MNR5020T6R8MT	6.8±20%	0.108	0.083	30	2.05	2.20	1.80	1.90
MNR5020T7R5MT	7.5±20%	0.117	0.090	26	1.85	2.00	1.75	1.90
MNR5020T8R2MT	8.2±20%	0.127	0.098	26	1.85	2.00	1.65	1.80
MNR5020T9R1MT	9.1±20%	0.143	0.110	24	1.70	1.80	1.55	1.70
MNR5020T100MT	10±20%	0.143	0.110	24	1.70	1.80	1.55	1.70

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current*3		Heat Rating Current *4	
	@100kHz,1V	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
MNR5020T120MT	12±20%	0.182	0.140	22	1.50	1.60	1.40	1.50
MNR5020T150MT	15±20%	0.215	0.165	20	1.35	1.40	1.25	1.30
MNR5020T180MT	18±20%	0.260	0.200	16	1.25	1.30	1.15	1.20
MNR5020T220MT	22±20%	0.294	0.226	14	1.15	1.20	1.10	1.20
MNR5020T330MT	33±20%	0.507	0.390	10	0.92	1.00	0.90	0.99
MNR5020T470MT	47±20%	0.680	0.523	7	0.77	0.84	0.77	0.84
MNR5020T560MT	56±20%	0.819	0.630	6	0.77	0.84	0.70	0.77
MNR5020T680MT	68±20%	0.962	0.740	6	0.65	0.70	0.64	0.70
MNR5020T820MT	82±20%	1.158	0.965	6	0.65	0.75	0.50	0.60
MNR5020T101MT	100±20%	1.430	1.100	6	0.53	0.58	0.53	0.58
MNR5020T121MT	120±20%	1.755	1.350	6	0.42	0.53	0.40	0.50
MNR5020T221MT	220±20%	2.60	2.00	4.5	0.30	0.33	0.40	0.45

MNR5040 Series

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current*3		Heat Rating Current *4	
	@100kHz,1V	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
MNR5040TR22NT	0.22±20%	0.008	0.006	289	18.00	20.00	6.50	7.50
MNR5040TR24NT	0.24±30%	0.008	0.006	251	15.70	18.00	6.40	7.40
MNR5040TR47NT	0.47±20%	0.009	0.007	171	10.00	11.50	6.60	7.60
MNR5040T1R0MT	1.0±20%	0.016	0.012	117	7.35	8.20	4.90	5.10
MNR5040T1R2MT	1.2±20%	0.021	0.016	110	6.50	7.10	4.15	4.30
MNR5040T1R5MT	1.5±20%	0.020	0.015	86	6.30	7.30	4.30	4.80
MNR5040T1R8MT	1.8±20%	0.021	0.016	55	5.50	6.40	4.15	4.30
MNR5040T2R2MT	2.2±30%	0.025	0.019	50	4.90	5.60	3.80	4.30
MNR5040T2R7MT	2.7±30%	0.029	0.022	37	4.30	5.10	3.60	4.10
MNR5040T3R0MT	3.0±30%	0.029	0.022	37	4.15	4.80	3.60	4.20
MNR5040T3R3MT	3.3±30%	0.031	0.024	32	3.95	4.60	3.40	3.90
MNR5040T3R6MT	3.6±20%	0.031	0.026	30	3.80	4.40	3.30	3.70
MNR5040T3R9MT	3.9±30%	0.035	0.027	29	3.55	4.20	3.20	3.70
MNR5040T4R7MT	4.7±30%	0.039	0.030	28	3.50	3.90	3.00	3.30
MNR5040T5R6MT	5.6±20%	0.046	0.035	27	3.00	4.10	2.80	3.10
MNR5040T6R8MT	6.8±20%	0.056	0.043	21	2.90	3.50	2.50	2.80
MNR5040T8R2MT	8.2±20%	0.062	0.048	20	2.70	3.00	2.30	2.60
MNR5040T100MT	10±20%	0.083	0.064	18	2.35	2.90	2.10	2.40
MNR5040T120MT	12±20%	0.100	0.077	14	2.20	2.50	2.00	2.10
MNR5040T150MT	15±20%	0.112	0.086	13	2.00	2.30	2.00	2.10
MNR5040T180MT	18±20%	0.155	0.119	12	1.70	2.00	1.45	1.65
MNR5040T220MT	22±20%	0.168	0.129	11	1.60	1.90	1.50	1.60
MNR5040T270MT	27±20%	0.244	0.188	9.8	1.52	1.75	1.10	1.25
MNR5040T330MT	33±20%	0.244	0.188	9	1.30	1.50	1.20	1.40
MNR5040T470MT	47±20%	0.354	0.272	7	1.10	1.30	1.00	1.10
MNR5040T510MT	51±20%	0.494	0.380	6	1.00	1.20	1.00	1.10
MNR5040T560MT	56±20%	0.494	0.380	6	1.05	1.20	0.80	0.90

Part Number	Inductance	DC Resistance		Self-resonant Frequency	Saturation Current*3		Heat Rating Current *4	
	@100kHz,1V	Max.	Typ.	Min.	Max.	Typ.	Max.	Typ.
Units	μH	Ω		MHz	A		A	
Symbol	L	DCR		S.R.F	Isat		Irms	
MNR5040T680MT	68±20%	0.520	0.40	6	0.90	1.10	0.80	0.90
MNR5040T750MT	75±20%	0.585	0.450	6	0.85	0.95	0.72	0.80
MNR5040T101MT	100±20%	0.728	0.560	5	0.75	0.90	0.70	0.80
MNR5040T151MT	150±20%	0.975	0.750	3.7	0.65	0.67	0.60	0.70
MNR5040T221MT	220±20%	1.820	1.400	3.0	0.48	0.55	0.40	0.50
MNR5040T301MT	300±20%	2.600	2.000	2.7	0.50	0.58	0.35	0.40
MNR5040T331MT	330±20%	2.730	2.100	2.7	0.42	0.47	0.40	0.50
MNR5040T471MT	470±20%	3.900	3.000	2.7	0.37	0.43	0.35	0.40
MNR5040T561MT	560±20%	4.920	3.780	1.5	0.31	0.36	0.31	0.35
MNR5040T681MT	680±20%	5.070	3.900	1.60	0.30	0.35	0.25	0.30

※1: All test data is referenced to 20°C ambient;

※2: Rated current: Isat or Irms, whichever is smaller;

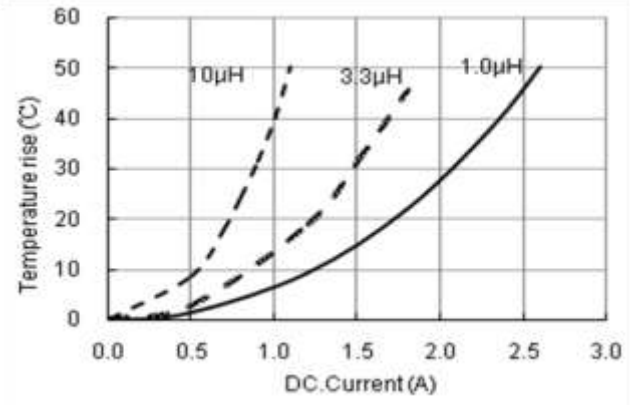
※*3: Isat: DC current at which the inductance drops approximate 30% from its value without current;

※*4: Irms: DC current that causes the temperature rise (△T =40°C) from 20°C ambient.

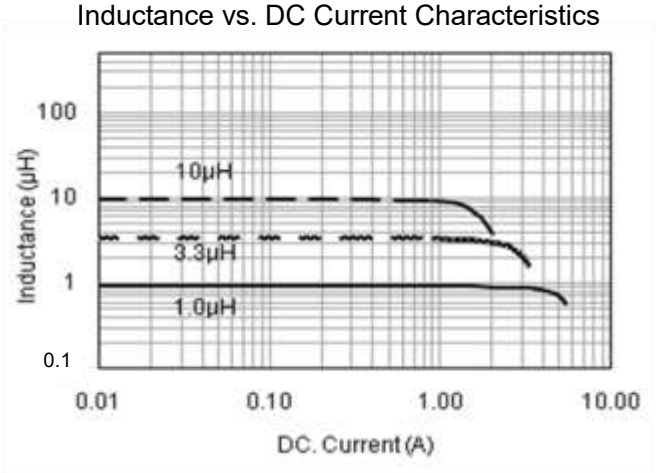
TYPICAL ELECTRICAL CHARACTERISTICS

MNR5012 Series

Temperature vs. DC Current Characteristics

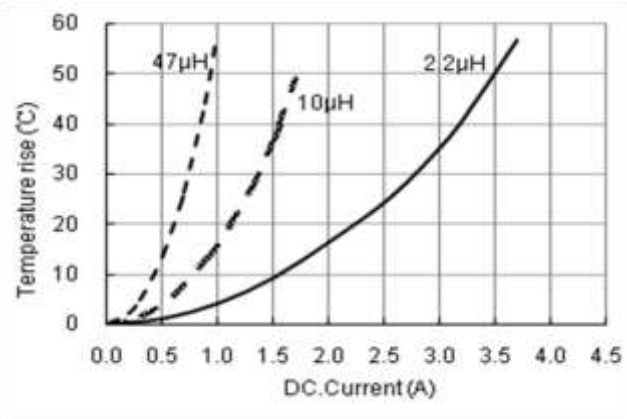


Inductance vs. DC Current Characteristics

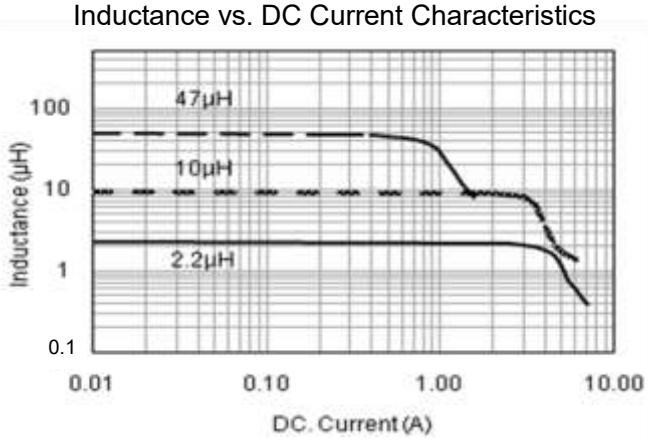


MNR5020 Series

Temperature vs. DC Current Characteristics

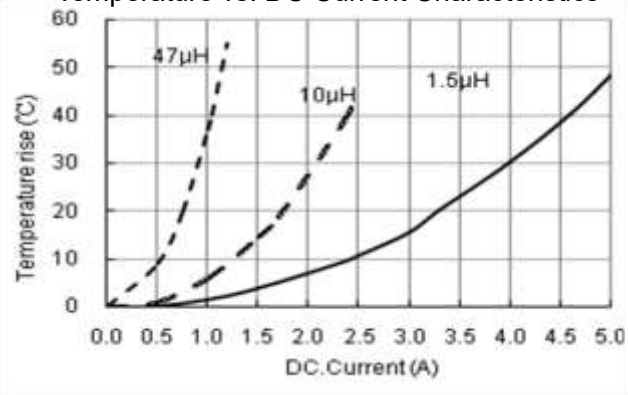


Inductance vs. DC Current Characteristics

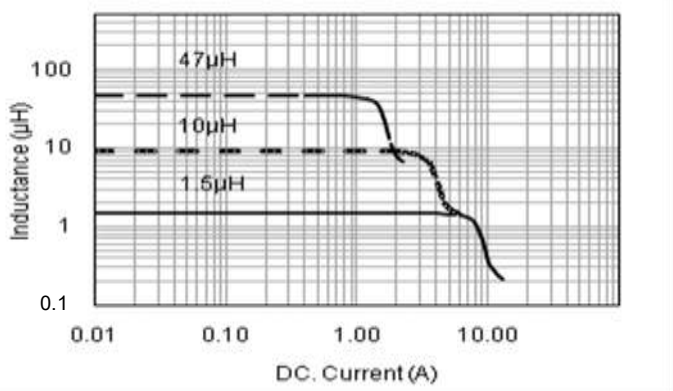


MNR5040 Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics



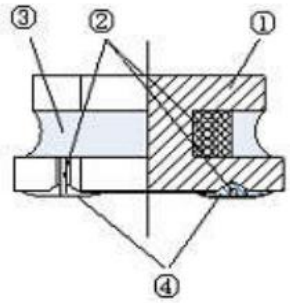
Reliability Test

TEST ITEM	SPECIFICATION	TEST CONDITION
Withstanding voltage test	After test, inductors shall have no evidence of electrical and mechanical damage.	AC voltage of 100v and AC current of 1mA applied between inductor's terminal and core for 3 secs.
Resistance to soldering heat	1. Inductor shall have no eviden of electrical and mechanical damage. 2. Inductance shall not chan more than ±5%. 3. Q shall not change more than 20%.	a. Temp: 260±5 b. Time: 10±1.0 se
Solderability test	The terminal shall be at least 95% covered with solder.	After fluxing, the terminal shall be dipped in a melted solder bath at 245±5℃ for 4±1.0 secs.
High temperature & high humidity test	The anti-erosion quality of the surface and the specimen's inductance shall not change from the initial value within ±10%	a. Test conditi 1)Temp.:85℃, R.H.:85% 2)Time:144±2hours b. Measurement method The experimental component should be put at normal condition for 2 hours then to measure again after test
Salt spray test		a. Test conditi 1)Temp.:35±2℃ 2)Time:48±2hours 3)Salt solution PH:6.5~7.2 b. Measurement method The experimental component should be put at normal condition for 2 hours then to measure again after test
Vibration test	1. Inductance shall be within 10% of the initial value. 2. Appearance:no dama	a. Frequency: 10 to 55 b. Amplitude: 1.5 c. Direction and tim X, Y and Z directions for 2 hours each.

TEST ITEM	SPECIFICATION	TEST CONDITION
Free fall test	No mechanical damage shall be noticed.	Drop 5 times on a concrete floor from lm the height
Temperature Cycling test	1. Inductance shall be within 10% of the initial value 2. Appearance:No dama	a. Test conditi 1)Temp.:-55℃,time:30±3min 2)Temp.:+125℃,time: 30±3min 3)Cycles times:12 cycles b. Measurement method The experimental component should be put at normal condition for 2 hours then to measure again after test
High Temperature resistance test		a. Test conditi 1)Applied rated current 2)Temp.:85℃±2℃ 3)Test time:1000+24/-0H b. Measurement method The experimental component should be put at normal condition for 24 hours then to measure again after test.
Low temperature resistance test		a. Test conditi 1)Temp.:-55℃±2℃ 2)Test time:1000+24/-0H b. Measurement method The experimental component should be put at normal condition for 24 hours then to measure again after test.

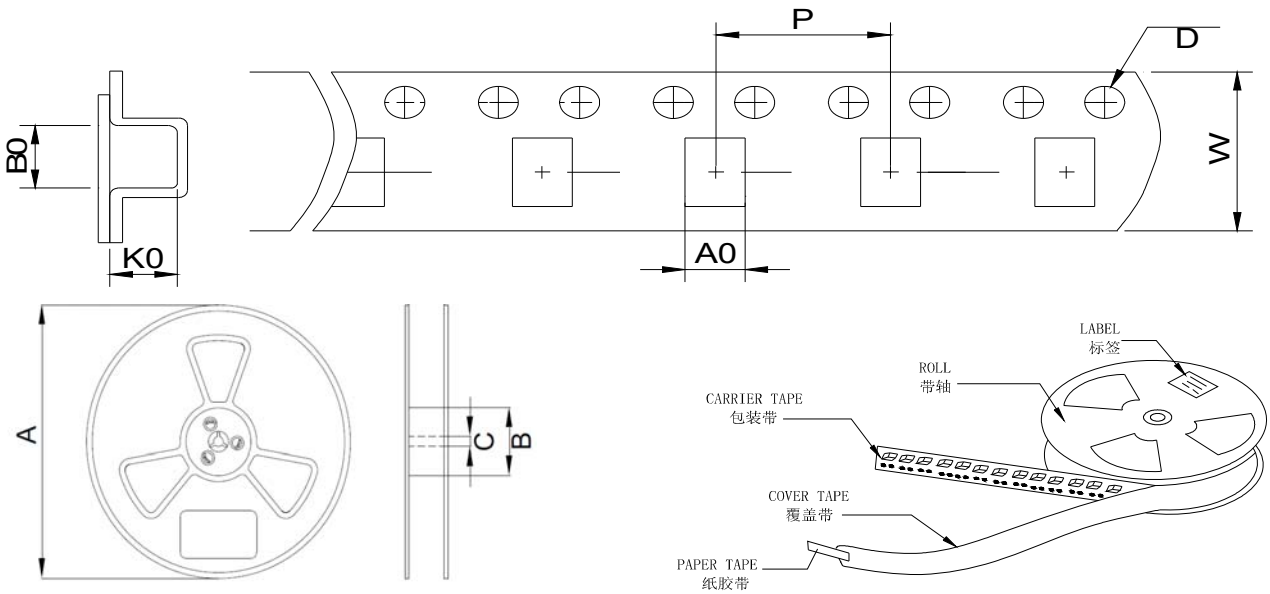
We have suggested the storage period of lead-free product should not over 6 months.

Structure (The structure of product.)



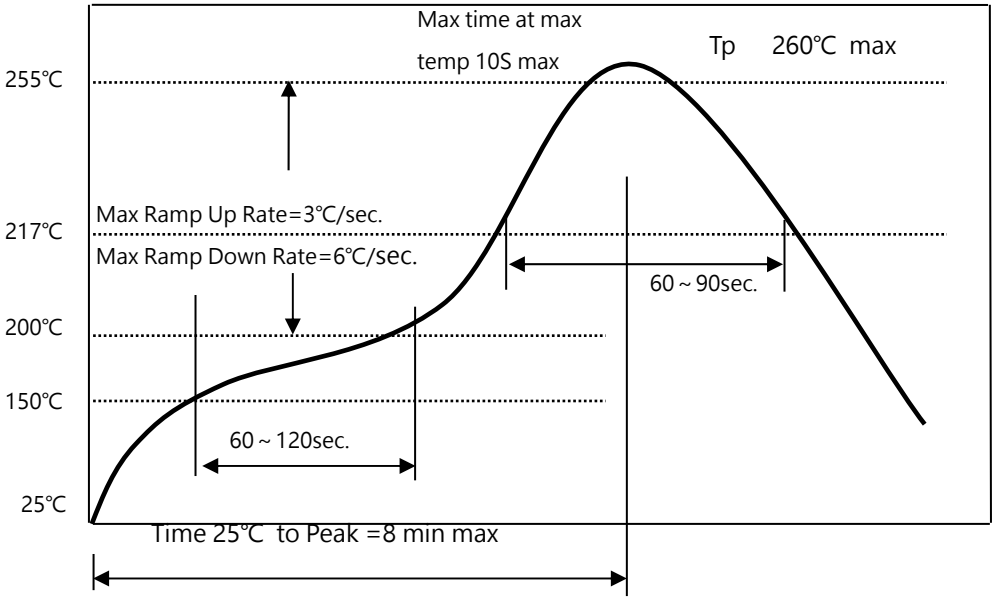
NO	Components	Material
①	Core	Ni-Zn Ferrite
②	Wire	Polyurethane system enameled copper wire
③	Magnetic Glue	Epoxy resin and magnetic powder
④	Plating	AgNiSn or FeNiCu + Sn Alloy

PACKAGING SPECIFICATION :



Type	Tape Dimension (mm)						Reel Dimension (mm)			Quantity (Pcs/Reel)
	W	A0	B0	K0	D	P	A	B	C	
MNR5012	12	5.3	5.3	1.4	1.5	8	330	100	13	4500
MNR5020	12	5.3	5.3	2.3	1.5	8	330	100	13	2500
MNR5040	12	5.3	5.3	4.2	1.5	8	330	100	13	1500

Re-flowing Profile:



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