

Relay Solutions for the Lighting Industry

Fujitsu Components America, Inc.
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Trends

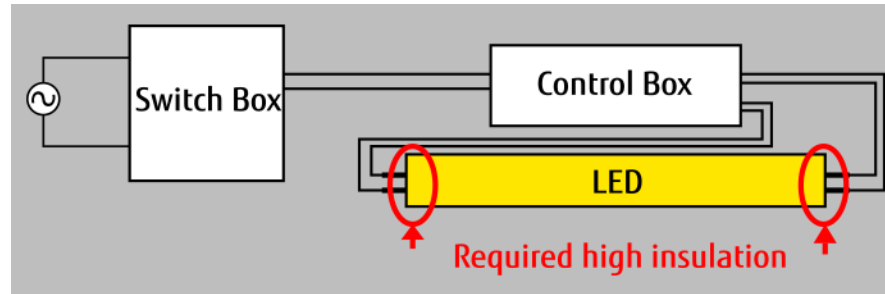
- Increased demand for advanced and energy-efficient lighting solutions

Our Solution

- We offer a wide range of suitable relays with:
 - Compact dimensions
 - Low power consumption
 - High insulation features
 - High inrush current capabilities



- LED lighting requires appropriate galvanic separation to provide the necessary safety at high voltage level
- Our FTR-C1 relays can provide the necessary creepage and clearance insulation distances



Product solution: FTR-C1 series

- High insulation distance in small package.
- Space saving SMT type & latching (power saving) types available

Advantage

- Downsizing LED tube. FTR-C1 relay is small enough to be mounted inside the tube

Product solution: FTR-B3 series

- Ultra miniature relay
- Space saving SMT type & latching (power saving) type available

Advantage:

- Downsizing LED
 - FTR-B3 relay is small enough to be mounted inside the LED
- Low cost compared with FTR-C1 x 2 pcs
- Low coil power

FTR-C1 Specifications

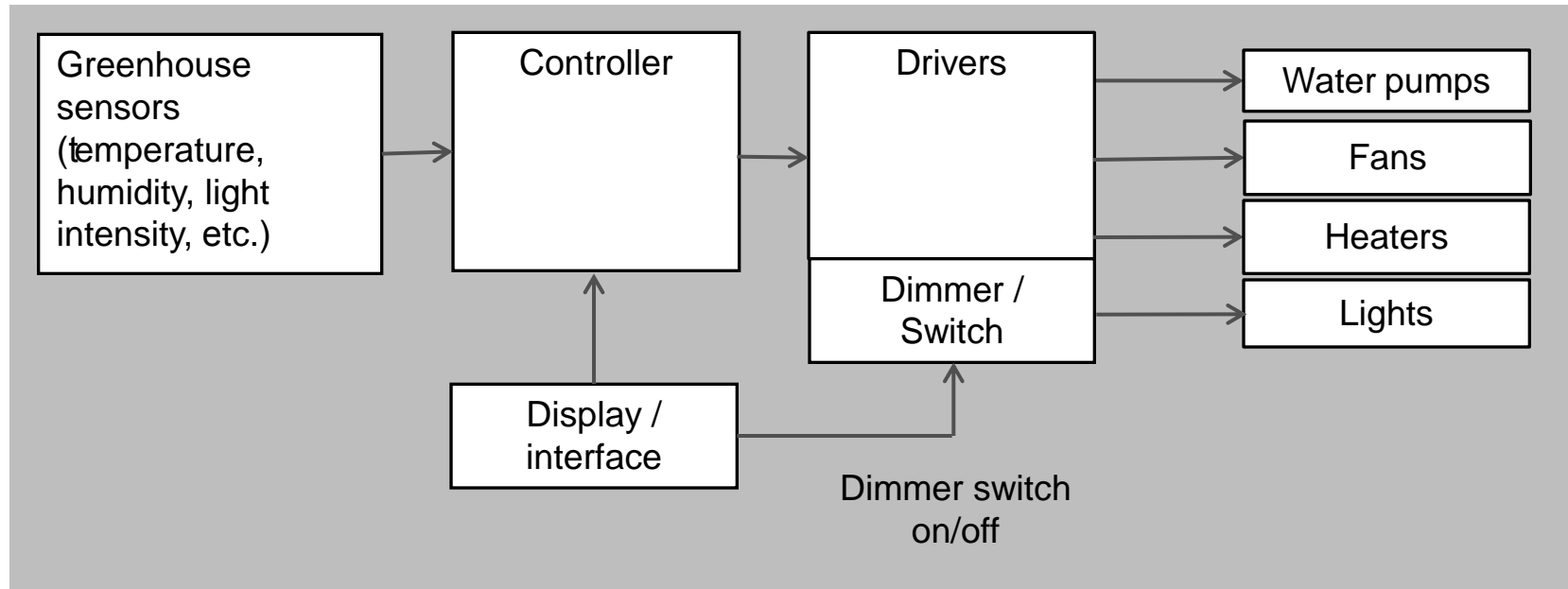
SPECIFICATIONS					
APPEARANCE		CHARACTERISTICS			
		Contact	Item	Non-latching FTR-C1(A)	Latching FTR-C1(B)
			Arrangement	2 form c	
			Rating (DC)	1A, 30V resistive	
			Rating (AC)	0.3A, 125V resistive	
			Max. switching power	62.5VA/30W	
			Max. carrying current	2A	
		Coil	Min. load (reference)	0.01mA, 10mVDC	
			Rated power	280~300mW	(140~180mW)
			Operate power	158~169mW	(80~101mW)
			Ambient temperature	-40 to +85 degree C	
DIMENSIONS		Life	Mechanical		> 10M operations
			Electrical (at rating)		> 100k operations
		Resistance (initial)		> 1,000M Ω at 500VDC	
		Surge voltage	Open contacts	2,500V, 2 × 10μs	
			Coil to contacts	5,000V, 2 × 10μs	
			Dielectric strength	Open contacts	1,500Vac, 1min.
		Adjacent contacts		1,500VAC, 1min.	
		Coil to contacts		3,000VAC, 1min.	
		Clearance	Open contacts	0.6mm	
			Adjacent contacts	1.0mm	
			Coil to contacts	2.0mm	
Creepage	Open contacts	0.6mm			
	Adjacent contacts	1.0mm			
	Coil to contacts	2.5mm			
Other	Dimension W × L × H [mm]	7.4 × 14.9 × 9.1 (SMT 9.4)			
	Weight	Approx. 2.0g			
	Sealing	Plastic sealed			

FTR-B3 Specifications

SPECIFICATIONS					
APPEARANCE		CHARACTERISTICS			
	Item	Non-latching FTR-B3(A)	Latching FTR-B3(B)		
		Arrangement	2 form c		
	Rating (DC)	1A, 30V resistive			
	Rating (AC)	0.3A, 125V resistive			
	Max. switching power	62.5VA/30W			
	Max. carrying current	2A			
	Min. load (reference)	0.01mA, 10mVDC			
	Coil	Rated power	140~230mW	(100~120mW)	
		Operate power	80~130mW	(57~68mW)	
		Ambient temperature	-40 to +85 degree C		
DIMENSIONS		Life	Mechanical	> 50M operations	> 20M operations
	Electrical (at rating)		> 100k operations		
		Resistance (initial)	> 1,000M Ω at 500VDC		
	Surge voltage		Coil to contacts	2,500V, 2 × 10μs	
		Dielectric strength	Open contacts	1,000Vac, 1min.	
			Adjacent contacts	1,000Vac, 1min.	
	Clearance	Coil to contacts	1,500Vac, 1min.		
		Open contacts	0.28mm		
			Adjacent contacts	1.0mm	
	Creepage	Coil to contacts	1.0mm		
		Open contacts	0.28mm		
Adjacent contacts			1.0mm		
Other	Coil to contacts	1.60mm			
		Dimension W × L × H [mm]	7.2 × 10.6 × 5.2 (SMT 5.45)		
		Weight	Approx. 0.85g		
	Sealing	Plastic sealed			

LED Lighting in Greenhouses

- LEDs are dimmed by the driver to a low (off) level but the driver itself still consumes energy. A relay can switch off the power completely




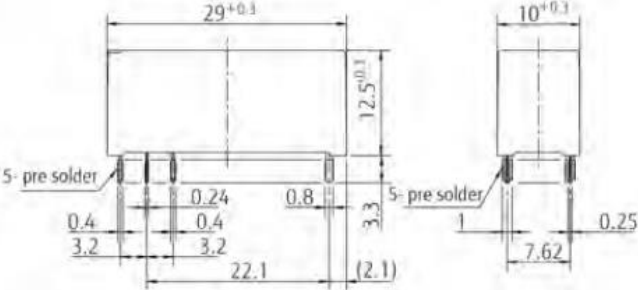
Product solution: JS series

- Low profile & low coil power
- High inrush 65A type & latching (power saving) types available

Advantages:

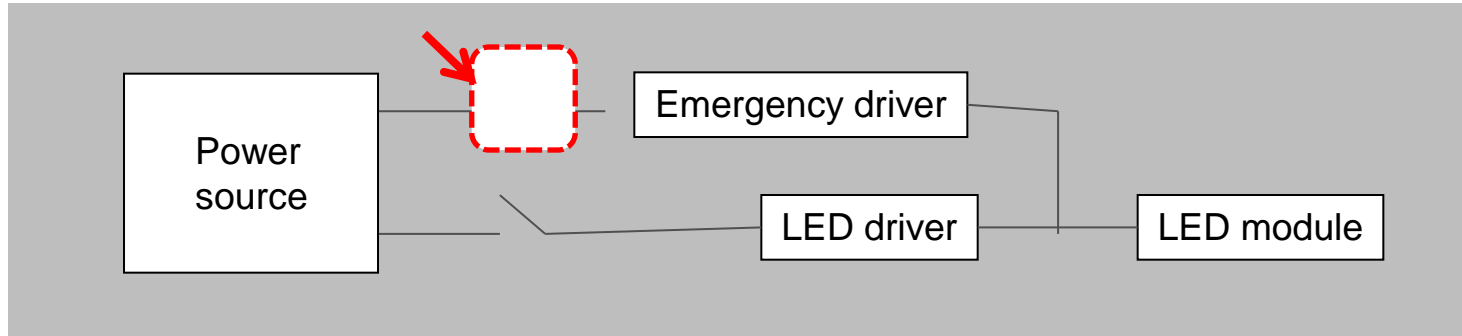
- Relays will limit energy consumption

JS Specifications

SPECIFICATIONS					
APPEARANCE	CHARACTERISTICS				
		Item	Standard	High inrush type (-KS)	
		Contact	Arrangement	1 form a/1 form c	1 form a
	Rating (DC)		8A, 24V resistive		
	Rating (AC)		8A, 250V resistive		
	Max. switching power		2,000VA/192W		
	Max. carrying current		10A		
	Min. load (reference)		100mA, 5VDC		
	Coil	Max. inrush current	-	65A, 250VAC	
		Rated power	220~290mW		
		Operate power	110~140mW	84~110mW	
		Ambient temperature	-40 to +85 degree C		
DIMENSIONS		Life	Mechanical		> 20M operations
			Electrical (at rating)		> 50k operations > 100k operations
Insulation		Resistance (initial)		> 1,000M Ω at 500Vdc	
		Dielectric strength	Surge voltage	Coil to contacts	10,000V, 1.2 × 10μs
			Open contacts	Coil to contacts	1,000Vac, 1min.
				Coil to contacts	5,000Vac, 1min.
				Coil to contacts	8.0mm
		Coil to contacts	8.0mm		
Other		Dimension W × L × H [mm]		10.0 × 29.0 × 12.5	
		Weight		Approx. 8.0g	
	Sealing		Plastic sealed		

LED Emergency Drivers

- Emergency lighting is used to illuminate corridors, stairs, escape doors
- A relay will switch the power source to the LED module



Product solution: FTR-C2 series

- Ultra high insulation distance in small package
- SMT type & Latching (power saving) type available

Advantages:

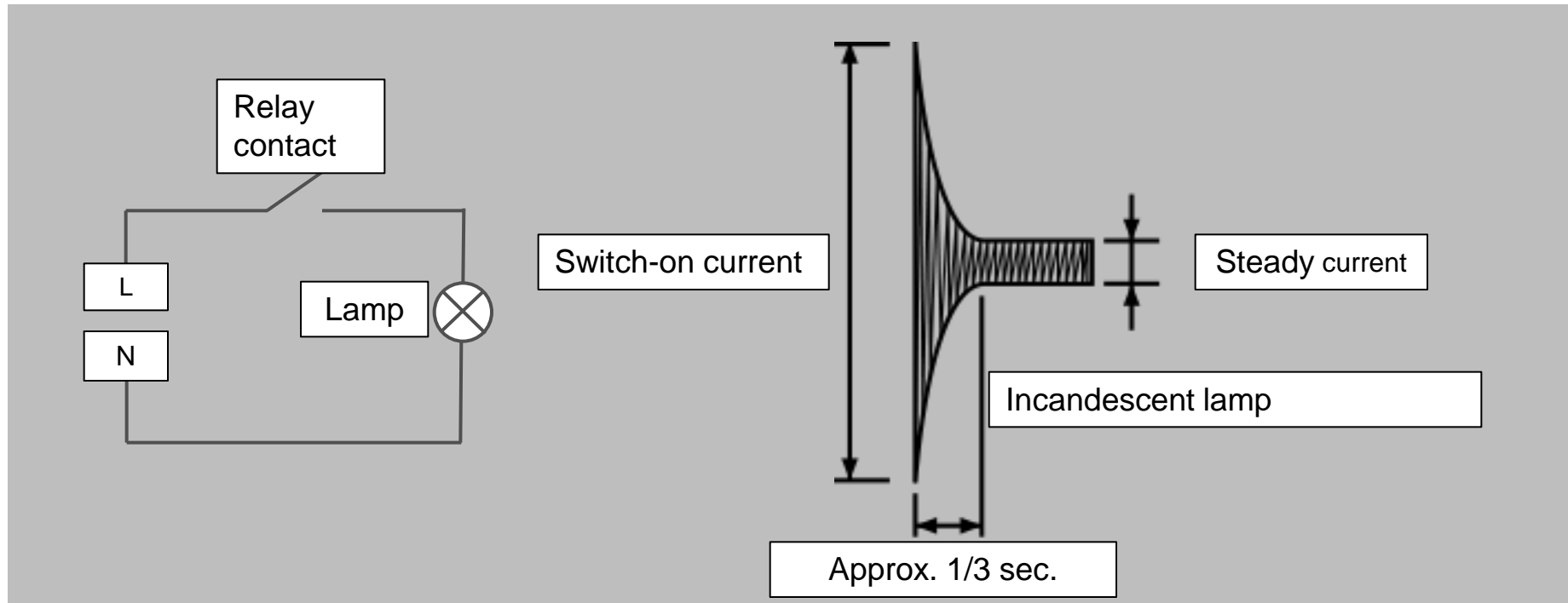
- Insulation clearance: 2.0mm
- Insulation creepage: 2.5mm

FTR-C2 Specifications

SPECIFICATIONS						
APPEARANCE		CHARACTERISTICS				
		Contact	Item	Non-latching FTR-C2()A	Latching FTR-C2()B	
			Arrangement		2 form c	
			Rating (DC)		1A, 30V resistive	
			Rating (AC)		0.3A, 125V resistive	
			Max. switching power		62.5VA/30W	
			Max. carrying current		2A	
		Min. load (reference)		0.01mA, 10mVDC		
		Coil	Rated power	300mW	150mW	
			Operate power	169mW	85mW	
		Ambient temperature		-40 to +85 degree C		
DIMENSIONS		Life	Mechanical		> 10M operations	
			Electrical (at rating)		> 100k operations	
		Resistance (initial)		> 1,000M Ω at 500VDC		
		Surge voltage	Coil to contacts		2,500V, 2 × 10μs	
			Open contacts		1,500Vac, 1min.	
		Dielectric strength	Adjacent contacts		1,500Vac, 1min.	
			Coil to contacts		2,000Vac, 1min.	
			Clearance	Open contacts		2.0mm
		Adjacent contacts		2.0mm		
		Coil to contacts		2.0mm		
		Creepage	Open contacts		2.0mm	
Adjacent contacts			2.0mm			
Coil to contacts			2.5mm			
Other	Dimension W × L × H [mm]		9.85 × 20.05 × 11.4 (SMT 11.7)			
	Weight		Approx. 3.7g			
	Sealing		Plastic sealed			

High Inrush Currents for Lamp Loads

- Switch-on lamp current can be 10 to 15 times higher than the steady lamp current, and can cause contact welding failures at the switching contacts
- Therefore, careful selection for suitable relays for lamp loads is required



Product solution: FTR-K1-KS series

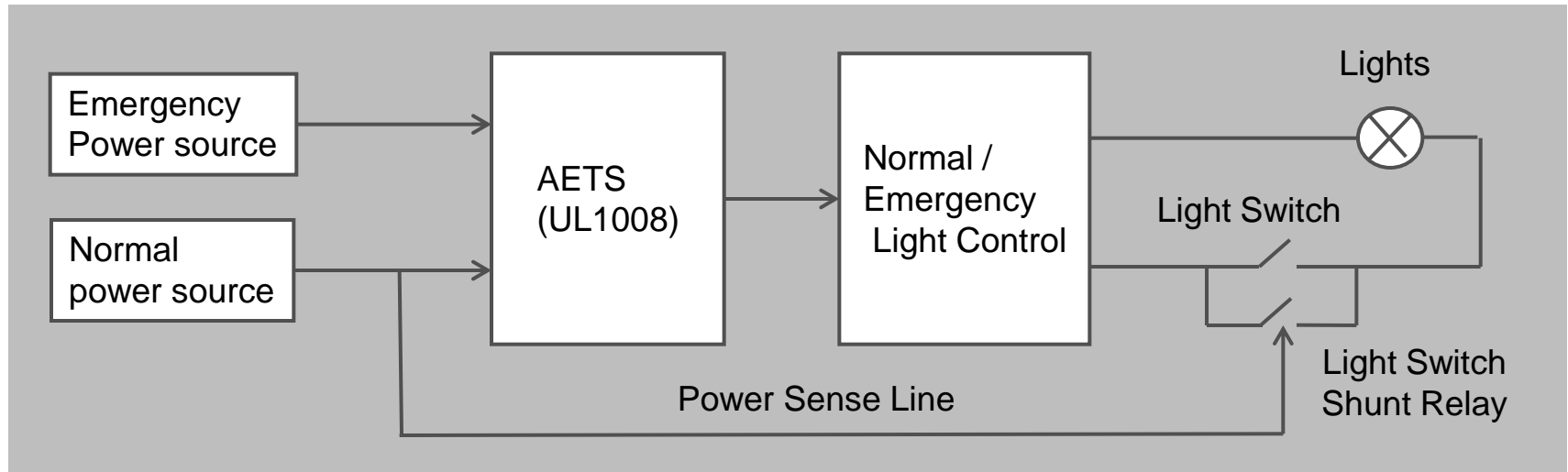
- High inrush current 120A (TV-8)
- High insulation in small package

FTR-K1-KS Specifications

SPECIFICATIONS					
APPEARANCE		CHARACTERISTICS			
		Item	FTR-K1-KS		
		Contact	Arrangement	1 form a 1 form c	
			Rating (DC)	16A, 24V resistive	
			Rating (AC)	16A, 250V resistive	
			Max. switching power	4,000VA/384W	
			Max. carrying current	20A	
			Max. inrush current	120A, 250VAC 120A, 250VAC (N.O. contact)	
		Coil	Min. load (reference)	100mA, 5VDC	
			Rated power	400~430mW	
			Operate power	200~210mW	
DIMENSIONS		Ambient temperature	-40 to +85 degree C		
		Life	Mechanical	> 20M operations	
			Electrical (at AC rating)	> 100k operations > 30k operations	
			Electrical (at inrush 120A, 250VAC)	> 30k operations	
			Electrical (at TV-8)	> 25k operations > 25k operations (N.O. contact)	
		Insulation	Resistance (initial)	> 1,000M Ω at 500Vdc	
			Surge voltage	Coil to contacts 10,000V, 1.2 × 50μs	
			Dielectric strength	Open contacts	1,000Vac, 1min.
				Coil to contacts	5,000Vac, 1min.
				Coil to contacts	10.0mm
Coil to contacts	10.0mm				
Other	Dimension W × L × H [mm]	12.7 × 29.0 × 15.7			
	Weight	Approx. 13.0g			
	Sealing	Flux proof			

Conventional Emergency Lighting


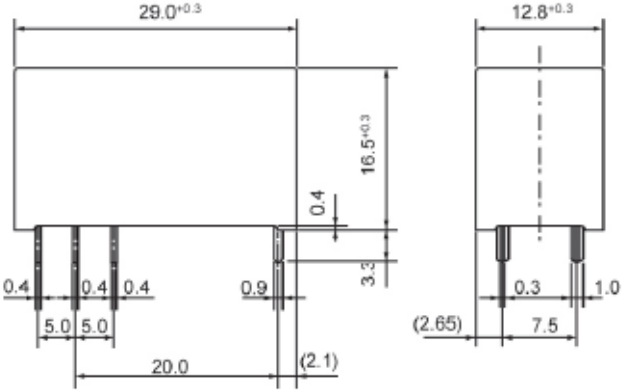
- When the normal power fails, an AETS (Automatic Emergency Transfer Switch) is required (UL1008)
- A change-over relay is used in the AETS to provide the switching from normal- to emergency power in case of power failure
- Some systems also use a light switch shunt relay



Product solutions:

- FTR-F1 series : 2 pole – 8A low profile
- JSL series : 1 pole – 8A polarized latching
- FTR-K3 series : 1 pole – 20A to 32A heavy load


FTR-F1R Specifications

SPECIFICATIONS						
APPEARANCE		CHARACTERISTICS				
		Item	FTR-F1-R			
		Contact	Arrangement	2 form a, 2 form c		
			Rating (DC)	8A, 24V resistive		
			Rating (AC)	8A, 250V resistive		
			Max. switching power	2,000VA/192W		
			Max. carrying current	8A		
			Min. load (reference)	10mA, 5VDC		
		Coil	Rated power	400mW		
			Operate power	225mW		
			Ambient temperature	-40 to +75 degree C		
DIMENSIONS		Life	Mechanical	> 20M operations		
			Electrical (at AC rating)	> 50k operations		
		Insulation	Resistance (initial)		> 1,000M Ω at 500Vdc	
			Dielectric strength	Surge voltage	Coil to contacts	10,000V, 1.2 × 10μs
				Open contacts	Adjacent contacts	3,000Vac, 1min.
					Coil to contacts	5,000Vac, 1min.
			Clearance	Coil to contacts	8.0mm	
			Creepage	Coil to contacts	8.0mm	
		Other	Dimension W × L × H [mm]		12.8 × 29.0 × 16.5	
			Weight		Approx. 12.0g	
			Sealing		Flux proof	

SPECIFICATIONS					
APPEARANCE		CHARACTERISTICS			
		Item	<div style="display: flex; justify-content: space-around;"> 1 coil 2 coils </div>		
		Contact	Arrangement	1 form a, 1 form c	
			Rating (DC)	8A, 24V resistive	
			Rating (AC)	8A, 250V resistive	
			Max. switching power	2,000VA/192W	
			Max. carrying current	10A	
			Min. load (reference)	100mA, 5VDC	
		Coil	Rated power	(220~250mW)	(480mW)
			Ambient temperature	-40 to +85 degree C	
		DIMENSIONS		Life	Mechanical
		Electrical (at rating)	> 50k operations		
		Insulation	Resistance (initial)	> 1,000M Ω at 500VDC	
			Surge voltage	Coil to contacts 10,000V, 1.2 \times 50 μ s	
			Dielectric strength	Open contacts	1,000Vac, 1min.
				Coil to contacts	5,000Vac, 1min.
			Clearance	Coil to contacts 8.0mm	
			Creepage	Coil to contacts 8.0mm	
		Other	Dimension W \times L \times H [mm]	10.0 \times 29.0 \times 12.5	
			Weight	Approx. 8.0g	
			Sealing	Plastic sealed	

FTR-K3 Specifications

SPECIFICATIONS							
APPEARANCE		CHARACTERISTICS					
		Item	Standard	High insulation type (-LS)	High capacity type (-HC)		
			Arrangement	1 form a			
		Contact	Rating (AC)	20A, 250V resistive	25A, 250V resistive		
			Max. switching power	6,250W			
			Max. carrying current	25A			
			Min. load (reference)	100mA, 5VDC			
		Coil	Rated power	780mW			
			Operate power	383mW			
			Ambient temperature	-40 to +60 degree C			
		DIMENSIONS		Life	Mechanical	> 2M operations	
		Electrical (at AC rating)	> 100k operations				
		Insulation	Resistance (initial)	> 1,000M Ω at 500VDC			
			Surge voltage	Coil to contacts	8,500V, 1.2 \times 50 μ s		
			Dielectric strength	Open contacts	1,000Vac, 1min.		
				Coil to contacts	5,000Vac, 1min.		
		Clearance	Coil to contacts	6.4mm	8.0mm	6.4mm	
Creepage	Coil to contacts	9.5mm	9.5mm	9.5mm			
Other	Dimension W \times L \times H [mm]	15.7 \times 30.1 \times 23.3					
	Weight	Approx. 25.0g					
	Sealing	Flux proof					
	Tab terminal type	Available					



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