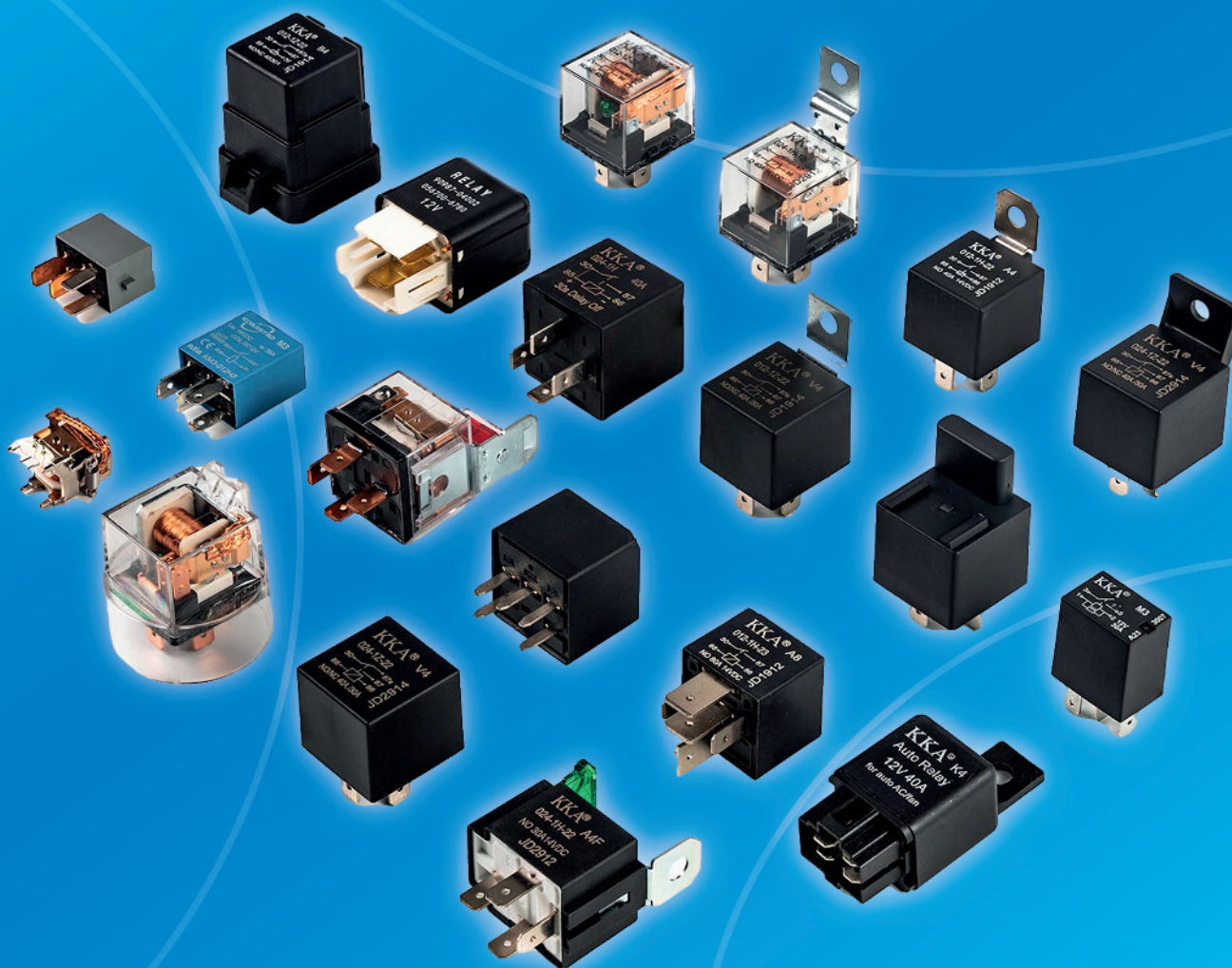


# 01

## 10A-80A Automotive Relay



### PRODUCT PROFILE

KKA®

#### KKA-A4

26\*26mm 40A Automotive Relay

##### Features

- 40A switching capability
- 1 Form A, 1 Form B & 1 Form C contact arrangement
- Terminal position complies with ISO 7588 PART1
- Comply with RoHS, ELV directive

##### Typical Application

Applicable to automotive grade 40A circuits, such as: ABS control, blower, car alarm, cooling fan, electric power steering, energy management, engine control, fuel pump, heated front windshield, lights: headlights, taillights, fog lights, main switch/ power relay, valve, wiper control



#### Ordering Guide

|                          |                                                                                                                                                                                                                                                                        |      |    |    |    |       |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|----|----|-------|
|                          | KKAA4                                                                                                                                                                                                                                                                  | -012 | 1H | 23 | -R | (XXX) |
| Type                     | A4 - cubic shell<br>A4M - with iron bracket                                                                                                                                                                                                                            |      |    |    |    |       |
| Coil Voltage             | 012:12VDC 024:24VDC                                                                                                                                                                                                                                                    |      |    |    |    |       |
| Contact Form             | 1H:1 Form A 1B:1 Form B 1Z: 1 Form C 1D:1 Form 2A                                                                                                                                                                                                                      |      |    |    |    |       |
| Terminal Type            | 22: brass coil pin,brass working pin, default tinned<br>23: brass coil pin,copper working pin, default tinned                                                                                                                                                          |      |    |    |    |       |
| Parallel Coil Components | Nil: without parallel component<br>R: parallel transient supression resistors (680Ω, 12V) (2700Ω, 24V)<br>D1:parallel transient supression diode, with anode connected to terminal #85<br>D2:parallel transient supression diode, with anode connected to terminal #86 |      |    |    |    |       |
| Special Code             | (XXX):customer special requirement Nil: Standard                                                                                                                                                                                                                       |      |    |    |    |       |

## CHARACTERISTICS

|                                         |                                                                                                                                                               |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact arrangement                     | 1A (SPST-NO), 1C (SPDT)                                                                                                                                       |
| Voltage drop                            | NO:Typ.20mV,250mV max. (at 10A)<br>NC:Typ.30mV,250mV max. (at 10A)                                                                                            |
| Max.continuous current <sup>1)10)</sup> | NO:60A(at 23°C),40A(at 85°C),17A(at 125°C)<br>NC:45A(at 23°C),30A(at 85°C), 12A(at 125°C)                                                                     |
| Max.switching current <sup>10)</sup>    | Make(NO):150A <sup>2)</sup><br>Break(NO):40A(Resistive,13.5VDC)                                                                                               |
| Min.contact load                        | 1A 6VDC                                                                                                                                                       |
| Electrical endurance                    | See "CONTACT DATA"                                                                                                                                            |
| Mechanical endurance                    | 1x10 <sup>8</sup> OPS (300OPS/min)                                                                                                                            |
| Insulation resistance                   | 100M Ω (at 500VDC)                                                                                                                                            |
| Dielectric strength <sup>3)</sup>       | 500VAC                                                                                                                                                        |
| Operate time <sup>10)</sup>             | Max.:10ms (at nomi.vol.)                                                                                                                                      |
| Release time <sup>10)</sup>             | Max.:10ms <sup>4)</sup>                                                                                                                                       |
| Ambient temperature                     | -40°C to 125°C                                                                                                                                                |
| Vibration resistance <sup>5)10)</sup>   | 5Hz to 22.3Hz 10mm DA 22.3Hz to 500Hz 98m/s <sup>2</sup>                                                                                                      |
| Shock resistance <sup>5)10)</sup>       | 294m/s <sup>2</sup>                                                                                                                                           |
| Flammability <sup>6)</sup>              | UL94-HB or better(meets FMVSS 302)                                                                                                                            |
| Termination                             | QC <sup>11)</sup> , PCB <sup>7)</sup>                                                                                                                         |
| Construction                            | Plastic sealed,Dust protected                                                                                                                                 |
| Unit weight                             | Approx.35g                                                                                                                                                    |
| Mechanical data <sup>8)</sup>           | housing retention (pull &push):200N min.<br>terminal retention(pull &push):100N min.<br>Terminal resistance to bending<br>(front &side):10N min <sup>9)</sup> |

1)For NO contacts,measured when applying 100% rated voltage on coil.

For NC contacts,measured when applying zero voltage on coil.

2)Inrush peak current under amp load,at 13.5VDC.

3)1min, leakage current less than 1mA.

4)The value is measured when voltage drops suddenly from nominal voltage to 0 VDC and coil is not paralleled with suppression circuit.

5)When energized, opening time of NO contacts shall not exceed 1ms, when non-energized,opening time of NC contacts shall not exceed 1ms, meantime, NO contacts shall not be closed.

6)FMVSS:Federal Motor Vehicle Safety Standard.

7)Since it is an environmental friendly product, please select lead-free solder when welding.The recommended soldering temperature and time is (250±3)C,(5±0.3)s.

8)Only valid for QC version.

9)Test point is at 2mm away from terminal end,and after removing testing force, the terminal transfiguration shall not exceed 0.5mm.

10) Only for the 12VDC coil voltage type.

11)Do NOT knock on relays with hard objects such as rubber rod and rubber hammer during mounting, which might lead to relay damage.

## COIL DATA

at 23°C

| Nominal voltage VDC | Pick-up voltage VDC max. | Drop-out voltage VDC min. | Coil resistance x(1±10%)Ω | Parallel Resistance <sup>2)</sup> x(1±5%)Ω | Equivalent resistance Ω | Power consumption W | Max.allowable overdrive voltage <sup>1)</sup> VDC |         |
|---------------------|--------------------------|---------------------------|---------------------------|--------------------------------------------|-------------------------|---------------------|---------------------------------------------------|---------|
|                     |                          |                           |                           |                                            |                         |                     | at 23°C                                           | at 85°C |
| 12                  | 7.2                      | 1.2                       | 90                        |                                            |                         | 1.6                 | 20.2                                              | 15.7    |
| 12                  | 7.2                      | 1.2                       | 90                        | 680                                        | 79.5                    | 1.8                 | 20.2                                              | 15.7    |
| 24                  | 16                       | 2.4                       | 320                       |                                            |                         | 1.8                 | 40.5                                              | 31.5    |
| 24                  | 16                       | 2.4                       | 320                       | 2700                                       | 286                     | 2.0                 | 40.5                                              | 31.5    |

1)Max.allowable overdrive voltage is stated with no load applied.

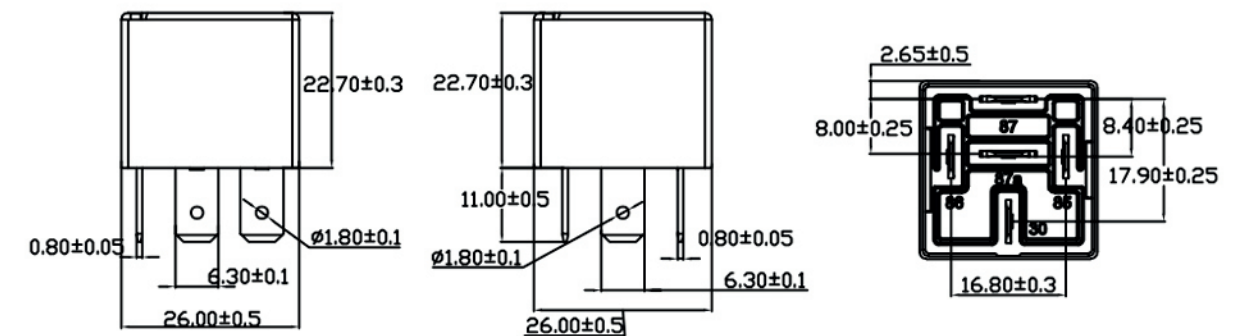
2)with the type with parallel resistor (680Ω,12V),(2700Ω,24V).

## CONTACT DATA

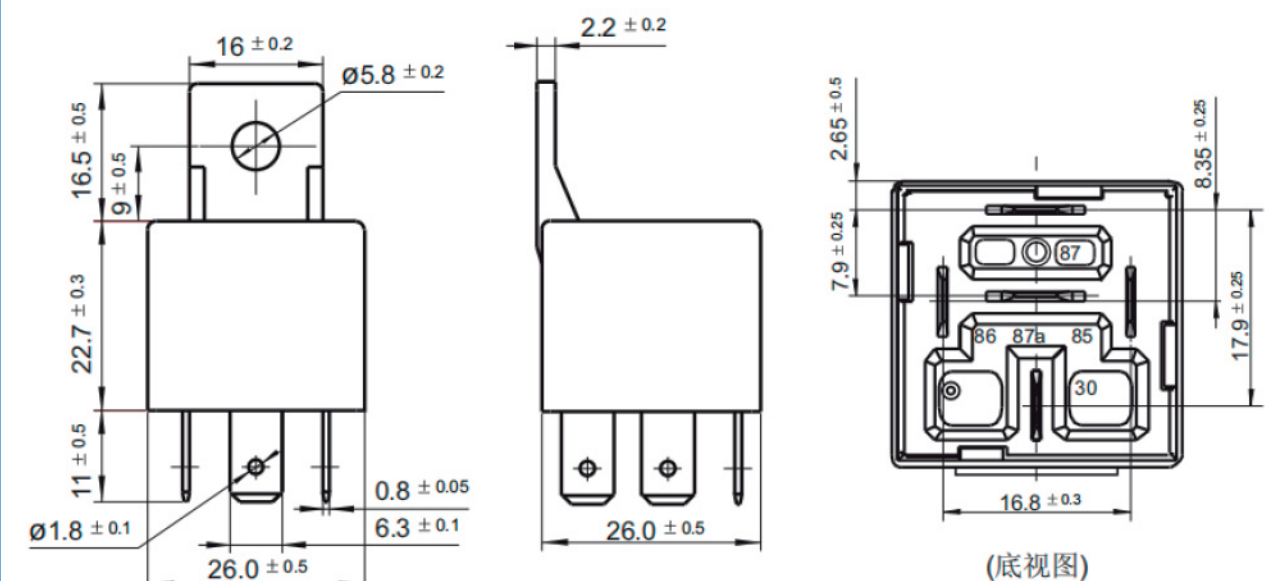
| Load voltage | Load type |       | Load current (A) |    |     | On/Off ratio |      | Electrical Endurance OPS | Contact Material   | Ambient temp            |
|--------------|-----------|-------|------------------|----|-----|--------------|------|--------------------------|--------------------|-------------------------|
|              |           |       | 1C               |    | 1A  | OnS          | OffS |                          |                    |                         |
|              |           |       | NO               | NC |     |              |      |                          |                    |                         |
| 13.5 VDC     | Resistive | Make  | 40               | 30 | 40  | 2            | 2    | 1×10 <sup>5</sup>        | AgSnO <sub>2</sub> | See Ambient Temp. Curve |
|              |           | Break | 40               | 30 | 40  |              |      |                          |                    |                         |
|              | Lamp      | Make  | 150              | -  | 150 | 2            | 2    | 1×10 <sup>5</sup>        | AgSnO <sub>2</sub> |                         |
|              |           | Break | 30               | -  | 30  |              |      |                          |                    |                         |
|              | Inductive | Make  | 80               | 40 | 80  | 2            | 2    | 1×10 <sup>5</sup>        | AgSnO <sub>2</sub> |                         |
|              |           | Break | 33               | 20 | 33  |              |      |                          |                    |                         |
| 27VDC        | Resistive | Make  | 20               | 10 | 20  | 2            | 2    | 1×10 <sup>5</sup>        | AgSnO <sub>2</sub> |                         |
|              |           | Break | 20               | 10 | 20  |              |      |                          |                    |                         |

## DIMENSION

## A4



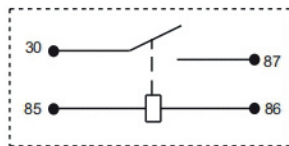
## A4M



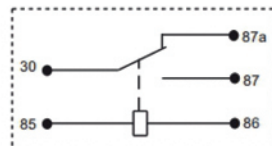
Remark: In case of no tolerance shown in outline dimension: outline dimension≤1mm, tolerance should be ±0.2mm;  
Outline dimension>1mm and≤5mm, tolerance should be ±0.3mm; outline dimension>5mm, tolerance should be ±0.4mm.

## WIRING DIAGRAM

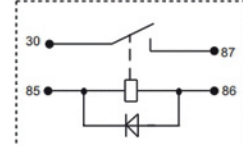
KKAA4-□1H□-□



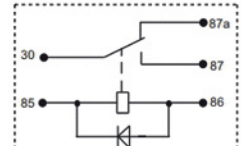
KKAA4-□1Z□-□



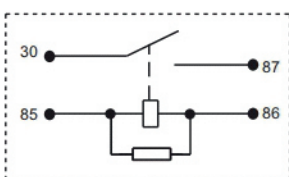
KKAA4-□1H□-D1



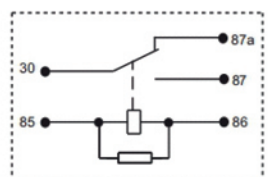
KKAA4-□1Z□-D1



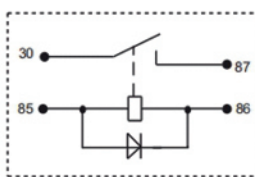
KKAA4-□1H□-R



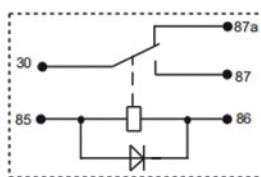
KKAA4-□1Z□-R



KKAA4-□1H□-D2



KKAA4-□1Z□-D2

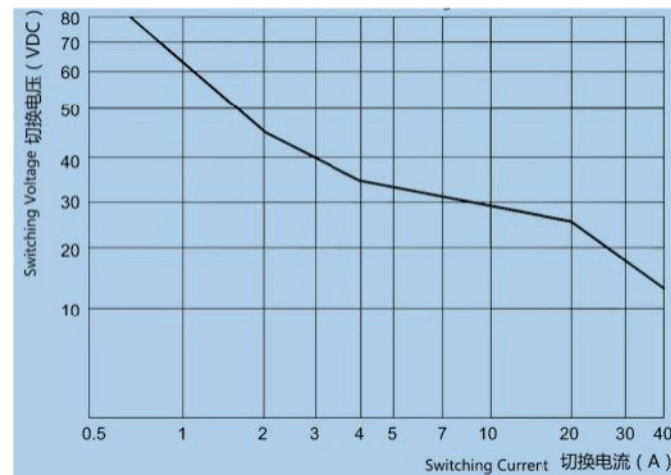


## CHARACTERISTICS CURVES

Ambient temperature curve of the electrical endurance test



Load limit curve (at 23°C)



- 1)The minimum temperature is -40°C.
- 2)The maximum temperature is 125°C.

- 1)This chart takes NO contact,resistive load as example.
- 2)The load and electrical endurance tests are made according to "CONTACT DATA" parameters' table. If actual load voltage, current, or operate frequency is different from "CONTACT DATA" table, please arrange corresponding tests for confirmation.



# KKAA<sup>®</sup> RELAY FOR YOU RELY ON US

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