

Power Relay PK2 (THT – THR)



Features

- 60% volume reduced Power K at increased performance
- PCB area requirements minimized by 50% to only 293 mm²
- Size optimized to L x W x H (mm) 18.3 x 16 x 15.9
- Limiting continuous current 40 A
- Maximum switch on current 200 A
- Increased ambient temperature 105°C
- Design allows highest reliability
- High shock and vibration resistance
- Wave (THT) and reflow (THR/pin-in-paste) solderable versions
- For latching (bistable) version refer to Power Relay PK2 Latching

Typical Applications

- ABS control
- Blower fans
- Cooling fan
- Engine control
- Fuel pump
- Glow plug
- Hazard warning signal
- Switched power supply

Please contact Tyco Electronics for relay application support.



201_C-R_303

Design

- ELV/RoHS/WEEE compliant
- THT: sealed type washable
- THR: sealed type open vent hole

Weight

Approx. 11 g (0.39 oz.)

Nominal Voltage

12 V

Terminals

PCB terminals for assembly on printed circuit boards

Conditions

All parametric, environmental and endurance tests are performed according to EIA Standard RS-407-A at standard test conditions unless otherwise noted:
23°C ambient temperature,
20 - 50% RH, 998.9 ±33.9 hPa.

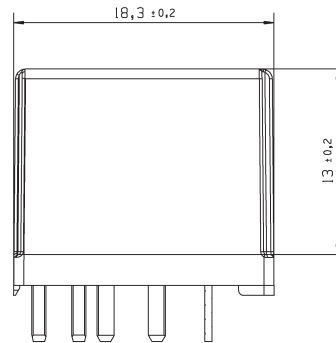
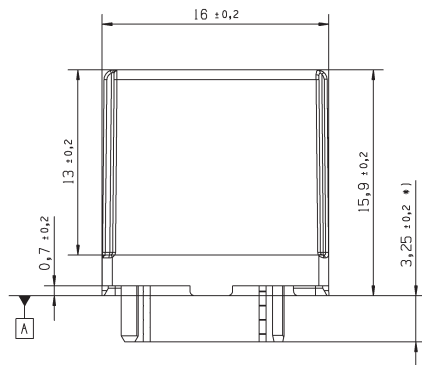
For general storage and processing recommendations please refer to our Application Notes and especially to *Storage* in the "Glossary" page 23 or at <http://relays.tycoelectronics.com/appnotes/>

Disclaimer

All technical performance data apply to the relay as such, specific conditions of the individual application are not considered. Please always check the suitability of the relay for your intended purpose. We do not assume any responsibility or liability for not complying herewith. We recommend to complete our questionnaire and to request our technical service. Any responsibility for the application of the product remains with the customer only. All specifications are subject to change without notification. All rights of Tyco Electronics are reserved.

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Dimensional Drawing

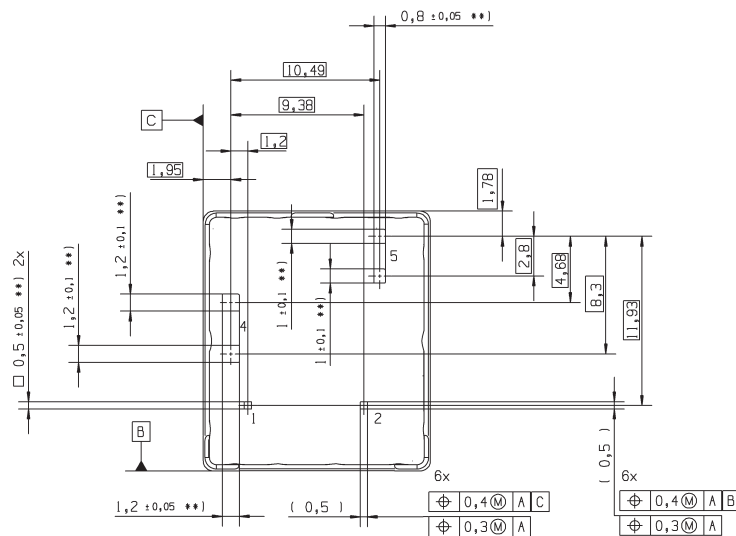


*) Additional tin tops max. 1 mm

2010_DD1

2010_DD2

View of the Terminals (bottom view)



Remark: Positional tolerances according to DIN EN ISO 5458

***) without tinning (hop dip)

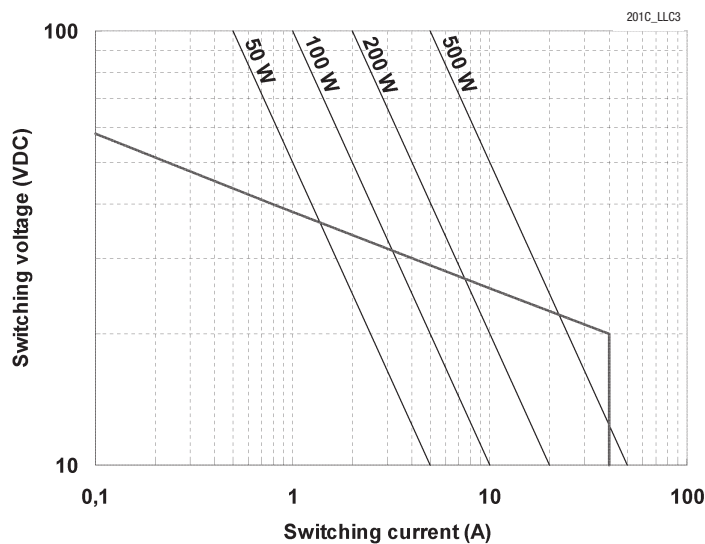
2010_VT1

Power Relay PK2 (THT – THR)

Contact Data	
Typical areas of application	Resistive/inductive/capacitive load
Contact configuration	1 Make contact/ 1 Form A
Circuit Symbol (see also Pin assignment)	5 (+) 4 (-)
Rated voltage	12 V
Rated current ¹⁾	33 A
Limiting continuous current ¹⁾	
23°C	40 A
85°C	33 A
105°C	22 A
Contact material	Silver based
Max. switching voltage/power	See load limit curve
Max. switching current ²⁾	
On	200 A
Off	40 A
Min. recommended load ³⁾	1 A at 5 V
Voltage drop at 10 A (initial) NO contact	Typ. 30 mV, 300 mV max.
Mechanical endurance (without load)	> 2 x 10 ⁶ operations
Examples of electrical endurance at cyclic temperature -40/+23/+85°C and 13.5 V; 120 ms - on/4880 ms - off	Inductive load: > 1 x 10 ⁵ operations, 60 A on/35 A Off, L = 0.5 mH Resistive load: > 1 x 10 ⁵ operations, 40 A on/40 A Off Capacitive load: > 1 x 10 ⁵ operations, 200 A on/20 A Off
Max. switching rate at nominal load	6 operations per minute (0.1 Hz)

- ¹⁾ Measured on 70 mm x 70 mm x 1.5 mm epoxy PCB FR4 with 52 cm² (double layer 140 μm thick) copper area.
- ²⁾ The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V load voltages.
- ³⁾ See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at <http://relays.tycoelectronics.com/appnotes/>

Load Limit Curve

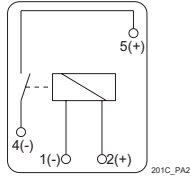


Load limit curve ≙ safe shutdown, no stationary arc/make contact

Power Relay PK2 (THT – THR)

Circuit Diagram

1 Make contact/1 Form A



Coil Data

Available for nominal voltages	12 V
Nominal power consumption of the unsuppressed coil at nominal voltage (monostable)	0.8 W
Test voltage winding/contact	500 VAC _{rms}
Maximum ambient temperature range ¹⁾	-40 to +105°C
Operate time at nominal voltage	Typ. 3 ms
Release time at nominal voltage ²⁾	Typ. 1.5 ms

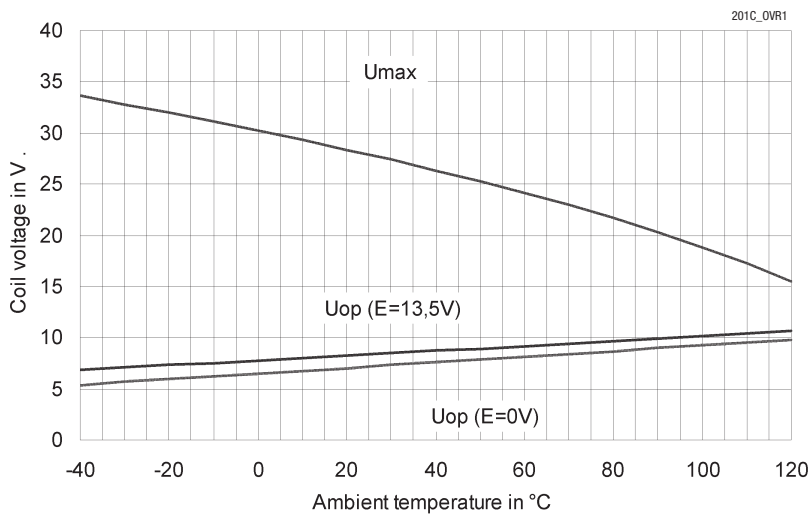
¹⁾ See also operating voltage range diagram.

²⁾ For unsuppressed relay coil.

Note:

A low resistive suppression device in parallel to the relay coil increases the release time and reduces the lifetime caused by increased erosion and/or higher risk of contact tack welding (monostable version only).

Operating Voltage Range



Does not take into account the temperature rise due to the contact current
E = pre-energization

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Environmental Conditions				
Temperature range, storage	Refer to <i>Storage</i> in the “Glossary” catalog page 23 or http://relays.tycoelectronics.com/appnotes/			
Test	Relevant standard	Testing as per	Dimension	Comments
Cold storage	IEC 68-2-1		1000 h	–40°C
Dry heat	IEC 68-2-2	Ba	1000 h	125°C
Thermal shock ¹⁾	IEC 68-2-14	Na	1000 cycles	–40/+125°C Dwell time 15 min
Vibration resistance	IEC 68-2-6 (sine pulse form)		30 - 440 Hz > 20 g	No change in the switching state > 10 μs
Shock resistance	IEC 68-2-27 (half sine form single pulses)		6 ms >30 g 11 ms > 100 g	Open contact will not close > 10 μs Closed contact will not open > 10 μs
Solderability	THT THR	IEC 68-2-20 IEC 68-2-58	Ta, Method 1	Hot dip 5 s 215°C 245°C Aging 3 (4 h/155°C) for leaded process (T _m = 183°C) for Pb-free process (T _m = 217°C)
Resistance to soldering heat	THT THR	IEC 68-2-20 IEC 68-2-58	Tb, Method 1A	Hot dip 10 s 260°C 260°C with thermal screen Preheating min 130°C
Sealing	THT THR	IEC 68-2-17	Qc, Method 2	1 min/70°C Open vent hole

¹⁾ Only storage.

Ordering Information

Part Numbers (see table below for coil data)		Contact Arrangement	Contact Material	Enclosure	Soldering Technology
Relay Description	Part Number				
V23201-C1001-A502	5-1414782-7	Form A	Silver based	Sealed	THT
V23201-R1005-A502	6-1414932-3	Form A	Silver based	Open vent hole	THR

Coil Versions

Coil Data for PK2 – THT/THR	Rated Coil Voltage (V)	Coil Resistance ±10% (Ω)	Must Operate Voltage (V)	Must Release Voltage (V)	Allowable Overdrive¹⁾ Voltage (V)	
					at 23°C	at 105°C
V23201-***01-****	12	176	6.9	1.5	27	17
V23201-***05-****	12	176	6.9	1.5	27	17

¹⁾ Allowable overdrive is stated with no load applied and minimum coil resistance.

Standard Delivery Packs (orders in multiples of delivery pack)

PK2 – THT/THR: 600 pieces