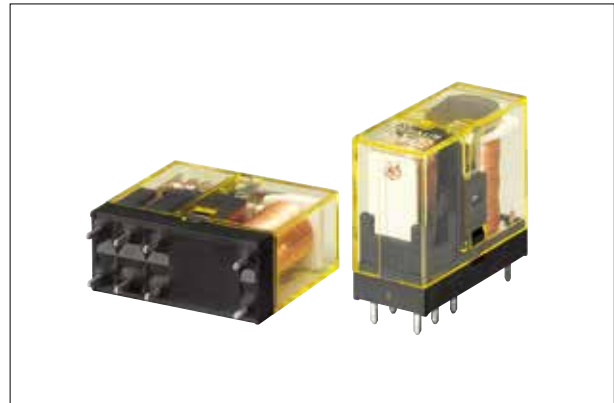


# RJ series Slim Power Relays PC Board Terminal

Compact power relays. High switching capacity up to 16A.

- Contact configurations:  
SPDT, SPST-NO, DPDT, DPST-NO.  
SPDT, SPST-NO are available in high capacity type.
- Compact housing—only 12.7-mm wide.
- High contact rating  
RJ1V (1-pole): 12A, 16A  
RJ2V (2-pole): 8A
- IDEC's unique spring return mechanism ensures long electrical and mechanical life.  
Electrical life: 200,000 operations (AC load)  
Mechanical life: 30 million operations (AC coil, SPDT, DPDT)
- Flux-tight structure
- Lloyd's Register of Shipping



## PC Board Terminal

No. of Poles	Style	Contact	Part No.	Coil Voltage Code	
1	Plain	SPDT	RJ1V-C-*	A12, A24, A100, A110, A115, A120	
				A200, A220, A230, A240	
				D5, D6, D12, D24, D48	
				D100	
		SPST-NO	RJ1V-A-*	A12, A24, A100, A110, A115, A120	
				A200, A220, A230, A240	
	High Capacity	SPDT	RJ1V-CH-*	A12, A24, A100, A110, A115, A120	
				A200, A220, A230, A240	
				D5, D6, D12, D24, D48	
				D100	
		SPST-NO	RJ1V-AH-*	A12, A24, A100, A110, A115, A120	
				A200, A220, A230, A240	
2	Plain	DPDT	RJ2V-C-*	A12, A24, A100, A110, A115, A120	
				A200, A220, A230, A240	
				D5, D6, D12, D24, D48	
				D100	
		DPST-NO	RJ2V-A-*	A12, A24, A100, A110, A115, A120	
				A200, A220, A230, A240	
					D5, D6, D12, D24, D48
					D100

## Coil Voltage Code \*

Code	Rated Coil Voltage
A12	12V AC
A24	24V AC
A100	100-(110)V AC
A110	110V AC
A115	115V AC
A120	120V AC
A200	200-(220)V AC
A220	220V AC
A230	230V AC
A240	240V AC
D5	5V DC
D6	6V DC
D12	12V DC
D24	24V DC
D48	48V DC
D100	100-110V DC

## Contact Ratings

No. of Poles	Style	Contact	Allowable Contact Power		Rated Load			Allowable Switching Current	Allowable Switching Voltage	Minimum Applicable Load (*1)
			Resistive Load	Inductive Load	Voltage	Resistive Load	Inductive Load cos $\phi$ = 0.3 L/R = 7 ms			
1	Plain	NO	3000VA AC	1875VA AC	250V AC	12A	7.5A	12A	250V AC 125V DC	5V DC, 100 mA
			360W DC	180W DC	30V DC	12A	6A			
		NC	3000VA AC	1875VA AC	250V AC	12A	7.5A			
			180W DC	90W DC	30V DC	6A	3A			
	High Capacity	NO	4000VA AC	2000VA AC	250V AC	16A	8A	16A	250V AC 125V DC	5V DC, 100 mA
			480W DC	240W DC	30V DC	16A	8A			
NC	4000VA AC	2000VA AC	250V AC	16A	8A					
	240W DC	120W DC	30V DC	8A	4A					
2	Plain	NO	2000VA AC	1000VA AC	250V AC	8A	4A	8A	250V AC 125V DC	5V DC, 10 mA
			240W DC	120W DC	30V DC	8A	4A			
		NC	2000VA AC	1000VA AC	250V AC	8A	4A			
			120W DC	60W DC	30V DC	4A	2A			

\*1) Measured at operating frequency of 120 operations / min (failure rate level P, reference value)

## Standard Ratings

### UL ratings

Voltage	Resistive					
	RJ1 (plain)		RJ2 (plain)		RJ1 (high capacity)	
	NO	NC	NO	NC	NO	NC
AC250V	12A	6A	8A	4A	16A	8A
30V DC	12A	6A	8A	4A	16A	8A

### VDE ratings

Voltage	Resistive			AC-15, DC-13 (Note)	
	RJ1 (plain)	RJ2 (plain)	RJ1 (high capacity)	RJ1 (plain)	RJ2 (plain)
	NO	NO	NO	NO	NO
AC250V	12A	8A	16A	6A	3A
30V DC	12A	8A	16A	2.5A	2A

Note: The operational current represents the classification by making and breaking currents (IEC 60947-5-1.)

### CSA ratings

Voltage	Resistive						Inductive					
	RJ1 (plain)		RJ2 (plain)		RJ1 (high capacity)		RJ1 (plain)		RJ2 (plain)		RJ1 (high capacity)	
	NO	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO	NC
AC250V	12A	12A	8A	8A	16A	16A	7.5A	7.5A	4A	4A	8A	8A
30V DC	12A	6A	8A	4A	16A	8A	6A	3A	4A	2A	8A	4A

## Coil Ratings

Rated Voltage	Coil Voltage Code	Rated Current (mA) ±15% (at 20°C)		Coil Resistance (Ω) ±10% (at 20°C)	Operating Characteristics (against rated values at 20°C)			Power Consumption	
		50 Hz	60 Hz		Minimum Pickup Voltage (initial value)	Dropout Voltage (initial value)	Maximum allowable voltage (Note)		
AC 50/60 Hz	12V	A12	87.3	75.0	62.5	80% maximum	30% minimum	140%	Approx. 1.1 VA (50Hz)  Approx. 0.9 to 1.2VA (60Hz)
	24V	A24	43.9	37.5	243				
	110V	A110	9.6	8.2	5270				
	115V	A115	9.1	7.8	6030				
	120V	A120	8.8	7.5	6400				
	220V	A220	4.8	4.1	21530				
	230V	A230	4.6	3.9	24100				
240V	A240	4.3	3.7	25570					
DC	5V	D5	106		47.2	70% maximum	10% minimum	170%	Approx. 0.53W to 0.64W
	6V	D6	88.3		67.9				
	12V	D12	44.2		271				
	24V	D24	22.1		1080				
	48V	D48	11.0		4340				
	100-110V	D100	5.3-5.8		18870				

Note: Maximum allowable voltage is the maximum voltage that can be applied to relay coils.

## Specifications

Model		RJ1V Plain	RJ1V High Capacity	RJ2V Plain
Number of Poles		1-pole	1-pole	2-pole
Contact Configuration		SPDT, SPST-NO	SPDT, SPST-NO	DPDT, DPST-NO
Contact Material		Ag-Ni	Ag-Sn-In	Ag-Ni
Enclosure Ratings		Flux-tight		
Contact Resistance (initial value) (*1)		50 mΩ maximum		
Operate Time (*2)		15 ms maximum		
Release Time (*2)		10 ms maximum		
Impulse Withstand Voltage		10,000V (between contact and coil)		
Dielectric Strength	Between contact and coil	5000V AC, 1 minute		5000V AC, 1 minute
	Between contacts of the same pole	1000V AC, 1 minute		1000V AC, 1 minute
	Between contacts of different poles	—		3000V AC, 1 minute
Vibration Resistance	Operating extremes	10 to 55 Hz, amplitude 0.75 mm		
	Damage limits	10 to 55 Hz, amplitude 0.75 mm		
Shock Resistance	Operating extremes	NO contact: 200 m/s <sup>2</sup> (20G), NC contact: 100 m/s <sup>2</sup> (10G)		
	Damage limits	1000 m/s <sup>2</sup> (100G)		
Mechanical Life (no load)		AC coil: 30 million operations minimum (SPDT/DPDT, operation frequency 18,000 operations per hour) 10 million operations minimum (SPST-NO/DPST-NO, operation frequency 18,000 operations/h) DC coil: 50 million operations minimum (SPDT/DPDT, operation frequency 18,000 operations per hour) 20 million operations minimum (SPST-NO/DPST-NO, operation frequency 18,000 operations/h)		
Electrical Life (rated load)		AC load: 200,000 operations minimum (operation frequency 1,800 operations per hour) DC load: 100,000 operations minimum (operation frequency 1,800 operations per hour)		
Operating Temperature (*3)		-40 to +70°C (no freezing)		
Operating Humidity		5 to 85% RH (no condensation)		
Weight (approx.)		SPDT: 17g SPST-NO: 16g	SPDT: 17g SPST-NO: 16g	DPDT: 17g DPST-NO: 16g

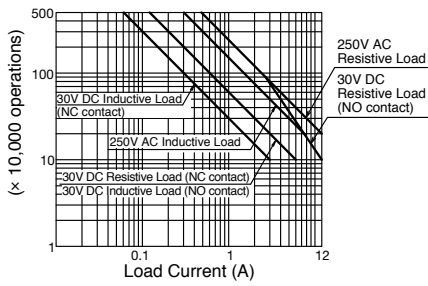
\*1: Measured using 5V DC, 1A voltage drop method.

\*2: Measured at the rated voltage (at 20°C), excluding contact bounce time.

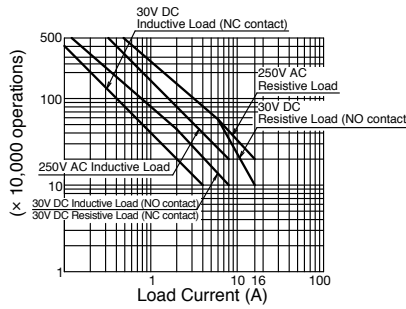
\*3: 100% rated voltage.

## Electrical Life Curve

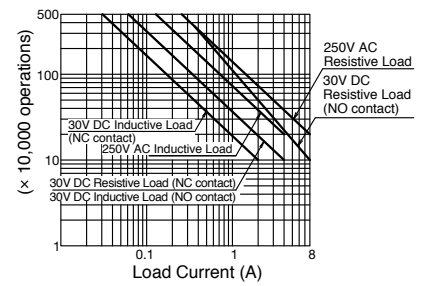
RJ1V Plain



RJ1V High Capacity

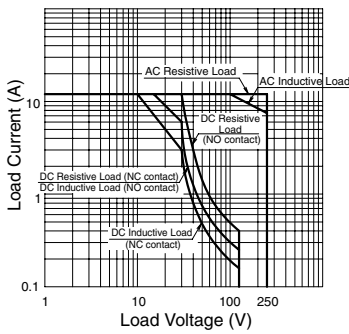


RJ2V Plain

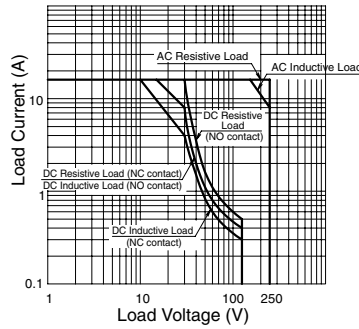


## Maximum Switching Current

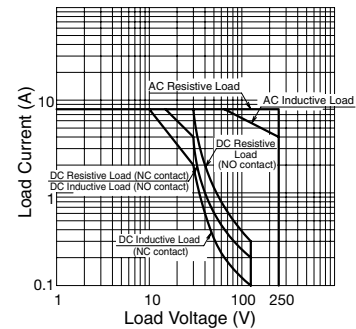
RJ1V Plain



RJ1V High Capacity

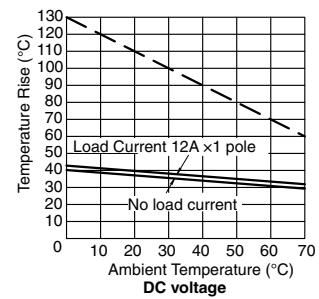
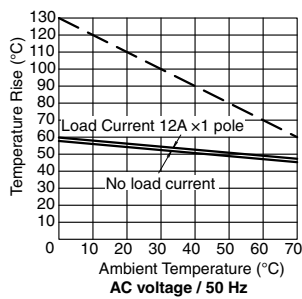
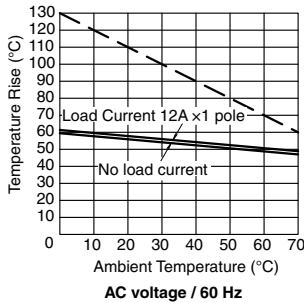


RJ2V Plain

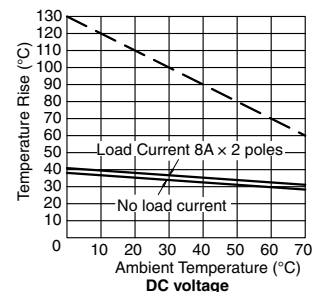
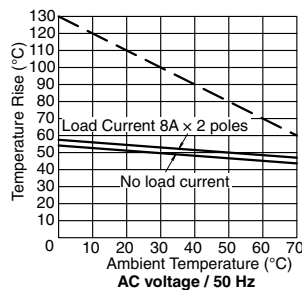
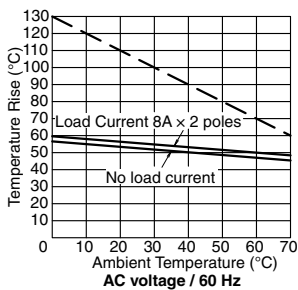


## Ambient Temperature vs. Temperature Rise Curves

RJ1V Plain



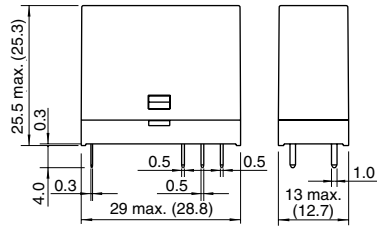
RJ2V Plain



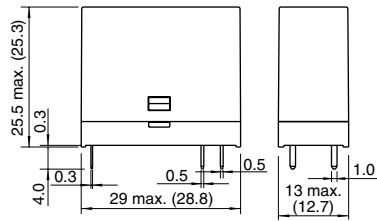
The above temperature rise curves show the characteristics when 100% of the rated coil voltage is applied. The slant dashed line indicates the allowable temperature rise for the coil at different ambient temperatures.

Dimensions

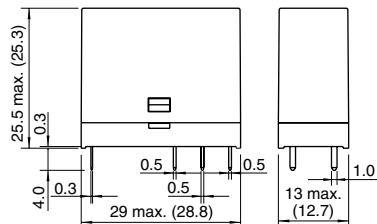
RJ1V-C-\*  
Plain SPDT



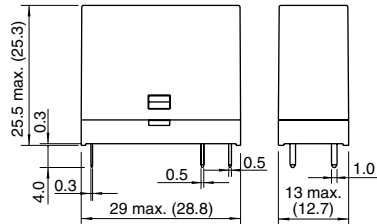
RJ1V-A-\*  
Plain SPST-NO



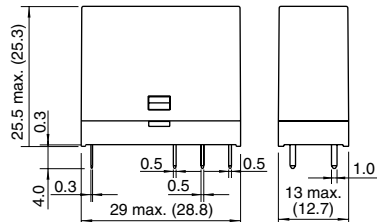
RJ1V-CH-\*  
High Capacity SPDT



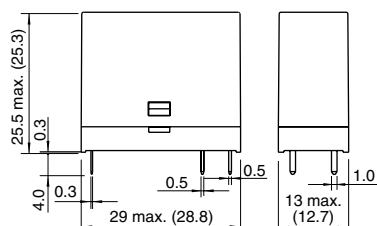
RJ1V-AH-\*  
High Capacity SPST-NO



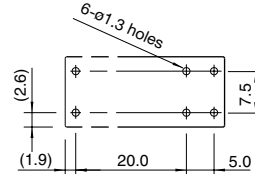
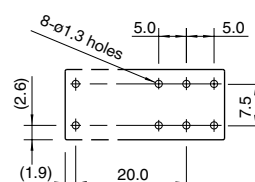
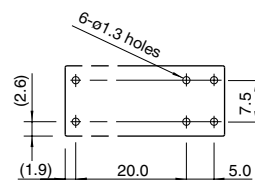
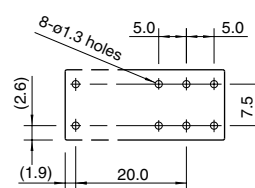
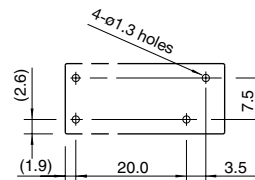
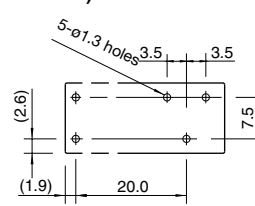
RJ2V-C-\*  
Plain DPDT



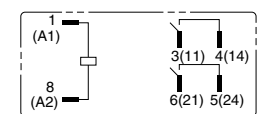
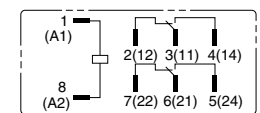
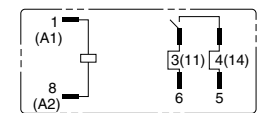
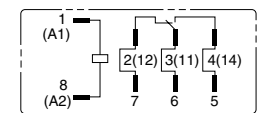
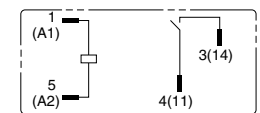
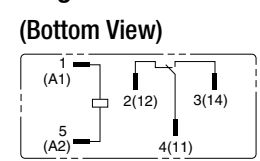
RJ2V-A-\*  
Plain DPST-NO



Mounting Hole Layout  
(Bottom View)



Internal Circuit Diagram  
(Bottom View)



All dimensions in mm.

Instructions

Notes on PC Board Mounting

- When using two or more RJ relays on a PC board, maintain at least 5mm distance between the relays.
- Manual soldering: Use a soldering iron of 60W (350°C), and quickly complete soldering with approximately 3 seconds. Sn-Ag-Cu is recommended when using lead-free solder.
- Auto-soldering: Solder at 250°C within 4 to 5 seconds.
- Because the terminal part is filled with epoxy resin, do not excessively solder or bend the terminal. Otherwise, air tightness will degrade.
- Avoid the soldering iron from touching the relay cover or the epoxy filled terminal part.
- Use a non-corrosive resin flux.

# Ordering Terms and Conditions

Thank you for using IDEC Products.

By purchasing products listed in our catalogs, datasheets, and the like (hereinafter referred to as "Catalogs") you agree to be bound by these terms and conditions. Please read and agree to the terms and conditions before placing your order.

## 1. Notes on contents of Catalogs

- (1) Rated values, performance values, and specification values of IDEC products listed in this Catalog are values acquired under respective conditions in independent testing, and do not guarantee values gained in combined conditions.  
Also, durability varies depending on the usage environment and usage conditions.
- (2) Reference data and reference values listed in Catalogs are for reference purposes only, and do not guarantee that the product will always operate appropriately in that range.
- (3) The specifications / appearance and accessories of IDEC products listed in Catalogs are subject to change or termination of sales without notice, for improvement or other reasons.
- (4) The content of Catalogs is subject to change without notice.

## 2. Note on applications

- (1) If using IDEC products in combination with other products, confirm the applicable laws / regulations and standards.  
Also, confirm that IDEC products are compatible with your systems, machines, devices, and the like by using under the actual conditions. IDEC shall bear no liability whatsoever regarding the compatibility with IDEC products.
- (2) The usage examples and application examples listed in Catalogs are for reference purposes only. Therefore, when introducing a product, confirm the performance and safety of the instruments, devices, and the like before use. Furthermore, regarding these examples, IDEC does not grant license to use IDEC products to you, and IDEC offers no warranties regarding the ownership of intellectual property rights or non-infringement upon the intellectual property rights of third parties.
- (3) When using IDEC products, be cautious when implementing the following.
  - i. Use of IDEC products with sufficient allowance for rating and performance
  - ii. Safety design, including redundant design and malfunction prevention design that prevents other danger and damage even in the event that an IDEC product fails
  - iii. Wiring and installation that ensures the IDEC product used in your system, machine, device, or the like can perform and function according to its specifications
- (4) Continuing to use an IDEC product even after the performance has deteriorated can result in abnormal heat, smoke, fires, and the like due to insulation deterioration or the like. Perform periodic maintenance for IDEC products and the systems, machines, devices, and the like in which they are used.
- (5) IDEC products are developed and manufactured as general-purpose products for general industrial products. They are not intended for use in the following applications, and in the event that you use an IDEC product for these applications, unless otherwise agreed upon between you and IDEC, IDEC shall provide no guarantees whatsoever regarding IDEC products.
  - i. Use in applications that require a high degree of safety, including nuclear power control equipment, transportation equipment (railroads / airplanes / ships / vehicles / vehicle instruments, etc.), equipment for use in outer space, elevating equipment, medical instruments, safety devices, or any other equipment, instruments, or the like that could endanger life or human health
  - ii. Use in applications that require a high degree of reliability, such as provision systems for gas / waterworks / electricity, etc., systems that operate continuously for 24 hours, and settlement systems
  - iii. Use in applications where the product may be handled or used deviating from the specifications or conditions / environment listed in the Catalogs, such as equipment used outdoors or applications in environments subject to chemical pollution or electromagnetic interference  
If you would like to use IDEC products in the above applications, be sure to consult with an IDEC sales representative.

## 3. Inspections

We ask that you implement inspections for IDEC products you purchase without delay, as well as thoroughly keep in mind management/maintenance regarding handling of the product before and during the inspection.

## 4. Warranty

- (1) Warranty period  
The warranty period for IDEC products shall be one (1) year after purchase or delivery to the specified location. However, this shall not apply in cases where there is a different specification in the Catalogs or there is another agreement in place between you and IDEC.
- (2) Warranty scope  
Should a failure occur in an IDEC product during the above warranty period for reasons attributable to IDEC, then IDEC shall replace or repair that product, free of charge, at the purchase location / delivery location of the product, or an IDEC service base. However, failures caused by the following reasons shall be deemed outside the scope of this warranty.
  - i. The product was handled or used deviating from the conditions / environment listed in the Catalogs
  - ii. The failure was caused by reasons other than an IDEC product
  - iii. Modification or repair was performed by a party other than IDEC
  - iv. The failure was caused by a software program of a party other than IDEC
  - v. The product was used outside of its original purpose
  - vi. Replacement of maintenance parts, installation of accessories, or the like was not performed properly in accordance with the user's manual and Catalogs
  - vii. The failure could not have been predicted with the scientific and technical standards at the time when the product was shipped from IDEC
  - viii. The failure was due to other causes not attributable to IDEC (including cases of force majeure such as natural disasters and other disasters)Furthermore, the warranty described here refers to a warranty on the IDEC product as a unit, and damages induced by the failure of an IDEC product are excluded from this warranty.

## 5. Limitation of liability

The warranty listed in this Agreement is the full and complete warranty for IDEC products, and IDEC shall bear no liability whatsoever regarding special damages, indirect damages, incidental damages, or passive damages that occurred due to an IDEC product.

## 6. Service scope

The prices of IDEC products do not include the cost of services, such as dispatching technicians. Therefore, separate fees are required in the following cases.

- (1) Instructions for installation / adjustment and accompaniment at test operation (including creating application software and testing operation, etc.)
- (2) Maintenance inspections, adjustments, and repairs
- (3) Technical instructions and technical training
- (4) Product tests or inspections specified by you

The above content assumes transactions and usage within your region. Please consult with an IDEC sales representative regarding transactions and usage outside of your region. Also, IDEC provides no guarantees whatsoever regarding IDEC products sold outside your region.

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 [www.idec.com](http://www.idec.com)

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