microtech GmbH electronic

Chip resistors • Networks • Sensors • Custom components

Catalogue

Presented by:

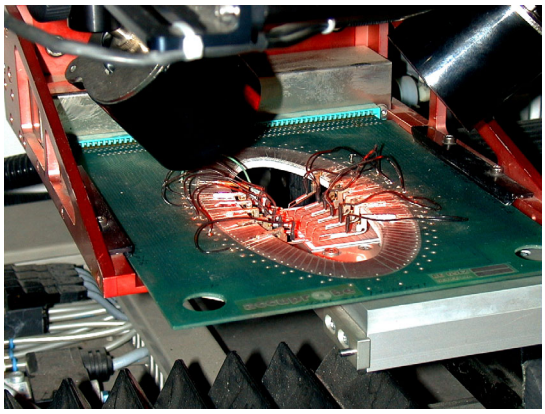
Content:

The microtech GmbH electronic was founded in October 1990 and has its headquarters in Teltow, a traditional site of manufacture of resistors.

The developing and production of resistors have been in Teltow since over 70 years. This tradition feel all employees of the microtech GmbH electronic still obligated, in particular value to high value, quality and reliability is laid.

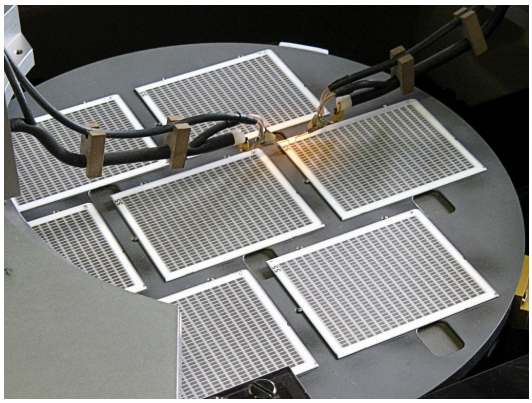
The fact that the microtech GmbH electronic, both on a thick film technology as well as a thin film technology, our businesses produce all high quality, low tolerances and special flat-chip resistors and offer the market for sophisticated electronics.

With these products, the microtech GmbH electronic already been a good reputation and supplies thus leading electronics companies in Europe, Asia and America as well as distributors inside and outside of Germany.



Our innovative technologies and expertise allow us to cooperate with other companies so that we, in addition to our innovative high-quality chip resistors, together with those also produce and offer SMD temperature sensors in thin- and thick-film technique.

Based on the lean corporate hierarchy of the family company the microtech GmbH electronic has the capacity to respond quickly and efficiently on customer requests and to accompany their clients with very short delivery times.



A highly motivated sales team provides our customers with modern logistics concepts every assistance to the optimum solution in terms of their functions to resistances.

Check us and use the short distances of a manufacturer in the heart of Europe.

Program of production

Metal film series

Metal film series								CMF
		Precision applications		Professional applications				
Type	Size	U_{max} (V)	P_{70} (W)	U_{max} (V)	P_{70} (W)	R-Range	R-Tolerance (%)	minimal TC (ppm/K)
CMF	0402	12,50	0,016	50	0,063	100R - 221k	0,1 to 1	25
CMF	0603	25,00	0,032	75	0,100	100R - 332k	0,05 to 1	10
						10R - 511k[1)]	0,05 to 1	25
						1R - 1M5[1)2)]	0,05 to 1	50
CMF	0805	35,00	0,050	150	0,125	100R - 511k	0,05 to 1	10
						10R - 1M[1)2)]	0,05 to 1	25
						1R - 2M[1)]	0,05 to 1	50
CMF	1206	50,00	0,100	200	0,250	100R - 1M	0,05 to 1	10
						10R - 2M[1)]	0,05 to 1	25
						1R - 4M7[1)2)]	0,05 to 1	50
CMF	1210	50,00	0,100	200	0,330	100R - 1M	0,05 to 1	10
	1218	50,00	0,300	200	1,000	10R - 2M[1)]		25
	2010	100,00	0,150	300	0,500	>2M - 4M7[1)]		50
	2512	100,00	0,250	300	0,750			
Jumper in thin film technique								**CMF-Jumper**
CMF-Jumper	All sizes					max. 0R020		

[1)] 10R – 100R at 0,1% tolerance [2)] 1R – 10R at 0,5% tolerance

Thick film series

Thick film series Standard						CDF
Type	Size	U_{max} (V)	P_{70} (W)	R-Range	R-Tolerance (%)	TC (ppm/K)
CDF	0402	50	0,063	1R - 10M	1	50 / 100
CDF	0603	75	0,100	1R - 10M	0,5 / 1	50 / 100
CDF	0805	150	0,125	1R - 10M	0,5 / 1	50 / 100
CDF	1206	200	0,250	1R - 10M	0,5 / 1	50 / 100
Jumper in thick film technique						**CDF-Jumper**
CDF-Jumper	All sizes			max. 0R020		
High power series						**CLF**
CLF	1210	200	0,33	1R - 10M	0,5 / 1 / 5	50 / 100
CLF	1218	200	1,00	1R - 10M	0,5 / 1 / 5	50 / 100
CLF	2010	300	0,50	1R - 10M	0,5 / 1 / 5	50 / 100
CLF	2512	300	1,00	1R - 10M	0,5 / 1 / 5	50 / 100
CLF	2040	250	2,00	1R - 10M	1 / 5	50 / 100

We like to realize special customer requests.

Thick film series

High ohmic series						CHF
Type	**Size**	**U_{max} (V)**	**P_{70} (W)**	**R-Range**	**R-Tolerance (%)**	**TC (ppm/K)**
CHF	0402	50		>10M - 1G[3)]	from 1,0 (>330M from 5,0%)	100 / 250 (>500M TC 500)
CHF	0603	75		>10M - 1G[3)]		
CHF	0805	150		>10M - 1G[3)]		
CHF	1206 / 1210 / 1218	200		>10M - 1G[3)]		
CHF	2010	300		>10M - 1G[3)]		
CHF	2512	300		>10M - 1G[3)]		
Low ohmic series						**CNF**
CNF	0603 to 1210, 2010, 2512	acc. CDF/ CLF		0R05 - 0R27	5 / 10	500
		acc. CDF/ CLF		0R27 - 0R99	1 / 5 / 10	100
CNF	1218, 2040	acc. CDF/ CLF		0R02 - 0R10	5 / 10	500
		acc. CDF/ CLF		0R10 - 0R99	1[4)] / 5 / 10	100
Trimmable series						**CRA / CRB**
CRA/B	0402	50	0,063	1R - 10M	Tolerance acc. customer specifications up to ±30% (also variably)	50 / 100
CRA/B	0603	75	0,100	1R - 10M		50 / 100
CRA/B	0805	150	0,125	1R - 10M		50 / 100
CRA/B	1206	200	0,250	1R - 10M		50 / 100
CRA/B	1210	200	0,330	1R - 10M		50 / 100
CRA/B	1218	200	1,000	1R - 10M		50 / 100
CRA/B	2010	300	0,500	1R - 10M		50 / 100
CRA/B	2512	300	1,000	1R - 10M		50 / 100
Networks						**CNR**
CNR	1206-4	50	0,063 per Element	10R - 1M	1/ 5	50 / 100
Impulse resistant series						**CDI / CLI**
CDI	0402	50	0,063	1R - 10M	5 / 10 / 20	50 / 100
CDI	0603	75	0,100	1R - 10M	5 / 10 / 20	50 / 100
CDI	0805	150	0,125	1R - 10M	5 / 10 / 20	50 / 100
CDI	1206	200	0,250	1R - 10M	5 / 10 / 20	50 / 100
CLI	1210	200	0,330	1R - 10M	5 / 10 / 20	50 / 100
CLI	1218	200	1,000	1R - 10M	5 / 10 / 20	50 / 100
CLI	2010	300	0,500	1R - 10M	5 / 10 / 20	50 / 100
CLI	2512	300	1,000	1R - 10M	5 / 10 / 20	50 / 100

[3)] Higher R-Values on request

[4)] Only for type 1218

SMD-Temperature sensors					CPT / PTC
Type	**Size**		**R-Range**	**Class**	**TC (ppm/K)**
Platinum CPT	0805 / 1206		100R, 500R,1k	B	3850
Thick film PTC	0805 / 1206		500R, 1k	B	3250

All components could be manufactured with following contact types:

- *All soldier contacts are conform acc.* RoHS(2002/95/EG)
- *Sticky contact*, tin free edge metallization for assembly with conductive
- *Low permeability contact*, edge metallization based on SAC, without galvanic Ni-Barrier (Non magnetics)
- *Corrosive gas resistant contact*, increased resistance against pollutant influences

We like to realize special customer requests.

Metal film series

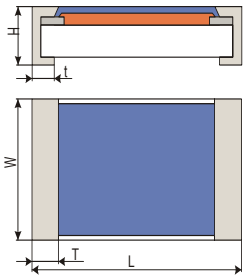
Type: **CMF**
Sizes: **0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512**

Specific notes

- Chip resistors in thin film technology
- Area of resistor with passivation of laquer
- Highest stability and reliability
- Very good precise resistance deposit
- Very small tolerance (≥0,05%) – low temperature coefficient (≥10ppm/K)
- Low current noise, good pulse proof
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Sticky contact
  - ⇒ Contact with low magnetic permeability

Dimensions of chip resistor (in mm):

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



Delivery forms:

- Bulk in plastic bags – from 20 pieces/ value
- Tape of paper according to EN 60286-3
- Reel: 180 mm packaging unit 1.000 (tol.<1%), 5.000 or 330 mm packaging unit 10.000, 20.000
- Specific barcodes for each customer
- Tape of blister according to EN 60286-3 – (from size 1210)
- Reel: 180 mm packaging unit 1.000 (tol.<1%), 4.000 or 330 mm packaging unit 8.000, 16.000
- Specific barcodes for each customer

Ordering designations:

Type	Size	Value	Tolerance	TC	Labelling/Package	Pieces/Tape (kpcs)
Example: CMF	0603	10k	0,1%	25ppm/K	KP	5

- CMF- K – Sticky contact
- CMF- P – Contact with low magnetic permeability

- P – Tape of paper
- B – Tape of blister
- S – Bulk

- K – With labelling (from BG 0603)
- N – Without labelling

Metall film series

Type: CMF
Sizes: 0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512

Technical data - depending on size:

	Precision application		Professional application							
Size	U_{max} (V)	P_{70} (W)	U_{max} (V)	P_{70} (W)	R-Range	R-Tolerance (%)	Lowest TC (ppm/K)	Packaging		
								P	B	S
0402	12,5	0,016	50	0,063	100R - 221k	0,1 / 0,25 / 0,5 / 1	25	x		x
0603	25,0	0,032	75	0,100	1R - 10R	0,5 / 1	50	x		x
					10R - 100R	0,1 / 0,25 / 0,5 / 1	25	x		x
					100R - 332k	0,05 / 0,1 / 0,25 / 0,5 / 1	10	x		x
					332k - 511k	0,05 / 0,1 / 0,25 / 0,5 / 1	25	x		x
					511k - 1M5	0,05 / 0,1 / 0,25 / 0,5 / 1	50	x		x
0805	35,0	0,050	150	0,125	1R - 10R	0,5 / 1	50	x		x
					10R - 100R	0,1 / 0,25 / 0,5 / 1	25	x		x
					100R - 511k	0,05 / 0,1 / 0,25 / 0,5 / 1	10	x		x
					511k - 1M	0,05 / 0,1 / 0,25 / 0,5 / 1	25	x		x
					1M - 2M	0,05 / 0,1 / 0,25 / 0,5 / 1	50	x		x
1206	50,0	0,100	200	0,250	1R - 10R	0,5 / 1	50	x		x
					10R - 100R	0,1 / 0,25 / 0,5 / 1	25	x		x
					100R - 1M	0,05 / 0,1 / 0,25 / 0,5 / 1	10	x		x
					1M - 2M	0,05 / 0,1 / 0,25 / 0,5 / 1	25	x		x
					2M - 4M7	0,05 / 0,1 / 0,25 / 0,5 / 1	50	x		x
1210	50,0	0,100	200	0,330	10R - 100R	0,1 / 0,25 / 0,5 / 1	25		x	x
					100R - 1M	0,05 / 0,1 / 0,25 / 0,5 / 1	10		x	x
					1M - 2M	0,05 / 0,1 / 0,25 / 0,5 / 1	25		x	x
					2M - 4M7	0,05 / 0,1 / 0,25 / 0,5 / 1	50		x	x
1218	50,0	0,300	200	1,000	10R - 100R	0,1 / 0,25 / 0,5 / 1	25		x	x
					100R - 1M	0,05 / 0,1 / 0,25 / 0,5 / 1	10		x	x
					1M - 2M	0,05 / 0,1 / 0,25 / 0,5 / 1	25		x	x
					2M - 4M7	0,05 / 0,1 / 0,25 / 0,5 / 1	50		x	x
2010	100,0	0,150	300	0,500	10R - 100R	0,1 / 0,25 / 0,5 / 1	25		x	x
					100R - 1M	0,05 / 0,1 / 0,25 / 0,5 / 1	10		x	x
					1M - 2M	0,05 / 0,1 / 0,25 / 0,5 / 1	25		x	x
					2M - 4M7	0,05 / 0,1 / 0,25 / 0,5 / 1	50		x	x
2512	100,0	0,250	300	0,750	10R - 100R	0,1 / 0,25 / 0,5 / 1	25		x	x
					100R - 1M	0,05 / 0,1 / 0,25 / 0,5 / 1	10		x	x
					1M - 2M	0,05 / 0,1 / 0,25 / 0,5 / 1	25		x	x
					2M - 4M7	0,05 / 0,1 / 0,25 / 0,5 / 1	50		x	x

Technical data in general:

	Precision application	Professional application
Operating temperature range	-10°C … +85°C	-55°C … +125°C
Climatic category according to EN 60068	10 / 85 / 56	55 / 125 / 56
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s	245°C 3s
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	± (0,05% +0,01R) bei 230°C 40s	± (0,05% +0,01R) bei 260°C 10s
Limit of resistance change ΔR		
Endurance at upper category temperature 125°C/1000 h	± (0,1% +0,02R)	± (0,25% +0,05R)
Endurance P_{70} / 70°C / 1000 h	± (0,1% +0,02R)	± (0,25% +0,05R)
Damp heat steady state (56 d / 40°C / 96 %)	± (0,1% +0,02R)	± (0,25% +0,05R)

Data which are not specified according to EN 140401-801 Date: November 08

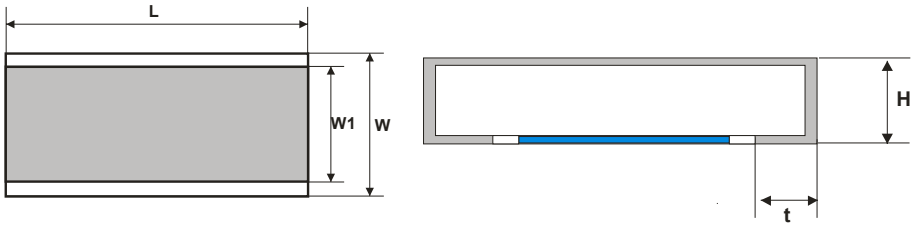
Jumper in thin film technique

Type: **CMF-Jumper**
Sizes: **0402, 0603, 0805, 1206**

Specific notes:
- Chip resistors in thin film technology
- Conform with RoHS
- Contacts: elctro-plated tinning

Dimensions of chip resistor (in mm):

Size	L Length		W Width		H Depth		t Contact behind		T Contact In front	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
0402	0,95	1,10	0,45	0,60	0,25	0,40	0,10	0,35	0,05	0,35
0603	1,50	1,70	0,75	0,95	0,35	0,55	0,10	0,50	0,10	0,50
0805	1,85	2,15	1,10	1,40	0,35	0,65	0,15	0,60	0,15	0,60
1206	2,90	3,35	1,45	1,75	0,35	0,65	0,25	0,75	0,25	0,75



Delivery forms:
- Bulk in plastic bags – from 20 pieces/ value
- Tape of paper according to EN 60286-3
- Reel: 180 mm packaging unit 5.000 or 330 mm packaging unit 10.000, 20.000
- Specific barcodes for each customer

Ordering designations:

Type	Size	Value	Labelling/Package	Pieces/ Tape (kpcs)
Example: CMF	0805	0R0	NP	5

- P – Tape of paper
- S – Bulk

- N – Without labelling

Jumper in thin film technique

Type: **CMF-Jumper**
Sizes: **0402, 0603, 0805, 1206**

Technical data - depending on size:

Size	Max. current I_{max} [A]	Max resistance R_{max} [mOhm]	Isolation voltage U_{ins} [V]		Packaging		
			1 min	Permanent voltage	P	B	S
0402	0,63	20	75	75	X		X
0603	1,00	20	100	75	X		X
0805	1,50	20	200	75	X		X
1206	2,00	20	300	75	X		X

Technical data in general:

Operating temperature range	-55°C … +125°C
Solderability according to EN 60068-2-58	245°C 3s
Resistance to soldering heat according to EN 60068-2-58	260°C 10s

Date: November 08

Thick film series Standard

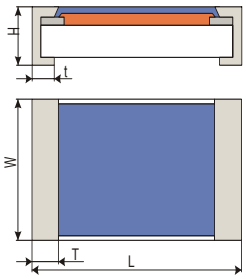
Type: CDF
Sizes: 0402, 0603, 0805, 1206

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- High stability and high reliability
- Small tolerances (≥0,5%) – low temperature coefficient
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Sticky contact
  - ⇒ Contact with low magnetic permeability
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

Size	L Length		W Width		H Depth		t Contact behind		T Contact in front	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
0402	0,95	1,10	0,45	0,60	0,25	0,40	0,10	0,35	0,05	0,35
0603	1,50	1,70	0,75	0,95	0,35	0,55	0,10	0,50	0,10	0,50
0805	1,85	2,15	1,10	1,40	0,35	0,65	0,15	0,60	0,15	0,60
1206	2,90	3,35	1,45	1,75	0,35	0,65	0,25	0,75	0,25	0,75



Delivery forms:

- Bulk in plastic bags – from 20 pieces/ value
- Tape of paper according to EN 60286-3
- Reel: 180 mm packaging unit 5.000 or 330 mm packaging unit 10.000, 20.000
- Specific barcodes for each customer

Ordering designations:

Type	Size	Value	Tolerance	TC	Labelling /Package	Pieces/Tape (kpcs)
Example: CDF	0805	1M	1,0%	50ppm/K	NP	5

- CDF- K – Sticky contact
- CDF- P – Contact with low magnetic permeability
- CDF- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- S – Bulk

- K – With labelling (from size 0603)
- N – Without labelling

Thick film series Standard

Type: CDF
Sizes: 0402, 0603, 0805, 1206

Technical data - depending on size:

Size	Voltage U_{max} (V)	Power rating P_{70} (W)	R-Range	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
0402	50	0,063	1R - 10M	1	50 / 100	X		X
0603	75	0,1	1R - 10M	0,5 / 1,0	50 / 100	X		X
0805	150	0,125	1R - 10M	0,5 / 1,0	50 / 100	X		X
1206	200	0,25	1R - 10M	0,5 / 1,0	50 / 100	X		X

Technical data in general:

Operating temperature range	-55°C … +125°C		
Climatic category according to EN 60068	55 / 125 / 56		
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s		
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	±(0,5% + 0,05R) at 260°C 10s		
Limit of resistance change ΔR	Size:	0402	0603, 0805, 1206
Endurance at upper category temperature 125°C / 1000h		± (2,0% + 0,1R)	± (1,0% + 0,05R)
Endurance P_{70} / 70°C / 1000h		± (2,0% + 0,1R)	± (0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)		± (2,0% + 0,1R)	± (1,0% + 0,05R)

Data which are not specified according to EN 140401-802

Date: November 08

Jumper in thick film technique

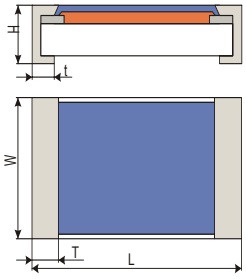
Type: **CDF-Jumper**
Sizes: **0402, 0603, 0805, 1206**

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Contact with low magnetic permeability
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

Size	L Length		W Width		H Depth		t Contact behind		T Contact in front	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
0402	0,95	1,10	0,45	0,60	0,25	0,40	0,10	0,35	0,05	0,35
0603	1,50	1,70	0,75	0,95	0,35	0,55	0,10	0,50	0,10	0,50
0805	1,85	2,15	1,10	1,40	0,35	0,65	0,15	0,60	0,15	0,60
1206	2,90	3,35	1,45	1,75	0,35	0,65	0,25	0,75	0,25	0,75



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of paper according to EN 60286-3
- Reel: 180 mm packaging unit 5.000 oder 330 mm packaging unit 10.000, 20.000
- Specific barcodes for each customer

Ordering designations:

Type Size Value Labelling /Package Pieces/Tape (kpcs)

Example: CDF 0805 0R0 NP 5

- CDF- P – Contact with low magnetic permeability
- CDF- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- S – Bulk

- K – With labelling (from size 0603)
- N – Without labelling

Jumper in thick film technique

Type: **CDF-Jumper**
Sizes: **0402, 0603, 0805, 1206**

Technical data - depending on size:

Size	max. Current I_{max} [A]	max. Resistance R_{max} [mOhm]	Isolation voltage U_{ins} [V]		Packaging		
			1 min	Permanent voltage	P	B	S
0402	0,63	20	75	75	X		X
0603	1,00	20	100	75	X		X
0805	1,50	20	200	75	X		X
1206	2,00	20	300	75	X		X

Technical data in general:

Operating temperature range	-55°C … +125°C
Solderability according to EN 60068-2-58	245°C 3s
Resistance to soldering heat according to EN 60068-2-58	260°C 10s

Date: November 08

High power series

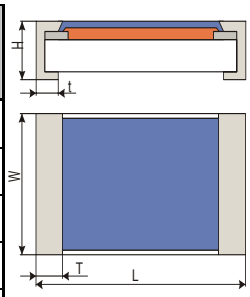
Type: CLF
Sizes: 1210, 1218, 2010, 2512, 2040

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- Special layout for high power application
- High stability and reliability
- Small tolerances (≥0,5%) – low temperature coefficient (≥50ppm/K)
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Contact with low magnetic permeability
  - ⇒ Sticky contact
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimension of Chipresistors (in mm):

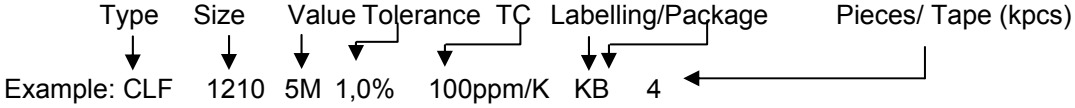
Size	L Length		W Width		H Depth		t Contact behind		T Contact in front	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1210	3,00	3,30	2,35	2,65	0,50	0,75	0,35	0,85	0,35	0,85
1218	3,00	3,30	4,50	4,80	0,50	0,75	0,35	0,85	0,35	0,85
2010	4,80	5,20	2,30	2,70	0,50	0,75	0,35	0,85	0,35	0,85
2512	6,10	6,50	3,00	3,30	0,50	0,75	0,35	0,85	0,35	0,85
2040	4,90	5,30	10,05	10,35	0,50	0,75	0,35	0,85	0,35	0,85



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of blister according to EN 60286-3
- Reel: 180mm packaging unit 4.000 or 330mm VPE 8.000, 16.000
- Specific barcodes for each customer

Ordering designations:



- CLF- K – Sticky contact
- CLF- P – Contact with low magnetic permeability
- CLF- S – Special contact which is resistant to influences by corrosive gas

- B – Tape of blister
- S – Bulk

- K – With labelling
- N – Without labelling

High power series

Type: CLF
Sizes: 1210, 1218, 2010, 2512, 2040

Technical data - depending on size:

Size	Voltage U_{max} (V)	Power rating P_{70} (W)	R-Range	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
1210	200	0,33	1R - 10M	0,5 / 1 / 5	50 / 100		x	x
1218	200	1,00	1R - 10M	0,5 / 1 / 5	50 / 100		x	x
2010	300	0,50	1R - 10M	0,5 / 1 / 5	50 / 100		x	x
2512	300	1,00	1R - 10M	0,5 / 1 / 5	50 / 100		x	x
2040	250	2,00	1R - 10M	1 / 5	50 / 100		x	x

Technical data in general:

Operating temperature range	-55°C … +125°C
Climatic category according to EN 60068	55 / 125 / 56
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	±(0,5% + 0,05R) at 260°C 10s
Limit of resistance change ΔR	
Endurance at upper category temperature 125°C / 1000h	±(1,0% + 0,05R)
Endurance P_{70} / 70°C / 1000h	±(0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)	±(1,0% + 0,05R)

Data which are not specified according to EN 140401-802

Date: November 08

High ohmic series

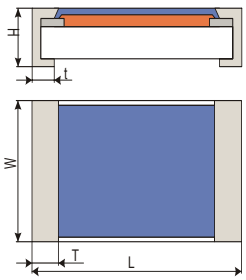
Type: CHF
Sizes: 0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- Special high ohmic resistance coat
- High stability and reliability
- Small tolerances
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Contact with low magnetic permeability
  - ⇒ Sticky contact
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

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



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of paper according to EN 60286-3
- Reel: 180mm packaging unit 5.000 or 330mm VPE 10.000, 20.000
- Tape of blister according to EN 60286-3 (from size 1210)
- Reel: 180mm packaging unit 4.000 or 330mm VPE 8.000, 16.000
- Specific barcodes for each customer

Ordering designations:

Type	Size	Value	Tolerance	TC	Labelling/ Packaging	Pieces/ Tape (kpcs)
Example: CHF	0805	150M	5,0%	250ppm/K	NP	5

- CHF- K – Sticky contact
- CHF- P – Contact with low magnetic permeability
- CHF- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- B – Tape of blister
- S – Bulk

- K – With labelling (from size 0603)
- N – Without labelling

High ohmic series

Type: CHF
Sizes: 0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512

Technical data - depending on size:

Size	Voltage U_{max} (V)	Power rating P_{70} (W)	R-Range*	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
0402	50	Limited by the maximum of permissible permant voltage	>10M - 330M	1 / 2 / 5 / 10	250	x		x
			330M - 500M	5 / 10 / 20	250	x		x
			500M - 1G	5 / 10 / 20	500	x		x
0603	75		>10M - 330M	1 / 2 / 5 / 10	250	x		x
			330M - 500M	5 / 10 / 20	250	x		x
			500M - 1G	5 / 10 / 20	500	x		x
0805	150		>10M - 330M	1 / 2 / 5 / 10	250	x		x
			330M - 500M	5 / 10 / 20	250	x		x
			500M - 1G	5 / 10 / 20	500	x		x
1206	200		>10M - 330M	1 / 2 / 5 / 10	250	x		x
			330M - 500M	5 / 10 / 20	250	x		x
			500M - 1G	5 / 10 / 20	500	x		x
1210 / 1218	200		>10M - 330M	1 / 2 / 5 / 10	250		x	x
			330M - 500M	5 / 10 / 20	250		x	x
			500M - 1G	5 / 10 / 20	500		x	x
2010	300		>10M - 330M	1 / 2 / 5 / 10	250		x	x
			330M - 500M	5 / 10 / 20	250		x	x
			500M - 1G	5 / 10 / 20	500		x	x
2512	300		>10M - 330M	1 / 2 / 5 / 10	250		x	x
			330M - 500M	5 / 10 / 20	250		x	x
			500M - 1G	5 / 10 / 20	500		x	x

*more resistor values on request

Technical data in general:

Operating temperature range	-55°C … +125°C
Climatic category according to EN 60068	55 / 125 / 56
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	±(0,5% + 0,05R) bei 260°C 10s
Limit of resistance change ΔR	
Endurance at upper category temperature 125°C / 1000h	±(1,0% + 0,05R)
Endurance P_{70} / 70°C / 1000h	±(0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)	±(1,0% + 0,05R)

Stand November 08

Low ohmic series

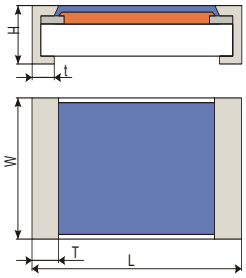
Type: **CNF**
Sizes: **0603, 0805, 1206, 1210, 1218, 2010, 2512, 2040**

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- Special low ohmic resistor coat
- High stability and reliability
- Small tolerances
- Conform with RoHS
- All configuration of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Contact with low magnetic permeability
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

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



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of paper according to EN 60286-3
- Reel: 180mm packaging unit 5.000 or 330mm VPE 10.000, 20.000
- Tape of blister according to EN 60286-3 (from size 1210)
- Reel: 180mm packaging unit 4.000 or 330mm VPE 8.000, 16.000
- Specific barcodes for each customer

Ordering designations:

Type	Size	Value	Tolerance	TC	Labelling/ Packaging	Pieces/ Tape (kpcs)
Example: CNF	0805	0R25	5,0%	100ppm/K	NP	5

- CNF- P – Contact with low magnetic permeability
- CNF- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- B – Tape of blister
- S – Bulk

- K – With labelling
- N – Without labelling

Low ohmic series

Type: CNF
Sizes: 0603, 0805, 1206, 1210, 1218, 2010, 2512, 2040

Technical data - depending on size:

Size	Voltage U_{max} (V)	Power rating P_{70} (W)	R-Range	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
0603	Limited by the maximum of power rating	0,100	0R05 - 0R27	5 / 10	500	x		x
			0R27 - 0R99	1 / 5 / 10	100	x		x
0805		0,125	0R05 - 0R27	5 / 10	500	x		x
			0R27 - 0R99	1 / 5 / 10	100	x		x
1206		0,250	0R05 - 0R27	5 / 10	500	x		x
			0R27 - 0R99	1 / 5 / 10	100	x		x
1210		0,330	0R05 - 0R27	5 / 10	500		x	x
			0R27 - 0R99	1 / 5 / 10	100		x	x
1218		1,000	0R02 - 0R10	5 / 10	500		x	x
			0R10 - 0R99	1 / 5 / 10	100		x	x
2010		0,500	0R05 - 0R27	5 / 10	500		x	x
			0R27 - 0R99	1 / 5 / 10	100		x	x
2512		1,000	0R05 - 0R27	5 / 10	500		x	x
			0R27 - 0R99	1 / 5 / 10	100		x	x
2040		2,000	0R02 - 0R10	5 / 10	500		x	x
			0R10 - 0R99	5 / 10	100		x	x

Technical data in general:

Operating temperature range	-55°C … +125°C
Climatic category according to EN 60068	55 / 125 / 56
Solderability according to EN 60068-2-58	245°C 3s
Resistance to soldering heat EN 60068-2-58	±(0,5% + 0,05R) bei 260°C 10s
Limit of resistance change ΔR	
Endurance at upper category temperature 125°C / 1000h	±(1,0% + 0,05R)
Endurance P_{70} / 70°C / 1000h	±(0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)	±(1,0% + 0,05R)

Date: November 08

Trimmable series

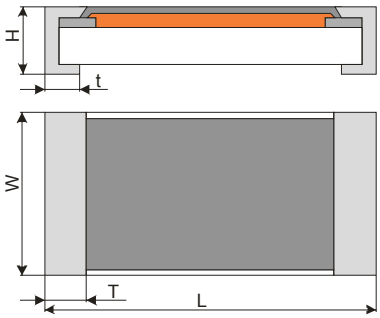
Type: **CRA / CRB**
Sizes: **0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512**

Specific notes:

- Chip resistors in thick film technology
- Area of resistor is additional trimmable
- Maximal factor to trim= 1.3 , higher factors are possible by decreasing U_{max} or P_{70}
- CRA with passivation of glass
- CRB without passivation of glass
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning (CRA)
  - ⇒ Dive plumb contact (CRB)
  - ⇒ Sticky contact
  - ⇒ Contact with low magnetic permeability
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

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



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of paper according to EN 60286-3
- Reel: 180mm packaging unit 5.000 or 330mm VPE 10.000, 20.000
- Tape of blister according to EN 60286-3 (from size 1210)
- Reel: 180mm packaging unit 4.000 or 330mm VPE 8.000, 16.000
- Specific barcodes for each customer

Ordering designations:

	Type	Size	Value	Tolerance	TC	Packaging	Pieces/ Tape (kpcs)
Example:	CRA	0603	4k7	-20,0%	50ppm/K	P	5

- CRA- K / CRB- K – Sticky contact
- CRA- P / CRB- P – Contact with low magnetic permeability
- CRA- S / CRB- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- B – Tape of blister
- S – Bulk

Trimmable series

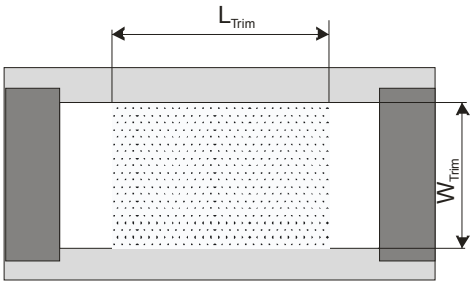
Type: CRA / CRB
Sizes: 0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512

Technical data - depending on size:

Size	Voltage Umax (V)	Power rating P70 (W)	R-Range	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
0402	50	0,063	1R - 10M	-5 / -10 / -20 / -30	50 / 100	x		x
0603	75	0,100	1R - 10M	-5 / -10 / -20 / -30	50 / 100	x		x
0805	150	0,125	1R - 10M	-5 / -10 / -20 / -30	50 / 100	x		x
1206	200	0,250	1R - 10M	-5 / -10 / -20 / -30	50 / 100	x		x
1210	200	0,330	1R - 10M	-5 / -10 / -20 / -30	50 / 100		x	x
1218	200	1,000	1R - 10M	-5 / -10 / -20 / -30	50 / 100		x	x
2010	300	0,500	1R - 10M	-5 / -10 / -20 / -30	50 / 100		x	x
2512	300	1,000	1R - 10M	-5 / -10 / -20 / -30	50 / 100		x	x

*optional with tolerances like ±5%, ±10%, ±20% oder ±30%

Size	L_{Trim} (mm) Length of the trim area		W_{Trim} (mm) Width of the trim area	
	Min	Max	Min	Max
0402	0,40	0,60	0,30	0,40
0603	0,80	1,10	0,35	0,55
0805	1,20	1,50	0,70	0,90
1206	2,20	2,50	1,00	1,20
1210	1,70	2,00	1,70	1,90
1218	1,80	2,10	3,60	3,80
2010	3,60	3,90	1,80	2,00
2512	4,80	5,10	1,90	2,10



Technical data in general:

Operating temperature range	-55°C… +125°C
Climatic category according to EN 60068	55 / 125 / 56
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	±(0,5% + 0,05R) bei 260°C 10s
Limit of resistance change ΔR	
Endurance at upper category temperature 125°C / 1000h	±(1,0% + 0,05R)
Endurance P70 / 70°C / 1000h	±(0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)	±(1,0% + 0,05R)

Date: November 08

Networks

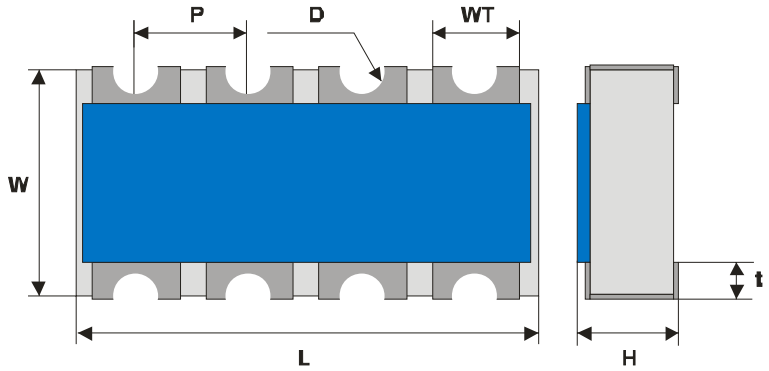
Type: **CNR**
Sizes: **1206-4 (4x 0603)**

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- High stability and reliability
- Small tolerances (≥1%) – low temperature coefficient
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Sticky contact
  - ⇒ Contact with low magnetic permeability
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

L Length	**W** Width	**H** Depth	**t** Contact behind	**WT** Width of contact	**P** Distance between contact	**D** Radius of contact
3,2 ± 0,10	1,6 ± 0,10	0,6 ± 0,10	0,3 ± 0,10	0,5 ± 0,10	0,8	0,3



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of paper according to EN 60286-3
- Reel: 180mm packaging unit 5.000 or 330mm VPE 10.000, 20.000
- Specific barcodes for each customer

Ordering designations:

	Type	Size	Value	Tolerance	TC	Labelling/ Packaging	Pieces/ Tape (kpcs)
Example:	CNR	1206-4	4k7	1,0%	50ppm/K	KP	5

- CNR- K – Sticky contact
- CNR- P – Contact with low magnetic permeability
- CNR- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- S – Bulk

- K – With labelling
- N – Without labelling

Networks

Type: **CNR**
Sizes: **1206-4 (4x 0603)**

Technical data - depending on size:

Size	Voltage U_{max} (V)	Power rating P_{70} (W)	R-Range	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
1206-4	50	4 x 0,063	10R - 1M	1 / 5	50 / 100	x		x

Technical data in general:

Operating temperature range	-55°C … +125°C
Climatic category according to EN 60068	55 / 125 / 56
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	±(0,5% + 0,05R) bei 260°C 10s
Limit of resistance change ΔR	
Endurance at upper category temperature 125°C / 1000h	±(1,0% + 0,05R)
Endurance P_{70} / 70°C / 1000h	±(0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)	±(1,0% + 0,05R)

Date: November 08

Impuls resistant series

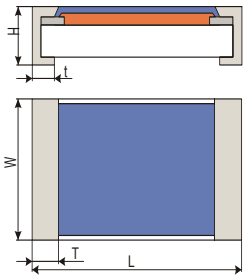
Type: **CDI / CLI**
Sizes: **0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512**

Specific notes:

- Chip resistors in thick film technology
- Area of resistor with passivation of laquer
- Special impulse resistor coat
- High stability and reliability
- Conform with RoHS
- All configurations of chip resistors can make with one of these contacts:
  - ⇒ Electro-plated tinning
  - ⇒ Sticky contact
  - ⇒ Contact with low magnetic permeability
  - ⇒ Special contact which is resistant to influences by corrosive gas

Dimensions of chip resistor (in mm):

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



Delivery forms:

- Bulk in plastic bags – from 20 pieces
- Tape of paper according to EN 60286-3
- Reel: 180mm packaging unit 5.000 or 330mm VPE 10.000, 20.000
- Tape of blister according to EN 60286-3 (from size 1210)
- Reel: 180mm packaging unit 4.000 or 330mm VPE 8.000, 16.000
- Specific barcodes for each customer

Ordering designations:

Type	Size	Value	Tolerance	TC	Labelling/ Packaging	Pieces/ Tape (kpcs)
Example: CDI	0805	1M	10,0%	50ppm/K	NP	5

- CDI- K / CLI- K – Sticky contact
- CDI- P / CLI- P – Contact with low magnetic permeability
- CDI- S / CLI- S – Special contact which is resistant to influences by corrosive gas

- P – Tape of paper
- B – Tape of blister
- S – Bulk

- K – With labelling (from size 0603)
- N – Without labelling

Impuls resistant series

Type: CDI / CLI
Sizes: 0402, 0603, 0805, 1206, 1210, 1218, 2010, 2512

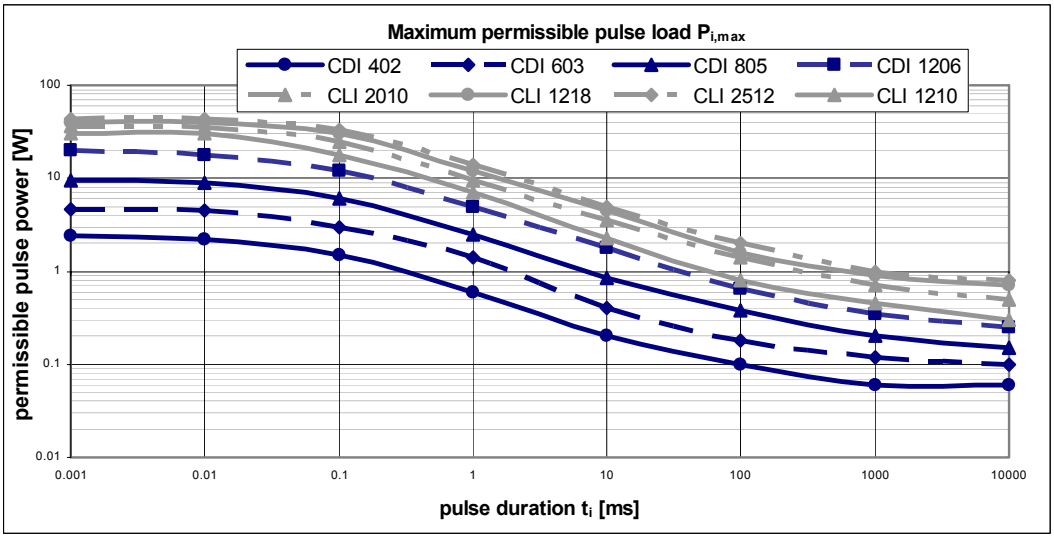
Technical data - depending on size:

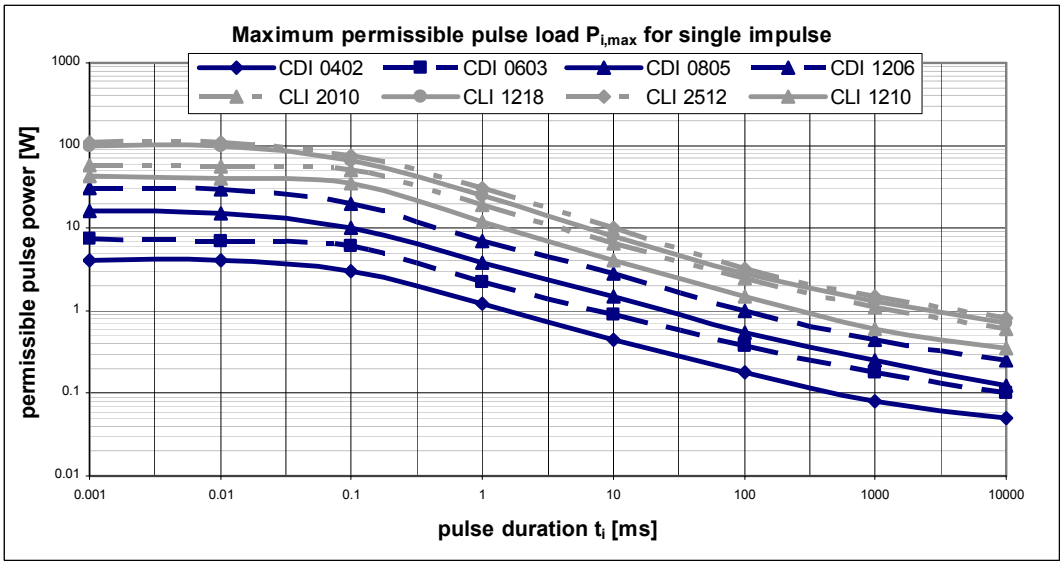
Size	Voltage U_{max} (V)	Power rating P_{70} (W)	R-Range	R-Tolerance (%)	TC (ppm/K)	Packaging		
						P	B	S
CDI								
0402	50	0,063	1R - 10M	5 / 10 / 20	50 / 100	x		x
0603	75	0,100	1R - 10M	5 / 10 / 20	50 / 100	x		x
0805	150	0,125	1R - 10M	5 / 10 / 20	50 / 100	x		x
1206	200	0,250	1R - 10M	5 / 10 / 20	50 / 100	x		x
CLI								
1210	200	0,330	1R - 10M	5 / 10 / 20	50 / 100		x	x
1218	200	1,000	1R - 10M	5 / 10 / 20	50 / 100		x	x
2010	300	0,500	1R - 10M	5 / 10 / 20	50 / 100		x	x
2512	300	1,000	1R - 10M	5 / 10 / 20	50 / 100		x	x

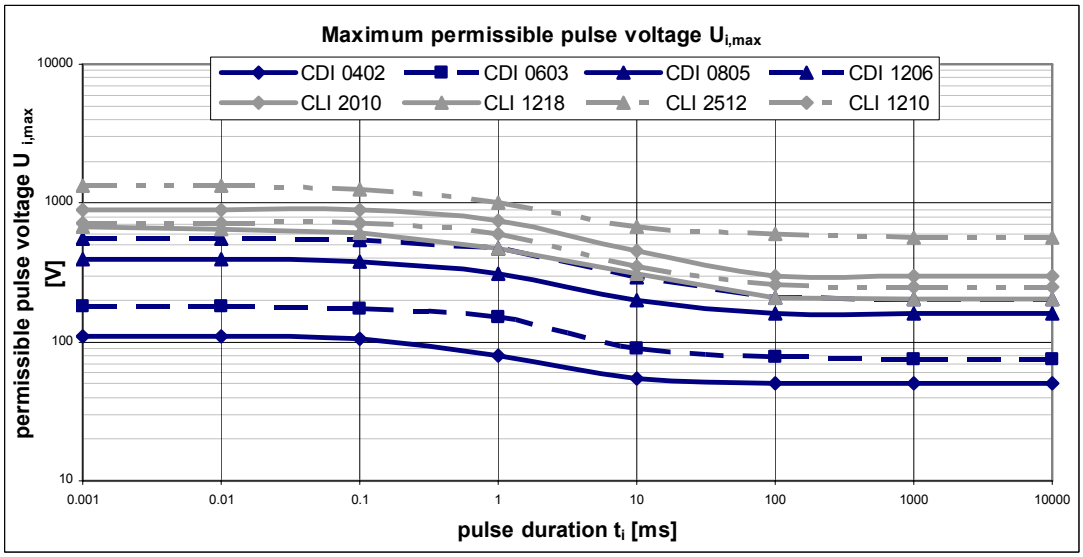
Technical data in general:

Operating temperature range	-55°C … +125°C
Climatic category according to EN 60068	55 / 125 / 56
Solderability according to EN 60068-2-58 (do not apply for sticky contact)	245°C 3s
Resistance to soldering heat according to EN 60068-2-58 (do not apply for sticky contact)	±(0,5% + 0,05R) bei 260°C 10s
Limit of resistance change ΔR	
Endurance at upper category temperature 125°C / 1000h	±(1,0% + 0,05R)
Endurance P_{70} / 70°C / 1000h	±(0,5% + 0,05R)
Damp heat steady state (56d / 40°C / 96%)	±(1,0% + 0,05R)

Characteristics by impulse proof resistors under pulse load (CDI / CLI):







Date: November 08

Platinum-Chip Temperature sensors acc. to DIN EN 60751

Type: **CPT**
Sizes: **0805, 1206**

Specific notes:

- Big temperature range from -50 bis +150°C
- Standardized values and tolerances
- High precision of measurement and good long-term stability
- Good linear characteristic curve
- Galvanic wrap-around contact with diffusion barrier
- For insertion in automatic large-scale production
- Tape of blister according to DIN IEC 286-3
- Conform with RoHS

Technical data:

Resistor:	100 Ohm, 500 Ohm, 1000 Ohm at 0°C	
Temperature coefficient:	α = 3,850 x 10^{-3}/°C (between 0 and 100°C)	
Temperature range:	-50 ... +150°C	
Tolerance:	Scope of temperature class B: -50 to +150°C	
Measuring current:	Pt 100	advised 1,0mA
	Pt 500	advised 0,7mA
	Pt 1000	advised 0,1mA
Maximum current:	Pt 100	7,0mA
	Pt 500	3,0mA
	Pt 1000	1,0mA
Long-term stability:	max. R_0-Drift = 0,05% / year	
Isolation resistance:	>10M at room temperature	
Self-heating:	$\Delta t = I^2 \times R \times E$	
Solder connections:	Electro-plated tinning, wrap-around contact with diffusion barrier Solderability according to DIN IEC 68 Part 2	
Processing:	Reflow-Soldering (soldering temperature/-time = 240°C / 8s) Wave-Soldering (soldering temperature/-time = 260°C / 10s)	
SMD-Size:	The types CPT 0805 and CPT 1206 achieve the requirements of Norm CECC 40401-004/DIN 45 921.	
Packaging:	Tape of paper, small amounts are possible as bulk	
Storage:	In standard packaging Platinum-chip temperature sensors can be stored for at least 12 month under ordinary ambient conditions.	

Date: November 08

PTC-Temperature sensors in thick-film technique

Type: **PTC**
Sizes: **0805, 1206**

Specific notes:

- Small size
- Suitable for harsh operating conditions and extreme temperature
- Special coat as active measuring area
- High precision of measurements and excellent long-term stability
- Specific realisation on customer request
- Electro-plated tinning with wrap-around contact and diffusion barrier
- Conform with RoHS

Technical data:

Resistor:	500 Ohm, 1000 Ohm at 0°C (other values on request)
Tolerance Resistor value:	0,5% (other tolerances on request)
Temperature coefficient:	α = 3250 x 10^{-6} K^{-1} ± 50 x 10^{-6} K^{-1}
Application temperature range:	-55°C...170°C
Maximum current:	
Resistor 500 Ohm	0,5mA
Resistor 1000 Ohm	0,1mA
Response time (in size 1206)**:**	
In moving water	V = 0,4m/s : t 0,9 = 0,6s
In moving air	V = 1m/s : t 0,9 = 20s
packaging:	• Tape of paper • bulk • special buildings on request
Long-term stability:	< 0,12% (1000h / 150°C)

Date: November 08

Custom components for special applications:

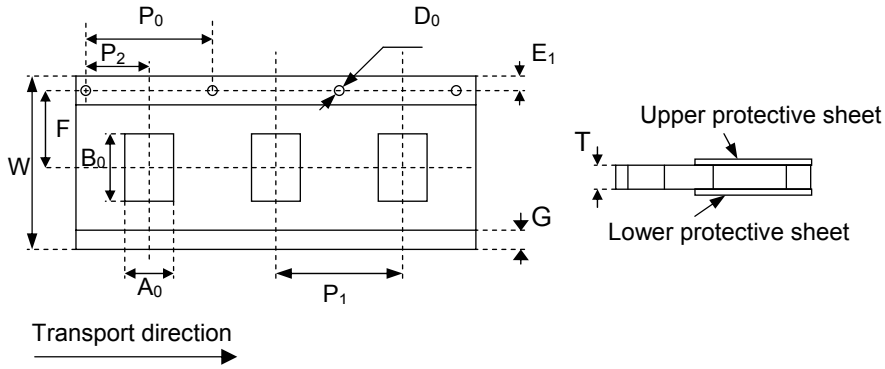
Sticky series -K	⇒	Tin free edge metallization for assembly with conductive adhasive
Low permeability series -P (Non magnetics)	⇒	Lead free edge metallization on SAC, without galvanic Ni-Barrier for application, which require low permeability
Corrosive gas resistant series -S	⇒	Specific adapted contact with high resistance to corrosive gas
Sub-Location CUT-K	⇒	Realization in metallized ceramic as assembly carrier
Jumper (Conductor bridge)	⇒	Realization as bridge resistor in thin film technology with continuous metallized area
	⇒	Also use as measurement point
Thin film TCR-Compensation resistor	⇒	Chip resistor in thin film technology at low ohmic range with concerted produced temperature coefficient at range from +2000 ppm/K
Heat-Pipe	⇒	Bridge to heat conducting on customer request
Matching resistors	⇒	Specific measured resistors, which values differ less than 0.02% from each other

On customer request we produce also outside of E-Series!

Tape deviations acc. to DIN EN 60286-3:

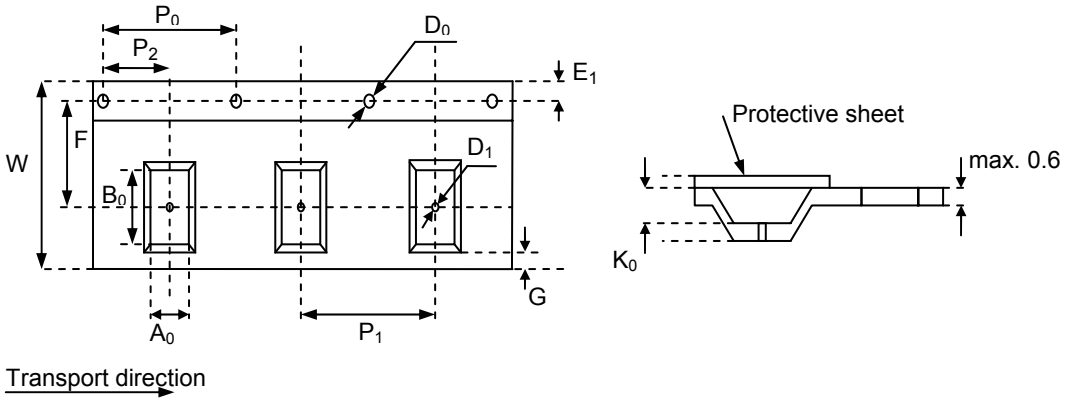
Tape of paper

Size	A_0	B_0	T	F	E_1	W	P_2	P_0	P_1	G	D_0
	in mm										
0402	0,70 ±0,05	1,20 ±0,05	0,50 ±0,05	3,50 ±0,05	1,75 ±0,10	8,00 ±0,30	1,00 ±0,05	4,00 ±0,10	2,00 ±0,10	min. 0,75	1,50 +0,10
0603	1,00 ±0,10	1,80 ±0,10	0,80 ±0,10	3,50 ±0,05	1,75 ±0,10	8,00 ±0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10
0805	1,65 ±0,20	2,40 ±0,20	0,80 ±0,10	3,50 ±0,05	1,75 ±0,10	8,00 ±0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10
1206	2,00 ±0,20	3,60 ±0,20	0,80 ±0,10	3,50 ±0,05	1,75 ±0,10	8,00 ±0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10



Tape of blister

Size	A_0	B_0	K_0	F	E_1	W	P_2	P_0	P_1	G	D_0
	in mm										
1210	2,80 ±0,10	3,50 ±0,10	1,10 +0,10	3,50 ±0,05	1,75 ±0,10	8,00 ±0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10
1218	3,30 ±0,10	5,10 ±0,10	0,90 ±0,10	5,50 ±0,05	1,75 ±0,10	12,00 ± 0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10
2010	2,95 ±0,10	5,47 ±0,10	0,80 ±0,10	5,50 ±0,05	1,75 ±0,10	12,00 ± 0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10
2512	3,40 ±0,10	6,70 ±0,10	0,80 ±0,10	5,50 ±0,05	1,75 ±0,10	12,00 ± 0,30	2,00 ±0,05	4,00 ±0,10	4,00 ±0,10	min. 0,75	1,50 +0,10
2040	6,00 ±0,10	11,00 ±0,10	1,40 ±0,10	7,50 ±0,10	1,75 ±0,10	16,00 ±0,30	2,00 ±0,10	4,00 ±0,10	8,00 ±0,10	min. 0,75	1,50 +0,10



Date: November 08

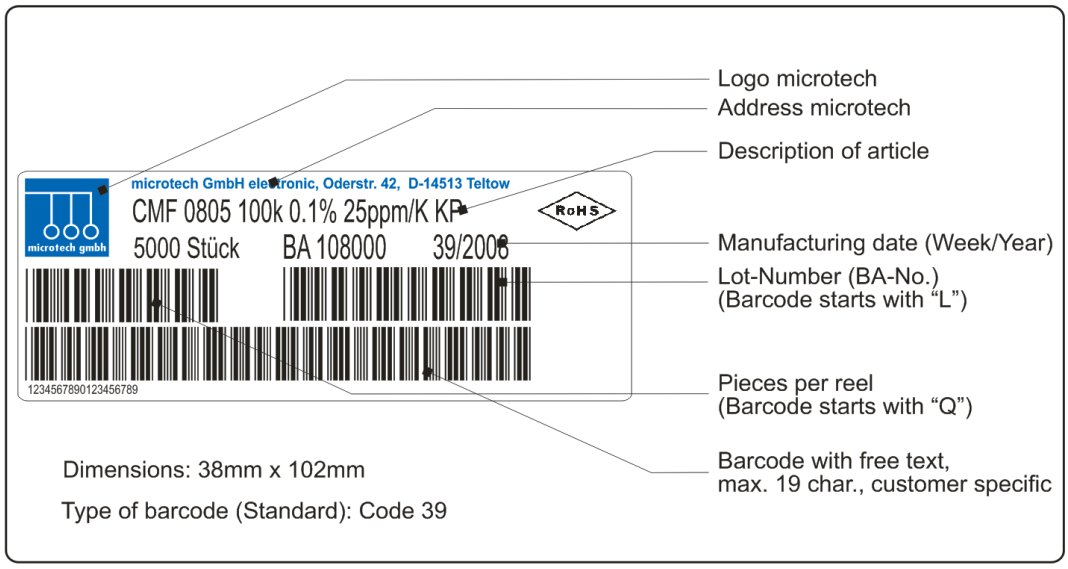
Labelling:

Our taped devices will be delivered standardized in reels without additional packaging. All reels will be labeled according to figure below.

By using barcodes a computer-assisted handling of the delivery data will be guaranteed. Standardized the codec 39 in high-density resolution will be used. According to agreement with the customer other sizes of labelling, types of barcodes or resolutions can be offer.

By ordering you can declare specific customer strings up to 19 signs for each ordering position, which will be printed as extra barcode-line on label.

From this figure you can take the assembly of the standadized labelling in detail:



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