



VISHAY INTERTECHNOLOGY, INC.



METAL FILM RESISTORS

CCF	MBx/SMA
CMF	MPR
CMF Fusible	MRS
CPF	NFR
DBU	NKS
FP	PR
FP...P	PR-L
FRJ	PTF
GSR	SFR
HMA0207	SR
HVR	UXx






Metal Film Resistors









Key Features

- A wide range of power ratings (0.05 W to 10 W)
- A wide resistance range (0.1 Ω to 50 M Ω)
- Low/High temperature performance (-65 $^{\circ}\text{C}$ to +230 $^{\circ}\text{C}$)
- Tight tolerance (down to $\pm 0.01\%$)
- Low temperature coefficient (down to ± 2 ppm/ $^{\circ}\text{C}$)
- Very low noise: -40 dB

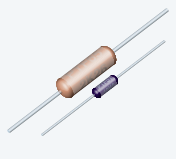
For available Military products (MIL-PRF-39017, MIL-PRF-55182, MIL-PRF-22684 and MIL-R-10509), consult Military Film Ledged Selector Guide.

Product	Model	Wattage Ratings	Resistance Range	TCR ppm/ $^{\circ}\text{C}$	Tolerance	Application	
	CCF07	0.25/0.50	10 Ω - 1 M Ω 1.1 M Ω - 2 M Ω	± 100 ± 250	$\pm 2\%$, $\pm 5\%$ $\pm 5\%$	<ul style="list-style-type: none"> • Telephones • Base stations • Transmitters • TV/Cable • Video • Amplifiers • Modem • Copy machines • Computer monitors • Avionics • Automotive • Heat pumps • Dishwasher 	
	CCF50	0.33	10 Ω - 1 M Ω	± 100	$\pm 1\%$, $\pm 5\%$		
	CCF55	0.25/0.50	10 Ω - 3.01 M Ω	± 100	$\pm 1\%$		
	CCF60	0.50/0.75/1.0	10 Ω - 1 M Ω	± 100	$\pm 1\%$		
	CCF02	2.0	4.99 Ω - 1 M Ω	± 100	$\pm 1\%$, $\pm 5\%$		
	CMF50	0.05/0.1/0.125/0.25	10 Ω - 22 M Ω 10 Ω - 2.5 M Ω 10 Ω - 2.5 M Ω 10 Ω - 2.5 M Ω	± 150 , ± 200 ± 100 ± 50 ± 25	$\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 0.1\%$ to $\pm 5\%$ $\pm 0.1\%$ to $\pm 1\%$		
	CMF55	0.1/0.125/0.25/0.5	0.1 Ω - 50 M Ω 0.5 Ω - 50 M Ω 0.5 Ω - 50 M Ω 1 Ω - 22 M Ω 10 Ω - 5 M Ω 10 Ω - 2.5 M Ω 10 Ω - 2.5 M Ω	± 200 ± 200 ± 150 ± 100 ± 50 ± 50 ± 25	$\pm 2\%$, $\pm 5\%$ $\pm 1\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 0.1\%$ to $\pm 0.5\%$ $\pm 0.1\%$ to $\pm 1\%$		
	CMF07	0.25	1 Ω - 5 M Ω 5 Ω - 5 M Ω	± 150 , ± 200 ± 100	$\pm 2\%$, $\pm 5\%$ $\pm 2\%$, $\pm 5\%$		
	CMF60	0.125/0.25/0.5/0.75/1.0	0.1 Ω - 10 M Ω 0.5 Ω - 10 M Ω 0.5 Ω - 10 M Ω 1 Ω - 10 M Ω 10 Ω - 10 M Ω 10 Ω - 2.5 M Ω 10 Ω - 2.5 M Ω	± 200 ± 200 ± 150 ± 100 ± 50 ± 50 ± 25	$\pm 2\%$, $\pm 5\%$ $\pm 1\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 0.1\%$ to $\pm 0.5\%$ $\pm 0.1\%$ to $\pm 1\%$		
	CMF20	0.5/0.75/1.0	1 Ω - 10 M Ω 5 Ω - 10 M Ω	± 150 , ± 200 ± 100	$\pm 2\%$, $\pm 5\%$ $\pm 2\%$, $\pm 5\%$		
	CMF65	0.25 /0.5/0.75/1.0	0.1 Ω - 22 M Ω 0.5 Ω - 22 M Ω 0.5 Ω - 22 M Ω 1 Ω - 15 M Ω 10 Ω - 10 M Ω 10 Ω - 2.5 M Ω 10 Ω - 2.5 M Ω	± 200 ± 200 ± 150 ± 100 ± 50 ± 50 ± 25	$\pm 2\%$, $\pm 5\%$ $\pm 1\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 0.1\%$ to $\pm 0.5\%$ $\pm 0.1\%$ to $\pm 1\%$		
	CMF70	0.25/0.5/0.75/1.0	1 Ω - 22 M Ω 1 Ω - 15 M Ω 10 Ω - 10 M Ω 10 Ω - 2.5 M Ω 10 Ω - 2.5 M Ω	± 150 , ± 200 ± 100 ± 50 ± 50 ± 25	$\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 1\%$ to $\pm 5\%$ $\pm 0.1\%$ to $\pm 0.5\%$ $\pm 0.1\%$ to $\pm 1\%$		
		CMF55..39	0.25	4 Ω - 10 K Ω	± 100		$\pm 1\%$
CMF60..64		0.50	4 Ω - 23 K Ω				



Product	Model	Wattage Ratings	Resistance Range	TCR ppm/°C	Tolerance	Application
 GSR	GSR55	0.10 / 0.125	10 Ω - 2.5 MΩ	15, 25, 50	±0.05 % to ±1 %	<ul style="list-style-type: none"> • Harsh environments • Space • Avionics
	GSR57	0.125 / 0.25	10 Ω - 1.0 MΩ			
	GSR60	0.125 / 0.25	10 Ω - 3.0 MΩ			
	GSR65	0.25 / 0.50	10 Ω - 10.0 MΩ			
	GSR70	0.50 / 0.75	10 Ω - 10.0 MΩ			
	GSR75	1.0 / 2.0	10 Ω - 5.0 MΩ			
 MBx/SMA	MBA/SMA 0204	0.25, 0.4 0.07, 0.25	0.22 Ω - 10 MΩ 0.22 Ω - 332 KΩ	±50, ±25 ±25, ±15	5, 1, 0.5 0.25, 0.1	<ul style="list-style-type: none"> • Industrial • Telecommunications • Medical equipment • Test and measurement equipment
	MBB/SMA 0207	0.4, 0.6 0.11, 0.4	0.22 Ω - 22 MΩ 10 Ω - 1 MΩ	±50, ±25 ±25, ±15		
	MBE/SMA 0414	0.65, 1.0 0.17, 0.65	0.22 Ω - 22 MΩ 22 Ω - 1.5 MΩ	±50, ±25 ±25, ±15		
 UXx	UXA 0204	0.1	22 Ω - 221 KΩ	±10, ±5, ±2	0.25, 0.1 0.05, 0.01	<ul style="list-style-type: none"> • Precision test and measuring system • Design of calibration reference standards
	UXB 0207	0.25	10 Ω - 1 MΩ	±10, ±5, ±2		
	UXE 0414	0.5	22 Ω - 511 KΩ	±10, ±5	0.1, 0.05	
 MPR24	MPR24	0.125	4.99 Ω - 1 MΩ	±25, ±15 ±10, ±5	0.05, 0.02, 0.01	<ul style="list-style-type: none"> • Test and measurement equipment • Telecommunications
		0.25			0.5, 0.25, 0.1	
 MRS	MRS16	0.4	4.99 Ω - 1 MΩ	±50	1	<ul style="list-style-type: none"> • All general purpose applications
	MRS25	0.6	1 Ω - 10 MΩ			
 MBx/SMA VG06	MBA/SMA 0204 VG06	0.4	1 Ω - 5.11 MΩ	±50, ±15	1, 0.1	<ul style="list-style-type: none"> • Military • Avionics • Space
	MBB/SMA 0207 VG06	0.6	1 Ω - 10 MΩ	±50, ±15	1, 0.1	
	MBE/SMA 0414 VG06	1	1 Ω - 21.5 MΩ	±50, ±15	1, 0.1	
 MBA/SMA HF	MBA/SMA 0204 HF	0.25, 0.4	1.5 Ω - 470 Ω	±50	2, 1	<ul style="list-style-type: none"> • Telecommunications • Industrial electronics
 FRJ	FRJ50	N/A	0.010 Ω max	N/A	N/A	<ul style="list-style-type: none"> • Jumper
 NFR01/02/03	NRF01	1	0.47 Ω - 1 KΩ	±200	5	<ul style="list-style-type: none"> • Audio • Video
	NFR02	2				
	NFR03	3				
 PRL	PR02L	2	2 KΩ - 70 KΩ	±250	5	<ul style="list-style-type: none"> • Lamp ignition
	PR2.5L	2.5				
	PR2.5LS	2.5				

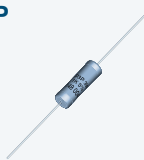



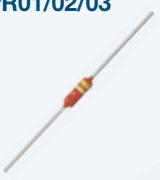



Product	Model	Wattage Ratings			Resistance Range	TCR ppm/°C	Tolerance	Application
		25°C	40°C	70°C				
	HVR25	0.25			100 KΩ - 22 MΩ 100 KΩ - 10 MΩ	±200	5 1	<ul style="list-style-type: none"> Power Supplies White goods, TV, electronic ballasts
	HVR37	0.5			100 KΩ - 33 MΩ 100 KΩ - 10 MΩ	±200	5 1	
	HVR68	1			100 KΩ - 10 MΩ	±200	5, 1	
	SR37	0.5			220 R - 10 KΩ	±250	10, 20	<ul style="list-style-type: none"> TV
	DB1U	N/A			0.006 Ω max	N/A	N/A	<ul style="list-style-type: none"> Jumper
	DB2U/DB4U				0.0045 Ω max 0.0025 Ω max			
	PTF51	0.05			15 Ω - 100 KΩ	±5, ±10, ±15	±0.02 % to ±1 %	<ul style="list-style-type: none"> Precision test equipment Instrumentation
	PTF56	0.125			15 Ω - 500 KΩ		±0.01 % to ±1 %	
	PTF65	0.25			15 Ω - 1 MΩ		±0.05 % to ±1 %	
	CPF1	1.0			0.1 Ω - 150 kΩ 0.5 Ω - 150 kΩ 0.5 Ω - 150 kΩ 1 Ω - 150 kΩ 5 Ω - 150 kΩ 5 Ω - 150 kΩ	±200 ±200 ±150 ±100 ±50 ±25	±2 %, ±5 % ±1 % ±1 % to ±5 % ±0.5 % to ±5 % ±0.1 % to ±5 % ±0.1 % to ±1 %	<ul style="list-style-type: none"> Small size, high power Automotive Industrial controls
	CPF2	2.0			0.1 Ω - 150 kΩ 0.5 Ω - 150 kΩ 0.5 Ω - 150 kΩ 1 Ω - 150 kΩ 5 Ω - 150 kΩ 5 Ω - 150 kΩ	±200 ±200 ±150 ±100 ±50 ±25	±2 %, ±5 % ±1 % ±1 % to ±5 % ±0.5 % to ±5 % ±0.1 % to ±5 % ±0.1 % to ±1 %	
	CPF3	3.0			0.1 Ω - 150 kΩ 1 Ω - 150 kΩ 1 Ω - 150 kΩ 1 Ω - 150 kΩ 8 Ω - 150 kΩ 8 Ω - 150 kΩ	±200 ±200 ±150 ±100 ±50 ±25	±2 %, ±5 % ±1 % ±1 % to ±5 % ±0.5 % to ±5 % ±0.1 % to ±5 % ±0.1 % to ±1 %	
	FP01/2 (FP1/2)	-	-	0.5	10 Ω - 1 MΩ	±150	±1 % to ±10 %	<ul style="list-style-type: none"> Telecommunications Power supplies Instrumentation
	FP0001 (FP1)	-	-	1	10 Ω - 1 MΩ			
	FP0032 (FP32)	-	-	1	10 Ω - 1 MΩ			
	FP0002 (FP2)	3.5	3	2	9 Ω - 1.5 MΩ			
	FP0042 (FP42)	-	-	2	10 Ω - 1.5 MΩ			
	FP0003 (FP3)	4	4	3	9 Ω - 1 MΩ			
	FP0004 (FP4)	5.5	5	4	6 Ω - 1 MΩ			
	FP0005 (FP5)	6.5	6	5	7 Ω - 1 MΩ			
	FP0007 (FP7)	7.5	-	7	8 Ω - 1 MΩ			
	FP0010 (FP10)	-	10	-	8 Ω - 1 MΩ			
	FP0067 (FP67)	5	-	-	5 Ω - 19 KΩ			
	FP0069 (FP69)	3	-	2	2.6 Ω - 1.5 MΩ			



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Product	Model	Wattage Ratings	Resistance Range	TCR ppm/°C	Tolerance	Application
	FP1/2P (FP1/2P)	0.5	10 Ω - 1 MΩ	±150	±1%, ±2%, ±5%	<ul style="list-style-type: none"> • Telecommunications • Pulse applications
	FP001P (FP1P)	1.0	10 Ω - 1 MΩ			
	FP002P (FP2P)	2.0	9 Ω - 1.5 MΩ			
	FP003P (FP3P)	3.0	9 Ω - 1 MΩ			
	FP069P (FP69P)	2.0	2.6 Ω - 1 MΩ			
	NKS2	0.4	0.1 Ω - 20 Ω	+ 2000 - 6000	±5, ±10 %, ±20 %	<ul style="list-style-type: none"> • Electronic scales • Measuring instruments • Industrial controls
	NKS4	0.7				
	HMA0207	0.8	4.7 Ω - 511 KΩ	±50	±1 %	<ul style="list-style-type: none"> • Electronic switch • Alert equipment • Industrial controls
	SFR16S	0.5	1 Ω - 3 MΩ 4.99 Ω - 3 MΩ	±100, ±250	5	<ul style="list-style-type: none"> • All general purpose applications
	SFR25	0.4	0.22 Ω - 10 MΩ 1 Ω - 10 MΩ		1	
	SFR25H	0.5	0.22 Ω - 10 MΩ 1 Ω - 10 MΩ		5	
	PR01	0.6	0.22 Ω - 1 Ω	±250	5, 1	<ul style="list-style-type: none"> • All general purpose power applications
		1.0	1 Ω - 1 MΩ			
	PR02	1.2	0.33 Ω - 1 Ω			
		2	1 Ω - 1 MΩ			
	PR03	1.6	0.68 Ω - 1 Ω			
3	1 Ω - 1 MΩ					
	NFR25	0.33	0.22 Ω - 15 KΩ	Refer to Datasheet	5	<ul style="list-style-type: none"> • Audio • Video
	NFR25H	0.5				

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