

Polymer PTC Resettable Fuse: KLM Series

SMD Low Resistance Type



■ Features

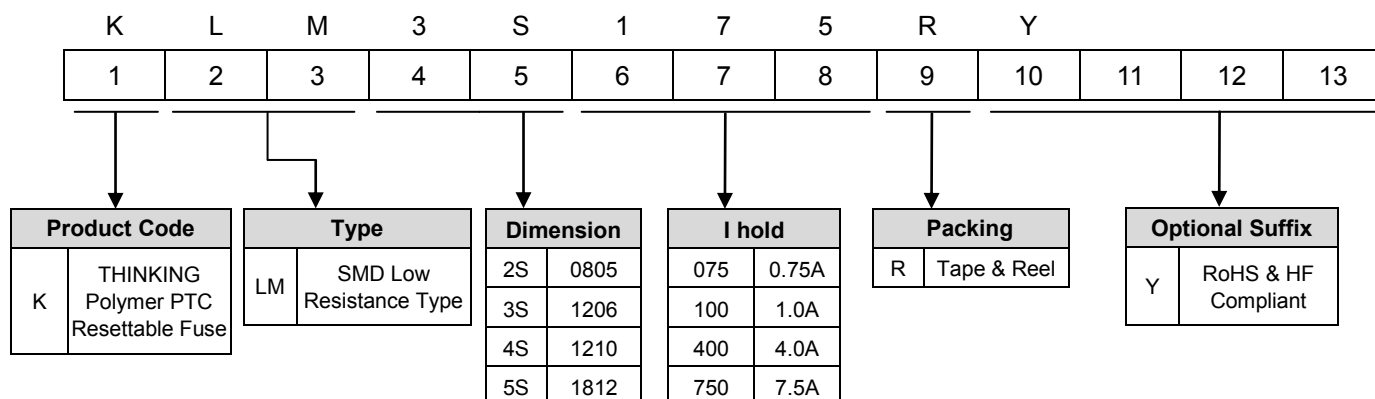
1. RoHS & Halogen-Free (HF) compliant
2. EIA size: 0805,1206,1210,1812
3. Hold current ratings from 0.75A to 5A
4. Vmax: 6V, 12V
5. Small footprint
6. Ultra low resistance
7. Fast time to trip
8. Operating & storage temperature range: -40~+85°C
9. Agency Approval: UL / cUL / TUV



■ Recommended Applications

1. USB, HDMI, IEEE 1394 interface
2. PC, Motherboard, NB, Tablet
3. Protection for lithium ion battery of cell phone
4. Digital cameras
5. Telecommunication
6. Consumer device

■ Part Number Code

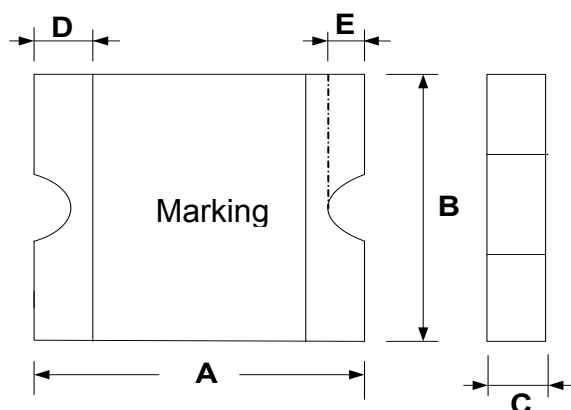


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■ Structure & Dimensions



(Unit: mm)

Part No.		A		B		C		D		E	
		(Min.)	(Max.)	(Min.)	(Max.)	(Min.)	(Max.)	(Min.)	(Max.)	(Min.)	(Max.)
KLM2S075	KLM2S075-12	2.00	2.20	1.20	1.50	0.4	0.7	0.150	0.55	0.05	0.45
KLM2S110	KLM2S110-12					0.4	0.7				
KLM2S150	KLM2S150-12					0.5	0.88				
KLM2S175	KLM2S175-12					0.5	0.88				
KLM3S075	KLM3S075-12	3.00	3.50	1.50	1.80	0.4	0.7	0.125	0.75	0.08	0.45
KLM3S110	KLM3S110-12					0.4	0.7				
KLM3S150	KLM3S150-12					0.4	0.7				
KLM3S175	KLM3S175-12					0.6	1.2				
KLM3S200	KLM3S200-12					0.6	1.2				
KLM3S260	KLM3S260-12					0.6	1.2				
KLM3S300	KLM3S300-12					0.6	1.2				
KLM3S350	KLM3S350-12					0.6	1.2				
KLM3S380	KLM3S380-12					0.8	1.6				
KLM3S400	KLM3S400-12					0.8	1.6				
KLM3S450	KLM3S450-12					0.8	1.6				
KLM3S500	KLM3S500-12					0.8	1.6				

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■ Structure & Dimensions

(Unit: mm)

Part No.		A		B		C		D		E	
		(Min.)	(Max.)	(Min.)	(Max.)	(Min.)	(Max.)	(Min.)	(Max.)	(Min.)	(Max.)
KLM4S175	KLM4S175-12	3.00	3.43	2.35	2.80	0.4	0.7	0.125	0.75	0.08	0.50
KLM4S200	KLM4S200-12					0.4	0.7				
KLM4S260	KLM4S260-12					0.4	0.7				
KLM4S300	KLM4S300-12					0.6	1.2				
KLM4S350	KLM4S350-12					0.6	1.2				
KLM4S380	KLM4S380-12					0.6	1.2				
KLM4S400	KLM4S400-12					0.6	1.2				
KLM4S450	KLM4S450-12					0.6	1.2				
KLM4S500	KLM4S500-12					0.6	1.2				
KLM5S190	KLM5S190-12	4.37	4.73	3.07	3.41	0.4	0.7	0.20	1.20	0.15	0.65
KLM5S260	KLM5S260-12					0.4	0.7				
KLM5S270	KLM5S270-12					0.4	0.7				
KLM5S300	KLM5S300-12					0.4	0.7				
KLM5S350	KLM5S350-12					0.4	0.7				
KLM5S370	KLM5S370-12					0.4	0.7				
KLM5S400	KLM5S400-12					0.4	0.7				
KLM5S450	KLM5S450-12					0.6	1.2				
KLM5S500	KLM5S500-12					0.6	1.2				

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■ Electrical Characteristics at 23°C

Part No.	Marking	Vmax. (V _{dc})	Imax. (A)	Ihold (A)	Itrip (A)	Pd (Max.) (W)	Maximum Time to Trip		Resistance		Safety Approvals	
							Current (A)	Time (Sec.)	Initial Ri Min. (Ω)	Post Trip R1 Max(Ω)	UL/cUL	TUV
KLM2S075	<u>A</u>	6	50	0.75	1.5	0.6	8.0	0.2	0.040	0.160	√	√
KLM2S075-12	<u>A</u>	12	50	0.75	1.5	1.2	8.0	0.2	0.040	0.160	√	√
KLM2S110	<u>B</u>	6	50	1.10	1.8	0.6	8.0	0.3	0.030	0.130	√	√
KLM2S110-12	<u>B</u>	12	50	1.10	1.8	1.2	8.0	0.3	0.030	0.130	√	√
KLM2S150	<u>C</u>	6	50	1.50	3.0	0.6	8.0	0.5	0.015	0.065	√	√
KLM2S150-12	<u>C</u>	12	50	1.50	3.0	1.2	8.0	0.5	0.015	0.065	√	√
KLM2S175	<u>D</u>	6	50	1.70	3.5	0.6	8.0	0.6	0.005	0.055	√	√
KLM2S175-12	<u>D</u>	12	50	1.70	3.5	1.2	8.0	0.6	0.005	0.055	√	√
KLM3S075	La	6	50	0.75	1.5	0.8	8.0	0.3	0.017	0.180	√	√
KLM3S075-12	La	12	50	0.75	1.5	1.2	8.0	0.3	0.017	0.180	√	√
KLM3S110	Lb	6	50	1.10	2.2	0.8	8.0	0.3	0.015	0.130	√	√
KLM3S110-12	Lb	12	50	1.10	2.2	1.2	8.0	0.3	0.015	0.130	√	√
KLM3S150	Lc	6	50	1.50	3.0	0.8	8.0	0.3	0.010	0.080	√	√
KLM3S150-12	Lc	12	50	1.50	3.0	1.2	8.0	0.3	0.010	0.080	√	√
KLM3S175	L3	6	50	1.75	3.5	0.8	8.0	0.4	0.005	0.045	√	√
KLM3S175-12	L3	12	50	1.75	3.5	1.2	8.0	0.4	0.005	0.045		
KLM3S200	L7	6	50	2.00	4.0	0.8	8.0	0.5	0.005	0.040	√	√
KLM3S200-12	L7	12	50	2.00	4.0	1.2	8.0	0.5	0.005	0.040	√	√
KLM3S260	L8	6	50	2.60	5.0	0.8	8.0	4.0	0.003	0.030	√	√
KLM3S260-12	L8	12	50	2.60	5.0	1.2	8.0	4.0	0.003	0.030	√	√
KLM3S300	L9	6	50	3.00	6.0	0.8	8.0	4.0	0.003	0.026	√	√
KLM3S300-12	L9	12	50	3.00	6.0	1.5	8.0	4.0	0.003	0.026	√	√
KLM3S350	L1	6	50	3.50	7.0	0.8	8.0	5.0	0.003	0.018	√	√
KLM3S350-12	L1	12	50	3.50	7.0	1.5	8.0	5.0	0.003	0.018		
KLM3S380	L2	6	50	3.80	8.0	0.8	8.0	5.0	0.002	0.014	√	√
KLM3S380-12	L2	12	50	3.80	8.0	1.5	8.0	5.0	0.002	0.014		
KLM3S400	L5	6	50	4.00	8.0	0.8	20.0	2.0	0.001	0.014	√	√
KLM3S400-12	L5	12	50	4.00	8.0	1.5	20.0	2.0	0.001	0.014		
KLM3S450	L6	6	50	4.50	9.0	0.8	22.0	2.0	0.001	0.014	√	√
KLM3S450-12	L6	12	50	4.50	9.0	1.5	22.0	2.0	0.001	0.014		
KLM3S500	Le	6	50	5.00	10.0	0.8	25.0	2.0	0.001	0.013	√	√
KLM3S500-12	Le	12	50	5.00	10.0	1.5	25.0	2.0	0.001	0.013		

Note: UL&cUL File No: E138827
TUV File No:R50311748

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■ Electrical Characteristics at 23°C

Part No.	Marking	Vmax.	I _{max} .	I _{hold}	I _{trip}	Pd (Max.)	Maximum Time to Trip		Resistance		Safety Approvals	
		(V _{dc})	(A)	(A)	(A)	(W)	Current	Time	Initial Ri	Post Trip R1	UL/cUL	TUV
							(A)	(Sec.)	Min. (Ω)	Max(Ω)		
KLM4S175	LA	6	50	1.75	3.5	0.8	8.0	2.5	0.006	0.040	√	√
KLM4S175-12	LA	12	50	1.75	3.5	1.2	8.0	2.5	0.006	0.040	√	√
KLM4S200	LB	6	50	2.00	4.0	0.8	8.0	3.0	0.005	0.024	√	√
KLM4S200-12	LB	12	50	2.00	4.0	1.2	8.0	3.0	0.005	0.024	√	√
KLM4S260	LE	6	50	2.60	5.0	0.8	8.0	4.0	0.003	0.020	√	√
KLM4S260-12	LE	12	50	2.60	5.0	1.2	8.0	4.0	0.003	0.020	√	√
KLM4S300	LG	6	50	3.00	6.0	0.8	15.0	2.0	0.003	0.020	√	√
KLM4S300-12	LG	12	50	3.00	6.0	1.5	15.0	2.0	0.003	0.020	√	√
KLM4S350	LN	6	50	3.50	7.0	0.8	17.5	2.0	0.003	0.018	√	√
KLM4S350-12	LN	12	50	3.50	7.0	1.5	17.5	2.0	0.003	0.018	√	√
KLM4S380	LK	6	50	3.80	8.0	0.8	19.0	2.0	0.003	0.016	√	√
KLM4S380-12	LK	12	50	3.80	8.0	1.5	19.0	2.0	0.003	0.016	√	√
KLM4S400	LM	6	50	4.00	8.0	0.8	20.0	2.0	0.002	0.014	√	√
KLM4S400-12	LM	12	50	4.00	8.0	1.5	20.0	2.0	0.002	0.014		
KLM4S450	LP	6	50	4.50	9.0	0.8	22.5	2.0	0.002	0.014	√	√
KLM4S450-12	LP	12	50	4.50	9.0	1.5	22.5	2.0	0.002	0.014		
KLM4S500	LQ	6	50	5.00	10.0	0.8	25.0	2.0	0.002	0.012	√	√
KLM4S500-12	LQ	12	50	5.00	10.0	1.5	25.0	2.0	0.002	0.012		

Note: UL&cUL File No.: E138827

TUV File No.: 50311748

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■ Electrical Characteristics at 23°C

Part No.	Marking	Vmax.	Imax.	Ihold	Itrip	Pd (Max.)	Maximum Time to Trip		Resistance		Safety Approvals	
									Initial Ri	Post Trip R1		
		(V _{dc})	(A)	(A)	(A)	(W)	Current (A)	Time (Sec.)	Min. (Ω)	Max(Ω)	UL/cUL	TUV
KLM5S190	L190	6	50	1.9	4.9	1	9.5	4.5	0.003	0.025	√	√
KLM5S190-12	L190	12	50	1.9	4.9	1.5	9.5	4.5	0.003	0.025	√	√
KLM5S260	L260	6	50	2.6	6.0	1	13.0	2.0	0.003	0.024	√	√
KLM5S260-12	L260	12	50	2.6	6.0	1.5	13.0	2.0	0.003	0.024		
KLM5S270	L270	6	50	2.7	6.2	1	13.0	2.0	0.003	0.023	√	√
KLM5S270-12	L270	12	50	2.7	6.2	1.5	13.0	2.0	0.003	0.023	√	√
KLM5S300	L300	6	50	3.0	6.2	1	8.0	5.0	0.003	0.021	√	√
KLM5S300-12	L300	12	50	3.0	6.2	2	8.0	5.0	0.003	0.021	√	√
KLM5S350	L350	6	50	3.5	8.1	1	8.0	5.0	0.003	0.020	√	√
KLM5S350-12	L350	12	50	3.5	8.1	2	8.0	5.0	0.003	0.020	√	√
KLM5S370	L370	6	50	3.7	9.1	1	18.5	2.0	0.003	0.018	√	√
KLM5S370-12	L370	12	50	3.7	9.1	2	18.5	2.0	0.003	0.018	√	√
KLM5S400	L400	6	50	4.0	8.0	1	20.0	2.0	0.003	0.017	√	√
KLM5S400-12	L400	12	50	4.0	8.0	2	20.0	2.0	0.003	0.017		
KLM5S450	L450	6	50	4.5	9.0	1	22.5	2.0	0.001	0.014	√	√
KLM5S450-12	L450	12	50	4.5	9.0	2	22.5	2.0	0.001	0.014		
KLM5S500	L500	6	50	5.0	10.0	1	25.0	2.0	0.001	0.013	√	√
KLM5S500-12	L500	12	50	5.0	10.0	2	25.0	2.0	0.001	0.013		

Note: UL&cUL File No.: E138827

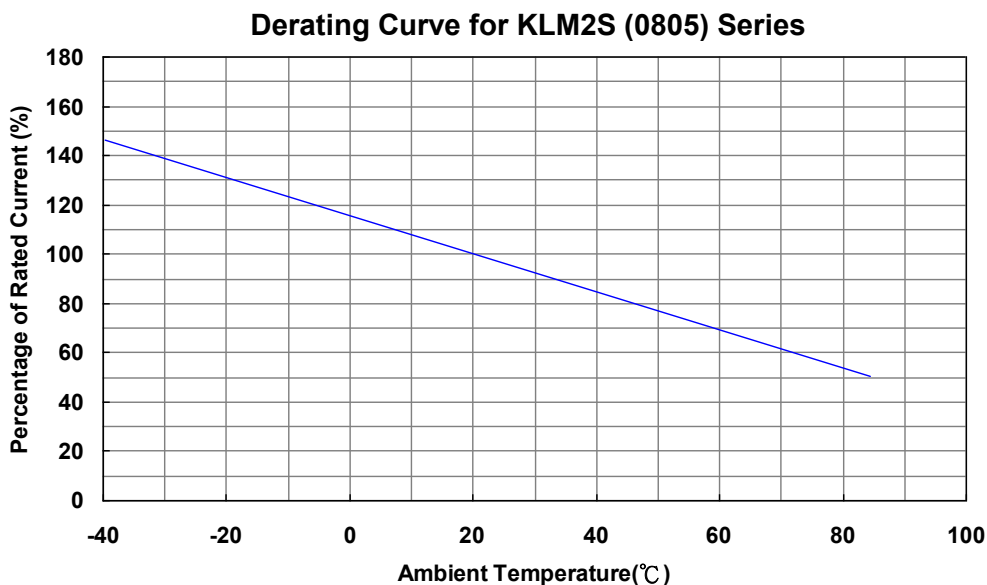
TUV File No.: R50311748

Polymer PTC Resettable Fuse: KLM Series

SMD Low Resistance Type



■ KLM2S (0805) Series Ihold & Itrip Thermal Derating Curve



■ KLM2S (0805) Series Ihold Thermal Derating Chart

KLM2S (0805) Series

(Unit: A)

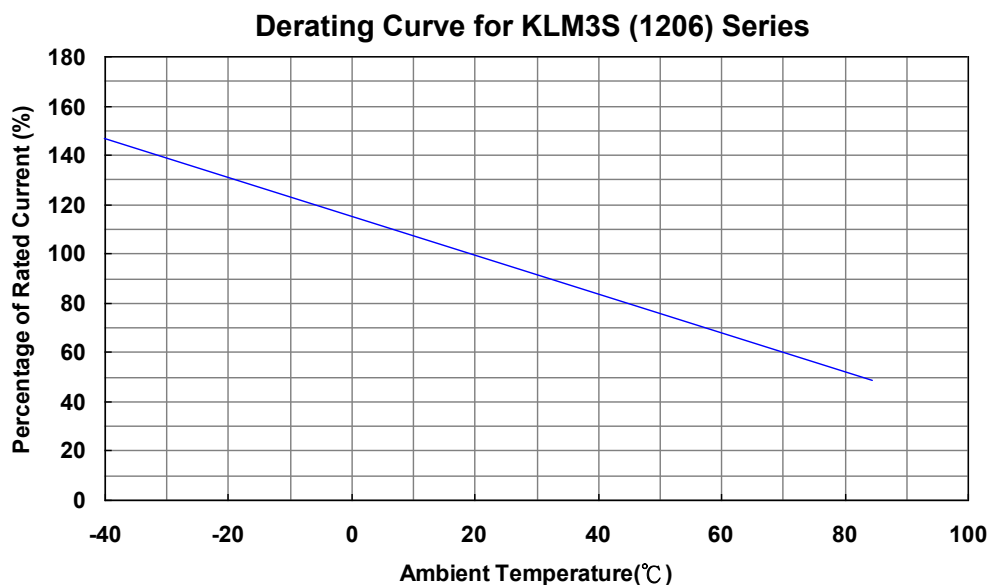
Part No.		Ambient Operation Temperature							
		-40°C	-20°C	0°C	23°C	40°C	60°C	70°C	85°C
KLM2S075	KLM2S075-12	1.24	1.07	0.94	0.75	0.62	0.47	0.37	0.21
KLM2S110	KLM2S110-12	1.93	1.65	1.38	1.10	0.83	0.55	0.41	0.23
KLM2S150	KLM2S150-12	2.37	2.07	1.80	1.50	1.25	0.93	0.74	0.50
KLM2S175	KLM2S175-12	2.57	2.33	2.07	1.75	1.49	1.24	1.00	0.91

Polymer PTC Resettable Fuse: KLM Series

SMD Low Resistance Type



■ KLM3S (1206) Series Ihold & Itrip Thermal Derating Curve



■ KLM3S (1206) Series Ihold Thermal Derating Chart

KLM3S (1206) Series

(Unit: A)

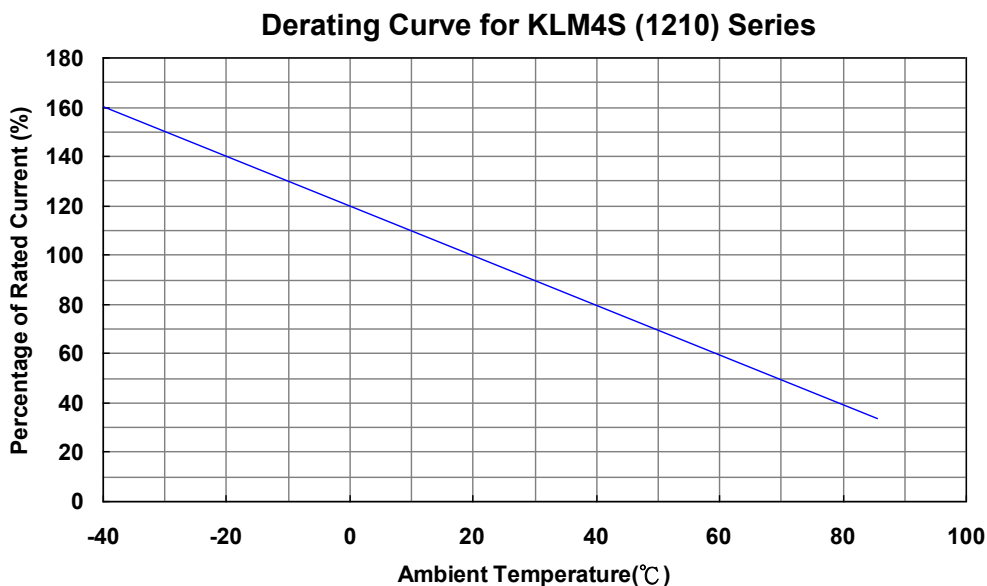
Part no		Ambient Operation Temperature							
		-40°C	-20°C	0°C	23°C	40°C	60°C	70°C	85°C
KLM3S075	KLM3S075-12	1.10	1.00	0.89	0.75	0.64	0.53	0.43	0.39
KLM3S110	KLM3S110-12	1.62	1.46	1.30	1.10	0.94	0.78	0.63	0.57
KLM3S150	KLM3S150-12	2.21	2.00	1.77	1.50	1.28	1.07	0.86	0.78
KLM3S175	KLM3S175-12	2.57	2.33	2.07	1.75	1.49	1.16	0.90	0.80
KLM3S200	KLM3S200-12	3.30	2.90	2.50	2.00	1.62	1.24	1.00	0.85
KLM3S260	KLM3S260-12	3.71	3.42	3.01	2.60	2.08	1.49	1.30	0.89
KLM3S300	KLM3S300-12	4.41	3.99	3.54	3.00	2.55	2.13	1.71	1.56
KLM3S350	KLM3S350-12	5.15	4.66	4.13	3.50	2.98	2.49	2.00	1.82
KLM3S380	KLM3S380-12	5.59	5.05	4.48	3.80	3.20	2.29	2.05	1.98
KLM3S400	KLM3S400-12	5.71	5.26	4.63	4.00	3.30	2.60	2.16	2.05
KLM3S450	KLM3S450-12	6.62	5.99	5.31	4.50	3.83	3.20	2.57	2.10
KLM3S500	KLM3S500-12	7.20	6.60	5.80	5.00	4.25	3.40	3.00	2.34

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■ KLM4S (1210) Series Ihold & Itrip Thermal Derating Curve



■ KLM4S (1210) Series Ihold Thermal Derating Chart

KLM4S (1210) Series

(Unit: A)

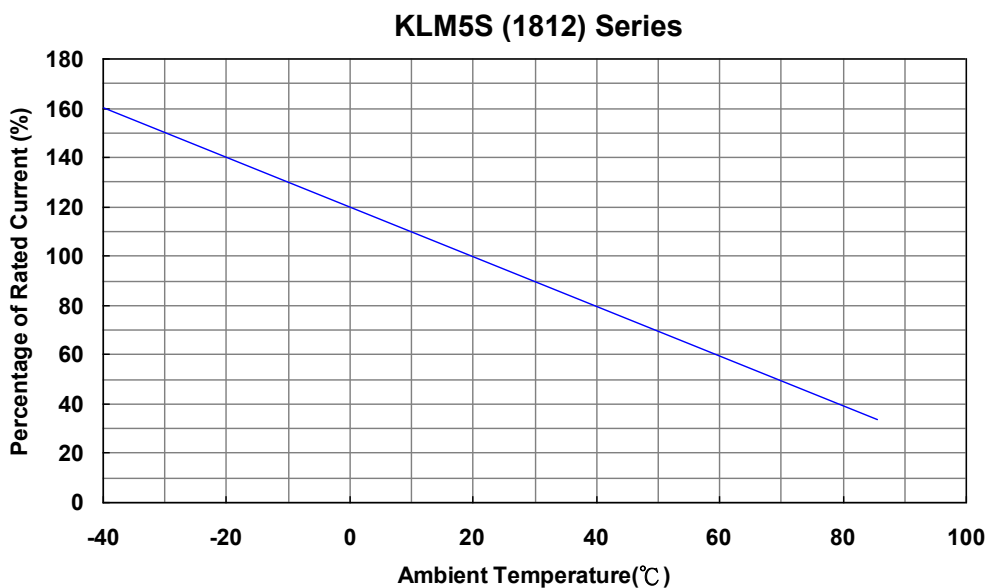
Part no		Ambient Operation Temperature							
		-40°C	-20°C	0°C	23°C	40°C	60°C	70°C	85°C
KLM4S175	KLM4S175-12	2.57	2.33	2.07	1.75	1.49	1.24	1.00	0.78
KLM4S200	KLM4S200-12	3.26	2.87	2.50	2.00	1.70	1.29	1.09	0.91
KLM4S260	KLM4S260-12	3.82	3.46	3.07	2.60	2.21	1.85	1.48	1.35
KLM4S300	KLM4S300-12	4.41	3.99	3.54	3.00	2.55	2.00	1.71	1.40
KLM4S350	KLM4S350-12	5.00	4.60	4.05	3.50	2.80	2.13	1.60	1.50
KLM4S380	KLM4S380-12	5.71	5.26	4.52	3.80	3.15	2.29	2.00	1.60
KLM4S400	KLM4S400-12	6.00	5.28	4.63	4.00	3.20	2.39	2.09	1.73
KLM4S450	KLM4S450-12	6.62	5.99	5.31	4.50	3.83	3.20	2.57	2.34
KLM4S500	KLM4S500-12	7.30	6.60	5.65	5.00	4.27	3.50	3.00	2.55

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■ KLM5S (1812)Series Ihold & Itrip Thermal Derating Curve



■ KLM5S (1812) Series Ihold Thermal Derating Chart

KLM5S (1812) Series

(Unit: A)

Part no		Ambient Operation Temperature							
		-40°C	-20°C	0°C	23°C	40°C	60°C	70°C	85°C
KLM5S190	KLM5S190-12	3.00	2.58	2.22	1.90	1.49	1.14	0.93	0.61
KLM5S260	KLM5S260-12	3.82	3.46	3.07	2.60	2.16	1.54	1.48	0.93
KLM5S270	KLM5S270-12	3.86	3.55	3.12	2.70	2.21	1.85	1.35	1.03
KLM5S300	KLM5S300-12	4.41	3.99	3.54	3.00	2.55	2.10	1.71	1.12
KLM5S350	KLM5S350-12	5.43	4.73	4.13	3.50	2.80	2.13	1.75	1.56
KLM5S370	KLM5S370-12	5.44	4.92	4.37	3.70	3.15	2.63	2.11	1.92
KLM5S400	KLM5S400-12	5.88	5.28	4.64	4.00	3.41	2.84	2.55	2.08
KLM5S450	KLM5S450-12	6.62	5.99	5.31	4.50	3.83	3.20	2.57	2.34
KLM5S500	KLM5S500-12	7.35	6.60	5.85	5.00	4.31	3.55	3.15	2.55

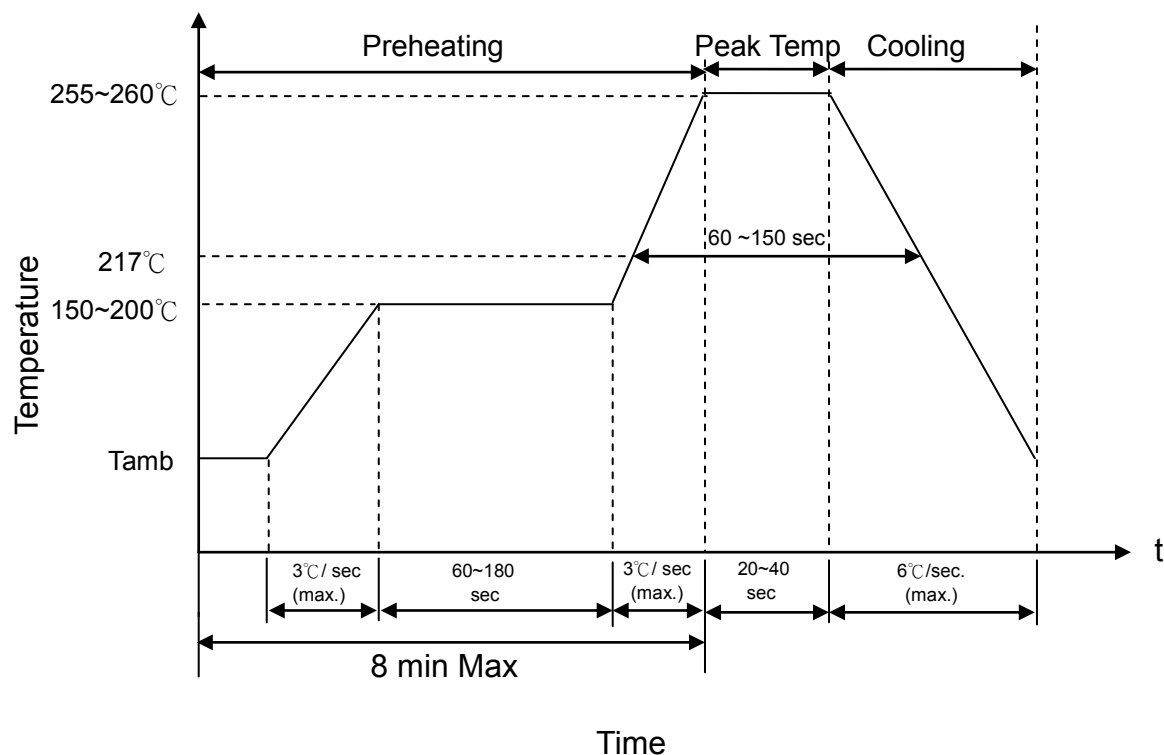
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■ Recommended Soldering Condition

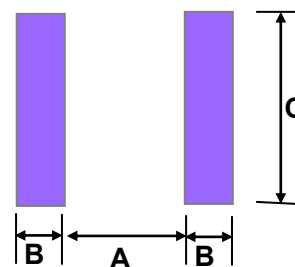
● IR-Reflow Soldering Profile



■ Recommended Soldering Pad Dimensions (Nominal)

(Unit: mm)

Series	Size	A	B	C
KLM2S	0805	1.20	1.00	1.50
KLM3S	1206	2.00	1.00	1.90
KLM4S	1210	2.00	1.00	2.80
KLM5S	1812	3.45	1.78	3.50



Polymer PTC Resettable Fuse: KLM Series

SMD Low Resistance Type

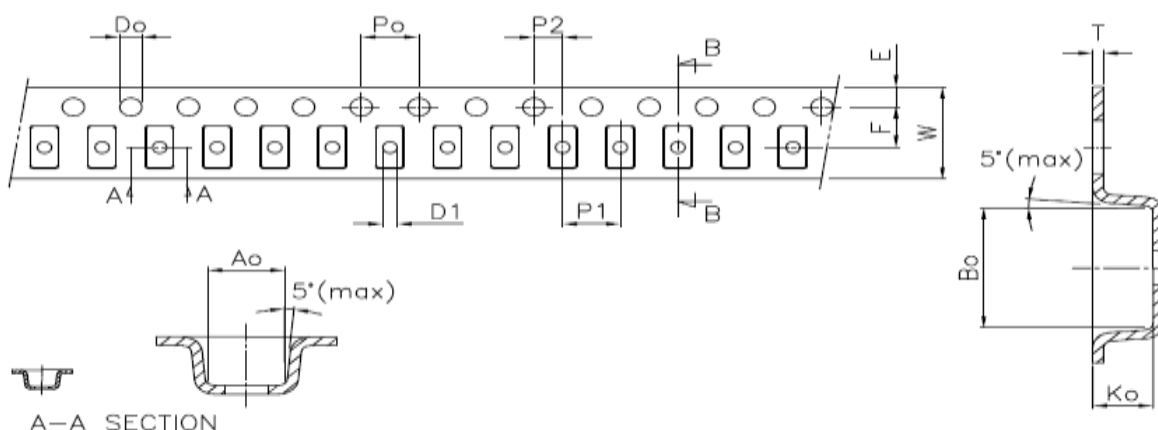


■ Reliability

Item	Standard	Test Condition / Methods	Criteria
Passive Aging	IEC 60738-1	85±5°C, 1000±24hrs	±10% typical resistance change
Humidity Aging	Specification Standard	85±5°C, 80~85%RH, 100±5hrs	±15% typical resistance change
Rapid Change of Temperature	IEC 60738-1	85±5/-40±5°C, 20 cycles Duration:30min	-30% typical resistance change
Overload and Endurance Test	UL 1434	Vmax, 120% Imax, 50 cycles Vmax, 300% Itrip, 6000 cycles	No visible damage
Aging Test	UL 1434	Vmax, Itrip ≤ I ≤ Imax , 1000±24hrs	No visible damage
Solderability	IEC 60068-2-58	245 ± 5°C, 3 ± 0.3sec	At least 95% of terminal electrode is covered by new solder.
Resistance to Soldering Heat	IEC 60068-2-58	260 ± 5°C, 10 ± 1sec	Rf<R1, No visible damage

■ Package

● Taping Specification



◆ KLM2S Series: SMD 0805 Type

(Unit: mm)

Index	A ₀	B ₀	K ₀	P ₀	P ₁	P ₂	T	E	F	D ₀	D ₁	W	10P ₀
Size	±0.10	±0.10	±0.050	±0.08	±0.10	±0.05	±0.10	±0.10	±0.05	±0.05	Min.	±0.10	±0.20
0805	1.6	2.3	0.9	4.0	4.0	2.0	0.25	1.75	3.50	1.55	1.0	8.0	40.0

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◆ KLM3S Series: SMD 1206 Type

For KLM3S075~KLM3S150, KLM3S075-12~KLM3S150 -12

(Unit: mm)

Index Size	A ₀ ±0.10	B ₀ ±0.10	K ₀ ±0.05	P ₀ ±0.10	P ₁ ±0.10	P ₂ ±0.10	T ±0.05	E ±0.10	F ±0.10	D ₀ ±0.05	D ₁ Min.	W ±0.30	10P ₀ ±0.20
1206	1.85	3.45	0.85	4.0	4.0	2.0	0.23	1.75	3.5	1.55	1.0	8.0	40.0

For KLM3S175~ KLM3S500, KLM3S175-12~KLM3S500-12

(Unit: mm)

Index Size	A ₀ ±0.10	B ₀ ±0.10	K ₀ ±0.05	P ₀ ±0.10	P ₁ ±0.10	P ₂ ±0.10	T ±0.05	E ±0.10	F ±0.10	D ₀ ±0.05	D ₁ Min.	W ±0.30	10P ₀ ±0.20
1206	1.95	3.55	1.4	4.0	4.0	2.0	0.23	1.75	3.5	1.55	1.0	8.0	40.0

◆ KLM4S Series: SMD 1210 Type

(Unit: mm)

Index Size	A ₀ ±0.10	B ₀ ±0.10	K ₀ ±0.05	P ₀ ±0.10	P ₁ ±0.10	P ₂ ±0.10	T ±0.05	E ±0.10	F ±0.10	D ₀ ±0.05	D ₁ Min.	W ±0.30	10P ₀ ±0.20
1210	2.82	3.63	1.47	4.0	4.0	2.0	0.23	1.75	3.5	1.55	1.0	8.0	40.0

◆ KLM5S Series: SMD 1812 Type

For KLM5S190~ KLM5S400, KLM5S190-12~KLM5S400-12

(Unit: mm)

Index Size	A ₀ ±0.10	B ₀ ±0.10	K ₀ ±0.05	P ₀ ±0.10	P ₁ ±0.10	P ₂ ±0.10	T ±0.03	E ±0.10	F ±0.10	D ₀ ±0.05	D ₁ Min.	W ±0.30	10P ₀ ±0.20
1812	3.50	5.0	0.9	4.0	8.0	2.0	0.25	1.75	5.5	1.55	1.50	12.0	40.0

For KLM5S450~ KLM5S500, KLM5S450-12~KLM5S500-12

(Unit: mm)

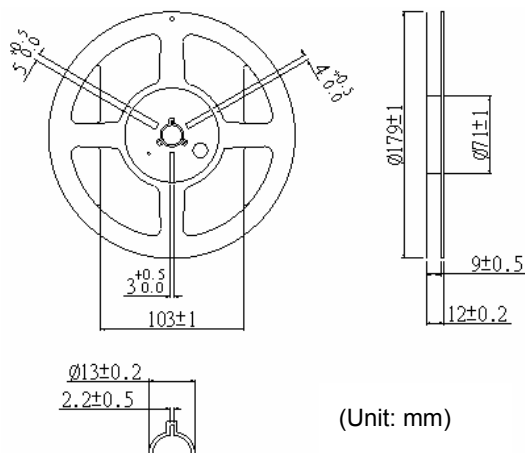
Index Size	A ₀ ±0.10	B ₀ ±0.10	K ₀ ±0.05	P ₀ ±0.10	P ₁ ±0.10	P ₂ ±0.10	T ±0.05	E ±0.10	F ±0.10	D ₀ ±0.05	D ₁ Min.	W ±0.30	10P ₀ ±0.20
1812	3.56	4.94	1.7	4.0	8.0	2.0	0.25	1.75	5.5	1.55	1.50	12.0	40.0

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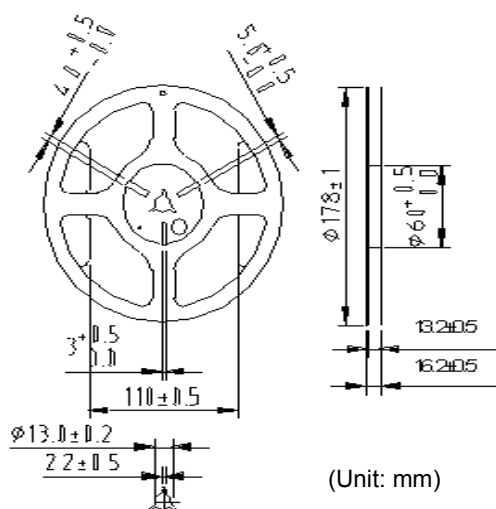
SMD Low Resistance Type



Quantity



Size	Part no	Quantity (pcs/reel)	Carton Size (mm)	Quantity (reel/carton)
0805	KLM2S	4,000	350*350*290	28
1206	KLM3S075~150	5,000		
	KLM3S175~500	2,500		
1210	KLM4S	3,000		



Size	Part no	Quantity (pcs/reel)	Carton Size (mm)	Quantity (reel/carton)
1812	KLM5S190~400	2,000	350*350*290	24
	KLM5S450~500	1,000		

Warehouse Storage Conditions of Products

Storage Conditions:

1. Storage Temperature: -10 °C ~ +40 °C
2. Relative humidity: ≤ 75%RH
3. Thermistors must be kept away from sunlight and stored in a non-corrosive atmosphere.

Period of Storage: 1 year