

Features

- Compliant with AEC-Q200 Rev-C -Stress Test Qualification for Passive Components in Automotive Applications
- Small footprint size (1210)
- Operating temperature range up to 125 °C
- Low thermal derating factor
- Higher hold currents at elevated temperatures

MF-USHT Series - PTC Resettable Fuses

Electrical Characteristics

Madal	V max.	IX. I max.	lhold	l _{trip}	Resis	stance	Max. Time To Trip		Tripped Power Dissipation	
Model	Volts	Amps		eres 3 °C	Ohms at 23 °C		Amperes at 23 °C	Seconds at 23 °C	Watts at 23 °C	
			Hold	Trip	R _{Min} .	R1Max.**			Тур.	
MF-USHT035KX	30	20	0.35	1.75	0.4	2.2	8.0	0.1	1.0	
MF-USHT050KX	30	20	0.50	2.50	0.3	1.6	8.0	0.1	1.0	

**R1Max. measured 24 hours post reflow.

Environmental Characteristics

Operating Temperature	40 °C to +125 °C +125 °C, 1000 hours	Bfinal < B1max
	+85 °C, 85 % R.H. 1000 hours	
	+125 °C to -40 °C, 20 times	
Solvent Resistance	MIL-STD-202, Method 215	. No change
Vibration	MIL-STD-883C, Method 2007.1,	. No change
	Condition A	
Moisture Sensitivity Level (MSL)		
ESD Classification - HBM	Class 6	

Test Procedures And Requirements For Model MF-USHT Series

Visual/Mech. Resistance Time to Trip Hold Current Trip Cycle Life. Trip Endurance	Test Conditions Verify dimensions and materials In still air @ 23 °C At specified current, Vmax, 23 °C 30 min. at I _{hold} V _{max} , I _{max} , 100 cycles V _{max} , 48 hours ANSI/J-STD-002	$\begin{array}{l} {R_{min} \leq R \leq R_{1max}} \\ {T \leq max. time to trip (seconds)} \\ {No trip} \\ {No arcing or burning} \\ {No arcing or burning} \\ {No arcing or burning} \end{array}$
	E174545 http://www.ul.com/ Follow link to Online Certificate E174545, or <u>click here</u> Certificate Number Available on Request, or <u>click</u>	

Thermal Derating Chart - Ihold (Amps)

Model Ambient Operating Temperature										
woder	-40 °C	-20 °C	0°C	+23 °C	+40 °C	+50 °C	+60 °C	+70 °C	+85 °C	+125 °C
MF-USHT035KX	0.508	0.459	0.406	0.350	0.308	0.284	0.259	0.235	0.196	0.095
MF-USHT050KX	0.725	0.655	0.580	0.500	0.440	0.405	0.370	0.335	0.280	0.135



*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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RoHS compliant*

Agency recognition: 🖓 🗤 🚣

Applications

- Protection of automotive circuitry including engine control modules
- Overcurrent surge protection of electronic equipment required to operate at high operating temperature ranges
- Resettable fault protection for general electronic equipment

MF-USHT Series - PTC Resettable Fuses

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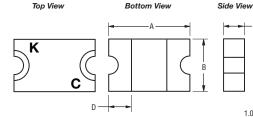
DIMENSIONS:

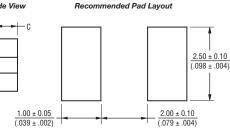
(INCHES)

Product Dimensions

Model		Α		В		D	
woder	Min.	Max.	Min.	Max.	Min.	Max.	Min.
MF-USHT035X	3.00	3.43	2.35	2.80	0.40	0.85	0.30
	(0.118)	(0.135)	(0.093)	(0.110)	(0.016)	(0.033)	(0.012)
	3.00	3.43	2.35	2.80	0.40	0.85	0.30
MF-USHT050X	(0.118)	(0.135)	(0.093)	(0.110)	(0.016)	(0.033)	(0.012)

Packaging: 3000 pcs. per reel.

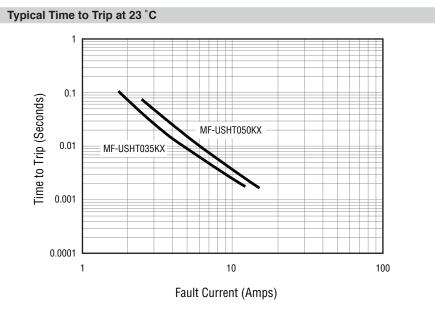




Terminal material: Nickel/gold plated.

Termination pad solderability: Standard Au finish: Meets ANSI/J-STD-002 Category 2.

Recommended Storage: 40 °C max./70 % RH max.

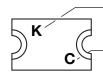


The Time to Trip curves represent typical performance of a device in a simulated application environment. Actual performance in specific customer applications may differ from these values due to the influence of other variables.

How to Order MF - USHT 035 K X - 2 Multifuse® Product Designator Series USHT = 1210 High Temperature Surface Mount Component Hold Current, Ihold 035 - 050 (0.35 - 0.50 Amps) Material Specific Code Multifuse[®] freeXpansion[™] Design Packaging Packaged per EIA 481-1 -2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.



PART IDENTIFICATION: MF-USHT035KX = F MF-USHT050KX = K

BIWEEKLY DATE CODE: WEEK 1 AND 2 = A WEEK 51 AND 52 = Z

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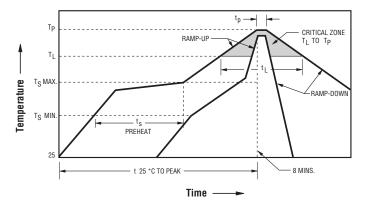
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MF-USHT Series - PTC Resettable Fuses

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Solder Reflow Recommendations



Notes:

- MF-USHT 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, especially during hand soldering. Please refer to the Multifuse[®] Polymer PTC Soldering Recommendation guidelines.
- · Designed for single solder reflow operations.

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate $(TS_{max} \text{ to } T_p)$	3 °C / second max.
PREHEAT: Temperature Min. (TS _{min}) Temperature Max. (TS _{max}) Time (ts _{min} to ts _{max})	150 °C 200 °C 60~180 seconds
TIME MAINTAINED ABOVE: Temperature (T _L) Time (t _L)	217 °C 60~150 seconds
Peak / Classification Temperature (T _P)	260 °C
Time within 5 °C of Actual Peak Temperature (tp)	20~40 seconds
Ramp-Down Rate	6 °C / second max.
Time within 25 °C to Peak Temperature	8 minutes max.

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MF-USHT SERIES, REV. D 05/18

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MF-USHT Series Tape and Reel Specifications

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(0.319 ± 0.10) 0 (0.157 ± 0.004) 01 (0.157 ± 0.004) 02 (0.157 ± 0.004) 02 (0.157 ± 0.004) 02 (0.079 ± 0.002) 0 (0.157 ± 0.004) 02 (0.079 ± 0.002) 0 (0.118 ± 0.004) 0 (0.118 ± 0.004) 0 (0.118 ± 0.004) 0 (0.118 ± 0.004) 0 (0.144 ± 0.004) 0 (0.144 ± 0.004) 0 (0.059 ± 0.004) 0 (0.059 ± 0.004) 1 (0.138 ± 0.002) 1 (0.138 ± 0.002) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.024) 1 (0.031 ± 1.0059) <t< th=""><th>Tape Dimensions</th><th>MF-USHT Series per EIA 481-1</th></t<>	Tape Dimensions	MF-USHT Series per EIA 481-1
$\begin{array}{c} -\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)} \\ -\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)} \\ -\frac{2.0 \pm 0.08}{(0.078 \pm 0.002)} \\ -\frac{3.0 \pm 0.00}{(0.078 \pm 0.002)} \\ -\frac{3.0 \pm 0.00}{(0.144 \pm 0.004)} \\ -\frac{3.0 \pm 0.00}{(0.158 \pm 0.002)} \\ -\frac{3.0 \pm 0.00}{(0.058 \pm 0.004)} \\$	W	
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$ \begin{array}{c} 1(0003 \pm 0.004) \\ 6.25 \\ 1 max. \\ \hline (0.246) \\ 1 max. \\ \hline (0.024) \\ 1 max. \\ \hline (0.003) \pm 0.004) \\ 0.055 \pm 0.10 \\ \hline (0.0033 \pm 0.004) \\ 0.65 \pm 0.10 \\ \hline (0.0033 \pm 0.004) \\ \hline (0.0033 \pm 0.004) \\ \hline (0.0033 \pm 0.004) \\ 0.65 \pm 0.10 \\ \hline (0.003 \pm 0.004) \\ \hline (0$	 E ₁	1.75 ± 0.10
$\begin{array}{c} 0.240) \\ 0.06 \\ 0.024) \\ 0.06 \\ 0.0024) \\ 0.004) \\ 0.685 \pm 0.10 \\ 0.033 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.635 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.635 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.653 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.653 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.633 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.633 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.633 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.635 \pm 0.004) \\ 0.685 \pm 0.10 \\ 0.685$	 E2 min.	6.25
$\begin{array}{c} (0.024) \\ (0.004) \\ (0.003) \pm 0.004) \\ (0.033 \pm 0.004) \\ (0.033 \pm 0.004) \\ (0.033 \pm 0.004) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (15.35) \\ (19.7) \\ (10.7) \\ (19.7) \\ (10.7) \\ (19.7) \\ (10.7) \\ (19.7) \\ (10.7) \\ (19.7) \\ (10.7) \\ $		0.6
K0 0.85 ± 0.10 (0.033 ± 0.004) .eader min. (15.35) Trailer min. 160 (6.30) Reel Dimensions (15.35) A max. (197) (1.97) N min. (0.331 ± 0.059/-0.0) (1.97) N_1 (0.367) M2 max. (0.667) DIMENSIONS: MM (INCHES) P P		
N (0.033 \pm 0.004) _eader min. (15.35) Trailer min. 160 (6.30) (6.30) Reel Dimensions 185 A max. (7.28) N min. (1.97) N_1 $(0.331 + 0.059/-0.0)$ N_2 max. (0.567) DIMENSIONS: MM (0.567) (0.567) DIMENSIONS: MM (0.567) (0.567) DIMENSIONS: MM (0.567) (0.567) DIMENSIONS: MM (0.567) $(0.431 + 0.059/-0.0)$ (0.567) (0.567) DIMENSIONS: MM (0.567) $(0.431 + 0.059/-0.0)$ MM (0.567) $M(HUB DIA)$ (0.567) $M(HUB DIA)$ $(MEASUREL M(HUB DIA) (MEASUREL M(HUB DIA) (MEASUREL $		
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$\begin{array}{c} \hline (7.28) \\ \hline S0 \\ \hline (1.97) \\ \hline N_1 \\ \hline N_2 \text{ max.} \\ \hline \\ M_2 \text{ max.} \\ \hline \\ \hline \\ \hline \\ \\ \hline \\ \\ \hline \\ \\ \\ \\ \hline \\$	Reel Dimensions	
$\begin{array}{c} (1.97) \\ \hline N_1 \\ \hline N_2 \text{ max.} \\ \hline \\ \hline \\ M_2 \text{ max.} \\ \hline \\ \hline \\ \\ \hline \\ \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ $	A max.	<u></u>
N_{1} $N_{2} \text{ max.}$ $\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0.0)}$ $\frac{14.4}{(0.567)}$ DIMENSIONS: $\frac{MM}{(NCHES}$ $TAPE$ $TAPE$ $F_{2} W$ $M_{1} W_{2} (MEASUREI)$ $M_{1} W_{2} (MEASUREI)$ $M_{2} W_{2} (MEASUREI)$ $M_{2} W_{2} (MEASUREI)$ $M_{2} W_{2} (MEASUREI)$ $M_{3} W_{4} W_{4} W_{4} W_{5} W_{4} W_{5} W_{5}$	N min.	<u>50</u> (1.97)
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$(U.SUT)^{(U.SUT)}$ DIMENSIONS: MM (INCHESS TAPE TAPE H H H H H H H H	W ₂ max.	14.4
$\begin{array}{c} \downarrow \\ \downarrow $		MAA
$\begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	⊢ •P0	DIMENSIONS: (INCHES)
$\begin{array}{c} COVER \\ TAPE \\ B1 \\ H \\ $	-+ +-T +-D0+ +-P2-+ E1	 ◄ ► ₩2(MEASURED
$H_{1} = H_{1} = H_{1$		AT HUB)
$ \begin{array}{c} B_1 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $		
$ \begin{array}{c} B_1 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $		A ((①) (①) (①) (①) (①) (①) (①) (①) (①) (
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $		
	\rightarrow \downarrow \downarrow \downarrow \downarrow $P1 \rightarrow$	
		AT HUB)

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