



# 香 港 電 阻 製 造 廠

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## HONG KONG RESISTORS MANUFACTORY

(wholly owned by Hong Kong Resistors Manufactory International Ltd.)

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AN OHSAS 18001:2007 MANUFACTURER

AN ISO 14001 : 2004 MANUFACTURER

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## DATA SHEET

**Name of Product :** **CARBON FILM FIXED RESISTOR – TAPING (SMALL SIZE)**

Sales Executive : \_\_\_\_\_

Date: \_\_\_\_\_

製造 Prepared by	檢驗 Inspected by	審核 Audited by	核准 Authorized by
客戶 customer approval	客戶 customer approval	客戶 customer approval	客戶 customer approval

Spec. No. CFTBS 2015

Rev. No.: 2015 May.(1)

<b>PRODUCT : CARBON FILM FIXED RESISTOR</b>	<b>TYPE : CF 25S/50S/100S/200S/300S/500S</b>
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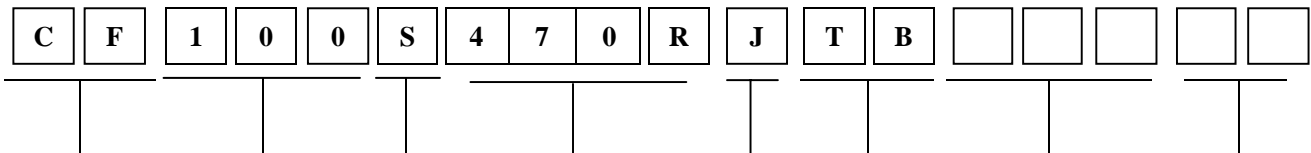
## 1. APPLICABLE SCOPE :

- 1.1 This data sheet is for use in CARBON FILM FIXED RESISTORS
- 1.2 Characteristics and specifications are according to those of :  
JIS C 5202
- 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 :



Product Code		Power Rating		Body Size		Nominal Resistance Value	Tolerance		Packaging		Lead Wire diameter		Taping width		
C	Carbon	Code	Wattage	S	Small Size		Code	Tol.	TB	Taping	Code	Size	Code	Size	
F	Film	25	0.25(1/4W)				G	2%		in					
		50	0.50(1/2W)				J	5%		box	043	25S: 0.43mm	26	26mm	
		100	1.0(1W)									50S: 0.40mm	62	62mm	
		200	2.0(2W)								048	50S: 0.48mm	73	73mm	
		300	3.0(3W)									100S: 0.48mm			
		500	5.0(5W)									060	100S: 0.60mm		
												200S: 0.55mm			
												070	200S: 0.70mm		
												300S: 0.70mm			
												075	300S: 0.75mm		
												500S: 0.70mm			
												075	500S: 0.75mm		

### 2.2 Explanation :

Part Number

CF 100S 470R J TB

Description

Carbon Film Fixed Resistor , 1W, small size, 470Ω, +/-5%, tape in box,  
Lead Wire diameter: d=0.48mm, Taping width=52mm.

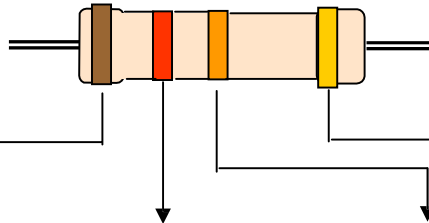
**PRODUCT : CARBON FILM FIXED RESISTOR**

**TYPE : CF 25S/50S/100S/200S/300S/500S**

### 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



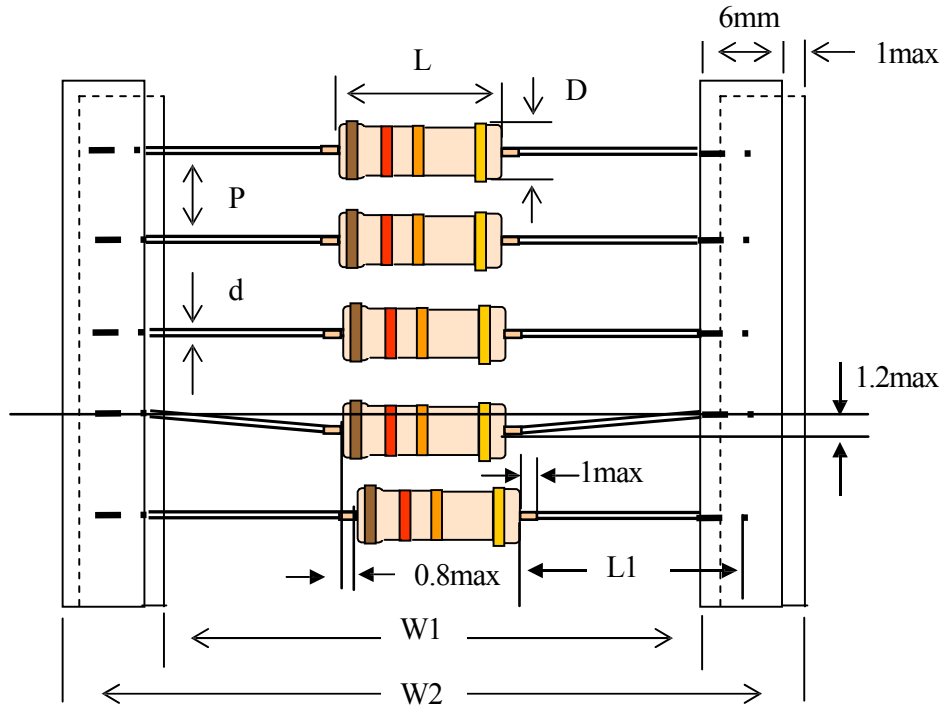
COLOR	1 <sup>ST</sup> DIGIT	2 <sup>ND</sup> DIGIT	MULTIPLIER	TOLERANCE
BLACK	0	0	1	
BROWN	1	1	10	
RED	2	2	100	G(±2%)
ORANGE	3	3	1,000	
YELLOW	4	4	10,000	
GREEN	5	5	100,000	
BLUE	6	6	1000,000	
VIOLET	7	7	10,000,000	
GREY	8	8		
WHITE	9	9		
GOLD			0.1	J (±5%)
SILVER			0.01	

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### 3. DIMENSIONS :

TABLE - 2



Unit : mm

TYPE	L	D	d	P	W1	W2	L1
CF25S	3.5±0.5	1.7±0.5	0.40 (0.43)±0.05	5±0.3	26±1	38±1	15±1
					52±1	64±1	27±1
CF50S	6.0±1.0	2.3±0.5	0.40 (0.48)±0.05	5±0.3	26±1	38±1	14±1
					52±1	64±1	26±1
CF100S	9.0±1.0	3.0±0.5	0.48 (0.60)±0.05	5±0.3	26±1	38±1	12±1
					52±1	64±1	26±1
CF200S	11.0±1.5	4.0±0.5	0.55(0.70)±0.05	5±0.3	52±1	64±1	25±1
					62±1.5	74±1.5	30±1
CF300S	15.0±1.5	5.0±0.5	0.70(0.75)±0.05	10±0.3	52±1	64±1	23±1
					73±1.5	85±1.5	34±1
CF500S	17.0±1.5	6.0±0.5	0.70(0.75)±0.05	10±0.3	73±1.5	85±1.5	33±1

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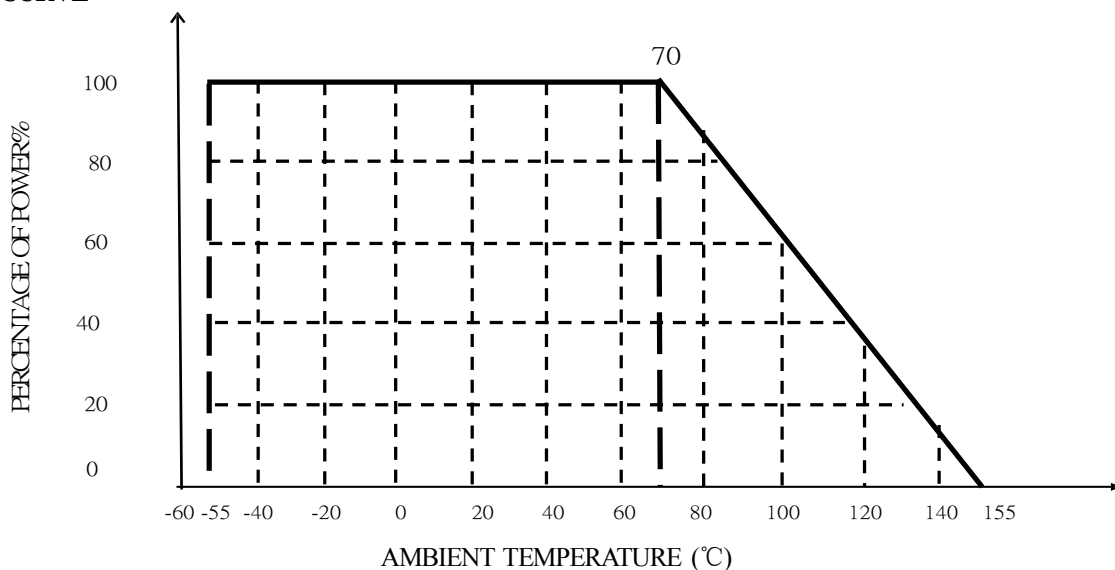
## 4. SPECIFICATIONS

TABLE - 3

DESCRIPTION	CF-25S	CF-50S	CF-100S	CF-200S	CF-300S	CF-500S
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	1/4W	1/2W	1W	2W	3W	5W
*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~+155°C	-55°C~+155°C	-55°C~+155°C	-55°C~+155°C
TEMPERATURE COEFFICIENT	≤10Ω 10Ω- 220KΩ 230KΩ- 1MΩ OVER 1MΩ	±300PPM 0~ -500PPM 0~ -1,000PPM 0~ -1,500PPM	±300PPM 0~ -500PPM 0~ -700PPM 0~ -1,000PPM	±300PPM 0~ -400PPM 0~ -600PPM 0~ -1,000PPM	±300PPM 0~ -400PPM 0~ -600PPM 0~ -1,000PPM	±300PPM 0~ -400PPM 0~ -600PPM 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.1,000 MΩ	MIN.1,000 MΩ	MIN.1,000 MΩ	MIN.1,000 MΩ	MIN.1,000 MΩ	MIN.1,000 MΩ
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  $V=\sqrt{P \cdot R}$  or to its maximum extent as indicated above
- \* The overload voltage is calculated based on the resistance value following the formula of  $V= 2.5 \cdot \sqrt{P \cdot R}$  or to its maximum extent as indicated above

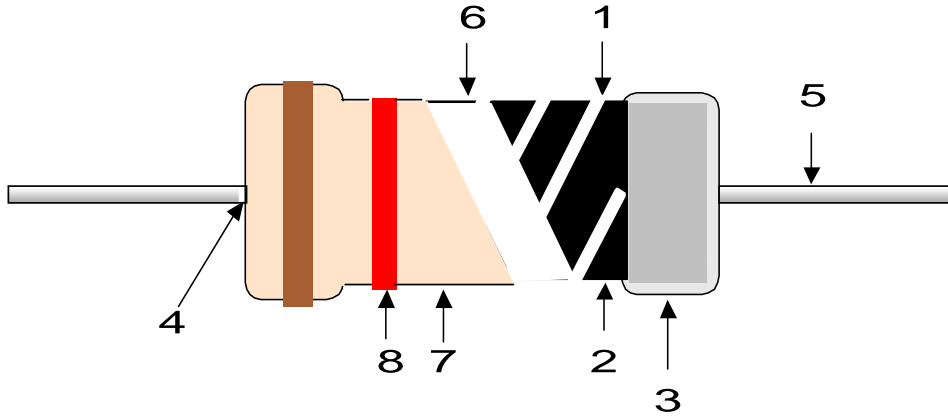
## 5. POWER DERATING CURVE



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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) UNDERCOAT          | ELECTRIC INSULATION VARNISH             |
| (7) FINISHING PAINTING | ELECTRIC INSULATION PAINT               |
| (8) INDICATION         | COLOR CODE INK                          |

TABLE - 4

RATED RESISTANCE VALUE	MAX. TESTING VOLTAGE	
	0.25W	0.5W / 1W / 2W / 3W/5W
$1\Omega \leq R < 10\Omega$	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

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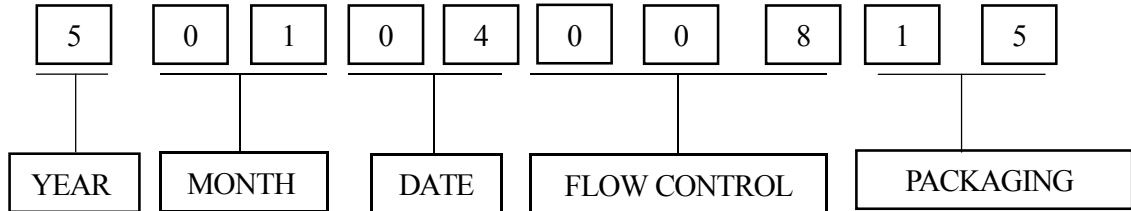
## 7. CHARACTERISTICS

TABLE – 5

DC RESISTANCE VALUE	TEST METHOD MIL-STD-202 ITEM 303	VOLTAGE AS TABLE -4. TEMPERATURE 25 $\pm$ 2°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°, 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°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°C $\pm$ 3°C 30MIN. ROOM TEMPERATURE : 10-15MIN. HIGH SIDE TEMPERATURE : +125°C $\pm$ 3°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°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
CF25S	5,000PCS	50,000PCS	256mm	80mm	69mm	421mm	264mm	161mm
CF50S	5,000PCS	50,000PCS	260mm	77mm	100mm	413mm	270mm	227mm
CF100S	2,000PCS	20,000PCS	260mm	77mm	100mm	413mm	270mm	227mm
CF200S	1,000PCS	10,000PCS	255mm	81mm	72mm	419mm	264mm	170mm
CF300S	1,000PCS	10,000PCS	260mm	78mm	87mm	422mm	270mm	200mm
CF500S	500PCS	5,000PCS	255mm	100mm	90mm	515mm	267mm	203mm

