



# 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 – (PM型)

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. CFPM 2015

Rev. No.: 2015 May.(1)

**PRODUCT : CARBON FILM FIXED RESISTOR**

**TYPE : CF 125/25/50/100/200**

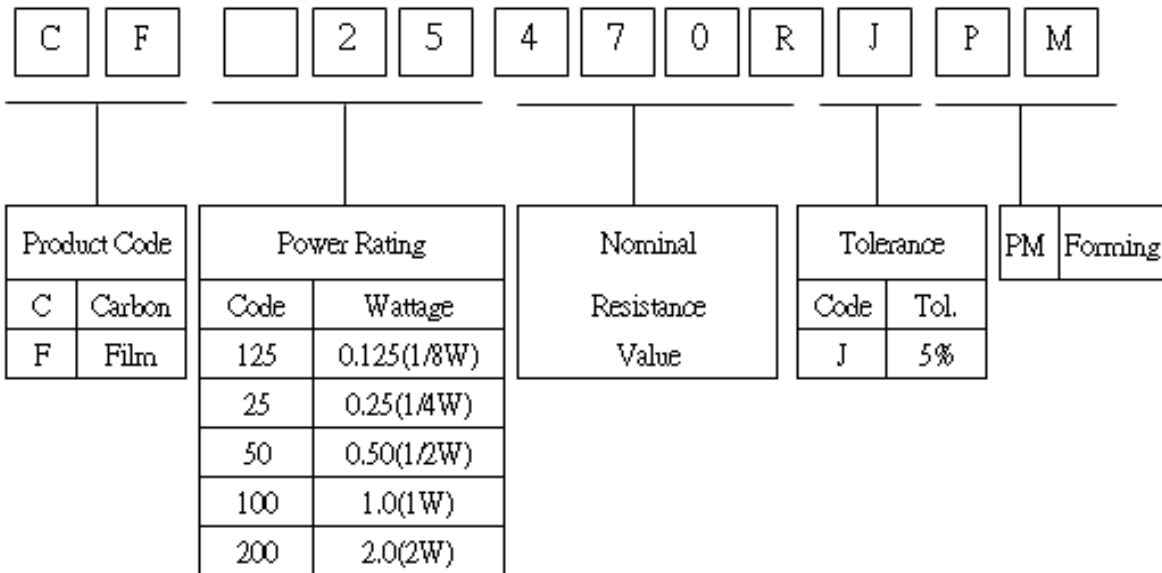
## 1. APPLICABLE SCOPE :

- 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 :



2.2 Explanation :

Part Number  
CF 25 470R J PM

Description  
Carbon Film Fixed Resistor , 1/4W , 470Ω , +/-5% tolerance , forming.

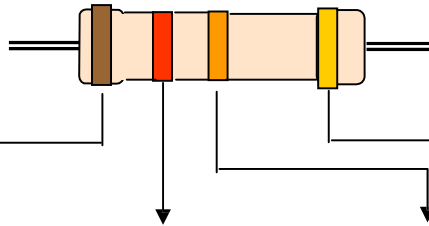
Remarks : The power rating of 1/8W is coded as 125

<b>PRODUCT : CARBON FILM FIXED RESISTOR</b>	<b>TYPE : CF125/25/50/100/200</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



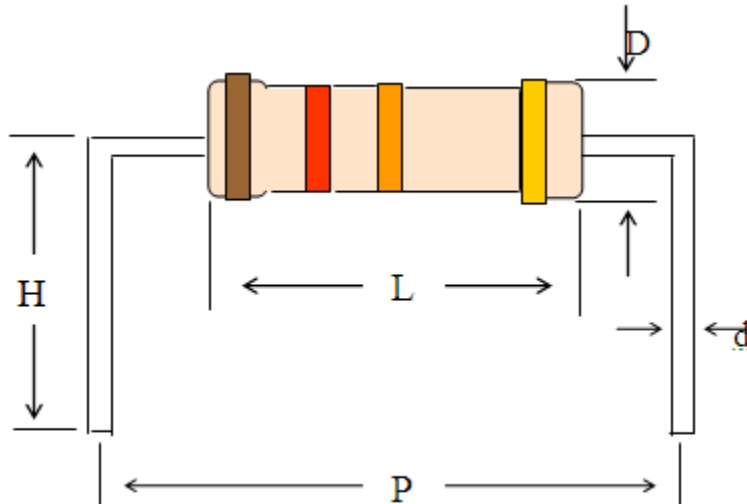
COLOR	1 <sup>ST</sup> DIGIT	2 <sup>ND</sup> DIGIT	MULTIPLIER	TOLERANCE
BLACK	0	0	1	
BROWN	1	1	10	
RED	2	2	100	
ORANGE	3	3	1,000	
YELLOW	4	4	10,000	
GREEN	5	5	100,000	
BLUE	6	6	1000,000	
VIOLET	7	7	10,000,000	
GREY	8	8		
WHITE	9	9		
GOLD			0.1	J (±5%)
SILVER			0.01	

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### 3. DIMENSIONS :

TABLE - 2



Unit : mm

TYPE	BODY		LEAD WIRE		
	L	D	H	P	d
CF125	$3.5 \pm 0.5$	$1.7 \pm 0.5$	$8 \pm 1.0$	$6 \pm 1.0$	$0.40 \pm 0.05$
CF25	$6.0 \pm 1.0$	$2.3 \pm 0.5$	$8 \pm 1.0$	$10 \pm 1.0$	$0.40 \pm 0.05$
CF50	$9.0 \pm 1.0$	$3.0 \pm 0.5$	$10 \pm 1.0$	$12.5 \pm 1.5$	$0.48 \pm 0.05$
CF100	$11.0 \pm 1.5$	$4.0 \pm 0.5$	$10 \pm 1.0$	$15 \pm 1.5$	$0.55 \pm 0.05$
CF200	$15.0 \pm 1.5$	$5.0 \pm 0.5$	$10 \pm 1.0$	$20 \pm 1.5$	$0.70 \pm 0.05$

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## 4. SPECIFICATIONS

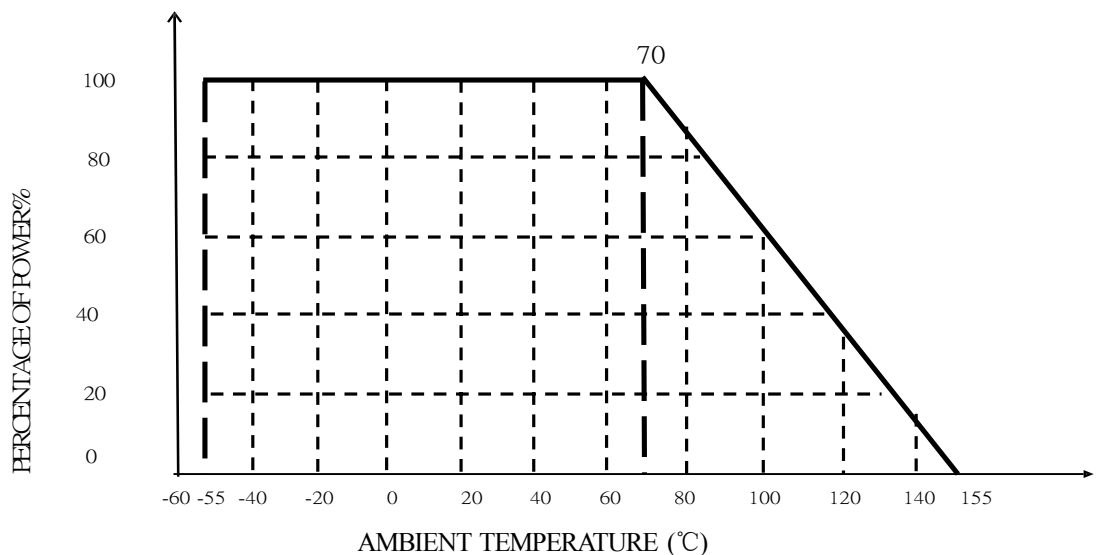
TABLE - 3

DESCRIPTION	CF125	CF25	CF50	CF100	CF200
STANDARD RESISTANCE VALUE RANGE	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
*MAX WORKING VOLTAGE	200V	250V	350V	500V	500V
*MAX OVERLOAD VOLTAGE	400V	500V	700V	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
TEMPERATURE COEFFICIENT					
≤ 10Ω	±300PPM 0~ -	±300PPM 0~ -	±300PPM 0~ -	±300PPM 0~ -	±300PPM 0~ -
10Ω- 220KΩ	500PPM	500PPM	500PPM	400PPM	400PPM
230KΩ- 1MΩ	0~ -1,000PPM	0~ -1,000PPM	0~ -700PPM	0~ -600PPM	0~ -600PPM
OVER 1MΩ	0~ -1,500PPM	0~ -1,500PPM	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)
VOLTAGE COEFFICIENT	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
HUMIDITY	±3%	±3%	±3%	±3%	±3%
SHORT-TIME OVERLOAD	±(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
VIBRATION	±(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%

\* 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

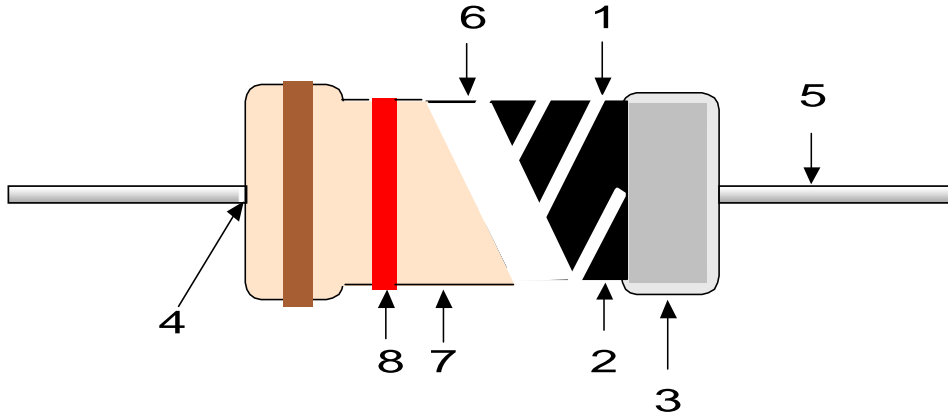
\* The overload voltage is calculated based on the resistance value following the formula of  $V= 2.5 * \sqrt{(P*R)}$  or to its maximum extent as indicated above

## 5. POWER DERATING CURVE



<b>PRODUCT : CARBON FILM FIXED RESISTOR</b>	<b>TYPE : CF 125/25/50/100/200</b>
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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	
	0.125W / 0.25W	0.5W / 1W / 2W
$0.1\Omega \leq R < 10\Omega$	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

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## 7. CHARACTERISTICS

TABLE - 5

DC RESISTANCE VALUE	TEST METHOD MIL-STD-202 ITEM 303	VOLTAGE AS TABLE -4. TEMPERATURE 25 ±2°C. AQL 0.25%.
VOLTAGE WITHSTAND	TEST METHOD MIL-STD-202 ITEM 301	V-BLOCK METHOD. VOLTAGE AS TABLE -3 ×1.42, 1 MIN. AQL 1%.
SHORT TIME OVERLOAD	TEST METHOD JIS C 5202 ITEM 5.5	RATED VOLTAGE × 2.5 TIMES OR MAX.WORKINGVOLTAGE × 2 TIMES. ABOVE TEST 5 SEC. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN ±(1%R+0.05 Ω).
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 ±(0.5%R+0.05 Ω).
SOLDERABILITY OF TERMINAL	TEST METHOD MIL-STD-202 ITEM 210	260±5°C 10±1SEC. AFTER TESTING, LEAVE FOR 3 HOURS. THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN ±(1%R+0.05 Ω).
TEMPERATURE CYCLE	TEST METHOD MIL-STD-202 ITEM 107	LOW SIDE TEMPERATURE : -55°C±3°C 30MIN. ROOM TEMPERATURE : 10-15MIN. HIGH SIDE TEMPERATURE : +125°C±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 ±(1%R+0.05 Ω).
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 ±(1%R+0.05 Ω).
LOAD LIFE	TEST METHOD MIL-STD-202 ITEM 108	70±2°C. 1000 HOURS RATED VOLTAGE (1.5 HOURS ON, 0.5 HOUR OFF). THE RESISTANCE VALUE CHANGE RATE SHALL BE WITHIN ±(5%R+0.1 Ω).
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 ±(5%R+0.1 Ω).

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