CARBON FILM FIXED RESISTOR

CR (EPOXY COATING TYPE)
FCF (FLAME－PROOF COATING TYPE)

INTRODUCTION

CR

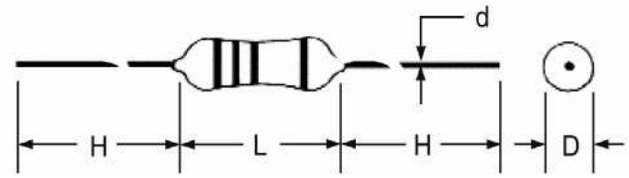
Carbon Film Resister is the earliest and most popular type of resistor which can be used in almost all kinds of electronic products. The resistive element is a high grade ceramic rod which is a homogenous film of pure carbon that is deposited by vacuum heating process to produce electricity conductivity on the surface. Fully automation and mass production on capping, sorting, cutting, welding, coating and double－checking which comes out stable quality, high reliability and economic cost for SYNTON-TECH's CR series.

FCF

Flame-proof carbon film resistors are coated with layers of non-flame lacquer which is resistant to 800 ℃ high temperature without causing crack, breakage, or even a fire hazard. All SYNTON-TECH's FCF series meet overload tests in accordance with UL specification # 1412.

FEATURES

- Met the requirements of JIS－C－5201 and MIL－R－22684B!
- The most economic industrial investment!
- Quicker dissipation of heat!
- Lower temperature rise!
- Small shelf life drift!
- Wider resistance range : 1Ω～10 MegΩ
- Tolerance available : ±5%, ±2%, ±1%
- Wattage available : 1/16W, 1/8W, 1/6W, 1/4W, 1/3W, 1/2W, 1W, 2W, 3W
- Variety of packaging : Bulk, Tape in Box (Ammopack T-26, T-52, T-74), Tape on Reel, Cut-and-Formed.



SPECIFICATIONS

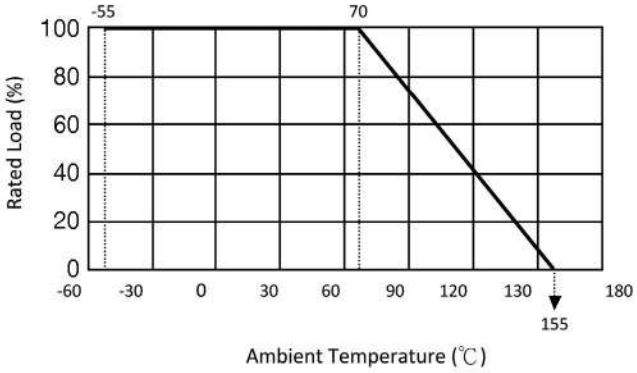
TYPE	POWER RATING @70℃	DIMENSIONS (mm)				MAXIMUM WORKING VOLTAGE	MAXIMUM OVERLOAD VOLTAGE	RESISTANCE RANGE
		L	D	H	d			
CR-12	1/16W, 1/8W, 1/6W	3.5±0.3	1.8±0.3	25±3	0.43±0.05	200V	400V	* STANDARD 1Ω～ 10MEGΩ * SPECIAL LOW TO 0.05Ω HIGH TO 100MEGΩ
CR-25S	1/4W	3.5±0.3	1.8±0.3	25±3	0.43±0.05	250V	500V	
CR-25	1/4W	6.0±0.5	2.3±0.3	25±3	0.54±0.1	250V	500V	
CR-33S	1/3W	6.0±0.5	2.3±0.3	25±3	0.54±0.1	350V	700V	
CR-50S	1/2W	6.0±0.5	2.3±0.3	25±3	0.54±0.1	350V	700V	
CR-50	1/2W	9.0±0.5	3.2±0.5	25±3	0.58±0.1	350V	700V	
CR-100SS	1W	6.0±0.5	2.3±0.5	25±3	0.54±0.1	350V	700V	
CR-100S	1W	9.0±0.5	3.2±0.5	25±3	0.58±0.1	500V	1000V	
CR-100	1W	11±1.0	4.5±0.5	35±3	0.75±0.1	500V	1000V	
CR-200SS	2W	9.0±0.5	3.2±0.5	25±3	0.58±0.1	500V	1000V	
CR-200S	2W	11±1.0	4.5±0.5	35±3	0.75±0.1	500V	1000V	
CR-200	2W	15±1.0	5.0±0.5	35±3	0.75±0.1	500V	1000V	
CR-200B	2W	17±1.0	6.0±0.5	35±3	0.75±0.1	500V	1000V	
CR-300S	3W	15±1.0	5.0±0.5	35±3	0.75±0.1	500V	1000V	
CR-300	3W	17±1.0	6.0±0.5	35±3	0.75±0.1	500V	1000V	

* FCF series have the same specifications as CR series except flame retardant.

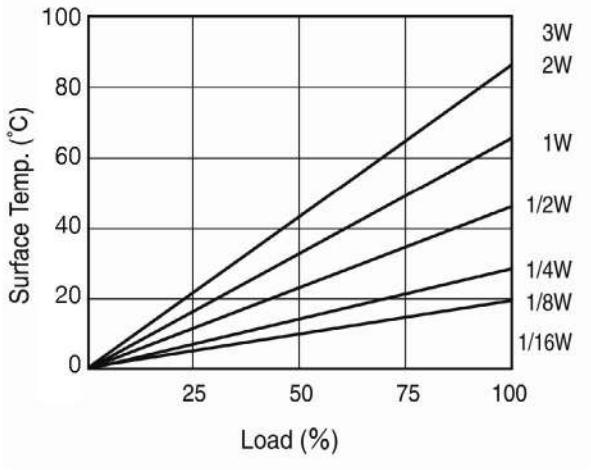
CHARACTERISTICS

TEST	TEST METHOD	LIMITS
TERMINAL STRENGTH	Pull a resistor with a weight of 1kg for 30 seconds. Bend the terminal lead wire with 500gs weight for 90 degree and bend it for 90 degree oppositely and return to normal.	Resistance shall not change more than ±0.3% or 0.5 ohm. No evidence of mechanical damage.
RESISTANCE TO SOLDERING HEAT	Immerse each terminal wire of a resistor up to 4±0.8mm away from the resistor body in the solder tank at 350±10℃ for 3±0.5 seconds. Measure its resistance in 3 hours.	Resistance shall not change more than ±1% or 0.5 ohm. No evidence of mechanical damage.
TEMPERATURE CYCLING	STEP 1 / 2 / 3 / 4 TEMP −55℃ / 25℃ / 155℃ / 25℃ TIME 30min. / 10−15min. / 30min. / 10−15min. From 1 to 4 is a cycle as shown above, repeat 5 cycles and measure its resistance after 1 hour in normal temperature.	Resistance shall not change more than ±1%. No evidence of mechanical damage.
VIBRATION	Total amplitude of 1.5mm. The frequency shall vary from 10HZ to 55HZ, for approximate 1 second. Make this test in the direction parallel to the resistor axis, and up/down for 2 hours respectively. (altogether 6 hours.)	Resistance shall not change more than ±0.5% or 0.5 ohm. No evidence of mechanical damage.
MOISTURE RESISTANCE	At temperature of 40±2℃ and a relative humidity of 90~95% for 1000±12 hours, under a rating DC voltage for 1 hour on and 1/2 hour off.	Resistance shall not change more than ±3%. No evidence of mechanical damage.
LOAD LIFE	Thermostatic chamber at a temperature of 70±5℃ under a rated DC voltage for 1.5 hours on and 1/2 hour off, repeat this cycle for 1000±12 hours.	Resistance shall not change more than ±3%. No evidence of mechanical damage.
TEMPERATURE COEFFICIENT	Resistance Temperature Coefficient : $\frac{R-R_o}{R_o} X \frac{1}{t-t_o} X 10^6$ ppm/℃. Where t : effective value of test temperature t_o : effective value of standard temperature R : resistance at t ℃ R_o : resistance at t_o ℃	10 ohm below : ±200ppm/℃ 56K ohm below : ±300ppm/℃ 56K~470K ohm : −500ppm/℃ 470K~1Meg ohm : −700ppm/℃ 1Meg up : −1000ppm/℃
DIELECTRIC WITHSTANDING VOLTAGE	Resistors shall be clamped in the trough of a 90 degree metallic V−block, apply AC between this electrode and another lead wire for 1 minute.	Resistance shall not change more than ±0.5%. No evidence of mechanical damage
NOISE	Quan−Tech Laboratories Inc. Model 515B	100K ohm below : 0.3μ V/V 100K ohm ~1M ohm below : 0.5μ V/V 1M ohm ~5.6M ohm : 1.0μ V/V
INSULATION RESISTANCE	Resistors shall be clamped in the trough of a 90 degree metallic V−block, apply DC 100V between this electrode and another lead wire for 1 minute.	1,000M ohm above.
SHORT−TIME OVERLOAD	Resistors shall be tested at 2.5 times rated voltage for 5 seconds at ambient room temperature.	Resistance shall not change more than ±1%. No evidence of mechanical damage.
RESISTANCE TO SOLVENTS	Immerse a resistor completely in reagent at a temperature of 20−25℃ for 30±5 seconds.	No evidence of mechanical damage.
SOLDERABILITY	Apply flux to the terminal wire of a resistor up to 4±0.8mm away from the resistor body and immerse the flux applied portion in the solder tank at 260±5℃ for 3±0.5 seconds.	More than 95% of a circumference of the immersed portion shall be completely covered with new solder.

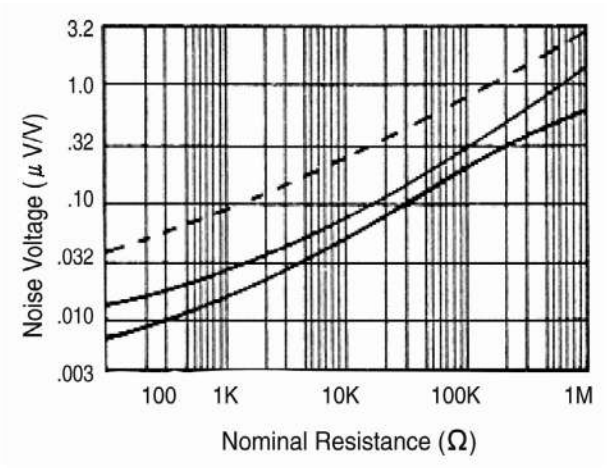
DERATING CURVE



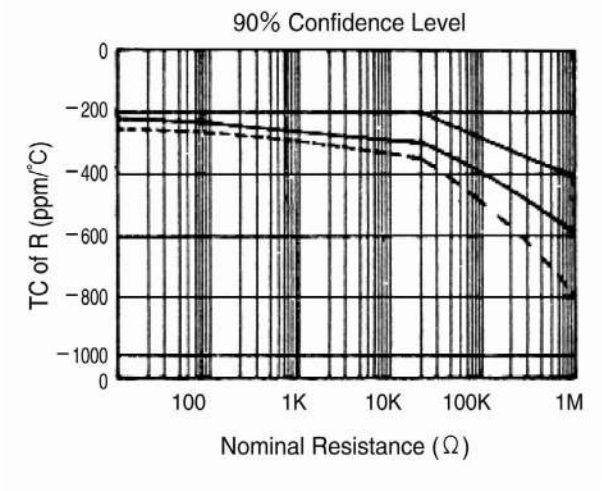
SURFACE TEMP RISE



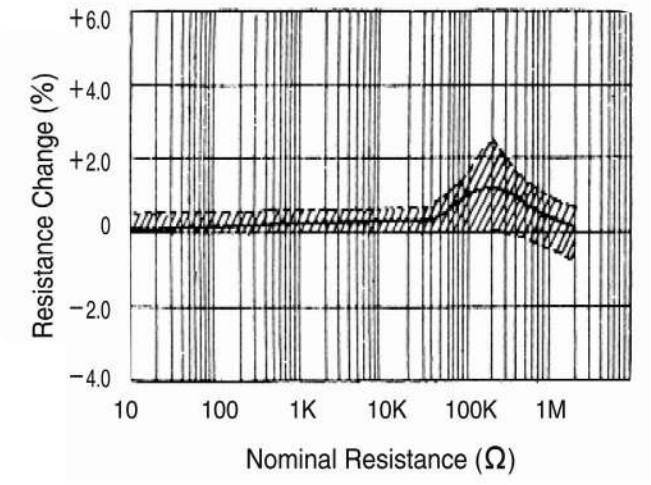
CURRENT NOISE



TEMPERATURE COEFFICIENT



LOAD STABILITY 1000 Hrs.



RESISTANCE DISTRIBUTION