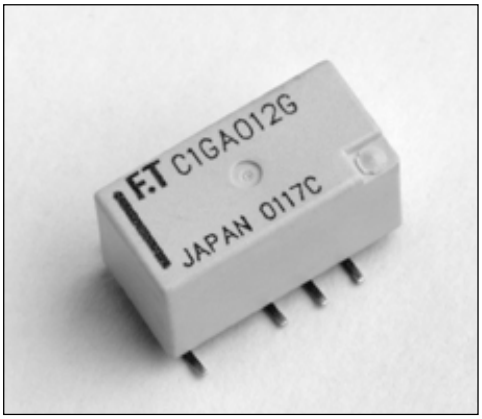
FUJITSU THE POSSIBILITIES ARE INFINITE

ULTRA MINIATURE RELAY
SIGNAL RELAY

FTR-C1 Series

RoHS Compliant

■ FEATURES



- Dimensions of large contact gap relay
  Height: 9.3 mm maximum (THT)
  9.65 mm maximum (SMT)
  Length: 15 mm maximum
  Width: 7.5 mm maximum
- Conforms to IEC60950 / EN60950 / UL1950/ C22.2 No.950 spacing & high breakdown voltage
  Clearance: 2.0 mm (coil and contacts)
  Creepage: 2.5 mm (coil and contacts)
- HIGH RELIABILITY
  Bifurcated contacts
- Low power consumption 280 mW (latching type 140mW)
- RoHS Compliant since beginning of production

■ ORDERING INFORMATION

[Example] FTR-C1 (a) C (b) A (c) 012 (d) G-(B05)* (e) (f)

(a)	Series Name	FTR-C1
(b)	Terminal Appearance	C: Through hole type G: Surface mount type
(c)	Operation Function	A: Standard Type B: Single coil latching type
(d)	Coil Number	Nominal Voltage
(e)	Contact Material	G: Silver alloy

Remarks: Actual marking on relay would not carry code FTR and be as below:

Ordering code		Actual marking
FTR-C1CA03G	→	C1CA03G

* If ordering tape and reel package, please add “B05” after the partnumber (tape and reel is only available for SMT type, example: FTR-C1GA003G-B05

■ COIL DATA CHART

Standard type

Model		Nominal Voltage	Coil Resistance (±10%)	Must Operate Voltage	Must Release Voltage	Nominal Operating Power (±10%)
THT	SMT					
FTR-C1CA003G	FTR-C1GA003G	3 VDC	32.1Ω	2.25 VDC	0.3 VDC	280 mW
FTR-C1CA4.5G	FTR-C1GA4.5G	4.5 VDC	72.3Ω	3.38 VDC	0.45 VDC	280 mW
FTR-C1CA005G	FTR-C1GA005G	5 VDC	89.3 Ω	3.75 VDC	0.5 VDC	280 mW
FTR-C1CA012G	FTR-C1GA012G	12VDC	514 Ω	9.00 VDC	1.2 VDC	280 mW
FTR-C1CA024G	FTR-C1GA024G	24VDC	1920 Ω	18.0 VDC	2.4 VDC	300 mW

Note: All values in the table are measured at 20˚C.

Single coil latching type

Model		Nominal Voltage	Coil Resistance (±10%)	Set Voltage	Reset Voltage	Nominal Operating Power (±10%)
THT	SMT					
FTR-C1CB003G	FTR-C1GB003G	3 VDC	64 Ω	2.25 VDC	2.25 VDC	140 mW
FTR-C1CB4.5G	FTR-C1GB4.5G	4.5 VDC	145 Ω	3.38 VDC	3.38 VDC	140 mW
FTR-C1CB005G	FTR-C1GB005G	5 VDC	179 Ω	3.75 VDC	3.75 VDC	140 mW
FTR-C1CB012G	FTR-C1GB012G	12VDC	1029 Ω	9.00 VDC	9.00 VDC	140 mW
FTR-C1CB024G	FTR-C1GB024G	24VDC	3200 Ω	18.0 VDC	18.0 VDC	180 mW

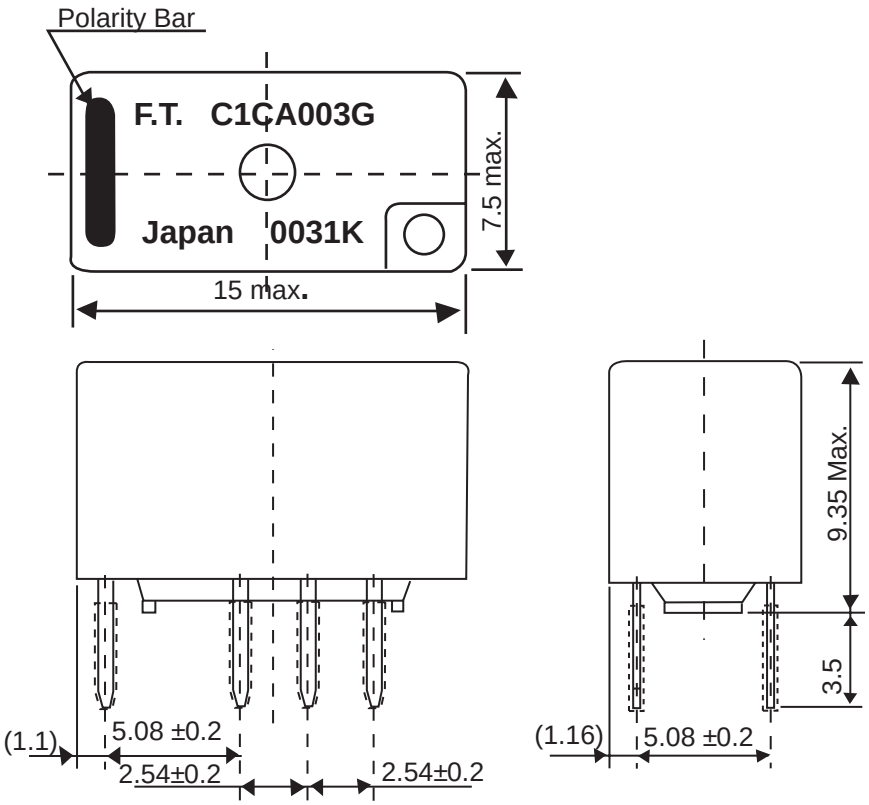
Note: - All values in the table are measured at 20˚C.
- Single coil latching type is applying to the standard now.

■ SPECIFICATIONS

Item			FTR-C1CA ( )G FTR-C1GA ( )G	FTR-C1CA ( )G-TL FTR-C1GA ( )G-TL
Contact	Arrangement		2 Form C	
	Material		Silver alloy	
	Resistance (initial)		Max. 100m ohm (at 1A 6VDC)	
	Max. Switching Power		37.5AV / 30W	
	Max. Switching Voltage		250VAC, 220 VDC	
	Max. Switching Current		1 A	
Coil	Operating Temperature		-40˚ C to + 85˚ C (no frost)	
	Max. Allowable Voltage		150% nominal voltage (at 20˚ C)	
Time Value	Operate Time		Max. 10ms (at nominal voltage, without bounce)	
	Release Time (without diode)		Max. 10ms (at nominal voltage, without bounce)	
Insulation	Resistance (at 500 VDC)		Min. 1,000M ohmS	
	Dieelectric Strenght	Between open contacts	1,500VAC, 1 minute	1,000VAC, 1 minute
		Between adjacent contacts	1,500VAC, 1 minute	
		Between coil and contacts	3,000VAC, 1 minute	
	Surge Strength	Between open contacts	2,500V (at 2/10 microsec)	
		Between adjacent contacts	2,500V (at 2/10 microsec)	
		Between coil and contacts	5,000V (at 2/10 microsec)	
Life	Mechanical		$10x10^6$ operations min. (at 10Hz)	
	Electrical (resistive load)		$100x10^3$ operations min. at 1A, 30VDC, 0.5Hz $100x10^3$ operations min. at 0.1A, 48VDC, 0.5Hz $100x10^3$ operations min. at 0.3A, 125VDC, 0.5Hz	
Vibration Resistance	Misoperation		10 to 55 Hz at double amplitude of 3.3 mm	
	Endurance		10 to 55 Hz at double amplitude of 5 mm	
Shock Resistance	Misoperation		Min. 500 m/s^2	
	Endurance		Min. 1,000 m/s^2	
UL / CSA	Contact Rating		0.3A 125 VAC 1A 30VDC 0.3 110VDC	
IEC060950 UL1950 C22.2 No.950 EN60950	Insulation Class		Supplementary Insulation	
	Working Voltage		250 V	
	Pollution Degree		2	
	Clearance		2.0 mm (between coil and contacts)	
	Creepage Distance		2.5 mm (between coil and contacts)	

■ DIMENSIONS AND SCHEMATICS

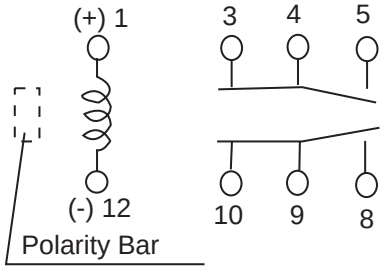
Through hole type



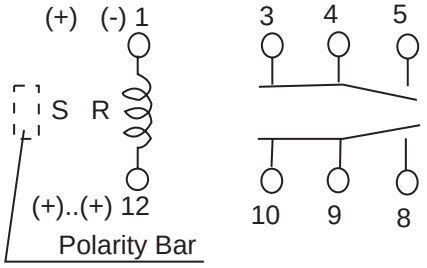
Unit: mm

■ TERMINAL DESIGNATIONS

Standard type
(Bottom view de-energized position)

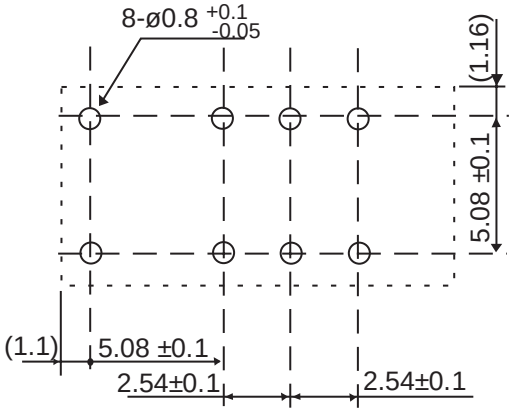


Single Coil Latching type
(Bottom view reset position)



S shows the polarity of set positin
R shows the polarity of reset position

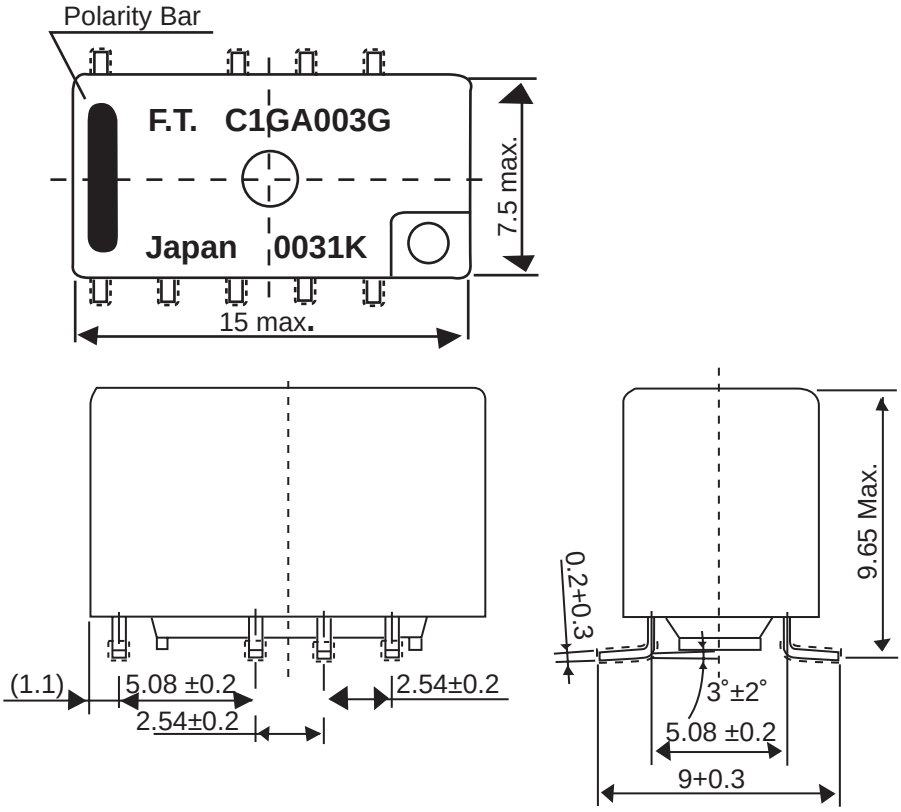
■ RECOMMENDED MOUNTING PAD



Unit: mm

■ DIMENSIONS AND SCHEMATICS

Surface mount type

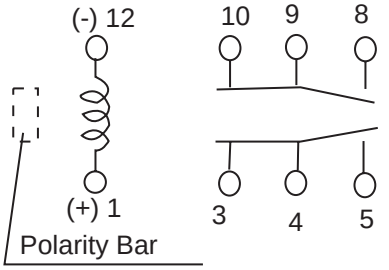


Unit: mm

■ TERMINAL DESIGNATIONs

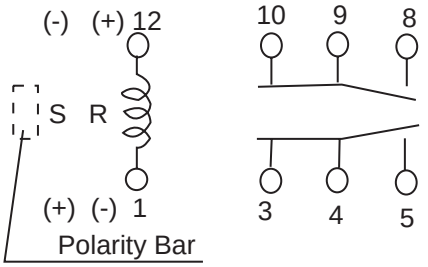
Standard type

(Top view de-energized position)

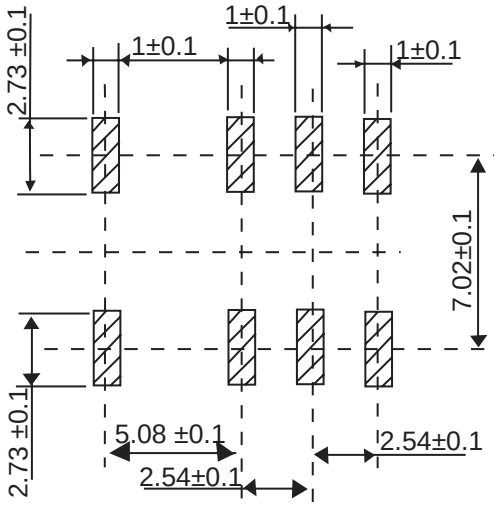


Single Coil Latching type

(Bottom view reset position)



■ RECOMMENDED MOUNTING PAD



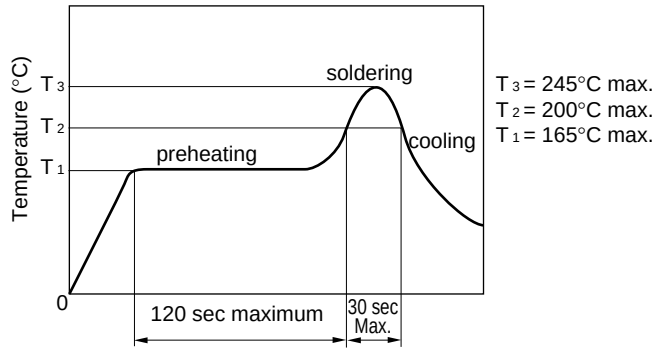
S shows the polarity of set positin

R shows the polarity of reset position

Unit: mm

■ RECOMMENDED SOLDERING CONDITIONS (TEMPERATURE PROFILE)

IRS (Infrared Reflow Soldering)

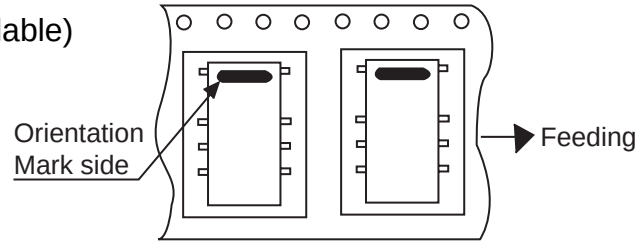


Note: 1.Temperature profiles show the temperature of PC board surface.
2. Please perform soldering test with your actual PC board before mass production, since the temperatures of PC board surfaces vary according to the size of PC board, status of parts mounting and heating method.

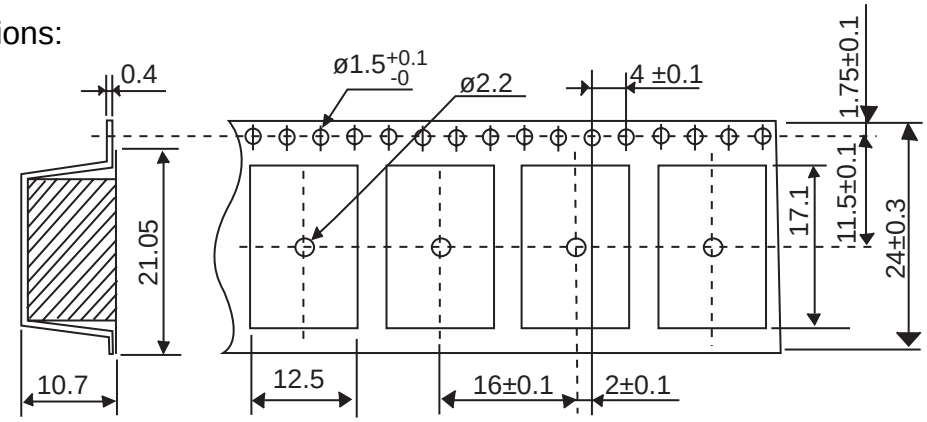
■ PACKAGING

Packaging method (only tape packaging is available)

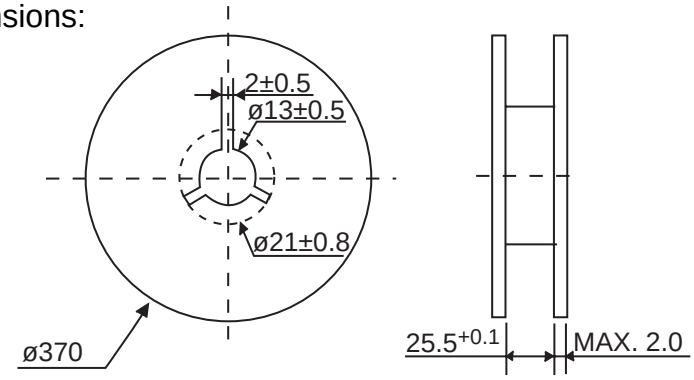
1. Taping standards: JIS C 0806 and RC-10092B (EIAJ)
2. Reel type: TB2416 or TB2416
3. Reel type: RD24D
4. Quantity of 1 reel: 500 pieces



Tape Dimensions:



Reel Dimensions:



Unit: mm

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Underwriters Laboratories Inc.®

File E63615
Project 01SC15305

November 14, 2001

REPORT

ON

COMPONENT - SWITCHES, INDUSTRIAL CONTROL

Fujitsu Component Ltd.
Tokyo, Japan

DESCRIPTION

PRODUCT COVERED:

Component - Magnetically Operated Switches, Type C1, with or without prefix FTR, followed by C or G, followed by A, followed by 003 through 024, followed by G, may be followed by two digits 01 through 99.

GENERAL:

These components are double-pole, double-throw magnetically operated switches using a DC operating coil with normally open and normally closed contacts. They are provided with terminals for surface mounting. These components are single stable type and double stable type. Single stable types have single winding coils. Double stable types have a single winding, latching magnetically when operated by a rated voltage and reverse operated by voltage of a reverse polarized rated voltage. The coils need not be continuously actuated, and therefore, a short time pulse voltage may be applied.

These components are intended for use in Information-Processing and Business Equipment and similar devices.

NOMENCLATURE:

Part No.	FTR-C1	C	A	4.5	G	01
	I	II	III	IV	V	VI

Note A: Part No. may be split and appear on two lines.

I. Indicates Relay type.

FTR-C1: Type number, may be with or without prefix FTR:

II. Indicates terminal configuration.

C - Through hole type

G - Surface mount type

III. Indicates relay type.

A: Single stable

IV. Indicates coil rated voltage.

003 thru 024 V dc

V. Indicates contact material.

	G
Movable Contact	AgPd
Stationary Contact	Au/AgPd

VI. Indicates minor constructive variation.

01 through 99: Additional two digits used for special variation of construction as below.

A. Variation of coil resistance

B. Variation of operating voltage, non-operating voltage, release voltage, as hold voltage.

C. Variation of operating time or release time.

Ratings -

Contact Ratings:

0.3 A, 125 V ac (General Use)
1 A, 30 V dc
0.3 A, 110 V dc

Coil Ratings: 3 through 24 V dc

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1253735 **Master Contract:** 169663 (LR 40304)

Edition: 1 (Project 1253735) **Date Issued:** November 29, 2001

Issued to: **FUJITSU COMPONENT LTD.**
3-5, Higashigotanda 2-chome
Shinagawa-ku
Tokyo, 141-8630 Japan

The products listed below are eligible to bear the CSA Mark shown with adjacent indicator "▲"

Issued by: Brij P. Aggarwal, P. Eng.
Vancouver, BC Canada

Signature: Brij P. Aggarwal

PRODUCTS

CLASS 3231 52 - SWITCHES - Component - Automatic - Industrial Control

.lays, open type with dust cover, Types FTR-C1 or C1 with suffixes, dpdt, rated contact (same polarity) 0.5A, 125V ac; 1A, 30V dc; 0.3A, 110V dc; coil 3 to 24V dc.

Notes:

1. These relays have been examined for use as components in industrial control equipment where the suitability of the combination is subject to further investigation by the CSA International.

2. These relays have been investigated to the requirements of supplementary insulation between input and output circuits at isolation voltage 250V rms in accordance with Std CAN/CSA-C22.2 No 60950-00.

3. These relays do not meet the "Markings" requirements of CSA Std. C22.2 No 14-95.

APPLICABLE REQUIREMENTS

Component Acceptance Notice No 7 -	Announcement of Component Acceptance Service for Relays Intended for Specific Applications
CSA Standard C22.2 No 14-95 -	Industrial Control Equipment
CAN/CSA-C22.2 No 60950-00 - (As a guide)	Safety of Information Technology Equipment, Including Electrical Business Equipment

Test Report

Product Services

Report No	245/4640159 (Addendum to Report No 245/4325529) This Report consists of 6 pages
Client	Fujitsu Components Limited 2-3-5 Higashi Gotanda Shinagawa-Ku Tokyo 141-0022 Japan
Authority & date	Recertification form from client dated 30 July 2004 signed by Mr T Hagino and letter from client dated 15 October 2004 signed by Ben Lagerweij
Items tested	Data isolating relay types FTR-C1CA024G and FTR-C1GA024G for issue of Certification No 8724 Samples received 20 October 2004 Tests started 22 October 2004
Specification	BS EN 60950-1:2002 Sub-clauses 2.9.1, 2.10.1, 4.7.3.4 (Clause A.2.7) and 5.2.2 in accordance with TL5
Results	Complies for supplementary insulation This addendum Report represents the full and current status of BSI Certification No 8724 and immediately follows BSI Report No 245/4325529 in the series of Reports concerning this certification.
Prepared by	N D Machado N D Machado — Senior Technician Engineer
Authorized by	H Najafipour Houshan — Senior Engineer
Issue Date	23 November 2004
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of *PS082* 'General conditions relating to acceptance of testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Managing Director, BSI Product Services, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.

UKAS TESTING
0135

MANUFACTURER

Miyazaki-Tech Co. Ltd.
1011 Otsu, Ohaza Higashi-Benbun,
Nichinan-Shi,
Miyazaki-Ken,
889-2521,
Japan

ITEMS COVERED BY THE SCOPE OF THIS REPORT

Data isolating relay type FTR-C1 series with a coil voltage up to and including 24 V d.c.

NOTES

1. For working parameters, see Appendix A.
2. For materials used, see Appendix B.
3. For explanation of type reference number, see Appendix C.

MARKINGS

The samples submitted were marked as follows:

1. F.T. C1GAO24G (Surface mount)
   JAPAN 0432B81

2. F.T. C1CAO24G (Through hole)
   JAPAN 0434B81

RESULTS

Complies for supplementary insulation.

NOTES

1. BS EN 60950:2000 has been replaced by BS EN 60950-1:2002.

2. BS EN 60950-1:2002 is based on IEC 60950-1:2001.

3. The tests of Sub-clauses 2.9.1, 2.10.1, 4.7.3.4 (Clause A.2.7) and 5.2.2 of each of BS EN 60950-1:2002 and IEC 60950-1:2001 are identical. Certification is, therefore, granted for all of these specifications from the one set of tests.

4. Samples from the Chikuma Tsushin Kogyo Co Ltd factory were not supplied for testing. This factory is no longer covered by the scope of this certification.

5. Certification No 8724 previously expired on 30 July 2004. Testing for the renewal of Certification No 8724 did not occur until 20 October 2004. Due to the period of time between the expiry date and testing date this certification has been reissued on the 29 October 2004 when assessment for this Report was completed. Relays manufactured between 31 July 2004 and 28 October 2004 are not covered by the scope of Certification No 8724.

6. Client has introduced a new space saving surface mount type variant. Attachment to client's email dated 30 July 2004 refers.

APPENDIX A

Working parameters for BS EN 60950-1:2002

1.	Hygroscopic/asbestos/natural rubber materials used:	None
2.	Insulation system:	Supplementary
3.	Mains supply voltage:	250 V r.m.s.
4.	Working voltage:	250 V r.m.s.
5.	Repetitive peak voltage:	None
6.	Pollution degree:	Internal 2 External 2
7.	Sub-clause 4.7.3.4 (Clause A.2.7)	Pass
8.	Maximum operating temperature:	85°C
9.	Clearance distance:	> 2.0mm
10.	Creepage distance:	> 2.5 mm
11.	Distance through insulation:	> 0.4 mm
12.	Electric strength test voltage:	1,500 V r.m.s.
13.	Comparative Tracking Index (CTI):	100 ≤ CTI ≤ 175
14.	Material Group:	IIIb

APPENDIX C

Explanation of type reference

FTR-C1	C	A	4.5	G	-01
1	2	3	4	5	6

1. Relay type

2. Terminal configuration

   C : Through hole type G : Surface mount type
   S : Space saving surface mount type

3. Relay type

   A : Single stable B : Double stable

4. Coil Voltage

   003 through 024 VDC 3, 4.5, 5, 12, 24 VDC

5. Contact material

	G
Moveable contact	AgPd
Stationary contact	Au/ AgPd

6. Minor construction variations
   01 through 99 Additional 2 digits used for special variation of construction as below
   a) Variation of coil resistance.
   b) Variation of operate voltage. Non-operate voltage, release voltage or hold voltage.
   c) Variation of operate or release time.