



# 香 港 電 阻 製 造 廠

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## HONG KONG RESISTORS MANUFACTORY

(Wholly owned by Charter Technology Ltd.)

AN ISO 9001:2008 CERTIFIED MANUFACTURER

AN OHSAS 18001 : 2007 MANUFACTURER

AN ISO 14001 : 2004 MANUFACTURER

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## DATA SHEET

Name of Product : Flameproof Carbon Film Fixed Resistors – Taping

Spec. No. CFFTB2013

Rev. No.: 2013Aug.(2)

**PRODUCT : Flameproof Carbon Film Fixed Resistors**

**TYPE : CFF - 125/25/50/100/200/300**

## 1. APPLICABLE SCOPE :

1.1 This data sheet is for use in FLAMEPROOF CARBON FILM FIXED RESISTORS

1.2 Characteristics and specifications are according to those of :

MIL-STD-105

MIL-STD-202

JIS C 5202

GB 5731-85

IEC 115-2-1-1982

QC 400101

1.3 RoHS and REACH compliant product

## 2. PART NUMBER

It is composed of description, rated wattage, nominal resistance value, tolerance and packaging.

2.1 Make Up :

C	F	F	1	0	0	4	7	0	R	J	T	B					
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Product Code		Power Rating		Nominal Resistance Value	Tolerance		Packaging		Lead Wire diameter		Taping width			
C	Carbon	Code	Wattage		Code	Tol.		Taping	Code	Size	Code	Size		
F	Film	125	0.125(1/8W)		G	2%	TB	in box		125: 0.40mm		52mm		
F	Flameproof	25	0.25(1/4W)								043	125: 0.43mm	26	26mm
		50	0.50(1/2W)									25: 0.40mm	62	62mm
		100	1.0(1W)						048	25: 0.48mm	73	73mm		
		200	2.0(2W)							50: 0.48mm				
		300	3.0(3W)							060	50: 0.60mm			
										100: 0.60mm				
									075	100: 0.75mm				
										200: 0.70mm				
									075	200: 0.75mm				
										300: 0.70mm				
									075	300: 0.75mm				

2.2 Explanation :

Part Number

Description

CFF 100 470R J TB

Flameproof Carbon Film Fixed Resistor , 1W , 470Ω , +/-5% , tape in box.

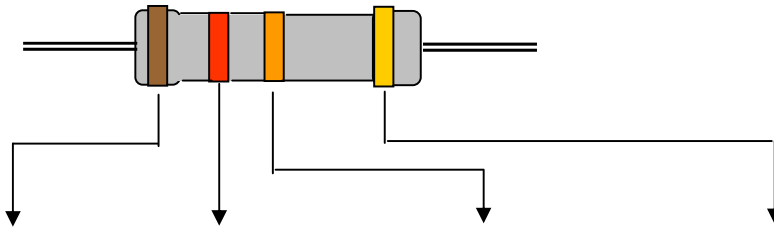
Lead Wire diameter: d=0.60mm, Taping width=52mm.

<b>PRODUCT : Flameproof Carbon Film Fixed Resistors</b>	<b>TYPE : CFF - 125/25/50/100/200/300</b>
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2.3 Color code indication

Fixed resistors of which the nominal resistance value and tolerance are indicated by color codes as per Table 1 :

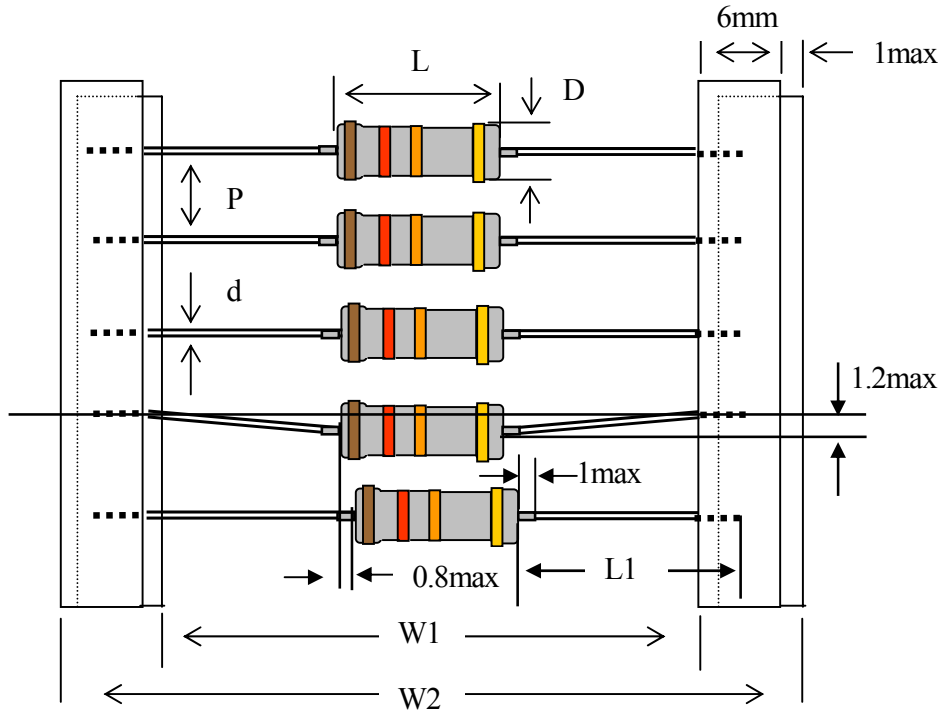
TABLE - 1



COLOR	1 <sup>ST</sup> DIGIT	2 <sup>ND</sup> DIGIT	MULTIPLIER	TOLERANCE
BLACK	0	0	1	
BROWN	1	1	10	
RED	2	2	100	G(±2%)
ORANGE	3	3	1,000	
YELLOW	4	4	10,000	
GREEN	5	5	100,000	
BLUE	6	6	1000,000	
VIOLET	7	7	10,000,000	
GREY	8	8		
WHITE	9	9		
GOLD			0.1	J(±5%)
SILVER			0.01	

**3. DIMENSIONS :**

TABLE - 2



Unit : mm

TYPE	L	D	d	P	W1	W2	L1
CFF125	$3.5 \pm 0.5$	$1.7 \pm 0.5$	$0.40 (0.43) \pm 0.05$	$5 \pm 0.3$	$26 \pm 1$	$38 \pm 1$	$15 \pm 1$
					$52 \pm 1$	$64 \pm 1$	$27 \pm 1$
CFF 25	$6.0 \pm 1.0$	$2.3 \pm 0.5$	$0.40 (0.48) \pm 0.05$	$5 \pm 0.3$	$26 \pm 1$	$38 \pm 1$	$14 \pm 1$
					$52 \pm 1$	$64 \pm 1$	$26 \pm 1$
CFF 50	$9.0 \pm 1.0$	$3.0 \pm 0.5$	$0.48 (0.60) \pm 0.05$	$5 \pm 0.3$	$26 \pm 1$	$38 \pm 1$	$12 \pm 1$
					$52 \pm 1$	$64 \pm 1$	$26 \pm 1$
CFF 100	$11.0 \pm 1.5$	$4.0 \pm 0.5$	$0.60(0.75) \pm 0.05$	$5 \pm 0.3$	$52 \pm 1$	$64 \pm 1$	$25 \pm 1$
					$62 \pm 1.5$	$74 \pm 1.5$	$30 \pm 1$
CFF 200	$15.0 \pm 1.5$	$5.0 \pm 0.5$	$0.70(0.75) \pm 0.05$	$10 \pm 0.3$	$52 \pm 1$	$64 \pm 1$	$23 \pm 1$
					$73 \pm 1.5$	$85 \pm 1.5$	$34 \pm 1$
CFF 300	$17.0 \pm 1.5$	$6.0 \pm 0.5$	$0.70(0.75) \pm 0.05$	$10 \pm 0.3$	$73 \pm 1.5$	$85 \pm 1.5$	$33 \pm 1$

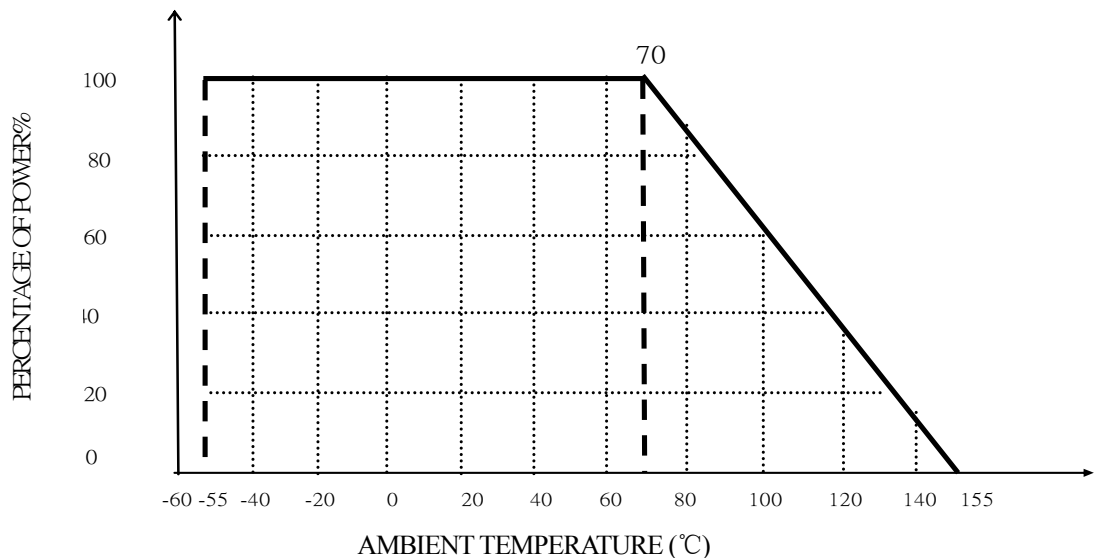
**PRODUCT : Flameproof Carbon Film Fixed Resistors**
**TYPE : CFF - 125/25/50/100/200/300**
**4. SPECIFICATIONS**

TABLE - 3

DESCRIPTION	CFF125	CFF25	CFF50	CFF100	CFF200	CFF300
STANDARD RESISTANCE VALUE RANGE	1Ω-4.7MΩ	1Ω-4.7MΩ	1Ω-4.7MΩ	1Ω-4.7MΩ	1Ω-4.7MΩ	1Ω-4.7MΩ
POWER RATING AT 70°C	1/8W	1/4W	1/2W	1W	2W	3W
*MAX WORKING VOLTAGE	200V	250V	350V	500V	500V	500V
*MAX OVERLOAD VOLTAGE	400V	500V	700V	1,000V	1,000V	1,000V
OPERATING TEMPERATURE RANGE	-55°C~+135°C	-55°C~+135°C	-55°C~+135°C	-55°C~+155°C	-55°C~+155°C	-55°C~+155°C
TEMPERATURE COEFFICIENT						
≤10Ω	±300PPM	±300PPM	±300PPM	±300PPM	±300PPM	±300PPM
10Ω- 220KΩ	0~-500PPM	0~-500PPM	0~-500PPM	0~-400PPM	0~-400PPM	0~-400PPM
230KΩ- 1MΩ	0~-1,000PPM	0~-1,000PPM	0~-700PPM	0~-600PPM	0~-600PPM	0~-600PPM
OVER 1MΩ	0~-1,500PPM	0~-1,500PPM	0~-1,000PPM	0~-1,000PPM	0~-1,000PPM	0~-1,000PPM
TEMPERATURE CYCLING	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)
VOLTAGE COEFFICIENT	MAX.50PPM/V	MAX.50PPM/V	MAX.50PPM/V	MAX.50PPM/V	MAX.50PPM/V	MAX.50PPM/V
INSULATION RESISTANCE	MIN.1,000MΩ	MIN.1,000MΩ	MIN.1,000MΩ	MIN.1,000MΩ	MIN.1,000MΩ	MIN.1,000MΩ
HUMIDITY	±3%	±3%	±3%	±3%	±3%	±3%
SHORT-TIME OVERLOAD	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)
SOLDERABILITY	MIN.95% COVERED	MIN.95% COVERED	MIN.95% COVERED	MIN.95% COVERED	MIN.95% COVERED	MIN.95% COVERED
VIBRATION	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)	±(1R%+0.05Ω)
LOAD LIFE	MAX.±5%	MAX.±5%	MAX.±5%	MAX.±5%	MAX.±5%	MAX.±5%

\* The working voltage is calculated based on the resistance value following the formula of  $V=\sqrt{P*R}$  or to its maximum extent as indicated above

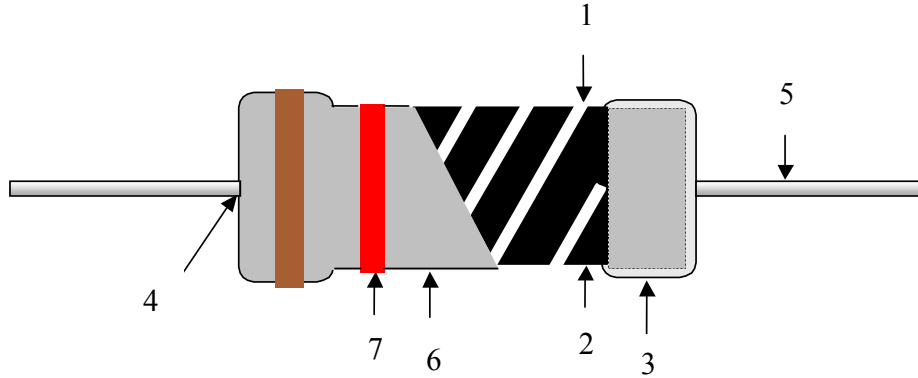
\* The overload voltage is calculated based on the resistance value following the formula of  $V=2.5*\sqrt{P*R}$  or to its maximum extent as indicated above

**5. POWER DERATING CURVE**


PRODUCT : Flameproof Carbon Film Fixed Resistors

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6. STRUCTURAL DIAGRAM



- |                        |   |
|------------------------|---|
| (1) CORE               | CERAMIC ROD                             |
| (2) RESISTANCE FILM    | CARBON FILM                             |
| (3) TERMINAL           | TINNED IRON CAP                         |
| (4) CONNECTION         | ELECTRIC WELDING                        |
| (5) LEAD WIRE          | SOLDERED OR TINNED ANNEALED COPPER WIRE |
| (6) FINISHING PAINTING | FLAMEPROOF SILICON PAINT                |
| (7) INDICATION         | COLOR CODE INK                          |

TABLE - 4

RATED RESISTANCE VALUE	MAX. TESTING VOLTAGE	
	0.125W / 0.25W	0.5W / 1W / 2W / 3W
$0.1\Omega \leq R < 10\Omega$	0.3	0.3
$10\Omega \leq R < 100\Omega$	0.3	1
$100\Omega \leq R < 1K\Omega$	1	3
$1K\Omega \leq R < 10K\Omega$	3	10
$10K\Omega \leq R < 100K\Omega$	10	30
$100K\Omega \leq R < 1M\Omega$	30	50
$1M\Omega \leq R$	50	100

<b>PRODUCT : Flameproof Carbon Film Fixed Resistors</b>	<b>TYPE : CFF - 125/25/50/100/200/300</b>
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## 7. CHARACTERISTICS

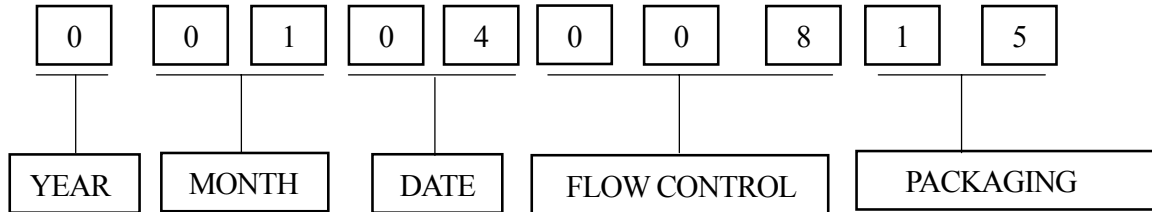
TABLE - 5

DC RESISTANCE VALUE	TEST METHOD MIL-STD-202 ITEM 303	VOLTAGE AS TABLE -4. TEMPERATURE 25 $\pm$ 2 $^{\circ}$ C. AQL 0.25%.
VOLTAGE WITHSTAND	TEST METHOD MIL-STD-202 ITEM 301	V-BLOCK METHOD. VOLTAGE AS TABLE -3 $\times$ 1.42, 1 MIN. AQL 1%.
SHORT TIME OVERLOAD	TEST METHOD JIS C 5202 ITEM 5.5	RATED VOLTAGE $\times$ 2.5 TIMES OR MAX.WORKINGVOLTAGE $\times$ 2 TIMES. ABOVE TEST 5 SEC. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (1%R+0.05 $\Omega$ ).
TERMINAL STRENGTH	TEST METHOD MIL-STD-202 ITEM 211	TENSILE STRENGTH : 1KG TENSIONAL STRENGTH : 180 $^{\circ}$ , 2 CYCLES. BENDING STRENGTH : 0.5KG, 2 TIMES. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (0.5%R+0.05 $\Omega$ ).
SOLDERABILITY OF TERMINAL	TEST METHOD MIL-STD-202 ITEM 210	260 $\pm$ 5 $^{\circ}$ C 10 $\pm$ 1SEC. AFTER TESTING, LEAVE FOR 3 HOURS. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (1%R+0.05 $\Omega$ ).
TEMPERATURE CYCLE	TEST METHOD MIL-STD-202 ITEM 107	LOW SIDE TEMPERATURE : -55 $^{\circ}$ C $\pm$ 3 $^{\circ}$ C 30MIN. ROOM TEMPERATURE : 10-15MIN. HIGH SIDE TEMPERATURE : +125 $^{\circ}$ C $\pm$ 3 $^{\circ}$ C 30MIN. ROOM TEMPERATURE : 10-15MIN. ABOVE TEST 5 CYCLES AFTER LAST CYCLE, LEAVE FOR 1-3 HOURS. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (1%R+0.05 $\Omega$ ).
VIBRATION WITHSTAND	TEST METHOD MIL-STD-202 ITEM 204	X, Y, Z-EACH DIRECTION 2 HOURS. AMPLITUDE 0.75MM. RANGE : 10HZ ~ 500HZ. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (1%R+0.05 $\Omega$ ).
LOAD LIFE	TEST METHOD MIL-STD-202 ITEM 108	70 $\pm$ 2 $^{\circ}$ C. 1000 HOURS RATED VOLTAGE (1.5 HOURS ON, 0.5 HOUR OFF). THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (5%R+0.1 $\Omega$ ).
RESISTANCE TEMPERATURE COEFFICIENT	TEST METHOD MIL-STD-202 ITEM 304	THE RESISTANCE VALUE CHANGE RATE SHALL BE AS TABLE - 3.
LOAD LIFE IN HUMIDITY	TEST METHOD MIL-STD-202 ITEM 103	THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN $\pm$ (5%R+0.1 $\Omega$ ).

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**8. LOT NO. (Coding System)**



**9. PACKING DATA**

TYPE	PER BOX	PER CARTON	INNER BOX			EXPORT CARTON		
			L	W	H	L	W	H
CFF125	5,000PCS	50,000PCS	255mm	81mm	72mm	419mm	264mm	170mm
CFF25	5,000PCS	50,000PCS	260mm	75mm	105mm	410mm	270mm	238mm
CFF50	2,000PCS	20,000PCS	258mm	78mm	80mm	423mm	270mm	355mm
CFF100	1,000PCS	10,000PCS	255mm	81mm	72mm	419mm	264mm	170mm
CFF200	1,000PCS	10,000PCS	260mm	78mm	87mm	422mm	270mm	200mm
CFF300	500PCS	5,000PCS	255mm	100mm	90mm	515mm	267mm	203mm

