

IV. General series

1. Over Current Protection Series

1) Merit

- Not noisy as non-contact way
- More excellent than Fuse or Bimetal
 - Reacting time is quick
 - Not necessary to shift parts because of self-restoration.
 - Not expensive
 - Good space efficiency on PCB
- Pb-Free (Pb content: Under standard)



2) Construction & Dimensions



(Straight)



(In-Kink)



(Out-Kink)

3) Technical Reference Data

Type	D _{max.}	T _{max.}	L _{min.}	H _{max.}	d ₀	F
D03	4.0	5.0	22.0	11.0	0.5 ± 0.1	5.0 ± 1.0
D04	4.5	5.5	22.0	11.5	0.5 ± 0.1	5.0 ± 1.0
D05	6.5	5.5	22.0	12.0	0.6 ± 0.1	5.0 ± 1.0
D07	8.5	5.5	22.0	14.0	0.6 ± 0.1	5.0 ± 1.0
D08	9.5	5.5	22.0	14.5	0.6 ± 0.1	5.0 ± 1.0
D10 ~ D12	14.0	5.5	22.0	17.0	0.6 ± 0.1	7.5 or 10.0 ±1.0
D13 ~ D14	18.0	5.5	22.0	22.0	0.8 ± 0.1	
D16 ~ D18	20.0	5.5	22.0	25.0	0.8 ± 0.1	

4) Specifications

Model No. *UL (E213419)	Electrical Characteristics										Dimensions		
	Rated Resistance (Ω)	Rated Voltage (Vrms)	Max. Voltage (Vrms)	Non-Over Current (mA)	Switch Current (mA)	Cure Temp. (°C)	Residual Current (mA)±30%	Switching Time (Sec)	Max. Current (A)	Withstand Voltage (V/50°C)	T max. (mm)	D max. (mm)	F/Ød (mm)
SYPGR05 150MD 14	15±20%	110	140	80	160	50	10	Max.2	2.0	350	5.5	17.0	7.5/0.8
SYPGR06 700MD 05	70±20%	DC63	DC80	20	40	60	8.0	Max.1	0.7	150	5.0	6.5	5.0/0.6
SYPGR06 141MD 05	140±20%	220	265	20	40	60	3.6	Max.1	0.4	400	5.0	6.5	5.0/0.6
SYPGR06 151MD 05	150±20%	220	265	20	40	60	3.5	Max.1	0.4	400	5.0	6.5	5.0/0.6
SYPGR08 302SD 04	1,500~3,750	220	265	5	10	80	3.3	Max.3	-	400	5.0	5.5	5.0/0.6
SYPGR08 202JD 04	2,000±25%	220	265	5	10	80	3.3	Max.3	-	400	5.0	5.5	5.0/0.6
SYPGR08 302JD 04	2,250~3,750	220	265	5	10	80	3.3	Max.3	-	400	5.0	5.5	5.0/0.6
SYPGR08 800JD 05	80±25%	220	265	35	70	80	6.0	Max.5	0.2	400	5.0	6.5	5.0/0.6
SYPGR08 151JD 05	150±25%	220	265	36	72	80	5	Max.3	0.2	400	5.0	6.5	5.0/0.6
SYPGR08 301JD 05	300±25%	220	265	17	34	80	4.0	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR08 122JD 05	1,200±25%	220	265	10	20	80	3.5	Max.2	0.1	400	5.0	6.5	5.0/0.6
SYPGR08 152JD 05	1,500±25%	220	265	9.5	19	80	3.4	Max.2	0.1	400	5.0	6.5	5.0/0.6
SYPGR08 050MD 06	5±20%	DC24	DC30	160	320	80	30.0	Max.3	1.0	50	5.0	7.5	5.0/0.6

3) Specifications

Model No. #JUL (E213419)	Electrical Characteristics										Dimensions		
	Rated Resistance (Ω)	Rated Voltage (Vrms)	Max. Voltage (Vrms)	Non-Operat Current (mA)	Switch Current (mA)	Curie Temp. (°C)	Residual Current (mA)±30%	Switching Time (Sec)	Max. Current (A)	Withstan- ding Voltage (V/3min)	T max (mm)	D max (mm)	F/φd (mm)
SYPGR08 100MD 06	10±20%	DC63	DC80	90	180	80	4.5	Max.2	0.1	100	5.0	7.5	5.0/0.6
SYPGR08 470M 6R6	47±20%	220	265	30	60	80	7.0	Max.1	1.0	400	5.0	8.5	5.0/0.6
SYPGR08 101MD 07	100±20%	220	265	35	70	80	5.5	Max.3	0.4	400	5.0	8.5	5.0/0.6
SYPGR08 200ND 08	20±30%	220	265	80	160	80	8.0	Max.3	1.0	400	5.0	9.5	5.0/0.6
SYPGR08 150JD 10	15±25%	220	265	110	220	80	10	Max.3	1.5	400	5.0	12.0	7.5/0.8
SYPGR08 520JD 10	50±25%	220	265	55	110	80	6.5	Max.3	1.0	400	5.0	12.0	5.0/0.6
SYPGR08 080JD 16	8±25%	220	265	170	340	80	14	Max.2	4.1	400	5.0	19.0	7.5/0.8
#SYPGR10 151JD 04	150±25%	220	265	36	72	100	5.8	Max.4	0.2	400	5.0	5.5	5.0/0.6
SYPGR10 151JD 04	150±25%	220	265	36	72	100	5.8	Max.2	0.4	400	5.0	5.5	5.0/0.6
#SYPGR10 251JD 04	250±25%	220	265	21	42	100	5.3	Max.4	0.2	400	5.0	5.5	5.0/0.6
#SYPGR10 501JD 04	500±25%	220	265	19	38	100	5	Max.4	0.2	400	5.0	5.5	5.0/0.6
SYPGR10 551MD 04	550±20%	220	265	16	32	100	4.8	Max.2	0.2	400	4.2±0.3	5.5	5.0/0.6
#SYPGR10 801JD 04	800±25%	220	265	14	28	100	4.8	Max.3	0.2	400	5.0	5.5	5.0/0.6
#SYPGR10 102JD 04	1,000±25%	220	265	13	26	100	4.7	Max.3	0.2	400	5.0	5.5	5.0/0.6
SYPGR10 102JD 04	1,000±25%	220	265	11	22	100	4.7	Max.3	0.1	400	5.0	5.5	5.0/0.6
#SYPGR10 152JD 04	1,500±25%	220	265	11	22	100	4.5	Max.3	0.2	400	5.0	5.5	5.0/0.6
SYPGR10 151JD 05	150±25%	220	265	40	80	100	5.8	Max.4	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 251JD 05	250±25%	220	265	23	46	100	5.5	Max.3	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 251MD 05	250±20%	220	265	23	46	100	5.5	Max.3	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 381JD 05	380±25%	220	265	24	48	100	5.5	Max.3	0.2	400	5.0	6.5	5.0/0.6
#SYPGR10 381JD 05	380±25%	220	265	24	48	100	5.5	Max.3	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 501JD 05	500±25%	220	265	20	40	100	5.1	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 501MD 05	500±20%	220	265	20	40	100	5.1	Max.2	-	400	5.0	6.5	5.0/0.6
SYPGR10 601MD 05	600±20%	220	265	18	36	100	5	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 801JD 05	800±25%	220	265	14	28	100	5	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 801MD 05	800±20%	220	265	14	28	100	5	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR10 102JD 05	1,000±25%	220	265	13	26	100	4.8	Max.3	0.1	400	5.0	6.5	5.0/0.6
SYPGR10 102MD 05	1,000±20%	220	265	13	26	100	4.8	Max.3	0.1	400	5.0	6.5	5.0/0.6
SYPGR10 102ND 05	1,000±30%	220	265	13	26	100	4.8	Max.3	0.1	400	5.0	6.5	5.0/0.6
SYPGR10 152JD 05	1,500±25%	220	265	12	24	100	4.2	Max.2	0.1	400	5.0	6.5	5.0/0.6
SYPGR10 502MD 05	5,000±20%	220	265	7.5	15	100	3.5	Max.2	-	400	5.0	6.5	5.0/0.6
SYPGR10 140MD 06	14±20%	150	180	115	230	100	11	Max.2	1.5	400	5.0	7.5	5.0/0.6
SYPGR010 500JD 06	50±25%	DC63	DC80	62	124	100	12	Max.2	0.7	200	5.0	7.5	5.0/0.6
SYPGR10 700JD 06	70±25%	DC63	DC80	56	112	100	11	Max.2	0.7	200	5.0	7.5	5.0/0.6
SYPGR10 251JD 6R6	250±25%	220	265	32	64	100	5.5	Max.7	0.2	400	7.0	8.5	5.0/0.6
SYPGR10 102JD 07	1,000±25%	220	265	17	34	100	5	Max.6	0.1	400	5.0	8.5	5.0/0.6
#SYPGR10 270MD 10	27±20%	220	265	110	220	100	9	Max.2.5	1.2	400	5.0	12.0	5.0/0.6

3) Specifications

Model No. "F" UL (E213419)	Electrical Characteristics										Dimensions		
	Rated Resistance (Ω)	Rated Voltage (Vrms)	Max. Voltage (Vrms)	Non-Operat Current (mA)	Switch Current (mA)	Curie Temp. (°C)	Residual Current (mA)±30%	Switching Time (Sec)	Max. Current (A)	Withstan- ding Voltage (V/3min)	T max. (mm)	D max. (mm)	F/Ed (mm)
#SYPGR10 330MD 10	33±20%	220	265	105	210	100	8.8	Max.2.5	1.2	400	5.0	12.0	5.0/0.6
#SYPGR10 390MD 10	39±20%	220	265	95	190	100	8.7	Max.2.5	1.0	400	5.0	12.0	5.0/0.6
#SYPGR10 450MD 10	45±20%	220	265	90	180	100	8.5	Max.2	1.0	400	5.0	12.0	5.0/0.6
#SYPGR10 660MD 10	66±20%	220	265	85	170	100	8.3	Max.2	1.0	400	5.0	12.0	5.0/0.6
SYPGR11 020MD 05	2.5±20%	DC13	DC24	235	470	110	60	Max.5	1.0	DC30	3.5	6.0	5.0/0.5
SYPGR12 101MD 08	100±20%	220	265	65	130	120	7.5	Max.5	0.4	400	5.0	9.5	5.0/0.6
SYPGR12 151JD 04	150±25%	220	265	45	90	120	7	Max.4	0.2	400	4.5	5.0	5.0/0.5
SYPGR12 301MD 04	300±20%	220	265	30	60	120	5	Max.4	0.2	400	5.0	5.5	5.0/0.8
SYPGR12 501JD 04	500±25%	220	265	25	50	120	5.2	Max.2	0.2	400	5.0	5.5	5.0/0.6
SYPGR12 122MD 04	1,200±20%	220	265	15	30	120	4.8	Max.3	0.1	400	4.2±0.3	5.5	5.0/0.6
SYPGR12 200MD 05	20±20%	DC12	DC20	110	220	120	45	Max.4	-	100	5.0	6.5	5.0/0.6
SYPGR12 700JD 05	70±25%	220	265	65	130	120	6.5	Max.3	0.4	400	5.0	6.5	5.0/0.6
SYPGR12 950JD 05	95±25%	220	265	55	110	120	7	Max.3	0.4	375	5.0	6.5	5.0/0.6
SYPGR12 101MD 05	100±20%	220	265	55	110	120	6.3	Max.3	0.2	400	5.5	6.5	5.0/0.6
SYPGR12 121JD 05	120±25%	220	265	50	100	120	6	Max.2	0.4	400	5.0	6.5	5.0/0.6
SYPGR12 151MD 05	150±20%	220	265	47	94	120	5.9	Max.5	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 181MD 05	180±20%	220	265	45	90	120	6	Max.5	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 201JD 05	200±25%	220	265	41	82	120	5.6	Max.4	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 251MD 05	250±20%	220	265	35	70	120	6	Max.4	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 251JD 05	250±25%	220	265	35	70	120	6	Max.4	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 301MD 05	300±20%	220	265	33	66	120	5.8	Max.3	0.2	400	5.5	6.5	5.0/0.6
SYPGR12 501SD 05	375~800	220	265	27	54	120	5.5	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 551LD 05	495~600	220	265	27	54	120	5.4	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 501JD 05	500±25%	220	265	27	54	120	5.5	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 501MD 05	500±20%	220	265	27	54	120	5.5	Max.2	0.2	400	5.5	6.5	5.0/0.6
SYPGR12 501ND 05	500±30%	220	265	27	54	120	5.5	Max.2	0.2	400	5.0	6.5	5.0/0.6
SYPGR12 102JD 05	1,000±25%	220	265	20	40	120	5	Max.3	0.1	400	5.0	6.5	5.0/0.6
SYPGR12 102MD 05	1,000±20%	220	265	20	40	120	5	Max.3	0.1	400	4.2±0.3	6.5	5.0/0.6
SYPGR12 112MD 05	1,100±20%	220	265	20	40	120	5	Max.3	0.1	400	5.5	6.5	5.0/0.6
SYPGR12 122JD 05	1,200±25%	220	265	17	34	120	4.8	Max.3	0.1	400	5.0	6.5	5.0/0.6
SYPGR12 122MD 05	1,200±20%	220	265	17	34	120	4.8	Max.3	0.1	400	5.0	6.5	5.0/0.6
SYPGR12 152JD 05	1,500±25%	220	265	16	32	120	4.5	Max.2	0.1	400	5.5	6.5	5.0/0.6
SYPGR12 152MD 05	1,500±20%	220	265	16	32	120	4.5	Max.2	0.1	400	5.0	6.5	5.0/0.6
SYPGR12 202MD 05	2,000±20%	220	265	16	32	120	4.4	Max.2	0.1	400	5.0	6.5	5.0/0.6
SYPGR12 352MD 05	3,500±20%	220	265	10	20	120	4	Max.1	-	400	5.0	6.5	5.0/0.6
SYPGR12 220JD 06	22±25%	220	265	110	220	120	10	Max.4	0.7	350	5.0	7.5	5.0/0.6
SYPGR12 08.2MD 6R6	8.2±20%	DC24	DC30	150	300	120	15	Max.1	1.3	80	5.0	6.5	5.0/0.6

3) Specifications

Model No. #1/UL (E213419)	Electrical Characteristics										Dimensions		
	Rated Resistance (Ω)	Rated Voltage (Vrms)	Max. Voltage (Vmax)	Non-Operat. Current (mA)	Switch Current (mA)	Curie Temp. (°C)	Residual Current (mA)±30%	Switching Time (Sec)	Max. Current (A)	Withstand Voltage (V/3min)	T max. (mm)	D max. (mm)	F/φ (mm)
SYPGR12 45JD 07	45±25%	220	265	85	170	120	8.2	Max.3	1.0	400	5.0	8.5	5.0/0.6
SYPGR12 65JD 07	65±25%	220	265	80	160	120	7.4	Max.2	1.0	400	5.0	8.5	5.0/0.6
SYPGR12 100MD 08	10±20%	110	140	162	324	120	14	Max.3	2.0	250	5.5	9.5	5.0/0.6
SYPGR12 250MD 08	25±20%	220	-	120	240	120	10.5	Max.3	1.0	350	5.0	9.5	5.0/0.6
#SYPGR12 270MD 08	27±20%	220	265	110	220	120	9	Max.2.5	1.0	400	5.5	9.5	5.0/0.6
SYPGR12 300MD 08	30±20%	220	265	95	190	120	8.7	Max.3	1.0	400	5.5	9.5	5.0/0.6
#SYPGR12 330MD 08	33±20%	220	265	105	210	120	8.7	Max.2.5	1.0	400	5.5	9.5	5.0/0.6
SYPGR12 350JD 08	35±25%	220	265	100	200	120	8.7	Max.3	1.0	400	5.0	9.5	5.0/0.6
#SYPGR12 390MD 08	39±20%	220	265	95	190	120	8.5	Max.2.5	1.0	400	5.5	9.5	5.0/0.6
#SYPGR12 450MD 08	45±20%	220	265	90	180	120	8.5	Max.2.5	1.0	400	5.5	9.5	5.0/0.6
#SYPGR12 650MD 08	65±20%	220	265	85	170	120	8.3	Max.3	1.0	400	5.5	9.5	5.0/0.6
SYPGR12 151MD 08	150±20%	220	265	55	110	120	7	Max.3.5	0.4	400	5.0	9.5	5.0/0.6
SYPGR12 102MD 08	1,000±20%	220	265	25	50	120	5.5	Max.3	1.0	400	5.5	9.5	5.0/0.6
SYPGR12 100JD 10	10±25%	220	265	180	360	120	11	Max.3	2.2	300	6.0	13.0	5.0/0.6
#SYPGR12 270MD 10	27±20%	220	265	120	240	120	10	Max.3	1.2	400	6.5	13.0	5.0/0.6
#SYPGR12 330MD 10	33±20%	220	265	115	230	120	10	Max.3	1.2	400	6.5	13.0	5.0/0.6
SYPGR12 390MD 10	39±20%	230	270	100	200	120	10	Max.3	1.2	400	6.5	13.0	10/0.8
#SYPGR12 390MD 10	39±20%	220	265	105	210	120	10	Max.3	1.2	400	6.5	13.0	5.0/0.6
#SYPGR12 450MD 10	45±20%	220	265	100	200	120	9.5	Max.3	1.0	400	6.5	13.0	5.0/0.6
#SYPGR12 650MD 10	65±20%	220	265	95	190	120	9	Max.3	1.0	400	6.5	13.0	5.0/0.6
SYPGR12 250MD 11	25±20%	220	265	140	280	120	9	Max.5	1.0	400	5.0	14.0	5.0/0.6
SYPGR12 270MD 11	27±20%	220	265	130	260	120	10	Max.4	1.5	400	5.5	14.0	10/0.6
SYPGR12 351JD 10	350±25%	220	265	45	90	120	8	Max.3	0.4	400	5.5	14.0	7.5/0.8
SYPGR12 060MD 14	6.8±20%	100	125	280	560	120	25	Max.30	1.4	180	5.0	17.0	7.5/0.8
SYPGR12 060MD 16	6.8±20%	220	265	300	600	120	17	Max.4	3.9	350	5.0	18.0	5.0/0.8
SYPGR13 101MD 04	100±20%	220	265	75	150	130	7.7	Max.8.5	0.2	400	5.0	5.5	5.0/0.6
SYPGR13 121MD 04	120±20%	220	265	70	140	130	7.1	Max.6	0.2	400	4.5	5.5	5.0/0.6
SYPGR13 501MD 05	500±20%	220	265	40	80	130	6	Max.3	0.2	400	5.0	6.5	5.0/0.6
SYPGR13 250JD 07	25±25%	220	265	125	250	135	10.5	Max.3	1.0	400	5.0	8.5	5.0/0.6
SYPGR13 150JD 10	15±25%	220	265	160	320	135	10	Max.4	1.5	300	5.0	13.0	10/0.8
SYPGR13 220JD 14	22±25%	220	265	220	440	135	13	Max.5	1.5	400	5.5	17.0	7.5/0.8
SYPGR13 020JD 16	2±25%	DC24	DC30	500	1000	135	90	Max.4	3.0	45	5.5	17.5	10/0.8
SYPGR15 101MD 05	100±20%	220	265	80	160	150	8.5	Max.3	0.4	400	5.0	6.5	5.0/0.6
SYPGS06 141MD 05	140±20%	220	265	20	40	60	3.6	Max.1	0.4	400	5.0	5±0.3	5.0/0.6
SYPGS12 102MD 05	1,000±20%	220	265	20	40	120	5	Max.3	0.1	400	5.0	5±0.3	5.0/0.6
SYPGS12 100MD 08	10±20%	100	140	135	270	120	14	Max.7	1.0	250	5.0	8±0.3	5.0/0.6
SYPGS12 200MD 08	20±20%	220	-	120	240	120	10.5	Max.3	1.0	400	5.0	8±0.3	5.0/0.6
SYPGS12 300MD 08	30±20%	220	-	105	210	120	8.7	Max.3	1.0	400	5.0	8±0.3	5.0/0.6