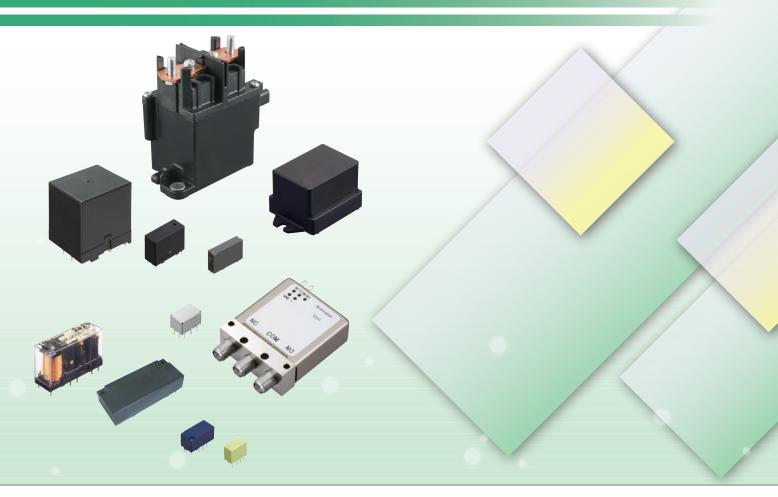
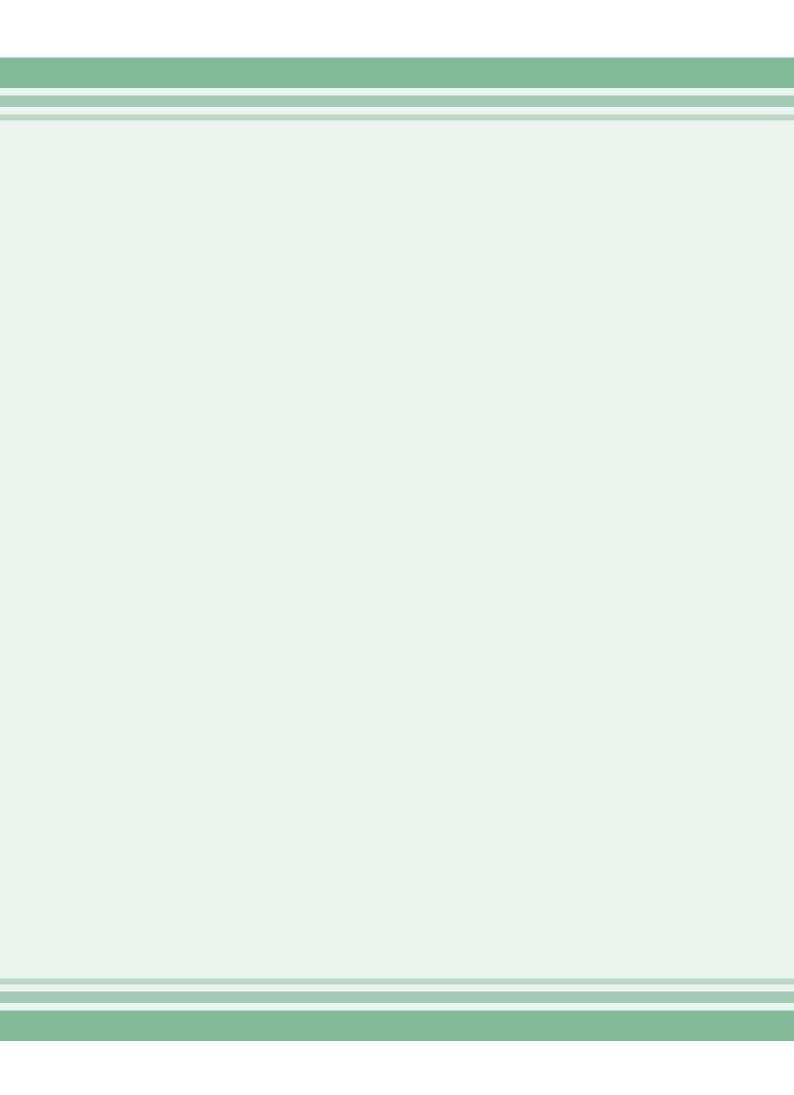
Panasonic INDUSTRY

Mechanical relays

Power relays (Over 2A) / High-capacity DC cut off relays / Signal relays (2A or less) / Microwave devices / Safety relays







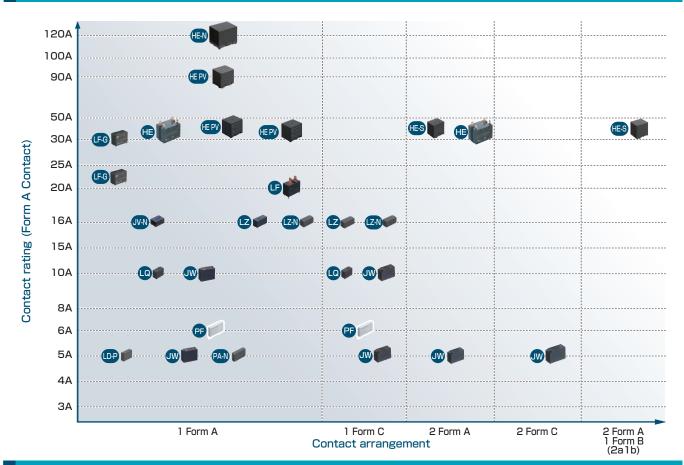
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SELECTION GUIDE FOR MECHANICAL RELAYS

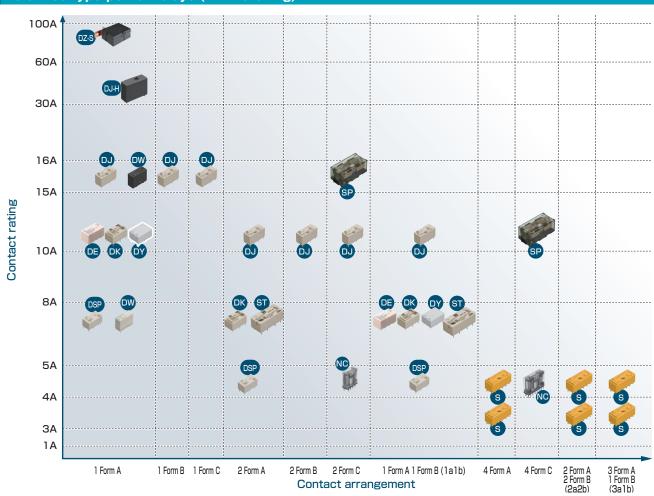
◆ Power relays (Over 2A) line up	2
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♦ Microwave devices line up	···- 6
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Power relays line up

Non polarized type power relays



Polarized type power relays (with latching)



DC load switching capacity (reference value)

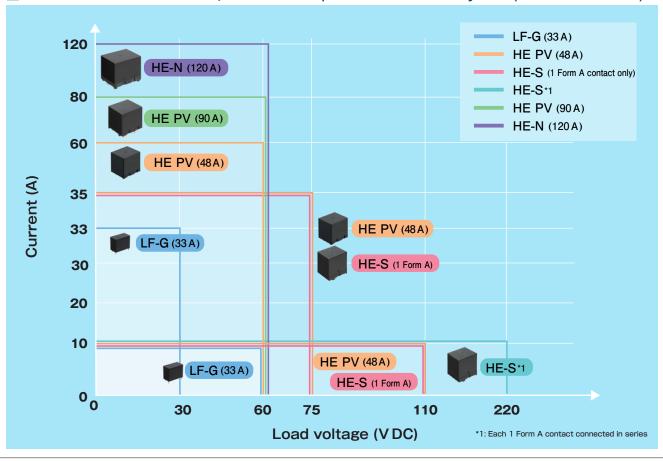
AC load relays shown below can switch DC load as following chart

Appearance	Product name	Contact	Load voltage	Current	Electrical expected life(resistive load)	Remarks
			30 V DC	33 A		
	LF-G (33A)	1 Form A	60 V DC	10 A		
			60 V DC	60 A		
	HE PV (48A)	1 Form A	75 V DC	35 A		
			110 V DC	10 A		
	HE PV (90A)	1 Form A	60 V DC	80 A	104	
	HE-N (120A)	1 Form A	60 V DC	120 A		
			75 V DC	35 A		1 Form A contact only
	HE-S (35A)	2 Form A	110 V DC	10 A		1 Form A contact only
			220 V DC	10 A		Each 1 Form A contact connected in series

This chart is guideline for using DC load. Please test actual condition before use.

Maximum DC load switching capacity

■ Conditions: resistive load, electrical expected life of 10⁴ cycles (reference value)

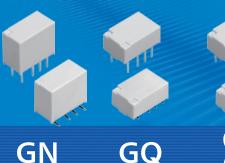


Wide variety of signal relays leading on the global market with high



Communication Network Equipment

Signal Relays









- $5.7 \times 10.6 \, \mathrm{mf}$ ·Compact slim body
- ·High sensitivity 100 mW type
- ·Botton surface area ·Low profile: 5.2 mm ·Compact flat body ·High sensitivity 100 mW type
- ·Small size controlled 3.5 A inrush current
- ·High contact capacity ·High breakdown

OA Equipment / Thermostat



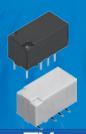


performance and quality

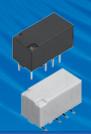
Signal Relays



Security













TX (TH)

·Controlled 7.5 A inrush current possible

TX-S

·High sensitivity 50 mW type TX-D

·Surge Breakdown voltage 6,000 V

D TQ

·Low profile: 5 mm

TQ (SMD)

 \cdot Low profile : 5.6 mm

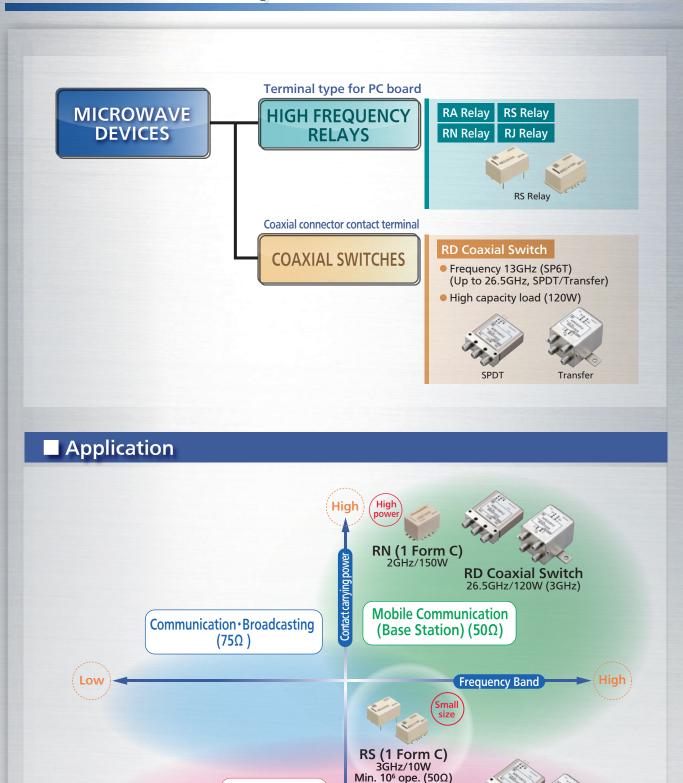
US

·High switching capacity : 2A

Precision / Industrial Equipment



Panasonic Corporations' Superior Microwave Devices Product Lineup



RA (2 Form C)

Min. 10×106 ope.

Measurement (50Ω)

RD Coaxial Switch 26.5GHz/120W (3GHz) Min. 5×106 ope.

RJ (2 Form C) 5GHz/1W

Min. 106 ope.

Support for Wide Range of Frequencies

Microwave Devices

Product lineup **Impedance Contact** Frequency range (GHz) **Features** (Ω) arrangement 8 13 RA 10 million operations For measurement 50 2 Form C equipment 8GHz*1 capable Surface mount terminal 50 2 Form C 1 Form C Small size microwave 50/75 relay 1 Form C Silent type available reversed RN 1 Form C **%2** 8GHz capable*2 50 150W carrying power 1 Form C available (at 2GHz) reversed RD **SPDT** Long life and high 50 Transfer sensitivity coaxial switch SP6T *1: Ratings are 5GHz *2: Ratings are 6GHz

Power relays (Over 2A) selector chart

[Order of products: Max.contact rating (small to large)]

[Order of products: Max.contact rating (small t					
Product na	Category	S RELAY	Power Relays (~5 A) LD-P RELAY	NC RELAY	
Type of relay (Height includes standoff unit = mm)		12	20.2	25.4 27.8 Slim (2 Form C) 10.9 Flat (2 Form C)	
Initial of pa	art number 	AG3	ALDP	AW8	
Features		2 Form A 2 Form B/3 Form A 1 Form B/4 Form A 4A polarized power relays	• 1 Form A 5A slim power relays	Transistor drive Transistor drive Transistor drive Sa Slim power relays	
	Contact arrangement	2 Form A 2 Form B, 3 Form A 1 Form B, 4 Form A	1 Form A	2 Form C, 4 Form C	
	Contact shape	Twin	Single	Twin	
	Contact material	Double layer contact of AgNi-AgSnO₂ type +Au clad	AgNi type	AgNi type +Au clad	
Contact data	20 A - 20 A - 15 A - Contact rating 10 A - (resistive) 8 A - 5 A - 3 A -	4 A 250 V AC 3 A 30 V DC	5 A 277 V AC 3 A 30 V DC	2c: 5 A 250 V AC*1 4c: 4 A 250 V AC*1 5 A 30 V DC	
	Min. switching load (reference value)	100 μA 100 mV DC	100 mA 5 V DC	100 μA 1 V DC	
	Max.switching voltage	250 V AC, 48 V DC	277 V AC, 30 V DC	250 V AC, 220 V DC	
Latching ty	pes availability	•	-	260 m-M/ (2 Farm - C)*2	
Coil data	Rated operating power	200 mW	200 mW	360 mW (2 Form C)*2, 720 mW (4 Form C)*2	
Oon data	Operate [Set] voltage (initial)	Max.70% V	Max.75% V	Max.80% V	
Time	Release [Reset] voltage (initial) Operate [Set] time (initial)	Min.10% V [Max.70% V] Max.15 ms	Min.5% V Max.10 ms	Min.10% V Max.20 ms	
Characteristics (initial)	Release [Reset] time (initial)	Max.10 ms [Max.15 ms]	Max.10 ms (with diode)	Max.10 ms	
Expected life	Mechanical life (ope.)	Min.100 x10 ⁶	Min.5 x10 ⁶	Min.50 x10 ⁶	
Dielectric	Between open contacts	750 V rms for 1 min	750 V rms for 1 min	1,000 V rms for 1 min	
strength	Between contact sets	1,000 V rms for 1 min	-	1,000 V rms for 1 min	
(initial)	Between contact and coil	1,500 V rms for 1 min	4,000 V rms for 1 min	2,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	-	10,000 V	-	
Ambient te	mperature	−55 to +65°C	-40 to +85°C	-40 to +70°C (2 Form C)*2 -40 to +55°C (4 Form C)	
Protective	Dust cover	-	-	•	
construction	Flux-resistant Sealed	-	-	-	
PC board pattern (BOTTOM VIEW) • indicates input terminal 2.54mm grid		Single side stable	(1.05) 11.5 7.0 4-\phi1.1	Slim 2 Form C 2 Form C 8-φ1.2 4 Form C 14-φ1.2 14-φ1.2	
Safety star	ndards	UL, CSA	UL/C-UL, VDE, CQC (Excluding Class F insulation)	UL, CSA	
Unit weight	t (Approx.)	8 g	4 g	16 g (2 Form C), 19 g (4 Form C: slim), 18 g (4 Form C: Flat)	
Option		Socket	-	Socket, Terminal socket	
Remarks		-	-	*1: Dust cover *2: Max.48 V DC	

	Category	Power Relays (~5 A)	Power	Relays (~10 A)	
Product na		PA-N RELAY	PF RELAY	DS-P RELAY	
Type of relay (Height includes standoff unit = mm)		20 12.5	28	20.2	
Initial of pa	art number	APAN3	AP		
Features		1 Form A 5A Slim power relays meet IEC61010 reinforced insulation	Compliant with European standard 1 Form A/1 Form C 6A Slim pow relays	ds /er 1 Form A 8A (AC) 5A(DC), 1 Form A 1 Form B/2 Form A 5A (AC/DC) small polarized power relays	
	Contact arrangement	1 Form A	1 Form A, 1 Form C	1 Form A 1 Form B, 2 Form A	
	Contact shape	Twin	Single	Single	
	Contact material	AgNi type +Au	AgNi type, AgNi type +Au plated	d AgSnO₂ type +Au flashed	
Contact data	30 A 20 A	5 A 250 V AC 5 A 30 V DC	6 A 250 V AC 6 A 250 V AC No Au plating Au plating type type	8 A 250 V AC 5 A 30 V DC 5 A 30 V DC 5 A 30 V DC	
	Min. switching load (reference value)	100 μA 100m V DC	100 mA 5 V DC 1 mA 1 V DC	10 mA 5 V DC 10 mA 5 V DC	
	Max.switching voltage	250 V AC, 110 V DC (0.4 A)	250 V AC	250 V AC, 125 V DC (0.2 A)	
Latching ty	pes availability	-		•	
Coil data	Rated operating power	110 mW	170 mW (4.5 to 24 V DC) 217 mW (48 V DC), 175 mW (60 V D		
Oon data	Operate [Set] voltage (initial)	Max.70% V	Max.70% V	Max.80% V	
Time	Release [Reset] voltage (initial)		Min.5% V	Min.10% V [Max.80% V]	
Time Characteristics (initial)	Operate [Set] time (initial) Release [Reset] time (initial)	Max.10 ms Max.5 ms	Max.8 ms Max.4 ms	Max.10 ms Max.5 ms [Max.10 ms]	
Expected	Mechanical life (ope.)	Min.20×10 ⁶	Min.5 x10 ⁶	Min.50 x10 ⁶	
	Between open contacts	1.000 V rms for 1 min	1,000 V rms for 1 min	1,000 V rms for 1 min	
Dielectric strength	Between contact sets	-	-	- 2,000 V rms for 1 mir	
(initial)	Between contact and coil	3,000 V rms for 1 min	4,000 V rms for 1 min	3,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	6,000 V	6,000 V	5,000 V	
Ambient te	mperature	-40 to +90°C	−40 to +85°C	-40 to +60°C (1 Form A, 2 Form A) -40 to +65°C (1 Form A 1 Form B)	
Drotosti	Dust cover	-	-	-	
Protective construction	Flux-resistant	-	-	-	
	Sealed	•	•	•	
PC board pattern (BOTTOM VIEW) • indicates input terminal 2.54mm grid		φ1 φ1 φ1.2 φ1.2	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Single stable 1 Form A 4-\phi 1.2 1 Form A 1 Form B, 2 Form A 6-\phi 1.2	
Safety stan	ndards	UL/C-UL, TÜV	UL/C-UL, VDE	UL/C-UL, TÜV	
Unit weight	t (Approx.)	3 g	5 g	4.5 g	
Option		Socket	-	Socket	
Remarks		-	_	-	

	Catano			Deute: Delevis (40.4)		
Product na	Category	DW R	ELAV	Power Relays (~10 A) ST RELAY	DE RI	EL AV
Product na	me	24	3.8	ST RELAY	DERI	≤12.5
Type of relations (Height inclu	ay udes standoff unit = mm)		24 10	11.3	15	12.5
Initial of pa	art number		ADW	AR2		ADE
Features		• 1 Form A 8A/16 small polarize	A (TV-8 rated)* , d power relays	TV-3 rated Torm A 1 Form B/2 Form A 8A polarized power relays	Meet European s 1 Form A/2 Form A 10A/8A polarized	/1 Form A 1 Form B power relays
	Contact arrangement	1 Fo		1 Form A 1 Form B, 2 Form A	1 Form A	1 Form A 1 Form B, 2 Form A
	Contact shape	Sin	<u> </u>	Single	Sin	
	Contact material	AgSnC	D ₂ type	AgSnO ₂ type +Au flashed	AgSnC	D ₂ type
Contact data	30 A - 20 A - 20 A - 20 A - 15 A - 16 A - 16 A - 17 A - 17 A - 17 A - 18	8 A 250 V AC Standard type	16 A 277 V AC*	8 A 250 V AC 5 A 30 V DC	10 A 250 V AC 10 A 30 V DC	8 A 250 V AC 8 A 30 V DC
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC
	Max.switching voltage	250 V AC	277 V AC	250 V AC, 30 V DC	250 V AC,	30 V DC
Latching ty	pes availability	(Latching type only)		•	•	
Coil data	Rated operating power	200 mW (1 coil latching) 400 mW (2 coil latching)		Approx 240 mW	200 mW	
Coll data	Operate [Set] voltage (initial)	Max.80% V		Max.80% V	Max.70% V	
	Release [Reset] voltage (initial)	Max.8		Min.10% V [Max.80% V]	Min.10% V [Max.70% V] Max.10 ms	
Time Characteristics	Operate [Set] time (initial) Release [Reset] time (initial)	Max.1		Max.15 ms Max.10 ms [Max.15 ms]	Max.1	
(initial) Expected life	Mechanical life (ope.)	Min		Min.10 x10 ⁶	Min.10	
Dielectric	Between open contacts	1,000 V rm	s for 1 min	1,200 V rms for 1 min	1,000 V rms for 1 min	
strength	Between contact sets	-		2,000 V rms for 1 min	- 4,000 V rms for 1 min	
(initial)	Between contact and coil	5,000 V rm	s for 1 min	3,750 V rms for 1 min	5,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	12,000 V		6,000 V	12,000 V	
Ambient te	mperature	-40 to +85°C -40 to +70°C	(Max.8 A) (Max.8 to 16 A)	-40 to +60°C	-40 to +70°C	
Protective	Dust cover	-	-	-	_	
construction	Flux-resistant	•		-	_	
PC board pattern (BOTTOM VIEW) • indicates input terminal 2.54mm grid		4 or 5-φ1.2 17.5 3.5 2 coil latching only		Single side stable $\begin{array}{c} 6-\phi 1.4 \\ \hline \\ $	Single side	
Safety star		UL/C-UL, \	/DE, CQC	UL, CSA, VDE	UL/C-U	L, VDE
Unit weigh	t (Approx.)	8 g (Low profi	le type: 7.5 g)	10 g	7	g
Option			-	Socket	_	
Remarks		* TV-8 rated and inrush type: 16 A only		_	-	

	Category			Power Re	lays (~10 A)		
Product na		DK R	ELAY	DY RELAY		LQ RELAY	
Type of relay (Height includes standoff unit = mm)		20 12.5 10 10		20 15 10		20 10 16	
Initial of pa	art number		AW3		ADY	A	LQ
Features		• 1 Form A 10A, 1 Form A 1 Form 8A small polarize			Form A 1 Form B ted power relays	• 1 Form A/1 Form C 10A small power relays	
	Contact arrangement	1 Form A	1 Form A 1 Form B, 2 Form A	1 Form A	1 Form A 1 Form B	1 Form A, 1 Form C	
	Contact shape		gle	Si	ngle	Single	
	Contact material	AgSnO ₂ type + Au flashed	AgNi type + Au flashed	AgSnO₂ typ	e +Au flashed	AgNi type	
Contact data	30 A - 20	10 A 250 V AC 10 A 30 V DC	8 A 250 V AC 8 A 30 V DC	10 A 250 V AC 10 A 30 V DC	8 A 250 V AC 8 A 30 V DC	10 A 125 V AC 5 A 250 V AC 5 A 30 V DC	
	Min. switching load (reference value)	10 mA 5 V DC	10 mA 5 V DC	10 mA 5 V DC	10 mA 5 V DC	Form A 100 mA 5 V DC	
	Max.switching voltage	250 V AC, 125	5 V DC (0.2 A)	250 V AC, 12	25 V DC (0.2 A)	250 V AC, 30 V DC	
Latching ty	pes availability	•	•		•	-	
Coil data	Rated operating power	200 mW) mW	200 mW (1 Form A), 400 mW (1 Form C)	
	Operate [Set] voltage (initial)		70% V		.70% V	Max.75% V Min.5% V	
Time	Release [Reset] voltage (initial) Operate [Set] time (initial)	Min.10% V [[Max.70% V] .10 ms	Max.20 ms	
Characteristics (initial)	Release [Reset] time (initial)	Max.8 ms [[Max.10 ms]	Max.20 ms (With diode)	
Expected life	Mechanical life (ope.)	Min.5	0 x10 ⁶	Min.	50 x10 ⁶	Min.10 x10 ⁶	
Dielectric	Between open contacts	1,000 V rm	s for 1 min	1,000 V rr	ns for 1 min	1,000 V rms for 1 min (1 Form 7750 V rms for 1 min (1 Form 0	
strength (initial)	Between contact sets	-	4,000 V rms for 1 min	- 4,000 V rms for 1 min		-	
	Between contact and coil	4,000 V rm	s for 1 min	4,000 V rr	ns for 1 min	4,000 V rms for 1 min	
	stand voltage contact and coil) (initial)	10,0	00 V	10,000 V		8,000 V	
Ambient te	mperature	-40 to	+65°C	-40 to	o +70°C	−40 to +85°C	
Protective	Dust cover		-		_		
construction	Flux-resistant		-		_	-	
	Sealed	Single sid	e stable $2-\phi 1.1$	Single si	de stable $\frac{2-\phi 1.1}{\phi + \frac{1}{2}}$	1 Form A 4-φ1.3	
PC board pattern (BOTTOM VIEW) • indicates input terminal 2.54mm grid		2-φ0.9 1 Form A 1 Form B, 2 Form A 2-φ0.9		2-φ0.9 1 Form A 1 Form B 2-φ0.9		1 Form C 5-\(\phi\)1.3	
Safety star		UL, CSA,			SA, TÜV	UL/C-UL, VDE, CQC	
Unit weight	t (Approx.)	5 g	6 g		6 g	7 g	
Option			cket	So	ocket	-	
Remarks		-	-		_		

	Category	Power Relays (~10 A)		Power Pol	ays (~20 A)		
Product na		JW RELAY	SD D	ELAY	DJ RELAY		
Type of relay (Height includes standoff unit = mm)		28.6 12.8 20 20	50	25.6		13 16,5	
Initial of pa	art number	WLA		AR1		ADJ	
Features		TV-5 rated (1a) Torm A/1 Form C/2 Form A/ Form C 5A/10A universal power relays	• 2 Form C 15A polarized pow	•		polarized power relays creepage distance entact and coil)	
	Contact arrangement	1 Form A, 1 Form C, 2 Form A, 2 Form C 1 Form C	2 Form C	4 Form C		1 Form A1 Form B, 2 Form C, 2 Form A, 2 Form B	
	Contact shape	Single 1 Form A: AgSnO₂ type		vin 0₂ type +Au flashed		3	
	Contact material	1 Form C, 2 Form A, 2 Form C: AgNi type			AgSnO₂ type	AgSnO ₂ type + Au flashed	
Contact data	30 A - 20 A - 15 A - 16 A - 17 A - 18	10 A 250 V AC 10 A 30 V DC 5 A 250 V AC	15 A 250 V AC 10 A 30 V DC	10 A 250 V AC 10 A 30 V DC	16 Ā 250 V ĀC	10 A 250 V AC	
	5 A -	5 A 30 V DC Standard High capacity type type	2c	4c			
	Min. switching load (reference value)	100 mA 5 V DC 100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	100 mA 5 V DC	
	Max.switching voltage	250 V AC, 30 V DC	250 V AC	, 30 V DC	250	V AC	
Latching ty	/pes availability	-	•	•	450 14/4 11	•	
Coil data	Rated operating power	530 mW		300 mW Max.70% V		150 mW (1 coil latching) 250 mW (Single side stable, 2 coil latching)	
00.1 44.44	Operate [Set] voltage (initial)	Max.70% V	_		Max.75% V [Max.70% V]		
Time	Release [Reset] voltage (initial)	Min.10% V	+	[Max.70% V]			
Time Characteristics	Operate [Set] time (initial)	Max.15 ms	Max.30 ms Max.20 ms [Max.30 ms]				
(initial) Expected	Release [Reset] time (initial) Mechanical life (ope.)	Max.5 ms Min.5 x10 ⁶		[Max.30 ms] 0 x10°	Max.20 ms		
life	1				Min.5 x10 ⁶		
Dielectric	Between open contacts	1,000 V rms for 1 min	- ,	s for 1 min	1,000 V rms for 1 min		
strength (initial)	Between contact sets Between contact and coil	3,000 V rms for 1 min (2 poles) — 5,000 V rms for 1 min	3,000 V rms for 1 min 3,000 V rms for 1 min		- 2,000 V rms for 1 min		
Surge with	estand voltage contact and coil (initial)	10,000 V		-		000 V	
	emperature	-40 to +60°C (Class E) -40 to +85°C (Class B)	-50 to +60°C		-40 to +70°C		
	Dust cover	-		•		_	
Protective construction	Flux-resistant	•	-	_		•	
CONSTRUCTION	Sealed	•	-	_	•*		
PC board pattern (BOTTOM VIEW) • indicates input terminal 2.54mm grid		1 Form A 20 3.5 2.4 4-φ1.5	4 Form C	10-φ2.5 1016 1016 16-φ2.5 1016 1016	1 Form C 2 coil latching only 2 Form C 2 coil latching only	φ1.5 φ1.5 φ1.5	
Safety star	ndards	UL, CSA, VDE, CQC (AJW7211 only)	UL, CS	A, TÜV	UL/C-UL,	VDE, CQC	
Unit weigh	t (Approx.)	13 g	50 g	65 g	1	4 g	
Option		Socket	Terminal socket,	Mounting board		_	
Remarks		-		-	* Please conta	pe is available act our sales ve for details	

	Category			Power Relays (~/	20.4)		
Product na		JV-N RELAY		LZ RELAY			
Type of relay (Height includes standoff unit = mm)		22 16 10.9		28.8		LZ-N RELAY	2.5
Initial of pa	nrt number		AJVN		ALZ		ALZN
Features		• 1 Form A 16A, low profile power relays for heater of		TV-5 rated Low profile: 15.7mm hei Form A/1 Form C 16A		• TV-5 rated and meet EN GWT Low profile: 15.7mr 1 Form A/1 Form C 16A p	n height
	Contact arrangement	1 Form A		1 Form A, 1 Forr	m C	1 Form A, 1 Forn	ı C
	Contact shape	Single		Single		Single	
	Contact material	AgSnO₂ type		AgSnO₂ type)	AgSnO₂ type	
Contact data	30 A - 20 A - 20 A - Contact rating 15 A - (resistive) 8 A - 5 A - 3 A - 3 A -	16 A 125 V AC 10 A 277 V AC 10 A 30 V DC		16 A 250 V AC		16 A 250 V AC	
	Min. switching load (reference value)	100 mA 5 V DC		100 mA 5 V DC		100 mA 5 V DC	
	Max.switching voltage	277 V AC, 110 V DC (0.3 A)	440 V AC		440 V AC	
Latching typ	pes availability	-		-		-	
	Rated operating power	200 mW (4.5 to 48 V DC) 600 mW (100 V DC)		400 mW		400 mW	
Coil data	Operate [Set] voltage (initial)	Max.75% V (4.5 to 48 Max.60 V DC (100 V D		Max.70% V		Max.70% V	
	Release [Reset] voltage (initial)	Min.5% V (4.5 to 48 V DC) Min.4 V DC (100 V DC)		Min.10% V		Min.10% V	
Time Characteristics	Operate [Set] time (initial)	Max.12 ms (4.5 to 48 \) Min.8 ms (100 V DC)	Max.12 ms (4.5 to 48 V DC) Min.8 ms (100 V DC) Max.15 ms			Max.15 ms	
(initial)	Release [Reset] time (initial)	Max.5 ms		Max.5 ms		Max.5 ms	
Expected life	Mechanical life (ope.)	Min. 20 x10 ⁶		Min.10 x10 ⁶		Min.10 ⁶	
Dielectric	Between open contacts	1,000 V rms for 1 m	nin	1,000 V rms for 1	min	1,000 V rms for 1	min
strength	Between contact sets	-		-		_	
(initial)	Between contact and coil	2,500 V rms for 1 n	nin	5,000 V rms for 1 min		5,000 V rms for 1	min
	stand voltage ontact and coil) (initial)	4,500 V		10,000 V		10,000 V	
Ambient ter	mperature	-40 to +70°C, -40 to +60°C ((100 V DC)	-40 to +85°C (Class B) -40 to +105°C (Class F)		−40 to +85°C (Clas −40 to +105°C (Cla	
Protective	Dust cover	-		_		-	
construction	Flux-resistant	•		•		•	
PC board pattern (BOTTOM VIEW) • indicates input terminal		17.78 2-φ0.9		1 Form C 20 5	6-φ1.3 8-φ1.3	1 Form C 20 5	6-φ1.3 8-φ1.3
Safety stan	dards	UL, CSA, TÜV		UL/C-UL, VDI	E	UL/C-UL, VDE	
Unit weight	(Approx.)	8 g		12 g		11 g	
Option		-		-		_	
Remarks		-		* Please contact ou representative for		Not meeting Electrical A and Material Safety Act	

	Category	Power Relays (~20 A)	Power Relays (~30 A)			
Product na		LF RELAY	LF-G RELAY	HE RELAY		
Type of relay (Height includes standoff unit = mm)		30.1 15.7 23.3 30.1 15.7 23.3	30.1 15.7 23.3	50 33 35.8		
Initial of pa	art number	ALF	ALFG	AHE		
Features		TV-8 rated 1 Form A 20A power relays for compress or and invertor load	1 Form A 22A/33A Compact power relays for solar inverter load	• TV-10/TV-15 rated • 1 Form A 30A, 2 Form A 25A power relays		
	Contact arrangement	1 Form A	1 Form A	1 Form A 2 Form A		
	Contact shape	Single	Single	Single		
	Contact material	AgSnO ₂ type	AgSnO ₂ type	AgSnO ₂ type		
Contact data	30 A - 20	20 A 250 V AC	22 A 250 V AC 31 A 250 V AC 33 A 250 V AC High capacity	30 A 277 V AC 25 A 277 V AC		
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 5 V DC 100 mA 5 V DC 100 mA 5 V DC			
	Max.switching voltage	250 V AC	250 V AC	277 V AC, 30 V DC		
Latching ty	pes availability	_	_	-		
Latering ty	Rated operating power	900 mW	1.4 W	1.7 to 2.7 VA (AC) , 1.92 W (DC)		
Coil data	Operate [Set] voltage (initial)	Max.70% V	Max.70% V	Max.70% V		
Oon data	Release [Reset] voltage (initial)	Min.10% V	Min.10% V	Min.15% V (AC) , Min.10% V (DC)		
Time	Operate [Set] time (initial)	Max.20 ms	Max.20 ms	Max.30 ms		
Characteristics (initial)	Release [Reset] time (initial)	Max.15 ms (With diode)	Max.10 ms	Max.30 ms (AC) , Max.10 ms (DC)		
Expected life	Mechanical life (ope.)	Min.2 x 10 ⁶	Min.10 ⁶ (Contact gap: 1.5 mm) Min.500 x 10 ³ (Contact gap: 1.8 mm)	Min.5 x 10 ⁶ (AC) Min.10 x 10 ⁶ (DC)		
Dielectric	Between open contacts	1,000 V rms for 1 min	2,500 V rms for 1 min	2,000 V rms for 1 min		
strength	Between contact sets	-	-	- 4,000 V rms for 1 min		
(initial)	Between contact and coil	5,000 V rms for 1 min	4,000 V rms for 1 min	5,000 V rms for 1 min		
	stand voltage contact and coil) (initial)	10,000 V	6,000 V	10,000 V		
Ambient te		-40 to +60°C	-40 to +60°C, -40 to +85°C*	−50 to +55°C		
	Dust cover	-	-			
Protective	Flux-resistant	•	•	(PC board terminal)		
construction	Sealed	_	_			
PC board pattern (BOTTOM VIEW) • indicates input terminal		PC board terminal $\frac{27.6}{13.8}$ $\frac{\phi^2}{13.8}$ $\frac{12}{10}$ $\frac{10}{13.8}$ (TMP type is also available)	φ2 13.8 φ2 φ2 φ1.8 12 10 φ1.8	Panel cutout Plug-in terminal type 2-\phi 4.5 TM type 47.6 PC board terminal, Screw teminal type are also available		
Safety stan	ndards	UL/C-UL, TÜV, VDE	UL/C-UL, VDE	UL, CSA, VDE, TÜV, CQC		
Unit weight	t (Approx.)	23 g	23 g	80 to 120 g		
Option		-	-	Terminal socket		
Option Remarks		-	Not meeting Electrical Appliance and Material Safety Act * Coil holding voltage is 45 to 85%V	-		

	Category		Power Relays (3	0 A~)			
Product na		HE-S RELAY	1 Owel Nelays (3	HE RELAY PV TYPE			
1 Toudet Ha		TIL-O RELAT		TIL NELAT EV TIPE			
Type of relay (Height includes standoff unit = mm)		standoff unit = mm)		38 33 36.3	90A 38 38.8 38.8		
Initial of pa	art number	AHES			AHE		
Features		TV-8 / TV-10 rated Form A/2 Form A 1 Form B 40A compact power relays	• 1 Form A 35A/4	48A/90A compact power r	relays for inverter		
	Contact arrangement	2 Form A, 2 Form A 1 Form B		1 Form A			
	Contact shape	Single		Single			
	Contact material	AgSnO₂ type (Form A) AgNi type +Au flashed (Form B)	AgSnO ₂ type (35 A)	AgNi type	(48 A/90 A)		
Contact data	120 A - 60 A Contact rating 50 A - (resistive) 30 A - 20 A - 10 A	40 A 277 V AC	35 A 277 V AC	48 A 277 V AC	90 A 277 V AC		
	Min. switching load (reference value)	Form A 100 mA 5 V DC	35 A type 100 mA 5 V DC	48 A type 100 mA 5 V DC	90 A type 100 mA 5 V DC		
	Max.switching voltage	480 V AC, 110 V DC	277 \/ Δ.	. 30 V DC	480 V AC		
Latching ty	pes availability	400 V AC, 110 V BC	277 V AC, 30 V DC 480 V AC				
Latering ty	Rated operating power	1.88 W	1.92 W				
Coil data	Operate [Set] voltage (initial)			Max.70% V			
Ooli data	Release [Reset] voltage (initial)	Min.5% V	Min.10% V				
Time	Operate [Set] time (initial)	Max.30 ms		Max.30 ms			
Characteristics (initial)	Release [Reset] time (initial)	Max.10 ms					
Expected life	Mechanical life (ope.)	Min.5 x 10 ⁶	Min.10 x 10 ⁶ (35 A/48 A) Min.10 ⁶ (90 A				
Dielectric	Between open contacts	2,000 V rms for 1 min (Between open Form A contacts)		2,000 V rms for 1 min			
strength	Between contact sets	5,000 V rms for 1 min (Between Form A contact sets)					
(initial)	Between contact and coil	5,000 V rms for 1 min (Between Form A contact and coil)		5,000 V rms for 1 min			
	stand voltage contact and coil) (initial)	10,000 V (Between From A contact and coil)	10,000 V				
Ambient te	mperature	-40 to 70°C (Max. carrying current 40 A) -40 to 85°C (Max. carrying current 35 A, transport and storage) *	_	-50 to +55°C, -50 to +85°	C*		
Protective	Dust cover	-					
construction	Flux-resistant	•		•			
PC board pattern (BOTTOM VIEW) • indicates input terminal		2 Form A 1 Form B 22.9 7.6 2-φ1.6 7.6 2-φ1.6 2-φ2.2 7.6 2-φ2.2 7.6 2-φ2.2 7.6 2-φ2.2 7.6 2-φ2.2	35A Type 48A Type 4.7 24 24 2 24 2 2 2 2 2 2 2 2 2 2 2 2 2 2		90A Type 20 R0.9 R0.6 R0.6		
Safety star	ndards	UL/C-UL, VDE, CQC	UL, CSA, VDE	UL/C-U	JL, VDE		
Unit weight		64 g) g	85 g		
Option		-		=			
Remarks		* When using at 55°C or higher, the coil holding voltage should be 30 to 60% V.	90 A type does not meet * Coil holding voltage is	t the Electrical Appliance 50 to 60%V	and Material Safety Law		

	Category	Power Relays (30 A~)					
Product na		DJ-H RELAY	DZ-S RELAY	HE-N RELAY			
Type of relay (Height includes standoff unit = mm)		39 15 30.2	38.5	50 40 43			
Initial of pa	art number	ADJH	ADZS	AHE6			
Features		• 1 Form A 50A latching relays for lighting and motor load	Meet IEC62055-31 UC3 Form A 90A power latching relays	High capacity 120A 480V AC Form A power relays			
	Contact arrangement	1 Form A	1 Form A	1 Form A			
	Contact shape	Single	Single	Single			
	Contact material	AgSnO₂ type	AgSnO₂ type	AgNi type			
Contact data	120 A - 60 A - 60 A - 7	50 A 277 V AC	90 A 276 V AC	120 A 480 V AC			
	Min. switching load (reference value)	100 mA 5 V DC	100 mA 125 V AC	100 mA 5 V DC			
	Max.switching voltage	480 V AC	276 V AC	800 V AC			
Latching ty	pes availability	• (Latching only)	• (Latching only)				
	Rated operating power	1 W (1 coil latching) 2 W (2 coil latching)	1.5 W (1 coil latching) 3 W (2 coil latching)	2.5 W			
Coil data	Operate [Set] voltage (initial)	Max.75% V	Max.70% V	Max.75% V			
	Release [Reset] voltage (initial)	Max.75% V	Max.70% V	Min.5% V			
Time	Operate [Set] time (initial)	Max.20 ms	Max.20 ms	Max.30 ms			
Characteristics (initial)	Release [Reset] time (initial)	Max.20 ms	Max.20 ms	Max.10 ms			
Expected life	Mechanical life (ope.)	Min.10 ⁶	Min.100 x 10 ³	Min.10 ⁶			
Dielectric	Between open contacts	1,500 V rms for 1 min	2,000 V rms for 1 min	2,000 V rms for 1 min			
strength (initial)	Between contact sets	-	-				
	Between contact and coil	4,000 V rms for 1 min	4,000 V rms for 1 min	5,000 V rms for 1 min			
	stand voltage contact and coil) (initial)	12,000 V	12,000 V	10,000 V			
Ambient te	mperature	-40 to +85°C	-40 to +85°C	-40 to +55°C*1 -40 to +85°C*2			
Protective	Dust cover	-	•	-			
construction	Flux-resistant	•	-	•			
PC board pattern (BOTTOM VIEW) • indicates input terminal		2 or 3-φ1.2 27.5 6.75 2-φ2.8 2 coil latching only	-	25.9 19.4 RO.3			
Safety star	ndards	UL/C-UL, VDE	-	UL/C-UL, VDE			
Unit weight		31 g	45 g	115 g			
Option			-	-			
Remarks		Reverse polarity type is available	IEC62055-31 UC3	*1: Coil holding voltage is 40 to 100%V (at 20°C) *2: Coil holding voltage is 50 to 60%V (at 85°C)			

High-capacity DC cut off relays selector chart

	Category		High	n-capacity DC cut off re	lave			
Product na		EP RELAY						
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		10A 45 37.9	20A	80A	[200A]	300A		
Type of rela (Height inclu	ay ides standoff unit = mm)	31,3	48.1	79.0	95.0	74.7		
Initial of pa	art number					AEP		
Features			• High Capacity	y Max. 1,000 V DC Cut	-off power relay			
	Contact arrangement			1 Form A				
	Contact shape			Single				
	Contact material	Molybdenum type	Copper type alloy	Tungsten type/ Copper type alloy	Copper type alloy	Copper type alloy		
Contact	200 A -				200 A 400 V DC	300 A 400 V DC		
Contact data	120 A -							
	Contact rating 100 A - (resistive) 80 A -			80 A 400 V DC				
	60 A - 20 A -	10 A 400 V DC	20 A 400 V DC	† 				
	10 A -	10 A 400 V BC						
	Min. switching load (reference value)	1 A 6 V DC	1 A 12 V DC	1 A 12 V DC	1 A 12 V DC	1 A 24 V DC		
Latching tv	pes availability	_	_	_	_	-		
						Inrush: Max. 40 W		
Coil data	Rated operating power	1.24 W	3.9 W	4.2 W	6 W	(12 V DC, approx. 0.1 sec.) Inrush: Max. 45 W (24 V DC, approx. 0.1 sec.) Stable: Max. 4 W		
	Operate [Set] voltage (initial)	Max. 75% V	Max. 75% V	Max. 75% V	Max. 75% V	Max. 75% V		
	Release [Reset] voltage (initial)	Min. 8.3% V	Min. 4.17% V	Min. 8.3% V	Min. 8.3% V	Min. 16.7% V		
Time	Operate [Set] time (initial)	Max. 50 ms	Max. 50 ms	Max. 50 ms	Max. 50 ms	Max. 30 ms		
Characteristics (initial)	Release [Reset] time (initial)	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 30 ms	Max. 10 ms		
Expected life	Mechanical life	Min. 100 x10 ³	Min. 200 x10 ³	Min. 200 x10 ³	Min. 200 x10 ³	Min. 200 x10 ³		
Dielectric	Between open contacts	2,500 V rms for 1 min	2,500 V rms for 1 min	2,500 V rms for 1 min	2,500 V rms for 1 min	2,500 V rms for 1 min		
strength (initial)	Between contact sets	_	_	-	_	-		
	Between contact and coil	2,500 V rms for 1 min	2,500 V rms for 1 min	2,500 V rms for 1 min	2,500 V rms for 1 min	2,500 V rms for 1 min		
	stand voltage contact and coil) (initial)	-	-	_	_	-		
Ambient te		-40 to +80°C	-40 to +80°C	-40 to +80°C	-40 to +80°C	-40 to +80°C		
5	Dust cover		-	_	_	_		
Protective construction	Flux-resistant	-	-	_	_	-		
	Sealed			• (Capsule contact)				
		PC board terminal $\frac{2-\phi 4.2}{4-\phi 2.45^{+0.5}}$						
PC board pattern (BOTTOM VIEW) • indicates input terminal		8.6 19.6 55.9	2-φ6±0.2 64±0.1	63.5±0.1	82±0.1	79±0.1		
		TM type 2-\(\phi 4.2 \pm 0.1\) 55.9 \pm 0.1			,,====	3-φ6±0.1		
Safety stan	ndards	UL/C-UL	UL	UL/C-UL	-	UL/C-UL		
Unit weight	,	80g	180g	400g	600g	750g		
Option soc	ket	_	_	Connector with lead wire	Hexagonal bolt x2 (M6)	Connector with lead wire		
Remarks		_	_	_	_	_		

Cotomonia Ulimb como situ DC aut off valous			
Product na	Category	High-capacity DC cut off relays HE-V RELAY	
Product na	ille	ΠΕ-V ΚΕLΑΥ	
Type of relay (Height includes standoff unit = mm)		50 41 39.4	
Initial of pa	art number	AHEV	
Features		High capacity Max. 1,000 V DC, 20 A cut-off power relay	
	Contact arrangement	2 Form A	
	Contact shape	Single	
	Contact material	AgNi type	
Contact data	100 A - 80 A - 80 A - 60 A - 60 A - 70 A - 7	25 A 600 V DC 20 A 800 V DC	
	Min. switching load (reference value)	100 mA 5 V DC	
Latching ty	pes availability	-	
	Rated operating power	1.92 W	
Coil data	Operate [Set] voltage (initial)	Max. 70% V	
	Release [Reset] voltage (initial)	Min. 5% V	
Time	Operate [Set] time (initial)	Max. 30 ms	
Characteristics (initial)	Release [Reset] time (initial)	Max. 10 ms	
Expected life	Mechanical life	Min. 10 ⁶	
Dielectric	Between open contacts	2,000 V rms for 1 min	
strength	Between contact sets	4,000 V rms for 1 min	
(initial)	Between contact and coil	5,000 V rms for 1 min	
	stand voltage ontact and coil) (initial)	10,000 V	
Ambient te	mperature	-40 to +55°C -40 to +85°C *2	
	Dust cover	-	
Protective	Flux-resistant	•	
construction	Sealed	_	
PC board pattern (BOTTOM VIEW) • indicates input terminal		40 10-\(\phi 2.1\) \(\frac{500}{500}\) \(\frac{500}\) \(\frac{500}{500}\) \(\frac{500}{500}\) \(\frac{500}{500}\) \(\frac{500}	
Safety star	ndards	UL/C-UL, VDE	
Unit weight		120 g	
	,		
Option socket Remarks		*1: Each 1a contact connected in series *2: When coil holding voltage is 33 to 60% of rated coil voltage	

Signal Relays (2 A or less) selector chart

Product name GN GQ GQ (TH type) 10,6 22,3 4,4 4,6 5,7 1,12,24 VDC Contact arrangement Contact rangement Contact rangement Contact arrangement Conta		Category		Signal Relays (2 A or less)	
Type of relay Height includes standoff unit: mm) Initial of part number - High sensitivity 100 mW type - Form C and 1 A Compact, 18 - Form C and 1 A Compact, 1					GQ (TH type)
Features	Type of rela	ау	10.6 5.7 10 10.6 7.2		10.6
Features	Initial of par	rt number	AGN2	AGQ2	AGQ2
Contact shape	Features		High sensitivity 100 mW type 2 Form C and 1 A Compact ,	• 2 Form C and 1 A Compact flat	
Contact data Contact material Stationary : AgPd + Au-clad Movable : AgPd Au-clad Movable : AgPd Au-clad AgNi + Au-plating		Contact arrangement	2 Form C	2 Form C	2 Form C
Contact data		Contact shape	Crossbar Twin	Crossbar Twin	Crossbar Twin
Contact rating (realistive) 1/4 1/3		Contact material			AgNi + Au-plating
Rated coll voltage		Contact rating 3A (resistive) 2A 1A			
Rated coll voltage		(reference value)	·	·	
Rated operating power Single side stable: 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 230 mW (24 V DC) 140 mW (1.5 to 12 V DC), 120 mW (24 V DC) 140 mW (1.5 to 1	Latching ty	pes availability	•	•	•
Rated operating power		Rated coil voltage	1.5, 3, 4.5, 6, 9, 12, 24 V DC	1.5, 3, 4.5, 6, 9, 12, 24 V DC	1.5, 2.4, 3, 4.5, 6, 9, 12, 24 V DC
Release [Reset] voltage (initial) Min. 10% V [Max. 75% V] Min. 10% V [Max. 4 ms Max. 4 ms Ma	Coil data	Rated operating power	140 mW (1.5 to 12 V DC), 230 mW (24 V DC) Latching type & High sensitivity:	140 mW (1.5 to 12 V DC), 230 mW (24 V DC) Latching type & High sensitivity:	140 mW (1.5 to 12 V DC), 230 mW (24 V DC)
Time characteristics Cha		Operate [Set] voltage (initial)	Max. 75% V , Max. 80% V (High sensitivity)	Max. 75% V , Max. 80% V (High sensitivity)	Max. 75 % V [Max. 75 % V]
Release Reset time (initial) Max. 4 ms Max.		Release [Reset] voltage (initial)	Min. 10% V [Max. 75% V]	Min. 10% V [Max. 75% V]	Min. 10 % V [Max. 75 % V]
Release Reset time (initial) Max. 4 ms Max. 4		Operate [Set] time (initial)	Max. 4 ms	Max. 4 ms	Max. 4 ms
Dielectric strength Between open contacts 750 Vrms for 1 min 750 Vrms for 1 min 750 Vrms for 1 min 1,500 Vrms for 1 min 1,000 Vrms for 1 min 1,		Release [Reset] time (initial)	Max. 4 ms	Max. 4 ms	Max. 4 ms
Between contact and coil 1,500 Vrms for 1 min 1,500 Vrms for 1 min 1,500 Vrms for 1 min 1,000 Vrms for 1	Expected life	Mechanical life	Min. 50 × 10 ⁶	Min. 50 × 10 ⁶	Min. 50 × 10 ⁶
Surge Between contact and coil 1,500 Vrms for 1 min 1,500 Vrms for 1 min 1,500 Vrms for 1 min 1,000 Vr	Dielectric	Between open contacts	750 Vrms for 1 min	750 Vrms for 1 min	750 Vrms for 1 min
Surge withstand voltage (initial) Between open contacts 1,500 V 10 × 160 µs (FCC Part 68) 1,500 V 10 µs (FCC Part 68)	strength	Between contact and coil	1,500 Vrms for 1 min	1,500 Vrms for 1 min	1,500 Vrms for 1 min
withstand voltage (initial) Between contact and coil 2,500 V 2 × 10 µs 2,500 V 2 × 10	(initial)	Between contact sets	1,000 Vrms for 1 min	1,000 Vrms for 1 min	1,000 Vrms for 1 min
Safety standards Service Continue Co	withstand	Between open contacts	1,500 V 10 × 160 µs (FCC Part 68)	1,500 V 10 × 160 µs (FCC Part 68)	1,500 V (10 × 160 µs) (FCC Part 68)
Ambient temperature		Between contact and coil	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs (Telcordia)
Flux-resistant Sealed Flux-resistant Sealed Sealed Flux-resistant Sealed Seal	Ambient ter	mperature	/ -40 to + 70°C	/ -40 to + 70°C	−40 to +85°C
Flux-resistant Sealed PC board pattern (BOTTOM VIEW) indicates input terminal Atype (TOP VIEW) Safety standards UL/C-UL, BSI Unit weight (Approx.) PC board terminal Atype (TOP VIEW) UL/C-UL, BSI Description PC board terminal Atype (TOP VIEW) UL/C-UL, BSI Description PC board terminal Atype (TOP VIEW) Surface-mount terminal Atype (TOP VIEW) UL/C-UL, BSI UL/C-UL, BSI UL/C-UL, BSI UL/C-UL, BSI Option PC board terminal Atype (TOP VIEW) Surface-mount terminal Atype (TOP VIEW) Top VIEW) Top VIEW Top VIE	Protective	Dust cover	-	-	_
Sealed • • • • • • • • • • • • • • • • • • •		Flux-resistant	-	-	_
Safety standards UL/C-UL, BSI UL/C-UL, BSI UL/C-UL, BSI Unit weight (Approx.) 1 g 1 g 1 g Option - - - -	PC board pattern (BOTTOM VIEW)		PC board terminal 3.22.2 2.2 \$\delta 0.85 \\ \text{Difface-mount terminal} \\ Atype	PC board terminal 3.2 2.2 2.2 0.8 Surface-mount terminal A type	PC board terminal 3.2 2.2 2.2 \$\int_{0.85}^{\infty}\$ PC board terminal 3.2 2.2 2.2 0.8 Surface-mount terminal A type
Unit weight (Approx.) 1 g 1 g 1 g Option - - -	Sofoty star	dordo			
Option – – – – –				·	
Option		(Арргох.)			
Tremans					
	Remarks				

	Category		Signal Relays (2 A or less)	
Product name		TX TX(TH)		TX-S
Type of relay (Height includes standoff unit: mm)		15 7.4 8.2 15 7.4 15 7.4 15 8.2 15 7.4 15 8.4		15 7,4 8,2 15 7,4 8,4
Initial of pa	rt number	ATX2	ATX2	ATXS2
Features		• 2, 000 V rms dielectric strength • 2 Form C and 2 A relays	Controlled 7.5 A inrush current possible 2 Form C Compact body type relays	High sensitivity 50 mW type Form C and 1 A Compact body type relays
	Contact arrangement	2 Form C	2 Form C	2 Form C
	Contact shape	Crossbar Twin	Crossbar Twin	Crossbar Twin
	Contact material	Standard : Ag + Au-clad	Ag + Au-plating	Standard : Ag + Au-clad
Contact data	Contact rating 3A (resistive) 2A	Standard 2 A 30 V DC	2 A 30 V DC	1A 30 V DC
	Min. switching load (reference value)	10 μA 10 mV DC	10 μA 10 mV DC	10 μA 10 mV DC
Latching ty	pes availability	•	•	•
	Rated coil voltage	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC (48 V; Only single side stable type)	1.5, 2.4, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC (48 V; Only single side stable type, 2.4 V; Only latching type)	1.5, 3, 4.5, 6, 9, 12, 24 V DC
Coil data	Rated operating power	Single side stable: 140 mW (1.5 to 24 V DC), 270 mW (48 V DC) Latching type: 200 mW (1.5 to 24 V DC)	Single side stable: 140 mW (1.5 to 24 V DC), 270 mW (48 V DC) Latching type: 140 mW (1.5 to 24 V DC)	Single side stable: 50 mW (1.5 to 12V DC), 70 mW (24 V DC) Latching type: 70 mW (1.5 to 12V DC), 150 mW (24 V DC)
	Operate [Set] voltage (initial)	Max. 75% V	Max. 75% V	Max. 80% V
	Release [Reset] voltage (initial)	Min. 10% V [Max. 75% V]	Min. 10% V [Max. 75% V]	Min. 10% V [Max. 80% V]
Time characteristics	Operate [Set] time (initial)	Max. 4 ms	Max. 4 ms	Max. 5 ms
(initial)	Release [Reset] time (initial)	Max. 4 ms	Max. 4 ms	Max. 5 ms
Expected life	Mechanical life	Min. 100 × 10 ⁶	Min. 100 × 10 ⁶	Min. 50 × 10 ⁶
Dielectric	Between open contacts	1,000 Vrms for 1 min	1,000 Vrms for 1 min	750 Vrms for 1 min
strength	Between contact and coil	2,000 Vrms for 1 min	2,000 Vrms for 1 min	1,800 Vrms for 1 min
(initial)	Between contact sets	1,000 Vrms for 1 min	1,000 Vrms for 1 min	1,000 Vrms for 1 min
Surge withstand	Between open contacts	1,500 V 10 × 160 µs (FCC Part 68)	1,500 V 10 × 160 µs (FCC Part 68)	1,500 V 10 × 160 µs (FCC Part 68)
voltage (initial)	Between contact and coil	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs	2,500 V 2 × 10 μs
Ambient ter	mperature	-40 to +85°C (1.5 to 24 V DC) / -40 to + 70°C (48 V DC)	-40 to + 85°C (1.5 to 24 V DC) / -40 to + 70°C (48 V DC)	-40 to + 70°C
Protective	Dust cover	-	-	-
Protective construction	Flux-resistant	=	-	-
PC board pattern (BOTTOM VIEW) • indicates input terminal		PC board terminal 5.08 2.54 2.54 PC board terminal 5.08 2.54 2.54 To be a second terminal SA type Single side stable (TOP VIEW)	Surface-mount terminal SA type Single side stable (TOP VIEW)	Surface-mount terminal SA type Single side stable (TOP VIEW)
Safety stan	ndards	UL/C-UL, BSI	UL/C-UL, BSI	UL/C-UL, BSI
Unit weight		2 g	2 g	2 g
		_	_	_
Option				

	Category		Signal Relays (2 A or less)		
Product na		TX-D	TQ*	TQ(SMD)	
Type of relay (Height includes standoff unit: mm)		15 7.4 8.2 15 7.4 18.4	14 9 15	14 9 15.6	
Initial of pa	rt number	ATXD2	ATQ	ATQ	
Features		6,000 V Surge withstand voltage type 2 Form A, 2 A and High dielectric strength type relays	• 5 mm Low profile • 2 Form C, 1 A type relays	• 5.6 mm Low profile • 2 Form C 2 A Surface-mount type relays	
	Contact arrangement	2 Form C	2 Form C	2 Form C	
	Contact shape	Crossbar Twin	Crossbar Twin	Crossbar Twin	
	Contact material	Standard : Ag + Au-clad	Ag + Au-clad	AgNi + Au-clad	
Contact data	Contact rating 3A (resistive) 2A	2 A 30 V DC	1 A 30 V DC	2 A 30 V DC	
	Min. switching load (reference value)	10 μA 10 mV DC	10 μA 10 mV DC	10 μA 10 mV DC	
Latching tv	pes availability	•	•	•	
3 7	Rated coil voltage	1.5, 3, 4.5, 6, 9, 12, 24 V DC	3, 4.5, 5, 6, 9, 12, 24, 48 V DC (48 V; Only single side stable type)	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC (48 V; Only single side stable type)	
Coil data	Rated operating power	2 Form C Single side stable: 200 mW (1.5 to 12 V DC), 230 mW (24V DC) 2 Form C Latching type: 150 mW (1.5 to 12 V DC), 170 mW (24 V DC)	2 Form C Single side stable: 140 mW (3 to 12 V DC) 200 mW (24 V DC) , 300 mW (48 V DC)	Single side stable: 140 mW (1.5 to 12 V DC) 200 mW (24 V DC), 300 mW (48 V DC)	
	Operate [Set] voltage (initial)	Max. 75% V	Max. 75% V	Max. 75% V	
	Release [Reset] voltage (initial)	Min. 10% V [Max. 75% V]	Min. 10% V [Max. 75% V]	Min. 10% V [Max. 75% V]	
Time	Operate [Set] time (initial)	Max. 4 ms	Max. 3 ms	Max. 4 ms	
characteristics (initial)	Release [Reset] time (initial)	Max. 4 ms	Max. 3 ms	Max. 4 ms	
Expected life	Mechanical life	Min. 100 × 10 ⁶	Min. 100 × 10 ⁶	Min. 100 × 10 ⁶	
Dielectric	Between open contacts	1,000 Vrms for 1 min	750 Vrms for 1 min	1,000 Vrms for 1 min	
strength	Between contact and coil	3,000 Vrms for 1 min	1,000 Vrms for 1 min	1,500 Vrms for 1 min	
(initial)	Between contact sets	1,000 Vrms for 1 min	1,000 Vrms for 1 min	1,500 Vrms for 1 min	
Surge withstand	Between open contacts	1,500 V 10 × 160 μs (FCC Part68)	1,500 V 10 × 160 μs (FCC Part68)	1,500 V 10 × 160 μs (FCC Part 68)	
voltage (initial)	Between contact and coil	6,000 V 1.2 × 50 µs	-	2,500 V 2 × 10 μs	
Ambient te	mperature	-40 to + 85°C	-40 to + 70°C	-40 to +85°C (1 A or less for use over 70°C)	
Protoctive	Dust cover	-	-	-	
Protective construction	Flux-resistant	-	-	-	
	Sealed	•	•	•	
PC board pattern (BOTTOM VIEW) • indicates input terminal		PC board terminal 5.08 2.54 2.54 PC board terminal 5.08 2.54 2.54 TO Surface-mount terminal SA type Single side stable	2.54 10.16 <u>b1</u> PC board terminal	Surface-mount SA type (TOP VIEW)	
Safety stan	ndards	(TOP VIEW) UL/C-UL, BSI	UL, CSA	UL, CSA	
Unit weight		2 g	1.5 g	2 g	
Option	(.PP(O/)		1.5 g		
Remarks		MBB contact	MBB contact	_	
. to.manto		55 3311401	DD contact	<u> </u>	

^{*} Standard PC board terminal and self-clinching terminal.

Cotomonia Cimrol Dolovo (2 A aviloso)			
Product na	Category	Signal Relays (2 A or less) DS	
Product na	IIIC	υδ	
Type of rela (Height inc	ay ludes standoff unit: mm)	9,9	
Initial of pa	rt number	AG2	
Features		High sensitivity 200 mW type 1 Form C, 2 A type relays	
	Contact arrangement	1 Form C	
	Contact shape	Twin	
	Contact material	Ag + Au-clad	
Contact data	Contact rating 3A (resistive) 2A	2 A 30 V DC	
	Min. switching load (reference value)	10 μA 10 mV DC	
Latching ty	pes availability	•	
	Rated coil voltage	1.5, 3, 5, 6, 9, 12, 24, 48 V DC	
Coil data	Rated operating power	Single side stable: 400 mW (Standard), 200 mW (High sensitivity) Latching type:360 mW (Standard), 180 mW (High sensitivity)	
	Operate [Set] voltage (initial)	Max. 70% V , Max. 80% V (High sensitivity)	
	Release [Reset] voltage (initial)	Min. 10% V [Max. 70% V , Max. 80% V (High sensitivity)]	
Time	Operate [Set] time (initial)	Max. 10 ms	
characteristics (initial)	Release [Reset] time (initial)	Max. 5 ms [Max. 10 ms]	
Expected life	Mechanical life	Min. 100 × 10 ⁶ (Single side stable), Min. 10 × 10 ⁶ (2 coil latching)	
Dielectric	Between open contacts	1,000 Vrms for 1 min (Standard), 500 Vrms for 1 min (High sensitivity)	
strength (initial)	Between contact and coil	1,500 Vrms for 1 min (Standard), 1,000 Vrms for 1min (High sensitivity)	
	Between contact sets	-	
Surge withstand	Between open contacts	-	
voltage (initial)	Between contact and coil	-	
Ambient te	mperature	-40 to + 70°C	
Protective	Dust cover	_	
Protective construction	Flux-resistant	_	
	Sealed	•	
PC board pattern (BOTTOM VIEW) ● indicates input terminal		PC board terminal Single side stable	
Safety stan	ndards	UL, CSA	
Unit weight	t (Approx.)	3 g	
Option		-	
Remarks		-	

Microwave Devices Selector Chart

	Category		Microwave Devices	
Product na	<u> </u>	RA RELAY	RJ RELAY	RS RELAY
Type of relay (Height includes standoff unit = mm)		9.7	14.0 9.0 [8.2 14.0 9.0 [8.2	14.0 8.6 14.0 8.6 [8.0]
Initial of pa	ırt number	ARA	ARJ	ARS
Features		1 GHz capable, 3 W carrying power (at 1 GHz), 50 Ω impedance and 2 Form C relays	8 GHz max. capable, 1 W carrying power (at 5 GHz), 50 Ω impedance and 2 Form C relays	3 GHz capable, 10 W carrying power (at 3 GHz), 50 W/75 Ω impedance and 1 Form C relays
Contact	Contact arrangement Contact material Contact input power	2 Form C Ag alloy / Au-clad Ag alloy 3 W (at 1 GHz)	2 Form C Au 1 W (at 5 GHz)	1 Form C Au 10 W (at 3 GHz)
Latching ty	pes availability	•	•	•
	Rated coil voltage	1.5, 3, 4.5, 5, 6, 9, 12, 24, 48 V DC (48 V: Only single side stable)	3, 4.5, 12, 24 V DC	3, 4.5, 9, 12, 24 V DC
Coil data	Rated operating power	140 mW (1.5 to 12 V) 200 mW (24 V) 300 mW (48 V)	(Single) 200 mW (-L2) 150 mW	(Single) 200 mW (-L) 200 mW (-L2) 400 mW
	Operate [Set] voltage (initial)	Max. 75 % V	Max. 75 % V	Max. 75 % V
	Release [Reset] voltage (initial)	Min. 10 % V	Min. 10 % V	Min. 10 % V
	Set] time (initial)	Max. 4 ms (about 2 ms)	Max. 5 ms	Max. 10 ms
	eset] time (initial)	Max. 4 ms (about 1 ms)	Max. 5 ms	Max. 6 ms
sctec fe	Mechanical life	Min. 100×106	Min. 10×10 ⁶	Min. 5×10 ⁶
d Expected	Electrical life	Min. 10×10 ⁶	Min. 10 ⁶	Min. 300×10³ (75 Ω) Min. 10⁶ (50 Ω)
Surge withstand voltage (initial)	Between open contacts	750 V rms for 1 min	500 V rms for 1 min	500 V rms for 1 min
Su with vol'	Between contact and coil	1,000 V rms for 1 min	500 V rms for 1 min	1,000 V rms for 1 min
Ambient te		-40 to +85 ℃	-30 to +70 ℃	-40 to +70 °C -40 to +60 °C (silent)
Protective construction	Dust cover	-	-	-
Prote	Flux-resistant Sealed	•	-	-
	Height (Height includes standoff unit = mm)	5.9	8.2	8
Dimensions	Bottom (mm)	14.7 S	0.000	9 14.0 ⊗ 1
PC board pattern (TOP VIEW) ■ indicates input terminal		14.0 2.54 0.3 0.3 2.00 12.40 14.90 For glue-pad	1.50 13.50 11.40 10.40 1.10 8.89 0.80 0.90 12.10 1.70 Relay terminals Ground. Note that soldering is required. The necessity of solder based on effect of heat when soldering. Ground. Note that some extra work is required due to the effect of lifting when soldering.	50 Ω type E layout 6-1.10 6-8.66 3.30 2.11 75 Ω type E layout 10.16 6.86 3.30 2.11 75 Ω type 13.46 10.16 6.86 3.30 2.11 2.12 75 Ω type 13.46 10.16 6.86 3.30 2.12 75 Ω type 13.46 10.16 3.30 2.12 75 Ω type 13.46 10.16 3.30 2.12 75 Ω type 13.46 10.16 3.30 3.30 1.27
Safety stan		-	-	-
	t (Approx.)	2 g	3 g	2 g
Option		_	-	-
Remarks		-	-	Reverse contact type available.

	Category	Microway	ve Devices
Product na		RN RELAY	RD COAXIAL SWITCH
Type of relay (Height includes standoff unit = mm)		14.6	TID CO, WILL SWITCH
Initial of pa	art number	ARN	ARD
Features		8 GHz max. capable, 150 W carrying power (at 2 GHz), compact SMD type, 50 Ω impedance and 1 Form C relays	26.5 GHz max. coaxial switches coming in SPDT, Transfer, and SP6T types
act	Contact arrangement	1 Form C	SPDT, Transfer, SP6T
Contact data	Contact material	Au	Au
Ö	Contact input power	Max. 150 W (at 2 GHz)	Max. 120 W (at 3 GHz)
Latching ty	pes availability	•	•
ata	Rated coil voltage	4.5, 12, 24 V DC	4.5, 5, 12, 24 V DC (4.5 V: Excepting Latching with TTL driver, 5 V: Latching with TTL driver)
Coil data	Rated operating	(Single) 320 mW	(SPDT, SP6T) 840 mW
8	Operate [Set] voltage / initial)	(-L2) 400 mW	(Transfer) 1,540 mW
	Operate [Set] voltage (initial)	Max. 75 % V	_
Onerate [9	Release [Reset] voltage (initial) Set] time (initial)	Min. 10 % V Max. 5 ms	Max. 15 ms (SPDT)
			Max. 20 ms (Transfer, SP6T)
Release [Re	eset] time (initial)	Max. 5 ms	_
ected	Mechanical life	Min. 10 ⁶	Min. 5 × 10 ⁶
Expected	Electrical life	Min. 10³	Min. 5 × 10° (SPDT)
Surge vithstand voltage (initial)	Between open contacts	500 V rms for 1 min	500 V rms for 1 min
Sur withs volt (ini	Between contact and coil	500 V rms for 1 min	500 V rms for 1 min
Ambient te	emperature	-40 to +85 ℃	-55 to +85 ℃
ive	Dust cover	-	_
Protective construction	Flux-resistant	•	_
- P. Con	Sealed	-	-
suc	Height (Height includes standoff unit = mm)	10	-
Dimensions	Bottom (mm)	9 14.6	-
PC board pattern (TOP VIEW) ■ indicates input terminal		14.90 5.00 5.00 2.90 4-0.80 8.89	_
Safety stan	ndards	_	_
	t (Approx.)	2.5 q	
Option	т (Арргол.)		_
Remarks		Reverse contact type available.	_
c. marks		contract type available.	l .

Safety Relays Selector Chart

Category Safety Relays							
Produ	uct name	SF-M REL	.AY		Slim type	SF-Y F	RELAY
Type of relay (Height includes standoff unit = mm)		33.0	14.0 17.8	40 13 24	50 13 24	39	28.6
Initial Featu	l of part number	Flat type safety relay	ASFM0	4 poles Slim type safety re	6 poles AG1S	Compact Relay Fa	AG1Y0 mily with Forcibly
	Contact arrangement	(1 Form A 1Form B 1 Form A 1 F	,	4-pole: 2 Form A 2 Form B, 3 For			n B, 3 Form A 1 Form B n B, 5 Form A 1 Form B
	Contact shape	Single			ngle	<u> </u>	gle
ata	Contact material	RTII: Au flashed a	AgNi type		AgSnO ₂ type	Au flashed	
Contactdata	Contact rating chart $\begin{array}{c} 30 \text{ A} \\ 20 \text{ A} \\ 15 \text{ A} \\ 15 \text{ A} \\ 10 \text{ A}$	NC contact 4 A 250 V AC 4 A 30 V DC	NO contact 6 A 250 V AC 6 A 30 V DC		50 V AC 90 V DC	6 A 25	
Latch	Minimum (For Reference) ling types availability	1 mA 10 V DC	1 mA 10 V DC	1 mA	5 V DC	10 mA	10 V DC
Laten	Nominal coil voltage	3, 5, 12, 16, 18, 2	21. 24 V DC	12 24	- 48 V DC	5, 12, 16, 18	. 21. 24 V DC
Coil data	Rated operating power	270 mW (When 100 mW (When	n input)	360 mW	500 mW		mW
Ö	Operate [Set] voltage (initial)	Max. 75			75 % V	Max. 7	,
S	Release [Reset] voltage (initial)	Min. 10 9		Min. 10 % V		Min. 15 % V	
Time characteristics	Operate [Set] time (initial)	Max. 15		Max. 20 ms Max. 20 ms		Max. 20 ms	
	Release [Reset] time (initial)	Max. 10	ms			Max. 10 ms	
Expected life	Mechanical life (ope.)	Min. 10×10 ⁶			0×10 ⁶		0×10 ⁶
trength al)	Between open contacts	1,500 Vrms for 1 min		1,500 Vrm	1,500 Vrms for 1 min		s for 1 min
Dielectric strength (initial)	Between contact and coil		contact (5-6 terminal) - coil; 000 Vrms for 1 min	4,000 Vrm	ns for 1 min	NC contact (5-6 terminal) - coil; 2,500 Vrms for 1 min	NO contact (7-8 terminal) - coil; 4,000 Vrms for 1 min
	withstandvoltage (initial) een contact and coil	-			_	-	-
	ent temperature	-40 to +8	 5 ℃	-40 to	+85 ℃	-40 to	+70 ℃
lon	Dust cover	_			_	-	-
Protectiv constructi	Flux-resistant	● (RT I	l)		•	-	-
Pro	Sealed	• (RTII	Ι)		_	● (R	ГШ)*
ion	height (mm) Including Standoff	7.8		2	24	14	5
External dimension	Bottom (mm)	4 33	→		6-pole) 0 (4-pole)	988	39 8.0
(BOT	ested PC board pattern TOM VIEW) iil terminal	6.25 13.7	6-φ1.2	4- 9 1 3.97 1 7(1.83) 75.	10-\phi1.4 11.43 15.08	6.25, 10.5, 6.25 7.6 1.5 4-pole	6.25 10.5 6.25 8 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
Safet	y standards	UL/C-UL,	TÜV	UL/C-UL, TÜV,	Korean S, CQC	UL/C-U	IL, TÜV
	weight (Approx.)	6.5 g		20 g	23 g	19 g	23 g
Optio		_			l terminal socket	-	-
Rema	arks rding to EN 61810-1:2015, ta			With LED	indication		-

^{*} According to EN 61810-1:2015, table 2.

	Category	Safaty	Relays	
Produ	uct name	SF RELAY	SF RELAY Double Contact Type	
Type of relay (Height includes standoff unit = mm)		53.3	53.3 25 53.3 33 116.5	
Initial	l of part number	AG103	2 Form A 2 Form B 4 Form A 4 Form B AG10	
Featu		Flat type safety relays	Flat type safety relays	
reato	I		(double contact) 2 Form A 2 Form B 4 Form A 4 Form B	
	Contact arrangement Contact shape	3 Form A 1 Form B Single	Double Contact	
	Contact material	Au flashed AgSnO2 type	Au flashed AgSnO ₂ type	
Contactdata	$\begin{array}{c} 30 \text{ A} - \\ 20 \text{ A} - \\ 20 \text{ A} - \\ 15 \text{ A} - \\ \text{Maximum} \qquad 10 \text{ A} - \\ (\cos \phi = 1) \qquad 8 \text{ A} - \\ 5 \text{ A} - \\ 3 \text{ A} - \\ \end{array}$	6 A 250 V AC 6 A 30 V DC	6 A 250 V AC 6 A 30 V DC	
	Minimum (For Reference)	100 mA 5 V DC	100 mA 5 V DC	
Latch	ning types availability	-	-	
	Nominal coil voltage	5, 12, 24, 48, 60 V DC	5, 12, 24, 48, 60 V DC	
Coil data	Rated operating power	500 mW	500 mW	
Coil	Operate [Set] voltage (initial)	Max. 80 % V	Max. 75 % V	
O	Release [Reset] voltage (initial)	Min. 10 % V	Min. 10 % V	
le eristics	Operate [Set] time (initial)	Max. 30 ms	Max. 30 ms	
Time characteristics	Release [Reset] time (initial)	Max. 15 ms	Max. 15 ms	
Expected	Mechanical life (ope.)	Min. 10×10 ⁶	Min. 10×10 ⁶	
Dielectric strength (initial)	Between open contacts	2,500 Vrms for 1 min	1,300 Vrms for 1 min	
	Between contact and coil	2,500 Vrms for 1 min	2,500 Vrms for 1 min	
	withstandvoltage (initial) reen contact and coil	-	-	
Ambi	ient temperature	-40 to +70 ℃	-40 to +70 ℃	
tective truction	Dust cover	-	-	
otective struction	Flux-resistant	-	-	
Pro	Sealed	•	•	
n	height (mm) Including Standoff	16.5	16.5	
External dimension	Bottom (mm)	53.3	33 (4 Form A 4 Form B) 25 (2 Form A 2 Form B) (2 Form B)	
Suggested PC board pattern (BOTTOM VIEW) •: coil terminal		2.54 10-φ1.4 holes 3 Form A 1 Form B	2.54 10-φ1.4 holes 2 Form A 2 Form B 2.54 18-φ1.4 holes 4 Form A 4 Form B	
Safet	y standards	UL/C-UL, TÜV	UL/C-UL, TÜV	
Unit v	weight (Approx.)	38 g	38 g 47 g	
Optio		-	-	
Rema	arks	-	_	

Characteristics

■ UL Coil Insulation

Coil Insulation	Relay	
UL-B	LQ, LZ, LZ-N, JW	
UL-F	LD-P, LF-G, LQ, LZ, LZ-N,HE,HE-PV, HE-N , HE-S, HE-V	

■ TV rated

TV rated	Relay	
TV-2	-	
TV-3	TZ	
TV-4	-	
TV-5	LZ, LZ-N, JW	
TV-8	DW (Inrush type), LF, HE-S (STD type N.O.)	
TV-10	HE (2 Form A), HE-S (Long life type N.O.)	
TV-15	HE (1 Form A), HE-PV (35 A)	

■ Surge voltage between contact and coil

Surge voltage	Relay	
5,000 V	DS-P	
6,000 V	ST, PF, LF-G, PA-N	
8,000 V	LQ	
10,000 V LF, LD-P,LZ, LZ-N, JW, HE, HE-PV, HE-N, HE-S, HE-V, DJ, DK, DY		
12,000 V	DE, DW	

■ High frequency characteristics

Relay	Arrangement	Isolation	Insertion loss
RD COAXIAL SWITCH	SPDT Transfer SP6T	Min. 80 dB (1 to 4 GHz) SPDT Min. 60 dB (12.4 to 18 GHz) Transfer Min. 80 dB (1 to 4 GHz) SP6T	Max. 0.2 dB (1 to 4 GHz) SPDT Max. 0.5 dB (12.4 to 18 GHz) Transfer Max. 0.2 dB (1 to 4 GHz) SP6T
RN RELAY	1 Form C	Min. 30 dB (3 to 6 GHz)	Max. 0.5 dB (3 to 6 GHz)
RJ RELAY	2 Form C	Min. 30 dB (5 GHz) (Between contact sets)	Max. 0.5 dB (5 GHz)
RA RELAY	2 Form C	Min. 30 dB (1 GHz) (Between contact sets)	Max. 0.3 dB (1 GHz)
RS RELAY	1 Form C	Min. 30 dB (3 GHz) 50 Ω Surface-mount terminal Min. 35 dB (3 GHz) 75 Ω PC board terminal	Max. 0.5 dB (3 GHz) 50 Ω Surface-mount terminal Max. 0.35 dB (3 GHz) 75 Ω PC board terminal

■ Terminal socket

SP, NC, HE, SFS

■ Socket

S, ST, NC, PA-N, DK, DS-P, JW, SFS

■ LED operation indication type

SFS

SAFETY STANDARDS Each standard may be updated at any time, so please check our Website for the latest information.

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