

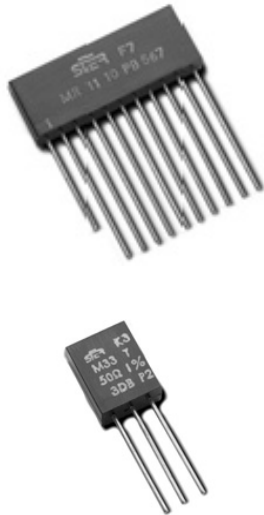


# Quick Reference Guide

## METAL FILM TECHNOLOGY

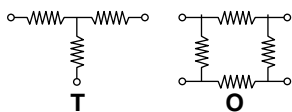


MOLDED RESISTORS							
REFERENCES	DATASHEET	POWER RATING	RES. RANGE	TOL.	TEMP. LIMITS	TYP. TCR	DIMENSIONS L x I x E
	NO.		$\Omega$	%	$^{\circ}\text{C}$	ppm/ $^{\circ}\text{C}$	mm
MSP 1C	50003	25 $^{\circ}\text{C}$ 0.5 W	10 to 1M	$\pm 0.1$ $\pm 0.5$ $\pm 1$	- 55 + 155	$\pm 25$ $\pm 50$	6.9 x 3.8 x 3.8
MSP 2C		1 W					11.4 x 7 x 5

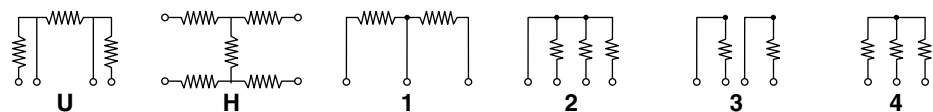


SERIES	STYLE	DIAGRAM	DATASHEET	INDIVIDUAL RESISTOR			TCR	DIMENSIONS L x H x T	
			NO.	POWER RATING	OHMIC VALUE	TOL.		ppm/ $^{\circ}\text{C}$	mm
				$\Omega$	%				
MR	32 S	1	52018	0.1 per element	0.1 to 10M	$\pm 0.1$ to $\pm 1$	$\pm 5$ to $\pm 50$	9.5 x 11 x 4.3	
	32 P	2							
	33 P or T	4							
	42 E	3							
	43 S or U	1						12 x 11 x 4.3	
	43 P	2							
	44 P	4							
	54 S	1							
	54 P	2						14.6 x 11 x 4.3	
	55 P	4							
	76 S	1							
	76 P	2							
	77 P	4						19.7 x 11 x 4.3	
	1110 S	1							
1110 P	2	30 x 11 x 4.3							
1111 P	4								

### Attenuator



### Networks Schematic Diagram



### METAL FILM TECHNOLOGY

REQUIRED PARAMETERS		SEMI PRECISION				PRECISION STABILITY						HIGH OHMIC VALUES		
VISHAY SFERNICE SERIES DOCUMENT NO.		RCMM 52006				RCMS 52007						RCMX 52008		
Stability		2 % 1000 h P <sub>r</sub> at 70 °C				0.5 % 1000 h P <sub>r</sub> at 70 °C 1 % 1000 h 2 P <sub>r</sub> at 70 °C						1 % 1000 h P <sub>r</sub> at 70 °C		
Climatic Category		- 65 °C/+ 155 °C/56 days				- 65 °C/+ 155 °C/56 days						- 65 °C/+ 125 °C/10 days		
ΔR/R Moisture Test		5 %				1 %						1.5 %		
Sfernice Style		€ 02	€ 05	€ 1		€ 02		€ 05	€ 1		02	05	1	
Dimensions max. mm		∅	2.5	3.75	6.4	2.5		3.75	6.4	2.5	3.75	6.4		
		L	6.7	10.4	16.5	6.7		10.4	16.5	6.7	10.4	16.5		
Specification Type	NFC/CECC	RC21U	RC32	RC31U	RC41U	RS58Y	RS64Y	RS71Y	RS63Y	RS69Y	RS68Y	-	-	-
	CECC	BV	-	CV	-	BC	-	-	CC	-	DC	-	-	-
Nominal Temperature Coeff.	P <sub>r</sub> 70 °C	0.25 W	0.50 W	0.5 W	1 W	0.125 W	0.250 W	0.500 W	0.25 W	0.500 W	0.500 W	0.125 W	0.250 W	0.500 W
K2 ± 100 ppm/°C	Limiting Element Voltage	300 V	350 V	350 V	400 V	300 V	300 V	350 V	350 V	350 V	400 V	500 V	800 V	1200 V
	Critical Res.	-	245 kΩ	245 kΩ	160 kΩ	-	-	245 kΩ	490 kΩ	245 kΩ	320 kΩ	2 MΩ	2.55 MΩ	2.87 MΩ
K3 ± 50 ppm/°C	± 5 %	E24 E48 1 Ω 332 kΩ	E24 E48 1 Ω 332 kΩ	E24 E48 1 Ω 1 MΩ	E24 E48 1 Ω 2.2 MΩ							E24 300 kΩ 10 MΩ	E24 1 MΩ 20 MΩ	E24 2 MΩ 50 MΩ
	± 1 % ± 0.5 %					Only tol. 1 % E96 1 Ω 332 kΩ			Only tol. 1 % E96 1 Ω 1 MΩ		Only tol. 1 % E96 1 Ω 2.21 MΩ	E96 301 kΩ 10 MΩ	E96 1 MΩ 20 MΩ	E96 2 MΩ 50 MΩ
	± 0.2 %													
K4 ± 25 ppm/°C	± 1 % ± 0.5 %													
	± 0.2 % ± 0.1 %													
K5 ± 15 ppm/°C	± 1 % ± 0.5 %													
	± 0.2 % ± 0.1 %													
K6 ± 10 ppm/°C	± 0.10 % ± 1 %													
K8 ± 5 ppm/°C	± 0.1 % ± 1 %													



	VERY HIGH STABILITY HIGH PRECISION						HIGH STABILITY HIGH TEMPERATURE						VERY LOW TCR		
	RCMA 52009						RCMT 52011						RCME 52010		
	K4 to K5: 0.1 % 1000 h P <sub>r</sub> at 70 °C K3: 0.25 % 1000 h P <sub>r</sub> at 70 °C						0.5 % 1000 h P <sub>r</sub> at 125 °C 0.25 % 1000 h P <sub>r</sub> at 70 °C						0.15 % 1000 h 0 % P <sub>r</sub> at 155 °C		
	- 65 °C/+ 155 °C/56 days						- 65 °C/+ 175 °C/56 days						- 65 °C/+ 155 °C/ 56 days		
	0.25 % 21 days			1 % 56 days			1 %						0.15 % 56 days		
	⊖ 02	⊖ 05	⊖ 08	1	2	4	01	⊖ 02	⊖ 05	⊖ 08	⊖ 1	2	4	02	05
	2.5	3.75	6.4	6.4	10.2	10.2	2.03	2.5	3.66	6.4	6.4	10.2	10.2	2.5	3.66
	6.7	10.4	16.5	19.3	29	54	4.32	6.7	10.4	16.5	19.3	29	54	6.7	10.4
	RS 58 P	RS 63 P	RS 68 P	-	-	-	-	RS 56 C/E	RS 60 C/E	RS 65 C/E	RS 70 C/E	-	-	-	-
	BE	CE	DE	-	-	-	-	-	-	-	-	-	-	-	-
	P <sub>r</sub> at 70 °C						P <sub>r</sub> at 125 °C						P <sub>r</sub> at 85 °C		
	0.125 W	0.25 W	0.5 W	0.75 W	1 W	2 W	0.05 W	0.1 W	0.125 W	0.125 W	0.5 W	1 W	2 W	0.125 W	0.25 W
K2	300 V 700 kΩ	350 V 490 kΩ	400 V 320 kΩ	500 V 333 kΩ	600 V 360 kΩ	800 V 320 kΩ	200 V -	300 V -	350 V 980 kΩ	400 V 640 kΩ	500 V 500 kΩ	600 V 360 kΩ	800 V 320 kΩ	300 V -	350 V -
	Ohmic Values on Request						Ohmic Values on Request								
K3	1 Ω 1 MΩ	1 Ω 1 MΩ	1 Ω 1.5 MΩ	1 Ω 2 MΩ	1 Ω 2.5 MΩ	1 Ω 5 MΩ	1 Ω 511 kΩ	1 Ω 332 kΩ	1 Ω 1 MΩ	1 Ω 1.5 MΩ	1 Ω 2 MΩ	1 Ω 2.5 MΩ	1 Ω 5 MΩ		
	10 Ω 332 kΩ	10 Ω 332 kΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	1 Ω 2.5 MΩ	10 Ω 511 kΩ	10 Ω 332 kΩ	10 Ω 332 kΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 2.5 MΩ		
K4	1 Ω 1 MΩ	1 Ω 1 MΩ	1 Ω 1.5 MΩ	1 Ω 2 MΩ	1 Ω 2.5 MΩ	1 Ω 5 MΩ	10 Ω 511 kΩ	1 Ω 332 kΩ	1 Ω 1 MΩ	1 Ω 1.5 MΩ	1 Ω 2 MΩ	1 Ω 2.5 MΩ	1 Ω 5 MΩ		
	10 Ω 332 kΩ	10 Ω 332 kΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 2.5 MΩ	49.9 Ω 511 kΩ	10 Ω 332 kΩ	10 Ω 332 kΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 2.5 MΩ		
K5	10 Ω 1 MΩ	10 Ω 1 MΩ	10 Ω 1.5 MΩ	10 Ω 2 MΩ	10 Ω 2.5 MΩ	10 Ω 2.5 MΩ	100 Ω 100 kΩ	10 Ω 332 kΩ	10 Ω 1 MΩ	10 Ω 1.5 MΩ	10 Ω 2 MΩ	10 Ω 2.5 MΩ			
	10 Ω 332 kΩ	10 Ω 332 kΩ	10 Ω 750 kΩ	10 Ω 750 kΩ	10 Ω 1 MΩ	10 Ω 2 MΩ	100 Ω 100 kΩ	10 Ω 100 kΩ	10 Ω 332 kΩ	10 Ω 500 kΩ	10 Ω 750 kΩ	10 Ω 1 MΩ			
K6														100 Ω 750 kΩ	100 Ω 750 kΩ
K8														100 Ω 100 kΩ	100 Ω 100 kΩ



IECQ-CECC: World-wide quality approval for electronic component



**THICK FILM TECHNOLOGY**



SERIES	DATASHEET	POWER RATING AT + 70 °C	RES. RANGE	TOL.	LIMITING ELEMENT VOLTAGE	NOMINAL TCR	DIMENSIONS				
	NO.						W	Ω	%	kV	ppm/°C
							Ø	L			
HTS 58	52014	0.25	1K to 200M	± 0.5 ± 1 ± 2 ± 5 ± 10	0.5	± 100	1.8	7			
HTS 63		0.5	1K to 500M		1		2.5	8.5			
HTS 68		1	1K to 2.5G		2		4	14			
HTS 523		1	1K to 5G		5		5	23			
HTS 547		1.5	1K to 50G		15		5	47			
HTS 729		2	1K to 15G		10		7	29			
HTS 747		2.5	1K to 30G		15		7	47			
HTS 923		2	1K to 15G		8		9	23			
HTS 932		2.5	1K to 30G		15			32			
HTS 947		3	1K to 50G		20			47			
HTS 972		4	1K to 100G		30			72			
HTS 9100		5	1K to 100G		50		100				
HPS 58		52015	1		200 to 100M		± 0.5 ± 1 ± 2 ± 5 ± 10	3	± 100	2.4	6.5
HPS 63			2		200 to 175M			0.7		3.7	10
HPS 68	3		300 to 400M	1.5	5.6	15					
HPS 523	4		800 to 650M	2	5	23					
HPS 923	6		1K to 1G	2.5	9	23					
HPS 932	8		1K to 1G	5		32					
HPS 947	10		2K to 1.5G	8		47					



**SFERNICE/SOVCOR METAL FILM RESISTORS**

REQUIRED PARAMETERS		HIGH STABILITY HIGH PRECISION												
Vishay SFERNICE-SOVCOR SERIES Document No. 52005														
Stability		NK: $\leq \pm 0.15\%$ NP, NT, NY: $\leq 0.1\%$												
Climatic Category		40101-002 and 40101-001: 55/125/56												
$\Delta R/\Delta R$ Moisture Test		$\leq \pm 0.2\%$												
Vishay Sfernice-Sovcor Style		NT3S	NP3S	NY3	NK3	NT4S	NP4S	NY4	NK4	NT5S	NP5S	NY5	NK5	
Dimensions max. mm	$\varnothing$	1.8				2.5				3.3				
	L	3.9				6.2				8.7				
Specification Types	40101-001				RC9 RC8U				RC32 RC21U				RC31U	
	40101-002			RS59Y RS48Y			RS64P RS58P	RS71Y RS64Y RS58K				RS69Y RS63Y		
	40101-801													
	40101-802				AV				BV				CV	
	40101-803			AC				BC				CC		
Power Rating, $P_r$ at + 70 °C		0.125 W	0.25 W			0.25 W	0.5 W			0.5 W				
Stability Class		1 %			2 %	1 %			2 %	1 %			2 %	
Preferred Standard Ohmic Values Series		E192 for 0.1 %/0.25 %/0.5 % E96 for 1 %			E24	E192 for 0.1 %/0.25 %/0.5 % E96 for 1 %			E24	E192 for 0.1 %/0.25 %/0.5 % E96 for 1 %			E24	
Ohmic Value Range in Relation to: Temperature Coefficient, TCR/Tolerance	$\pm 15 \text{ ppm}/^\circ\text{C}^{(1)}$	$\pm 0.1\%$	100 $\Omega$	-	-	-	49.9 $\Omega$	-	-	-	100 $\Omega$	-	-	-
		$\pm 0.25\%$	200 k $\Omega$	-	-	-	499 k $\Omega$	-	-	-	499 k $\Omega$	-	-	-
		$\pm 0.5\%$	10 $\Omega$	-	-	-	10 $\Omega$	-	-	-	10 $\Omega$	-	-	-
	$\pm 25 \text{ ppm}/^\circ\text{C}^{(2)}$	$\pm 1\%$	200 k $\Omega$	-	-	-	499 k $\Omega$	-	-	-	499 k $\Omega$	-	-	-
		$\pm 0.1\%$	-	100 $\Omega$	-	-	-	10 $\Omega$	-	-	-	100 $\Omega$	-	-
		$\pm 0.25\%$	-	511 k $\Omega$	-	-	-	1 M $\Omega$	-	-	-	1 M $\Omega$	-	-
	$\pm 50 \text{ ppm}/^\circ\text{C}^{(2)}$	$\pm 0.5\%$	-	10 $\Omega$	-	-	-	10 $\Omega$	-	-	-	10 $\Omega$	-	-
		$\pm 1\%$	-	511 k $\Omega$	-	-	-	1 M $\Omega$	-	-	-	1 M $\Omega$	-	-
		$\pm 0.1\%$	-	-	-	-	-	-	10 $\Omega$	-	-	-	10 $\Omega$	-
	$\pm 100 \text{ ppm}/^\circ\text{C}^{(2)}$	$\pm 0.25\%$	-	-	10 $\Omega$	-	-	-	10 $\Omega$	-	-	-	10 $\Omega$	-
$\pm 0.5\%$		-	-	1.5 M $\Omega$	-	-	-	3.32 M $\Omega$	-	-	-	4.7 M $\Omega$	-	
$\pm 1\%$		-	-	1 $\Omega$ 1.5 M $\Omega$	-	-	-	10 $\Omega$ 3.32 M $\Omega$	-	-	-	2.67 $\Omega$ 4.7 M $\Omega$	-	
Limiting Element Voltage $U_{MAX. RMS}$		200 V				350 V				350 V				
Critical Resistance		-	-	160 k $\Omega$	490 k $\Omega$	245 k $\Omega$			245 k $\Omega$					
Thermal Resistance		170 °C/W				145 °C/W				110 °C/W				

**Notes**

- ECQ-CECC: World-wide quality approval for electronic components
- (1) TCR requirement for temperature between - 25 °C and + 85 °C
- (2) TCR requirement for temperature between - 55 °C and + 125 °C