

Power Relay PK2 Latching



Features

- Limiting continuous current 50 A
- Increased ambient temperature 125°C
- Maximum switch on current 200 A
- Reduced coil power consumption of latching version allows higher limiting continuous current and increased ambient temperature
- 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
- Design allows highest reliability
- High shock and vibration resistance
- No change of switching state version at breakdown of battery voltage
- For monostable version refer to Power Relay PK2



201L_3d4

Typical Applications

- Energy management
- Engine control
- Ignition
- Main switch/supply relay
- Preheating system
- Quiescent current management

Please contact Tyco Electronics for relay application support.

Design

- ELV/RoHS/WEEE compliant
- THT: sealed type washable

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.

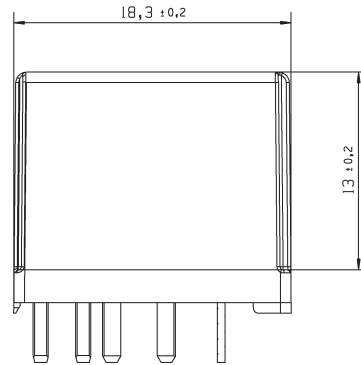
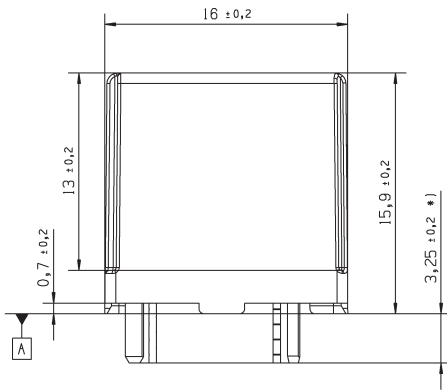
For general storage and processing recommendations please refer to our Application Notes and especially to *Storage* in the "Glossary" page 23 or at <http://relays.tycoelectronics.com/appnotes/>

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.

Power Relay PK2 Latching

Dimensional Drawing

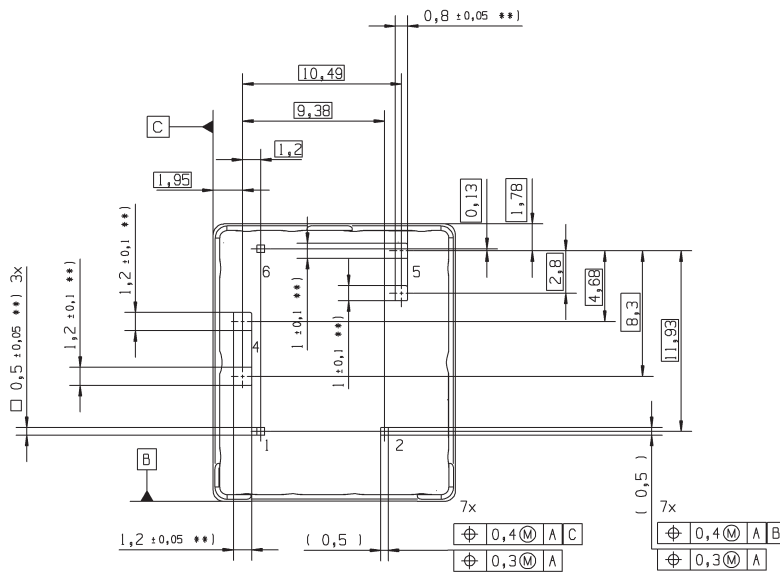


*) Additional tin tops max. 1 mm

201L_DD1

201L_DD2

View of the Terminals (bottom view)

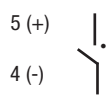


Remark: Positional tolerances according to DIN EN ISO 5458

**) without tinning (hop dip)

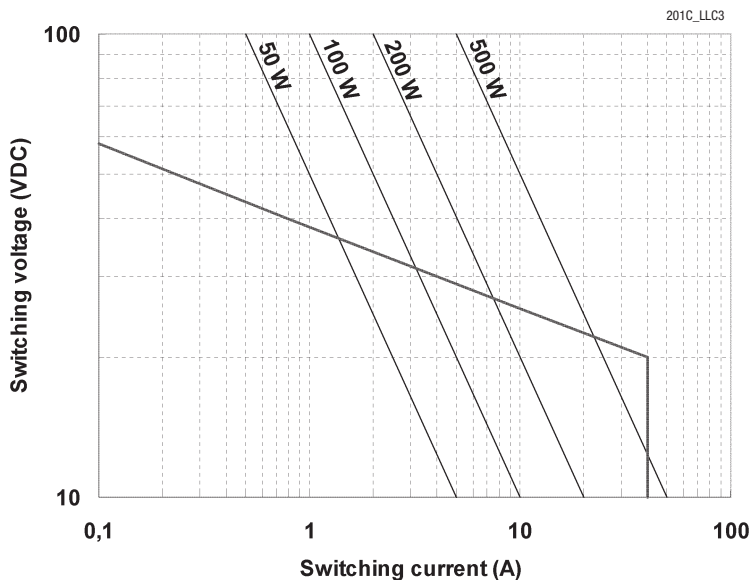
201L_VT1

Power Relay PK2 Latching

Contact Data	
Typical areas of application	Resistive/inductive/capacitive load
Contact configuration	1 Make contact/ 1 Form A
Circuit symbol (see also Pin assignment)	Latching (Delivery status "ex works") ¹⁾ 
Rated voltage	12 V
Rated current ²⁾	40 A
Limiting continuous current ²⁾	23°C 50 A 85°C 40 A 105°C 30 A
Contact material	Silver based
Max. switching voltage/power	See load limit curve
Max. switching current ³⁾	
On	200 A
Off	40 A
Min. recommended load	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	Motor 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⁾ Refer to *Latching Relay* in the "Glossary" at <http://relays.tycoelectronics.com/appnotes/>
²⁾ Measured on 70 mm x 70 mm x 1.5 mm epoxy PCB FR4 with 52 cm² (double layer 140 μm thick) copper area.
³⁾ The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5 V for 12 V load voltages.
⁴⁾ See chapter Diagnostics of Relays in our Application Notes page 31 or consult the internet at <http://relays.tycoelectronics.com/appnotes/>

Load Limit Curve

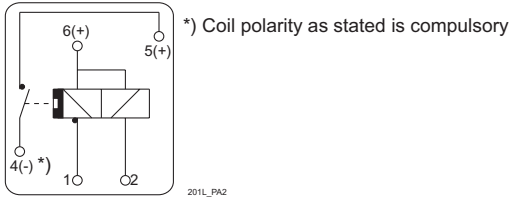


Load limit curve ≙ safe shutdown, no stationary arc/make contact

Power Relay PK2 Latching

Circuit Diagram

1 Make contact/1 Form A



Coil Data									
Available for nominal voltages	12 V								
Polarity for energizing/deenergizing main contact (pin 4 - 5)	<table border="1"> <tr> <td>0 V Pin 1</td> <td>Set n.a. Pin 2</td> <td>+</td> <td>Pin 6</td> <td>Reset n.a. Pin 1</td> <td>0 V Pin 2</td> <td>+</td> <td>Pin 6</td> </tr> </table>	0 V Pin 1	Set n.a. Pin 2	+	Pin 6	Reset n.a. Pin 1	0 V Pin 2	+	Pin 6
0 V Pin 1	Set n.a. Pin 2	+	Pin 6	Reset n.a. Pin 1	0 V Pin 2	+	Pin 6		
Nominal power consumption of the unsuppressed coil at nominal voltage (latching)	Impuls energy of approx. 1 Ws only required								
Minimum and maximum set pulse width	10 ms < pulse width < 100 ms								
Test voltage winding/contact	500 VAC _{rms}								
Maximum ambient temperature range	-40 to +125°C								
Operate time at nominal voltage	Typ. 1.5 ms								
Release time at nominal voltage	Typ. 1.5 ms								

Environmental Conditions				
Temperature range, storage	Refer to <i>Storage</i> in the "Glossary" at 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	IEC 68-2-20	Ta, Method 1	Hot dip 5 s 215°C	Aging 3 (4 h/155°C); for leaded process (Tm = 183°C) for Pb-free process (Tm = 217°C)
Resistance to soldering heat	IEC 68-2-20	Ta, Method 1A	Hot dip 10 s 260°C	with thermal screen
Sealing	IEC 68-2-17	Qc, Method 2		1 min/70°C

¹⁾ Only storage.

Power Relay PK2 Latching

Ordering Information

Part Numbers (see table below for coil data)		Contact Arrangement	Contact Material	Enclosure	Special Features
Relay Description	Part Number				
V23201-L1004-A502	4-1414915-9	Form A	Silver based	Sealed	Latching

Coil Versions

Coil Data for PK2 Latching	Rated Coil Voltage (V)	Coil Resistance $\pm 10\%$ (Ω)		Must Pulse Voltage (V)		Allowable Overdrive ¹⁾ Voltage (V)			
		Set	Reset	Set	Reset	at 23°C		at 85°C	
						Set	Reset	Set	Reset
V23201-***04-****	12	20	19	6.9	6.9	28	18; 28 ²⁾³⁾	28	18; 28 ²⁾³⁾

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

²⁾ Overvoltage according to ISO 16750-2 functional status C. In case of a reset latch pulse up to 28 V the contact may reclose, but will not remain closed (no latching function).

³⁾ The delay between driving impulses at cyclic energizing at $T_{Amb} = 85^\circ\text{C}$ must be at least 10 s.

Standard Delivery Packs (orders in multiples of delivery pack)

PK2 Latching: 600 pieces