

Micro Relay K (THT - THR)

- Small power relay
- Limiting continuous current 20A at 85°C
- Low weight
- Low noise operation
- Wave (THT) and reflow (THR/pin-in-paste) solderable versions
- For double version refer to Double Micro Relay K



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086C/R1_fcw1b

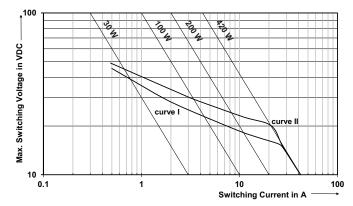
Typical applications

Door lock, heated front/rear screen, lamps front/rear/fog light, interior lights, seat control, sun roof, window lifter, wiper control.

Contact Data

Contact Data				
Typical applications	Inductive load	Wiper load	Resistive/inductive load	Lamp load
	V23086-*1*01-A403	V23086-*1*02-A803	V23086-*1*01-A402	V23086-*1*51-A502
Contact arrangement	1 form C, 1 CO	1 form C, 1 CO	1 form A, 1 NO	1 form A, 1 NO
Rated voltage	12VDC	10VDC	12VDC	10VDC
	NO/NC	NO/NC		
Rated current ¹⁾	30/25A	30/25A	30A	15A
Limiting continuous current ¹⁾				
23°Č	30/25A	30/25A	30A	15A
85°C	20/15A	20/15A	20A	10A
105°C	15/10A	15/10A	15A	
Limiting making current	40A ²⁾	40A ²⁾	40A ²⁾	100A ³⁾
Limiting breaking current	30A	30A	30A	30A
Contact material		AgSnO ₂		
Min. contact load		>1A at 5VDC ⁴⁾		
Initial voltage drop at 10A, typ./max.		30/300mV		
Operate/release time		typ. 3/1.5ms ⁵⁾		
Electrical enduranc				
cyclic temperature -40°C, +25°C, +85°	С			
form C contact (CO) at 14VDC	motor reverse blocked,	wiper,		
	25A, 0.77mH	25A make/5A break,		
	>1x10 ⁵ ops.	generator peak,		
		20A on NC,1mH		
		>1x10 ⁶ ops.		
form A contact (NO) at 14VDC			resistive 20A	lamp 100A inrush,
			>1x10 ⁵ ops.	10A steady state
			-	>1x10 ⁵ ops.
Mechanical endurance		>5x10 ⁶ ops.		·

Max. DC load breaking capacity



Load limit curve 1: arc extinguishes, during transit time (changeover contact). Load limit curve 2: safe shutdown, no stationary arc (make contact). Load limit curves measured with low inductive resistors verified for 1000 switching events.

07-2017, Rev. 0717 <u>www.te.com</u> © 2017 TE Connectivity. Datasheets and product specification according to IEC 61810-1 and to be used only together with the 'Definitions' section.

- Measured on 70x70x1.5mm epoxy PCB FR4 with 25cm² (double layer 105µm) copper area. Connecting cable cross section 6 mm².Boundary conditions: 180°C coil temperature;130°C solder joint.
- 2) The values apply to a resistive or inductive load with suitable spark suppression and at maximum 13.5VDC for 12VDC load voltages. For a load current duration of maximum 3s for a make/break ratio of 1:10.
- Corresponds to the peak inrush current on initial actuation (cold filament).
- See chapter Diagnostics of Relays in our Application Notes or consult the internet at http://relays.te.com/appnotes/
- 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.

Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at http://relays.te.com/definitions

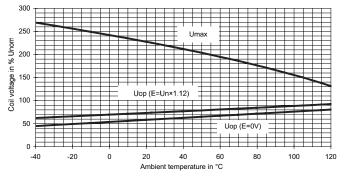
Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change. 1



Coil Data									
Rated coil	voltage		12VDC						
Coil versions, DC coil									
Coil	Rated	Operate	Release	Coil	Rated coil				
code	voltage voltage		voltage	resistance	power				
	VDC	VDC	VDC	Ω±10%	mW				
001/801	12	6.9	1.5	254	567				
002/802	10	5.7	1.25	181	552				
051/851	10	6.5	1.1	90	1111				
All figures are given for coil without pre-energization, at ambient temperature +23°C									

All fig res are given for coil without pre-energization, at ambient temp

Coil operating range



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

Insulation Data

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

Other Data

EU RoHS/ELV compliancecompliantAmbient temperature, DC coil-40 to $\pm 105^{\circ}$ CCold storage, IEC 60068-2-11000h; $\pm 40^{\circ}$ CDry heat, IEC 60068-2-21000h; $\pm 125^{\circ}$ CClimatic cycling with condensation, EN ISO 698820 cycles, storage 8/16hTemperature cycling (shock), IEC 60068-2-14, Na100 cycles; $\pm 40/\pm 125^{\circ}$ CDamp heat cyclic, IEC 60068-2-30, Db, variant 16 cycles 25^{\circ}C/55^{\circ}C/93%RHDamp heat cyclic, IEC 60068-2-3 method Ca56 days 40^{\circ}C/95%RHDegree of protection THT: THR:RT III (61810)THR:RT III (61810)Sealing test, IEC 60068-2-17: THT Corrosive gas IEC 60068-2-4310 daysIEC 60068-2-4310 daysIEC 60068-2-4310 daysVibration resistance (functional) IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g^{6)}Shock resistance (functional) IEC 60068-2-17: THT IEC 60068-2-27 (half sine)6ms, up to 30g^{6)}Terminal typePCB:THT, THR Weight approx. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THT IEC 60068-2-28Fa, method 1, hot dip 5s, 215°CSolderability THR IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THT IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)Packaging unit2000 pcs.	Other Data	
Cold storage, IEC 60068-2-11000h; -40°CDry heat, IEC 60068-2-21000h; +125°CClimatic cycling with condensation, EN ISO 698820 cycles, storage 8/16hTemperature cycling (shock), IEC 60068-2-14, Na100 cycles; -40/+125°CTemperature cycling, IEC 60068-2-30, Db, variant 16 cycles 25°C/55°C/93%RHDamp heat cyclic, IEC 60068-2-3 method Ca56 days 40°C/95%RHDegree of protection THT: Corrosive gas IEC 60068-2-43RT III (61810) RT II (61810)Vibration resistance (functional) IEC 60068-2-430 daysIEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional) IEC 60068-2-206ms, up to 30g ⁶)Terminal typePCB:THT, THR weight IEC 60068-2-58Solderability THR IEC 60068-2-5810, hot dip 5s, 215°CSolderability THR IEC 60068-2-58To, method 1, hot dip 10s, 260°C with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)	EU RoHS/ELV compliance	compliant
Dry heat, IEC 60068-2-2 $1000h; +125^{\circ}C$ Climatic cycling with condensation, EN ISO 698820 cycles, storage 8/16hTemperature cycling (shock), IEC 60068-2-14, Na $100 \text{ cycles}; -40/+125^{\circ}C$ Temperature cycling, IEC 60068-2-30, Db, variant 1 $6 \text{ cycles } 25^{\circ}C/55^{\circ}C/93\%$ RHDamp heat cyclic, IEC 60068-2-30, Db, variant 1 $6 \text{ cycles } 25^{\circ}C/55^{\circ}C/93\%$ RHDamp heat cyclic, IEC 60068-2-3 method Ca $56 \text{ days } 40^{\circ}C/95\%$ RHDegree of protection THT: TR:RT III (61810) RT II (61810)THR:RT III (61810) Sealing test, IEC 60068-2-17: THT Corrosive gas IEC 60068-2-43IEC 60068-2-4310 daysVibration resistance (functional) IEC 60068-2-43 10 days IEC 60068-2-4310 to $500\text{Hz}; 6g^{6}$ Shock resistance (functional) IEC 60068-2-27 (half sine) $6\text{ms, up to } 30g^{6}$ Terminal typePCB:THT, THR approx. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THT IEC 60068-2-20Ta, method 1, hot dip 5s, 215°CSolderability THR IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THT IEC 60068-2-58ThIEC 60068-2-58A tdip 5s 245°CResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)	Ambient temperature, DC coil	-40 to +105°C
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Temperature cycling, IEC 60068-2-14, Nb35 cycles; -40/+125°CDamp heat cyclic, IEC 60068-2-30, Db, variant 16 cycles $25^{\circ}C/55^{\circ}C/93\%$ RHDamp heat constant, IEC 60068-2-3 method Ca56 days $40^{\circ}C/95\%$ RHDegree of protection THT: THR:RT III (61810) RT II (61810)Sealing test, IEC 60068-2-17: THT Corrosive gas IEC 60068-2-420 daysIEC 60068-2-4210 daysIEC 60068-2-4310 daysVibration resistance (functional) IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional) IEC 60068-2-27 (half sine)6ms, up to $30g^{6}$)Terminal typePCB:THT, THR weightWeightapprox. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THT IEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THT IEC 60068-2-20Tb, method 1A, hot dip 10s, $260^{\circ}C$ with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)	Temperature cycling (shock),	
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Damp heat cyclic, IEC 60068-2-30, Db, variant 16 cycles $25^{\circ}C/55^{\circ}C/93\%$ RHDamp heat constant, IEC 60068-2-3 method Ca56 days $40^{\circ}C/95\%$ RHDegree of protection THT: THR:RT III (61810) RT II (61810)Sealing test, IEC 60068-2-17: THT Corrosive gas IEC 60068-2-42Qc, method 2, 1min, 70°CCorrosive gas IEC 60068-2-4310 daysIEC 60068-2-4310 daysVibration resistance (functional) IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional) IEC 60068-2-27 (half sine)6ms, up to $30g^{6}$)Terminal typePCB:THT, THR WeightSolderability (aging 3: 4h/155°C) THT IEC 60068-2-20Ta, method 1, hot dip 5s, 215°CSolderability THR IEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THT IEC 60068-2-20Tb, method 1A, hot dip 10s, $260^{\circ}C$ with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)	Temperature cycling,	
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Damp heat constant, IEC 60068-2-3 method Ca56 days 40°C/95%RHDegree of protection THT: THT: RT III (61810)RT III (61810)THR: Corrosive gas IEC 60068-2-42RT III (61810)IEC 60068-2-4210 daysIEC 60068-2-4310 daysVibration resistance (functional) IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional) IEC 60068-2-27 (half sine)6ms, up to 30g ⁶)Terminal typePCB:THT, THR WeightWeight IEC 60068-2-207a, method 1, hot dip 5s, 215°CSolderability (aging 3: 4h/155°C) THT IEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THT IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)	Damp heat cyclic,	
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Corrosive gas IEC 60068-2-42IEC 60068-2-4310 daysVibration resistance (functional)IEC 60068-2-6 (sine sweep)10 to 500Hz; $6g^{6}$)Shock resistance (functional)IEC 60068-2-27 (half sine)6ms, up to $30g^{6}$)IEC 60068-2-27 (half sine)6ms, up to $30g^{6}$)Terminal typePCB:THT, THRWeightapprox. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THTIEC 60068-2-20Ta, method 1, hot dip 5s, 215°CSolderability THRIEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THTIEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THRIEC 60068-2-58260°C; preheating min 130°CStorage conditionsaccording IEC 60068-17)	THR:	RT II (61810)
$\begin{array}{cccc} \operatorname{IEC} 60068-2-42 & 10 \ days \\ \operatorname{IEC} 60068-2-43 & 10 \ days \\ \end{array}$	Sealing test, IEC 60068-2-17: THT	Qc, method 2, 1min, 70°C
IEC 60068-2-4310 daysVibration resistance (functional)IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional)IEC 60068-2-27 (half sine)6ms, up to 30g ⁶)Terminal typePCB:THT, THRWeightapprox. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THTIEC 60068-2-20Ta, method 1, hot dip 5s, 215°CSolderability THRIEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THTIEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THRIEC 60068-2-58260°C; preheating min 130°CStorage conditionsaccording IEC 60068-17)	Corrosive gas	
Vibration resistance (functional) IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional)IEC 60068-2-27 (half sine)6ms, up to 30g ⁶)Terminal typePCB:THT, THRWeightapprox. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THTIEC 60068-2-20Ta, method 1, hot dip 5s, 215°CSolderability THRIEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THTIEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THRIEC 60068-2-58Resistance to soldering heat THRIEC 60068-2-58Solderability THRIEC 60068-2-70Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THRIEC 60068-2-58260°C; preheating min 130°CStorage conditionsaccording IEC 60068-17)	IEC 60068-2-42	
IEC 60068-2-6 (sine sweep)10 to 500Hz; 6g ⁶)Shock resistance (functional)IEC 60068-2-27 (half sine)6ms, up to 30g ⁶)Terminal typePCB:THT, THRWeightapprox. 4g (0.14oz)Solderability (aging 3: 4h/155°C) THTIEC 60068-2-20Ta, method 1, hot dip 5s, 215°CSolderability THRIEC 60068-2-58hot dip 5s 245°CResistance to soldering heat THTIEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THRIEC 60068-2-58260°C; preheating min 130°CStorage conditionsaccording IEC 60068-17)	IEC 60068-2-43	10 days
Shock resistance (functional) IEC 60068-2-27 (half sine) 6ms, up to 30g ⁶) Terminal type PCB:THT, THR Weight approx. 4g (0.14oz) Solderability (aging 3: 4h/155°C) THT IEC 60068-2-20 Ta, method 1, hot dip 5s, 215°C Solderability THR IEC 60068-2-58 hot dip 5s 245°C Resistance to soldering heat THT IEC 60068-2-20 Tb, method 1A, hot dip 10s, 260°C with thermal screen Resistance to soldering heat THR IEC 60068-2-58 260°C; preheating min 130°C Storage conditions according IEC 60068-1 ⁷)	Vibration resistance (functional)	
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Terminal type PCB:THT, THR Weight approx. 4g (0.14oz) Solderability (aging 3: 4h/155°C) THT IEC 60068-2-20 Ta, method 1, hot dip 5s, 215°C Solderability THR IEC 60068-2-58 hot dip 5s 245°C Resistance to soldering heat THT IEC 60068-2-20 Tb, method 1A, hot dip 10s, 260°C with thermal screen Resistance to soldering heat THR IEC 60068-2-58 260°C; preheating min 130°C Storage conditions according IEC 60068-1 ⁷)	Shock resistance (functional)	
Weight approx. 4g (0.14oz) Solderability (aging 3: 4h/155°C) THT IEC 60068-2-20 Ta, method 1, hot dip 5s, 215°C Solderability THR IEC 60068-2-58 hot dip 5s 245°C Resistance to soldering heat THT IEC 60068-2-20 Tb, method 1A, hot dip 10s, 260°C with thermal screen Resistance to soldering heat THR IEC 60068-2-58 260°C; preheating min 130°C Storage conditions according IEC 60068-1 ⁷)		
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IEC 60068-2-20 Ta, method 1, hot dip 5s, 215°C Solderability THR IEC60068-2-58 IEC 60068-2-20 hot dip 5s 245°C Resistance to soldering heat THT IEC 60068-2-20 Resistance to soldering heat THR IEC 60068-2-58 IEC 60068-2-58 260°C with thermal screen Resistance to soldering heat THR 260°C; preheating min 130°C Storage conditions according IEC 60068-1 ⁷)		approx. 4g (0.14oz)
Solderability THR IEC60068-2-58hot dip 5s 245°CResistance to soldering heat THT IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)		
IEC60068-2-58hot dip 5s 245°CResistance to soldering heat THTIEC 60068-2-20IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THRIEC 60068-2-58IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)		Ta, method 1, hot dip 5s, 215°C
Resistance to soldering heat THT IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)		
IEC 60068-2-20Tb, method 1A, hot dip 10s, 260°C with thermal screenResistance to soldering heat THR IEC 60068-2-58260°C; preheating min 130°C according IEC 60068-17)		hot dip 5s 245°C
Resistance to soldering heat THR 260°C with thermal screen IEC 60068-2-58 260°C; preheating min 130°C Storage conditions according IEC 60068-17)		
Resistance to soldering heat THR IEC 60068-2-58 260°C; preheating min 130°C Storage conditions according IEC 60068-1 ⁷)	IEC 60068-2-20	
IEC 60068-2-58 260°C; preheating min 130°C Storage conditions according IEC 60068-17)		260°C with thermal screen
Storage conditions according IEC 60068-1 ⁷)		
		, 1
Packaging unit 2000 pcs.		
	Packaging unit	2000 pcs.

6) Depending on mounting position: no change in the switching state >10µs.

For general storage and processing recommendations please refer to our Application Notes and especially to Storage in the Definitions or at http://relays.te.com/appnotes/

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Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at http://relays.te.com/definitions

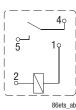
Datasheets, product data, 'Definitions' sec-tion, application notes and all specifications are subject to change.

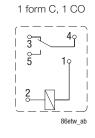


Terminal Assignment

Bottom view on solder pins

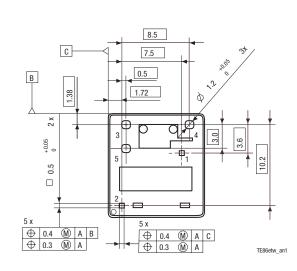






Mounting Hole Layout

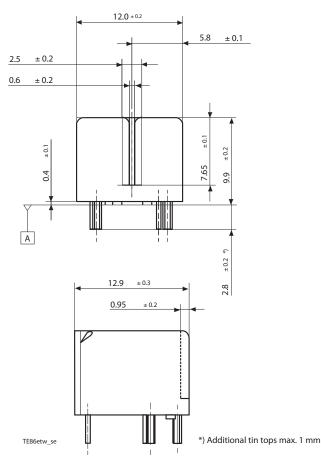
Bottom view on solder pins



Remark: Positional tolerances according to DIN EN ISO 5458

Dimensions

Micro Relay K, THT version



*) Additional tin tops max. 1mm

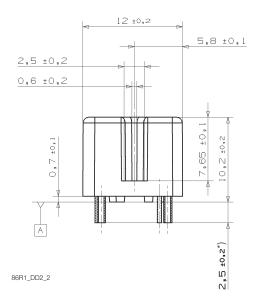
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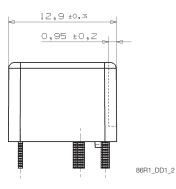
Datasheets and product specification according to IEC 61810-1 and to be used only together with the 'Definitions' section. Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at http://relays.te.com/definitions

Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change. 3



Micro Relay K, THR version

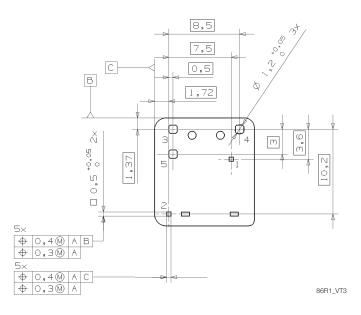




*) Additional tin tops max. 1mm

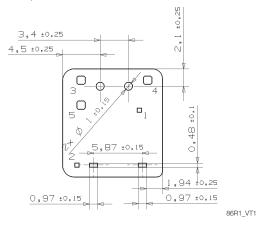
Mounting Hole Layout

Bottom view on solder pins



View of Stand-Offs

Bottom view on solder pins



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Datasheets and product specification according to IEC 61810-1 and to be used only together with the 'Definitions' section. Datasheets and product data is subject to the terms of the disclaimer and all chapters of the 'Definitions' section, available at http://relays.te.com/definitions

Datasheets, product data, 'Definitions' section, application notes and all specifications are subject to change.



Product code structure Typical product code				Typical product code V23	3086	-C	1	001	-A	4	03
Туре	V230	86 Micro Relay K (THT – THR)									
Termi		d enclosure									
	С	PCB version THT, sealed	R	PCB version THR, vented							
Desig	n						-				
-	1	Single relay									
Coil								-			
	001	Standard (THT)	002	Sensitive (THT)							
	801	Standard (THR)	802	Sensitive (THR)							
	051	Lamp load (THT)	851	Lamp load (THR)							
Conta	act type	e									
A Single contact											
Conta	ict ma	terial index									
	4	AgSnO ₂ standard	8	AgSnO ₂ wiper load							
	5	AgSnO ₂ lamp load									
Conta	act arra	angement index									
	02	NO	03	CO							

Product code	Version	Design	Coil	Contact	Cont. material	Arrangement	Part number
V23086-C1001-A402	PCB THT,	Single	Standard	Single	AgSnO ₂ (standard)	1 form A, 1 NO	0-1393280-5
V23086-C1001-A403	cleanable					1 form C, 1 CO	0-1393280-6
V23086-C1051-A502			Lamp load		AgSnO ₂ (lamp)	1 form A, 1 NO	2-1904093-1
V23086-C1002-A803			Sensitive		AgSnO ₂ (wiper)	1 form C, 1 CO	2-1414987-3
V23086-R1801-A402	PCB THR,		Standard		AgSnO ₂ (standard)	1 form A, 1 NO	2-1904093-2
V23086-R1801-A403	vented					1 form C, 1 CO	6-1414920-0
V23086-R1851-A502			Lamp load		AgSnO ₂ (lamp)	1 form A, 1 NO	9-1904064-4
V23086-R1802-A803			Sensitive		AgSnO ₂ (wiper)	1 form C, 1 CO	7-1414967-8

This list represents the most common types and does not show all variants covered by this datasheet. Other types on request.

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