MORE® CHANCE 茂昌电子

CUSTOMER :	STD
PRODUCTS :	Molded Wire Wound Chip Inductors
PART NO :	MCML Series
CUST P/ NO :	
DATE :	2025.04.16
SALES DEP :	
E-MAIL :	

VERSION :	REV.A
CHANGE PROJECT :	-
BEFORE :	-
AFTER :	-
CHANGE DATE :	-
CUSTOMER SIGNATURE :	-

APPROVAL BY :	*CHECK BY :*	*DRAWN BY :*
Honey Wei	***Leo Wang***	***May Gao***

ISO 9001:2015 CERTIFIED COMPANY · Pb lead-free · RoHS 2 COMPLIANT · Halogen Free

CHANGE HISTORY

Ver	Revision Items	Before Revision	After Revision	Date
Rev.A	-	-	-	2025.04.16

MCML Series

- *Molded Wire Wound Chip Inductors*
- *Operating Temperature up tp -40 ℃ ~ 125 ℃*
- *High Current up to 1050 mA*
- *Low DCR down to 0.11 Ohms*
- *Environmental Lead free*
- *Environmental RoHS2.0 compliant*
- *Environmental halogen free*
- *Storage Temperature ：-40 ℃ ~ +85 ℃*
- *Packaging 7"/13"Reel, Plastic tape:8/12 mm wide*

FEATURES

- Lead-free materials is used for the plating on the terminals.
- The product uses metal terminals,which realize excellent connection reliability.
- High resistance to heat,humidity,mechanical shocks and presser.
- Accurate dimensions for automatically surface mounted.
- The product has good heat durability that withstands lead-free compatible reflow soldering conditions.

Applications

. EM serials high reliable wire would chip inductors for communication , equipment , instrument
- video & audio have been developen in response to the trend toward higher density mounting of parts in electric circuits.

PRODUCT IDENTIFICATION

MC	ML	4532	Z	2R2	K	C
①	②	③	④	⑤	⑥	⑦

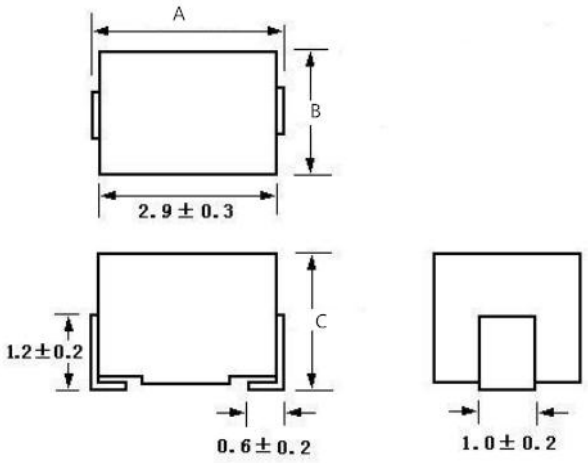
① Brand & Product classification
② Product Series NO.(ML：Chip Inductors)
③ External Dimensions.(4532：L:4.5 × W:3.2 × H:3.2) [mm]
④ Separator code.
⑤ Nominal Inductance

Example	Nominal Value
R22	0.22uH
2R2	2.2uH
100	10uH
101	100uH
70N	70nH

⑥ Inductance Tolerance.(J：±5% ;K：±10% ; M：±20%)
⑦ Material Code.(C：C Type material.)

Mechanical & Dimensions

(Unit: mm)



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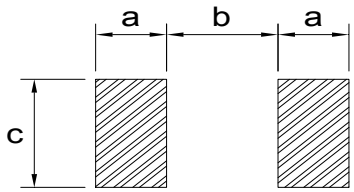
Recommend Land Pattern Dimensions

(Unit: mm)



Code	Dimensions
a	1.0 Ref
b	2.0 Ref
c	2.0 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML3225ZR10☐	0.10	0.44	450	700	100	28
MCML3225ZR12☐	0.12	0.22	450	500	25.2	30
MCML3225ZR15☐	0.15	0.25	450	450	25.2	30
MCML3225ZR18☐	0.18	0.28	450	400	25.2	30
MCML3225ZR22☐	0.22	0.32	450	350	25.2	30
MCML3225ZR27☐	0.27	0.36	450	320	25.2	30
MCML3225ZR33☐	0.33	0.40	450	300	25.2	30
MCML3225ZR39☐	0.39	0.45	450	250	25.2	30
MCML3225ZR47☐	0.47	0.50	450	220	25.2	30
MCML3225ZR56☐	0.56	0.55	450	180	25.2	30
MCML3225ZR68☐	0.68	0.60	450	160	25.2	30
MCML3225ZR82☐	0.82	0.65	450	140	25.2	30
MCML3225Z1R0☐	1.00	0.70	400	120	7.96	30
MCML3225Z1R2☐	1.20	0.75	390	100	7.96	30
MCML3225Z1R5☐	1.50	0.85	370	85	7.96	30

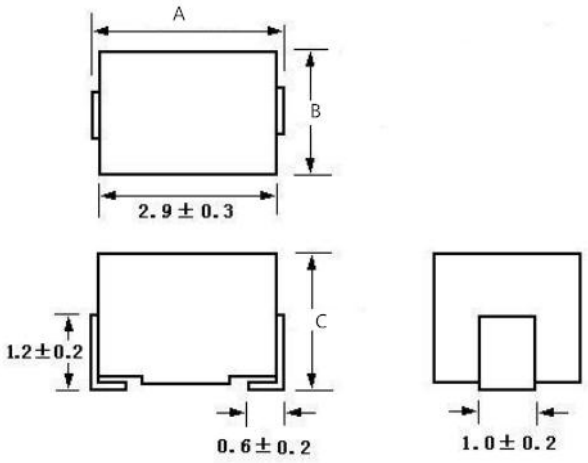
Note:

1.The nominal DCR is measured at 20℃ ambient temperature.

2.Rated current: Value obtained when current flows and the temperature has risen to 20°C or when DC current the initial value of inductance has fallen by 10%, whichever is smaller

Mechanical & Dimensions

(Unit: mm)



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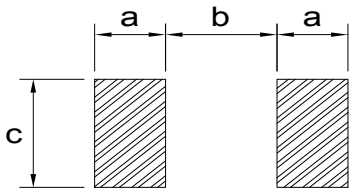

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Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML3225Z1R8☐	1.8	0.90	350	80	7.96	30
MCML3225Z2R2☐	2.2	1.00	320	75	7.96	30
MCML3225Z2R7☐	2.7	1.10	290	70	7.96	30
MCML3225Z3R3☐	3.3	1.20	260	60	7.96	30
MCML3225Z3R9☐	3.9	1.30	250	55	7.96	30
MCML3225Z4R7☐	4.7	1.50	220	50	7.96	30
MCML3225Z5R6☐	5.6	1.60	200	45	7.96	30
MCML3225Z6R8☐	6.8	1.80	180	40	7.96	30
MCML3225Z8R2☐	8.2	2.00	170	35	7.96	30
MCML3225Z100☐	10.0	2.10	150	30	2.52	30
MCML3225Z120☐	12.0	2.50	140	20	2.52	30
MCML3225Z150☐	15.0	2.80	130	20	2.52	30
MCML3225Z180☐	18.0	3.30	120	20	2.52	30
MCML3225Z220☐	22.0	3.70	110	20	2.52	30
MCML3225Z270☐	27.0	5.00	80	20	2.52	30

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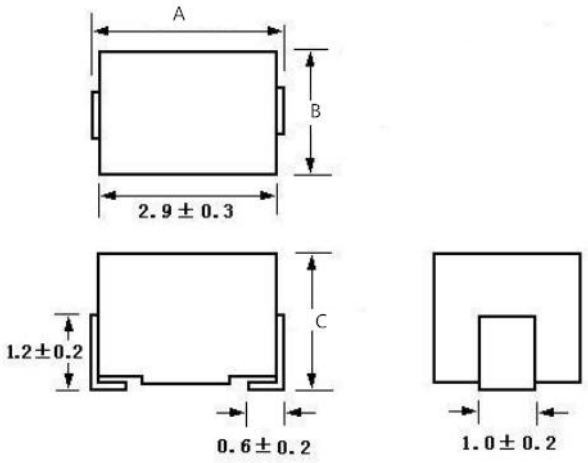

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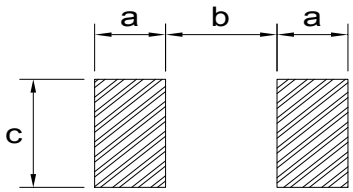

Code	Dimensions
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c	2.0 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML3225Z330☐	33	5.6	70	17	2.52	30
MCML3225Z390☐	39	6.4	65	16	2.52	30
MCML3225Z470☐	47	7.0	60	15	2.52	30
MCML3225Z560☐	56	8.0	55	13	2.52	30
MCML3225Z680☐	68	9.0	50	12	2.52	30
MCML3225Z820☐	82	10.0	45	11	2.52	30
MCML3225Z101☐	100	10.0	40	10	0.796	20
MCML3225Z121☐	120	11.0	70	10	0.796	20
MCML3225Z151☐	150	15.0	65	8	0.796	20
MCML3225Z181☐	180	17.0	60	7	0.796	20
MCML3225Z221☐	220	21.0	50	7	0.796	20

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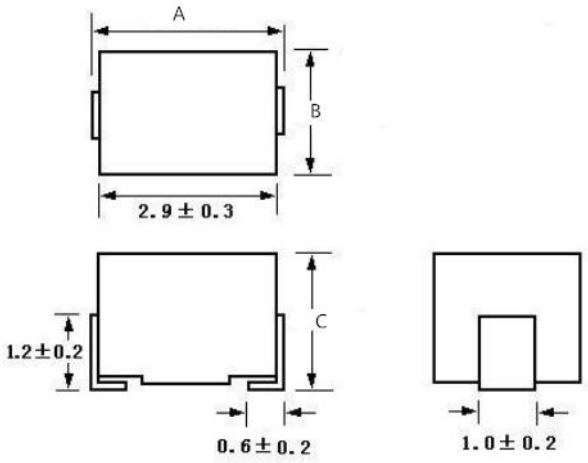

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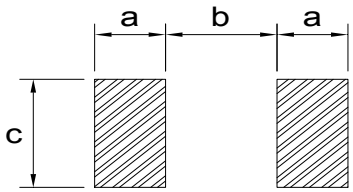

Code	Dimensions
a	1.0 Ref
b	2.0 Ref
c	2.0 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML3225Z1R0MC	1.0	0.156	770	100	7.96	10
MCML3225Z1R5MC	1.5	0.195	580	80	7.96	10
MCML3225Z2R2MC	2.2	0.260	480	65	7.96	10
MCML3225Z3R3MC	3.3	0.325	400	55	7.96	10
MCML3225Z4R7MC	4.7	0.520	320	45	7.96	10
MCML3225Z6R8MC	6.8	0.650	280	35	7.96	10
MCML3225Z100KC	10.0	1.105	220	28	2.52	15
MCML3225Z150KC	15.0	1.690	180	25	2.52	15
MCML3225Z220KC	22.0	2.600	145	20	2.52	15
MCML3225Z330KC	33.0	3.640	115	15	2.52	15
MCML3225Z390KC	39.0	4.500	110	14	2.52	15
MCML3225Z470KC	47.0	5.460	105	13	2.52	15
MCML3225Z560KC	56.0	7.050	95	11	2.52	15
MCML3225Z680KC	68.0	8.450	85	10	2.52	15
MCML3225Z820KC	82.0	8.710	80	9	2.52	15
MCML3225Z101KC	100.0	9.900	75	8	0.796	15

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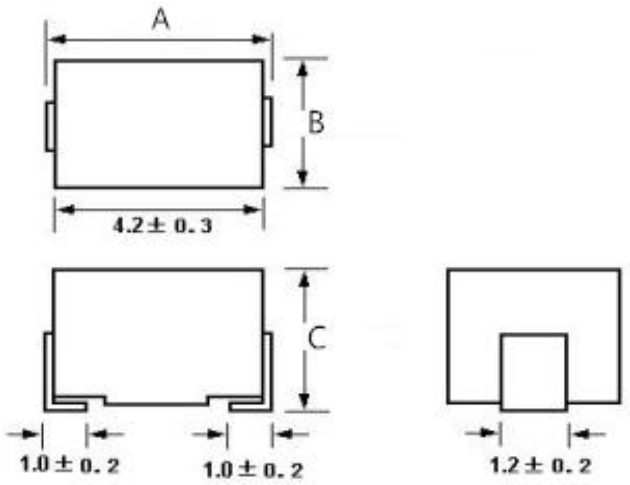
Mechanical & Dimensions

(Unit: mm)



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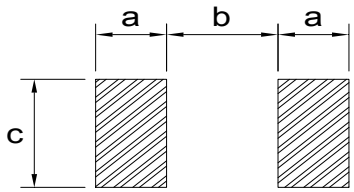
(Unit: mm)



Code	Dimensions
a	1.5 Ref
b	3.0 Ref
c	2.8 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML4532ZR10☐	0.10	0.18	800	300	25.2	35
MCML4532ZR12☐	0.12	0.20	770	280	25.2	35
MCML4532ZR15☐	0.15	0.22	730	250	25.2	35
MCML4532ZR18☐	0.18	0.24	700	220	25.2	35
MCML4532ZR22☐	0.22	0.25	665	200	25.2	40
MCML4532ZR27☐	0.27	0.26	635	180	25.2	40
MCML4532ZR33☐	0.33	0.28	605	165	25.2	40
MCML4532ZR39☐	0.39	0.30	575	150	25.2	40
MCML4532ZR47☐	0.47	0.32	545	145	25.2	40
MCML4532ZR56☐	0.56	0.36	520	140	25.2	40
MCML4532ZR68☐	0.68	0.40	500	135	25.2	40
MCML4532ZR82☐	0.82	0.45	475	130	25.2	40
MCML4532Z1R0☐	1.00	0.50	450	100	7.96	50
MCML4532Z1R2☐	1.20	0.55	430	80	7.96	50
MCML4532Z1R5☐	1.50	0.60	410	70	7.96	50

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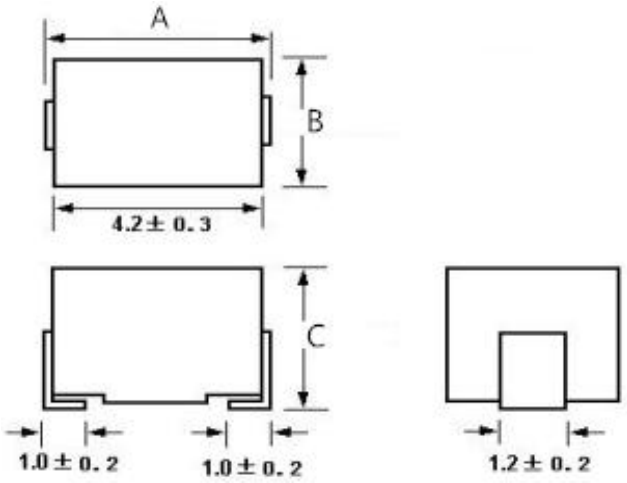
Mechanical & Dimensions

(Unit: mm)



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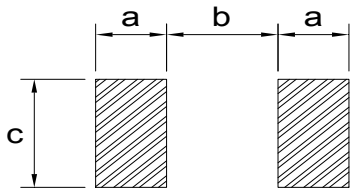

Code	Dimensions
a	1.5 Ref
b	3.0 Ref
c	2.8 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML4532Z1R8☐	1.8	0.65	390	60	7.96	50
MCML4532Z2R2☐	2.2	0.70	380	55	7.96	50
MCML4532Z2R7☐	2.7	0.75	370	50	7.96	50
MCML4532Z3R3☐	3.3	0.80	355	45	7.96	50
MCML4532Z3R9☐	3.9	0.90	330	40	7.96	50
MCML4532Z4R7☐	4.7	1.00	315	35	7.96	50
MCML4532Z5R6☐	5.6	1.10	300	33	7.96	50
MCML4532Z6R8☐	6.8	1.20	285	27	7.96	50
MCML4532Z8R2☐	8.2	1.40	270	25	7.96	50
MCML4532Z100☐	10.0	1.60	250	20	2.52	50
MCML4532Z120☐	12.0	2.00	225	18	2.52	50
MCML4532Z150☐	15.0	2.50	200	17	2.52	50
MCML4532Z180☐	18.0	2.80	190	15	2.52	50
MCML4532Z220☐	22.0	3.20	180	13	2.52	50
MCML4532Z270☐	27.0	3.60	170	12	2.52	50

Note:

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Mechanical & Dimensions

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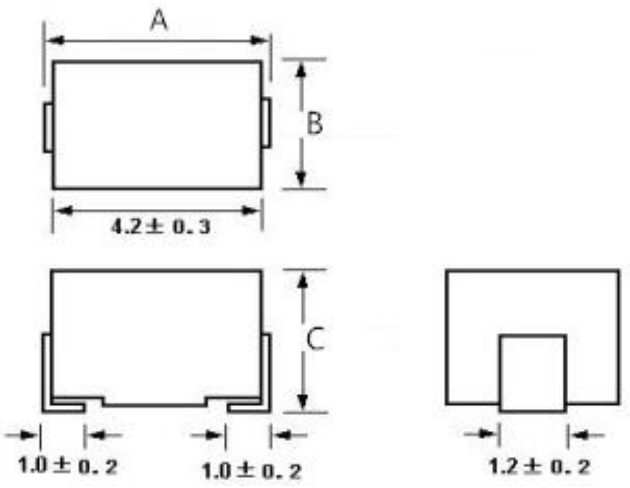

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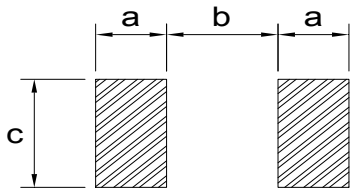

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c	2.8 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML4532Z330☐	33	4.0	160	11.0	2.52	50
MCML4532Z390☐	39	4.5	150	10.0	2.52	50
MCML4532Z470☐	47	5.0	140	10.0	2.52	50
MCML4532Z560☐	56	5.5	135	9.0	2.52	50
MCML4532Z680☐	68	6.0	130	9.0	2.52	50
MCML4532Z820☐	82	7.0	120	8.0	2.52	50
MCML4532Z101☐	100	8.0	110	8.0	0.796	40
MCML4532Z121☐	120	8.0	110	6.0	0.796	40
MCML4532Z151☐	150	9.0	105	5.0	0.796	40
MCML4532Z181☐	180	9.5	102	5.0	0.796	40
MCML4532Z221☐	220	10.0	100	4.0	0.796	40
MCML4532Z271☐	270	12.0	92	4.0	0.796	40
MCML4532Z331☐	330	14.0	85	3.5	0.796	40
MCML4532Z391☐	390	18.0	80	3.0	0.796	40
MCML4532Z471☐	470	26.0	62	3.0	0.796	40

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Mechanical & Dimensions

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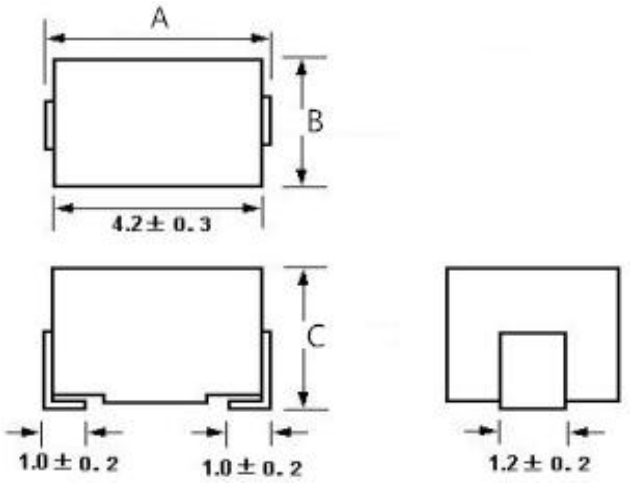

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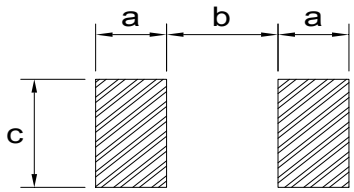

Code	Dimensions
a	1.5 Ref
b	3.0 Ref
c	2.8 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML4532Z561☐	560	30.0	50	3.0	0.796	30
MCML4532Z681☐	680	30.0	50	3.0	0.796	30
MCML4532Z821☐	820	35.0	30	2.5	0.796	30
MCML4532Z102☐	1000	40.0	30	2.5	0.252	20

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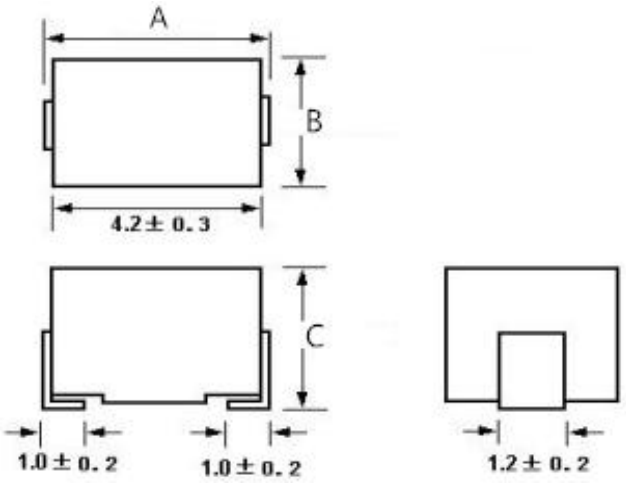

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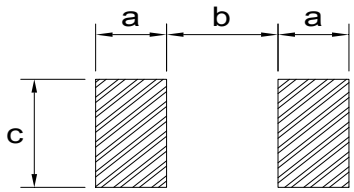

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MCML4532Z1R0KC	1.0	0.11	1050	180	7.96	10
MCML4532Z1R2KC	1.2	0.12	1000	160	7.96	10
MCML4532Z1R5KC	1.5	0.15	950	130	7.96	10
MCML4532Z1R8KC	1.8	0.16	900	100	7.96	10
MCML4532Z2R2KC	2.2	0.18	850	80	7.96	10
MCML4532Z2R7KC	2.7	0.20	800	60	7.96	10
MCML4532Z3R3KC	3.3	0.22	750	45	7.96	10
MCML4532Z3R9KC	3.9	0.24	700	40	7.96	10
MCML4532Z4R7KC	4.7	0.27	650	35	7.96	10
MCML4532Z5R6KC	5.6	0.30	650	30	7.96	10
MCML4532Z6R8KC	6.8	0.35	600	28	7.96	10
MCML4532Z8R2KC	8.2	0.40	600	25	7.96	10
MCML4532Z100KC	10.0	0.50	550	22	2.52	10
MCML4532Z120KC	12.0	0.60	500	21	2.52	10
MCML4532Z150KC	15.0	0.70	450	20	2.52	10
MCML4532Z180KC	18.0	0.80	400	19	2.52	10

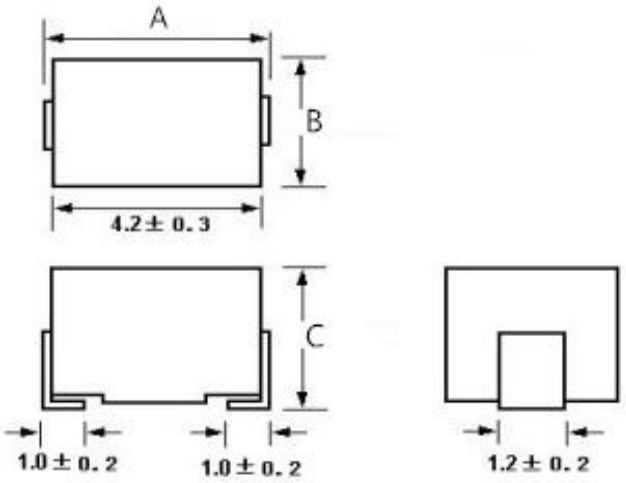
Note:

1.The nominal DCR is measured at 20℃ ambient temperature.

2.Rated current: Value obtained when current flows and the temperature has risen to 20°C or when DC current the initial value of inductance has fallen by 10%, whichever is smaller

Mechanical & Dimensions

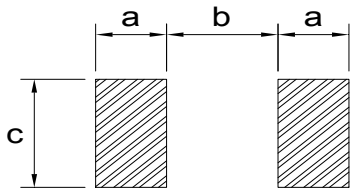
(Unit: mm)



Code	Dimensions
A	4.5 ± 0.4
B	3.2 ± 0.2
C	3.2 ± 0.2

Recommend Land Pattern Dimensions

(Unit: mm)



Code	Dimensions
a	1.5 Ref
b	3.0 Ref
c	2.8 Ref

Electrical Characteristics

Part Number	Inductance (μH)	DCR[1] (Ω) Max	Rated Current[2] (mA)Max	SRF(MHz) Min.	Test Frequency L,Q (MHz)	Q Min
MCML4532Z220KC	22.0	0.9	370	18.0	2.52	10
MCML4532Z270KC	27.0	1.2	330	16.0	2.52	10
MCML4532Z330KC	33.0	1.4	300	14.0	2.52	10
MCML4532Z390KC	39.0	1.6	280	12.0	2.52	10
MCML4532Z470KC	47.0	1.9	260	11.5	2.52	10
MCML4532Z560KC	56.0	2.2	240	11.0	2.52	10
MCML4532Z680KC	68.0	2.6	220	10.0	2.52	10
MCML4532Z820KC	82.0	3.5	200	9.0	2.52	10
MCML4532Z101KC	100.0	4.0	180	8.0	0.796	20
MCML4532Z121KC	120.0	4.5	160	7.5	0.796	20
MCML4532Z151KC	150.0	6.5	140	7.0	0.796	20
MCML4532Z181KC	180.0	7.5	120	6.5	0.796	20
MCML4532Z221KC	220.0	9.0	120	5.5	0.796	20
MCML4532Z271KC	270.0	11.0	100	5.0	0.796	20
MCML4532Z331KC	330.0	13.0	90	4.0	0.796	20

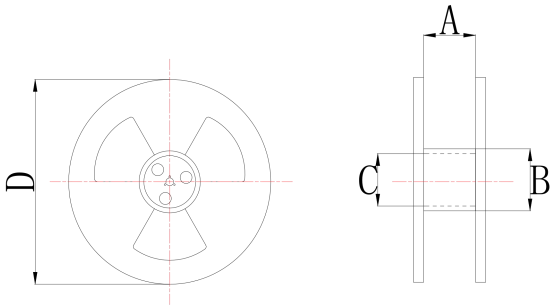
Note:

1.The nominal DCR is measured at 20℃ ambient temperature.

2.Rated current: Value obtained when current flows and the temperature has risen to 20°C or when DC current the initial value of inductance has fallen by 10%, whichever is smaller

Packaging

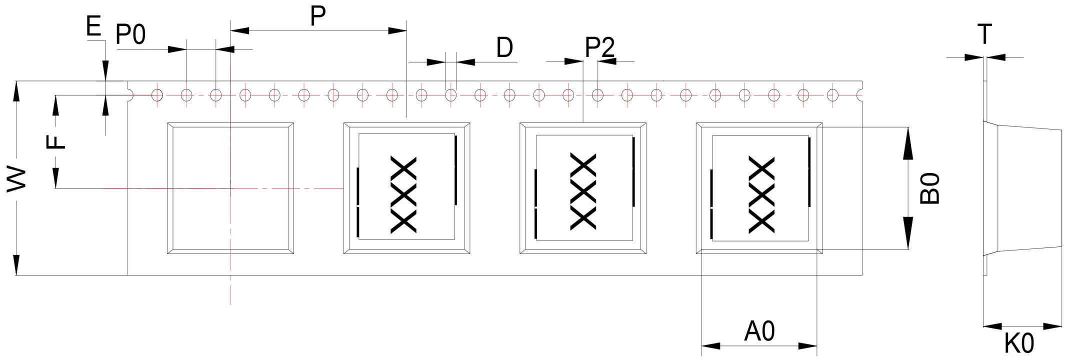
Reel Dimension:



P/N	Type	A(mm)	B(mm)	C(mm)	D(mm)	Chip/Reel
MCML3225	7" x 8mm	10max.	50 min	13 ± 0.5	178± 2	2,000
MCML4532	7" x 12mm	14max.	50 min	13 ± 0.5	178± 2	500
	13" x 12mm	14max.	100 min	13 ± 0.5	330± 2	2,000

Packaging

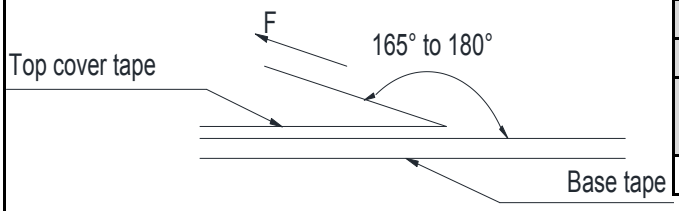
Tape Dimension:



P/N	Ao	Bo	Ko	E	F	D	P2	P	W	P0
MCML3225	2.88±0.1	3.65±0.1	2.50±0.1	1.75±0.1	3.50±0.1	1.5±0.1	2.0±0.1	4.0±0.1	8±0.3	4.0±0.1
MCML4532	3.31±0.1	4.95±0.1	3.50±0.1	1.75±0.1	3.50±0.1	1.5±0.1	2.0±0.1	8.0±0.1	12±0.3	4.0±0.1

Packaging

Tearing Off Force:



The force tearing off cobe tape is 10 to 130 g.f in the arrow direction under the following conditions			
Room Temp (℃)	Room Humidity (%)	Room atrn (hPa)	Teaming Speed (mm/min)
5~35	45~85	860~1060	300

※Storage Conditions

1. Temperature and humidity conditions: -40℃ ~ +85℃ and 70% RH.
2. Recommended products should be used within 6 months form the time of delivery.
3. The packaging material should be kept where no chlorine or sulfur exists in the air.

※Transportation

1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

Recommended Soldering Conditions

Figure 1. Re-flow Soldering

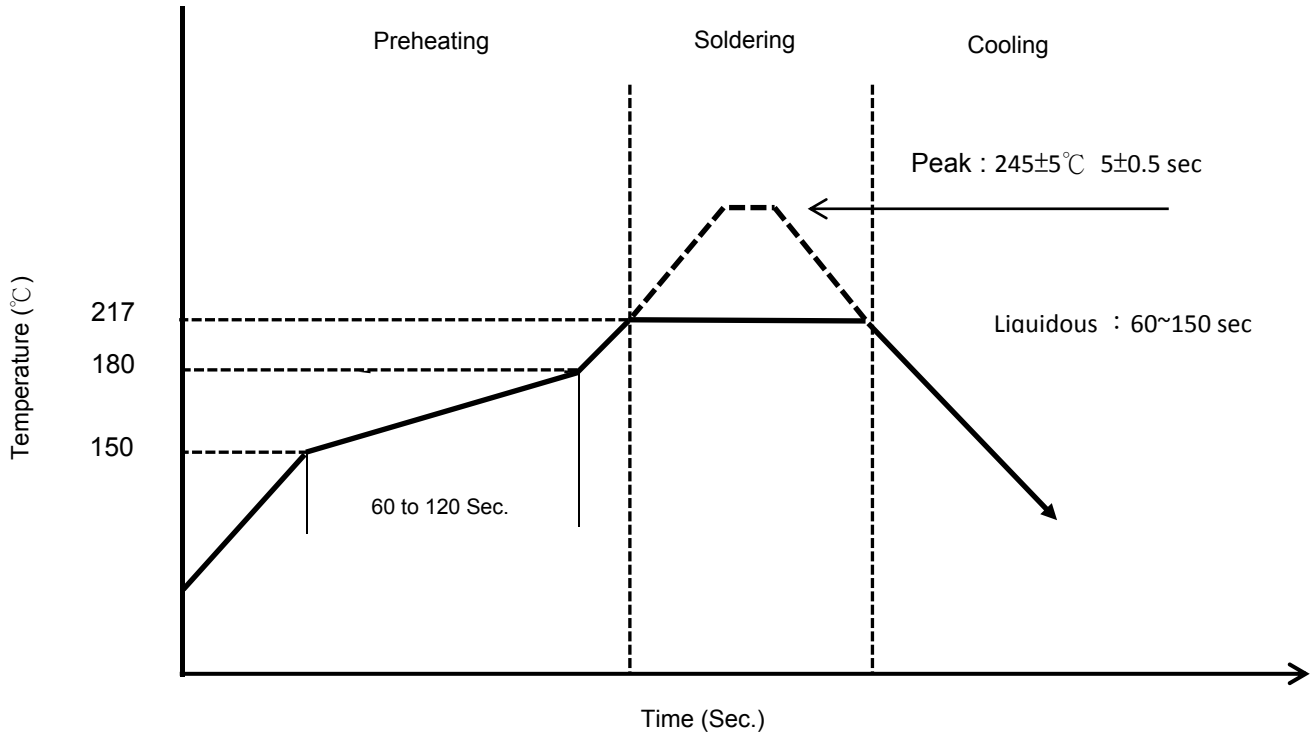
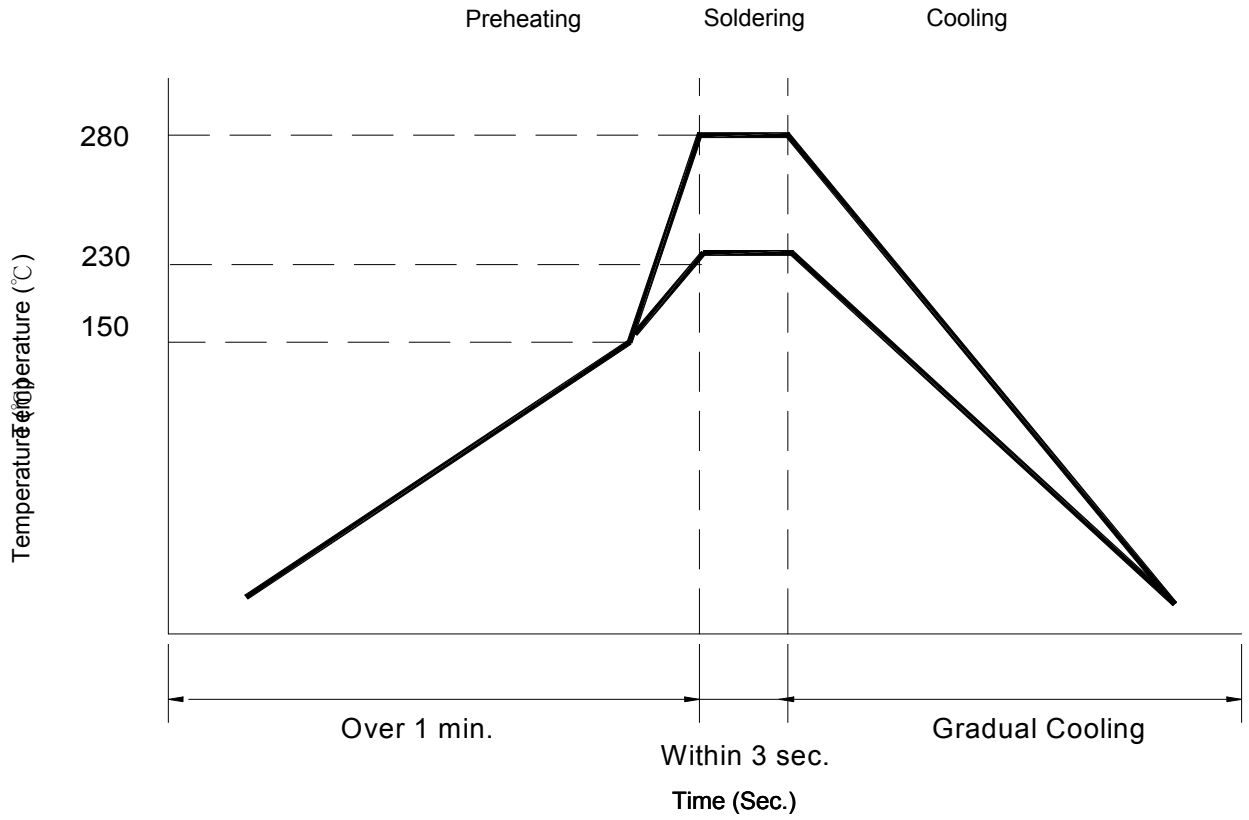


Figure 2. Hand Soldering



Reliability and Testing Conditions

Item	Specification	Conditions
Operating temperature range	-40℃ ~ +125℃ (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.	- Preheat: 150 ℃, 60 sec - Solder: Sn96.5%-Ag3%-Cu0.5% - Temperature: 245±5℃ - Flux for lead free: Rosin 9.5% - Dip time: 4±1 sec - Depth: completely cover the termination
Resistance to Soldering Heat	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	- Solder technique simulation: SMD - Temperature (°C): 260 ± 5 (solder temp) - Time (s): 10 ± 1 - Temperature ramp / immersion and emersion rate: 25 mm/s ± 6 mm/s - Number of heat cycles: 1
Resistance to High Temperature	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	500 hrs. at 125°C±3°C Unpowered. Measurement at 24±4 hours after test conclusion.
Resistance to Low Temperature	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	500 hrs. at -40°C±2°C. Unpowered. Measurement at 24±4 hours after test conclusion.
Resistance to Humidity	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 500 hours in 40±2℃ and 90 to 95% humidity , 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.	After 30 cycles of following condition.
Vibration Test	Inductance within ±10% 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	Solder a chip to test substrate, and then laterally apply a load 10N in the arrow direction, Duration :5s
Drop Test	Inductance within ±20% of initial value. The appearance shall not break.	Drop 3 times on a concrete floor from a height of 75cm by inimum packing

Step	Temperature (℃)	Times (min.)
1	-40±3°C	30
2	Room Temperature	Within 3
3	125±3°C	30
4	Room Temperature	Within 3