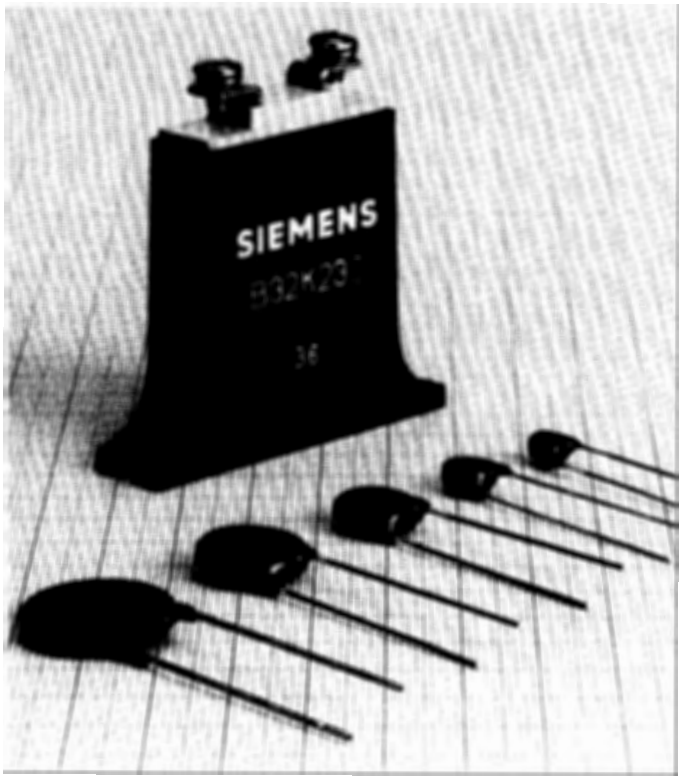
SIEMENS

SIOV

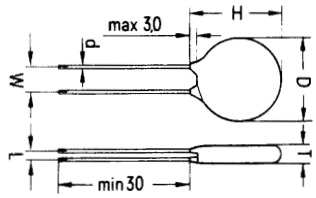
Metal Oxide Varistors SIOV



Siemens manufactures a wide range of more than 120 different types of Varistors, covering all design requirements. The devices are ideally suited for the protection of individual electronic components, as well as line dependent equipment.

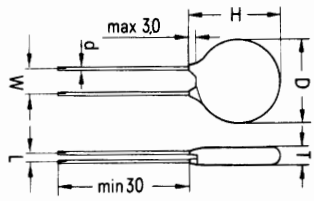
The metal oxide Varistor is based on zinc oxide ceramic. The working principle of these devices is that of a voltage dependent resistor, whose resistance decreases with an increase of voltage applied (transient). The response time of varistors is typically in the low nano second range.

Disc-Varistors Standard table



Type	Maximum allowable operating voltage (V)		Maximum allowable energy absorption (Wsec) Energy input with standard wave 8/20 µsec Number of energy absorptions (strike)				Energy input with rectangle wave 2 msec Number of energy absorptions (strike)				Capacitance	Varistor-voltage**	Dimensions (mm)					
	ac_{rms}	dc	1	10^2	10^4	10^6	1	10^2	10^4	10^6	(pF)	(V)	D_{max}	T±1	W±1	H_{max}	L±1	d
SIOV-S10K14	14	18	0,6	0,12	0,04	0,03	0,8	0,20	0,16	0,14	6000	22	13,5	3,7	7,5	16,5	1,4	0,8
SIOV-S14K14			1,2	0,24	0,08	0,04	1,6	0,40	0,32	0,24	15000		17,0	3,7	7,5	20,0	1,4	0,8
SIOV-S10K17	17	22	0,75	0,15	0,05	0,03	1,0	0,25	0,20	0,16	4000	27	13,5	3,8	7,5	16,5	1,5	0,8
SIOV-S14K17			1,5	0,30	0,1	0,04	1,9	0,50	0,40	0,30	10000		17,0	3,8	7,5	20,0	1,5	0,8
SIOV-S10K20	20	26	0,9	0,18	0,06	0,03	1,2	0,30	0,25	0,20	3000	33	13,5	4,0	7,5	16,5	1,7	0,8
SIOV-S14K20			1,8	0,36	0,12	0,04	2,4	0,60	0,50	0,40	7500		17,0	4,0	7,5	20,0	1,7	0,8
SIOV-S10K25	25	31	1,05	0,22	0,07	0,04	1,4	0,36	0,28	0,22	2600	39	13,5	4,0	7,5	16,5	1,8	0,8
SIOV-S14K25			2,1	0,44	0,14	0,05	2,8	0,72	0,56	0,44	6500		17,0	4,0	7,5	20,0	1,8	0,8
SIOV-S10K30	30	38	1,3	0,26	0,09	0,04	1,8	0,44	0,35	0,28	2200	47	13,5	4,1	7,5	16,5	1,8	0,8
SIOV-S14K30			2,6	0,52	0,18	0,06	3,3	0,88	0,70	0,56	5500		17,0	4,1	7,5	20,0	1,8	0,8
SIOV-S10K35	35	45	1,55	0,30	0,1	0,04	2,0	0,52	0,42	0,33	1800	56	13,5	4,2	7,5	16,5	1,9	0,8
SIOV-S14K35			3,1	0,60	0,2	0,07	4,0	1,04	0,84	0,66	4500		17,0	4,2	7,5	20,0	1,9	0.8
SIOV-S10K40	40	56	1,9	0,38	0,13	0,05	2,5	0,62	0,5	0,4	1300	68	13,5	4,3	7,5	16,5	2,2	0,8
SIOV-S14K40			3,8	0,76	0,26	0,08	4,8	1,24	1,0	0,8	3300		17,0	4,3	7,5	20,0	2,2	0,8
SIOV-S10K50	50	65	2,0	0,5	0,2	0,08	2,0	1,2	1,0	0,6	700	82	13,5	4,3	7,5	16,5	2,2	0,8
SIOV-S14K50			5,0	1,2	0,3	0,10	5,0	3,0	1,5	1,0	2000		17,0	4,3	7,5	20,0	2,2	0,8
SIOV-S05K60			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	150		7,0	3,7	5,0	10,0	1,6	0,6
SIOV-S07K60			2,0	0,5	0,2	0,10	2,0	1,2	1,0	0,8	240		9,0	3,7	5,0	12,0	1,6	0,6
SIOV-S10K60	60	85	4,0	1,0	0,4	0,15	4,0	2,5	2,0	1,2	600	100	13,5	4,3	7,5	16,5	1,8	0,8
SIOV-S14K60			8,0	2,0	0,6	0,20	8,0	5,0	3,0	1,7	1800		17,0	4,3	7,5	20,0	1,8	0,8
SIOV-S20K60			15,0	3,7	0,8	0,22	15.0	9,0	4,0	2,0	4800		23,0	4,6	10,0	27,0	2,0	1,0
SIOV-S05K75			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	130		7,0	3,8	5,0	10,0	1,8	0,6
SIOV-S07K75			2,0	0,5	0,2	0,10	2,0	1,2	1,0	0,8	220		9,0	3,8	5,0	12,0	1,8	0,6
SIOV-S10K75	75	100	4,0	1,0	0,4	0,15	4,0	2,5	2,0	1,2	500	120	13,5	4,3	7,5	16,5	2,0	0,8
SIOV-S14K75			8,0	2,0	0,6	0,20	8,0	5,0	3,0	1,7	1500		17,0	4,3	7,5	20,0	2,0	0,8
SIOV-S20K75			15,0	3,7	0,8	0,22	15,0	9,0	4,0	2,0	3000		23,0	4,7	10,0	27,0	2,2	1,0

Disc-Varistors Standard table – Continued



Type	Maximum allowable operating voltage (V)		Maximum allowable energy absorption (Wsec) Energy input with standard wave 8/20 µsec Number of energy absorptions (strike)				Energy input with rectangle wave 2 msec Number of energy absorptions (strike)				Capacitance	Varistor-voltage**	Dimensions (mm)					
	ac_{rms}	dc	1	10^2	10^4	10^6	1	10^2	10^4	10^6	(pF)	(V)	D_{max}	T±1	W±1	H_{max}	L±1	d
SIOV-S05K95			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	100		7,0	4,0	5,0	10,0	2,0	0,6
SIOV-S07K95			2,0	0,5	0,2	0,10	2,0	1,2	1,0	0,8	160		9,0	4,0	5,0	12,0	2,0	0,6
SIOV-S10K95	95	125	4,0	1,0	0,4	0,15	4,0	2,5	2,0	1,2	450	150	13,5	4,5	7,5	16,5	2,2	0,8
SIOV-S14K95			8,0	2,0	0,6	0,20	8,0	5,0	3,0	1,7	1100		17,0	4,5	7,5	20,0	2,2	0,8
SIOV-S20K95			15,0	3,7	0,8	0,22	15,0	9,0	4,0	2,0	2600		23,0	4,9	10,0	27,0	2,4	1,0
SIOV-S05K130			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	80		7,0	4,2	5,0	10,0	2,0	0,6
SIOV-S07K130			2,5	0,6	0,2	0,10	2,5	1,5	1,2	1,0	130		9,0	4,2	5,0	12,0	2,0	0,6
SIOV-S10K130	130*	170*	5,0	1,2	0,5	0,20	5,0	3,0	2,5	1,5	400	205	13,5	4,6	7,5	16,5	2,2	0,8
SIOV-S14K130			10,0	2,5	0,8	0,23	10,0	6,0	4,0	2,0	1000		17,0	4,6	7,5	20,0	2,2	0,8
SIOV-S20K130			20,0	5,0	1,0	0,25	20,0	12,5	5,0	2,5	2300		23,0	5,0	10,0	27,0	2,4	1,0
SIOV-S05K140			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	60		7,0	4,3	5,0	10,0	2,1	0,6
SIOV-S07K140			2,5	0,6	0,2	0,10	2,5	1,5	1,2	1,0	110		9,0	4,3	5,0	12,0	2,1	0,6
SIOV-S10K140	140	180	5,0	1,2	0,5	0,20	5,0	3,0	2,5	1,5	300	220	13,5	4,7	7,5	16,5	2,3	0,8
SIOV-S14K140			10,0	2,5	0,8	0,23	10,0	6,0	4,0	2,0	1000		17,0	4,7	7,5	20,0	2,3	0,8
SIOV-S20K140			20,0	5,0	1,0	0,25	20,0	12,5	5,0	2,5	2000		23,0	5,2	10,0	27,0	2,6	1,0
SIOV-S05K150			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	60		7,0	4,4	5,0	10,0	2,2	0,6
SIOV-S07K150			2,5	0,6	0,2	0,10	2,5	1,5	1,2	1,0	100		9,0	4,4	5,0	12,0	2,2	0,6
SIOV-S10K150	150*	200*	5,0	1,2	0,5	0,20	5,0	3,0	2,5	1,5	250	240	13,5	4,8	7,5	16,5	2,4	0,8
SIOV-S14K150			10,0	2,5	0,8	0,23	10,0	6,0	4,0	2,0	850		17,0	4,8	7,5	20,0	2,4	0,8
SIOV-S20K150			20,0	5,0	1,0	0,25	20,0	12,5	5,0	2,5	1500		23,0	5,3	10,0	27,0	2,7	1,0
SIOV-S05K175			1,0	0,2	0,1	0,06	1,0	0,6	0,5	0,4	55		7,0	4,6	5,0	10,0	2,4	0,6
SIOV-S07K175			2,5	0,6	0,2	0,10	2,5	1,5	1,2	1,0	90		9,0	4,6	5,0	12,0	2,4	0,6
SIOV-S10K175	175	225	5,0	1,2	0,5	0,20	5,0	3,0	2,5	1,5	250	270	13,5	5,1	7,5	16,5	2,6	0,8
SIOV-S14K175			10,0	2,5	0,8	0,23	10,0	6,0	4,0	2,0	700		17,0	5,1	7,5	20,0	2,6	0,8
SIOV-S20K175			20,0	5,0	1,0	0,25	20,0	12,5	5,0	2,5	1400		23,0	5,5	10,0	27,0	2.9	1,0
SIOV-S05K230			2,5	0,6	0,2	0,1	2,5	1,5	1,2	1,0	50		7,0	5,2	5,0	10,0	3,0	0,6
SIOV-S07K230			5,0	1,2	0,5	0,2	5,0	3,0	2,5	2,0	80		9,0	5,2	5,0	12,0	3,0	0,6
SIOV-S10K230	230*	300*	10	2,5	1,0	0,4	10	6	5,5	4,0	200	360	14,0	5,7	7,5	17,0	3,2	0,8
SIOV-S14K230			20	5	1,5	0,45	20	12,5	8,0	4,5	600		17,5	5,7	7,5	20,5	3,2	0,8
SIOV-S20K230			40	10	2,0	0,5	40	25	10	5,0	1300		24,0	6,2	10,0	28,0	3,5	1,0
SIOV-S05K250			2,5	0,6	0,2	0,1	2,5	1,5	1,2	1,0	50		7,0	5,4	5,0	10,0	3,2	0,6
SIOV-S07K250			5,0	1,2	0,5	0,2	5,0	3,0	2,5	2,0	80		9,0	5,4	5,0	12,0	3,2	0,6
SIOV-S10K250	250*	320*	10	2,5	1,0	0,4	10	6	5,5	4,0	180	390	14,0	5,8	7,5	17,0	3,4	0,8
SIOV-S14K250			20	5	1,5	0,45	20	12,5	8,0	4,5	600		17,5	5,8	7,5	20,5	3,4	0,8
SIOV-S20K250			40	10	2,0	0,5	40	25	10	5,0	1200		24,0	6,4	10,0	28,0	3,7	1,0
SIOV-S05K275			2,5	0,6	0,2	0,1	2,5	1,5	1,2	1,0	45		7,0	5,7	5,0	10,0	3,5	0,6
SIOV-S07K275			5,0	1,2	0,5	0,2	5,0	3,0	2,5	2,0	70		9,0	5,7	5,0	12,0	3,5	0,6
SIOV-S10K275	275*	350*	10	2,5	1,0	0,4	10	6	5,5	4,0	180	430	14,0	6,2	7,5	17,0	3,7	0,8
SIOV-S14K275			20	5	1,5	0,45	20	12,5	8,0	4,5	500		17,5	6,2	7,5	20,5	3,7	0,8
SIOV-S20K275			40	10	2,0	0,5	40	25	10	5,0	1000		24,0	6,7	10,0	28,0	4,0	1,0
SIOV-S05K300			2,5	0,6	0,2	0,1	2,5	1,5	1,2	1,0	40		7,0	6,0	5,0	10,0	3,8	0,6
SIOV-S07K300			5,0	1,2	0,5	0,2	5,0	3,0	2,5	2,0	70		9,0	6,0	5,0	12,0	3,8	0,6
SIOV-S10K300	300	385	10	2,5	1,0	0,4	10	6	5,5	4,0	150	470	14,0	6,5	7,5	17,0	4,0	0,8
SIOV-S14K300			20	5	1,5	0,45	20	12,5	8,0	4,5	400		17,5	6.5	7,5	20,5	4,0	0,8
SIOV-S20K300			40	10	2,0	0,5	40	25	10	5,0	900		24,0	7.0	10,0	28,0	4,3	1,0
SIOV-S10K385			10	2,5	1,0	0,4	10	6	5,5	4,0	150		14,0	6,5	7,5	17,0	4,0	0,8
SIOV-S14K385	385*	505*	20	5	1,5	0,45	20	12,5	8,0	4,5	350	620	17,5	6,5	7,5	20,5	4,0	0,8
SIOV-S20K385			40	10	2,0	0,5	40	25	10	5,0	900		24,0	7,0	10,0	28,0	4,3	1,0
SIOV-S10K420			10	2,5	1,0	0,4	10	6	5,5	4,0	130		14,0	6,5	7,5	17,0	4,1	0,8
SIOV-S14K420	420*	560*	20	5	1,5	0,45	20	12,5	8,0	4,5	350	680	17,5	6,5	7,5	20,5	4,1	0,8
SIOV-S20K420			40	10	2,0	0,5	40	25	10	5,0	850		24,0	7,0	10,0	28,0	4,4	1,0
SIOV-S10K460			20	5,0	2,0	0,8	20	12,5	10	8	120		14,0	6,8	7,5	17,0	4,4	0,8
SIOV-S14K460	460*	615*	40	10	3,0	0,9	40	25	15	9	300	750	17,5	6,8	7,5	20,5	4,4	0,8
SIOV-S20K460			80	20	4,0	1,0	80	50	20	10	800		24,0	7,3	10,0	28,0	4,8	1,0
SIOV-S10K510			20	5,0	2,0	0,8	20	12,5	10	8	120		14,0	7,1	7,5	17,0	4,7	0,8
SIOV-S14K510	510	670	40	10	3,0	0,9	40	25	15	9	300	820	17,5	7,1	7,5	20,5	4,7	0,8
SIOV-S20K510			80	20	4,0	1,0	80	50	20	10	700		24,0	7,6	10,0	28,0	5,1	1,0
SIOV-S10K550			20	5,0	2,0	0,8	20	12,5	10	8	100		14,0	7,6	7,5	17,0	5,2	0,8
SIOV-S14K550	550*	745*	40	10	3,0	0,9	40	25	15	9	300	910	17,5	7,6	7,5	20,5	5.2	0,8
SIOV-S20K550			80	20	4,0	1,0	80	50	20	10	700		24,0	8,1	10,0	28,0	5,6	1,0
SIOV-S10K625			20	5,0	2,0	0,8	20	12,5	10	8	100		14,0	8,0	7,5	17,0	5,6	0,8
SIOV-S14K625	625	825	40	10	3,0	0,9	40	25	15	9	200	1000	17,5	8,0	7,5	20,5	5,6	0,8
SIOV-S20K625			80	20	4,0	1,0	80	50	20	10	500		24,0	8,5	10,0	28,0	6,0	1,0
SIOV-S10K680			20	5,0	2,0	0,8	20	12,5	10	8	80		14,0	8,5	7,5	17,0	6,1	0,8
SIOV-S14K680	680	895	40	10	3,0	0,9	40	25	15	9	200	1100	17,5	8,5	7,5	20,5	6,1	0,8
SIOV-S20K680			80	20	4,0	1,0	80	50	20	10	400		24,0	9,0	10,0	28,0	6,5	1,0
SIOV-S14K1000	1000	1465	80	20	6,0	1,2	80	50	30	10	150	1800	18,0	13,0	15,0	22,0	9,5	0,8
SIOV-S20K1000			160	40	8,0	1,4	160	100	40	12	300		25,0	13,0	15,0	30,0	9,5	1,0

* For this Rating Block-Varistors are available. See table
** SIOV-S05 series at 0,1 mA

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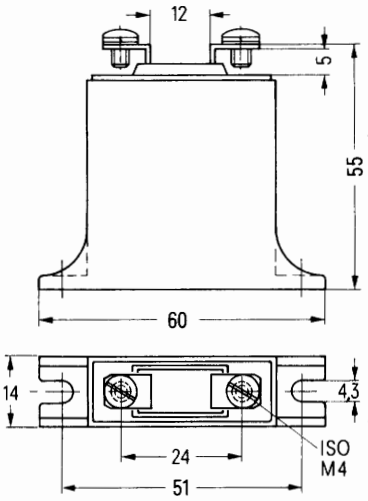


Block-Varistors Standard table

Type	Maximum allowable operating (v)		Maximum allowable energy absorption(Wsec)								Capacitance	Varistor-voltage*
			Energy input with standard wave 8/20 µsec Number of energy absorptions				Energy input with rectangle wave 2 msec Number of energy absorptions					
	ac_{rms}	dc	1	10^2	10^4	10^6	1	10^2	10^4	10^6	(pf)	(V)
SIOV-B25K130	130	170	60	10	1,3	0,28	80	40	8	2,8	3400	205
SIOV-B32K130			120	20	1,5	0,3	150	80	10	3	5500	
SIOV-B32K150	150	200	120	20	1,5	0,3	150	80	10	3	5000	240
SIOV-B32K230	230	300	300	40	3	0,6	250	120	20	6	3500	360
SIOV-B25K250	250	320	150	20	2,5	0,55	120	60	15	5,5	1800	390
SIOV-B32K250			300	40	3	0,6	250	120	20	6	3000	
SIOV-B32K275	275	350	300	40	3	0,6	250	120	20	6	2500	430
SIOV-B32K385	385	505	300	40	3	0,6	250	120	20	6	2200	620
SIOV-B25K420	420	560	150	20	2,5	0,55	120	60	15	5,5	1250	680
SIOV-B32K420			300	40	3	0,6	250	120	20	6	2100	
SIOV-B32K460	460	615	900	80	6	1,2	300	160	40	12	2000	750
SIOV-B32K550	550	745	900	80	6	1,2	300	160	40	12	1700	910

Operating temperature range −40 to + 85°C
Storage temperature range −40 to +125°C
Response time < 50 nsec
Maximum voltage temperature coefficient < $-0{,}5 \cdot 10^{-3}$/°C

Note: For further electrical details request the Metal Oxide Varistor Data Book.

Comparative cross reference list (M.O.V. → SIOV)

M.O.V.	→	SIOV
V40LA2A		S10K40
B		S10K40
V60LA3A		S07K60
B		S07K60
V80LA4A		S10K75
B		S10K75
V95LA7A		S14K95
B		S14K95
V130LA1		S05K130
2		S07K130
10A		S14K130
20A		S20K130
20B		S20K130
V150LA1		S05K150
2		S07K150
10A		S14K150
20A		S20K150
20B		S20K150
V250LA2		S05K250
4		S07K250
15A		S14K250
20A		S14K250
40A		S20K250
40B		S20K250
V275LA2		S05K275
4		S07K275
15A		S14K275
20A		S14K275
40A		S20K275
40B		S20K275

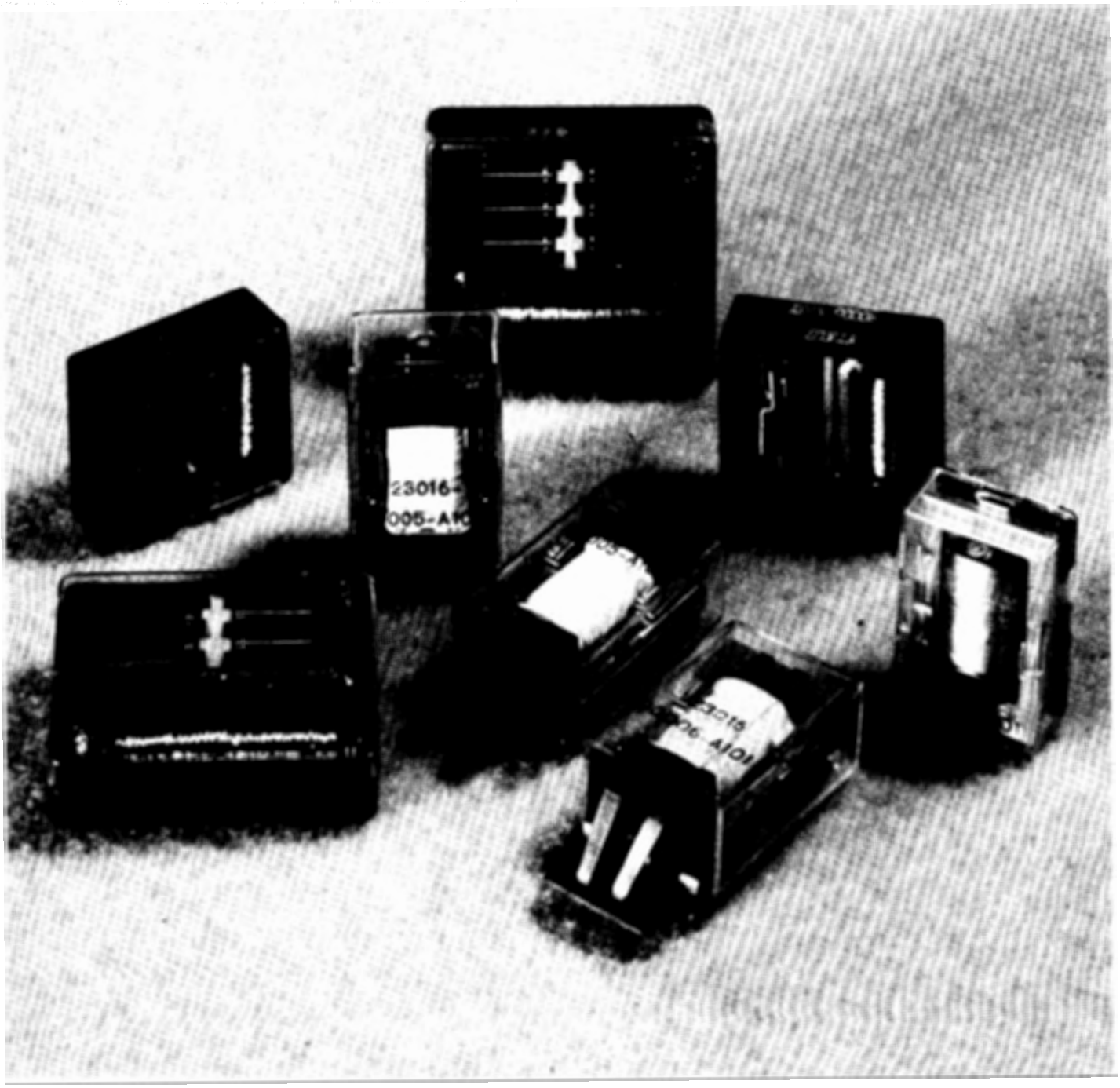
M.O.V.	→	SIOV
V300LA2		S05K300
4		S07K300
V320LA15A		S14K385
20A		S14K385
40A		S20K385
40B		S20K385
V420LB20A		S14K420
40A		S20K420
40B		S20K420
V460LB20A		S14K460
40A		S20K460
40B		S20K460
V480LB20A		S14K510
40A		S14K510
80A		S20K510
80B		S20K510
V510LB20A		S14K510
40A		S14K510
80A		S20K510
80B		S20K510
V550LB20A		S14K550
40A		S14K550
80A		S20K550
80B		S20K550
V575LB20A		S14K625
40A		S14K625
80A		S20K625
80B		S20K625
V1000LB80A		S14K1000
160A		S20K1000
160B		S20K1000

M.O.V.	→	SIOV
V22ZA1		S10K14
3		S14K14
V24ZA1		S10K14
4		S14K14
V27ZA1		S10K17
4		S14K17
V33ZA1		S10K20
5		S14K20
V39ZA1		S10K25
6		S14K25
V47ZA1		S10K30
7		S14K30
V56ZA2		S10K35
8		S14K35
V68ZA2		S10K40
10		S14K40
V82ZA2		S10K50
12		S14K50
V100ZA3		S10K60
15		S14K60
V120ZA1		S05K75
6		S14K75
V150ZA1		S05K95
8		S14K95
V180ZA1		S05K130
10		S14K130

General Purpose Relays

SIEMENS

V23012
V23016 V23054
V23027 V23154
V23030 V23162



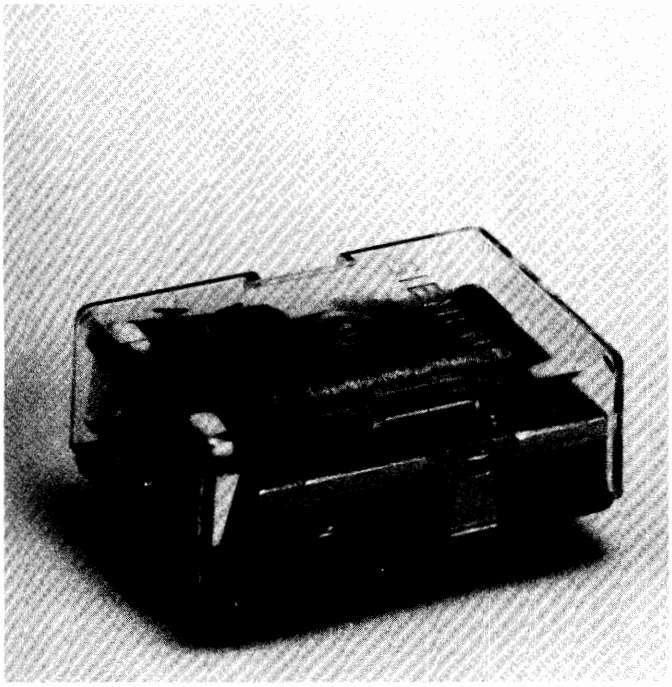
Siemens developed a popular line of general purpose relays, suitable for mounting onto printed circuit boards. A variety of styles, emphasizing compactness, choice in contact arrangement and material, coil voltages, dust cover protection or hermetically sealed types are available. Some types have CSA certification including TV-5 rating. All relay types are available in a magnetic latching version.

Siemens Electric Limited, Canada, also represents MAGNECRAFT ELECTRIC, Chicago, exclusively in Canada. The magnecraft line of relays ranges from D.I.P.'s, general purpose types, power, mercury displacement, solid state, coaxial, and high voltage relays. For more detailed information please request.

SIEMENS

V23012

General Purpose Relays



PC Board Relay

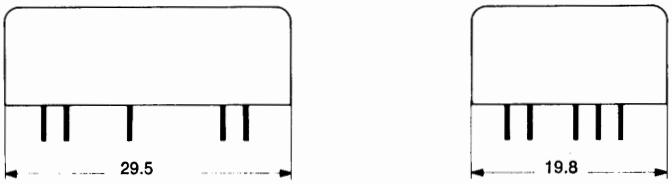
Model V23012
DPDT Contacts

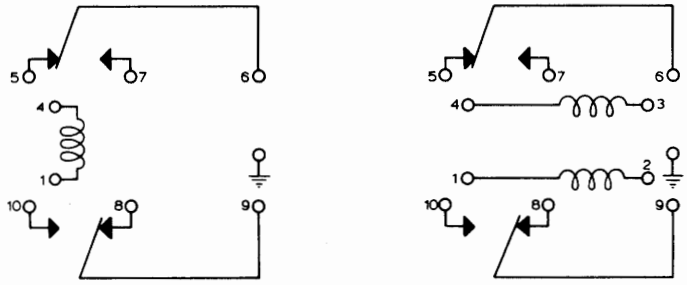
Features

- **Excellent packaging density**
- **High reliability**
- **Long life**
- **Low cost**
- **Extremely low height**
- **Low power consumption**
- **Single or bifurcated contacts**
- **Dual wound coils optional**
- **Standard .1 inch grid spacing for terminals**
- **Magnetic latch version available (Request data sheet model V23015)**

Dimensions

PC Board layout as seen from the wiring side of relay.
Standard grid spacing 2.5 G = Ground terminal.





Relay with one winding

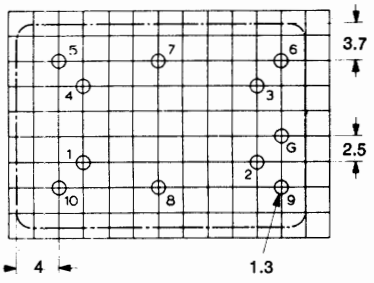
Pin numbering

Relay with two windings

Operating Data

Nominal Coil Voltage VDC	Maximum Continuous VDC	Must Operate		OHMS	Number Turns	Ordering Code	
		mA	VDC			Standard Contacts DPDT	Bifurcated Contacts DPDT
6	10.5	57.5	4.2	81	1750	A0101-A001	A0101-B001
12	20.5	28.6	8.3	322	3500	A0102-A001	A0102-B001
24	41.0	19.2	17.0	1045	6100	A0105-A001	A0105-B001
48	82.0	7.3	32.8	5350	14600	A0133-A001	A0133-B001

The above values are at 20°C. Coil resistances are ±15% (24 to 48V coils), ±10% (6 to 12V coils). Coils with other resistances for different nominal voltages available on request.



Coil

Pull-In Power of Coil ..... 250 mW
Nominal Coil Power ..... 450 mW
Drop-Out Value..20% of must operate current or voltage
Maximum Coil Power at 20°C Ambient Temperature ..... 1.5 W
Maximum Ambient Temp. at Nominal Coil Power..70°C
Maximum Switching Rate 50/second
Dielectric Strength, Winding/Frame ..... 500 V RMS
Insulation Resistance ..... 10,000 Megohms minimum

Contact Data (each circuit)

Contact Arrangement — standard or bifurcated .. DPDT
Contact Rating ..... 1 A, 24 VDC resistive
.3 A, 115 VAC/DC resistive
Capacitance
Contact/contact ..... .3 pF
Open contact/frame ..... .5 pF
Closed contact/frame ..... 1.6 pF
Operate Time (including bounce) ..... 15 msec.
Release Time (including bounce) ..... 6 msec.

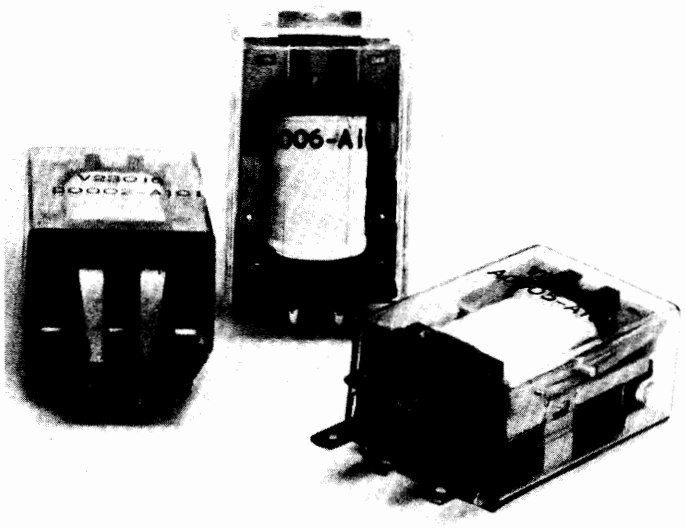
General

Shock
No contact discontinuity ..... 12 G's
Mechanically ..... 20 G's
Vibration — 10 to 55 Hz ..... 10 G's
Weight ..... 5 oz. approx.
Life, under Resistive Load
12 W ..... 10^7 operations
24 W ..... 5×10^6 operations
Mechanical Life ..... 2×10^8 operations

The materials used in the manufacture of these relays are subject to damage by some cleaning solutions when removing flux from P.C. boards. Consult Siemens for proper cleaning methods.

General Purpose Relays

V23016



Power Relay

Model V23016
SPST No. or SPDT Contacts
SPST-NODM

Features

- **Compact design — excellent packaging density**
- **High reliability**
- **Low cost**
- **Unusually high surge capability**
- **Contact rating 7.5 A steady state, 15 A in-rush**
- **Standard Amp fast-on tap terminals**
- **Standard .1 inch grid spacing for P.C. terminals**
- **Low operate power**
- **Other mounting formats available**
- **CSA approved under file No. LR 26128 for 5A/250V operation.**

Operating Data

Nominal Coil Voltage VDC	Maximum Continuous VDC	Must Operate VDC	Ohms	Ordering Code			
				Amp Type Terminals		PC Board Type Terminals	
				SPDT	SPST-NODM	SPDT	SPST-NODM
6	11	4.2	65	A0002-A101	A0002-A102	D0002-A101	D0002-A102
12	22	8.3	230	A0005-A101	A0005-A102	D0005-A101	D0005-A102
24	44	16.8	970	A0006-A101	A0006-A102	D0006-A101	D0006-A102
48	88	32.8	3150	A0004-A101	A0004-A102	D0004-A101	D0004-A102

The above values are at 20°C. Coil resistances are ±15% (24 to 48V coils), ±10% (6 to 12V coils).
Coils with other resistances for different nominal voltages available on request.

Contact Data (each circuit)

Contact Arrangement .. SPST-NO Double Make or SPDT
Contact Rating, continuous current at 7.5 A 115/208 VAC
Surge Rating, at 10% Duty cycle
(with 4 sec. on time maximum) ..... 15 A
Power Rating
30 VDC ..... 120 W resistive
250 VDC ..... 50 W resistive
115 VAC ..... 900 VA resistive
200 VAC ..... 1650 VA resistive
Capacitance
Contact/contact ..... 1.0 pF
Open contact/frame ..... 2.5 pF
Closed contact/frame ..... 5.0 pF
Dielectric Strength
Contacts/frame ..... 2500 V RMS
Contacts/winding ..... 2500 V RMS
Operate Time (including bounce) ..... 10 msec.
Release Time (including bounce) ..... 6 msec.

Coil

Nominal Coil Power ..... 600 mW
Maximum Coil Power at 20°C Ambient Temp. ..... 1.6 W
Maximum Ambient Temp. at Nominal Coil Power .. 70°C
Maximum Switching Rate 40/second
Dielectric Strength, Winding/Frame ..... 1500 V RMS
Insulation Resistance ..... 1000 Megohms minimum

General

Shock
No contact discontinuity ..... 10 G's
Mechanically ..... 15 G's
Vibration — 10 to 50 Hz ..... 5 G's
Weight ..... 5 oz. approx.
Life, under Resistive Load
7.5 A at 115 VAC ..... 10^4 operations
7.5 A at 24 VDC ..... 10^6 operations
Mechanical Life ..... 2×10^8 operations

SIEMENS

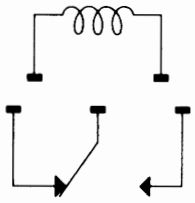
V23016

General Purpose Relays

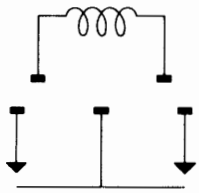
Dimensions

V23016 Contact arrangement wiring diagrams viewed from terminals

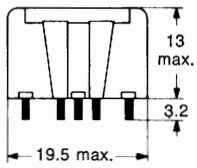
SPDT

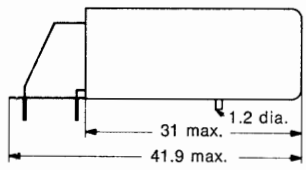


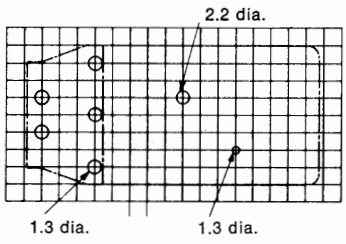
SPST-NODM

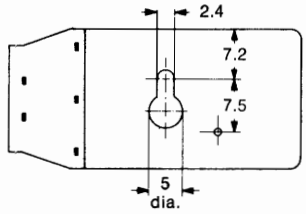


D version



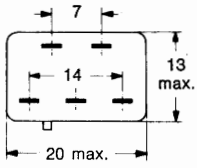


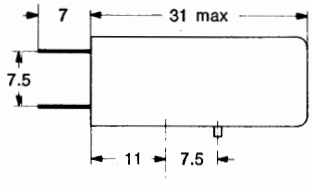




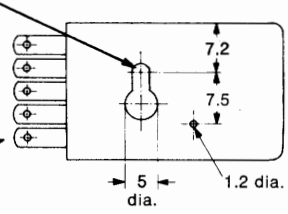
D Version P.C. board layout viewed from wiring side. Standard grid spacing 2.54 mm

A version

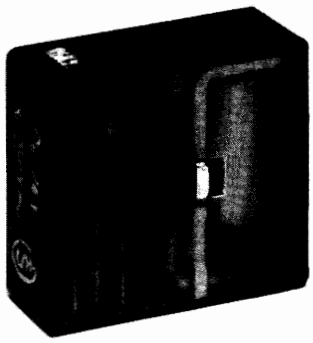




center location of mounting screw
No. 2-56 x ¼″ depth of screw
slot .08



AMP Fast-On Tap 2.8 + .05



PC Board Relay

Model V23027
SPST — Contacts
SPST NO. or SPDT

Features

- **Slim and compact design**
- **8 Amp contact rating**
- **Contact material for resistive, inductive or lamp loads**
- **SPDT contacts**
- **PC board mounting on 0.1″ grid spacing**
- **Low cost**
- **Dust proof housing**
- **Low power consumption**

Siemens miniature P.C. Board power relay fills the need for a low cost power relay to switch heavy current loads at a low power consumption rate. Typical applications are in heating systems, automotive and consumer electronics, process control, communications and data processing. Three different contact materials are available for resistive, lamp and inductive loads up to 8 Amps continuous or switching.

Coil Ordering Data

Nominal Coil VDC	Must Operate VDC	Maximum Continuous VDC	Coil Resistance In OHMS	Coil Code	
				Horizontal Mount	Vertical Mount
6	4.2	10.6	80 ± 8	—A0001—	—B0001—
12	8.3	21.5	330 ± 33	—A0002—	—B0002—
24	16.8	40.0	1200 ± 180	—A0006—	—B0006—
48	32.8	79.0	4750 ± 700	—A0013—	—B0013—

The above values are at 20°C. Other coils on request.

Contact Ordering Data

Type	Silver Gold Flashed	Silver Nickel	Silver Cadmium-Oxide
SPDT	—A101*	—A201	—A401
SPST-NO	—A102	—A202	—A402

*Preferred Stock Model

Ordering Data

The relay part number consists of 3 blocks:
Block I – V23027 – Relay model
Block II – Digit 1 – Relay mounting
– Digits 2-5 – Coil code

V	2	3	0	2	7	—	B	0	0	0	2	—	A	1	0	2
I							II						III			

Block III – Digits 1-2 – Contact Material
– Digits 3-4 – Contact Type

SIEMENS

V23027 General Purpose Relays

V23027 Cont.

Contact Data

Contact Arrangement ..... SPDT or SPST-NO

Contact Rating
- Maximum Continuous Current 8A
- Maximum Switching Current 8A
- Surge Rating at 10% Duty Cycle with 4 sec. on-time maximum 15A
- Maximum Continuous Volts 250VRMS

Power Rating 100W/500VA

Contact Life, Resistive Load
- 100 VAC/8A ..... 10^5
- 100 VAC/5A ..... 2×10^5
- 24 VDC/8A ..... 10^5
- 250 VDC/0.4A ..... 5×10^6

Contact Pressure ..... 15 grams

Operate Time (including bounce) 8msec

Release Time (including bounce) 4msec

Capacitance
- Contact/Contact 1.6pF
- Contact/Winding 1.0pF
- Contact/Frame ..... <1.25pF

Dielectric Strength
- Contact/Contact 500VRMS
- Contact/Winding 2500VRMS
- Contact/Frame 2500VRMS

Contact Material (3 types) ..... Silver, gold flashed
Silver Nickel
Silver Cad.-Oxide

Coil

Nominal Coil Power 450mW

Average Pull-in Coil Power 200mW

Maximum Continuous Coil Power Dissipation @ 20°C Ambient Temperature 1W

Maximum Ambient Temperature at Nominal Coil Power ..... 60°C

Maximum Switching Rate 20/sec

Dielectric Strength Winding/Frame 500VRMS

Insulation Resistance ..... >100Mohms

General

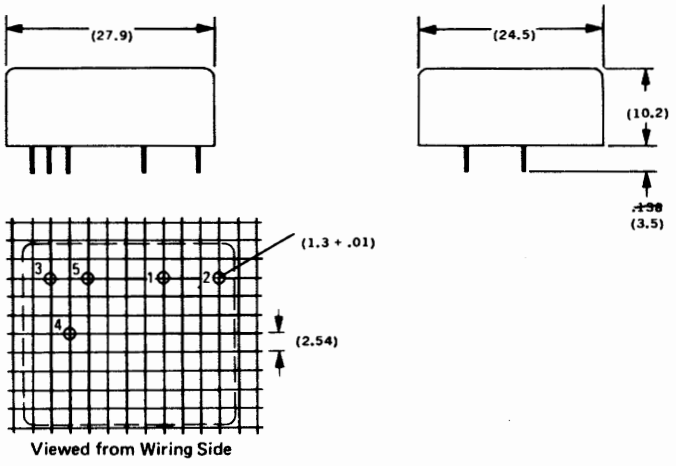
Weight ..... 12 grams

Mechanical Life ..... 2×10^7

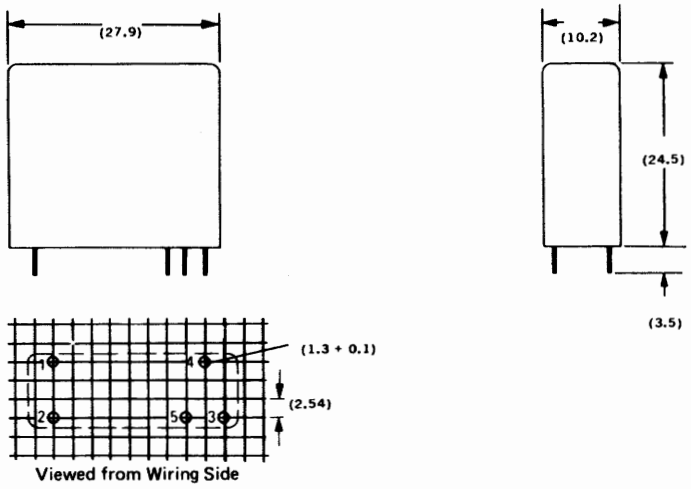
Dimensions (all dimension in mm)

All dimensions max. unless noted.

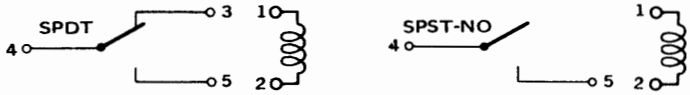
V23027-A



V23027-B

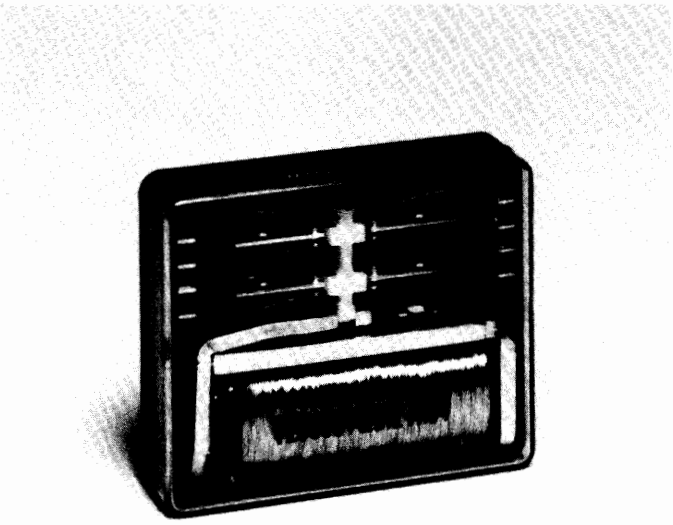


WIRING DIAGRAM



General Purpose Relays

V23030



PC Board Relay

Model V23030
4 PDT and 6 PDT

Features

- **Overall height above P.C. board only .4 inches**
- **Allows .5″ center-to-center P.C. board spacing**
- **Bifurcated contacts for high reliability**
- **1 Amp contact rating**
- **Base sealed against flux creepage**
- **Terminals on standord .1 inch grid spacing**
- **Long life**

Model V23030 was designed as a compact multipole relay for use directly on P. C. boards. It is the lowest profile electromechanical relay available for applications where close rack mounting of P. C. boards is required. With its overall height of .4″ above the P. C. board, it permits standard .5″ center-to-center P. C. board spacing. The sealed base prevents flux or solder from entering the relay, thus allowing automated wave soldering processes for simplification and economy. It is particularly suited for applications such as communication systems, data processing, and automatic control systems.

Ordering Data

Nominal Coil Voltage DC	Maximum Continuous VDC	Must Operate				Coil Resistance in OHMS	Ordering Code Bifurcated Contacts	
		4 PDT		6 PDT				
		mA	VDC	mA	VDC		4 PDT	6 PDT
6	9.7	78.0	3.5	102.0	4.6	50	A2012-A104	C2012-A106
12	19.0	42.0	7.0	57.0	9.5	185	A2017-A104	C2017-A106
24	37.0	21.5	14.0	28.2	18.5	730	A2021-A104	C2021-A106
48	70.0	12.4	28.5	16.2	37.0	2700	A2026-A104	C2026-A106

The above values are at 20°C. Coil resistances are ±10% up to and including 730 ohms; ±15% for 2.7 K ohms and up.
Coils with other resistances for different nominal voltages available on request.

How to Order

Ordering Code — Add the code reference to the basic relay type number V23030. For example: a 24VDC relay with 6PDT Bifurcated Contacts.

V23030 (type) — C2021 (coil) — A106 (contact)

Coil

	4PDT	6PDT
Nominal Coil Power	700mW	700mW
Average Pull-in Coil Power	250mW	450mW
Drop-out Value (% of Nominal Coil VDC)	10%	10%
Maximum Continuous Coil Power Dissipation @ 20°C Ambient Temperature	2W	2W
Maximum Ambient Temperature at Nominal Coil Power	70°C	70°C
Maximum Switching Rate	20/sec	20/sec
Dielectric Strength, Winding/Frame	500VRMS	500VRMS
Insulation Resistance	10^{10} ohms	10^{10} ohms

SIEMENS

V23030 General Purpose Relays

V23030 Continued

Contact Data

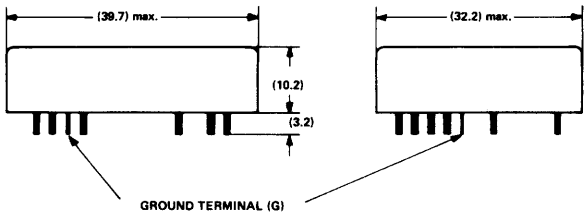
	4PDT	6PDT
Contact Arrangement (Bifurcated)		
Contact Rating		
@ 24 VDC resistive	1A	1A
@ 115 VAC/DC resistive	.3A	.3A
Capacitance		
Contact/Contact	<2pF	<2pF
Open Contact/Frame	<1.8pF	<1.8pF
Closed Contact/Frame	<2.3pF	<2.3pF
Operate Time (including bounce)	11msec	11msec
Release Time (including bounce)	5.5msec	5.5msec
Contact Material Standard	Copper Nickel Alloy, Silver Plated	
Optional, for low level switching applications	Gold	Gold
Contact Pressure	10 grams	10 grams
Dielectric Strength		
Contact/Contact	500VRMS	500VRMS
Contact/Frame	500VRMS	500VRMS

General

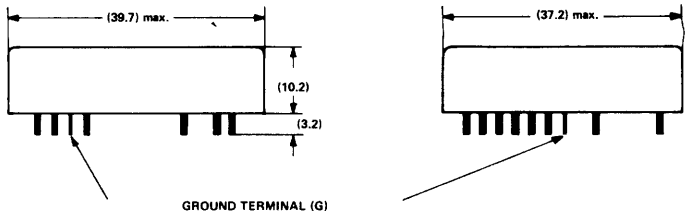
Weight	25 grams	30 grams
Mechanical Life	10^8 operations	10^8 operations

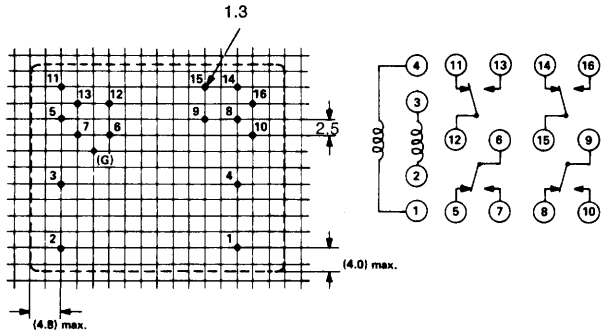
Dimensions

4 PDT



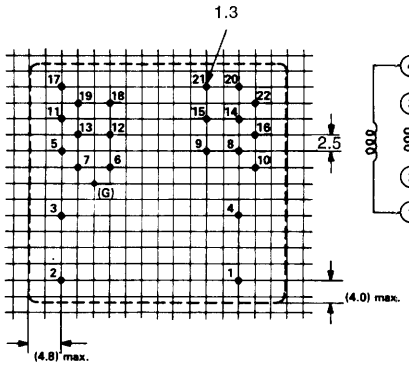
6 PDT

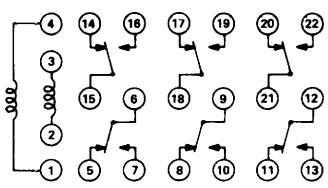




PC BOARD LAYOUTS AS SEEN FROM THE WIRING SIDE OF RELAYS. STANDARD GRID SPACING .1" G = GROUND TERMINAL

WIRING DIAGRAM SHOWN WITH TWO COILS.



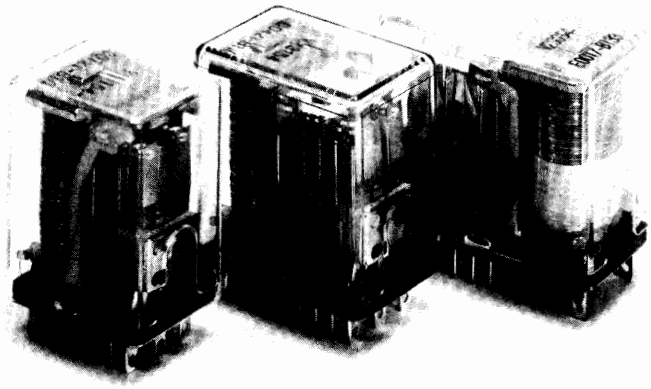


WIRING DIAGRAM SHOWN WITH TWO COILS.

SIEMENS

General Purpose Relays

V23054
V23154
V23162



Cradle Relay

Models V23054, V23154 and V23162

The **Cradle Relay,** originally designed by Siemens, is now one of the most successful and widely used relays in the world. It was developed as a communications relay sensitive enough to operate with minimum power consumption but capable of switching up to 5 Amp loads. A perfect interface for such applications as computer peripherals, communications, industrial controls, alarms and signal equipment, medical electronics and office machines.

Contact Data

	2 Amps	**0.2 Amps**	**5 Amps**
Material	Silver/gold flashed	Gold	Silver/gold flashed
Type	Single*	Single*	Single
Rating	2A @ 28VDC/115VAC Resistive	0.2A @ 24V Resistive	5A @ 28VDC/115VAC Resistive
Max. switching rate	50/sec.	50/sec.	10/sec.
Contact pressure	9 to 12 grams	9 to 12 grams	12 grams
Test Voltage			
(Contact/contact)	1000 VRMS	1000 VRMS	1000 VRMS
(Contact/frame)	1000 VRMS	1000 VRMS	1000 VRMS
Approx. operate time	7.5 m sec	7.5 m sec	7.5 m sec
Approx. release time	3 m sec	3 m sec	3 m sec
Mechanical life	10^8	10^8	10^7

*Bifurcated contacts available on request.

Coil

Max. cont. coil power dissipation	2 watts
Test voltage (coil/frame)	1000 VRMS

General

Weight (depending on size)	20 to 27 grams
Relay ambient temperature range	−55°C to +80°C
Terminal material	Silver

Note:

The materials used in the manufacture of these relays are subject to damage by some cleaning solutions when removing solder and flux from P.C. Boards. We suggest you use only solutions compatible with materials such as Lexan, Phenolic, Magnet Wire, Silver and Gold. P.C. Boards should only be cleaned on the side being flow soldered. When it is necessary to clean both sides of the P.C. Board it is suggested that sockets or hermetically-sealed relays be used.

SIEMENS

V23054
V23154
V23162

General Purpose Relays

V23054, V23154, and V23162 Continued

Ordering Data

The Relay Part Number consists of 3 blocks:

V	2	3	1	5	4	—	D	0	4	2	1	—	B	1	1	0
			I						II						III	

Block I: Relay Type Number: See Table 1
II: Digit 1 — Enclosure/Terminal Code: See Table 1
2 - 5 — Coil Number: See Table 2
III: Contact Code: See Table 1

Example:	V23154-D Dust covered plug-in DC relay in 4-pole size	0421- with 700Ω 24VDC coil	B110 4 PDT single 2 Amp contacts

TABLE 1

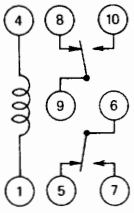
Relay Type And Standard Contacts*

Type	Enclosure	Terminal	Contact	Silver 2 Amp	Gold 0.2 Amp	Silver 5 Amp
V23154-C	Dust Cover	Plug-in	2 PDT	B104	B604	W089
V23154-D			4 PDT	B110	B610	W075
V23054-E			6 PDT	B133	B633	W090
V23154-M		PC	2 PDT	B104	B604	W089
V23154-N			4 PDT	B110	B610	W075
V23162-A	Hermetically Sealed	Plug-in	2 PDT	B104	B604	W589
V23162-B			4 PDT	B110	B610	W575

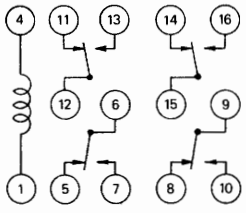
*Other contact materials and configurations are available on request.

Wiring Diagram

2 PDT



4 PDT



6 PDT

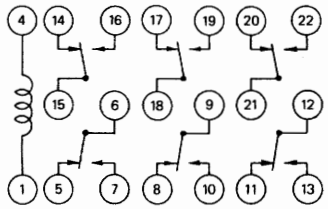


TABLE 2

Coil Data

Coil Number		Nom. VDC	Coil Resistance in Ω @ 20°C		Must Operate** in V @ 20°C			Max. Cont. V
2+4 PDT	6 PDT		2+4 PDT	6 PDT	2 PDT	4 PDT	6 PDT	
0412	0012	**6**	52	70	2.1	3.3	4.4	13
0417	0017	**12**	185	270	4.2	6.6	8.7	25
0421	0021	**24**	700	1050	8.9	14	13	50
0426	0026	**48**	2500	3800	18	27	36	94
0403	0004	**115**	15000	9200	48	76	54	145

**Must Operate figures are for single contacts only. Add 40 % for bifurcated contacts. Coil Resistance tolerance ±10%, except 48V and over. Other coils available on request.

TABLE 3

Coil Derating Factors

Ambient Temp. °C	20°	30°	40°	50°	60°	70°	80°
Must Operate Voltage Factor	1.0	1.05	1.09	1.13	1.17	1.215	1.255
Max. Continuous Voltage Factor	1.0	0.93	0.86	0.79	0.705	0.615	0.5

When operating relays at temperatures above 20°C ambient coil derating factors for Must Operate and Maximum Continuous Voltage must be calculated to obtain the permissible operating voltage range of the relay.

Example: V23154-D0421-B110

Must Operate Voltage at 20°C is 14 volts. At 70°C this voltage multiplied by the factor 1.215 equals 17 volts.

Sockets and Retainers

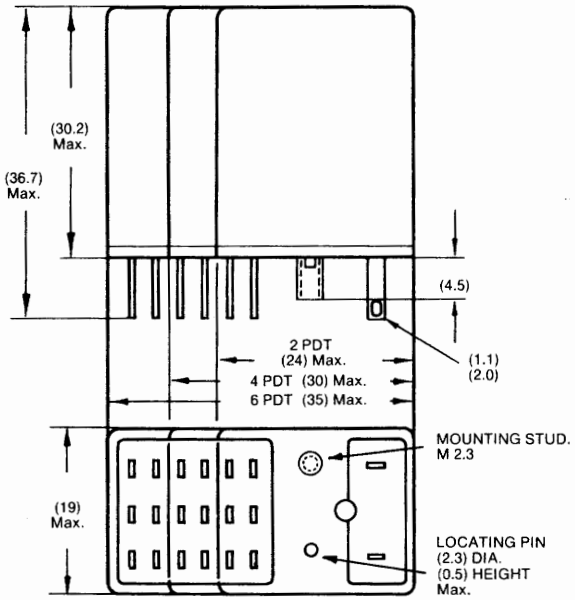
	Sockets		Retainers
For relays up to	Solder terminals	P.C. terminals	
2 PDT	V23154-Z1005	V23154-Z1001	V23154-Z1021
4 PDT	V23154-Z1006	V23154-Z1002	V23154-Z1022
6 PDT	V23154-Z1015	V23154-Z1028	V23154-Z1034

V23054, V23154, and V23162 Continued

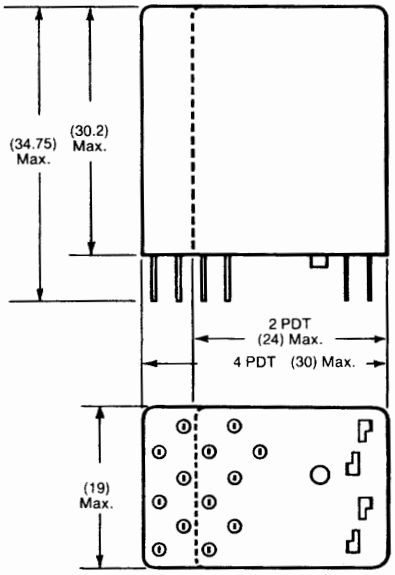
Mechanical Outlines

Note: All dimensions shown are in mm, unless otherwise noted.

Plug-in Terminals



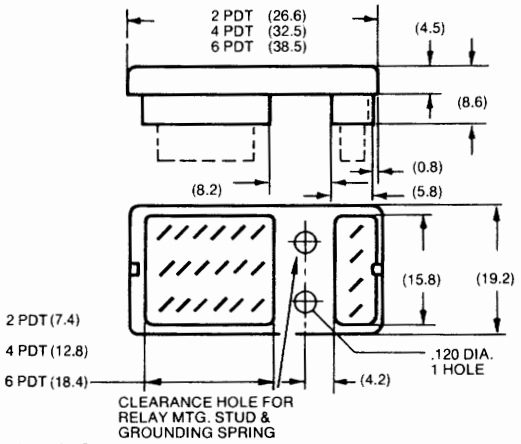
Printed Circuit Terminals



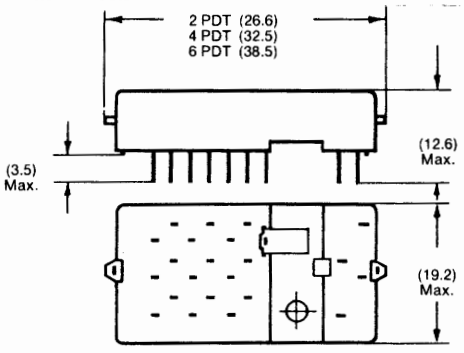
Board layout identical to socket below

Sockets

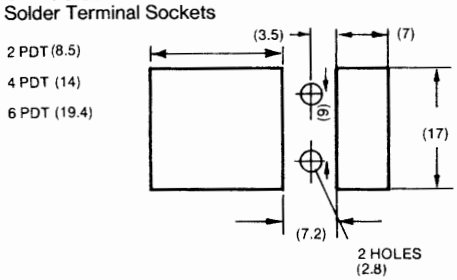
Solder Terminal



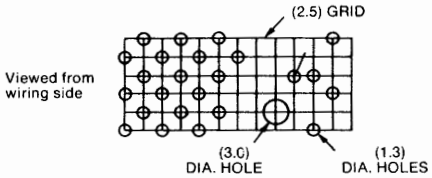
Printed Circuit Terminal



Chassis Cutout
Solder Terminal Sockets



Printed Circuit Board
Grid Layout for Pins



a) Hole for mechanical armature actuation if required
b) Hole for fixing socket with 3-48 screw if required

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