Features

- Surface mount packaging for automated assembly
- Small footprint size (1210) and low profile for space-constrained mobile applications
- Ultra-low resistance, quick response
- RoHS compliant*
- Agency recognition:

MF-USML/X Series - Low Ohmic PTC Resettable Fuses

Electrical Characteristics

Model	V max.	I max.	I_{hold}	I_{trip}	Resistance		Max. Time To Trip		Tripped Power Dissipation	Certifications	
			at 23 °C		at 23 °C Ohms		at 23 °C		Watts at 23 °C	cUL	TÜV
	Volts	Amps	Amps		R_{min}	R_{1max}	Amps	Seconds	Typ.	E174545	R50391579
MF-USML175/12	12	50	1.75	3.5	0.006	0.050	8.0	0.8	1.0	✓	✓
MF-USML200/12	12	50	2.0	4.0	0.005	0.040	8.0	5.0	1.0	✓	✓
MF-USML260/12	12	50	2.6	5.2	0.004	0.030	8.0	5.0	1.0	✓	✓
MF-USML300/12	12	50	3.0	6.0	0.003	0.024	15.0	5.0	1.0	✓	✓
MF-USML350/12	12	50	3.5	7.0	0.002	0.022	17.0	5.0	1.0	✓	✓
MF-USML380/12	12	50	3.8	7.6	0.002	0.020	19.0	5.0	1.0	✓	✓
MF-USML400/12	12	50	4.0	8.0	0.002	0.018	20.0	5.0	1.0	✓	✓
MF-USML450/12	12	50	4.5	9.0	0.002	0.014	22.5	2.0	1.0	✓	✓
MF-USML500/12	12	50	5.0	10.0	0.001	0.012	25.0	2.0	1.2	✓	✓
MF-USML550/12	12	50	5.5	11.0	0.001	0.010	27.5	2.0	1.2	✓	✓

Environmental Characteristics

Operating Temperature ..... -40 °C to +85 °C
Storage Condition
  Before Opening ..... +40 °C max. / 70 % RH max.
  After Opening ..... +40 °C max. / 10 % RH max.
Floor Condition After Opening ..... Consumption within 4 weeks at floor condition +30 °C max. / 60 % RH max.
Passive Aging ..... +85 °C, 1000 hours ..... ±10 % typical resistance change
Humidity Aging ..... +85 °C, 85 % R.H. 100 hours ..... ±15 % typical resistance change
Thermal Shock ..... +85 °C to -40 °C, 20 times ..... ±30 % typical resistance change
Solvent Resistance ..... MIL-STD-202, Method 215 ..... No change (marking still legible)
Vibration ..... MIL-STD-883C, Method 2007.1, Condition A ..... No change (R_{min}<R<R_{1max})
Moisture Sensitivity Level (MSL) ..... See Note
ESD Classification - HBM 6

Test Procedures and Requirements

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.	Verify dimensions and materials	Per MF physical description
Resistance	In still air @ 23 °C	$R_{min} \le R \le R_{1max}$
Time to Trip	At specified current, V_{max}, 23 °C	T ≤ max. time to trip (seconds)
Hold Current	30 min. at I_{hold}	No trip
Trip Cycle Life	V_{max}, I_{max}, 100 cycles	No arcing or burning
Trip Endurance	V_{max}, 48 hours	No arcing or burning
Solderability	245 °C ±5 °C, 5 seconds	95 % min. coverage

WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

* RoHS Directive 2015/863, Mar 31, 2015 and Annex.

** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

Applications

- Li-ion battery pack protection
- Power delivery port protection
- Higher voltage withstand
- PC motherboards – Plug & Play protection
- Mobile phones – battery & charging protection
- USB port protection
- Game console port protection

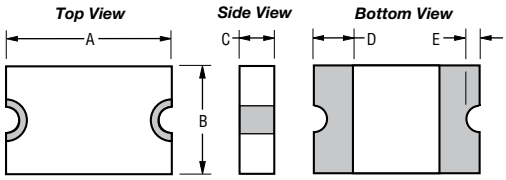
MF-USML/X Series – Low Ohmic PTC Resettable Fuses

BOURNS®

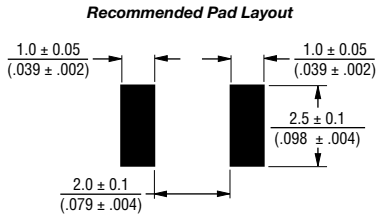
Product Dimensions

Model	A		B		C		D	E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.	Max.
MF-USML175/12	3.00 (0.12)	3.43 (0.14)	2.35 (0.09)	2.80 (0.11)	0.40 (0.016)	0.80 (0.031)	0.25 (0.010)	0.05 (0.002)	0.45 (0.018)
MF-USML200/12									
MF-USML260/12									
MF-USML300/12	3.00 (0.12)	3.43 (0.14)	2.35 (0.09)	2.80 (0.11)	0.60 (0.024)	1.20 (0.047)	0.25 (0.010)	0.05 (0.002)	0.45 (0.018)
MF-USML350/12									
MF-USML380/12									
MF-USML400/12									
MF-USML450/12									
MF-USML500/12									
MF-USML550/12									

DIMENSIONS: MM (INCHES)



Terminal material:
ENIG-plated terminals



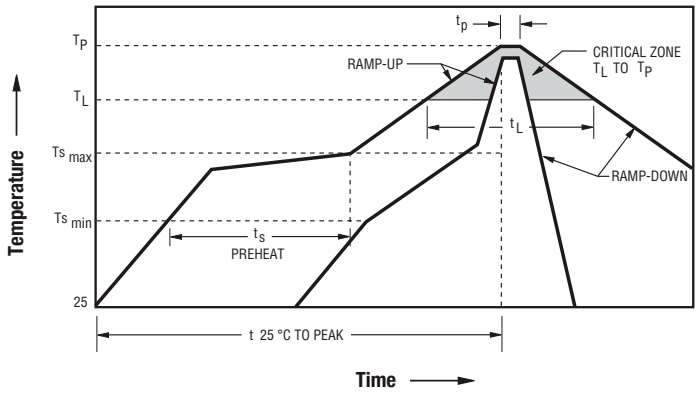
Packaging Quantity

MF-USML175/12 ~ MF-USML260/12 = 5000 pcs. per reel
MF-USML300/12 ~ MF-USML550/12 = 3500 pcs. per reel

Thermal Derating Table - I_{hold} (Amps)

Model	Ambient Operating Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
MF-USML175/12	2.57	2.33	2.07	1.75	1.49	1.34	1.24	1.00	0.88
MF-USML200/12	2.94	2.65	2.35	2.00	1.70	1.53	1.42	1.14	1.00
MF-USML260/12	3.82	3.46	3.07	2.60	2.21	1.95	1.85	1.48	1.30
MF-USML300/12	4.41	3.99	3.54	3.00	2.55	2.30	2.13	1.71	1.50
MF-USML350/12	5.10	4.65	4.13	3.50	2.98	2.65	2.50	2.00	1.75
MF-USML380/12	5.59	5.05	4.48	3.80	3.23	2.95	2.70	2.17	1.90
MF-USML400/12	5.80	5.25	4.70	4.00	3.40	3.10	2.80	2.28	2.00
MF-USML450/12	6.30	5.65	4.95	4.50	3.83	3.40	2.95	2.50	2.05
MF-USML500/12	7.00	6.25	5.50	5.00	4.25	3.75	3.25	2.75	2.25
MF-USML550/12	7.70	6.90	6.05	5.50	4.68	4.15	3.60	3.05	2.40

Solder Reflow Recommendations



Notes:

- MF-USML/X models cannot be wave soldered or hand soldered. Please contact Bourns for soldering recommendations.
- All temperatures refer to topside of the package, measured on the package body surface.
- If reflow temperatures exceed the recommended profile, devices may not meet the published specifications.
- Compatible with Pb and Pb-free solder reflow profiles.
- Excess solder may cause a short circuit. Please refer to the Multifuse® Polymer PTC Soldering Recommendation guidelines.

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Ts_{max} to T_p)	3 °C / second max.
PREHEAT: Temperature Min. (Ts_{min}) Temperature Max. (Ts_{max}) Time (Ts_{min} to Ts_{max}) (ts)	 150 °C 200 °C 60~180 seconds
TIME MAINTAINED ABOVE: Temperature (T_L) Time (t_L)	 217 °C 60~150 seconds
Peak Temperature (T_p)	260 °C
Time within 5 °C of Actual Peak Temperature (t_p)	20~40 seconds
Ramp-Down Rate	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.

How to Order

MF - USML 400 / 12 - 2

Multifuse® Product Designator

Series
USML = 1210 Low Ohmic Surface Mount Component

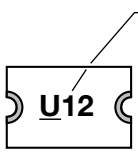
Hold Current, I_{hold}
175 - 550 (1.75 Amps - 5.50 Amps)

Maximum Voltage, V_{max}
12 = 12 Volts

Packaging
-2 = Tape and Reel
Packaged per EIA 481

Typical Part Marking

Represents total content. Layout may vary.

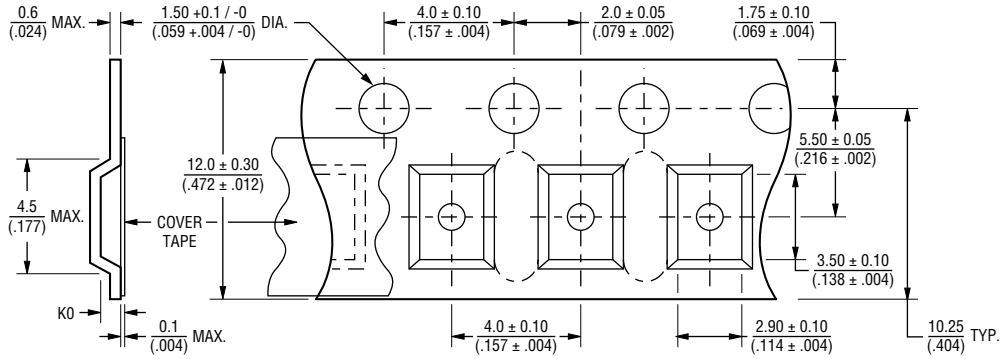


PART IDENTIFICATION:
MF-USML175/12 = H12
MF-USML200/12 = J12
MF-USML260/12 = N12
MF-USML300/12 = P12
MF-USML350/12 = S12
MF-USML380/12 = V12
MF-USML400/12 = U12
MF-USML450/12 = X12
MF-USML500/12 = Y12
MF-USML550/12 = 512

MANUFACTURING DATE CODE IS LOCATED ON PACKING LABEL.

Packaging Specifications

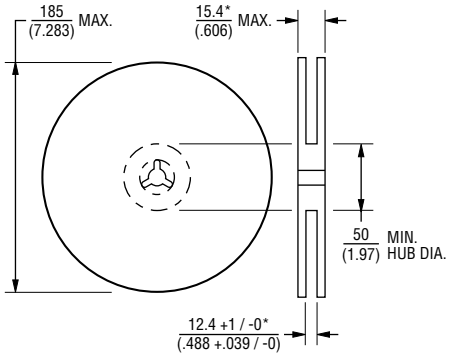
MF-USML/X Series per EIA 481



K0

0.65 ± 0.10 (.026 ± .004) MF-USML175/12 ~ MF-USML260/12

1.10 ± 0.10 (.043 ± .004) MF-USML300/12 ~ MF-USML550/12



DIMENSIONS: MM / (INCHES)

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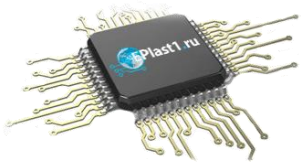
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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