

CMA1 Relay



1.COIL DATA

1-1.Nominal Voltage	6,12,24VDC
1-2.Coil Restistance	Refer to CoilData Chart
1-3.Operate Voltage	Refer to CoilData Chart
1-4.Release Voltage	Refer to CoilData Chart
1-5.Coil Power	360mW、 800mW

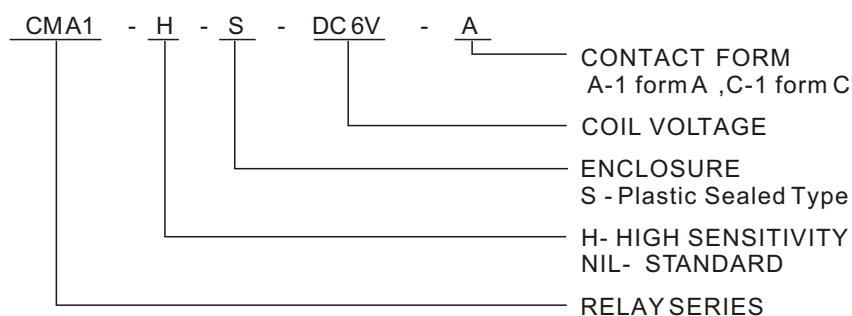
2.CONTACT DATA

2-1.Contact Form	A-1 form A, C-1 form C
2-2.Contact Material	Ag Alloy
2-3.Contact Rating	15A 14VDC Resistive (C-1 form C) 20A 14VDC Resistive (A-1 formA)
2-4.Max.Switching Voltage	75VDC
2-5.Max.Switching Current	20A
2-6.Max.Switching Power	280W
2-7.Contact Resistance	$\leq 100m\Omega$ (6VDC 1A)
2-8.Life	
Electrical	100,000 operations at nominal load
Mechanical	10,000,000 operations

3.GENERAL DATA

3-1.Insulation Resistance	Min.1000M Ω . 500VDC
3-2.Dielectric Strength	750VAC,1min between open contacts 1,500VAC,1min between coil and contacts
3-3.Operate Time	Max.15ms
3-4.Release Time	Max.10ms
3-5.Operate Temperature	-40 ~+85°C
3-6.Shock Resistance	
Endurance	1,000m/s ²
Misoperation	100m/s ²
3-7.Vibration Resistance	
Endurance	10 -55Hz,double amplitude 1.5mm
Misoperation	10 -55Hz,double amplitude 1.5mm
3-8.Weight	Approximately10.0g

4. ORDER CODE

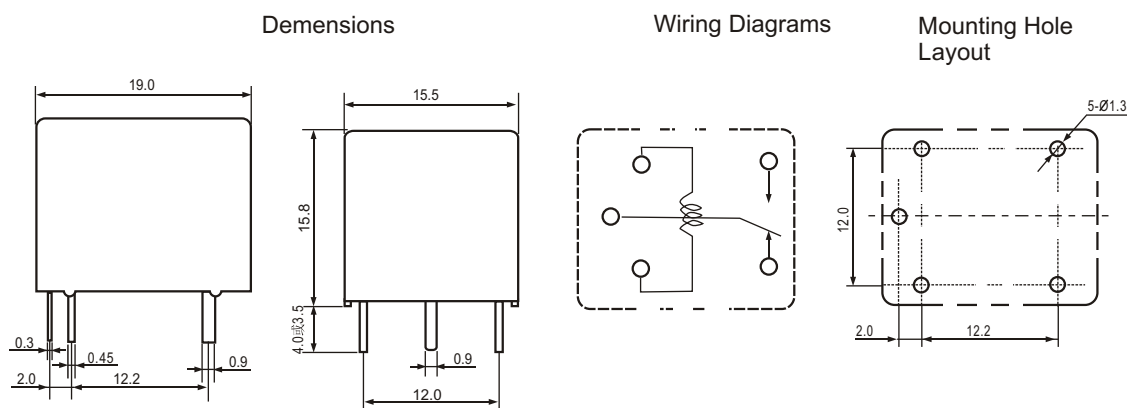


5.COIL DATA CHART

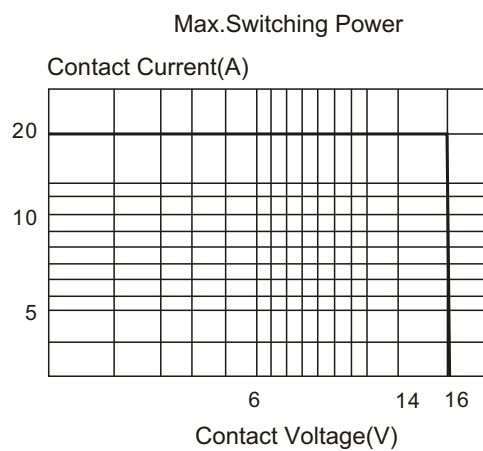
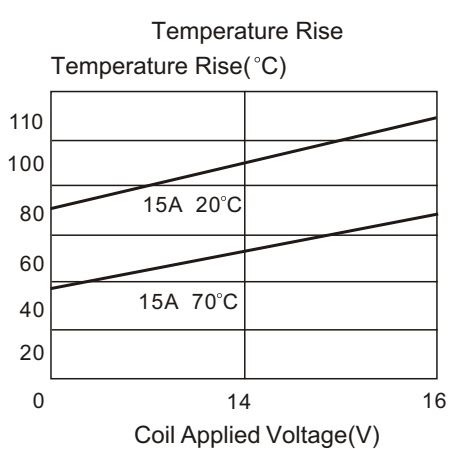
20°C

Model	Nominal Voltage VDC	Coil Resistance Ω $\pm 10\%$	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA1-(S)- DC6V	6	45	3.6	0.60	800
CMA1-(S)-DC12V	12	180	7.2	1.20	
CMA1-(S)-DC24V	24	720	14.4	2.40	
CMA1H-(S)-DC12V	12	400	7.2	1.20	360
CMA1H-(S)-DC24V	24	1600	14.4	2.40	

6.DIMENSIONS (mm)



7.CMA1 CHARACTERISTIC CHART DATA



CMA2 Relay



1.COIL DATA

1-1.Nominal Voltage	3 ~ 24VDC
1-2.Coil Restistance	Refer to CoilData Chart
1-3.Operate Voltage	Refer to CoilData Chart
1-4.Release Voltage	Refer to CoilData Chart
1-5.Coil Power	1100mW

2.CONTACT DATA

2-1.Contact Form	C-1 form C, A-1 form A, U-2 form U, W-2 form2, V-2 form V
2-2.Contact Material	Ag Ni ,AgSnOInO
2-3.Contact Rating	Refer to Table1
2-4.Max.Switching Voltage	75VDC
2-5.Max.Switching Current	20A
2-6.Max.Switching Power	280W
2-7.Max.Load Current (14VDC Load Voltage)	

Table 1

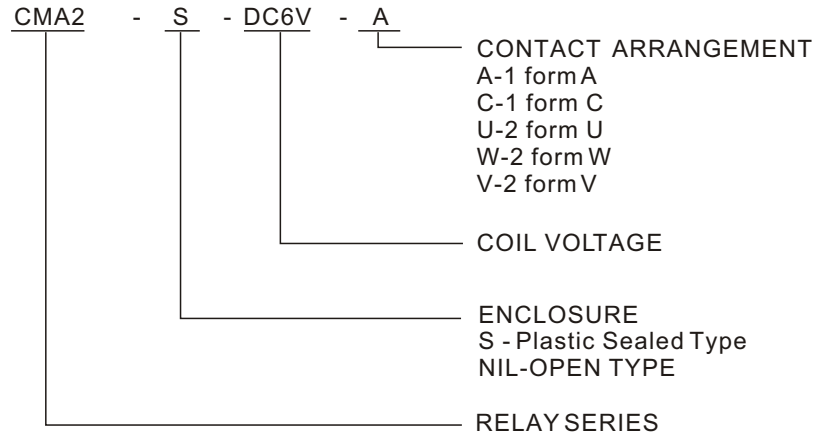
Load	A	C		W		U	V
		NO	NC	NO	NC		
Max.Carry Current	15A	15A	10A	2x7A	2x5A	2x10A	2x7A
Max.Make Current	60A	60A	12A	2x30A	2x5A	2x40A	2x8A
Max.Break Current	20A	20A	10A	2x15A	2x5A	2x20A	2x7A

2-8.Contact Resistance	≤100mΩ (6VDC 1A)
2-9.Life	
Electrical	100,000 operations
Mechanical	10,000,000 operations

3.GENERAL DATA

3-1.Insulation Resistance	Min.100MΩ 500VDC
3-2.Dielectric Strength	500VAC,1min between open contacts 1000VAC,1min between coil and contacts
3-3.Operate Time	Max.3ms
3-4.Release Time	Max.1.5ms
3-5.Operate Temperature	-40 ~ +85°C
3-6.Shock Resistance	
Endurance	1,000m/s ²
Misoperation	100m/s ²
3-7.Vibration Resistance	
Endurance	10 -55Hz, double amplitude 1.5mm
Misoperation	10 -55Hz ,double amplitude 1.5mm
3-8.Weight	Approximately 12.0g Approximately 8.0g (open)

4. ORDER CODE

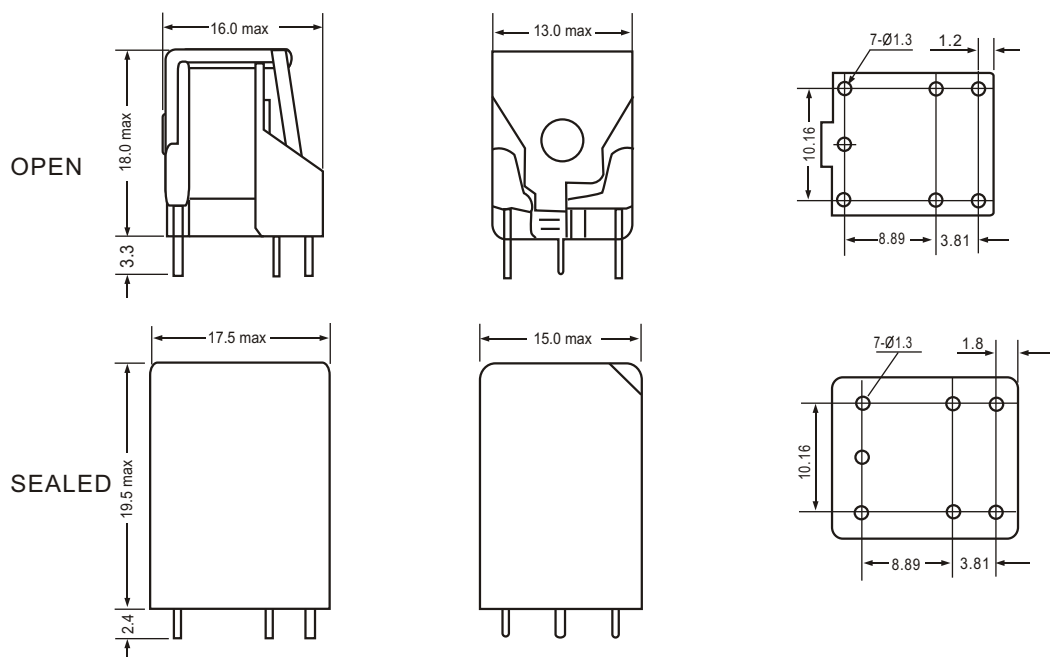


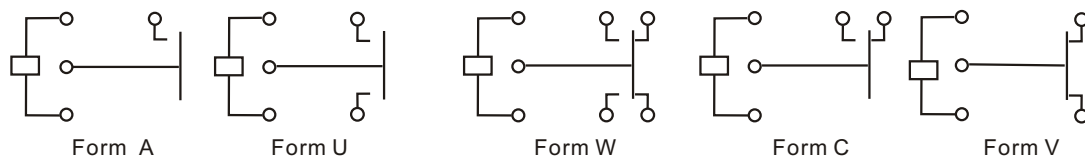
5.COIL DATA CHART

20 °C

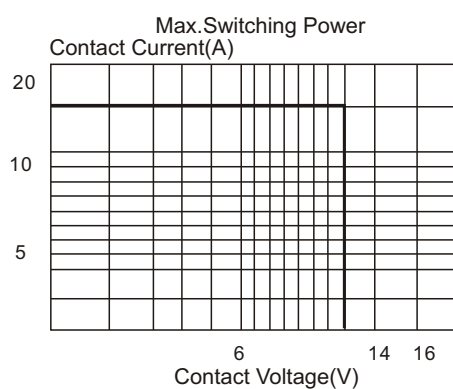
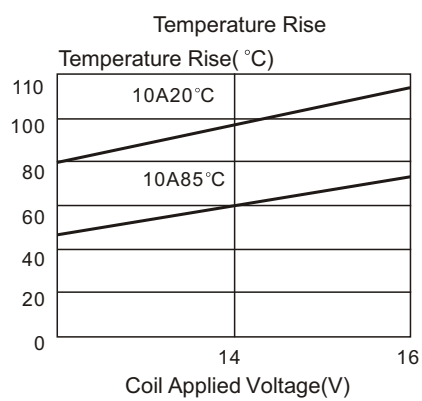
Model	Nominal Voltage VDC	Coil Resistance Ω $\pm 10\%$	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA2-(S)-DC3V	3	8.2	2.1	0.3	1100
CMA2-(S)-DC5V	5	22.7	3.5	0.5	
CMA2-(S)-DC6V	6	32.7	4.2	0.6	
CMA2-(S)-DC9V	9	73.6	6.3	0.9	
CMA2-(S)-DC12V	12	130.9	8.4	1.2	
CMA2-(S)-DC24V	24	523.6	16.8	2.4	

6.DIMENSIONS (mm)





7. CMA2 CHARACTERISTIC CHART DATA



CMA31 Relay



1.COIL DATA

1-1.Nominal Voltage	6~ 24VDC
1-2.Coil Restistance	Refer to CoilData Chart
1-3.Operate Voltage	Refer to CoilData Chart
1-4.Release Voltage	Refer to CoilData Chart
1-5.Coil Power	1600mW

2.CONTACT DATA

2-1.Contact Form	C-1 form C, A-1 form A, B-1 form B
2-2.Contact Material	Ag Alloy
2-3.Contact Rating	30A 14VDC Resistive (1 Form C) 40A 14VDC Resistive (1 Form A) 30A 14VDC Resistive (1 Form B)
2-4.Max.Switching Voltage	75VDC
2-5.Max.Switching Current	40A
2-6.Max.Switching Power	420W(1 Form C),560W(1 Form A)
2-7.Max.Load Current(14VDC Load Voltage)	

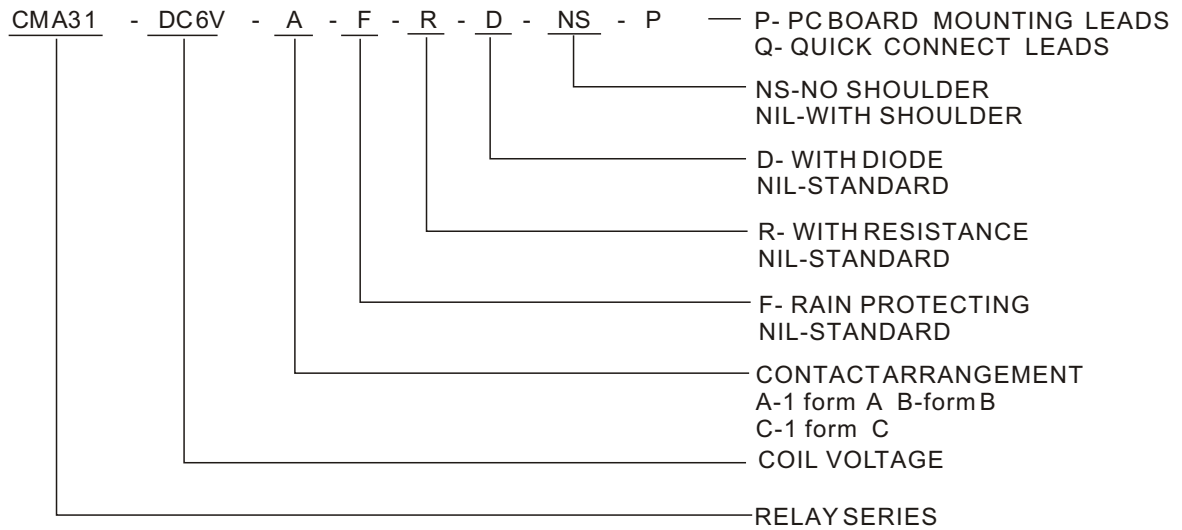
Load	A	B	C	
			NO	NC
Max.Carry Current	40A	30A	40A	30A
Max.Make Current	100A	60A	100A	30A
Max.Break Current	40A	30A	40A	30A

2-8. Contact Resistance	$\leq 100\text{m}\Omega$.(6VDC 1A)
2-9. Life	
Electrical	100,000 operations
Mechanical	10,000,000 operations

3.GENERAL DATA

3-1.Insulation Resistance	Min.100M Ω 500VDC
3-2.Dielectric Strength	500VAC,1min between open contacts 500VAC,1min between coil and contacts
3-3.Operate Time	Max.10ms
3-4.Release Time	Max.10ms
3-5.Operate Temperature	-40 ~ +85°C
3-6.Shock Resistance	
Endurance	1,000m/s ²
Misoperation	100m/s ²
3-7.Vibration Resistance	
Endurance	10 -55Hz ,double amplitude 1.5mm
Misoperation	10 -55Hz ,double amplitude 1.5mm
3-8.Weight	Approximately 37.0g(WITH SHOULDER) Approximately 32.0g(NO SHOULDER)

4. ORDER CODE

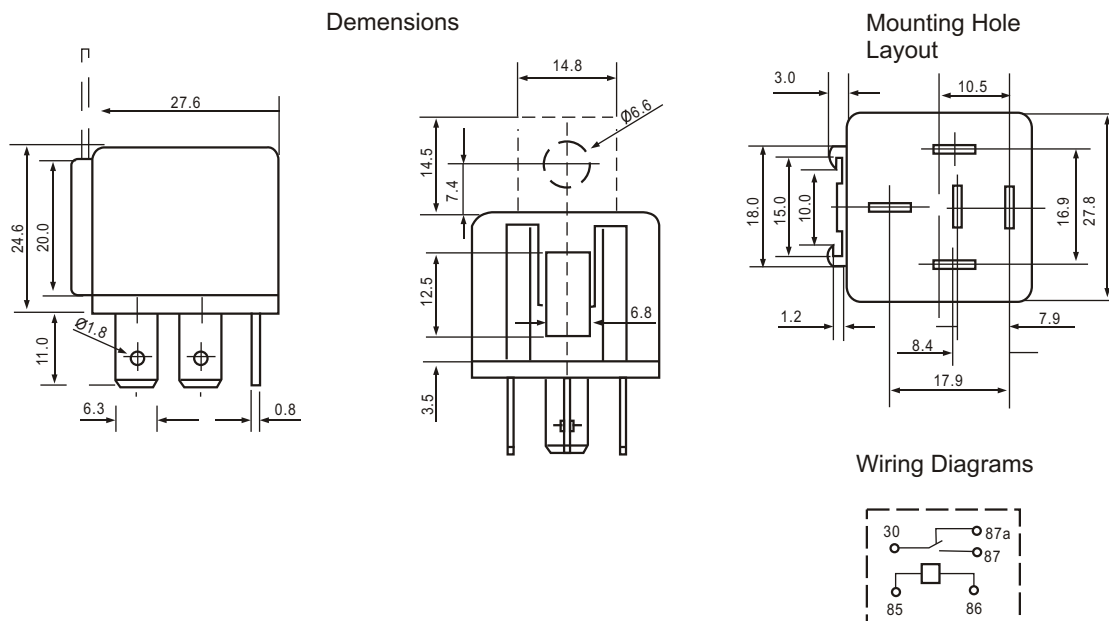


5.COIL DATA CHART

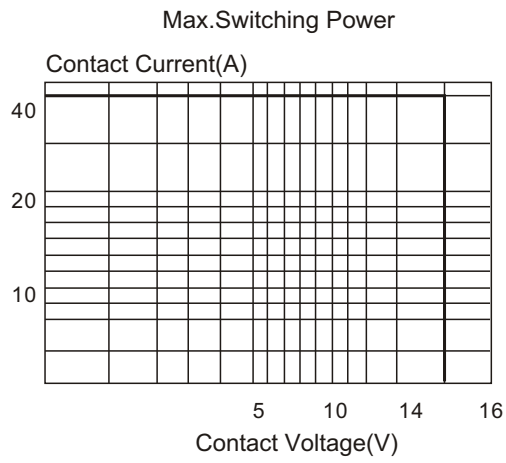
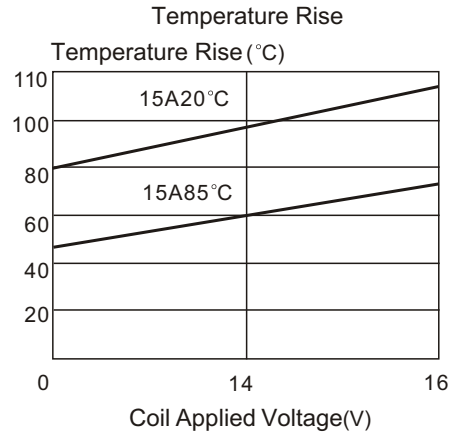
20°C

Model	Nominal Voltage VDC	Coil Resistance Ω +/-10%	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA31- DC6V	6	22.5	4.2	0.6	1600
CMA31- DC12V	12	90.0	8.4	1.2	
CMA31-DC24V	24	360	16.8	2.4	

6.DIMENSIONS (mm)



7. CMA31 CHARACTERISTIC CHART DATA



CMA33 Relay



1.COIL DATA

1-1.Nominal Voltage	12VDC, 24VDC
1-2.Coil Restistance	Refer to Coil Data Chart
1-3.Operate Voltage	Refer to Coil Data Chart
1-4.Release Voltage	Refer to Coil Data Chart
1-5.Coil Power	1.5W(12V), 1.8W(24V)

2.CONTACT DATA

2-1.Contact Form	C-1 form C, A-1 form A
2-2.Contact Material	Ag Alloy
2-3.Contact Rating	

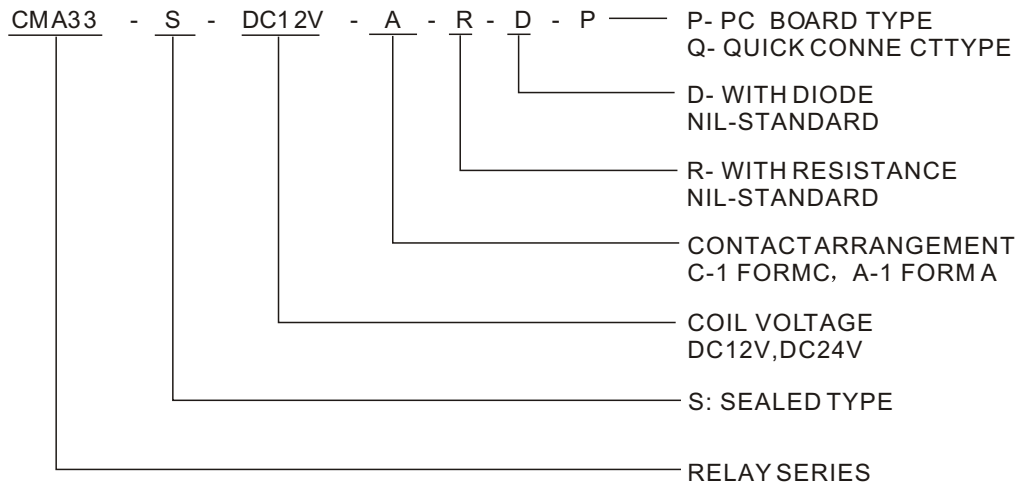
Type		12VDC coil voltage	24VDC coil voltage
Rating(resistive load)	Nominal Switchig Capacity	N.O.:35A 14VDC N.C.:20A 14VDC	N.O.:15A 28VDC N.C.: 8A 28VDC
	85°C Switching Current	N.O.:20A(14VDC) N.C.:10A(14VDC)	N.O.:15A(28VDC) N.C.:8A(14VDC)

2-4.Max.Switching Power	490W(12V coil voltage) 420W(24V coil voltage)
2-5.Contact Resistance	Max50m Ω .(6VDC 1A)
2-6.Life	
Electrical	100,000 operations
Mechanical	1,000,000 operations

3.GENERAL DATA

3-1.Insulation Resistance	Min.20M Ω 500VDC
3-2.Dielectric Strength	500VAC, 1min between open contacts 500VAC, 1min between coil and contacts
3-3.Operate Time	Max.10ms
3-4.Release Time	Max.10ms
3-5.Operate Temperature	-40 ~ +85°C
3-6.Shock Resistance	
Endurance	200m/s ²
Misoperation	1000m/s ²
3-7.Vibration Resistance	
Endurance	10 -500Hz, 44.1m/s ² (45m/s ²)
Misoperation	10 -2,000Hz, 44.1m/s ² (45m/s ²)
3-8.Weight	Approximately 18g

4. ORDER CODE

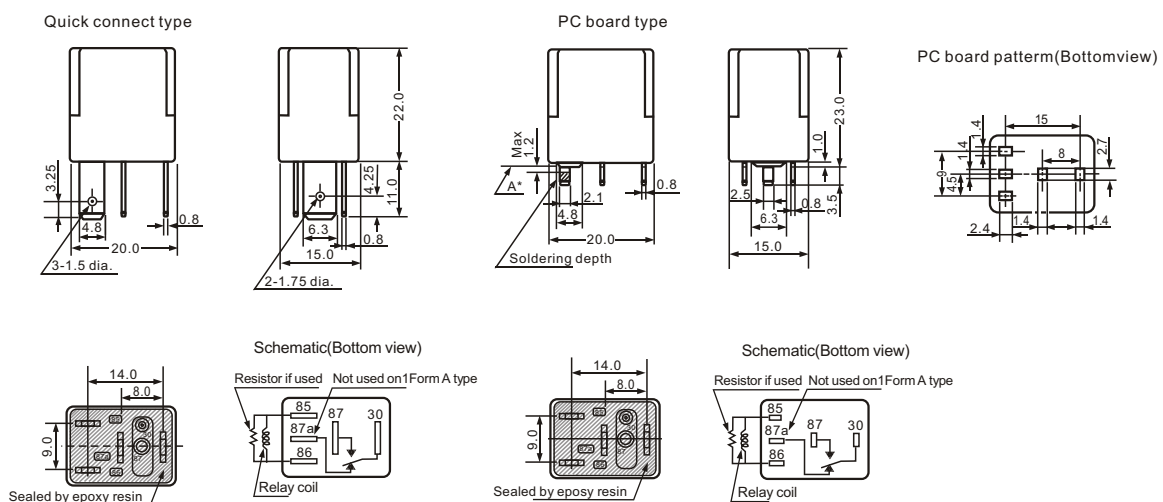


5.COIL DATA CHART

20°C

Model	Coil Voltage VDC	Coil Resistance Ω $\pm 10\%$	Shunt-wound Resistance (Ω)	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA33-(S)- DC12V	12	96	680	7.2	1.2	1500 R:1800
CMA33-(S)-DC24V	24	320	2700	14.4	2.4	1800 R:2000

6.DIMENSIONS (mm)



Dimension:

Max. 1mm :
1 to 3mm :
Min. 3mm :

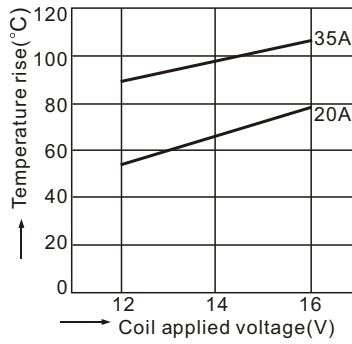
General tolerance:

± 0.1
 ± 0.2
 ± 0.3

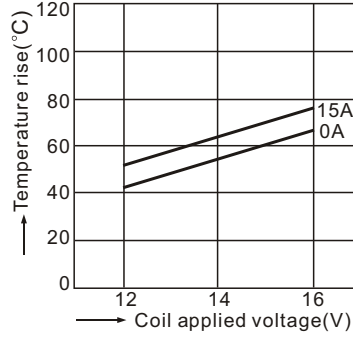
*Dimensions(thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surfaces level.

7. CMA33 CHARACTERISTIC DATA

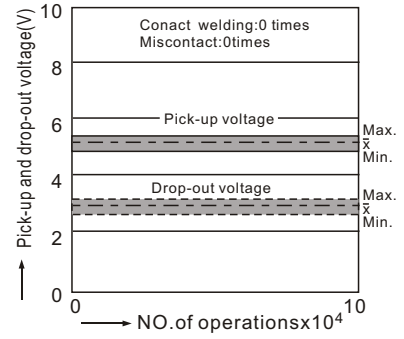
Coil temperature rise(12V type)



Coil temperature rise(24V type)

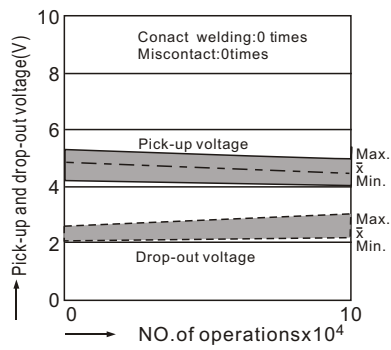
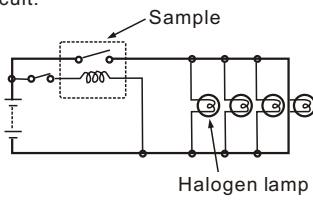


Electrical life test(12V resistive load)



Electrical test(Lamp load)

Circuit:



CMA4 Relay



1.COIL DATA

1-1.Nominal Voltage	6,9,12,24VDC
1-2.Coil Restistance	Refer to Coil Data Chart
1-3.Operate Voltage	Refer to Coil Data Chart
1-4.Release Voltage	Refer to Coil Data Chart
1-5.Coil Power	1600mW

2.CONTACT DATA

2-1.Contact Form	C-1 form C, A-1 form A
2-2.Contact Material	Ag Alloy
2-3.Contact Rating	30A 14VDC Resistive (1C) 40A 14VDC Resistive (1A)
2-4.Max.Switching Voltage	75VDC
2-5.Max.Switching Current	40A
2-6.Max.Switching Power	420W(1C) 560W(1A)
2-7. Max.Load Current(12VDC Load Voltage)	

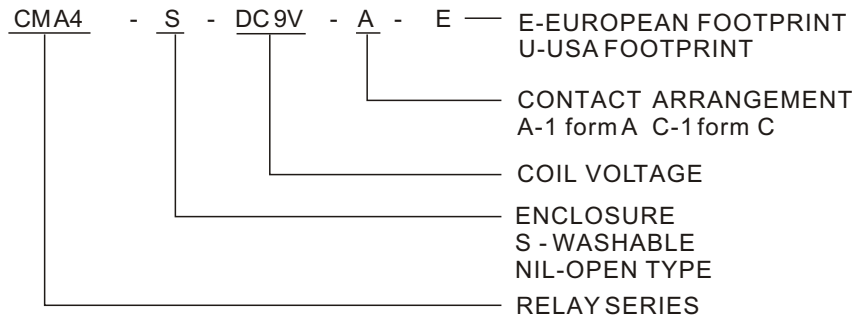
Load	A	C	
		NO	NC
Max.Carry Current	40A	40A	30A
Max.Make Current	100A	100A	30A
Max.Break Current	40A	40A	30A

2-8. Contact Resistance	Max 100mΩ . (6VDC 1A)
2-9. Life	
Electrical	100,000 operations
Mechanical	10,000,000 operations

3.GENERAL DATA

3-1.Insulation Resistance	Min.100MΩ 500VDC
3-2.Dielectric Strength	500VAC,1min between open contacts 500VAC,1min between coil and contacts
3-3.Operate Time	Max.5ms
3-4.Release Time	Max.3ms
3-5.Operate Temperature	-40 ~ +85°C
3-6.Shock Resistance	100m/s ²
3-7. Vibration Resistance	10 -55Hz, Amplitude 1.5mm
3-8. Weight	Approximately 21g Approximately 15g(open))

4. ORDER CODE

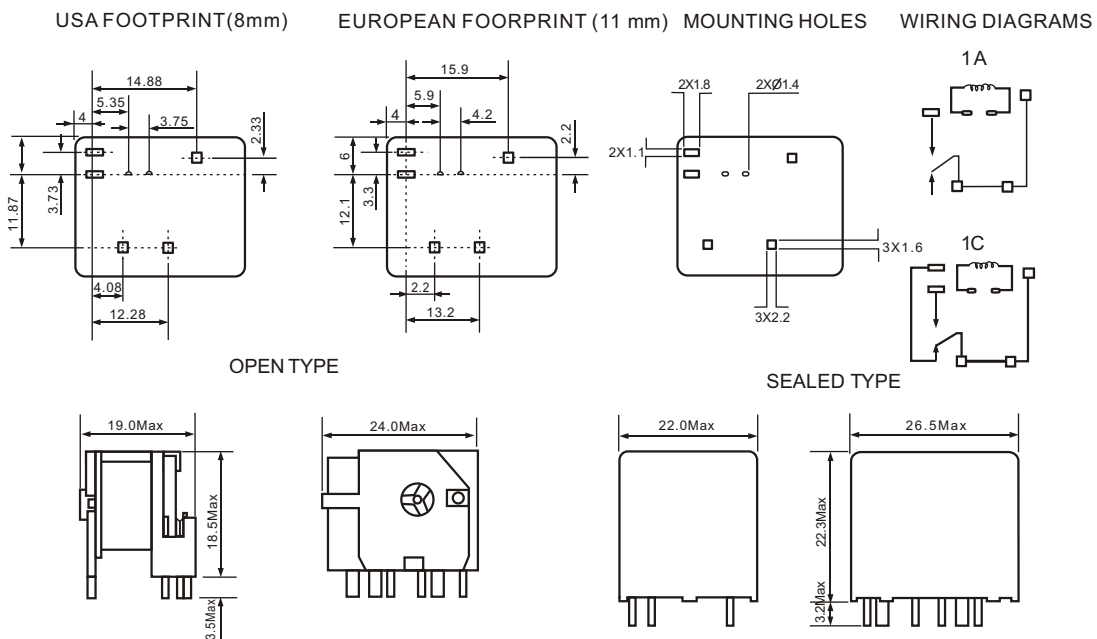


5.COIL DATA CHART

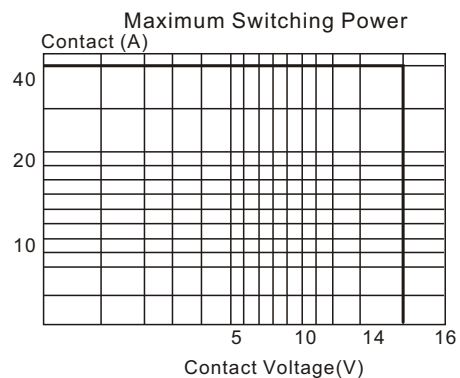
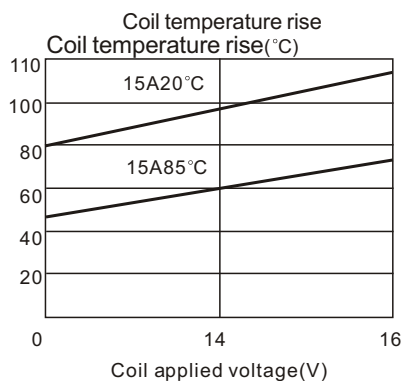
20°C

Model	Nominal Voltage VDC	Coil Resistance Ω $\pm$ 10%	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA4-(S)-DC6V	6	22.5	3.6	0.6	1600
CMA4-(S)-DC9V	9	51.0	5.4	0.9	
CMA4-(S)-DC12V	12	90.0	7.8	1.2	
CMA4-(S)-DC24V	24	360	14.4	2.4	

6.DIMENSIONS(mm)



7. CMA4 CHARACTERISTIC DATA



CMA51/52 继电器



1.COIL DATA

1-1.Nominal Voltage	6 ,9,10,12,24VDC
1-2.Coil Restistance	Refer to CoilData Chart
1-3.Operate Voltage	Refer to CoilData Chart
1-4.Release Voltage	Refer to CoilData Chart
1-5.Coil Power	600mW 、 800mW

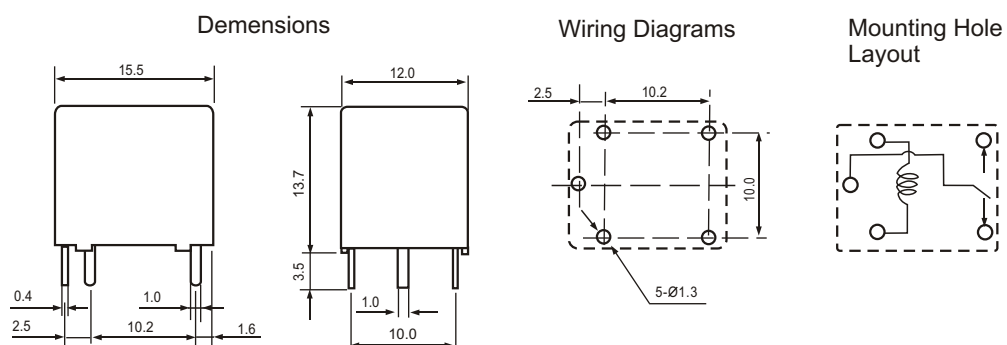
2.CONTACT DATA

2-1.Contact Form	C-1 form C, A-1 form A
2-2.Contact Material	Ag Alloy
2-3.Contact Rating	15A 14VDC Resistive
2-4.Max.Switching Voltage	16VDC
2-5.Max.Carrying Current	35A/10min.25A/1 Hr
2-6.Max.Switching Load	35A
2-7.Max.Inrush Current	60A
2-8.MIN.Switching Load	6VDC 1A
2-9.Contact Resistance	$\leq 50m\Omega$. (6VDC 1A)
2-10. Life	
Electrical	100,000 operations
Mechanical	10,000,000 operations

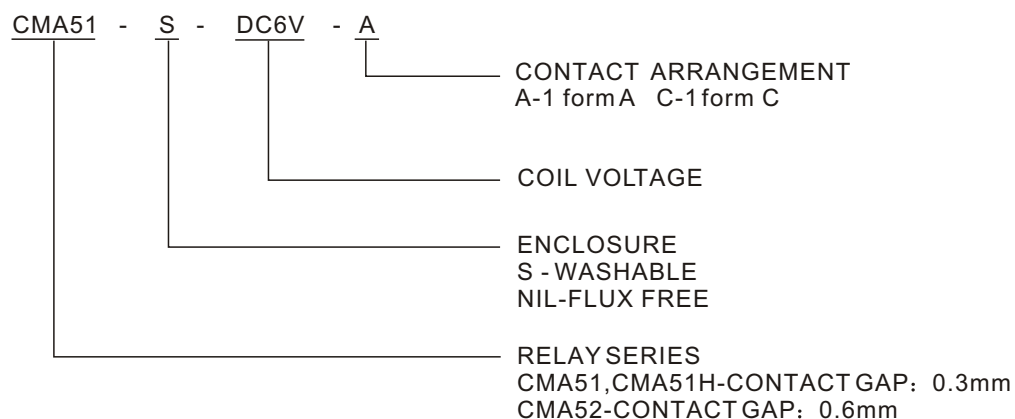
3.GENERAL DATA

3-1.Insulation Resistance	Min.100M Ω 500VDC
3-2.Dielectric Strength	500VAC,1min between open contacts 500VAC,1min between coil and contacts
3-3.Operate Time	Max.10ms
3-4.Release Time	Max.10ms
3-5.Operate Temperature	-30 ~ +85℃
3-6.Shock Resistance	100m/s ²
3-7.Vibration Resistance	10 -55Hz,Amplitude 1.5mm
3-8.Weigh	Approximately 6g

4.DIMENSIONS(mm)



5. ORDER CODE

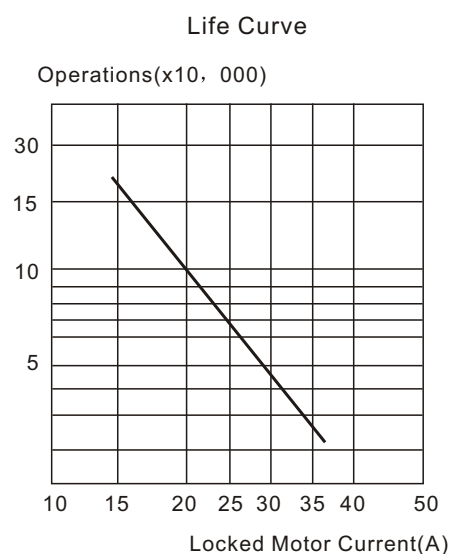
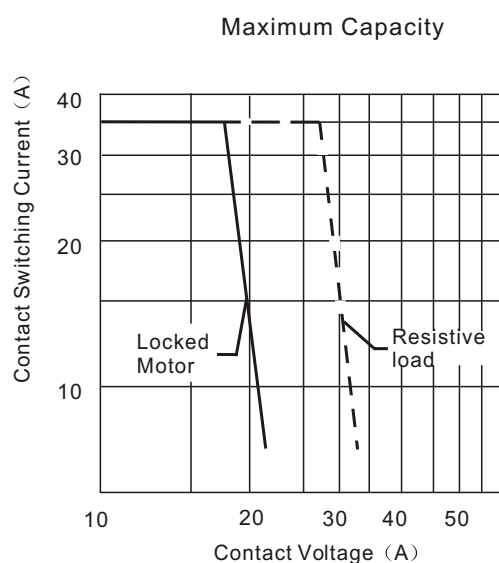


6.COIL DATA CHART

20°C

Model	Nominal Voltage VDC	Coil Resistance Ω +/-10%	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA51H-(S)-DC6V	6	60	3.6	0.6	600
CMA51H-(S)-DC9V	9	135	5.4	0.9	
CMA51H-(S)-DC10V	10	167	6.0	1.0	
CMA51H-(S)-DC12V	12	240	7.2	1.2	
CMA51H-(S)-DC24V	24	960	14.4	2.4	
CMA51/52-(S)-DC6V	6	45	3.6	0.6	800
CMA51/52-(S)-DC9V	9	100	5.4	0.9	
CMA51/52-(S)-DC10V	10	125	6.0	1.0	
CMA51/52-(S)-DC12V	12	180	7.2	1.2	
CMA51H-(S)-DC24V	24	720	14.4	2.4	

7. CMA51/52 CHARACTERISTIC DATA



CMA512/522 Relay



1.COIL DATA

1-1.Nominal Voltage	6,9,10,12VDC
1-2.Coil Restistance	Refer to Coil Data Chart
1-3.Operate Voltage	Refer to Coil Data Chart
1-4.Release Voltage	Refer to Coil Data Chart
1-5.Coil Power	600mW、800mW

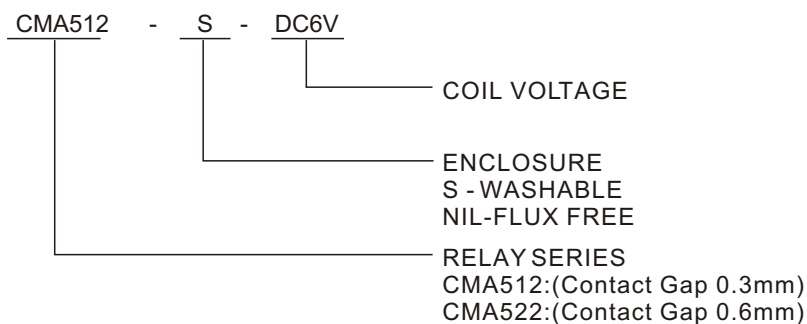
2.CONTACT DATA

2-1.Contact Form	1CX2-1 form CX2
2-2. Contact clearance	CMA512:(Contact clearance 0.3mm) CMA522:(Contact clearance 0.6mm)
2-3.Contact Material	Ag Aulloy
2-4.Contact Rating	15A 14VDC Resistive
2-5.Max.Carrying Current	35A/10min.25A/1 Hr
2-6.Max.Switching Load	35A
2-7.Min.Switching Load	6VDC 1A
2-8.Max.Inrush Current	60A
2-9.Contact Resistance	Max 50mΩ .(6VDC 1A)
2-10. Life	
Electrical	100,000 operations
Mechanical	10,000,000 operations

3.GENERAL DATA

3-1.Insulation Resistance	Min.100MΩ 500VDC
3-2.Dielectric Strength	500VAC,1min between open contacts 500VDC,1min between coil and contacts
3-3.Operate Time	Max.10ms
3-4.Release Time	Max.5ms
3-5.Operate Temperature	-30 ~+85°C
3-6.Shock Resistance	100m/s ²
3-7.Vibration Resistance	10 -55Hz (Amplitude 1.5mm)
3-8.Weigh	Approximately 12g

4. ORDER CODE

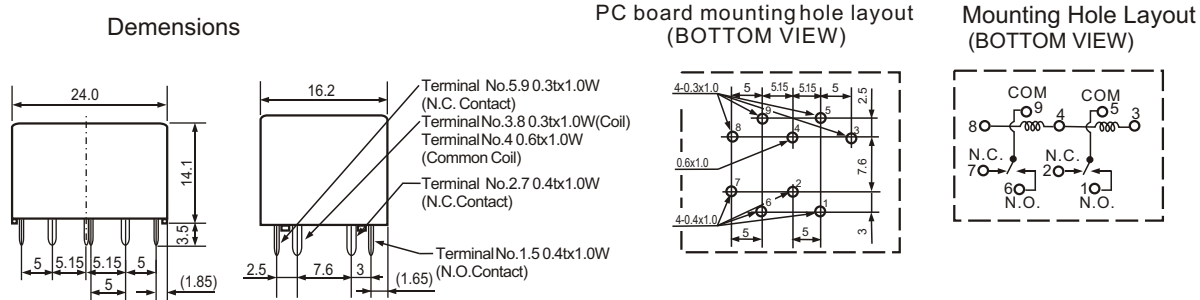


5.COIL DATA CHART

20°C

Model	Nominal Voltage VDC	Coil Resistance Ω $\pm 10\%$	Operate Voltage $\leq$ VDC	Release Voltage $\geq$ VDC	Coil Power mW
CMA512-(S)-DC6V	6	60	3.6	0.6	600
CMA512-(S)-DC9V	9	135	5.4	0.9	
CMA512-(S)-DC10V	10	167	6.3	1.0	
CMA512-(S)-DC12V	12	240	7.3	1.2	
CMA522-(S)-DC6V	6	45	3.6	0.6	800
CMA522-(S)-DC9V	9	100	5.4	0.9	
CMA522-(S)-DC10V	10	125	6.3	1.0	
CMA522-(S)-DC12V	12	180	7.3	1.2	

6.DIMENSIONS(mm)



7.CMA512/522 CHARACTERISTIC CHART DATA

