

## **Product Description**

Transistor or MOSFET Output

Optical Isolation

PCB or Socket Mounted

Load Current: 0.1A, 3A, 4A, 6A
Load Voltage: 24VDC, 48VDC
Dielectric Strength: 2500Vrms

◆ RoHS Compliant





## **Product Selection**

KSM

KSM Series

D

Load Type D: DC Load 24

Load Voltage 24:24VDC 48:48VDC D

Control Mode D: DC Control 3

Load Current 0.1: 0.1Amp 3: 3Amp 4: 4Amp

6: 6Amp

nt Con 5: 5 12: 1 24: 1

-5

5: 5VDC 12: 12VDC 24: 24VDC 48: 48VDC 60: 60VDC D

Control Voltage Socket 5: 5VDC Blank: Without Socket 12: 12VDC D: With Socket (1)

#### Note: (1) The types of sockets are listed in the table below.

Socket Model	Socket Type	Applicable Control Voltage
KPD-1A(194)	Screw Terminal	5VDC
KPD-1A	Screw Terminal	12VDC/24VDC/48VDC/60VDC
KPD-1A-C1	Spring Terminal	5VDC
KPD-1A-C2	Spring Terminal	12VDC/24VDC/48VDC/60VDC

## **Technical Specifications**

Input Specifications	Condition	KS	MD3/4	/6-5	KSM	1D3/4/	6-12	KSN	1D3/4	/6-24	KSM	D3/4/	6-48	KSM	1D3/4/	/6-60	
(Ta=25°C)	Condition	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
Turn-on Voltage <sup>(2)</sup>		4	5	6	9.6	12	14.4	19.2	24	28.8	38.4	48	57.6	48	60	72	VDC
Input Current (Typ)	@Turn-on Voltage	6.6	8.9	11.1	7.1	9.2	11.2	6	7.6	9.2	4.4	5.6	6.7	3.1	3.9	4.7	mA
Turn-off Voltage	!	1	i !		2.4	 		2.4		!	4.8		!	4.8		!	VDC
Input Impedance			0.44			1.19			3			8.4			15.1		kΩ

Input Specifications	Condition	K	SMD0.	1-5	KS	MD0.1	-12	KS	MD0.1	I-24	KSI	4D0.1-	-48	KS	MD0.1	-60	
(Ta=25°C)	Condition	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
Turn-on Voltage <sup>(2)</sup>	 	4	5	6	9.6	12	14.4	19.2	24	28.8	38.4	48	57.6	48	60	72	VDC
Input Current (Typ)	@Turn-on   Voltage	6.7	9.1	11.4	5.6	7.2	8.8	6	7.6	9.2	3.8	4.7	5.7	3.1	3.8	4.6	mA
Turn-off Voltage	!	1			2.4		!	2.4		!	4.8		!	4.8		!	VDC
Input Impedance	1	1	0.43		1	1.51			3			9.9		1	15.3		kΩ

Note: (2) For KSMD with control voltage at 12V, 24V, 48V, 60V that operating with the socket, the minimum control voltage should increase 1.4V. For example, for KSMD24D2-12D, please ensure that the minimum control voltage is 9.6V+1.4V=11V Min









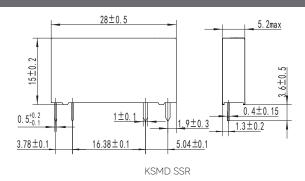
Load Voltage Range   24V   3   24   30   VDC     48V   3   48   58   VDC     MOSFET Transient Overvoltage   24V   75   Vpk     48V   37   39   41   VDC     48V   64 6   68   71 4   VDC     58V   75V   75V   75V     68V   75V   75V   75V     75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75V   75V     75V   75V   75	Output Specifications (Ta=25°C)	Condition	Model	Min	Тур	Max	Unit
MOSFET Transient Overvoltage   24V   75   Vpk   Vpk	Lood Valtage Dange		24V	3	24	30	VDC
MOSFET Transient Overvoltage   48V   100   Vpk	Load vollage Range	[   	48V	3	48	58	VDC
TVS Breakdown Voltage Range  @1mA  24V  37  39  41  VDC  48V  64.6  68  71.4  VDC  0.1A  0.001  0.1  A  A  0.002  3 A  0.002  3 A  A  4A  0.002  4 A  A  Turn-on Time  6A  0.002  6 A  Turn-off Time  0ff-State Leakage Current  0ff-State Leakage Current  0mC  ©Rated Voltage  0n-state Resistance  @Tj=25°C  3A/4A  0n-state Resistance  @Tj=25°C  3A/4A  0n-state Resistance  @Tj=25°C  0mQ  0mg  0mg  0mg  0mg  0mg  0mg  0mg	MOCFFT Transient Overveltage	 	24V		 	75	Vpk
TVS Breakdown Voltage Range  @1mA  48V 64.6 68 71.4 VDC  0.1A 0.001 0.1 A  Load Current Range  3A 0.002 3 A  4A 0.002 4 A  A  Turn-on Time  Turn-off Time  GRated Voltage  On-State Voltage Drop  @Rated Current  @Rated Current  @Rated Current  0.1A 0.002 6 A  Turn-off Time  300 μs  Turn-off Time  0Rated Current  0.1A 0.75 1.5 VDC  @Tj=25°C 3A/4A  On-state Resistance  @Tj=25°C 3A/4A  On-state Resistance  @Tj=25°C 6A  10 mΩ  @Tj=125°C  0RΩ	MOSEL Iransient Overvottage	1	48V		 	100	Vpk
A8V   64,6   68   71,4   VDC	TVS Broakdown Voltago Pango	@1m ∧	24V	37	39	41	VDC
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	1 V3 bleakdowi i Voltage Narige	e IIIIA	48V	64.6	68	71.4	VDC
Load Current Range         4A         0.002         4         A           Turn-on Time         6A         0.002         6         A           Turn-off Time         300         μs           Off-State Leakage Current         @Rated Voltage         100         μA           On-State Voltage Drop         @Rated Current         0.1A         0.75         1.5         VDC           @Tj=25°C         3A/4A         16         mΩ           @Tj=125°C         3A/4A         16         mΩ           @Tj=25°C         6A         10         mΩ           @Tj=125°C         6A         20         mΩ		 	0.1A	0.001	1	0.1	A
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Load Current Pango	 	3A	0.002		3	A
Turn-on Time         300         μs           Turn-off Time         300         μs           Off-State Leakage Current         @Rated Voltage         100         μA           On-State Voltage Drop         @Rated Current         0.1A         0.75         1.5         VDC           @Tj=25°C         3A/4A         16         mΩ           On-state Resistance         @Tj=125°C         3A/4A         10         mΩ           @Tj=25°C         6A         10         mΩ           @Tj=125°C         6A         20         mΩ	Load Current Nange	1	4A	0.002		4	A
Turn-off Time         300         μs           Off-State Leakage Current         @Rated Voltage         100         μA           On-State Voltage Drop         @Rated Current         0.1A         0.75         1.5         VDC           @Tj=25°C         3A/4A         16         mΩ           On-state Resistance         @Tj=125°C         3A/4A         10         mΩ           @Tj=25°C         6A         10         mΩ           @Tj=125°C         6A         20         mΩ			6A	0.002	 	6	A
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Turn-on Time	 		1	 	300	¦ µs
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Turn-off Time	1				300	¦ µs
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Off-State Leakage Current	@Rated Voltage		! ! !	i I	100	μΑ
On-state Resistance $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	On-State Voltage Drop	@Rated Current	0.1A	 	0.75	1.5	VDC
On-state Resistance		@Tj=25°C	Z / / / / /	!	16	 	mΩ
@Tj=25°C 10 mΩ @Tj=125°C 20 mΩ	On-state Peristance	@Tj=125°C	3A/4A			37	mΩ
@Tj=125°C 20 mΩ	OII-State Resistance	@Tj=25°C	4.0		10	 	mΩ
0.1A 1 A		@Tj=125°C	OA 		1	20	mΩ
		 	0.1A		1		A
Surae Current @10ms 3A 30 A	Surga Current	@10mc	3A		30		A
Surge Current @10ms	Surge Current	e ions	4A		48		
6A 60 A			6A	+	60		A

General Specifications (Ta=25°C)	Condition	Model	Min	Тур	Max	Unit
Dielectric Strength	50/60Hz, Input/Output			2500		Vrms
Insulation Resistance	@500VDC, Input/Output			1000		ΜΩ
Ambient Temperature Range			-30	i I	+80	°C
Storage Temperature Range	 		-30		+100	°C
Moight	1	Without Socket		4		g
Weight		With Socket		30		g

# Applications

Suitable for high density PCB mounted, PLC control applications, and etc.

# **Outline Dimensions**



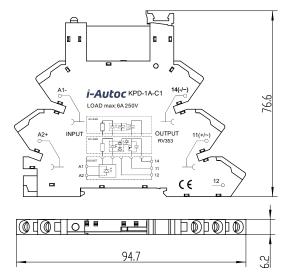




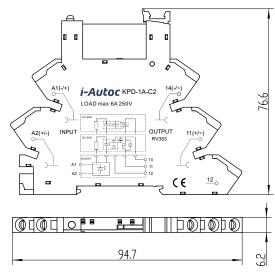




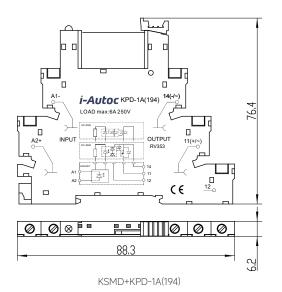
## **Outline Dimensions**



KSMD+KPD-1A-C1

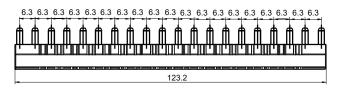


KSMD+KPD-1A-C2

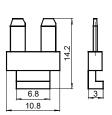


\_ A1(-/+) i-Autoc KPD-1A LOAD max:6A 250V A2(+/-) OUTPUT RV353 (€ 0 0 × F = 88.3 KSMD+KPD-1A

# **Jumper Strap Dimensions**







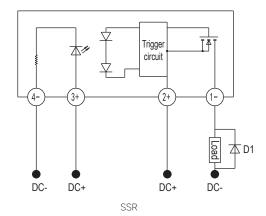


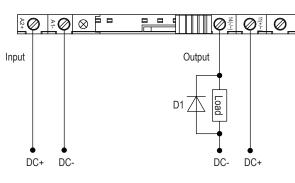




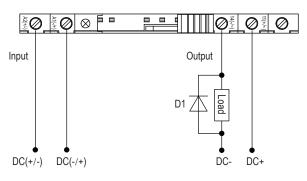


## Wiring Diagram





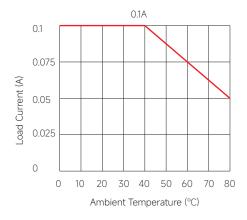
KSMD...-5D

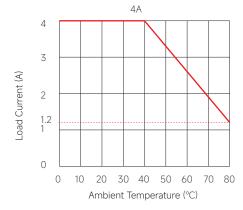


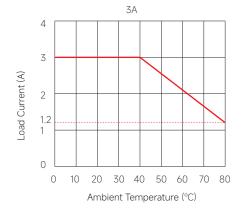
KSMD...-12/24/48/60D

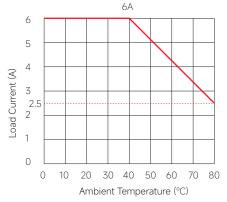
Note: When the relay is used for inductive load control, please be sure to use a suppression circuit, just like the drawing above. Both load terminals are inverse anti-paralleled with a fly-wheel diode D1. D1: Fast Recovery Diode

### Thermal Derating Curve













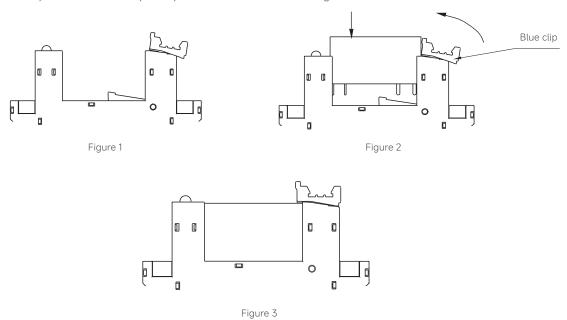




### **Installation Instructions**

#### 1. Install the relay

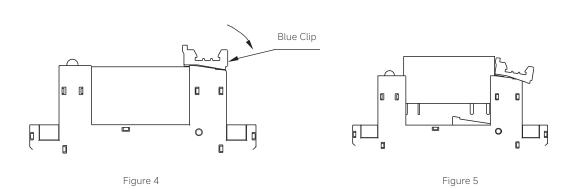
Set the blue clip of socket in the open state (see Figure 1), and insert the relay into the socket cavity (see Figure 2). Then press the relay down until the relay is fully installed in the socket (see Figure 3).

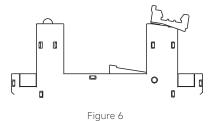


### 2. Remove the relay

Pull the blue clip of socket to remove the relay (see Figure 4-6).

Note: When disassembling the relay, in order to prevent the relay from being ejected and causing it to fall, please be sure to hold the relay and then pull the blue clip to remove the relay.







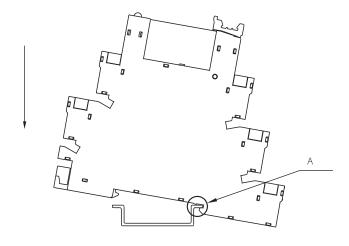






#### 3. Install the socket

Insert part A of the socket into the din-rail first, and then press the socket down in the direction of the arrow(see Figure 7).



## Figure 7

#### 4. Remove the socket

Insert a proper size screwdriver into part B of the socket, turn the screwdriver in the direction of the arrow, and then remove the socket (see Figure 8).

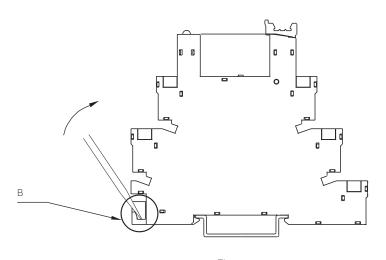


Figure 8









### **General Notes**

- 1. Soldering must be finished within 10 seconds at 260°C, or finished within 5 seconds at 350°C. Otherwise, it may cause damage to the relay
- 2. Terminal polarity must be observed. Otherwise, it may cause damage to the relay.
- 3. When the ambient temperature of the product is high, derate the product according to the temperature curve.
- 4. Capacitive load will produce very high surge current at the moment of conduction, which may lead to the damage of solid state relay due to the excessive surge current. Therefore, if the actual load is capacitive, or the load has paralleled large capacitance, it is strongly recommended that NTC should be connected in series in the load loop to suppress surge current in order to avoid damage to the product.

# ! Warnings

- l. The product's may become hot during operation, allow it to cool before touching.
- 2. Disconnect all power before installing or working with this equipment.
- 3. Verify all connections and replace all covers before turning on power.

## **Certification Standards**

Certification	Test Standard
UI	UL508
UL	C22.2 No. 14-13
CE	EN 60947-1:2007/A2:2014
	EN 60947-5-1:2017
TUV	EN 60947-1:2007/A2:2014
10 v	EN 60947-5-1:2017





