

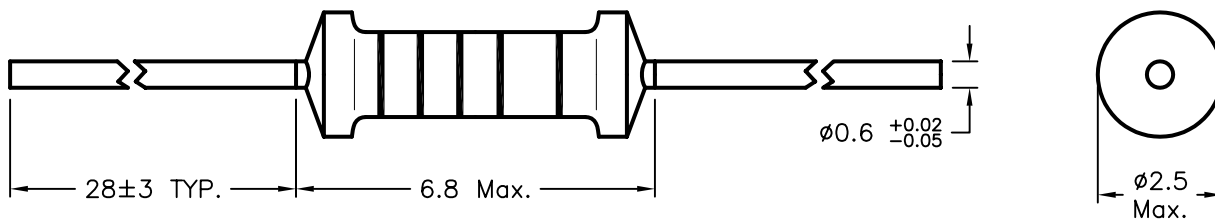
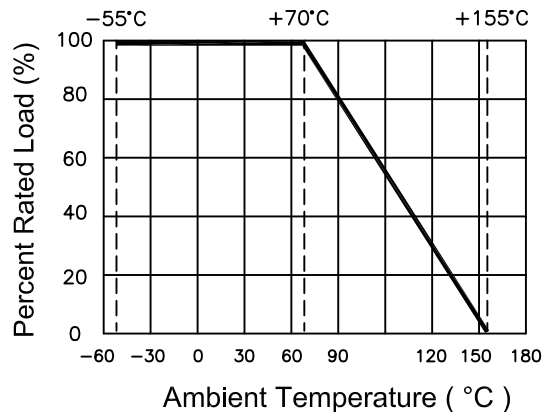
| DCP # | REV | DESCRIPTION | DRAWN | DATE | CHECKD | DATE | APPRVD | DATE |
|-------|-----|-------------|-------|----------|--------|---------|--------|----------|
| 1861 | A | RELEASED | EYO | 10/31/05 | HO | 11/2/05 | JWM | 10/31/05 |



| 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: 0.25W
- Dielectric Withstanding Voltage: 500V
- Maximum Working Voltage: 250V
- Maximum Overload Voltage: 500V
- Tolerance: $\pm 5\%$
- Resistance Range: (See parts table)
- Rated Ambient Temp.: 70°C
- Operating Temp. Range: -55°C to +155°C


Derating Curve


SPC-F004.DWG

| | | | | | | |
|--|--------------|------------|--|---------------------|-----------------|---------------|
| TOLERANCES: UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE FOR REFERENCE PURPOSES ONLY. | DRAWN BY: | DATE: | DRAWING TITLE: | | | |
| | EKLAS ODISH | 10/31/05 | RoHS Compliant Carbon Film Resistors, 1/4W, 5% | | | |
| | CHECKED BY: | DATE: | SIZE | DWG. NO. | ELECTRONIC FILE | REV |
| | HISHAM ODISH | 11/2/05 | A | TA-668 | TA-668.DWG | A |
| APPROVED BY: | DATE: | SCALE: NTS | | U.O.M.: MILLIMETERS | | SHEET: 1 OF 3 |
| JEFF MCVICKER | 10/31/05 | | | | | |

ALL RIGHTS RESERVED. NO PORTION OF THIS PUBLICATION, WHETHER IN WHOLE OR IN PART CAN BE REPRODUCED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPC TECHNOLOGY. DISCLAIMER: ALL STATEMENTS AND TECHNICAL INFORMATION CONTAINED HEREIN ARE BASED UPON INFORMATION AND/OR TESTS WE BELIEVE TO BE ACCURATE AND RELIABLE. SINCE CONDITIONS OF USE ARE BEYOND OUR CONTROL, THE USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR THE INTENDED USE AND ASSUME ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THEREWITH.

| 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 | Resist. Range | T.C.R (PPM/°C) | 5.2 Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R ₁ : Resistance value at room temperature (t ₁) R ₂ : Resistance value at room temp. plus 100°C (t ₂) | | | | | | | | | | | | | | | |
| | ≤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 withstanding voltage | 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 sheet '1'. for 60+10/-0 seconds | | | | | | | | | | | | | | | |
| Terminal strength | No evidence of mechanical damage. | | 6.1 Direct load: Resistance to a 2.5 kgs direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist test: 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. Test temperature of solder: 245°C ±3°C 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 : <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 | Resistance Value | | 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. | | | | | | | | | | | | | | | |
| | Normal type | ΔR/R | | | | | | | | | | | | | | | | |
| | Less than 100KΩ | ±3% | | | | | | | | | | | | | | | | |
| | 100KΩ or more | ±5% | | | | | | | | | | | | | | | | |
| Load life | Resistance Value | | 7.10 Permanent resistance change after 1,000 hours operating at * RCWV with duty cycle of 1.5 hours "on", 0.5 hour "off" at 70°C ±2°C ambient. | | | | | | | | | | | | | | | |
| | Normal type | ΔR/R | | | | | | | | | | | | | | | | |
| | Less than 56KΩ | ±2% | | | | | | | | | | | | | | | | |
| | 56KΩ or more | ±3% | | | | | | | | | | | | | | | | |

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

ALL RIGHTS RESERVED. NO PORTION OF THIS PUBLICATION, WHETHER IN WHOLE OR IN PART CAN BE REPRODUCED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPC TECHNOLOGY.
SPC-F004.DWG

SIZE DWG. NO.

A

TA-668

ELECTRONIC FILE

TA-668.DWG

REV

A

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

SCALE: NTS

U.O.M.: Millimeters

SHEET: 2 OF 3

| Multicomp P/N # | Resistance |
|------------------|------------|
| MCZOT0W400000A50 | 0 ohm |
| MCCFR0W4J050KA50 | 0.5 ohm |
| MCCFR0W4J010JA50 | 1 ohm |
| MCCFR0W4J011JA50 | 1.1 ohm |
| MCCFR0W4J012JA50 | 1.2 ohm |
| MCCFR0W4J013JA50 | 1.3 ohm |
| MCCFR0W4J016JA50 | 1.4 ohm |
| MCCFR0W4J015JA50 | 1.5 ohm |
| MCCFR0W4J018JA50 | 1.8 ohm |
| MCCFR0W4J020JA50 | 2 ohm |
| MCCFR0W4J022JA50 | 2.2 ohm |
| MCCFR0W4J024JA50 | 2.4 ohm |
| MCCFR0W4J027JA50 | 2.7 ohm |
| MCCFR0W4J030JA50 | 3 ohm |
| MCCFR0W4J033JA50 | 3.3 ohm |
| MCCFR0W4J036JA50 | 3.6 ohm |
| MCCFR0W4J039JA50 | 3.9 ohm |
| MCCFR0W4J0435A50 | 4.3 ohm |
| MCCFR0W4J043JA50 | 4.3 ohm |
| MCCFR0W4J047JA50 | 4.7 ohm |
| MCCFR0W4J051JA50 | 5.1 ohm |
| MCCFR0W4J056JA50 | 5.6 ohm |
| MCCFR0W4J062JA50 | 6.2 ohm |
| MCCFR0W4J068JA50 | 6.8 ohm |
| MCCFR0W4J075JA50 | 7.5 ohm |
| MCCFR0W4J082JA50 | 8.2 ohm |
| MCCFR0W4J091JA50 | 9.1 ohm |
| MCCFR0W4J0100A50 | 10 ohm |
| MCCFR0W4J0110A50 | 11 ohm |
| MCCFR0W4J0120A50 | 12 ohm |
| MCCFR0W4J0130A50 | 13 ohm |
| MCCFR0W4J0150A50 | 15 ohm |
| MCCFR0W4J0160A50 | 16 ohm |
| MCCFR0W4J0180A50 | 18 ohm |
| MCCFR0W4J0200A50 | 20 ohm |
| MCCFR0W4J0220A50 | 22 ohm |
| MCCFR0W4J0240A50 | 24 ohm |
| MCCFR0W4J0270A50 | 27 ohm |
| MCCFR0W4J0300A50 | 30 ohm |
| MCCFR0W4J0330A50 | 33 ohm |
| MCCFR0W4J0360A50 | 36 ohm |
| MCCFR0W4J0390A50 | 39 ohm |
| MCCFR0W4J0430A50 | 43 ohm |
| MCCFR0W4J0470A50 | 47 ohm |
| MCCFR0W4J0510A50 | 51 ohm |
| MCCFR0W4J0560A50 | 56 ohm |
| MCCFR0W4J0620A50 | 62 ohm |
| MCCFR0W4J0680A50 | 68 ohm |
| MCCFR0W4J0750A50 | 75 ohm |
| MCCFR0W4J0820A50 | 82 ohm |
| MCCFR0W4J0910A50 | 91 ohm |
| MCCFR0W4J0101A50 | 100 ohm |
| MCCFR0W4J0111A50 | 110 ohm |
| MCCFR0W4J0121A50 | 120 ohm |
| MCCFR0W4J0131A50 | 130 ohm |
| MCCFR0W4J0151A50 | 150 ohm |
| MCCFR0W4J0161A50 | 160 ohm |

| Multicomp P/N # | Resistance |
|------------------|------------|
| MCCFR0W4J0181A50 | 180 ohm |
| MCCFR0W4J0201A50 | 200 ohm |
| MCCFR0W4J0221A50 | 220 ohm |
| MCCFR0W4J0241A50 | 240 ohm |
| MCCFR0W4J0271A50 | 270 ohm |
| MCCFR0W4J0301A50 | 300 ohm |
| MCCFR0W4J0331A50 | 330 ohm |
| MCCFR0W4J0361A50 | 360 ohm |
| MCCFR0W4J0391A50 | 390 ohm |
| MCCFR0W4J0431A50 | 430 ohm |
| MCCFR0W4J0471A50 | 470 ohm |
| MCCFR0W4J0511A50 | 510 ohm |
| MCCFR0W4J0561A50 | 560 ohm |
| MCCFR0W4J0621A50 | 620 ohm |
| MCCFR0W4J0681A50 | 680 ohm |
| MCCFR0W4J0751A50 | 750 ohm |
| MCCFR0W4J0821A50 | 820 ohm |
| MCCFR0W4J0911A50 | 910 ohm |
| MCCFR0W4J0102A50 | 1 kohm |
| MCCFR0W4J0112A50 | 1.1 kohm |
| MCCFR0W4J0122A50 | 1.2 kohm |
| MCCFR0W4J0132A50 | 1.3 kohm |
| MCCFR0W4J0152A50 | 1.5 kohm |
| MCCFR0W4J0162A50 | 1.6 kohm |
| MCCFR0W4J0182A50 | 1.8 kohm |
| MCCFR0W4J0202A50 | 2 kohm |
| MCCFR0W4J0222A50 | 2.2 kohm |
| MCCFR0W4J0242A50 | 2.4 kohm |
| MCCFR0W4J0272A50 | 2.7 kohm |
| MCCFR0W4J0302A50 | 3 kohm |
| MCCFR0W4J0332A50 | 3.3 kohm |
| MCCFR0W4J0362A50 | 3.6 kohm |
| MCCFR0W4J0392A50 | 3.9 kohm |
| MCCFR0W4J0432A50 | 4.3 kohm |
| MCCFR0W4J0472A50 | 4.7 kohm |
| MCCFR0W4J0512A50 | 5.1 kohm |
| MCCFR0W4J0562A50 | 5.6 kohm |
| MCCFR0W4J0622A50 | 6.2 kohm |
| MCCFR0W4J0682A50 | 6.8 kohm |
| MCCFR0W4J0752A50 | 7.5 kohm |
| MCCFR0W4J0822A50 | 8.2 kohm |
| MCCFR0W4J0912A50 | 9.1 kohm |
| MCCFR0W4J0103A50 | 10 kohm |
| MCCFR0W4J0113A50 | 11 kohm |
| MCCFR0W4J0123A50 | 12 kohm |
| MCCFR0W4J0133A50 | 13 kohm |
| MCCFR0W4J0153A50 | 15 kohm |
| MCCFR0W4J0163A50 | 16 kohm |
| MCCFR0W4J0183A50 | 18 kohm |
| MCCFR0W4J0203A50 | 20 kohm |
| MCCFR0W4J0223A50 | 22 kohm |
| MCCFR0W4J0243A50 | 24 kohm |
| MCCFR0W4J0273A50 | 27 kohm |
| MCCFR0W4J0303A50 | 30 kohm |
| MCCFR0W4J0333A50 | 33 kohm |
| MCCFR0W4J0363A50 | 36 kohm |
| MCCFR0W4J0393A50 | 39 kohm |

| Multicomp P/N # | Resistance |
|------------------|------------|
| MCCFR0W4J0433A50 | 43 kohm |
| MCCFR0W4J0473A50 | 47 kohm |
| MCCFR0W4J0513A50 | 51 kohm |
| MCCFR0W4J0563A50 | 56 kohm |
| MCCFR0W4J0623A50 | 62 kohm |
| MCCFR0W4J0683A50 | 68 kohm |
| MCCFR0W4J0753A50 | 75 kohm |
| MCCFR0W4J0823A50 | 82 kohm |
| MCCFR0W4J0913A50 | 91 kohm |
| MCCFR0W4J0104A50 | 100 kohm |
| MCCFR0W4J0114A50 | 110 kohm |
| MCCFR0W4J0124A50 | 120 kohm |
| MCCFR0W4J0134A50 | 130 kohm |
| MCCFR0W4J0154A50 | 150 kohm |
| MCCFR0W4J0164A50 | 160 kohm |
| MCCFR0W4J0184A50 | 180 kohm |
| MCCFR0W4J0204A50 | 200 kohm |
| MCCFR0W4J0224A50 | 220 kohm |
| MCCFR0W4J0244A50 | 240 kohm |
| MCCFR0W4J0274A50 | 270 kohm |
| MCCFR0W4J0304A50 | 300 kohm |
| MCCFR0W4J0334A50 | 330 kohm |
| MCCFR0W4J0364A50 | 360 kohm |
| MCCFR0W4J0394A50 | 390 kohm |
| MCCFR0W4J0434A50 | 430 kohm |
| MCCFR0W4J0474A50 | 470 kohm |
| MCCFR0W4J0514A50 | 510 kohm |
| MCCFR0W4J0564A50 | 560 kohm |
| MCCFR0W4J0624A50 | 620 kohm |
| MCCFR0W4J0684A50 | 680 kohm |
| MCCFR0W4J0754A50 | 750 kohm |
| MCCFR0W4J0824A50 | 820 kohm |
| MCCFR0W4J0914A50 | 910 kohm |
| MCCFR0W4J0105A50 | 1 Mohm |
| MCCFR0W4J0115A50 | 1.1 Mohm |
| MCCFR0W4J0125A50 | 1.2 Mohm |
| MCCFR0W4J0135A50 | 1.3 Mohm |
| MCCFR0W4J0155A50 | 1.5 Mohm |
| MCCFR0W4J0165A50 | 1.6 Mohm |
| MCCFR0W4J0185A50 | 1.8 Mohm |
| MCCFR0W4J0205A50 | 2 Mohm |
| MCCFR0W4J0225A50 | 2.2 Mohm |
| MCCFR0W4J0245A50 | 2.4 Mohm |
| MCCFR0W4J0275A50 | 2.7 Mohm |
| MCCFR0W4J0305A50 | 3 Mohm |
| MCCFR0W4J0335A50 | 3.3 Mohm |
| MCCFR0W4J0365A50 | 3.6 Mohm |
| MCCFR0W4J0395A50 | 3.9 Mohm |
| MCCFR0W4J0475A50 | 4.7 Mohm |
| MCCFR0W4J0515A50 | 5.1 Mohm |
| MCCFR0W4J0565A50 | 5.6 Mohm |
| MCCFR0W4J0625A50 | 6.2 Mohm |
| MCCFR0W4J0685A50 | 6.8 Mohm |
| MCCFR0W4J0755A50 | 7.5 Mohm |
| MCCFR0W4J0825A50 | 8.2 Mohm |
| MCCFR0W4J0915A50 | 9.1 Mohm |
| MCCFR0W4J0106A50 | 10 Mohm |

ALL RIGHTS RESERVED. NO PORTION OF THIS PUBLICATION, WHETHER IN WHOLE OR IN PART CAN BE REPRODUCED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPC TECHNOLOGY.

SPC-F004.DWG

SIZE DWG. NO.

A

TA-668

ELECTRONIC FILE

TA-668.DWG

REV

A

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

SCALE: NTS

U.O.M.: Millimeters

SHEET: 3 OF 3