

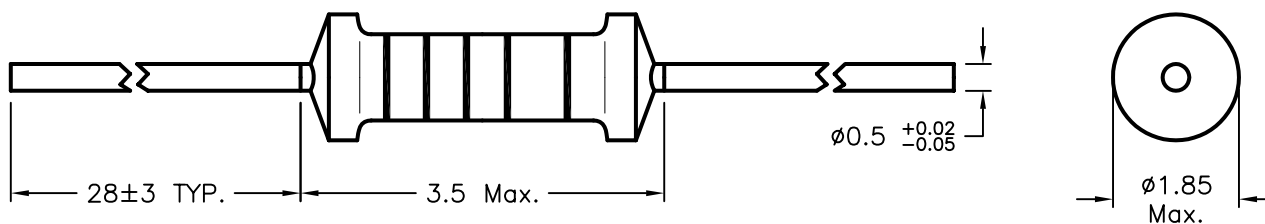
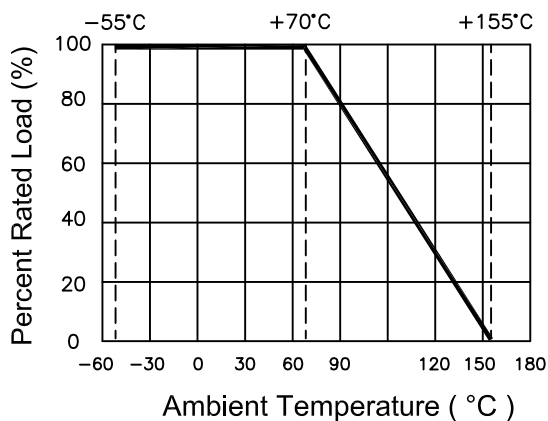
| DCP # | REV | DESCRIPTION | DRAWN | DATE | CHECKD | DATE | APPRVD | DATE |
|-------|-----|-------------|-------|----------|--------|----------|--------|----------|
| 1861 | A | RELEASED | EYO | 10/31/05 | HO | 10/31/05 | JWM | 10/31/05 |
| 1995 | B | Parts Added | JN | 01/08/09 | JN | 01/08/09 | JN | 01/08/09 |


 RoHS
Compliant

| Layer Name | Material |
|-----------------|---|
| Basic Body | Rod Type Ceramics |
| Resistance Film | Metal 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 : Sky blue) |
| Color Code | Epoxy Resin |

GENERAL SPECIFICATIONS:

- Rating Wattage @ 70°C: 0.125W
- Dielectric Withstanding Voltage: 400V
- Maximum Working Voltage: 200V
- Maximum Overload Voltage: 400V
- Tolerance: ±1%
- T.C.R.: ±50PPM/°C
- 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 Precision Metal Film Resistors, 1/8 W, 1% | | |
| | CHECKED BY: | DATE: | SIZE | DWG. NO. | ELECTRONIC FILE |
| | HISHAM ODISH | 10/31/05 | A | TA-667 | TA-667.DWG |
| | 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 1% of resistance tolerance | | | | | | | | | | | | | | | |
| Temperature coefficient | Within the temperature coefficient specified below: ±50 PPM/°C Maximum | 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) | | | | | | | | | | | | | | | |
| Short time overload | Resistance change rate is ±(0.5% +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 | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | |
| Pulse overload | Resistance change rate is ±(1% +0.05Ω) Max. with no evidence of mechanical damage. | 5.8 Resistance change after 10,000 cycles (1 second "ON", 25 seconds "OFF") at 4 times * RCWV. | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | |
| Resistance to solvent | No deterioration of protective coating and markings. | 6.9 Specimens shall be immersed in a bath of trichroethane completely for 3 mins with ultrasonic. | | | | | | | | | | | | | | | |
| 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 | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Resistance Value</td> <td>ΔR/R</td> </tr> <tr> <td>Normal type</td> <td>±1.5%</td> </tr> </table> | Resistance Value | ΔR/R | Normal type | ±1.5% | 7.9 Resistance change after 1,000 hours (1.5 hours "ON, 0.5 hour "OFF") at * RCWV in humidity test chamber controlled at 40°C±2°C and 90 to 95% relative humidity. | | | | | | | | | | | |
| Resistance Value | ΔR/R | | | | | | | | | | | | | | | | |
| Normal type | ±1.5% | | | | | | | | | | | | | | | | |
| Load life | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Resistance Value</td> <td>ΔR/R</td> </tr> <tr> <td>Normal type</td> <td>±1.5%</td> </tr> </table> | Resistance Value | ΔR/R | Normal type | ±1.5% | 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. | | | | | | | | | | | |
| Resistance Value | ΔR/R | | | | | | | | | | | | | | | | |
| Normal type | ±1.5% | | | | | | | | | | | | | | | | |

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

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|---|------------|---------------------|-----------------|-----|
| 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. | ELECTRONIC FILE | REV |
| | A | TA-667 | TA-667.DWG | B |
| DOC. NO. SPC-F004 * Effective: 7/8/02 * DCP No: 1398 | SCALE: NTS | U.O.M.: Millimeters | SHEET: 2 OF 3 | |

| Mfg. P/N | Resistance |
|------------------|------------|
| MCMF0W8FF100JA20 | 10 ohm |
| MCMF0W8FF1000A20 | 100 ohm |
| MCMF0W8FF1001A20 | 1 kohm |
| MCMF0W8FF1002A20 | 10 kohm |
| MCMF0W8FF1003A20 | 100 kohm |
| MCMF0W8FF1004A20 | 1 Mohm |
| MCMF0W8FF110JA20 | 11 ohm |
| MCMF0W8FF1100A20 | 110 ohm |
| MCMF0W8FF1102A20 | 11 kohm |
| MCMF0W8FF120JA20 | 12 ohm |
| MCMF0W8FF1200A20 | 120 ohm |
| MCMF0W8FF1202A20 | 12 kohm |
| MCMF0W8FF1203A20 | 120 kohm |
| MCMF0W8FF130JA20 | 13 ohm |
| MCMF0W8FF1300A20 | 130 ohm |
| MCMF0W8FF150JA20 | 15 ohm |
| MCMF0W8FF1500A20 | 150 ohm |
| MCMF0W8FF1502A20 | 15 kohm |
| MCMF0W8FF1503A20 | 150 kohm |
| MCMF0W8FF160JA20 | 16 ohm |
| MCMF0W8FF1600A20 | 160 ohm |
| MCMF0W8FF180JA20 | 18 ohm |
| MCMF0W8FF1800A20 | 180 ohm |
| MCMF0W8FF1802A20 | 18 kohm |
| MCMF0W8FF1803A20 | 180 kohm |
| MCMF0W8FF200JA20 | 20 ohm |
| MCMF0W8FF2000A20 | 200 ohm |
| MCMF0W8FF220JA20 | 22 ohm |
| MCMF0W8FF2200A20 | 220 ohm |
| MCMF0W8FF2202A20 | 22 kohm |
| MCMF0W8FF2203A20 | 220 kohm |
| MCMF0W8FF240JA20 | 24 ohm |
| MCMF0W8FF2400A20 | 240 ohm |
| MCMF0W8FF2402A20 | 24 kohm |
| MCMF0W8FF270JA20 | 27 ohm |
| MCMF0W8FF2700A20 | 270 ohm |
| MCMF0W8FF2702A20 | 27 kohm |
| MCMF0W8FF2703A20 | 270 kohm |
| MCMF0W8FF300JA20 | 30 ohm |
| MCMF0W8FF3000A20 | 300 ohm |
| MCMF0W8FF330JA20 | 33 ohm |
| MCMF0W8FF3300A20 | 330 ohm |
| MCMF0W8FF3302A20 | 33 kohm |
| MCMF0W8FF3303A20 | 330 kohm |
| MCMF0W8FF360JA20 | 36 ohm |
| MCMF0W8FF3600A20 | 360 ohm |
| MCMF0W8FF390JA20 | 39 ohm |

| Mfg. P/N | Resistance |
|------------------|------------|
| MCMF0W8FF3900A20 | 390 ohm |
| MCMF0W8FF3902A20 | 39 kohm |
| MCMF0W8FF3903A20 | 390 kohm |
| MCMF0W8FF430JA20 | 43 ohm |
| MCMF0W8FF4300A20 | 430 ohm |
| MCMF0W8FF470JA20 | 47 ohm |
| MCMF0W8FF4700A20 | 470 ohm |
| MCMF0W8FF4702A20 | 47 kohm |
| MCMF0W8FF4703A20 | 470 kohm |
| MCMF0W8FF510JA20 | 51 ohm |
| MCMF0W8FF5100A20 | 510 ohm |
| MCMF0W8FF560JA20 | 56 ohm |
| MCMF0W8FF5600A20 | 560 ohm |
| MCMF0W8FF5602A20 | 56 kohm |
| MCMF0W8FF5603A20 | 560 kohm |
| MCMF0W8FF680JA20 | 68 ohm |
| MCMF0W8FF6800A20 | 680 ohm |
| MCMF0W8FF6802A20 | 68 kohm |
| MCMF0W8FF6803A20 | 680 kohm |
| MCMF0W8FF750JA20 | 75 ohm |
| MCMF0W8FF820JA20 | 82 ohm |
| MCMF0W8FF8200A20 | 820 ohm |
| MCMF0W8FF8202A20 | 82 kohm |
| MCMF0W8FF8203A20 | 820 Kohm |
| MCMF0W8FF910JA20 | 91 ohm |
| MCMF0W8FF1101A20 | 1.1 kohm |
| MCMF0W8FF1103A20 | 110 kohm |
| MCMF0W8FF1201A20 | 1.2 kohm |
| MCMF0W8FF1301A20 | 1.3 kohm |
| MCMF0W8FF1302A20 | 13 kohm |
| MCMF0W8FF1303A20 | 130 kohm |
| MCMF0W8FF1501A20 | 1.5 kohm |
| MCMF0W8FF1601A20 | 1.6 kohm |
| MCMF0W8FF1602A20 | 16 kohm |
| MCMF0W8FF1603A20 | 160 kohm |
| MCMF0W8FF1801A20 | 1.8 kohm |
| MCMF0W8FF2001A20 | 2 kohm |
| MCMF0W8FF2002A20 | 20 kohm |
| MCMF0W8FF2003A20 | 200 kohm |
| MCMF0W8FF2201A20 | 2.2 kohm |
| MCMF0W8FF2401A20 | 2.4 kohm |
| MCMF0W8FF2403A20 | 240 kohm |
| MCMF0W8FF2701A20 | 2.7 kohm |
| MCMF0W8FF3001A20 | 3 kohm |
| MCMF0W8FF3002A20 | 30 kohm |
| MCMF0W8FF3003A20 | 300 kohm |
| MCMF0W8FF3301A20 | 3.3 kohm |

| Mfg. P/N | Resistance |
|------------------|------------|
| MCMF0W8FF3601A20 | 3.6 kohm |
| MCMF0W8FF3602A20 | 36 kohm |
| MCMF0W8FF3603A20 | 360 kohm |
| MCMF0W8FF3901A20 | 3.9 kohm |
| MCMF0W8FF4301A20 | 4.3 kohm |
| MCMF0W8FF4302A20 | 43 kohm |
| MCMF0W8FF4303A20 | 430 kohm |
| MCMF0W8FF4701A20 | 4.7 kohm |
| MCMF0W8FF5101A20 | 5.1 kohm |
| MCMF0W8FF5102A20 | 51 kohm |
| MCMF0W8FF5103A20 | 510 kohm |
| MCMF0W8FF5601A20 | 5.6 kohm |
| MCMF0W8FF620JA20 | 62 ohm |
| MCMF0W8FF6200A20 | 620 ohm |
| MCMF0W8FF6201A20 | 6.2 kohm |
| MCMF0W8FF6202A20 | 62 kohm |
| MCMF0W8FF6203A20 | 620 kohm |
| MCMF0W8FF6801A20 | 6.8 kohm |
| MCMF0W8FF7500A20 | 750 ohm |
| MCMF0W8FF7501A20 | 7.5 kohm |
| MCMF0W8FF7502A20 | 75 kohm |
| MCMF0W8FF7503A20 | 750 kohm |
| MCMF0W8FF8201A20 | 8.2 kohm |
| MCMF0W8FF9100A20 | 910 ohm |
| MCMF0W8FF9101A20 | 9.1 kohm |
| MCMF0W8FF9102A20 | 91 kohm |
| MCMF0W8FF9103A20 | 910 kohm |
| MCMF0W8FF1302A20 | 13kohm |
| MCMF0W8FF2001A20 | 2kohm |
| MCMF0W8FF2201A20 | 2.2kohm |
| MCMF0W8FF2701A20 | 2.7kohm |
| MCMF0W8FF4301A20 | 4.3kohm |
| MCMF0W8FF4701A20 | 4.7kohm |
| MCMF0W8FF5101A20 | 5.1kohm |
| MCMF0W8FF5601A20 | 5.6kohm |
| MCMF0W8FF620JA20 | 62ohm |

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SPC-F004.DWG

SIZE DWG. NO.

A TA-667

ELECTRONIC FILE

TA-667.DWG

REV

B

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

SCALE: NTS

U.O.M.: Millimeters

SHEET: 3 OF 3