Power Relay PK2 HE (THT – THR)

- **High endurance performance up to 105°C**
- **Limiting continuous current 40A at 85°C**
- **Maximum switch on current 250A**
- **High shock and vibration resistance**
- **Wave (THT) and reflow (THR/pin-in-paste) solderable versions**
- **For latching (bistable) version refer to Power Relay PK2 HE Latching**

Typical applications
Clamp switch (power distribution boxes), blower fan, cooling fan, fuel pump, glow plug, starter (start stop), heated screens.

Contact Data	
Contact arrangement	1 form A, 1 NO
Rated voltage	12VDC
Maximum switching voltage	16VDC
Rated current[1)]	50A
Limiting continuous current[1)]	
23°C	50A
85°C	40A
105°C	25A

Contact Data (continued)	
Contact material	silver alloy
Min. contact load[2)]	1A 5VDC
Initial voltage drop at 10A, typ./max.	30/300mV
Operate time[3)]	typ. 3ms
Release time[3)]	typ. 1.5ms
Mechanical endurance	>2x10^6 ops.

Electrical Endurance 12VDC Coil

Load voltage/ coil voltage	Load type			Load current 1 form A NO	On / off ratio	Electrical endurance[4)]
14VDC	resistive		make	40A	0.12s/4.88s	>5x10^5 ops.
			break	40A		
	capacitive		make	250A	0.12s/4.88s	>5x10^5 ops.
			break	20A		
	inductive	L=0.50mH	make	60A	0.12s/4.88s	>1.5x10^5 ops.
			break	35A		

All tests performed with cyclic temperature -40 to 85°C

1) Measured on 70x70x1.5mm epoxy PCB FR4 with 52cm^2 (double layer 105µm) copper area. Connected cable cross section 6mm^2. Boundary conditions: 180°C coil temperature; 130°C solder joint. Solder joint results above 130°C on request. The load circuit shall withstand current applied on 50A MAXI fuse. Tested for 100h according IEC 61810.
2) See Definitions for automotive relays https://relays.te.com/definitions/ and chapter Diagnostics of Relays in our Application Notes at https://relays.te.com/appnotes/
3) Measured at nominal voltage without coil suppression unit. 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).
4) Be aware of using right polarity, see terminal assignment. Wrong polarity could reduce endurance. Endurance values according Weibull.

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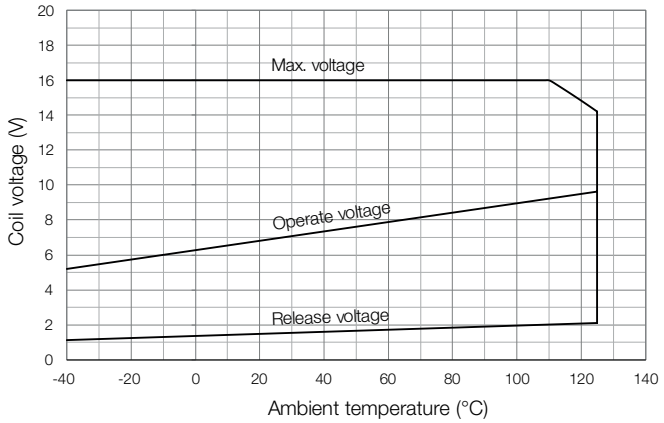
Power Relay PK2 HE (THT – THR) (Continued)

Coil Data

Coil code	Rated voltage [VDC]	Must Operate voltage [VDC]	Must Release voltage [VDC]	Coil resist. ±10% [Ω]	Rated coil power [W]
001	12	6.9	1.5	176	0.82

All figures are given for coil without pre-energization, at ambient temperature +23°C.

Coil operating range coil 001



Does not take into account the temperature rise due to the contact current

Insulation Data

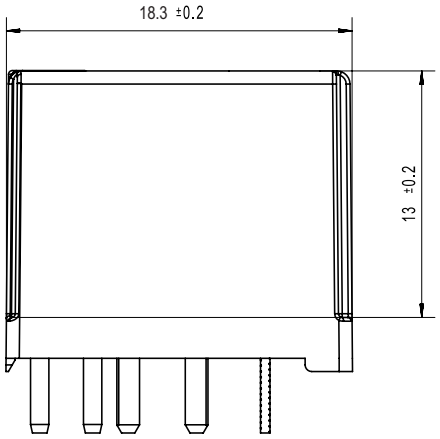
Initial dielectric strength	
between open contacts	500VAC$_{rms}$
between contact and coil	500VAC$_{rms}$

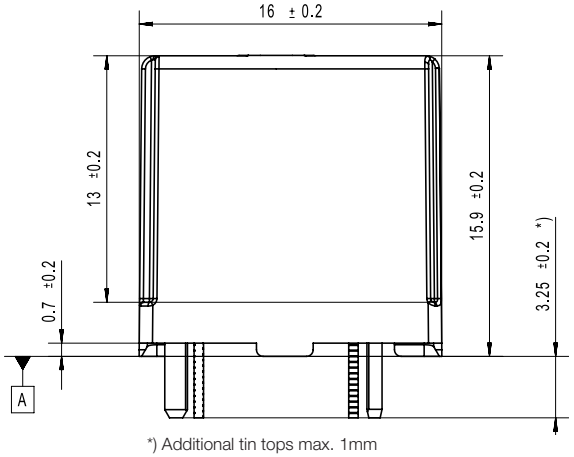
Other Data

EU RoHS/ELV compliance		compliant
Ambient temperature		-40 to +105°C
Cold storage		
IEC 60068-2-1 (2008-01)		1000h; -40°C
Dry heat		
IEC 60068-2-2 (2008-05)		1000h; +125°C
Rapid change of temperature (thermal shock),		
IEC 60068-2-14 (2010-04)		
Na		1000 cycles, -40°C /+125°C
Damp heat cyclic,		
IEC 60068-2-30 (2006-06)		
Db, variant 1		6 cycles 25°C/55°C/93%RH
Category of environmental protection		
IEC 61810 (2015-02)	THT:	RT III
	THR:	RT II
Sealing test		
IEC 60068-2-17 (1994-07)	THT:	Qc, method 2, 1min, 70°C
	THR:	n.a. - vented
Vibration resistance (functional)		
IEC 60068-2-6 (2007-12)		30 to 440Hz, >20g
sine pulse form		No change of switching state >10µs
Shock resistance (functional) half sine		
IEC 60068-2-27 (2008-01)		
open NO contact will not close >10µs		6ms > 30g
closed NO contact will not open >10µs		11ms > 100g
Solderability (aging 3: 4h/155°C)[5] THT		
IEC 60068-2-20 (2008-07)		Ta, method 1, hot dip 5s, 245°C[6]
Solderability (aging 3: 4h/155°C)[5] THR		
IEC 60068-2-58 (2017-07)		Ta, method 1, hot dip 5s 245°C[6]
Resistance to soldering heat THT		Tb, method 1A, hot dip 10s,
IEC 60068-2-20 (2008-07)		260°C with thermal screen
Resistance to soldering heat THR		Tb, method 1A, hot dip 10s, 260°C
IEC 60068-2-58 (2017-07)		preheating min 130°C
Storage conditions[7]		according IEC 60068-1 (2013-10)
Terminal type		PCB:THT, THR
Weight		approx. 11g (0.39oz)
Packaging unit		600 pcs.

5) For leaded process (Tm = 183°C), for Pb-free process (Tm = 217°C)
6) Depends on the alloy composition, please check IEC
7) For general storage and processing recommendations please refer to our Application Notes and especially to storage in the Definitions or at https://relays.te.com/appnotes/

Dimensions

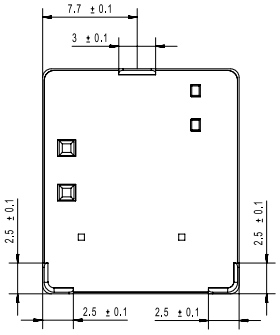




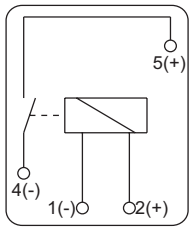
*) Additional tin tops max. 1mm

Power Relay PK2 HE (THT – THR) (Continued)

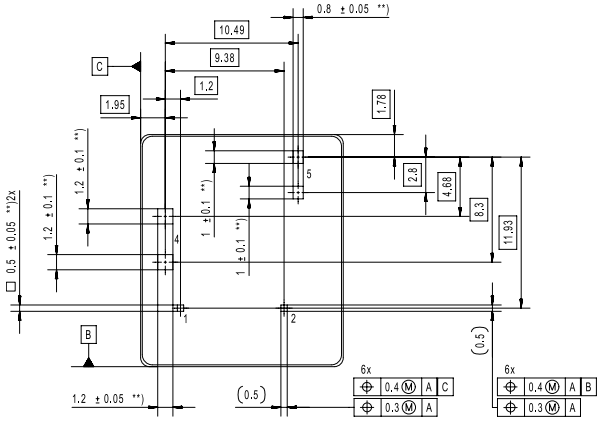
Dimensions



Terminal Assignment
Bottom view on solder pins
1 form A, 1 NO



PCB Layout
Bottom view on solder pins



Remark: Positional tolerances according to DIN EN ISO 5458
**) without tinning (hot dip)

Product Code Structure — Typical product code: **V23201 -C/R 1 001 -A 5 12**

Type
PK2 Power Relay PK2 HE (THT – THR, High Endurance)

Terminals and enclosure
C Sealed **R** Vented

Design
1 Single relay

Coil
001 (THT – THR), 176Ω

Contact type
A Single contact

Contact material
5 Silver Alloy

Contact arrangement
12 1 form A, 1 NO

Product Code	Version	Design	Coil	Arrangement	Part Number
V23201-C1001-A512	PCB, sealed	Single relay	High endurance (THT), 176Ω	1 form A, 1 NO	7-1904100-8
V23201-R1001-A512	PCB, vented		High endurance (THR), 176Ω		7-1904107-4

Other types on request.