YAGEO | Through Hole Resistors

Carbon Film Resistors



APPLICATIONS

- All general purpose applications
- Power applications

FEATURES

- AEC-Q200 qualified
- Wide resistance range
- High stability
- PPAP ready (CFR-25/CFR50S)
- RoHS compliant & halogen-free

ORDERING INFORMATION

Part number of the general purpose carbon film resistor are identified by the series, power rating, tolerance, packing, temperature coefficient, forming and resistance value.

PART NUMBER

CFR

<u>CFR</u> (1)	<u>200</u> (2)	<u>J</u> (3)	<u>T</u> (4)	<u>-</u> (5)	<u>73-</u> (6)	<u>100R</u> (7)			
(1) SER		IE							
CFR	Series								
(2) POV	VER RAT	ING							
-12 :	= 1/6W			-50	= 1/2W		200 = 2W		
25S	= 1/4W			100	= 1W		3WS = 3W		
-25 :	= 1/4W			2W\$	5 = 2W		1WS = 1W		
50S	= 1/2W								
(3) TOL	ERANCE								
G =	±2%					J = ±5%			
(4) PAC	KAGING	i							
R =	Reel Pacl	k				B = Bulk	(
T =	Box Pack								
(5) TEN	IPERATU	IRE CO	EFF		IT OF R	ESISTAN	CE		
- = E	Based on	spec , p	leas	e refe	r to pag	je 4 Table	2.		
(6) FOF	MING								
26- :	= 26mm					M =	M-Type Forming		
52- :	= 52.4mm	ı				MT	= MT Type Forming		
73- :	= 73mm					MB	MB = M-form W/flat		
73G = 73mm, Φd≧0.6mm						FT = FT Type Forming			

- $26A = 26mm, \Phi d=0.4\pm0.02mm$ F = F Type

 $26C = 26mm, \Phi d=0.5\pm0.02mm$ FK = FK Type
- 26G = 26mm, Φd≧0.6mm
- 52A = 52.4mm, Φd=0.4±0.02mm
- 52B = 52.4mm, Φd=0.45±0.02mm
- 52C = 52.4mm, Φd=0.5±0.02mm
- 52G = 52.4mm, Φd≧0.6mm

52H = 52.4mm, non-painting on welding spot

FKK = FKK Type PN = PANAsert AV = AVIsert FB-= FB- Type (for -25&50S)welding spot

FFK = F-form Kink

Note:26mm, 52.4mm and 73mm represent dimension A of the axial type, please refer to the category of AXIAL/REEL TAPE SPECIFICATION for the detail.

(7) RESISTANCE VALUE

E24 Series Example: 100R = 100Ω, 10K = 10,000Ω, 1M = 1,000,000Ω <u>2</u> 16

DIMENSIONS

_

					Unit: mm
Normal	Miniature	L	ψD	Н	ψd
CFR-12	CFR 25S	3.4 ± 0.3	1.9 ± 0.2	28 ± 2.0	0.45 ± 0.05
CFR -25	CFR 50S	6.3 ± 0.5	2.4 ± 0.2	28 ± 2.0	0.55 ± 0.05
CFR -50	CFR 1WS	9.0 ± 0.5	3.3 ± 0.3	26 ± 2.0	0.55 ± 0.05
CFR 100	CFR 2WS	11.5 ± 1.0	4.5 ± 0.5	35 ± 2.0	0.8 ± 0.05
CFR 200	CFR 3WS	15.5 ± 1.0	5.0 ± 0.5	33 ± 2.0	0.8 ± 0.05

DERATING CURVE



ELECTRICAL CHARACTERISTICS

TABLE 1										
CHARACTERISTICS	CFR -12	CFR 25S	CFR -25	CFR 50S	CFR -50	CFR 1WS	CFR 100	CFR 2WS	CFR 200	CFR 3WS
Power Rating at 70 °C	1/6W	1/4W	1/4W	1/2W	1/2W	1W	1W	2W	2W	3W
Maximum Working Voltage	150V	200V	250V	300V	350V	400V	500V	500V	500V	500V
Maximum Overload Voltage	300V	400V	500V	600V	700V	800V	1000V	1000V	1000V	1000V
Voltage Proof on Insulation	300V	400V	500V	500V	500V	700V	1000V	1000V	1000V	1000V
Resistance Range	1Ω ~ 10	MΩ for E2	24 series \	alue						
Operating Temp. Range - 55°C to +155°C										
Temperature Coefficient	see Tab	ole 2								

Note: For resistance value out of above range is by request.

TABLE 2 TEMPERATURE COEFFICIENT

TYPE	Temp. Coefficient ppm/°C					
	Under 100KΩ	100K ~ 1MΩ	1M ~ 10MΩ			
CFR100, CFR200, CFR2WS CFR3WS	± 350	-500~0	-1500~0			
CFR-12 , CFR-25 , CFR-50 CFR25S , CFR50S , CFR1WS	- 500 ~ +350	-700~0	-1500~0			

TEST AND REQUIRMENTS

TEST	TEST METHOD	PROCEDURE	APPRAISE
Short Time Overload	IEC 60115-1 4.13	2.5 times RCWV for 5 sec.(Not more than maximum overload voltage)	±0.75%+0.05Ω
Voltage Proof on Insulation	IEC 60115-1 4.7	In V-Block for 60 sec. test voltage as above table	No Breakdown
Temperature Coefficient	IEC 60115-1 4.8	Between -55°C to +155°C	Ву Туре
Insulation Resistance	IEC 60115-1 4.6	In V-Block for 60 sec.	>1,000MΩ
Solderability	IEC 60115-1 4.17	245±5°C for 3±0.5 Sec.	95% Min. coverage
Solvent Resistance of Marking	IEC 60115-1 4.30	IPA for 5±0.5 Min. with ultrasonic	No deterioration of coatings and markings
Robustness of Terminations	IEC 60115-1 4.16	Direct load for 10 Sec. in the direction of the terminal leads	≥2.5Kg(24.5N)
Periodic-pulse Overload	IEC 60115-1 4.39	4 times RCWV(or Umax., whichever less) 10,000 cycles (1 Sec. on, 25 Sec.off)	±1.0%+0.05Ω
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C,90-95% RH for 56 days, loaded with 0.1 times RCWV (or Umax., whichever less)	±3.0%+0.05Ω
Endurance at 70°C	IEC 60115-1 4.25	70±2°C at RCWV(or Umax., whichever less) for 1,000 Hr.(1.5 Hr.on,0.5 Hr. off)	±3.0%+0.05Ω
Temperature Cycling	IEC 60115-1 4.19	-55°C → Room Temp. → +155°C → Room Temp.(5 cycles)	±1.0%+0.05Ω
Resistance to Soldering Heat	IEC 60115-1 4.18	260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body	±1.0%+0.05Ω



16

Note:.

RCWV (Rated Continuous Working Voltage):

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

V=√(P X R) or max. working voltage whichever is less Where V=Continuous rated DC or AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)

PULSE DIAGRAMS







1 1	
I Init'	mm
om.	

Normal	Miniature	а	Α	B1-B2 (Max.)	S (spacing)	T (max. deviation of spacing)		
CFR-12	CEDDES	6.05	52.4 ± 1.5	1.2	F			
	CFR255	0 ± 0.5	26.0 ± 1.5	1.0	- 5			
CFR-25		C · O F	52.4 ± 1.5	1.2	F	_		
	CFR303	0 ± 0.5	26.0 ± 1.5	1.0	- 5	1 mm per 10 spacing,		
CFR-50	CFR1WS	6 ± 0.5	52.4 ± 1.5	1.2	5			
CFR100		C · O F	73.0 ± 1.5	1.5	F			
	CFR2WS	ν ± 0.5	52.4 ± 1.5	1.2	5			
CFR200		NS 6±0.5	73.0 ± 1.5	1.5	- 10			
	CFK3WS		52.4 ± 1.5	1.2				

16

MARKING

4-BAND-CODE ±2%, ±5%								
COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERA	NCE		
BLACK	0	0	0	1Ω				
BROWN	1	1	1	10Ω				
RED	2	2	2	100Ω	± 2%	(G)		
ORANGE	3	3	3	1KΩ				
YELLOW	4	4	4	<u>10KΩ</u>				
GREEN	5	5	5	100K				
BLUE	6	6	6	1MΩ				
VIOLET	7	7	7	10MΩ				
GREY	8	8	8	0.001Ω				
WHITE	9	9	9	0.0001Ω				
GOLD				0.1Ω	±5%	(J)		
SILVER				0.01Ω				