LP-MSML-HF Series

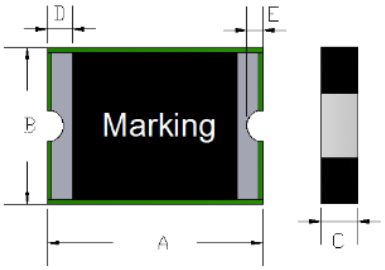
Current Sensing Resistor

Features

- Small size of 4532mm/1812mils
- Coating
- Lead-free and compliant with the European Union RoHS Directive (EU)2015/863
- Fast tripping resettable circuit protection
- Surface mount packaging for automated assembly
- Normal working temperature with -40ºC ~85ºC
- Agency Recognition: UL 、TUV

Product Dimension (mm)

Part number	A	B	C	D	E
	Max.	Max.	Max.	Min.	Min.
LP-MSML500HF	4.80	3.60	0.85	0.20	0.20
LP-MSML500/12HF	4.80	3.60	1.00	0.20	0.20
LP-MSML550HF	4.80	3.60	0.85	0.20	0.20
LP-MSML550/12HF	4.80	3.60	1.00	0.20	0.20
LP-MSML600HF	4.80	3.60	0.85	0.20	0.20
LP-MSML600/12HF	4.80	3.60	1.00	0.20	0.20
LP-MSML650HF	4.80	3.60	0.85	0.20	0.20
LP-MSML650/12HF	4.80	3.60	1.00	0.20	0.20
LP-MSML700HF	4.80	3.60	0.85	0.20	0.20
LP-MSML700/12HF	4.80	3.60	1.00	0.20	0.20
LP-MSML750HF	4.80	3.60	0.85	0.20	0.20
LP-MSML750/12HF	4.80	3.60	1.00	0.20	0.20
LP-MSML800HF	4.80	3.60	1.40	0.20	0.20
LP-MSML800/12HF	4.80	3.60	1.40	0.20	0.20
LP-MSML850HF	4.80	3.60	1.40	0.20	0.20
LP-MSML850/12HF	4.80	3.60	1.40	0.20	0.20
LP-MSML900HF	4.80	3.60	1.40	0.20	0.20
LP-MSML900/12HF	4.80	3.60	1.40	0.20	0.20



Electrical Characteristics

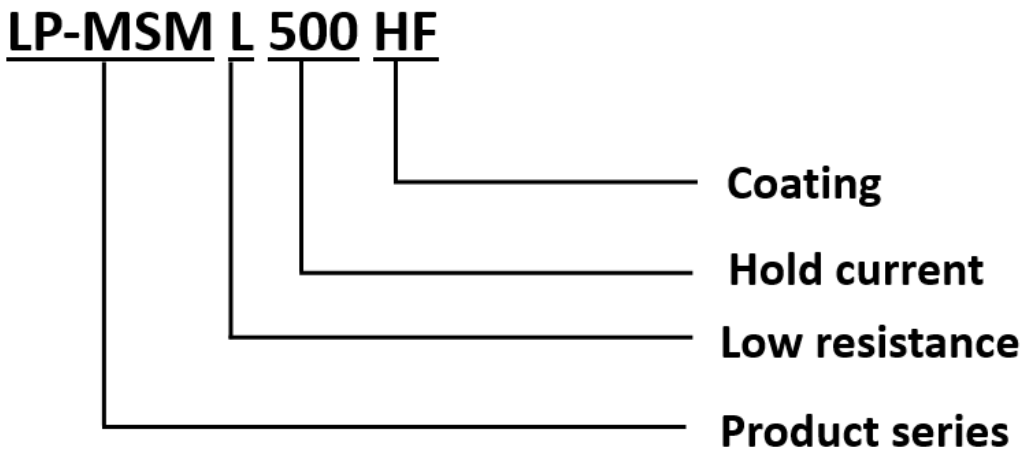
Part number	I_H	I_T	V_{max}	I_{max}	Max.Time-to-trip		Pd_{typ}	R_{min}	R_{1max}
	(A)	(A)	(V)	(A)	(A)	(S)	(W)	(Ω)	(Ω)
LP-MSML500HF	5.00	10.00	6	50	25.00	5.00	1.5	0.001	0.012
LP-MSML500/12HF	5.00	10.00	12	50	25.00	5.00	1.5	0.001	0.012
LP-MSML550HF	5.50	11.00	6	50	27.50	5.00	1.5	0.001	0.010
LP-MSML550/12HF	5.50	11.00	12	50	27.50	5.00	1.5	0.001	0.010
LP-MSML600HF	6.00	12.00	6	50	30.00	5.00	1.5	0.001	0.010
LP-MSML600/12HF	6.00	12.00	12	50	30.00	5.00	1.5	0.001	0.010
LP-MSML650HF	6.50	13.00	6	50	32.50	5.00	1.5	0.001	0.009
LP-MSML650/12HF	6.50	13.00	12	50	32.50	5.00	1.5	0.001	0.009
LP-MSML700HF	7.00	14.00	6	50	35.00	5.00	1.5	0.001	0.008
LP-MSML700/12HF	7.00	14.00	12	50	35.00	5.00	1.5	0.001	0.008
LP-MSML750HF	7.50	15.00	6	50	37.50	5.00	1.5	0.0005	0.008
LP-MSML750/12HF	7.50	15.00	12	50	37.50	5.00	1.5	0.0005	0.008
LP-MSML800HF	8.00	16.00	6	50	40.00	5.00	1.5	0.0005	0.007
LP-MSML800/12HF	8.00	16.00	12	50	40.00	5.00	1.5	0.0005	0.007
LP-MSML850HF	8.50	17.00	6	50	42.50	5.00	1.5	0.0005	0.007
LP-MSML850/12HF	8.50	17.00	12	50	42.50	5.00	1.5	0.0005	0.007
LP-MSML900HF	9.00	18.00	6	50	45.00	5.00	1.5	0.0005	0.007
LP-MSML900/12HF	9.00	18.00	12	50	45.00	5.00	1.5	0.0005	0.007

I_H=Hold current: maximum current at which the device will not trip at 25°C still air.
I_T=Trip current: minimum current at which the device will always trip at 25°C still air.
V_{max}=Maximum voltage device can withstand without damage at rated current.
I_{max}=Maximum fault current device can withstand without damage at rated voltage.
Max. Time-to-trip =Maximum time to trip(s) at assigned current.
Pd_{typ}=Typical power dissipation: typical amount of power dissipated by the device when in state air environment.
R_{min}=Minimum device resistance at 25°C prior to tripping.
R_{1max}=Maximum device resistance measured in the nontripped state 1 hour post one reflow.

Thermal Derating

Part number	Maximum Ambient Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
LP-MSML500HF	7.36	6.66	5.80	5.13	5.00	4.40	3.90	3.50	3.05
LP-MSML500/12HF	7.36	6.66	5.80	5.13	5.00	4.40	3.90	3.50	3.05
LP-MSML550HF	8.12	7.32	6.40	5.65	5.50	4.85	4.28	3.88	3.40
LP-MSML550/12HF	8.12	7.32	6.40	5.65	5.50	4.85	4.28	3.88	3.40
LP-MSML600HF	8.88	8.00	6.99	6.15	6.00	5.10	4.55	4.00	3.40
LP-MSML600/12HF	8.88	8.00	6.99	6.15	6.00	5.10	4.55	4.00	3.40
LP-MSML650HF	9.65	8.66	7.58	6.65	6.50	5.53	4.95	4.33	3.68
LP-MSML650/12HF	9.65	8.66	7.58	6.65	6.50	5.53	4.95	4.33	3.68
LP-MSML700HF	10.63	9.33	8.15	7.17	7.00	5.95	5.31	4.67	3.97
LP-MSML700/12HF	10.63	9.33	8.15	7.17	7.00	5.95	5.31	4.67	3.97
LP-MSML750HF	11.35	9.95	8.70	7.64	7.50	6.35	5.68	5.00	4.25
LP-MSML750/12HF	11.35	9.95	8.70	7.64	7.50	6.35	5.68	5.00	4.25
LP-MSML800HF	11.78	10.56	9.25	8.23	8.00	7.05	6.25	5.50	4.95
LP-MSML800/12HF	11.78	10.56	9.25	8.23	8.00	7.05	6.25	5.50	4.95
LP-MSML850HF	12.50	11.23	9.82	8.70	8.50	7.45	6.63	5.83	5.26
LP-MSML850/12HF	12.50	11.23	9.82	8.70	8.50	7.45	6.63	5.83	5.26
LP-MSML900HF	13.25	11.87	10.36	9.26	9.00	7.92	7.05	6.20	5.55
LP-MSML900/12HF	13.25	11.87	10.36	9.26	9.00	7.92	7.05	6.20	5.55

Part Numbering System

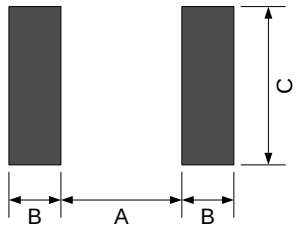


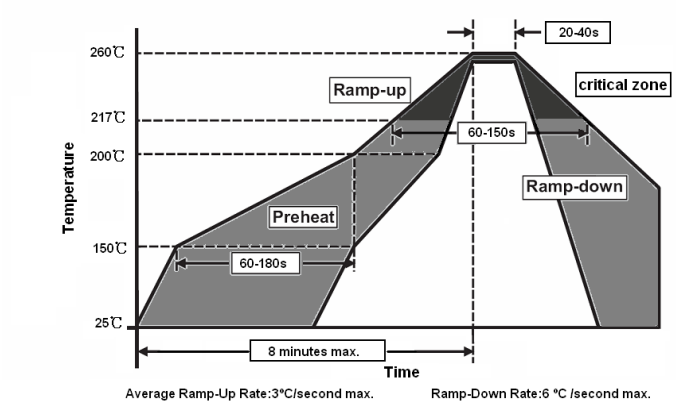
Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25°C	$R_{min} \leqslant R \leqslant R_{1max}$
Time to Trip	Specified current, V_{max}, 25°C	T≤maximum Time to Trip
Hold Current	60min, at I_H	No trip
Trip Cycle Life	V_{max}, I_{max}, 100cycles	No arcing or burning
Trip Endurance	V_{max}, 2hours	No arcing or burning

Packaging and Marking Information

Part number	Tape & Reel Quantity	Tape spc code	Part Marking	Recommended Pad Layout Figures[mm]			Agency Recognition
				Dimension A(Nom.)	Dimension B(Nom.)	Dimension C(Nom.)	
LP-MSML500HF	1800	1812A	W500	3.10	1.68	3.20	UL,TUV
LP-MSML500/12HF	1800	1812A	W500-1	3.10	1.68	3.20	UL
LP-MSML550HF	1800	1812A	W550	3.10	1.68	3.20	UL,TUV
LP-MSML550/12HF	1800	1812A	W550-1	3.10	1.68	3.20	UL
LP-MSML600HF	1800	1812A	W600	3.10	1.68	3.20	UL,TUV
LP-MSML600/12HF	1800	1812A	W600-1	3.10	1.68	3.20	UL
LP-MSML650HF	1800	1812A	W650	3.10	1.68	3.20	UL,TUV
LP-MSML650/12HF	1800	1812A	W650-1	3.10	1.68	3.20	UL
LP-MSML700HF	1800	1812A	W700	3.10	1.68	3.20	UL,TUV
LP-MSML700/12HF	1800	1812A	W700-1	3.10	1.68	3.20	UL
LP-MSML750HF	1800	1812A	W750	3.10	1.68	3.20	UL,TUV
LP-MSML750/12HF	1800	1812A	W750	3.10	1.68	3.20	UL
LP-MSML800HF	1000	1812B	W800	3.10	1.68	3.20	UL,TUV
LP-MSML800/12HF	1000	1812B	W800-1	3.10	1.68	3.20	UL
LP-MSML850HF	1000	1812B	W850	3.10	1.68	3.20	UL,TUV
LP-MSML850/12HF	1000	1812B	W850-1	3.10	1.68	3.20	UL
LP-MSML900HF	1000	1812B	W900	3.10	1.68	3.20	UL,TUV
LP-MSML900/12HF	1000	1812B	W900-1	3.10	1.68	3.20	UL





* Recommended reflow methods: IR, Vapor phase, hot air oven.

Notes:

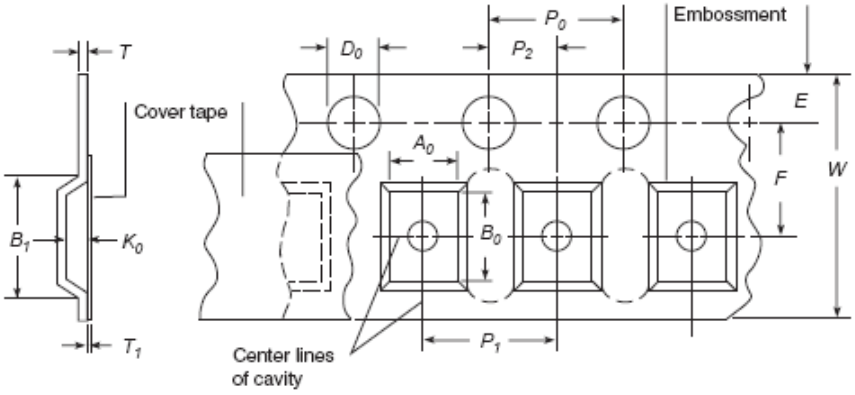
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
- Devices are not designed to be wave soldered to the bottom side of the board.

Effectivity: Reference documents shall be the issue in effect on the date of invitation for bid.

Caution: Operation beyond the rated voltage or current may result in rupture electrical arcing or flame.

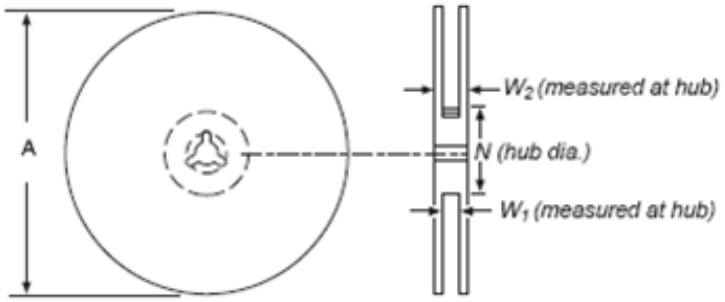
Tape Specification And Reel Dimensions

1812A	W	P0	P1	P2	A0	B0
	12.00±0.30	4.00±0.10	8.00±0.10	2.00±0.10	3.60±0.10	5.20±0.10
	D0	F	E	T	K0	/
	1.55±0.05	5.50±0.10	1.75±0.10	0.25±0.05	1.15±0.10	/
1812B	W	P0	P1	P2	A0	B0
	12.00±0.30	4.00±0.10	8.00±0.10	2.00±0.10	3.66±0.10	4.95±0.10
	D0	F	E	T	K0	/
	1.55±0.05	5.50±0.10	1.75±0.10	0.25±0.05	1.85±0.10	/



Reel Dimensions

Tape spc code	A	N	W_1	W_2
1812	180+0/-1.5	60+1/-0	13.0+1/-0	15.4+1/-0



Contact Information

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Product Specification Statement

1.The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

2.The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

3.WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

4.Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

5.The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

6.Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.

Cautions for SMD PTC Use

1. Operation beyond the maximum voltage or current may result in device damage and possible electrical arcing or flame.

2. Hold current at all temperatures specified in the SPEC is the conventional performance of PTC obtained by one time reflow welding. PTC can hold 1 hour under current conditions at a given temperature. This current is not the condition of long-term charging or discharging current for this type of PTC.

3. The above parameters are concluded from one time of reflow soldering processing the PTC. If there is any further heat generated process like injection or dispensing at the customer's premise, the aforementioned parameters will decrease at certain degree. Therefore the verification test to be conducted is necessary.

4. The PTC is thermal sensitive device. It is recommended not to design any heat source devices around it to reduce the outside heat source impact.

5. SMD PTC is designed for SMT processing which applies reflow soldering. Please refer to the Wayon recommended curve for reference. If the reflow soldering temperature exceeds the recommended value, the PTC might be damaged. Hand welding PTC is prohibited. Heat gun is not allowed to use during the circuit board components or terminals rework.

6. When mounting or using PTC, all injection molding materials, curing adhesives, UV glue , silica gel and cleaning agents or solvents must be tested in terms of application parameters e.g. temperature, time, and etc to ensure the consistency between the product and the processing before use.

7. When mounting or using PTC, it is not recommended to use circuit board washer water or other cleaning agent. If cleaning is required, it is necessary to verify the applicability of various cleaning agents, washboard water and solvents, and confirm that they will not affect the PTC performance . The known chemicals that impacts PTC include but not limited to ethers, benzene homolog, ketones, lipids and derivates that is of strong solubleness and ruinous. Please place the product in open environment for at least 24 hours to volatilize solvents residuals.

8. Please do not smash, clamp, pull, dent or twist by tool during assembling process otherwise it might be a cause of the performance degradation.

9. When PTC is welded to the PCM in product application, if injection or gluing is needed, it should be completed in as short a time as possible. If the time slot between mounting and injection or gluing surpasses 1 month,, please keep in airtight environment to avoid long air exposure.

10. PTC is resettable protection device which shall not be taken for use as switch. Multiple times tripping shall lower the PTC hold current.

11. In charging terminal application, PP type material is recommended to use as inner membrane and TPE and PVC type material is inhibited.

12.In the process of PTC processing, if there is soldering iron welding process, it is suggested that the welding positio n should be more than 1.5mm away from PTC, the welding tool temperature should be lower than 350°C, and the con tact time between soldering iron and solder joint should not exceed 3sec.

13. Wayon low resistance SMD PTC humidity sensitivity grade 2a, for sealed packaging. If customers find damaged packaging in stock, they should isolate the product immediately; if there is surplus material, they need to restore the packaging status , and do sealed storage.

14. When the product is finally discarded, it can be treated recycled in accordance with local laws and regulations, and raw material compositions of PPTC can be referred to MSDS.

15. It is recommended to keep PTC away from precision resistance,MOS and other heating components as much as possible when designing the protection plate.

16. It is recommended that the direction of the PTC layout should be parallel to the length direction of the protection plate, not perpendicular to the length direction of the protection plate, and try to ensure that the copper width of the PTC bottom wiring is as large as possible.