

ZCM Series Datasheet

SMD Precision Metal Film Resistors | MELF Style

ORDERING CODE-Example

New SAP Part Nr.:

ZCM	207	F	K	E	07-	1K	AA
Serie	Power rating 204 = 0,4W 207 = 1,0W	Tol. B = ±0,1% C = ±0,25% D = ±0,5% F = ±1% G = ±2% J = ±5%	Pack-Code K = Blister tape reel	TCR C = ±15ppm D = ±25ppm E = ±50ppm F = ±100ppm	Forming type 07- = 07 inch (Reel diameter) or 13- = 13 inch (Reel diameter)	R Value	Special AA = Standard

Historical VTM Part Nr.:

ZC	0207	F	K	E	07	1K
Type	Size	Tol.	K = Blister tape reel	TC	Reel diam.	R Value

APPLICATIONS

- Automotive
- Charger
- Alternative Energy
- Power Supply
- Home Appliances
- Industrial

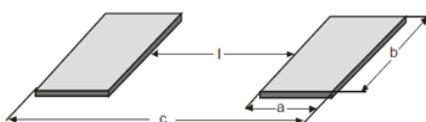
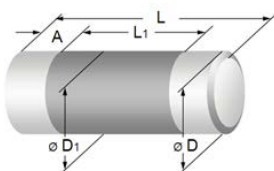
FEATURES

- Precision MELF resistor
- Advanced MELF technology
- Best in class pulse load capability
- Biased (85/85) test (±0,25% R) up to 1M0
- AEC – Q200 Qualified
- Intrinsic sulfur resistance
- RoHs & REACH Compliant

ELECTRICAL SPECIFICATIONS

Type		ZCM204	ZCM207
Historical Part Number	SMD	ZC0204	ZC0207
Nominal Power Rating P_{70}	[W]	0,4	1,0
Resistance Range	[Ω]	OR22 ... 10M	OR16 ... 10M
E-Series		(Other values upon request) E24 / E96 / E192	
Tolerances	±[%]	B = 0,1% , C = 0,25% , D = 0,5% , F = 1% , G = 2% , J = 5%	
Temperature Coefficient <i>IEC60115-1 clause 4.2 ; 4.8</i> <i>(+20 / -55[°C] and (+20 / +125[°C])</i>	±[10 ⁻⁶ * K ⁻¹]	Depends on the value, please check the table below	
Working Temperature Range	[°C]	-55 ... +155	
Permissible film temperature <i>(9F max.)</i>	[°C]	155	
Max. Working Voltage	[AC or DC] _{RMS}	200	350
Dielectric Withstanding Voltage <i>IEC115-1 clause 4.7 (1[min])</i>	[V] _{RMS}	300	500

DIMENSIONS [mm]



Type	Historical P/N:	L	∅ D	L ₁	∅ D ₁	A	MASS (mg)
ZCM204	ZC0204	3,6 +0/-0,2	1,4 +0/-0,1	1,8 min.	D +0/-0,15	0,80 ±0,10	22
ZCM207	ZC0207	5,8 +0/-0,3	2,2 ±0,2	2,6 min.	D +0/-0,2	1,25 ±0,2	77

Recommended solder pads dimensions

Type	Wave soldering				Reflow soldering			
	l	a	b	c	l	a	b	c
ZCM204	1,5	1,5	1,8	4,5	1,7	1,2	1,6	4,1
ZCM207	2,4	2,3	2,6	7,0	2,6	2,0	2,4	6,6

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PERFORMANCE DATE

Type		ZCM204	ZCM207
Historical Part Number		ZC0204	ZC0207
Climatic Category		55/155/56	
Short Time Overload <i>IEC60115-1 clause 4.13</i> $(U=2,5 \cdot \sqrt{P_{70} \cdot R} \text{ or } \leq 2 \cdot U_{max}, 5 [s])$	±[%]	0,03 (≤1M) ; 0,1 (>1M)	0,03 (≤1M) ; 0,15 (>1M)
Single pulse high voltage overload <i>IEC60115-1 clause 4.27</i> $U = 10 \cdot \sqrt{P_{70} \cdot R}$, Severity 4, 10 pulses 10[μs]/700[μs]	±[%]	0,15	0,25
Periodic electric overload <i>IEC60115-1 clause 4.39</i> $U = \sqrt{15 \cdot P_{70} \cdot R}$, 0,1[s] on, 2,5 [s] off, 1000 cycles	±[%]	0,15	0,15
Failure Rate (Total, 90, max, 60[%] cont. lev.)	[10 ⁻⁹ h ⁻¹]	≤ 0,1	
Endurance at 70°C, standard operation <i>IEC60115-1 clause 4.25.1</i> $(P_{70} @ 70[°C], 1,5[h]ON ; 0,5[h]OFF)$	±[%]	1000h	0,15 (<10R) ; 0,1 (10R≤1M) ; 0,25 (>1M)
		8000h	0,3 (<10R) ; 0,2 (10R≤1M) ; 0,5 (>1M)
Damp Heat, Steady State <i>IEC60115-1 clause 4.24</i> (40[°C], 93[% r.h.], 56[d])	±[%]	0,15 (≤ 1M) ; 0,25 (>1M)	0,25 (≤ 1M) ; 1 (>1M)
Biased Humidity <i>IEC60068-2-67</i> $(85^{±2}[°C], 85^{±5}[% RH], U = \sqrt{0,3 \cdot P_{70} \cdot R})$	±[%]	0,25 (≤ 1M) ; 2 (>1M)	0,5 (≤ 1M) ; 2 (>1M)
Temperature Cycling <i>IEC60068-2-14 ; IEC60115-1 clause 4.19</i> (-55 ~ +125[°C], 30[min] each, 1000 cycles)	±[%]	0,15 (≤ 1M) ; 0,25 (>1M)	0,25
Vibration <i>IEC60068-2-6 ; IEC60115-1 clause 4.22</i> (10;2000[Hz], ≤1,5[mm], or ≤200[m/s ²], 7,5[h])	±[%]	0,05 (≤ 1M) ; 0,1 (>1M)	0,05
Resistance to Soldering Heat <i>IEC60115-1 clause 4.18</i> (260 ^{±5} [°C], 10 ^{±2} [s]) Solder bath method	±[%]	0,1 (≤ 1M) ; 0,05 (>1M)	0,1 (≤ 1M) ; 0,05 (>1M)
Electrostatic Discharge <i>IEC60115-1 clause 4.38 ; IEC61340-3-1</i> (3 positives + 3 negatives discharges)	±[%]	0,5 [2 kV]	0,5 [4 kV]
Voltage proof <i>IEC60115-1 clause 4.7</i> $U_{RMS}=U_{INS}, 60 [s]$		No flash over or breakdown	
Flammability <i>IEC60115-1 clause 4.35, IEC60695-11-5</i> Needle flame test, 10[s]		No burning after 30[s]	
Solderability <i>IEC60068-2-20 ; IEC60115-1 clause 4.17</i> (235 ^{±3} [°C] 2 ^{±0,2} [s], SnAg ₃ Cu _{0,3})		≥ 95% covered, no visible damage	
Component Resistance to Solvents <i>IEC60068-2-45 ; IEC60115-1 clause 4.29</i> (50[°C] method 2)		No visible damage	
Resistance to solvents of Marking <i>IEC60068-2-45 ; IEC60115-1 clause 4.30</i> (50[°C] method 1)		Marking visible, no visible damage	
Marking <i>IEC60062</i>		Color code	

NOTES: MARKING [COLOR CODE]:

- **ZCM204** Color code marking is applied according to IEC 60062 in four bands (E24 series) for 5 % tolerance, or in five bands (E96 or E192 series). Each color band appears as a single solid line, voids are permissible if at least 2/3 of the band is visible from each radial angle of view. The last color band for tolerance is approximately 50 % wider than the other bands.
- **ZCM207** Color code marking is applied according to IEC 60062 in four (E24 series) or six bands (E96 series). Each color band appears as a single solid line, voids are permissible if at least 2/3 of the band is visible from each radial angle of view. The last color band represents the TCR for resistors with TCR ≤50 ppm/K and nominal tolerance ≤1 %. Zero ohm jumpers are marked with one centered black band.

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TEMPERATURE COEFFICIENT

ZCM204		ZCM207		Tolerance	TCR	E-Series
Resistance range		Resistance range				
0R22 ... 0R91	0R16 ... 0R91	0R22 ... 0R91	0R16 ... 0R91	± 5%	± 100 ppm/K	E24
0R82... 10M	1R... 10M	1R... 2M21	1R... 10M	± 2%		
10R... 1M65	1R... 2M21	1R... 2M21	1R... 10M	± 1%	± 50 ppm/K	E24 / E96
10R... 1M65	43R... 1M	43R... 1M	1R... 2M21	± 0,5%		
22R... 1M65	43R... 1M	43R... 1M	43R... 1M	± 0,5%	± 25 ppm/K	E24 / E192
22R... 1M65	43R... 1M	43R... 1M	43R... 1M	± 0,25%		
10R... 221K	100R... 511K	100R... 511K	100R... 511K	± 0,1%	± 15 ppm/K	E24 / E192
22R... 221K	100R... 511K	100R... 511K	100R... 511K	± 0,5%		
43R... 221K	100R... 511K	100R... 511K	100R... 511K	± 0,25%		
Jumper $I_{max} = 3A$	Jumper $I_{max} = 5A$	Jumper $I_{max} = 5A$	Jumper $I_{max} = 5A$	≤ 10 mΩ		

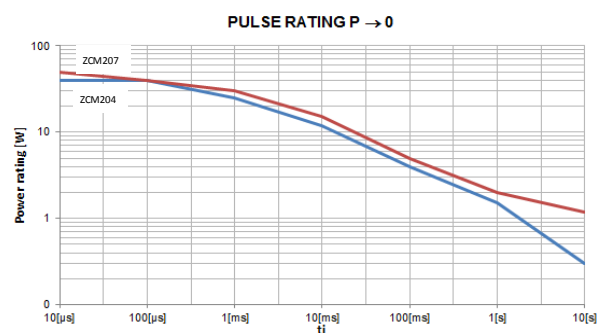
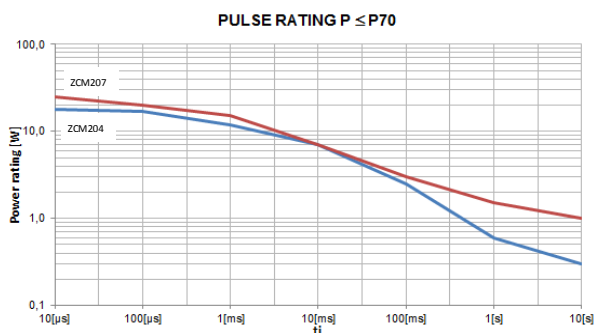
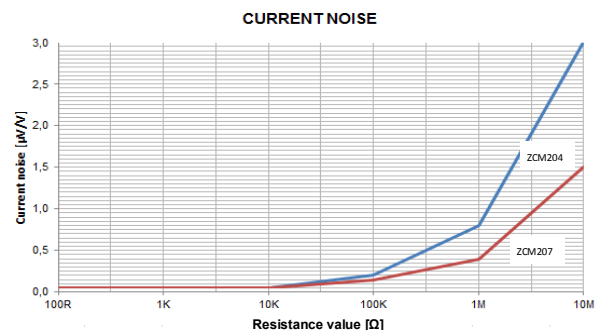
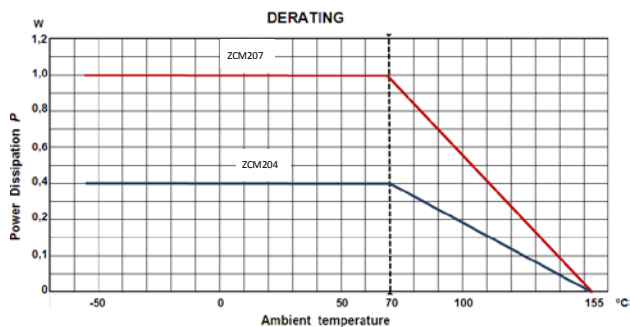
NOTES: RESISTOR BODY COLOR CODE:

- The body coating color is light green for jumpers and for a temperature coefficient of ±50 or 100 [ppm], pink for ±25[ppm] and violet for ±15[ppm]

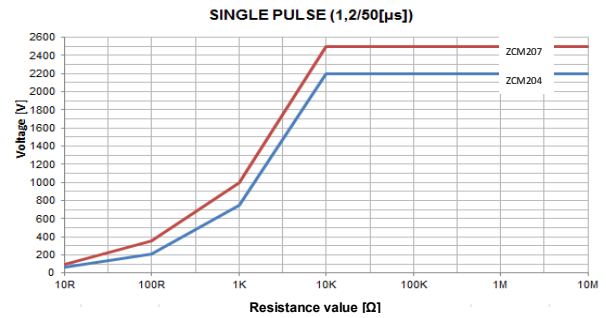
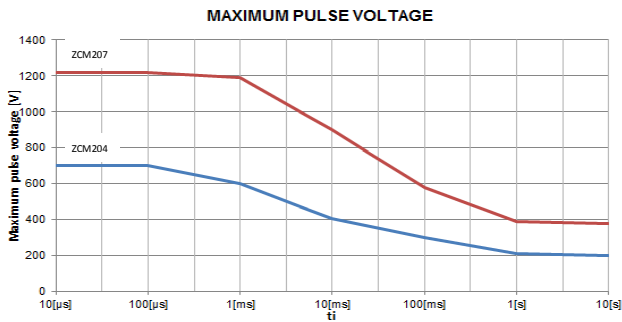
MAXIMUM RESISTANCE CHANGE AT RATED DISSIPATION

OPERATION MODE	ZCM204			ZCM207		
	PRECISION	STANDARD	POWER	PRECISION	STANDARD	POWER
Rated Power dissipation P_{70} [W]	0,07	0,25	0,4	0,125	0,4	1,0
Operating temp. range [°C]	-10 to 85	-55 to 125	-55 to 155	-10 to 85	-55 to 125	-55 to 155
Permissible film temperature ϑF_{Max} [°C]	85	125	155	85	125	155
Resistance range	10R – 1M	R22 – 1M	R22 – 10M	100R – 511K	1R0 – 1M	1R0 – 1M
Max. Resistance drift [%] [$\Delta R/R$]	1000h	≤0,05	≤0,15	≤0,25	≤0,05	≤0,15
	8000h	≤0,1	≤0,3	≤0,5	≤0,1	≤0,3
	225 000h	≤0,25	≤0,75	-	≤0,25	≤1,0

PERFORMANCE GRAPH'S

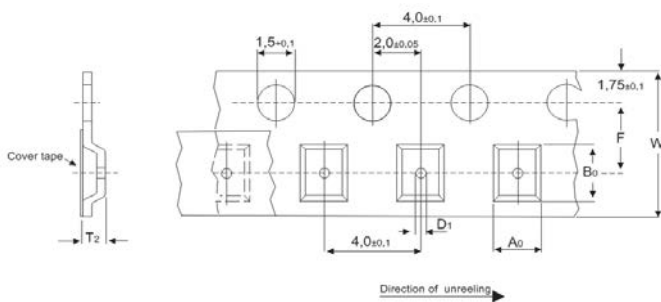
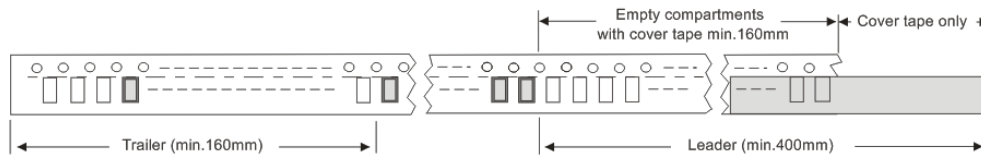


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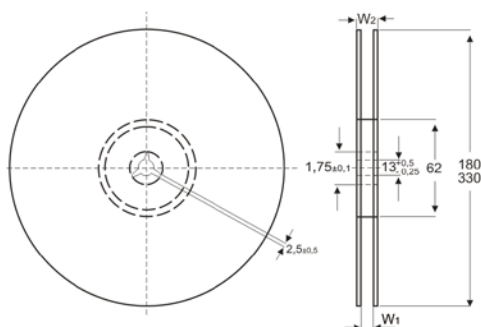


PACKAGING - Blister tape

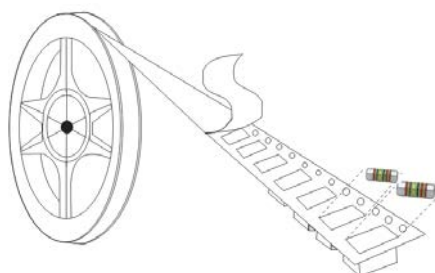
The type ZCM is packed in antistatic blister tape according to IEC60286-3, type 2a, packing details described below,



Type	A ₀	B ₀	F	W	D ₁	T ₂
ZCM204	1,55±0,1	3,7±0,1	3,5±0,05	8,0±0,3	1,0	≤ 1,8
ZCM207	2,40±0,1	6,0±0,1	5,5±0,05	12,0±0,3	1,5	≤ 2,7



Type	W ₁ [±1,5]	W ₂ [max]
ZCM204	8,4	14,4
ZCM207	12,4	18,4



Type	Packaging [dimensions]	Quantity [pcs]
ZCM204	07(inch)	3000
ZCM207	Blister tape	1500
ZCM204	13(inch)	10000
ZCM207	Blister tape	7500

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