

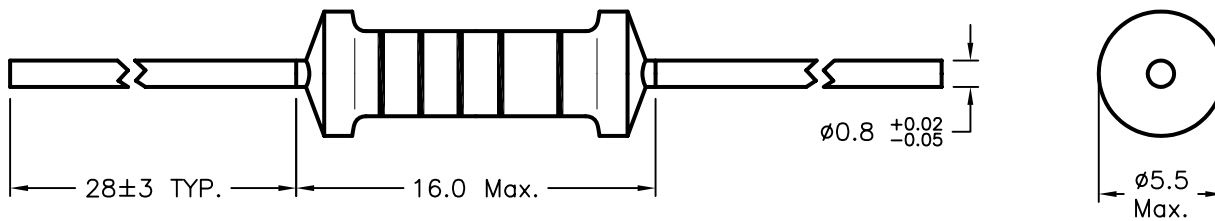
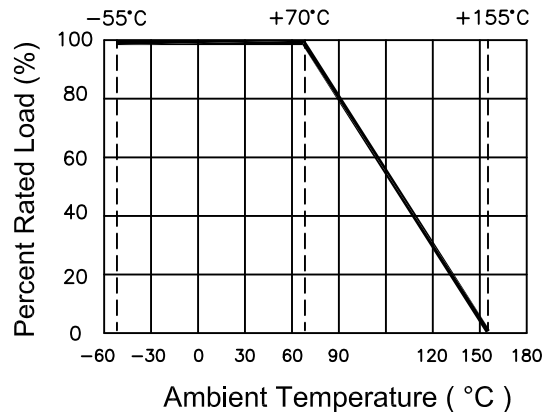
DCP #	REV	DESCRIPTION	DRAWN	DATE	CHECKD	DATE	APPRVD	DATE
1861	A	RELEASED	EYO	11/02/05	HO	11/2/05	JWM	10/31/05


 RoHS
Compliant

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: 2W
- Dielectric Withstanding Voltage: 1000V
- Maximum Working Voltage: 500V
- Maximum Overload Voltage: 1000V
- Resistance 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	11/02/05	RoHS Compliant Carbon Film Resistors, 2W, 5%			
	CHECKED BY:	DATE:	SIZE	DWG. NO.	ELECTRONIC FILE	REV
	HISHAM ODISH	11/2/05	A	TA-673	TA-673.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 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.		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	ΔR/R	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	±3%																
Load life	Resistance Value	ΔR/R	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	±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-673

ELECTRONIC FILE

TA-673.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
MCCFR02SJ047JA19	4.7 ohm
MCCFR02SJ0100A19	10 ohm
MCCFR02SJ0150A19	15 ohm
MCCFR02SJ0220A19	22 ohm
MCCFR02SJ0330A19	33 ohm
MCCFR02SJ0470A19	47 ohm
MCCFR02SJ0510A19	51 ohm
MCCFR02SJ0680A19	68 ohm
MCCFR02SJ0101A19	100 ohm
MCCFR02SJ0111A19	110 ohm
MCCFR02SJ0151A19	150 ohm
MCCFR02SJ0181A19	180 ohm
MCCFR02SJ0201A19	200 ohm
MCCFR02SJ0221A19	220 ohm
MCCFR02SJ0331A19	330 ohm
MCCFR02SJ0391A19	390 ohm
MCCFR02SJ0471A19	470 ohm
MCCFR02SJ0681A19	680 ohm
MCCFR02SJ0102A19	1 kohm
MCCFR02SJ0122A19	1.2 kohm
MCCFR02SJ0152A19	1.5 kohm
MCCFR02SJ0182A19	1.8 kohm
MCCFR02SJ0202A19	2 kohm
MCCFR02SJ0222A19	2.2 kohm
MCCFR02SJ0332A19	3.3 kohm
MCCFR02SJ0472A19	4.7 kohm
MCCFR02SJ0682A19	6.8 kohm
MCCFR02SJ0822A19	8.2 kohm
MCCFR02SJ0103A19	10 kohm
MCCFR02SJ0123A19	12 kohm
MCCFR02SJ0153A19	15 kohm
MCCFR02SJ0183A19	18 kohm
MCCFR02SJ0203A19	20 kohm
MCCFR02SJ0223A19	22 kohm
MCCFR02SJ0333A19	33 kohm
MCCFR02SJ0473A19	47 kohm
MCCFR02SJ0683A19	68 kohm
MCCFR02SJ0104A19	100 kohm
MCCFR02SJ0124A19	120 kohm
MCCFR02SJ0154A19	150 kohm
MCCFR02SJ0184A19	180 kohm
MCCFR02SJ0224A19	220 kohm
MCCFR02SJ0334A19	330 kohm
MCCFR02SJ0474A19	470 kohm
MCCFR02SJ0684A19	680 kohm
MCCFR02SJ0105A19	1 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-673

ELECTRONIC FILE

TA-673.DWG

REV

A

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

SCALE: NTS

U.O.M.: Millimeters

SHEET: 3 OF 3