SIEMENS

Miniature Power Relay Mini L

Product Information

PCB relay for DC voltage, neutral, monostable

Features

- High switching capacity of 10 A, small dimensions
- High ambient temperature of 85 °C
- Clearance and creepage distances of the basic insulation comply with the requirements of VDE 0435 and VDE 0700
- Tracking resistance of the plastics ≥ CTI 250
- Ideal for a wide variety of switching functions
- Fully automated production with integrated testing and inspection for high quality

ECR0976-I

Approx. 1:1 scale

Typical applications

- White goods
- Household appliances
- Building wiring systems
- Open and closed-loop control equipment
- Immobilizers
- Heater controls

Design

– With 1 changeover contact
or
1 make contact

– Standard or sensitive

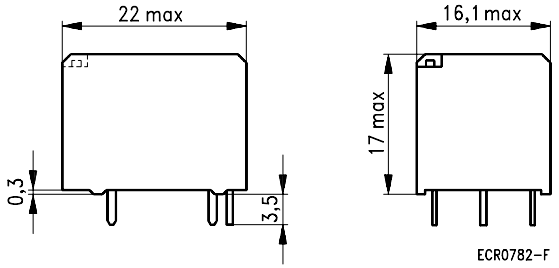
– For printed circuit assembling

– Immersion cleanable

Approvals

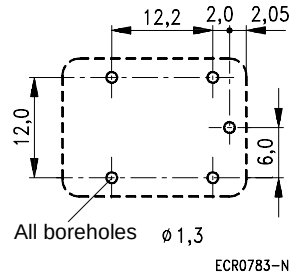
VDE	VDE	6006 ÜG
UL	UL	File E 48 393
SEMKO	SEMKO	applied for
CSA	CSA	applied for

Dimensional drawing (in mm)



Mounting hole layout

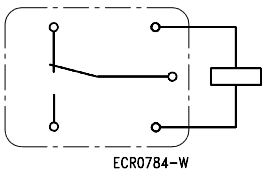
View on the terminals



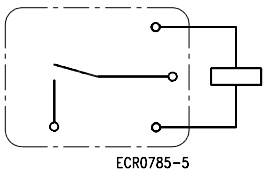
Terminal assignment

View on the terminals

1 changeover contact



1 make contact

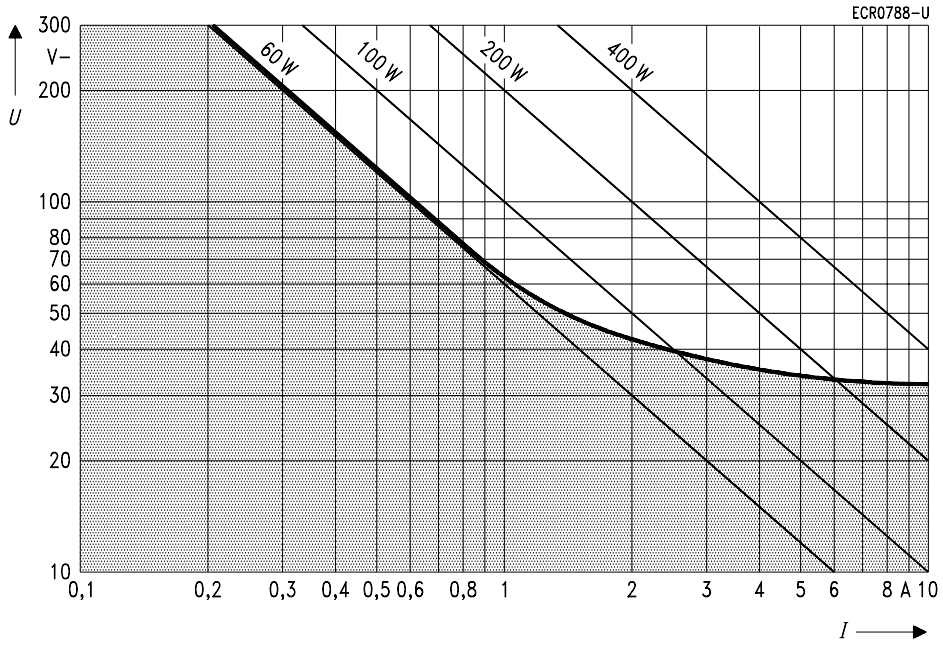


Contact data

Contact category III according to VDE 0435 Part 120/10.81, Appendix B			
Ordering code, block 3	A101/A102	A301/A302	A401/A402
Number of contacts and type	1 changeover/1 make	1 changeover/1 make	1 changeover/1 make
Contact assembly	Single contacts		
Contact material	Ag, gold-flashed	$AgSnO_2$	AgCdO
Max. continuous current at max. ambient temperature	5 A to 85 °C (sensitive version) 5 A to 85 °C (standard version) 10 A to 70 °C (standard version)		
Inrush current (max.4 s for 10% duty cycle)	Depending on type of contact 20 A		
Maximum switching voltage	300 V~ 250 V–		
Maximum switching capacity AC voltage DC voltage	 2500 VA See load limit curve		
Recommended for loads greater than	10 mA, 6 V–	500 mA, 12 V~/V–	500 mA, 12 V~
Contact resistance (initial value)/ measuring current/driver voltage	≤ 100 mΩ/100 mA/6 V	≤ 100 mΩ/1 A/24 V	≤ 100 mΩ/1 A/24 V

Note: Inrush currents up to 40 A on request.

Load limit curve



I = switching current
U = switching voltage
Definition of the load limit curve:
In 1000 operations there must be no arc with a burning time > 0.4 ms (transit time).

Coil data

Nominal voltages	From 3 V– to 48 V– Special voltages on request
Nominal power consumption, at 20 °C	450 mW (standard version) 360 mW (sensitive version)
Pull-in power, at 20 °C	200...240 mW (standard version) 180 mW (sensitive version)
Operating range/class of energizing voltage to DIN IEC 255 Part 1-00 or VDE 0435 Part 201	1/a
Minimum release voltage	10 % of the nominal voltage

Coil versions (Standard coil)

Nominal voltage U_{nom} V–	Operate voltage at 20 °C $U_{on\ cold}$ V–	Operating voltage range at 20 °C		Resistance at 20 °C Ω	Number of coil, ordering code, block 2
		Oper. voltage U_I V–	Max. voltage U_{II} V–		
3	2.1	2.4	6.3	20 ± 2	001
5	3.5	4.0	10.5	55 ± 5.5	002
6	4.2	4.7	12.5	80 ± 8	003
9	6.3	7.1	19	180 ± 18	004
12	8.4	9.5	25	320 ± 32	005
18	12.6	14.3	36	700 ± 70	006
24	16.8	18.9	50	1280 ± 128	007
36	25.2	28.5	73	2800 ± 280	008
48	33.6	37.7	101	5100 ± 510	009

Other coil versions available on request

$U_{on\ cold}$ = Operate voltage at 20 °C without pre-energizing the coil

U_I = Operate voltage at 20 °C after pre-energizing with U_{nom} without contact current

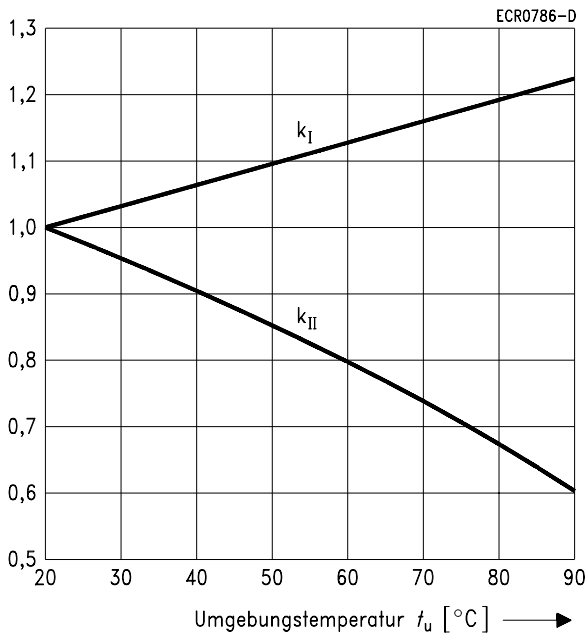
U_{II} = Maximum continuous voltage at 20 °C for $T_{c\ max}$ = 130 °C without contact loading

U_{nom} = Nominal voltage

Operating voltage limits U_I and U_{II} depend on temperature and can be calculated by:

$U_{I\ tamb} = k_I \cdot U_{I\ 20\ °C}$ and $U_{II\ tamb} = k_{II} \cdot U_{II\ 20\ °C}$

t_{amb} = Ambient temperature
$U_{I\ tamb}$ = Minimum voltage at ambient temperature t_{amb}
$U_{II\ tamb}$ = Maximum voltage at ambient temperature t_{amb}
k_I a. k_{II} = Factors (dependent on temperature), see diagram
$T_{c\ max}$ = Maximum coil temperature



Coil versions (Sensitive coil)

Nominal voltage U_{nom} V–	Operate voltage at 20 °C $U_{on\ cold}$ V–	Operating voltage range at 20 °C		Resistance at 20 °C Ω	Number of coil, ordering code, block 2
		Oper. voltage U_I V–	Max. voltage U_{II} V–		
3	2.1	2.3	7.0	25 ± 2.5	201
5	3.5	3.9	11.5	70 ± 7.0	202
6	4.2	4.6	14.0	100 ± 10	203
9	6.3	6.9	21.0	225 ± 25	204
12	8.4	9.3	28.0	400 ± 40	205
18	12.6	13.9	42.0	900 ± 90	206
24	16.8	18.5	56.0	1600 ± 160	207
36	25.2	27.7	85.0	3600 ± 360	208
48	33.6	37.0	113.0	6400 ± 640	209

*) Restriction: according to UL a maximum ambient temperature of 70 °C and a maximum energizing voltage of 1.1 · U_{nom} are allowed.

Other coil versions available on request

$U_{on\ cold}$= Operate voltage at 20 °C without pre-energizing the coil

U_I = Operate voltage at 20 °C after pre-energizing with U_{nom} without contact current

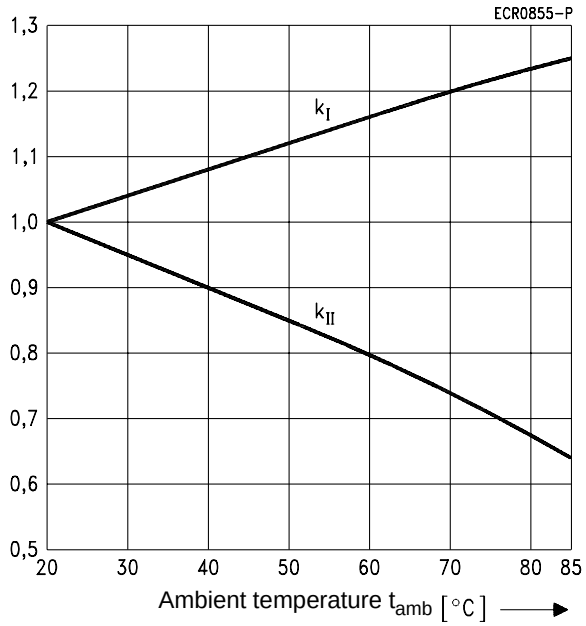
U_{II} = Maximum continuous voltage at 20 °C for $T_{c\ max}$ = 130 °C without contact loading

U_{nom} = Nominal voltage

Operating voltage limits U_I and U_{II} depend on temperature and can be calculated by:

$U_{I\ tamb}$ = $k_I \cdot U_{I\ 20\ °C}$ and $U_{II\ tamb} = k_{II} \cdot U_{II\ 20\ °C}$

t_{amb} = Ambient temperature
$U_{I\ tamb}$ = Minimum voltage at ambient temperature t_{amb}
$U_{II\ tamb}$ = Maximum voltage at ambient temperature t_{amb}
k_I a. k_{II} = Factors (dependent on temperature), see diagram
$T_{c\ max}$ = Maximum coil temperature



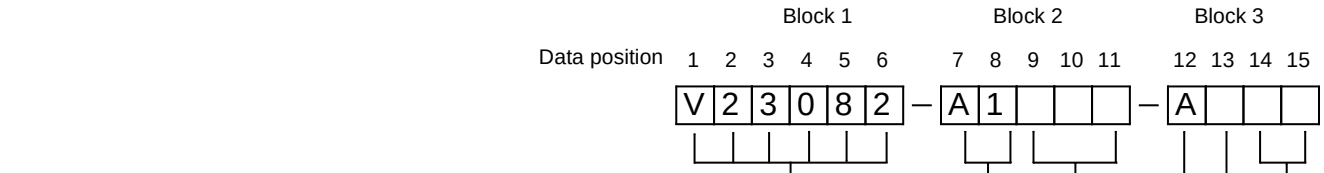
General data

Operate time at U_{nom} and 20 °C, typ.	6 ms			
Release time, max.	2.5 ms/10 ms			
Bounce time, make/break contact, typ.	1/15 ms			
Maximum switching rate without load	1200 min^{-1}			
Maximum switching rate with rated load	30 min^{-1}			
Ambient temperature range according to DIN IEC 255 Part 1-00 or VDE 0435 Part 201	-40 °C ... +85 °C			
Thermal resistance	70 K/W			
Coil temperature rise due to rated contact current	Approx. 10 K			
Maximum permissible coil temperature	130 °C			
Vibration resistance of the make contact, frequency range	10 g at 55 to 200 Hz			
Shock resistance	10 g at 11 ms, half-sine wave			
Protection class according to DIN 40050/IEC 529	Immersion cleanable IP 67			
Electrical endurance	Load	Contact material	Loading on	Endurance, typ., operations
	5 A/230 V~, resistive	AgCdO	Changeover contact	1 x 10^5
	10 A/230 V~, resistive	AgCdO	Make contact	1 x 10^5
	Valve load, 230 V~, 50 mA	AgCdO	Make contact	6 x 10^6
	Motor load, 3 A/0.6 A inductive	AgCdO	Make contact	3 x 10^5
Mechanical endurance	Approx. 1 x 10^7 operations			
Flammability according to UL 94	V-0			
Solder bath temperature/max. duration	260 °C / 5 s			
Mounting position	Any			
Processing information	Wherever possible, ultrasonic cleaning should not be used; if absolutely necessary, then only after consultation with the manufacturer.			
Weight	12 g			

Insulation

According to VDE 0110 (2/79): insulation group/rated voltage	B/250
Dielectric test voltage, contact – coil (1 min)	2000 $V~_{rms}$
Dielectric test voltage between open contacts (1 min)	1000 $V~_{rms}$
Clearances/creepage distances	2 mm / 3 mm
Tracking resistance of the fundamental frame according to DIN IEC 112	CTI 250

Ordering code



Identifier for
Miniature Power Relay Mini L

Design
A1 = Immersion cleanable

Coil number

Standard:
001 = 3 V– nominal voltage
002 = 5 V–
003 = 6 V–
004 = 9 V–
005 = 12 V–
006 = 18 V–
007 = 24 V–
008 = 36 V–
009 = 48 V–

Sensitive version:
201 = 3 V– nominal voltage
202 = 5 V–
203 = 6 V–
204 = 9 V–
205 = 12 V–
206 = 18 V–
207 = 24 V–
208 = 36 V–
209 = 48 V–

Type of contact
A = Single contact

Contact material
1 = Ag, gold-flashed
3 = $AgSnO_2$
4 = AgCdO

Contact arrangement
01 = Changeover contact
02 = Make contact

Ordering example: V23082-A1005-A401
Miniature Power Relay Mini L, standard coil, 12 V nominal voltage, with 1 changeover contact, contact material silver cadmium oxide (AgCdO)

Note: Special versions are available on customer request. Please contact your local sales office.

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