

Specification For Approval



Item P/N	CM2012AI-SERIES	Test Instrument	E4991 / 4339 / 19073
Product	Common Mode Choke	Test Frequency	100 MHz / 0.5V

Customer : _____

Customer P/N : _____

Description : _____ Common Mode Choke

HT P/N : _____ CM2012AI - SERIES

Revision No. : _____ Version: 1.1

Date : _____

Notes : _____ Automobile Conform to AEC-Q200



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IATF 16949:2016 / ISO 9001:2015 / ISO 14001:2015

Ht Documented		Customer Approval
Approved	Jack	
Checked	George	
Prepared	Cherrie	



HUNGTRON TECHNOLOGY Co., Ltd.

✓ RoHS2
2011 65/EU

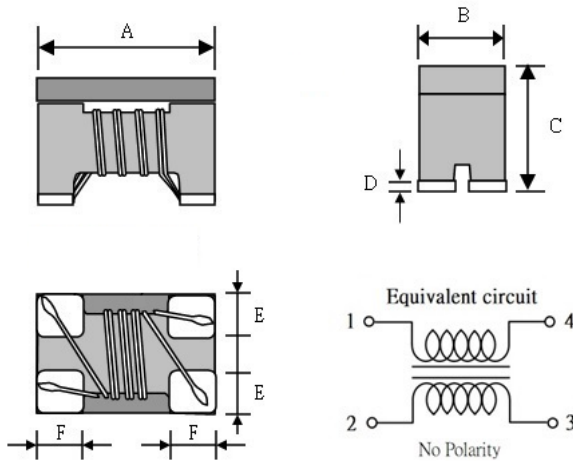
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Specification



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■ Style and Dimensions (mm)



CM2012	Dimensions
A	2.0 ± 0.2
B	1.2 ± 0.2
C	1.2 ± 0.2
D	0.2 ± 0.1
E	0.50 ± 0.1
F	0.50 ± 0.1

■ Explanation Of Part Numbers

① ② ③ ④ ⑤
CM 2012 AI - 900 S

- ① Product name
- ② Shapes and dimensions
- ③ Shielding Type for automotive Electronics based on AEC-Q200 except for Power train and Safety
- ④ Impedance 【at 100MHz】 900:90Ω
- ⑤ Tolerance : S = ±25% ; M = ±20%

■ Electrical Characteristics

P/N	Z(Ω) Common Mode	DCR (Ω)	Rated current (mA)	Rated Voltage	Insulation Resistance	Withstanding Voltage
	Impedance at 100MHz	Max.	Max.	Vdc (V) Typ.	IR (MΩ) Min	Vdc (V)Typ.
CM2012AI-900□	90	0.30	400	50	10	125
CM2012AI-121□	120	0.30	370	50	10	125
CM2012AI-201□	200	0.35	330	50	10	125
CM2012AI-361□	360	0.40	280	50	10	125
CM2012AI-681□	680	0.80	220	50	10	125
CM2012AI-102□	1000	1.50	190	50	10	125
CM2012AI-222□	2200	2.00	150	50	10	125

※Operating temperature : -40 to +125℃

Storage temp. and humidity: Less than 40℃ and 60% RH.

Typical Heat Rating DC Current would cause an approximately ΔT of 40℃

If Use Wave soldering is there will be some risk.

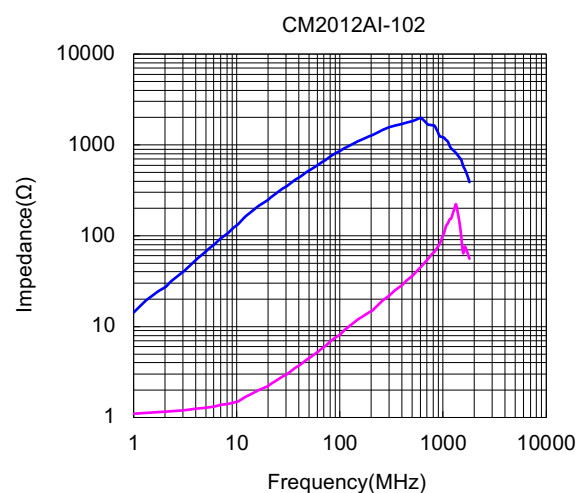
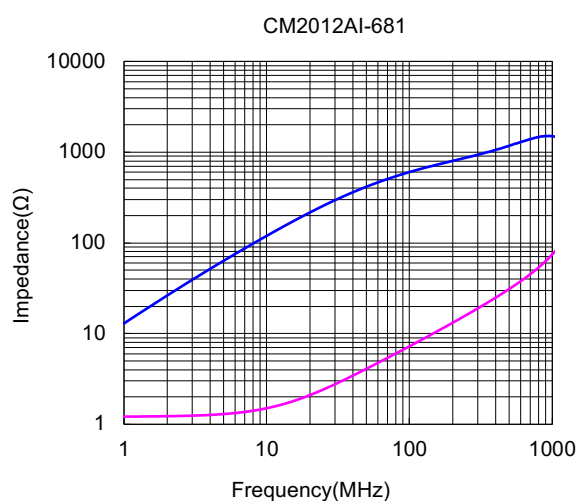
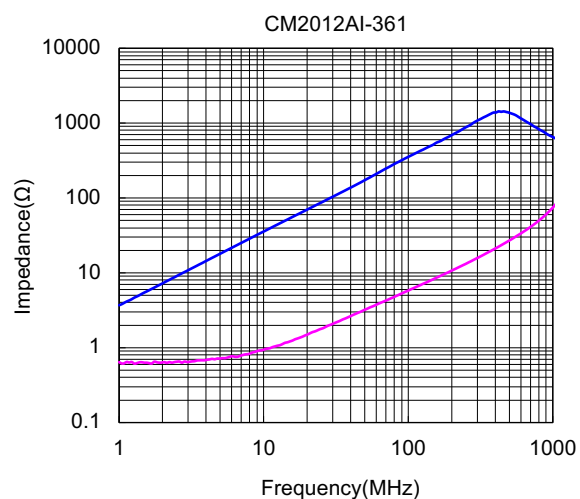
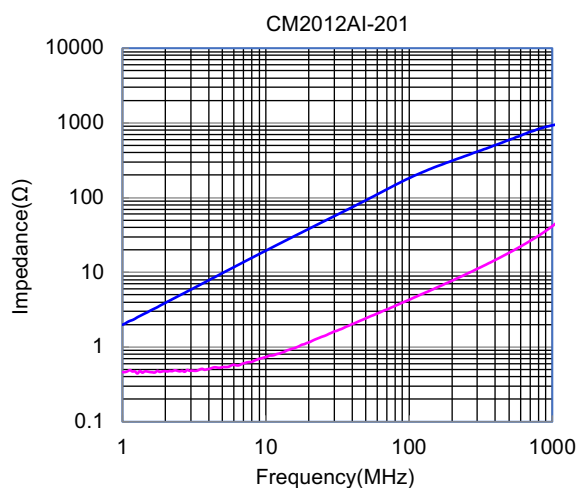
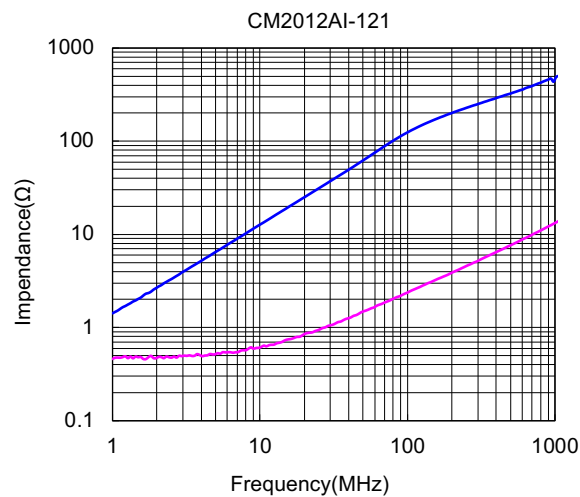
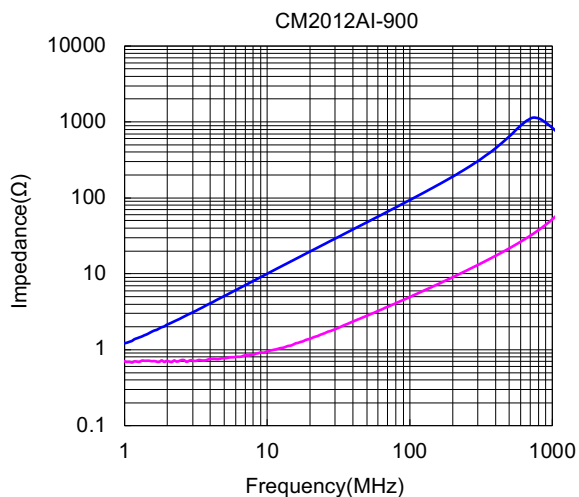
Re-flow soldering temperatures below 240 degrees, there will be unwitting risk.

Characteristics



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■ Performance Curves

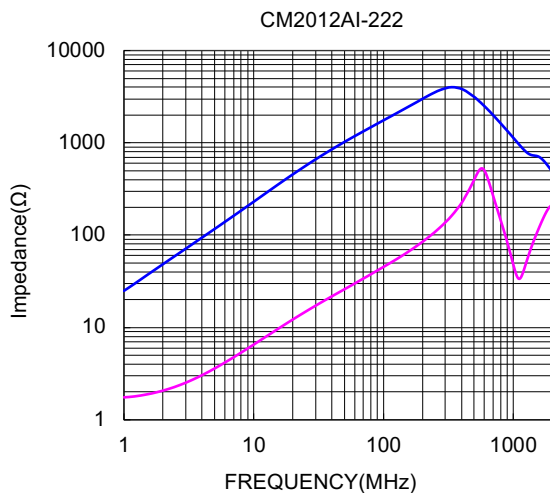


Characteristics



Item P/N	CM2012AI-SERIES	Test Instrument	E4991 / 4339 / 19073
Product	Common Mode Choke	Test Frequency	100 MHz / 0.5V

■ Performance Curves



Characteristics



Item P/N	CM1210AI-SERIES	Test Instrument	E4991 / 4339 / 19073
Product	Common Mode Choke	Test Frequency	100 MHz / 0.5V

Electrical Performance

No.	Item	Specifications	Test Method
1	Impedance (Ω) (at 100MHz)	Electrical Characteristics	Measuring Equipment : Agilent E4991 or the Equivalents. Measuring Frequency : 100MHz
2	DC Resistance (Ω)		Measuring Equipment : Agilent 4339B or the Equivalents. Measuring Current : 100 mA max. (ref. Item 10.) (In Case of Doubt in The Above-mentioned Standard Condition, Measure by 4 Terminal Method.)
3	Heat Rating Current DC I rms.(A)		Measuring Equipment : Microtest 6379 + Microtest 6220. Typical Heat Rating DC Current would cause an approximately ΔT of 40°C
4	Saturation Current DC I sat. (A)		Measuring Equipment : Microtest 6379 + Microtest 6220. Base on temp. rise & $\Delta L/L0A \leq 30\%$ Typ.
5	Insulation Resistance (I.R.)		Measuring Equipment : Chroma 19073 or the Equivalents. Test Voltage : 50 V(DC) Time : Within 60 s
6	Withstanding Voltage (V)	Products shall not be damaged.	Voltage : 125 V(DC) Time : 60 s Charge Current : 1 mA max.
7	Rated Voltage (V)		Voltage : 50 V(DC) Time : 60 s

Characteristics



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Terminal to be Tested

When measuring and supplying the voltage, the following terminal is applied.

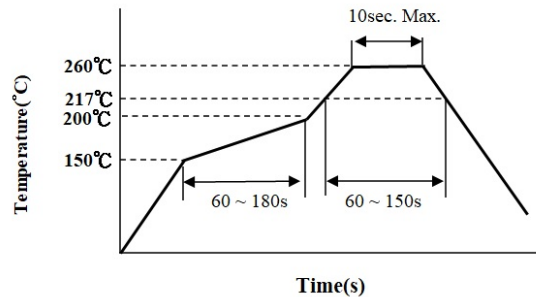
No.	Item	Terminal to be Tested
1	Impedance (Ω) (Measurement Terminal)	
2	DC Resistance (Ω) (Measurement Terminal)	
3	Heat Rating Current DC I rms.(A) (Measurement Terminal)	
4	Saturation Current DC I sat. (A) (Measurement Terminal)	
5	Insulation Resistance (M Ω) (Measurement Terminal)	
6	Withstanding Voltage (V) (Measurement Terminal)	
7	Rated Voltage (V) (Measurement Terminal)	

Characteristics

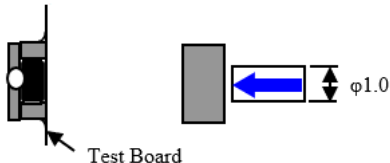


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■ Recommended Soldering Temp. Graph



■ Reliability and Test Condition

Test item	Test condition / Test method		Specification
Resistance to soldering heat	Solder: Sn99.5%-Cu0.5% Solder temperature: $260 \pm 5 / -0^{\circ}\text{C}$ ° Equipment : KUNG CHENG Tin furnace 400°C 、RF LCR Meter ° Flux for lead free: Rosin. 9.5% ° Dip time: $10 \pm 0.5\text{sec}$. Within : 1.5mm ° Magnification 10X ° Test the quantity : 30pcs °		Appearance: Cracking , chipping and any other should not be allowed ° L: Within $\pm 10\%$ of initial value °
Solder-ability Test	Preheat: 150°C , 60sec. Solder: Sn99.5%-Cu0. 5% ° Solder temperature: $245 \pm 5^{\circ}\text{C}$ ° Equipment : KUNG CHENG Tin furnace 400°C ° Flux for lead free: Rosin. 9.5% ° Dip time: $4 \pm 1\text{sec}$. Within : 19~31mm ° Magnification 50X ° Test the quantity : 50pcs °		Appearance: More than 95% of the terminal electrode should be covered with solder °
Terminal strength	Series No.	F (Kg)	Solder a chip to test substrate and then laterally apply a force in the arrow direction 
	CM1210AI/D	0.2	
	CM1608A/C	0.5	
	CM2012AI	0.5	
	CM3216AI	1.0	
	3225AI/CI	1.0	
	4532AI/CI	1.0	

Characteristics



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■ Reliability and Test Condition

Test item	Test condition / Test method	Specification
Temperature Cycling Test	-40 +0/-2℃, + 125 +2/-0℃ Kept for 30 minutes each, 1000 cycles, Transfer Time: 5 minutes Equipment : 高新 TH-1S-C 、 RF LCR Meter 。 Test the quantity : 90pcs 。	Appearance: Cracking, chipping and any other defects harmful to the characteristics should not be allowed 。 L: Within ±10% of initial value 。
Humidity Resistance Test	85~90% RH. 25~65 +2/-0℃ *10 Cycles 。 Equipment : 高新 TH-1S-C 、 RF LCR Meter 。 Test the quantity : 90pcs 。	
Thermal Shock Test	CONDITION(Air-to-air): -40 +0/-2℃, + 125 +2/-0℃ Kept for 15 minutes each, 300 cycles 。 Transfer Time: 20 seconds 。 Equipment : 高新 TH-1S-C 、 RF LCR Meter 。 Test the quantity : 90pcs 。	
High Temperature Exposure	125 +0/-2℃ *1000±12HRs Equipment : 高新 TH-1S-C 、 RF LCR Meter 。 Test the quantity : 90pcs 。	
Biased Humidity Test	85% R.H.*85 +2/-0℃ *1000±12HRs Equipment : 高新 TH-1S-C 、 RF LCR Meter 。 Test the quantity : 90pcs 。	
Vibration Test	It shall be soldered on substrate 。 Oscillation Frequency: 10~2K~10Hz for 20 minute 。 Equipment : Vibration checker 。 Total Amplitude: 1.52mm±10% 。 Testing Time:12 hours (20 minutes, 12 cycles each of 3 orientations) Test the quantity : 30pcs 。	

Characteristics



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■ Application Notice

●Storage Conditions(component level)

To maintain the solderability of terminal electrodes:

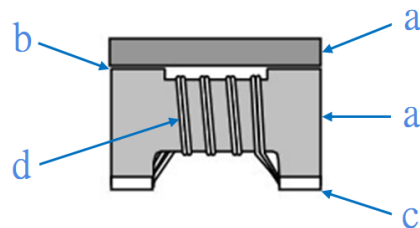
1. HUNGTRON products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40℃ and 60% RH.
3. Recommended products should be used within 12 months form the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.

●Transportation

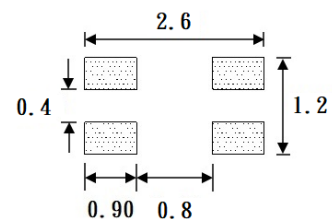
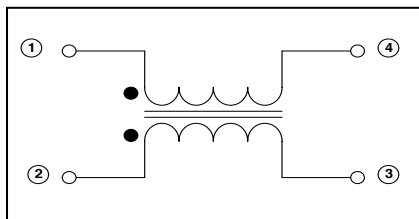
1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

■ Product Composition Diagram

No.	Description	Specification
a.	Core	Ferrite Core
b.	Coating	Epoxy
c.	Termination	Tin Pb Free
d.	Wire	Enameled Copper Wire



■ Recommended Footprint

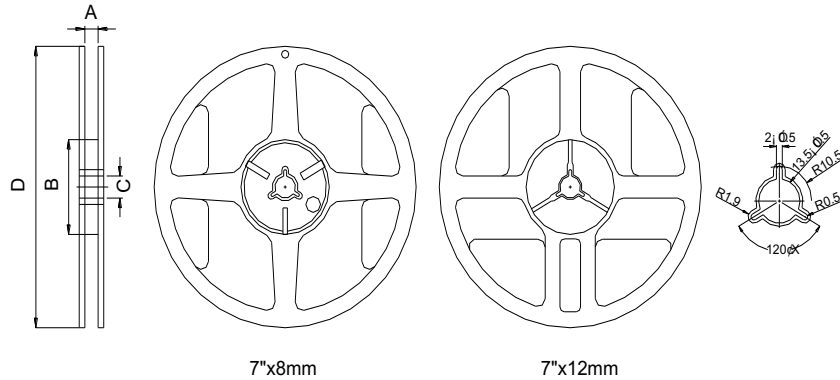


Packing For SMD

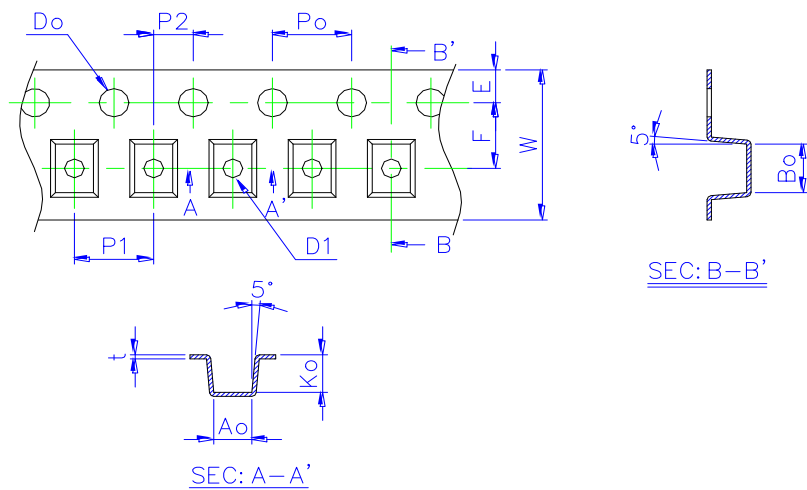


Item P/N	CM1210AI-SERIES	Test Instrument	E4991 / 4339 / 19073
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■ Reel Dimension & Tape Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.5±0.5	60±0.5	13.5±0.5	178±1
7"x12mm	13.7±0.5	60±0.5	13.5±0.5	178±1



Size	t(mm)	Ao(mm)	Bo(mm)	Ko(mm)	W(mm)	E(mm)	F(mm)	Po(mm)	P1(mm)	P2(mm)	Do(mm)
1210	0.22±0.05	1.22±0.05	1.45±0.05	0.96±0.05	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.1,-0
1608	0.22±0.05	1.00±0.05	1.70±0.05	1.18±0.05	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.1,-0
2012	0.23±0.05	1.35±0.10	2.25±0.10	1.37±0.10	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.1,-0
3216	0.23±0.05	1.88±0.10	3.50±0.10	2.10±0.10	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.1,-0
3225	0.23±0.05	2.80±0.10	3.60±0.10	2.20±0.10	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.1,-0
4532	0.27±0.05	3.45±0.10	4.90±0.10	3.05±0.10	12.00±0.20	1.75±0.10	3.50±0.05	4.00±0.05	8.00±0.10	2.00±0.05	1.50+0.1,-0

■ Packaging Quantity

Chip Size	1210	1608	2012	3216	3225	4532
7"/ Reel	3000	2000	2000	2000	1000	500