

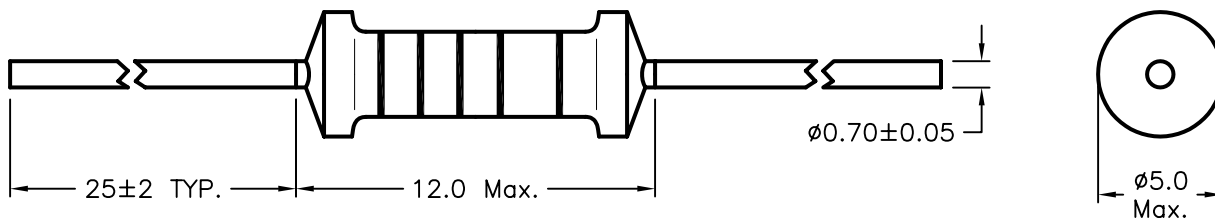
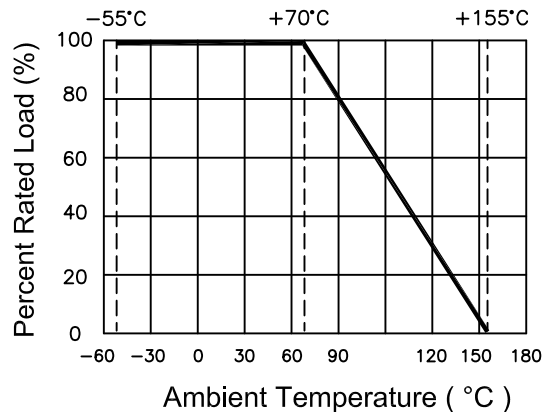
| DCP # | REV | DESCRIPTION          | DRAWN | DATE     | CHECKD | DATE    | APPRVD | DATE     |
|-------|-----|----------------------|-------|----------|--------|---------|--------|----------|
| 1861  | A   | RELEASED             | EYO   | 11/02/05 | HO     | 11/2/05 | JWM    | 10/31/05 |
| 1910  | B   | Update Multicomp P/N | HO    | 6/7/06   | JWM    | 6/9/06  | JWM    | 6/9/06   |



| Layer Name      | Material  |
|-----------------|---|
| Basic Body      | Rod Type Ceramics   |
| Resistance Film | Carbon Film   |
| End Cap         | Steel (Tin plated iron surface)                             |
| Lead Wire       | Annealed copper wire (Electrosolder plated surface) Pb Free |
| Joint           | By Welding  |
| Coating         | Insulated resin (Color : Beige)                             |
| Color Code      | Epoxy Resin   |

**GENERAL SPECIFICATIONS:**

- Rating Wattage @ 70°C: 1W
- Dielectric Withstanding Voltage: 1000V
- Maximum Working Voltage: 500V
- Maximum Overload Voltage: 1000V
- Resistance Tolerance: ±5%
- Resistance Range: (See part table)
- Rated Ambient Temp.: 70°C
- Operating Temp. Range: -55°C to +155°C


**Derating Curve**


SPC-F004.DWG

|  |              |            |  |                     |                 |     |
|--|--------------|------------|--|---------------------|-----------------|-----|
| TOLERANCES:<br>UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE FOR REFERENCE PURPOSES ONLY. | DRAWN BY:    | DATE:      | DRAWING TITLE:                               |                     |                 |     |
|  | EKLAS ODISH  | 11/02/05   | RoHS Compliant Carbon Film Resistors, 1W, 5% |                     |                 |     |
|  | CHECKED BY:  | DATE:      | SIZE   | DWG. NO.            | ELECTRONIC FILE | REV |
|  | HISHAM ODISH | 11/2/05    | A  | TA-672              | TA-672.DWG      | B   |
| APPROVED BY:   | DATE:        | SCALE: NTS |  | U.O.M.: MILLIMETERS |                 |     |
| JEFF MCVICKER  | 10/31/05     |            |  | SHEET: 1 OF 3       |                 |     |

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| Characteristics                 | Limits   |                       | Test Methods (JIS C 5201-1)  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
|---------------------------------|--|-----------------------|--|---------------------|-------------|------------|-----|------------|---|---|------------|---------|---|-------------|----|---|------------|---------|
| DC. Resistance                  | Must be within the specified tolerance   |                       | 5.1 The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance   |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Temperature coefficient         | <b>Resist. Range</b>   | <b>T.C.R (PPM/°C)</b> | 5.2 Natural resistance change per temp. degree centigrade.<br>$\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$<br>R <sub>1</sub> : Resistance value at room temperature (t <sub>1</sub> )<br>R <sub>2</sub> : Resistance value at room temp. plus 100°C (t <sub>2</sub> )   |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
|                                 | ≤10Ω   | 0 ~ ±350              |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
|                                 | 11Ω ~ 99K  | 0 ~ -450              |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
|                                 | 100K ~ 1M  | 0 ~ -700              |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| 1.1M ~ 10M                      | 0 ~ -1500  |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Short time overload             | Resistance change rate is ±(1% +0.05Ω) Max. with no evidence of mechanical damage.   |                       | 5.5 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds   |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Insulation Resistance           | Insulation resistance is 10,000 MΩ Min   |                       | 5.6 Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at DC potential respectively specified in above list for 60+10/-0 seconds   |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Dielectric withstanding voltage | No evidence of flashover mechanical damage, arcing or insulation breakdown.  |                       | 5.7 Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at AC potential respectively specified in table '1'. for 60+10/-0 seconds   |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Terminal strength               | No evidence of mechanical damage.  |                       | <u>6.1 Direct load:</u><br>Resistance to a 2.5 kgs direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads.<br><u>Twist test:</u><br>Terminal leads shall be bent through 90° at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating directions for a total of 3 rotations.  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Resistance to soldering heat    | Resistance change rate is ±(1% +0.05Ω) Max. with no evidence of mechanical damage.   |                       | 6.4 Permanent resistance change when leads immersed to 3.2 to 4.8mm from the body in 350°C ±10°C solder for 3 ±0.5 seconds.  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Solderability                   | 95% coverage Min.  |                       | 6.5 The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes.<br>Test temperature of solder: 245°C ±3°C<br>Dwell time in solder: 2-3 seconds   |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Temperature cycling             | Resistance change rate is ±(1% +0.05Ω) Max. with no evidence of mechanical damage.   |                       | 7.4 Resistance change after continuous five cycles for duty shown below :<br><table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C ±3°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>10 ~ 15</td> </tr> <tr> <td>3</td> <td>+155°C ±2°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>10 ~ 15</td> </tr> </tbody> </table> | Step                | Temperature | Time (min) | 1   | -55°C ±3°C | 30  | 2 | Room Temp. | 10 ~ 15 | 3 | +155°C ±2°C | 30 | 4 | Room Temp. | 10 ~ 15 |
| Step                            | Temperature  | Time (min)            |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| 1                               | -55°C ±3°C   | 30                    |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| 2                               | Room Temp.   | 10 ~ 15               |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| 3                               | +155°C ±2°C  | 30                    |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| 4                               | Room Temp.   | 10 ~ 15               |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Load life in humidity           | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Resistance Value</th> <th>ΔR/R</th> </tr> </thead> <tbody> <tr> <td>Normal type &lt; 100KΩ</td> <td>±3%</td> </tr> <tr> <td>≥ 100KΩ</td> <td>±5%</td> </tr> </tbody> </table> | Resistance Value      | ΔR/R   | Normal type < 100KΩ | ±3%         | ≥ 100KΩ    | ±5% |            | 7.9 Resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "ON", 0.5 hour "OFF" ) in a humidity test chamber controlled at 40°C±2°C and 90 to 95% relative humidity. |   |            |         |   |             |    |   |            |         |
| Resistance Value                | ΔR/R   |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Normal type < 100KΩ             | ±3%  |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| ≥ 100KΩ                         | ±5%  |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Load life                       | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Resistance Value</th> <th>ΔR/R</th> </tr> </thead> <tbody> <tr> <td>Normal type &lt; 56KΩ</td> <td>±2%</td> </tr> <tr> <td>≥ 56KΩ</td> <td>±3%</td> </tr> </tbody> </table>   | Resistance Value      | ΔR/R   | Normal type < 56KΩ  | ±2%         | ≥ 56KΩ     | ±3% |            | 7.10 Permanent resistance change after 1,000 hours operating at<br>* RCWV with duty cycle of 1.5 hours "on", 0.5 hour "off" at 70°C ±2°C ambient.   |   |            |         |   |             |    |   |            |         |
| Resistance Value                | ΔR/R   |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| Normal type < 56KΩ              | ±2%  |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |
| ≥ 56KΩ                          | ±3%  |                       |  |                     |             |            |     |            |   |   |            |         |   |             |    |   |            |         |

\*RCWV = Rated Continuous Working Voltage =  $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$

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SPC-F004.DWG

DOC. NO. SPC-F004 \* Effective: 7/8/02 \* DCP No: 1398

SIZE DWG. NO.

A

TA-672

ELECTRONIC FILE

TA-672.DWG

REV

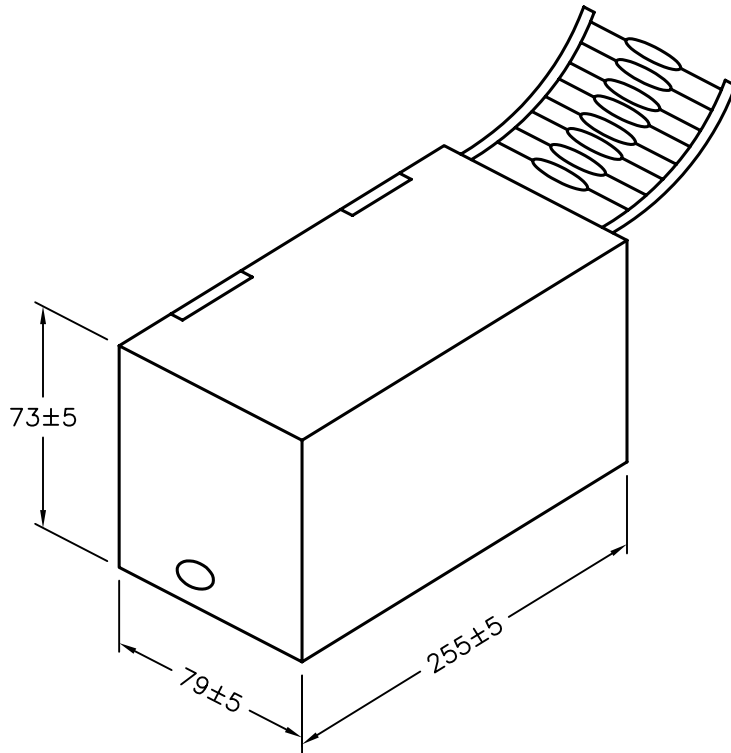
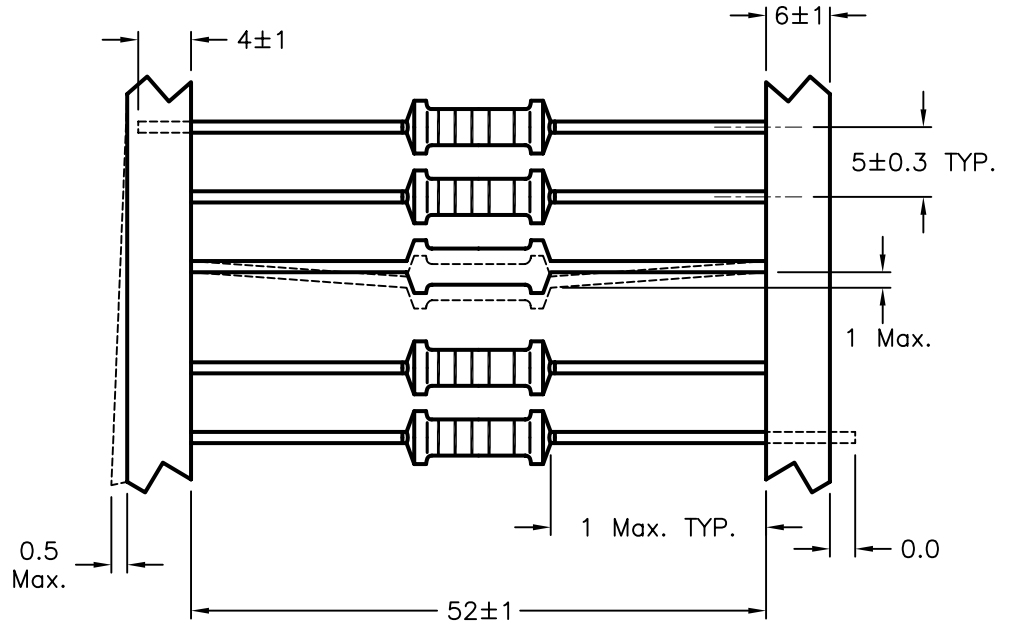
B

SCALE: NTS

U.O.M.: Millimeters

SHEET: 2 OF 3

| Multicomp P/N #  | Resistance |
|------------------|------------|
| MCCFR01SJ047JA10 | 4.7 ohm    |
| MCCFR01SJ0100A10 | 10 ohm     |
| MCCFR01SJ0150A10 | 15 ohm     |
| MCCFR01SJ0220A10 | 22 ohm     |
| MCCFR01SJ0330A10 | 33 ohm     |
| MCCFR01SJ0470A10 | 47 ohm     |
| MCCFR01SJ0510A10 | 51 ohm     |
| MCCFR01SJ0680A10 | 68 ohm     |
| MCCFR01SJ0101A10 | 100 ohm    |
| MCCFR01SJ0111A10 | 110 ohm    |
| MCCFR01SJ0151A10 | 150 ohm    |
| MCCFR01SJ0181A10 | 180 ohm    |
| MCCFR01SJ0201A10 | 200 ohm    |
| MCCFR01SJ0221A10 | 220 ohm    |
| MCCFR01SJ0331A10 | 330 ohm    |
| MCCFR01SJ0391A10 | 390 ohm    |
| MCCFR01SJ0471A10 | 470 ohm    |
| MCCFR01SJ0681A10 | 680 ohm    |
| MCCFR01SJ0102A10 | 1 kohm     |
| MCCFR01SJ0122A10 | 1.2 kohm   |
| MCCFR01SJ0152A10 | 1.5 kohm   |
| MCCFR01SJ0182A10 | 1.8 kohm   |
| MCCFR01SJ0202A10 | 2 kohm     |
| MCCFR01SJ0222A10 | 2.2 kohm   |
| MCCFR01SJ0332A10 | 3.3 kohm   |
| MCCFR01SJ0472A10 | 4.7 kohm   |
| MCCFR01SJ0682A10 | 6.8 kohm   |
| MCCFR01SJ0822A10 | 8.2 kohm   |
| MCCFR01SJ0103A10 | 10 kohm    |
| MCCFR01SJ0123A10 | 12 kohm    |
| MCCFR01SJ0153A10 | 15 kohm    |
| MCCFR01SJ0183A10 | 18 kohm    |
| MCCFR01SJ0203A10 | 20 kohm    |
| MCCFR01SJ0223A10 | 22 kohm    |
| MCCFR01SJ0333A10 | 33 kohm    |
| MCCFR01SJ0473A10 | 47 kohm    |
| MCCFR01SJ0683A10 | 68 kohm    |
| MCCFR01SJ0104A10 | 100 kohm   |
| MCCFR01SJ0124A10 | 120 kohm   |
| MCCFR01SJ0154A10 | 150 kohm   |
| MCCFR01SJ0184A10 | 180 kohm   |
| MCCFR01SJ0224A10 | 220 kohm   |
| MCCFR01SJ0334A10 | 330 kohm   |
| MCCFR01SJ0474A10 | 470 kohm   |
| MCCFR01SJ0684A10 | 680 kohm   |
| MCCFR01SJ0105A10 | 1 Mohm     |



Quantity per box 1,000 pcs.

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SPC-F004.DWG

SIZE DWG. NO.

A

TA-672

ELECTRONIC FILE

TA-672.DWG

REV

B

SCALE: NTS

U.O.M.: Millimeters

SHEET: 3 OF 3

DOC. NO. SPC-F004 \* Effective: 7/8/02 \* DCP No: 1398