

### Thin film series

**Type: CMF**

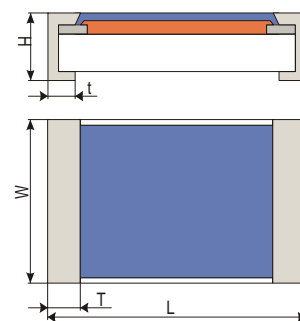
**Sizes: 0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512, 2040**

#### Characteristics:

- Chip resistors in thin film technology
- High-precision resistor layers
- Resistance area coated with surface passivation
- Highest stability and reliability
- Very tight tolerances ( $\geq 0,05\%$ ) - low temperature coefficient ( $\geq 10\text{ppm/K}$ )
- Low current noise, good pulse strength
- R-Value-Matching available
- RoHS-conform
- Order quantities from 1000 pieces for  $<1\%$  and  $<TCR 50$  available by extra charge
- Customer specific barcodes available - also in 2D
- All sizes can be manufactured with the following contact variants
  - ⇒ Electroplated pure tin
  - ⇒ Contact with low rest permeability -N, suitable only for reflow soldering method
  - ⇒ Epoxy bondable contact -K

#### Dimensions (in mm):

Size	L Length		W Width		H Depth		t Contact back		T Contact Front	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
<b>0402</b>	0,95	1,10	0,45	0,60	0,25	0,40	0,10	0,35	0,05	0,35
<b>0603</b>	1,50	1,70	0,75	0,95	0,35	0,55	0,10	0,50	0,10	0,50
<b>0805</b>	1,85	2,15	1,10	1,40	0,35	0,65	0,15	0,60	0,15	0,60
<b>1206</b>	2,90	3,35	1,45	1,75	0,35	0,65	0,25	0,75	0,15	0,75
<b>1210</b>	3,00	3,30	2,35	2,65	0,50	0,75	0,35	0,85	0,25	0,85
<b>1218</b>	3,00	3,30	4,50	4,80	0,50	0,75	0,35	0,85	0,25	0,85
<b>2010</b>	4,80	5,20	2,30	2,70	0,50	0,75	0,35	0,85	0,25	0,85
<b>2512</b>	6,10	6,50	3,00	3,30	0,50	0,75	0,35	0,85	0,25	0,85
<b>2040</b>	4,90	5,30	10,05	10,35	0,50	0,75	0,35	0,85	0,25	0,85



#### Packaging units:

Reel Ø	Card tape acc. EN 60286-3	Blister tape
<b>180 mm</b>	5 T pcs. 10 T pcs. for size 0402	4 T pcs.
<b>330 mm</b>	10 T pcs. 20 T pcs.	8 T pcs. 16 T pcs.

Samples possible up to 50 pcs./value

#### Ordering information:

CMF	- N	0603	10k	0,1%	10ppm/K	K	P	5 (optional)
Type	Contact	Size	R- Value	± Tolerance	± TCR	Marking	Packaging	pcs. / Reel (T pcs.)
CMF	Standard (without add.) -N (non magnetic) -K (epoxy bondable)	0402 . to . 2040	1R . to . 4M7	0,05 0,1 0,25 0,5 1	10 15 25 50	K- with (from size 0603) N- without (only size 0402)	P- Card tape B- Blister tape S- Bulk	Depends on size and packaging unit

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Sizes: **0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512, 2040**

**Technical data – depending on size:**

Size	Precision application		Professional application		R-Range	R-Tolerance (± %)	TCR (± ppm/K)	Packaging		
	U <sub>max</sub> (V)	P <sub>70</sub> (W)	U <sub>max</sub> (V)	P <sub>70</sub> (W)				P	B	S
0402	12,5	0,016	50	0,063	100R – 47k0	0,1 / 0,25 / 0,5 / 1	15 <sup>5)</sup>	x		x
					100R – 221k	0,1 / 0,25 / 0,5 / 1	25	x		x
					100R – 511k	0,1 / 0,25 / 0,5 / 1	50	x		x
					10R0 – 1M00	1	50	x		x
0603	25,0	0,032	75	0,100	100R – 332k	0,05 / 0,1 / 0,25 / 0,5 / 1	10 / 15 <sup>4)</sup>	x		x
					10R0 – 511k <sup>1)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	25	x		x
					1R00 – 1M50 <sup>1) 2)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	50	x		x
0805	35,0	0,050	150	0,125	100R – 511k	0,05 / 0,1 / 0,25 / 0,5 / 1	10 / 15 <sup>4)</sup>	x		x
					10R0 – 1M00 <sup>1)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	25	x		x
					1R00 – 2M00 <sup>1) 2)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	50	x		x
1206	50,0	0,100	200	0,250	100R – 1M00	0,05 / 0,1 / 0,25 / 0,5 / 1	10 / 15 <sup>4)</sup>	x		x
					10R0 – 2M00 <sup>1)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	25	x		x
					1R00 – 4M70 <sup>1) 2)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	50	x		x
1210	50,0	0,100	200	0,330	100R – 1M00	0,05 / 0,1 / 0,25 / 0,5 / 1	10 / 15 <sup>4)</sup>	x		x
2010	100,0	0,150	300	0,500	10R0 – 2M00 <sup>1)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	25		x	x
2512	100,0	0,250	500	1,000	10R0 – 4M70 <sup>1)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	50		x	x
1218	50,0	0,300	200	1,000	100R – 1M00	0,05 / 0,1 / 0,25 / 0,5 / 1	10 / 15 <sup>4)</sup>		x	x
2040	50,0	0,750	250	2,000	10R0 – 2M00 <sup>1)</sup>	0,05 / 0,1 / 0,25 / 0,5 / 1	25 / 50		x	x

<sup>1)</sup> 10R – 100R from ±0,1% tolerance    <sup>2)</sup> 1R – 10R from ±0,5% tolerance    <sup>4)</sup> TCR ±5 on request    <sup>5)</sup> TCR ±10 on request  
<sup>3)</sup> For continuous operation a sufficient heat dissipation must be ensured.

**Technical data - general:**

Technical data	Precision application	Professional application
Operating temperature range	-10°C ... +85°C	-55°C ... +155°C
Climatic category acc. EN 60068	10 / 85 / 56	55 / 155 / 56
Solderability acc. EN 60068-2-58	245°C 3s	245°C 3s
Soldering heat resistance acc. EN 60068-2-58	± (0,05% +0,01R) at 260°C 10s	± (0,05% +0,01R) at 260°C 10s
<b>Long time stability</b>		
Storage 155°C / 1000 h	± (0,1% +0,02R)	± (0,25% +0,05R)
Endurance P <sub>70</sub> / 70°C / 1000 h	± (0,1% +0,02R)	± (0,25% +0,05R)
Endurance P <sub>70</sub> / 70°C / 8000 h	± (0,25% +0,02R)	± (0,5% +0,05R)
Endurance P <sub>70</sub> / 70°C / 225000 h <sup>1)</sup>	± (1,0% +0,02R)	± (1,5% +0,05R)
Damp heat, steady state (56d / 40°C / 96%)	± (0,1% +0,02R)	± (0,25% +0,05R)

<sup>1)</sup> calculated acc. Arrhenius

Data, unless specified, acc. EN 140401-801.