



# 香 港 電 阻 製 造 廠

香港柴灣安業街十二號長益工業大廈10字樓A座

## HONG KONG RESISTORS MANUFACTORY

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

AN ISO 9001:2008 CERTIFIED MANUFACTURER

AN OHSAS 18001:2007 MANUFACTURER

AN ISO 14001 : 2004 MANUFACTURER

10A Cheong Yick Industrial Building, 12 On Yip St., Chai Wan, Hong Kong

Tel.: (852) 2896 2782 Fax.: (852)2896 5291

國內工廠一: 東莞溢輝電子有限公司

地址: 東莞市虎門鎮懷德社區蔗寮工業區4號

Tel.: (86 769) 8331 5373 Fax.: (86 769) 8331 1603

國內工廠二: 恆輝電阻(益陽)有限公司

地址: 湖南省益陽市資陽區長春工業園五福路

Tel.: (86 737) 3800 399 Fax.: (86 737) 3800 199

## DATA SHEET

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

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

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

|                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|
| 製造<br>Prepared by       | 檢驗<br>Inspected by      | 審核<br>Audited by        | 核准<br>Authorized by     |
|                         |                         |                         |                         |
|                         |                         |                         |                         |
| 客戶<br>customer approval | 客戶<br>customer approval | 客戶<br>customer approval | 客戶<br>customer approval |
|                         |                         |                         |                         |

**Spec. No. CFBPS 2015**

**Rev. No.: 2015 May.(1)**

**PRODUCT : CARBON FILM FIXED RESISTOR**

**TYPE : CF25S/50S/100S/200S/300S/500S**

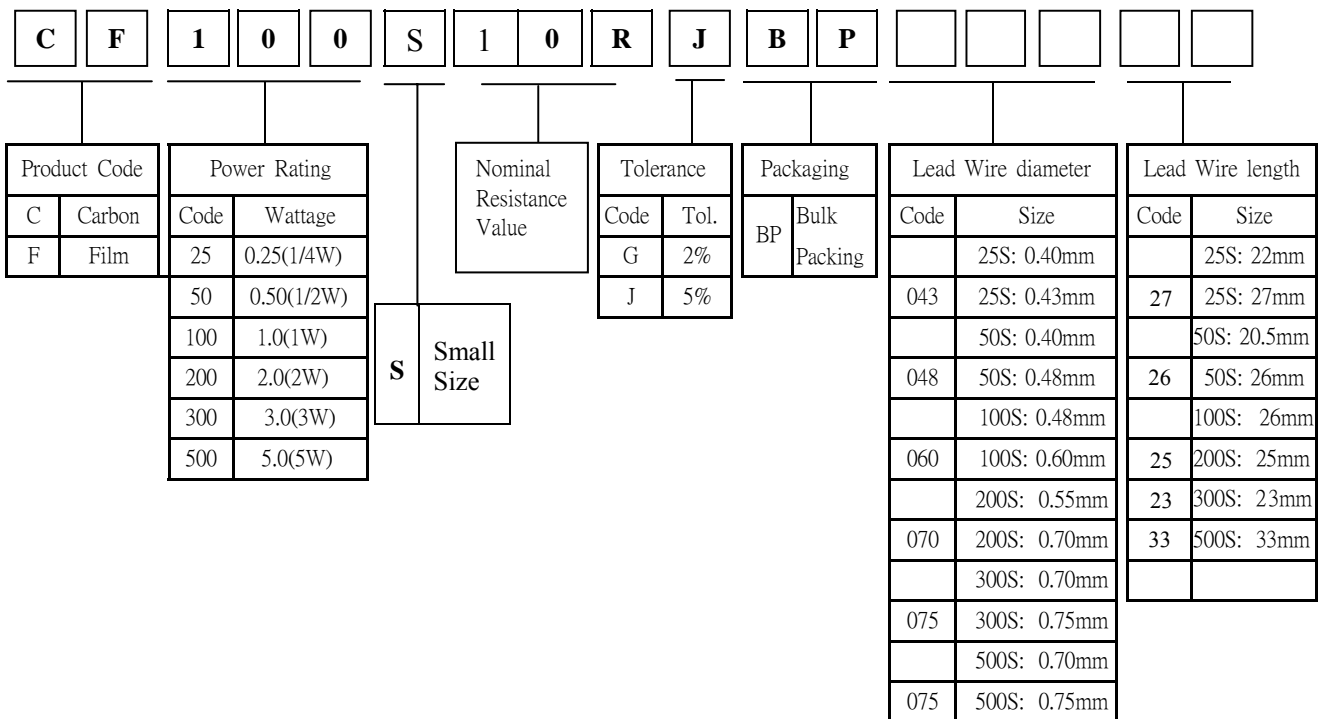
**1. APPLICABLE SCOPE :**

- 1.1 This specification 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. TYPE**

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

2.1 Make Up :



2.2 Explanation :

Part Number

Description

CF 100S 10R J BP

Carbon Film Fixed Resistor ,1WS ,10Ω, +/-5% tolerance , bulk packing

Lead Wire diameter: d=0.48mm, Lead Wire length: L=26mm.

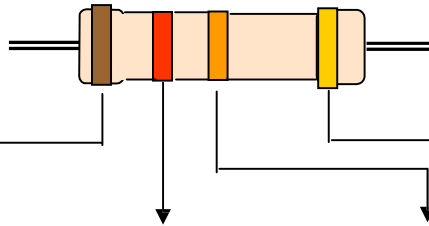
\* Remarks : The power rating of 1/8W is coded as 125

|   |   |
|---|---|
| <b>PRODUCT : CARBON FILM FIXED RESISTOR</b> | <b>TYPE : CF25S/50S/100S/200S/300S/500S</b> |
|---|---|

### 2.3 Color code indication

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

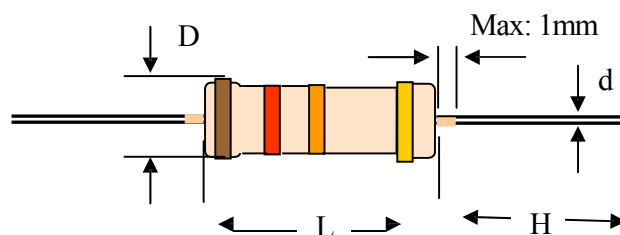
TABLE - 1



| 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       |           |

**PRODUCT : CARBON FILM FIXED RESISTOR**
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**3. DIMENSIONS :**

TABLE - 2



Unit : mm

| TYPE   | BODY           |               | LEAD WIRE         |                        |
|--------|----------------|---------------|-------------------|------------------------|
|        | L              | D             | H                 | d                      |
| CF25S  | $3.5 \pm 0.5$  | $1.7 \pm 0.5$ | $22 (27) \pm 1$   | $0.40 (0.43) \pm 0.05$ |
| CF50S  | $6.0 \pm 1.0$  | $2.3 \pm 0.5$ | $20.5 (26) \pm 1$ | $0.40 (0.48) \pm 0.05$ |
| CF100S | $9.0 \pm 1.0$  | $3.0 \pm 0.5$ | $26 \pm 1$        | $0.48 (0.60) \pm 0.05$ |
| CF200S | $11.0 \pm 1.5$ | $4.0 \pm 0.5$ | $25 \pm 1$        | $0.55 (0.70) \pm 0.05$ |
| CF300S | $15.0 \pm 1.5$ | $5.0 \pm 0.5$ | $23 \pm 1$        | $0.70 (0.75) \pm 0.05$ |
| CF500S | $17.0 \pm 1.5$ | $6.0 \pm 0.5$ | $33 \pm 1$        | $0.70 (0.75) \pm 0.05$ |

|   |   |
|---|---|
| <b>PRODUCT : CARBON FILM FIXED RESISTOR</b> | <b>TYPE : CF25S/50S/100S/200S/300S/500S</b> |
|---|---|

## 4. SPECIFICATIONS

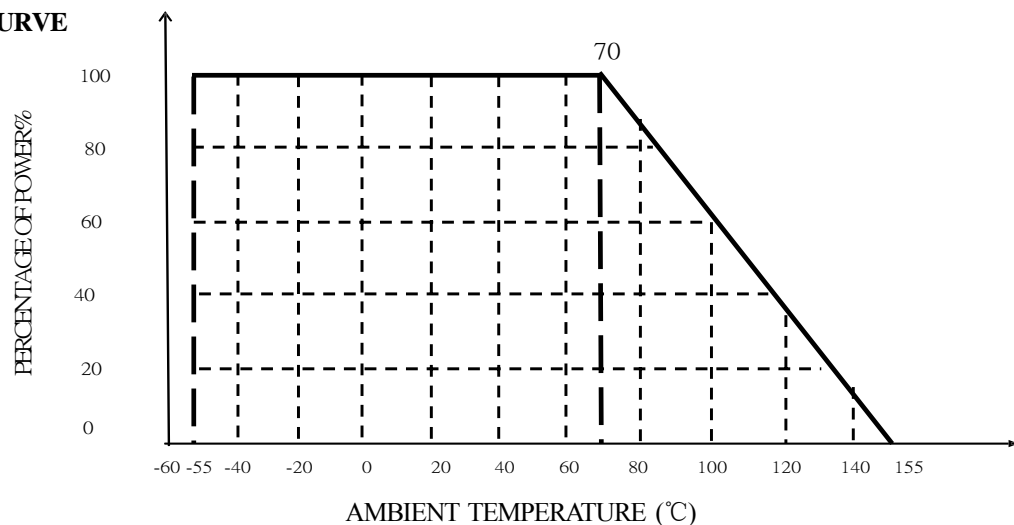
TABLE - 3

| DESCRIPTION                     | CF125   | CF25  | CF50  | CF100   | CF200   | CF300   |   |
|---------------------------------|---|---|---|---|---|---|---|
| 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<br>10Ω- 220KΩ<br>230KΩ- 1MΩ<br>OVER 1MΩ | ±300PPM<br>0~ -500PPM<br>0~ -1,000PPM<br>0~ -1,500PPM | ±300PPM<br>0~ -500PPM<br>0~ -1,000PPM<br>0~ -1,500PPM | ±300PPM<br>0~ -500PPM<br>0~ -700PPM<br>0~ -1,000PPM | ±300PPM<br>0~ -400PPM<br>0~ -600PPM<br>0~ -1,000PPM | ±300PPM<br>0~ -400PPM<br>0~ -600PPM<br>0~ -1,000PPM | ±300PPM<br>0~ -400PPM<br>0~ -600PPM<br>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%<br>COVERED                            | MIN.95%<br>COVERED                                    | MIN.95%<br>COVERED                                    | MIN.95%<br>COVERED                                  | MIN.95%<br>COVERED                                  | MIN.95%<br>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 is calculated based on the resistance value following the formula of  $V=\sqrt{P \cdot R}$  or to its maximum extent as indicated above

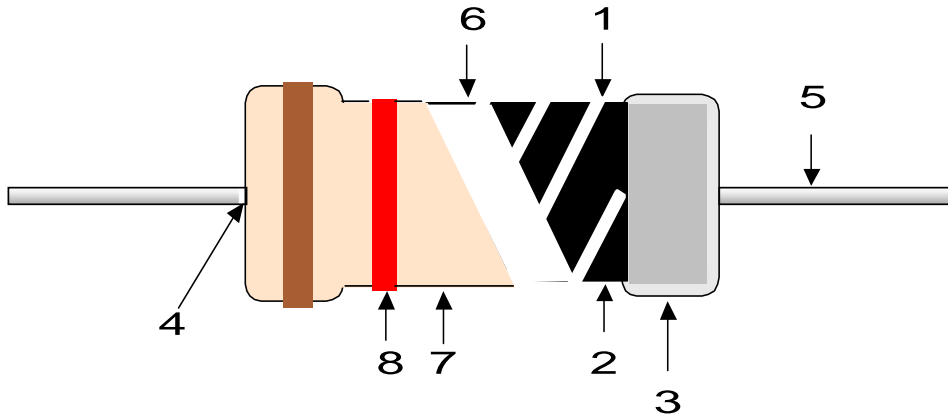
\* The overload voltage is calculated based on the resistance value following the formula of  $V=2.5 \cdot \sqrt{P \cdot R}$  or to its maximum extent as indicated above

## 5. POWER DERATING CURVE



|   |   |
|---|---|
| <b>PRODUCT : CARBON FILM FIXED RESISTOR</b> | <b>TYPE : CF25S/50S/100S/200S/300S/500S</b> |
|---|---|

**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 |
| $0.1\Omega \leq R < 10\Omega$   | 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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|---|--|
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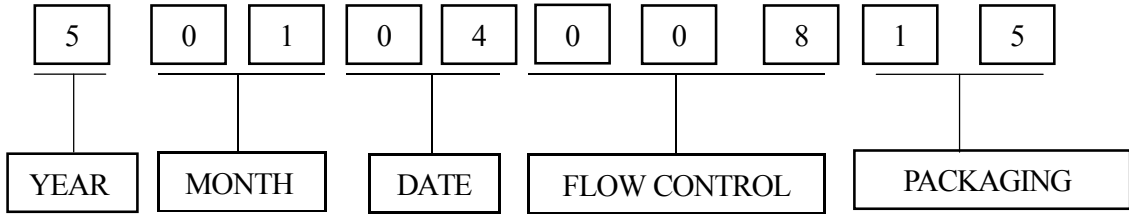
## 7. CHARACTERISTICS

TABLE - 5

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

|   |  |
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| <b>PRODUCT : CARBON FILM FIXED RESISTOR</b> | <b>TYPE : CF 25S/50S/100S/200S/300S/500S</b> |
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### 8. LOT NO. (Coding System)



### 9. PACKING DATA

| TYPE   | PER PACKET | PER BOX   | PER CARTON | INNER BOX |       |      | EXPORT CARTON |       |       |
|--------|------------|-----------|------------|-----------|-------|------|---------------|-------|-------|
|        |            |           |            | L         | W     | H    | L             | W     | H     |
| CF25S  | 1,000PCS   | 10,000PCS | 100,000PCS | /         | /     | /    | 305mm         | 198mm | 180mm |
| CF50S  | 1,000PCS   | 10,000PCS | 100,000PCS | 220mm     | 138mm | 57mm | 310mm         | 295mm | 245mm |
| CF100S | 500PCS     | 5,000PCS  | 50,000PCS  | /         | /     | /    | 280mm         | 280mm | 260mm |
| CF200S | 500PCS     | 4,000PCS  | 40,000PCS  | /         | /     | /    | 310mm         | 295mm | 245mm |
| CF300S | 250PCS     | 2,000PCS  | 20,000PCS  | /         | /     | /    | 280mm         | 280mm | 260mm |
| CF500S | 100PCS     | 1,000PCS  | 10,000PCS  | /         | /     | /    | 280mm         | 280mm | 260mm |

