

Fujitsu Relays

Automotive, Power, Signal,
High Frequency, Solid State





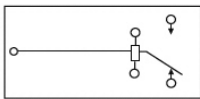
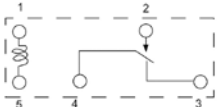
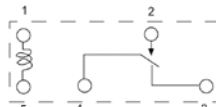
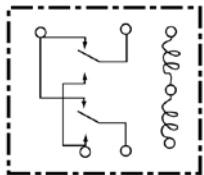


shaping tomorrow with you





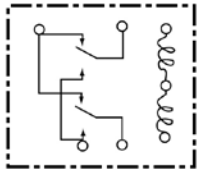
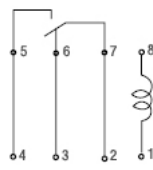
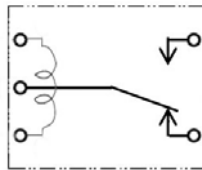
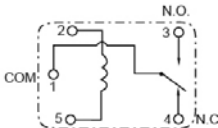
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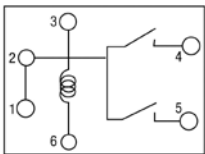
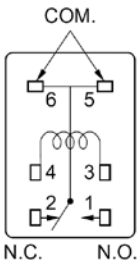
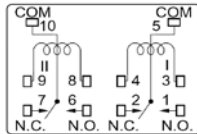
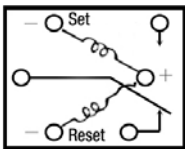
Automotive relays (25A)

SERIES NAME		FTR-G1	FTR-P3	FTR-P5	FTR-P2
■ Dimensions W x L x H (mm)		 6.6 x 13.7 x 13.5	 7.2 x 17.4 x 13.5	 9.7 x 20.4 x 16.7	 16.5 x 21.0 x 18.0
■ Weight (approx.)		3.5 g	5.0 g	7.0 g	13.0 g
■ Contact form		1 form C	1 form C	1 form C	1 form C x2 (H-bridge)
■ Contact current rating		25A	25A	25A	25A
■ Expected life on load example 14 VDC Inrush 25A, power window motor (1 operation: 1 forward and 1 reverse) 100x10 ³ ops. 14VDC Inrush 20A, door lock locked motor 100x10 ³ ops. Max. operate current 35A		14 VDC, free motor load Inrush 17A 300x10 ³ ops. 14 VDC, 25A locked motor 100x10 ³ ops. Max. operate current 35A	14 VDC, free motor load Inrush 17A 300x10 ³ ops. 14 VDC, 25A locked motor 100x10 ³ ops. Max. operate current 35A	14 VDC, free motor load Inrush 17A 300x10 ³ ops. 14 VDC, 25A locked motor 100x10 ³ ops. Max. operate current 35A	14 VDC, free motor load Inrush 17A 300x10 ³ ops. 14 VDC, 25A locked motor 100x10 ³ ops. Max. operate current 35A
■ Coil voltage (DC)		9 to 12 V	9 to 12 V	9 to 12 V	9 to 12 V
■ Nominal coil power		0.64 W	0.6 to 0.86 W	0.45 W	0.45 W
■ Dielectric strength	Open contacts	500 VAC	500 VAC	500 VAC	500 VAC
	Coil and contacts	500 VAC	500 VAC	500 VAC	500 VAC
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		- 0.25mm contact gap	- SMC type available - Higher stand-off types available - High temp. versions available - 0.25 or 0.6mm contact gap	- Average acoustic noise level: 50 dB - Pin compatible with P3 - 0.25mm contact gap	- Average acoustic noise level: 50 dB - Pin compatible with P4 - 0.25mm contact gap





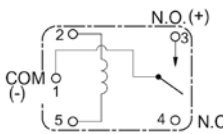
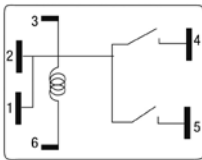
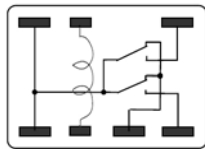
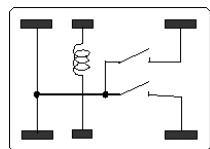
Automotive relays (25A)

SERIES NAME		FTR-P4	FTR-P6	FTR-P7 New design	FBR51/52
■ Dimensions W x L x H (mm)		 14.2 x 17.4 x 13.5	 9.0 x 12.0 x 10.3	 17.0 x 20.8 x 14.0	 12.1 x 15.5 x 13.7
■ Weight (approx.)		10.0 g	3.0 g	7.0 g	6.0 g
■ Contact form		1 form C x 2 (H-bridge)	1 form C	1 form C	1 form C
■ Contact current rating		25A	25A	25A	25A
■ Expected life on load example 14 VDC, 25A locked motor 100x10 ³ ops. Max. operate current 35A			14 VDC, 25A locked motor 100x10 ³ ops. 14 VDC, 20A free motor load Inrush 20A 300x10 ³ ops. Max. operate current 35A	14 VDC, 25A locked motor 100x10 ³ ops. Max. operate current 35A	14 VDC, free motor load Inrush 20A 400x10 ³ ops. 14 VDC, 25A locked motor 200x10 ³ ops. (-W1 type) 14VDC-120W lamp load 100 x 103 ops (-WL) Max. inrush 60A (-W1) Max. inrush 80A (-WL)
■ Coil voltage (DC)		9 to 12 V	10 to 12 V	12 V	6 to 12 V
■ Nominal coil power		0.6 W	0.8 W	0.6 W	0.6 W / 0.8 W
■ Dielectric strength	Open contacts	500 VAC	500 VAC	500 VAC	500 VAC
	Coil and contacts	500 VAC	500 VAC	500 VAC	500 VAC
■ Mounting		Through hole	Surface mount	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		- Pin compatible with FTR-P2 - Contact gap 0.25mm	- Average acoustic noise level: 60 dB - 0.25mm contact gap - SMD	- Average acoustic noise level: 45dB	- 0.3/0.6mm contact gap


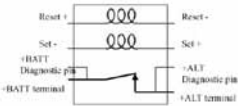
Automotive relays (25A ~ 35A)

SERIES NAME		FBR53	FBR57	FBR572/582	FBR51NL
■ Dimensions W x L x H (mm)		 12.3 x 15.7 x 14.0	 14.4 x 20.0 x 16.2	 20.0 x 26.0 x 16.2 (FBR572) 20.0 x 26.0 x 17.0 (FBR582)	 12.1 x 15.5 x 13.7
■ Weight (approx.)		6.0 g	9.4 g	18.0 g	6.0 g
■ Contact form		1 form U	1 form C	1 form C x 2 (SPDT X2)	1 form C
■ Contact current rating		30A	28VDC, 12A	28VDC, 12A	25A
■ Expected life on load example 14 VDC, 25A resistive load 100x10 ³ ops. 14 VDC, 6 x 21W lamp load 100x10 ³ ops. Max. inrush 60A		14 VDC, 25A resistive load 100x10 ³ ops. 14 VDC, 6 x 21W lamp load 100x10 ³ ops. Max. inrush 60A	28 VDC, 12A locked motor 100x10 ³ ops. 28 VDC, 12A free motor load, inrush 15A 500x10 ³ ops. Max. inrush 70A	28VDC, 12A locked motor 100 x 10 ³ ops. (FBR572) Maximum break rating locked motor load 32V, 14A (FBR582) Max. inrush 60A	14 VDC, 25A locked motor 200x10 ³ ops. (-W1 type) Inrush 60A
■ Coil voltage (DC)		9 to 12 V	24 V	24 V	10 V
■ Nominal coil power		0.6 W	1.5 W	1.5 W / 3.4 W	1.1 W
■ Dielectric strength	Open contacts	500 VAC	500 VAC	500 VAC	500 VAC
	Coil and contacts	500 VAC	500 VAC	500 VAC	500 VAC
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)		Standard 			
■ Remarks		- SMC type available - 0.25mm contact gap	- For 24V battery applications - 0.8mm contact gap	- For 24V battery applications - 0.8/1.4mm contact gap	- Dual coil latching - SMC type




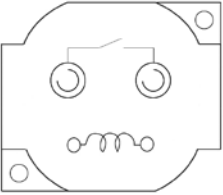
Automotive relays (35A ~ 45A)

SERIES NAME		FBR51 (-WF)	FBR53-HW	FBR56-HW	FBR59-HW
<div>■ Dimensions</div> W x L x H (mm)		<div></div> <div>12.1 x 15.5 x 13.7</div>	<div></div> <div>12.3 x 15.7 x 14.0</div>	<div></div> <div>15.0 x 20.0 x 16.5</div>	<div></div> <div>15.0 x 20.0 x 16.5</div>
<div>■ Weight (approx.)</div>		6.0 g	6.0 g	13.0 g	13.0 g
<div>■ Contact form</div>		1 form A (SPST)	1 form U	1 form C	1form U
<div>■ Contact current rating</div>		35A	40A	45A	45A
<div>■ Expected life on load example</div>		14 VDC, 80W lamp load 250x10 ³ ops. Max. inrush 80A Special type for flasher lamp applications.	14 VDC, 40A resistive load 100x10 ³ ops. Max. inrush 80A	14 VDC, 45A, 100x10 ³ ops. Inrush 220A Max. carrying current 60A	14 VDC, 45A, 100x10 ³ ops. Inrush 220A Max. carrying current 60A
<div>■ Coil voltage (DC)</div>		6 to 12 V	9 to 12 V	9 to 12 V	8 to 12 V
<div>■ Nominal coil power</div>		0.6 W	0.9 W	0.45 W	0.45 W
<div>■ Dielectric strength</div>	Open contacts	500 VAC	500 VAC	500 VAC	500 VAC
	Coil and contacts	500 VAC	500 VAC	500 VAC	500 VAC
<div>■ Mounting</div>		Through hole	Through hole	Through hole	Through hole
<div>■ Terminal layout (Bottom view)</div>		<div></div>	<div>High capacity (-HW type)</div> <div></div>	<div>High capacity (-HW type)</div> <div></div>	<div>High capacity (-HW type)</div> <div></div>
<div>■ Remarks</div>		- 0.3mm contact gap	- SMC type available - High power type	- SMC / SMT type available - High power type	- SMC / SMT type available - High power type





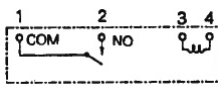
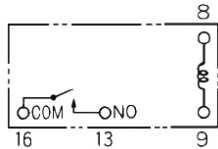

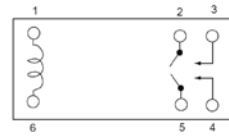
Automotive relays (100A/150A)

SERIES NAME		FTR-V1
<div>■ Dimensions</div> <div>W x L x H (mm)</div>		<div></div> <div>49.5 x 50.6 x 23.8</div>
<div>■ Weight (approx.)</div>		115.0 g
<div>■ Contact form</div>		1 form A
<div>■ Contact current rating</div>		150A @ 100°C
<div>■ Expected life on load example</div>		230A peak break 1A 14VDC, 100x10 ³ ops. Inrush 1200A Capacitor load
<div>■ Coil voltage (DC)</div>		12 V
<div>■ Nominal coil power</div>		20.6 W
<div>■ Dielectric strength</div>	Open contacts	500 VAC
	Coil and contacts	500 VAC
<div>■ Mounting</div>		Screw/press-fit
<div>■ Terminal layout (Bottom view)</div>		<div></div>
<div>■ Remarks</div>		<div>- Contact state diagnostic terminals</div> <div>- High current 12VDC relay</div>





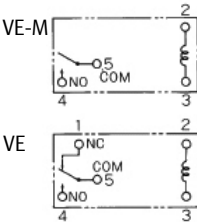
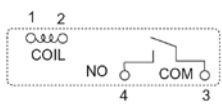
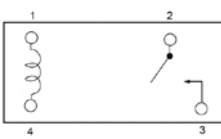

Automotive relays (450VDC, 10A ~ 200A)

SERIES NAME		FTR-E1 New design	FTR-E3 UNDER DEVELOPMENT*
■ Dimensions W x L x H (mm)		 28.0 x 64.5 x 49.5	 64.0 x 74.0 x 74.0
■ Weight (approx.)		85.0 g	550.0 g
■ Contact form		1 form A	1 form A
■ Contact current rating	Make	20 A	200 A
	Break	20 A	200 A
■ Expected life on load example		450 VDC, 20A, 10x10 ³ ops. 450 VDC, 10A, 75x10 ³ ops	450 VDC, 200A, 1x10 ³ ops.
■ Coil voltage (DC)		9 to 12 V	12 V
■ Nominal coil power		0.9 W	36W / 3.6 W (stable)
■ Dielectric strength	Open contacts	2,500 V	2,500 V
	Coil and contacts	2,500 V	5,000 V
■ Mounting		Tab terminals/through hole/ plug-in	Screw / plug-in
■ Terminal layout (Bottom view)			
■ Remarks		- Contact Fujitsu for details	- Contact Fujitsu for details -* Specifications may be changed without prior notice




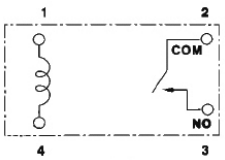
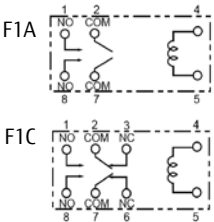
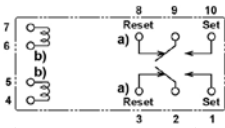
Power relays (3A ~ 5A)

SERIES NAME		NY	JY	FTR-F3	FTR-F4
■ Dimensions W x L x H (mm)		 5.0 x 20.1 x 17.5	 9.8 x 20.0 x 12.8	 7.0 x 20.3 x 15.0	 12.0 x 24.0 x 25.0
■ Weight (approx.)		3.5 g	5.0 g	4.0 g	12.0 g
■ Contact form		1 form A (SPST-NO)	1 form A (SPST-NO)	1 form A (SPST-NO), 1 form C (SPDT)	2 form A (DPST)
■ Contact current rating		5A	(5A carry) 3A 3A 5A 3A 5A	3A (standard type) 5A (-HA) (5A carry)	5A
■ Minimum switching load (ref.)		5VDC 1mA	100mVDC 0.1mA 5VDC 10mA 5VDC 100mA	5VDC 10mA	5VDC 100mA
■ Contact rating (Resistive load)		5A, 250VAC/30VDC	3A, 250VAC/30VDC 5A, 250VAC/30VDC	3A, 125VAC/30VDC (standard type) 5A, 250VAC/30VDC (-HA)	5A, 250VAC/30VDC
■ Coil voltage (DC)		4.5 to 24 V	4.5 to 48 V	5 to 24 V	5 to 48 V
■ Nominal coil power		0.12 W	0.2 to 0.36 W	0.2 W	0.53 W
■ Dielectric strength	Open contacts	750 VAC	750 VAC	750 VAC	1,000 VAC
	Coil and contacts	3,000 VAC	2,000 VAC	4,000 VAC	4,000 VAC
■ Surge strength (Coil and contacts)		5,080 V	4,000 V	10,000 V	10,000 V
■ Expected life	Mechanical	20 x 10 ⁶ ops.	20 x 10 ⁶ ops.	5 x 10 ⁶ ops.	2 x 10 ⁶ ops.
	Electrical (Rated load)	100 x 10 ³ ops. (at 3A, 250VAC, 30VDC) 50 x 10 ³ ops. (at 5A, 250VAC, 30VDC)	100 x 10 ³ ops.	200 x 10 ³ ops. (standard type) 100 x 10 ³ ops. (-HA)	100 x 10 ³ ops.
■ Safety standards		UL, CSA	UL, CSA	UL, CSA, VDE, CQC	UL, CSA, VDE, CQC
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		- Socket available (-NYP)	- Socket available	- Right angle versions (1 a) - TV-3, TV-5 rating types available - 1 form c type available	- Flux-free type available - TV-3 rated






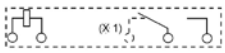

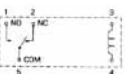

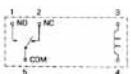
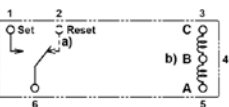
Power relays (5A)

SERIES NAME		VE	FTR-MY	FTR-F2	FTR-F4G
■ Dimensions W x L x H (mm)		 10.5 x 20.5 x 20.5	 5.0 x 20.0 x 12.0	 11.0 x 24.0 x 25.0	 12.7 x 28.7 x 25.2
■ Weight (approx.)		8.0 g	2.5 g	13.0 g	18.0 g
■ Contact form		1 form A (SPST-NO), 1 form C (SPDT)	1 form A (SPST-NO)	1 form A (SPST-NO)	2 form A (DPST-NO)
■ Contact current rating		(7A carry) 5A (3A*) 5A (3A*)	5A	5A	5A
■ Minimum switching load (ref.)		5VDC 10mA 5VDC 100mA	5VDC 1mA	5VDC 100mA	5VDC 100mA
■ Contact rating (Resistive load)		VE-() H5 5A, 250VAC VE-() H 3A/5A, 250VAC	5A, 250VAC/30VDC	5A, 250VAC/30VDC	5A, 250VAC
■ Coil voltage (DC)		5 to 48 V	4.5 to 24 V	5 to 48 V	3 to 60 V
■ Nominal coil power		0.25W (VE-IS), 0.36 W (standard type)	0.11 W	0.25W (high sensitive type) 0.53 W (standard type)	0.8 W
■ Dielectric strength	Open contacts	750 VAC (1 c) 1,000 VAC (1 a)	750 VAC	1,000 VAC	1,500 VAC
	Coil and contacts	2,000 VAC	3,000 VAC	4,000 VAC	5,000 VAC
■ Surge strength (Coil and contacts)		4,000 V (VE) / 6,000 V (VE-HV)	5,080 V	10,000 V	10,000 V
■ Expected life	Mechanical	10 x 10 ⁶ ops.	20 x 10 ⁶ ops.	2x 10 ⁶ ops.	500 x 10 ³ ops.
	Electrical (Rated load)	100 x 10 ³ ops. (VE) 50 x 10 ³ ops. (VE-S)	50 x 10 ³ ops.	100 x 10 ³ ops.	100 x 10 ³ ops.
■ Safety standards		UL, CSA, VDE	UL, CSA, VDE, CQC	UL, CSA, VDE	cULus, TUV
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		* N.C. contact	- Right angle type available	- TV-5 rated	- 1.5mm contact gap - TV-3 rated - 8A version available (FTR-4R)





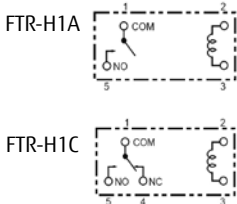
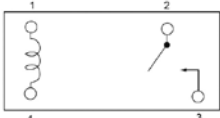
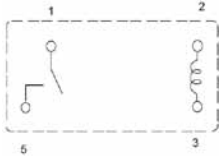
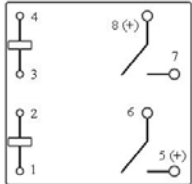
Power relays (5A ~ 10A)

SERIES NAME		JV	FTR-F1	FTR-F1L
■ Dimensions W x L x H (mm)		 10.0 x 17.5 x 12.5	 12.8 x 29.0 x 16.5	 12.8 x 29.0 x 16.5
■ Weight (approx.)		4.3 g	13.0 g	13.0 g
■ Contact form		1 form A (SPST-NO)	2 form A, 2 form C	2 form A, 2 form C
■ Contact current rating		5A, 10A	5A, 8A	8A
■ Minimum switching load (ref.)		5VDC 100mA	5VDC 10mA	5VDC 10mA
■ Contact rating (Resistive load)		5A, 250VAC/30VDC (JV) 10A, 250VAC/24VDC (JV-KS)	5A, 250VAC/24VDC 8A, 250VAC/24VDC	8A, 250VAC/24VDC
■ Coil voltage (DC)		3 to 48 V (JV)/3 to 24V (JV-KS)	3 to 48 V	5 to 24 V
■ Nominal coil power		0.2 W / 0.3 W	0.4W (high sensitive) 0.53 to 0.55 W (standard)	0.4W (single winding) 0.6 W (double winding)
■ Dielectric strength	Open contacts	750 VAC	1,000 VAC	1,000 VAC
	Coil and contacts	5,000 VAC	5,000 VAC	5,000 VAC
■ Surge strength (Coil and contacts)		10,000 V	10,000 V	10,000 V
■ Expected life	Mechanical	5 x 10 ⁶ ops.	20 x 10 ⁶ ops.	3 x 10 ⁶ ops.
	Electrical (Rated load)	100 x 10 ³ ops. (JV) 50 x 10 ³ ops. (JV-KS)	100 x 10 ³ ops. (5A type) 50 x 10 ³ ops. (8A type)	50 x 10 ³ ops.
■ Safety standards		UL, CSA, VDE, SEMKO, CQC	UL, CSA, VDE, BSI	UL, CSA, VDE
■ Mounting		Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)				 (this is typical layout)
■ Remarks		- High sensitive type available - 10 A type JV-KS	- Pin compatible with VB series - TV-3 rating available - Clear cover available	- 1 and 2 coil versions - Latching type





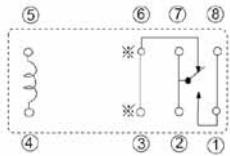
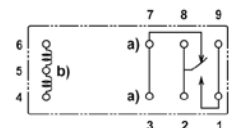
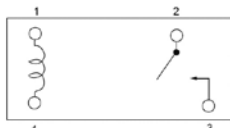
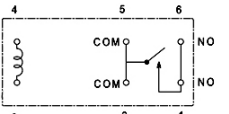
Power relays (6A ~ 8A)

SERIES NAME		FTR-LY	JS	JS-RW New design	JSL
■ Dimensions W x L x H (mm)		 5.0 x 28.0 x 15.0	 10.0 x 29.0 x 12.5	 10.0 x 29.0 x 12.5	 10.0 x 29.0 x 12.5
■ Weight (approx.)		5.0 g	8.0 g	8.0 g	8.0 g
■ Contact form		1 form A (SPST-NO), 1 form C (SPDT)	1 form A (SPST-NO), 1 form C (SPDT)	1 form A (SPST-NO), 1 form C (SPDT)	1 form A (SPST-NO), 1 form C (SPDT)
■ Contact current rating		6A	8A (10A carry)	8A (10A carry)	8A (10A carry)
■ Minimum switching load (ref.)		5VDC 10mA	5VDC 10mA	5VDC 10mA	5VDC 100mA
■ Contact rating (Resistive load)		6A, 250VAC/24VDC	8A, 250VAC/24VDC	8A, 250VAC/24VDC	8A, 250VAC/24VDC
■ Coil voltage (DC)		5 to 60 V	5 to 60 V	5 to 60 V	3 to 24 V
■ Nominal coil power		0.17 W / 0.21 W	0.22 to 0.29 W	0.22 to 0.29 W	0.22 to 0.25 W (single winding) 0.48 W (double winding)
■ Dielectric strength	Open contacts	1,000 VAC	1,000 VAC	1,000 VAC	1,000 VAC
	Coil and contacts	4,000 VAC	5,000 VAC	5,000 VAC	5,000 VAC
■ Surge strength (Coil and contacts)		6,000 V	10,000 V	10,000 V	10,000 V
■ Expected life	Mechanical	10 x 10 ⁶ ops.	20 x 10 ⁶ ops.	20 x 10 ⁶ ops.	5 x 10 ⁶ ops.
	Electrical (Rated load)	100 x 10 ³ ops (JS) 50 x 10 ³ ops (NS-()N) 20 x 10 ³ ops (JS-()F, JS-()D)	100 x 10 ³ ops (JS) 50 x 10 ³ ops (NS-()N) 20 x 10 ³ ops (JS-()F, JS-()D)	100 x 10 ³ ops.	50 x 10 ³ ops.
■ Safety standards		UL, CSA, VDE	UL, CSA, VDE, CQC	Pending	UL, CSA, VDE
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)		Through hole type  Right angle type 	JS-MK, JS-M()-KT  JS-K 	JS-MK, JS-M()-KT  JS-K 	 (this is typical layout)
■ Remarks		- Ultra slim - Socket version available - Right angle type available	- 1000W lamp load type available (Inrush 64A) (JS-MN(-)-KS)	- Reflow solderable relay (RTH)	- 1 and 2 coil versions available - Latching type





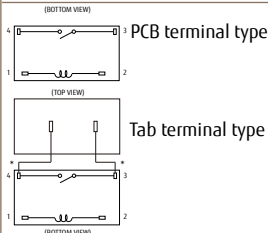
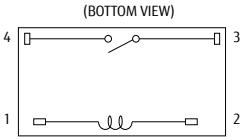
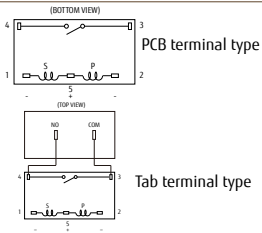

Power relays (10A)

SERIES NAME		FTR-H1	FTR-H2	FTR-H3	FTR-J2
■ Dimensions W x L x H (mm)		 12.8 x 28.0 x 16.5	 11.0 x 24.0 x 25.0	 13.7 x 28.8 x 18.8	 23.5 x 24.0 x 27.0
■ Weight (approx.)		12.0 g	13.0 g	13.0 g	26.0 g
■ Contact form		1 form A (SPST-NO), 1 form C (SPDT)	1 form A (SPST-NO)	1 form A (SPST-NO)	2 x 1 form A
■ Contact current rating		10A (14A carry)	10A	10A (14A carry)	10A (12A carry)
■ Minimum switching load (ref.)		5VDC 10mA	5VDC 100mA	5VDC 10mA	5VDC 100mA
■ Contact rating (Resistive load)		10A, 250VAC/30VDC	10A, 250VAC/30VDC	10A, 250VAC/30VDC TV-5/TV-8	10A, 200VDC x 2 10A, 450VDC
■ Coil voltage (DC)		5 to 48 V	5 to 48 V	5 to 24 V	5 to 110 V
■ Nominal coil power		0.4W (high sensitive) 0.53 W (standard type)	0.4W (high sensitive) 0.53 W (standard type)	0.53 W	530mW per coil
■ Dielectric strength	Open contacts	1,000 VAC	1,000VAC	1,000 VAC	1,000 VAC
	Coil and contacts	5,000 VAC	4,000 VAC	5,000 VAC	4,000 VAC
■ Surge strength (Coil and contacts)		10,000 V	10,000 V	10,000 V	10,000 V
■ Expected life	Mechanical	20 x 10 ⁶ ops.	2 x 10 ⁶ ops.	20 x 10 ⁶ ops.	2 x 10 ⁶ ops.
	Electrical (Rated load)	100 x 10 ³ ops.	100 x 10 ³ ops.	100 x 10 ³ ops.	10 x 10 ³ ops.
■ Safety standards		UL, CSA, VDE, CQC	UL, CSA, VDE, CQC	UL, CSA VDE, CQC	UL, VDE
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		- TV-5 rating available - Clear cover available	- Flux-free type available - TV-5 rated	- Pin compatible with FTR-H1 series (1 form A) - Low noise level 55dB - TV-8 rating available	- Arc extinguishing construction is embedded





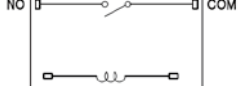
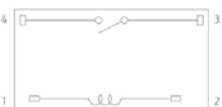
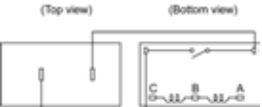
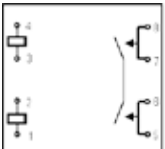
Power relays (10A ~ 20A)

SERIES NAME		FTR-K1	FTR-K1L	FTR-K2	FTR-K2G								
<div>■ Dimensions</div> W x L x H (mm)		<div></div> <div>12.7 x 29.0 x 15.7</div>	<div></div> <div>12.7 x 29.0 x 15.7</div>	<div></div> <div>11.0 x 24.0 x 25.0</div>	<div></div> <div>16.0 x 35.0 x 28.0</div>								
<div>■ Weight (approx.)</div>		13.0 g	12.0 g	13.0 g	34.0 g								
<div>■ Contact form</div>		1 form A, 1 form C	1 form A, 1 form C	1 form A (SPST-NO)	1 form A (SPST-NO)								
<div>■ Contact current rating</div>		<table><tr><td colspan="2">(14A carry)</td><td colspan="2">(20A carry)</td></tr><tr><td>10A</td><td>12A</td><td>16A</td><td>17A</td></tr></table>	(14A carry)		(20A carry)		10A	12A	16A	17A	16A (20A carry)	16A	20A (25A carry)
(14A carry)		(20A carry)											
10A	12A	16A	17A										
<div>■ Minimum switching load (ref.)</div>		5VDC 100mA	5VDC 10mA	5VDC 100mA	5VDC 100mA								
<div>■ Contact rating (Resistive load)</div>		16A, 250VAC/24VDC (except following types) 16A, 250VAC (inrush 120A type, FTR-KW) 12A, 250VAC/24VDC (12A type) 10A, 250VAC (High sensitive type) 17A, 250VAC (FTR-K1T)	16A, 250VAC/24VDC	16A, 250VAC/30VDC	20A, 250VAC								
<div>■ Coil voltage (DC)</div>		5 to 48 V (high sensitive) 5 to 110 V (others)	5 to 24 V	3 to 48 V	5 to 110 V								
<div>■ Nominal coil power</div>		0.4 W	1 coil: 0.4 W 2 coils: 0.5W	0.53 W	1 W								
<div>■ Dielectric strength</div>	Open contacts	1,000 VAC	1,000 VAC	1,000 VAC	2,000 VAC								
	Coil and contacts	5,000 VAC	5,000 VAC	4,000 VAC	5,000 VAC								
<div>■ Surge strength (Coil and contacts)</div>		10,000 V	10,000 V	10,000 V	10,000 V								
<div>■ Expected life</div>	Mechanical	20 x 10 ⁶ ops.	3 x 10 ⁶ ops.	2 x 10 ⁶ ops.	1 x 10 ⁶ ops.								
	Electrical (Rated load)	30 x 10 ³ ops. to 150 x 10 ³ ops.	AC : 1 form A : 100 x 10 ³ ops 1 form C : 50 x 10 ³ ops DC: 1 form A: 100 x 10 ³ ops 1form C: 30 x 10 ³ ops	100 x 10 ³ ops.	100 x 10 ³ ops.								
<div>■ Safety standards</div>		UL, CSA, VDE	cULus, VDE	UL, CSA, VDE, CQC	cULus, VDE								
<div>■ Mounting</div>		Through hole	Through hole	Through hole	Through hole								
<div>■ Terminal layout (Bottom view)</div>		<div></div> <div>1 form C type layout</div>	<div></div> <div>1 form C / 2 coil type layout</div>	<div></div>	<div></div>								
<div>■ Remarks</div>		<div>- High sensitive, 105°C type, clear cover, 120A & TAB-terminals available (17A) - Sealed versions available - 120A inrush type available - AC coil version under development 10A: K1 high sensitive (FTR-K1AL()-W-LA/(-LB), -K1CL()W-LA/(-LB) 12A: 12A type (FTR-K1AK()W-MA(-MB), -K1CK()-MA(-MB)K1-KW, K1-KS 17A: Tab terminal type (FTR-K1Txxx) 16A : FTR-K1 others</div>	<div>- 1 and 2 coil versions available - Latching type - Inrush 80A</div>	<div>- TV-5 rated</div>	<div>- TV-8 rated - 3mm contact gap</div>								


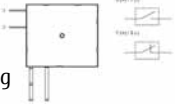
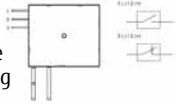
Power relays (20A ~ 25A)

SERIES NAME		FTR-K3	FTR-K3-WG	FTR-K3L	FTR-K3-WS
■ Dimensions W x L x H (mm)		 15.7 x 30.1 x 23.3	 15.7 x 30.1 x 23.3	 15.7 x 30.1 x 23.3	 15.7 x 30.1 x 23.3
■ Weight (approx.)		25.0 g	25.0 g	25.0 g	25.0 g
■ Contact form		1 form A	1 form A	1 form A	1 form A
■ Contact current rating		20A, 25A	25A	25A	25A
■ Minimum switching load (ref.)		5VDC 100mA	5VDC 100mA	5VDC 100mA	5VDC 100mA
■ Contact rating (Resistive load)		20A, 250VAC 25A, 250VAC 25A is applicable for K3-HC and K3F	25A, 250VAC	25A, 250VAC	25A, 250VAC
■ Coil voltage (DC)		5 to 48 V	5 to 48 V (non-latching) 5 to 24 V (latching)	5 to 24 V	5 to 48 V
■ Nominal coil power		0.78 W	0.78 W	0.9 W	1.2 W
■ Dielectric strength	Open contacts	1,000 VAC	2,500 VAC	1,000 VAC	2,500 VAC
	Coil and contacts	5,000 VAC	5,000 VAC	5,000 VAC	5,000 VAC
■ Surge strength (Coil and contacts)		8,500 V	8,500 V	8,500 V	8,500 V
■ Expected life	Mechanical	2 x 10 ⁶ ops.	2 x 10 ⁶ ops.	1 x 10 ⁶ ops.	100 x 10 ³ ops.
	Electrical (Rated load)	100 x 10 ³ ops.	100 x 10 ³ ops	100 x 10 ³ ops.	30 x 10 ³ ops.
■ Safety standards		UL, CSA, VDE, CQC	UL, VDE, CQC	cULus, VDE	cULus, VDE
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		- TAB-terminals available - Flat type available (FTR-K3F series, 25A)	- EU Photovoltaic standard compliance (VDE0126) - 1.5mm contact gap - 2 coils latching type available (FTR-K3L-WG)	- 2 coils latching type	- 1.8 mm contact gap





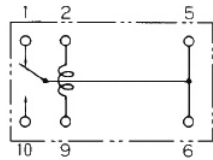
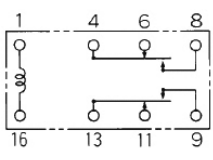
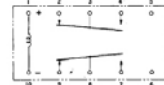
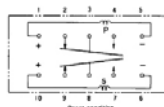
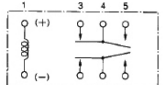
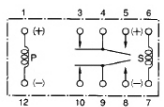
Power relays (30A ~ 32A)

SERIES NAME		FTR-K3-PV	FTR-K3-PS	FTR-K3LV	FTR-K2W
■ Dimensions W x L x H (mm)		 15.7 x 30.1 x 23.3	 15.7 x 30.1 x 23.3	 15.7 x 30.1 x 23.3	 34.9 x 36.5 x 30.2
■ Weight (approx.)		26.0 g	26.0 g	27.0 g	74.0 g
■ Contact form		1 form A	1 form A	1 form A	1 form A
■ Contact current rating		32A	32A	32A	30A
■ Minimum switching load (ref.)		5VDC 100mA	5VDC 100mA	5VDC 100mA	5VDC 100mA
■ Contact rating (Resistive load)		32A, 250VAC	32A, 250VAC	32A, 250VAC	30A, 60VDC 25A, 72VDC
■ Coil voltage (DC)		5 to 48 V	5 to 48 V	4.5 to 48 V	5 to 48 V
■ Nominal coil power		1.2 W	1.4 W	1.2 W	2 W
■ Dielectric strength	Open contacts	2,500 VAC	2,500 VAC	2,500 VAC	2,000 VAC
	Coil and contacts	4,000 VAC	4,000 VAC	4,000 VAC	5,000 VAC
■ Surge strength (Coil and contacts)		6,000 V	6,000 V	6,000 V	10,000 V
■ Expected life	Mechanical	1 x 10 ⁶ ops.	100 x 10 ³ ops.	1 x 10 ⁶ ops.	1 x 10 ⁶ ops.
	Electrical (Rated load)	30 x 10 ³ ops.	30 x 10 ³ ops.	30 x 10 ³ ops.	10 x 10 ³ ops.
■ Safety standards		cULus, VDE	cULus, VDE	Pending	UL, TUV
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)					
■ Remarks		<ul style="list-style-type: none"> - EU Photovoltaic standard compliance (VDE0126) - High capacity 32A - 1.5mm contact gap - 2 coils latching type available (FTR-K3L-PV) 	<ul style="list-style-type: none"> - 1.8 mm contact gap 	<ul style="list-style-type: none"> - Screw hole terminals for contacts 	- n/a





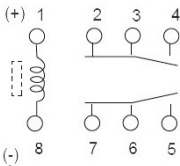
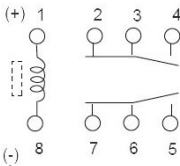
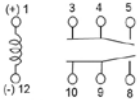
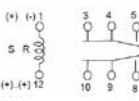
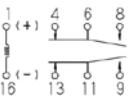
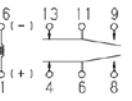
Power relays (120A)

SERIES NAME		FTR-K4
■ Dimensions W x L x H (mm)		<div>UNDER DEVELOPMENT*</div> <div></div> <div>37.0 x 43.0 x 22.0</div>
■ Weight (approx.)		80.0 g
■ Contact form		1 form A
■ Contact current rating		120A
■ Minimum switching load (ref.)		-
■ Contact rating (Resistive load)		120A, 277VAC
■ Coil voltage (DC)		6 to 48 V
■ Nominal coil power		2.4 W (single winding) 4.8 W (double winding)
■ Dielectric strength	Open contacts	2,000 VAC
	Coil and contacts	4,000 VAC
■ Surge strength (Coil and contacts)		12,000 V
■ Expected life	Mechanical	1 x 10 ⁶ ops.
	Electrical (Rated load)	5 x 10 ³ ops.
■ Safety standards		Pending
■ Mounting		Through hole
■ Terminal layout (Bottom view)		<div><div>Single winding</div><div>Double winding</div></div>
■ Remarks		<div>- 120A latching relay</div> <div>- Specification may change without prior notice</div>


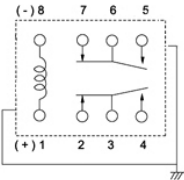
Signal relays (1A ~ 2A)

SERIES NAME		SY	RY	A	NA
■ Dimensions W x L x H (mm)		 7.4 x 12.5 x 9.5	 9.8 x 20.2 x 12.5	 9.4 x 14.0 x 5.0	 7.4 x 14.9 x 9.7
■ Weight (approx.)		1.7 g	5.0 g	1.2 g	1.6 g
■ Contact form		1 form C (SPDT)	2 form C (DPDT)	2 form C (DPDT)	2 form C (DPDT)
■ Contact current rating		(2A carry) 1A 1A	1A (1.25A carry) 2A (2A carry)	1A (2A carry)	1A (2A carry)
■ Minimum switching load (ref.)		100mVDC 0.1mA 1VDC 1mA	10mVDC 0.01mA	10mVDC 0.01mA	10mVDC 0.01mA
■ Contact rating (Resistive load)		0.5, 120VAC (SY) 1A, 24VDC 0.5A, 60VAC (SY-W) 1A, 24VDC	0.5A, 120VAC (RY-W, WZ) 1A, 24VDC 0.25A, 120VAC (RY-WF) 1A, 24VDC 0.5A, 125VAC (RY-WFZ) 2A, 30VDC	0.5A, 125VAC 1A, 30VDC	0.5A, 125VAC 1A, 30VDC
■ Coil voltage (DC)		1.5 to 24 V	3 to 48 V	1.5 to 24 (48*) V	1.5 to 24V (*48 V)
■ Nominal coil power		0.15 to 0.175 W	0.15 to 0.58 W	0.1 to 0.3 W	0.1 to 0.3 W
■ Dielectric strength	Open contacts	300 VAC 400 VAC	500 VAC (W, WZ, WFZ) 1,000 VAC (WF)	1,000 VAC	1,000 VAC
	Coil and contacts	1,000 VAC	1,000 VAC	1,000 VAC	1,500 VAC (NA, NAL) 1,000 VAC (NAL-D)
■ Surge strength (Coil and contacts)		1,500 V	1,500 V	1,500 V	2,500 V (NA, NAL) 1,500 V (NAL-D)
■ Expected life	Mechanical	5 x 10 ⁶ ops.	20 x 10 ⁶ ops. (W) 10 x 10 ⁶ ops. (WF, WZ, WFZ)	100 x 10 ⁶ ops. (A) 10 x 10 ⁶ ops. (AL, AL-D)	100 x 10 ⁶ ops. (NA) 10 x 10 ⁶ ops. (NAL, NAL-D)
	Electrical (Rated load)	100 x 10 ³ ops.	100x10 ³ ops. (DC 30V, 2A)*1 200x10 ³ ops. (AC 120V, 0.5A)*2 500x10 ³ ops. (DC 24V, 1A / AC 120V, 0.25A)	500 x 10 ³ ops. (DC) 200 x 10 ³ ops. (AC)	500 x 10 ³ ops. (DC) 200 x 10 ³ ops. (AC)
■ Safety standards		UL, CSA, FCC68	UL, CSA, FCC68	UL, CSA, FCC68	UL, CSA, BSI, FCC68, Telcordia, IEC60950-1
■ Mounting		Through hole	Through hole	Through hole	Through hole
■ Terminal layout (Bottom view)				A, AL  AL-D 	NA, NAL  NAL-D 
■ Remarks			*1: 2 Amp type *2: 1 Amp type	- 1 and 2 coil versions available - Latching type available * Only standard type	- Latching type available * Only standard type






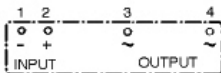
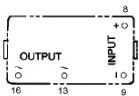
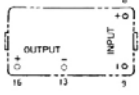

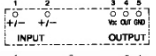

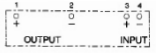
Signal relays (2A)

SERIES NAME		FTR-B3	FTR-B4	FTR-C1	FTR-C2
■ Dimensions W x L x H (mm)		 7.2 x 10.6 x 5.45*	 5.7 x 10.6 x 9.0	 7.5 x 15.0 x 9.3	 9.85 x 20.05 x 11.4
■ Weight (approx.)		0.85 g	1.0 g	2.0 g	3.7 g
■ Contact form		2 form C (DPDT)	2 form C (DPDT)	2 form C (DPDT)	2 form C 2 form C (DPDT)
■ Contact current rating		1A (2A carry)	1A (2A carry)	1A (2A carry)	1A (2A carry)
■ Minimum switching load (ref.)		10mVDC 0.01mA	10mVDC 0.01mA	10mVDC 0.01mA	10mVDC 0.01mA
■ Contact rating (Resistive load)		0.3A, 125VAC 1A, 30VDC	0.3A, 125VAC 1A, 30VDC	0.3A, 125VAC 1A, 30VDC	0.3A, 125VAC 1A, 30VDC
■ Coil voltage (DC)		1.5 to 24 V	1.5 to 24 V	3 to 24 V	3 to 24 V
■ Nominal coil power		0.14 to 0.23 W	0.14 to 0.23 W	0.14 to 0.3 W	0.3 W
■ Dielectric strength	Open contacts	1,000 VAC	1,000 VAC	1,500 VAC	1,500 VAC
	Coil and contacts	1,500 VAC	1,500 VAC	3,000 VAC	2,000 VAC
■ Surge strength (Coil and contacts)		2,500 V	2,500 V	5,000 V	2,500 V
■ Expected life	Mechanical	50 x 10 ⁶ ops. (FTR-B3...A) 20 x 10 ⁶ ops. (FTR-B3...B)	50 x 10 ⁶ ops. (FTR-B4...A) 20 x 10 ⁶ ops. (FTR-B4...B)	10 x 10 ⁶ ops.	10 x 10 ⁶ ops.
	Electrical (Rated load)	100 x 10 ³ ops.	100 x 10 ³ ops.	100 x 10 ³ ops.	100 x 10 ³ ops.
■ Safety standards		UL, CSA, BSI, FCC68, Telcordia, IEC60950-1	UL, CSA, FCC68, Telcordia, IEC60950-1	UL, CSA, BSI, Telcordia	UL, CSA, BSI, Telcordia, IEC60950-1
■ Mounting		Through hole / surface mount	Through hole / surface mount	Through hole / surface mount	Through hole / surface mount
■ Terminal layout (Bottom view)				Standard  Latching 	Through hole  Surface mount 
■ Remarks		- Latching type available * Through hole 7.2 x 10.6 x 5.2 mm	- Latching type available	- Latching type available - Contact gap 0.6 mm	- 2mm contact gap

High frequency relays (0.3A / 1A)

SERIES NAME		FTR-B3-RF
<div>■ Dimensions</div> <div>W x L x H (mm)</div>		<div></div> <div>7.7 x 13.6 x 5.45</div>
<div>■ Weight (approx.)</div>		1.3 g
<div>■ Contact form</div>		2 form C
<div>■ Contact current rating</div>		0.3A, 125VAC / 1A, 30VDC
<div>■ Minimum switching load (ref.)</div>		1A
<div>■ RF characteristics</div> <div>@ 50 Ω</div>		3W @ 1GHz-carry 1W @ 1GHz-switching Isolation > 30dB @ 1GHz Insertion loss < 0.2dB @ 1 GHz V.S.W.R < 1.2 @ 1 GHz
<div>■ Coil voltage (DC)</div>		1.5 to 24V
<div>■ Nominal coil power</div>		0.14 to 0.23 W
<div>■ Dielectric strength</div>	Open contacts	750 VAC
	Ground and coil/contacts	500 VAC
<div>■ Surge strength</div> <div>(Coil and contacts)</div>		1,500 V
<div>■ Expected life</div>	Mechanical	50 x 10 ⁶ ops.
	Electrical (Rated load)	100 x 10 ³ ops.
<div>■ Safety standards</div>		-
<div>■ Mounting</div>		Surface mount
<div>■ Terminal layout</div> <div>(Bottom view)</div>		<div></div>
<div>■ Remarks</div>		- Latching type available

Solid state relays (1A ~ 3A)

SERIES NAME			FTR-SL	SE	SJ	SN			
<div>■ Dimensions</div> W x L x H (mm)			<div></div> 5.0 x 28.0 x 15.0	<div></div> 5.0 x 20.0 x 17.0	<div></div> 10.0 x 20.0 x 12.8	<div></div> 5.0 x 20.0 x 17.0			
<div>■ Weight (approx.)</div>			4.0 g	4.0 g	5.5 g	2.0 g3.3 g3.5 g2.9 g			
<div>■ Type</div>			-	-	-	Input moduleOutput module			
<div>■ Voltage type</div>			AC	AC	ACDC	ACDCACDC			
<div>■ Current</div>			1.0 A	1.5 A	1 A	- -1A			
<div>■ Nominal voltage</div>			5, 12, 24, 60 VDC	3, 5, 12, 24 VDC	3,5,12,24 VDC5,12,24 VDC	100 VAC12, 24 VDC3,5,12, 24 VDC5, 12, 24 VDC			
Input side	<div>■ Impedance</div>	3V	5 V: 560 Ω	130 Ω	120 Ω	-	130/180 Ω	-	
		5V	12 V: 1.3k Ω	330 Ω	360 Ω	430 Ω	-	330/470 Ω	390 Ω
		12V	24V: 2.4k Ω	1.0k Ω	1.0k Ω	1.2k Ω	-	1.0k/1.5k Ω	1.2k Ω
		24V	60V: 10k Ω	2.2k Ω	2.0k Ω	2.4k Ω	-	2.2k/3.8k Ω	2.4k Ω
Output side	<div>■ Load voltage range</div>	AC 24 to 250 VAC rms		AC 24 to 265 V rms		24 to 265 V rms		3 to 30 VDC	
	<div>■ Max. load current</div>	1.0 A rms		1.5 A rms		1.0 A rms		1.0 A	
	<div>■ Min. load current</div>	10mA rms		10mA rms		10 mA rms		1 mA	
	<div>■ 1 cycle surge current</div>	50 A		50 A		50 A		3.0 A (10ms)	
	<div>■ Max. off-state leakage current</div>	1 mA rms		0.5mA rms (100VAC rms 60Hz) 1.0mA rms (200VAC rms 60Hz)		0.75mA rms (100VAC rms 60Hz) 1.5mA rms (200VAC rms 60Hz)		0.1 mA	
	<div>■ Max. on-state voltage drop</div>	1.3 V rms		1.2 V rms		1.2 V rms		1.2 V	
<div>■ Max. operate time</div>			1/2 cycle + 1 ms		1 ms		1 ms		
<div>■ Max. release time</div>			1/2 cycle + 1 ms		1/2 cycle + 1 ms		1/2 cycle + 1 ms		
<div>■ Dielectric strength (Input-output)</div>			2,500 V rms		2,500 V rms		2,500 V rms		
<div>■ Operating temperature</div>			-30°C to + 85°C		-30°C to + 85°C		-30°C to + 85°C		
<div>■ Storage temperature</div>			-40°C to + 100°C		-40°C to + 100°C		-40°C to + 100°C		
<div>■ Safety standard</div>			-		-		-		
<div>■ Mounting</div>			Through hole		Through hole		Through hole		
<div>■ Terminal layout (Bottom view)</div>			<div></div>	<div></div>	<div>SJ-()A, SJ-()AN<div></div></div> <div>SJ-()D, SJ-()DN<div></div></div>	<div>SN-A (input module)<div></div></div> <div>SN-D (input module)<div></div></div> <div>SN-A (output module)<div></div></div> <div>SN-D (output module)<div></div></div>			
<div>■ Remarks</div>			<div>- Pin compatible with FTR-LY</div> <div>- Internal zero cross circuit available</div> <div>- Internal varistor and snubber circuit</div>		<div>- Internal zero cross circuit available</div> <div>-2A type available</div>		<div>- Pin compatible with JY</div> <div>- Internal surge absorber</div> <div>- Socket available</div>		

Reference

Contact forms

Pole and throw

Since relays are switches, the terminology applied to switches is also applied to relays; a relay switches one or more poles, each of whose contacts can be thrown by energizing the coil in one of three ways:

Normally-open (NO)

Normally-open (NO) contacts connect the circuit when the relay is activated; the circuit is disconnected when the relay is inactive. It is also called a Form A contact or "make" contact. NO contacts may also be distinguished as "early-make" or NOEM, which means that the contacts close before the button or switch is fully engaged.

Normally-closed (NC)

Normally-closed (NC) contacts disconnect the circuit when the relay is activated; the circuit is connected when the relay is inactive. It is also called a Form B contact or "break" contact. NC contacts may also be distinguished as "late-break" or NCLB, which means that the contacts stay closed until the button or switch is fully disengaged.

Change-over (CO), or double-throw (DT)

Change-over (CO), or double-throw (DT), contacts control two circuits: one normally-open contact and one normally-closed contact with a common terminal. It is also called a Form C contact or "transfer" contact ("break before make"). If this type of contact utilizes a "make before break" functionality, then it is called a Form D contact.

Designations

SPST – Single Pole Single Throw

These have two terminals which can be connected or disconnected. Including two for the coil, such a relay has four terminals in total. It is ambiguous whether the pole is normally open or normally closed. The terminology "SPNO" and "SPNC" is sometimes used to resolve the ambiguity.

SPDT – Single Pole Double Throw

A common terminal connects to either of two others. Including two for the coil, such a relay has five terminals in total.

DPST – Double Pole Single Throw

These have two pairs of terminals. Equivalent to two SPST switches or relays actuated by a single coil. Including two for the coil, such a relay has six terminals in total. The poles may be Form A or Form B (or one of each).

DPDT – Double Pole Double Throw

These have two rows of change-over terminals. Equivalent to two SPDT switches or relays actuated by a single coil. Such a relay has eight terminals, including the coil.

Contacts

Contact Resistance

Statistical value. Specifies the total resistance of the closed contacts, terminals and contact springs, in milli-Ohms (or max Voltage drop) Not reproducible value. Sometimes the measuring condition is specified e.g. 6V/1A.

Contact Rating

The resistive Voltage and Ampere rating of a contact.

Max Switching Voltage

The max open circuit voltage that can be safely switched by the contacts to reach the limiting switching cycles. AC and DC voltages may differ.

Max Switching current

The max inrush current that can be safely switched by the contacts. <0.5sec. Meeting the specified number of making cycles. AC and DC currents may differ.

Max carry current

The current that can safely be carried by the contacts without causing damage due to overheating.

Max Switching Power

The max power in Watts or VA that can be safely switched by the contacts.

Coil Values

Coil Voltage

Nominal voltage to be applied to the coil terminals, to assure reliable operation, maintaining all specifications

Coil Resistance

Nominal resistance measured in Ohms @ 20C or 23C. In most cases tolerance is +/- 10%.

Coil Power

The Voltage-current product of the coil indicating the dissipation (Heat) of the coil in Watts @ nominal coil voltage at 20C. (Short time value)

Coil Inductance

Inductance of the relay coil in [H or mH]. Normally not mentioned in the specifications, but can be important for designers.

Coil operating temperature

Indicating temp. Operating range of the coil. Is depending on the used coil wire temperature class and used relay materials. Coil temperature is an important parameter to calculate the actual operating voltage of the relay. (See operating range graphs in the relay specifications)

About Fujitsu Components

Fujitsu Components America, Inc. is responsible for managing the sales, marketing and distribution of electronic and system components and sub-systems throughout North and South America. Products include relays, connectors, input and pointing devices, touch panels, thermal printers, and wireless modules.

Primary customers include large original equipment manufacturers and resellers of a broad range of electronic equipment for various industries.

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