



0440 Series 250mA and 375mA Product Validation Report

1206 Ceramic Fuse – High I²T

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I. Objective

This report summarizes the performance of the 0440.250WR and 0440.375WR Series through electrical, environmental, mechanical, and application testing to confirm product reliability and overall compliance.

The Littelfuse 0440.250WR and 0440.375WR series is listed under the Underwriters Laboratories(UL) Recognized Component evaluated to Canadian and USA standards(cURUs) and is also certified by CSA Group.

Electrical Specifications

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC) ¹	Nominal Resistance (Ohms) ²	Nominal Melting I ² t (A ² Sec.) ³	Nominal Voltage Drop At Rated Current (V) ⁴	Nominal Power Dissipation At Rated Current (W)	Agency Approvals	
								cULus	CSA
0.250	.250	125	50 A @ 125 V AC/DC	2.060	0.00649	0.5260	0.132	X	X
0.375	.375	125		1.216	0.01455	0.4993	0.187	X	X
0.500	.500	63	50 A @ 63 V AC/DC	0.8384	0.0399	0.4831	0.242	X	X
0.750	.750	63		0.4624	0.1162	0.3983	0.299	X	X
1.00	001.	50	50 A @ 50 VAC/DC	0.3096	0.2200	0.3457	0.346	X	X
1.25	1.25	50		0.2265	0.3900	0.3240	0.405	X	X
1.50	01.5	50	50 A @ 32 V AC/DC	0.1759	0.5080	0.3215	0.482	X	X
1.75	1.75	32		0.0450	0.4000	0.0777	0.136	X	X
2.00	002.	32		0.0385	0.4700	0.0792	0.158	X	X
2.50	02.5	32		0.02850	0.8200	0.0747	0.187	X	X
3.00	003.	32		0.02252	1.2470	0.0742	0.223	X	X
3.50	03.5	32		0.01845	2.3800	0.0757	0.265	X	X
4.00	004.	32		0.01553	3.136	0.0709	0.284	X	X
5.00	005.	32		0.0120	5.949	0.0654	0.327	X	X
7.00	007.	32		0.00753	10.38	0.0696	0.487	X	X
8.00	008.	32		0.00634	13.03	0.0655	0.524	X	X

II. Methodology

A. Part Preparation and Pre-Test

1. Testing (except as noted) is preceded by the following steps:

- 1.1. Loose resistance measurement
- 1.2. Board mounting with one hour in room ambient for cooling.
- 1.3. Mounted resistance measurement
- 1.4. Resistance measurements taken during testing are taken as follows:
 - 1.4.1. Fuse resistance is to be measured with a digital ohmmeter, having a reference current of no more than 10% of the current rating of the fuse under test.
 - 1.4.2. Measurements are to be made using a four-terminal network to the ohmmeter.

2. All tests, except for Solderability, Resistance to Dissolution of Metallization and Physical Dimensions, are conducted on appropriate test boards, fixtures and/or wires. Test boards for each product series and ratings are specified in page 23 of Appendix VII.

3. Fuses are mounted to test boards with one time (1) pass through a reflow oven, using a sample profile shown in Table 1 and Figure 1 below. Lead-free solder paste is applied with a stainless-steel stencil and squeegee 0.004" to 0.006" inches thick. Fuses are not cleaned after mounting unless otherwise stated.

Profile Feature		Pb-Free Assembly
Pre - Heat Soak	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (Min to Max)(t_s)	60-180 sec
Ramp-up rate (T_L to T_p)		3°C/second max
Liquidous temperature (T_L)		217°C
Time (t_L) maintained above T_L		60-150 sec
Peak Temperature (T_p)		260 ^{+5/-0} °C
Time (t_p) within 5°C of the specified		30 sec (min)
Ramp-down rate (T_p to T_D)		6°C/second max
Time 25°C to Peak Temperature (T_p)		8 min max

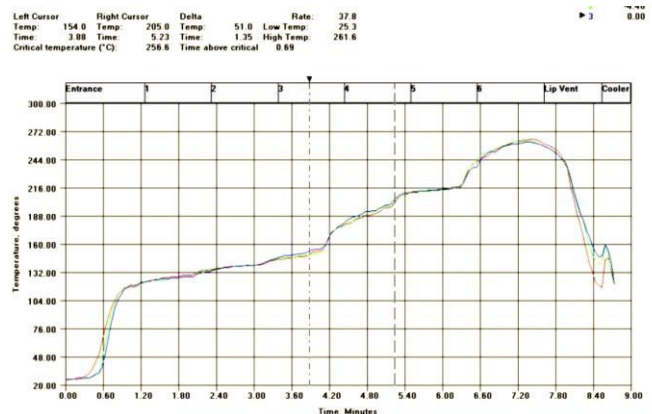


Table 1. Reflow profile parameters

II. Methodology

B. Post Tests

1. To prove acceptance after each test (unless otherwise specified), the fuses shall undergo the following:
 - 1.1. Half of the fuse quantity from each test shall be tested for current carrying capacity as per datasheet specifications.
 - 1.2. The remaining half of the fuse quantity from each test shall be subjected to Overload Test at its lowest gate, as per datasheet specifications.

III. References

1. Littelfuse Validation Specs Reference: VS-006091 Rev F Validation Specification for Ceramic Chip Fuses for Leaded Fuses
2. Reference Standards as Stated in Test Results Summary
3. Littelfuse Engineering Test Request System

IV. Summary of Validation Test Results

Test Item	Reference Standard	Test Conditions	Sample Size per Lot	Criteria	Post Test	Results
A. ELECTRICAL TESTS						
Current carrying capacity	Device specification	1. Subject fuses to Life Test as per datasheet specifications 2. Measure fuse resistance.	30pcs/ 3Lots	<ul style="list-style-type: none"> Fuses shall exhibit no significant physical, mechanical or electrical damage 	N/A	PASSED
Extended Current Carrying Capacity	Device specification	1. Subject fuses to 168 hrs Life Test at fuse de-rated current. 2. Measure fuse resistance	30pcs/ 3Lots	<ul style="list-style-type: none"> Fuses shall exhibit no significant physical, mechanical or electrical damage No open fuse 	N/A	PASSED
Clearing time-current characteristics (Overload test)	Device specification	1. Fuses shall be tested at the appropriate overload levels at room temperature. 2. Measure opening time.	30pcs/ 3Lots	<ul style="list-style-type: none"> Opening times shall be within published limits 	N/A	PASSED
Short circuit interrupting capability	Device specification	1. Fuses shall be subjected to tests at the voltage(s), current(s), power factors (AC) and time constants (DC) specified in the fuse specification sheet. 2. For AC tests, arcing angles shall between 60° and 90° (or as specified). 3. For AC tests, power factor = 1 4. Unless otherwise stated, all DC tests shall be conducted with a resistive circuit. 5. Insulation resistance shall be measured at a DC potential equal to the voltage rating of the device unless otherwise noted	30pcs/ 3Lots	<ul style="list-style-type: none"> No re-striking Fuse may discolor but marking must still be readable No bursting of fuse. Fuse must remain onboard (cracking in half is permissible, as long as both halves remain on the test boards) No hole in fuse cover No ignition as evidenced by burnt test board Insulation resistance measured shall be at least 100 kΩ 	N/A	PASSED

IV. Summary of Validation Test Results

Test Item	Reference Standard	Test Conditions	Sample Size per Lot	Criteria	Post Test	Results
B. ENVIRONMENTAL TESTS						
Moisture Resistance	MIL-STD-202 Method 106G	<ol style="list-style-type: none"> 1. Perform pre-conditioning at 50C for 24 hours. 2. Subject fuses to 10 continuous cycles with profile as per MIL STD202 106G. 3. Measure fuse resistance 4. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/3Lots	<ul style="list-style-type: none"> • Fuses shall exhibit no physical, mechanical or electrical damage • Opening times shall be within published limits 	Life Test Overload	PASSED
Thermal Shock	MIL-STD-202, Method 107	<ol style="list-style-type: none"> 1. Fuses shall be subjected to 100 cycles: 15 min. at – 55°C lowest temp and 15 min. at 150°C highest temp 2. Measure fuse resistance 3. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/3Lots	<ul style="list-style-type: none"> • Fuses shall exhibit no physical, mechanical or electrical damage • Opening times shall be within published limits. 	Life Test Overload	PASSED
Biased Humidity	JESD22-A110-B	<ol style="list-style-type: none"> 1. Place fuses in a chamber at 85oC/85%RH for 1000hrs. 2. Powered: 10% In with a DC Voltage maximum of Vrat. 3. Measure fuse resistance at 168hrs, 336hrs, and 1000hrs unless otherwise specified. 4. Cool to room temp for 1hr before measurement. 5. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/3Lots	<ul style="list-style-type: none"> • Fuses shall exhibit no physical, mechanical or electrical damage • Opening times shall be within published limits 	Life Test Overload	PASSED
Moisture Sensitivity Level 1	JEDEC J-STD020D	<ol style="list-style-type: none"> 1. Perform 24-hr baking at 125C. 2. MSL 1: 85C/85%RH 168hrs. 3. Not sooner than 15 minutes and not longer than 4 hours after removal from the chamber, subject the samples to 3 times reflow. 4. Measure resistance after every reflow. 5. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/3Lots	<ul style="list-style-type: none"> • Fuses shall be successfully mounted on the test boards without physical or mechanical damage. • Opening times shall be within published limits. 	Life Test Overload	PASSED
High Temp Operational Life	MIL-STD-202, Method 108, Test Condition D	<ol style="list-style-type: none"> 1. Place fuses in a chamber at 150oC for 1000hrs. 2. Apply de-rated current as per datasheet specifications. 3. Measure fuse resistance at 168hrs, 336hrs, and 1000hrs unless otherwise specified. 	30pcs/3Lots	<ul style="list-style-type: none"> • Fuses shall exhibit no physical, mechanical or electrical damage. 	NA	PASSED

IV. Summary of Validation Test Results

Test Item	Reference Standard	Test Conditions	Sample Size per Lot	Criteria	Post Test	Results
C. MECHANICAL TESTS						
Terminal Strength	IEC-60127-4	<ol style="list-style-type: none"> Apply a force that will bend the board a minimum distance of $x=2\text{mm}$. Apply the force once for 60 seconds. Measure fuse resistance. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/ 3Lots	<ul style="list-style-type: none"> Fuses shall exhibit no physical, mechanical or electrical damage. Opening times shall be within published limits. 	Life Test Overload	PASSED
Mechanical Shock	MIL-STD-202 Method 213	<ol style="list-style-type: none"> Perform Mechanical Shock Test: 50G, 11msec duration, Half-sine, 11.3 velocity 6 shock pulses in 3 planes (Test Condition A, unless otherwise specified). Measure fuse resistance. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/ 3Lots	<ul style="list-style-type: none"> Fuses shall exhibit no physical, mechanical or electrical damage. Opening times shall be within published limits 	Life Test Overload	PASSED
Low frequency vibration	MIL-STD-202 Method 201	<ol style="list-style-type: none"> Vibration amplitude is to be 0.03 inches (0.06 inch total excursion) unless otherwise specified. Frequency sweep is to be 10 Hz to 55 and back to 10 Hz in one minute. Fuses are to be tested under these conditions for two (2) hours in each plane for a total of six (6) hours. Measure fuse resistance. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/ 3Lots	<ul style="list-style-type: none"> Fuses shall exhibit no physical, mechanical or electrical damage. Opening times shall be within published limits. 	Life Test Overload	PASSED
High Frequency Vibration	MIL-STD-202 Method 204	<ol style="list-style-type: none"> Perform Test Condition D (20 G peak acceleration, 10-2000-10 Hz sweep in 20 minutes, 12 sweeps per plane), unless otherwise specified. Measure fuse resistance. Perform post tests as indicated in section 6 of VS-006091 standard. 	30pcs/ 3Lots	<ul style="list-style-type: none"> Fuses shall exhibit no physical, mechanical or electrical damage. Opening times shall be within published limits. 	Life Test Overload	PASSED
Physical Dimension	JESD22-B100B	<ol style="list-style-type: none"> Fuses shall be inspected in accordance with JESD22-B100B and the appropriate individual part specification. 	30pcs/ 3Lots	<ul style="list-style-type: none"> All physical dimensions of the fuses shall be within stated tolerances. 	N/A	PASSED

IV. Summary of Validation Test Results

Test Item	Reference Standard	Test Conditions	Sample Size per Lot	Criteria	Post Test	Results
D. APPLICATION TESTS						
Resistance to Dissolution of Metallization	IPC/EIA/JE DEC J-STD-002B	<ol style="list-style-type: none"> 1. Conduct steam age for 8 hours. 2. Each fuse termination shall be dipped separately, at an angle of 20° to 40° to the surface of the solder bath, to a minimum depth to completely cover the termination being tested. 3. The immersion and emersion rates shall be 0.984 ± 0.24 inches per second. 4. The dwell time in the solder bath shall be 30 +0/-0.5 seconds. 5. The solder bath shall be stabilized at 260° ± 5°C. 6. Surface shall be skimmed prior to each immersion. 7. Components shall have excess flux removed by means of a rinse in isopropyl alcohol (not applicable for fuses employing a Dymax or similar coating). 8. Perform visual inspection. 	30pcs/ 3Lots	<ul style="list-style-type: none"> • No more than 5% of the solderable termination shall visibly exhibit underlying, non-wettable base metal or metallization layers or portions of the substrate after a single exposure to the molten solder per termination. 	N/A	PASSED
Solderability	IPC/EIA/JE DEC J-STD-002D	<ol style="list-style-type: none"> 1. Conduct steam age for 8 hours. 2. Each fuse termination shall be dipped separately, at an angle of 20° to 40° to the surface of the solder bath, to a minimum depth to completely cover the termination being tested. 3. The immersion and emersion rates shall be 0.984 ± 0.24 inches per second. 4. The dwell time in the solder bath shall be 5seconds + 0/-0.5 second. 5. The solder bath shall be stabilized at 245° ± 5°C. 6. Perform visual inspection. 	30pcs/ 3Lots	<ul style="list-style-type: none"> • Fuses shall exhibit 95% solder coverage. 	N/A	PASSED

V. Data and Test Results

A. Electrical Tests

1. Current Carrying Capacity / Life test

100% Lifetest															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	209028 209506	5B13VL041	1.627	1.842	2.036	0.110	1.626	1.842	2.032	0.109	1.620	1.835	2.025	0.109	Passed
		5B13VL042	1.647	1.851	2.418	0.143	1.650	1.854	2.421	0.143	1.647	1.851	2.417	0.143	Passed
		5B13VL043	1.587	1.714	1.835	0.071	1.591	1.720	1.836	0.070	1.589	1.717	1.835	0.070	Passed

100% Lifetest															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	209028 209506	5B13VL046	1.050	1.151	1.247	0.046	1.047	1.147	1.243	0.045	1.045	1.144	1.241	0.045	Passed
		5B13VL047	0.970	1.126	1.333	0.090	0.970	1.127	1.333	0.090	0.966	1.125	1.334	0.091	Passed
		5B13VL048	0.949	1.160	1.287	0.064	0.952	1.160	1.288	0.064	0.948	1.157	1.283	0.064	Passed

2. Extended Current Carrying Capacity

Extended Life Test															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	205041/ 203009	4H08VL021	1.628	1.952	2.251	0.181	1.636	1.956	2.254	0.182	1.631	1.951	2.247	0.181	Passed
		4H08VL022	1.877	2.172	2.464	0.151	1.859	2.151	2.438	0.150	1.868	2.163	2.452	0.151	Passed
		4H08VL023	1.918	2.117	2.335	0.095	1.900	2.097	2.312	0.094	1.908	2.106	2.321	0.094	Passed

Extended Life Test															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	203006	4H08VL024	0.980	1.146	1.280	0.069	0.974	1.139	1.271	0.069	0.975	1.141	1.274	0.069	Passed
		4H08VL025	1.061	1.172	1.270	0.056	1.058	1.166	1.262	0.055	1.059	1.168	1.263	0.056	Passed
		4H08VL026	1.027	1.178	1.295	0.079	1.021	1.171	1.287	0.078	1.021	1.173	1.289	0.078	Passed

V. Data and Test Results

A. Electrical Tests

3. Clearing Time Current Characteristics / Overload

350% Overload Test															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	210513 209507	5B13VL041	1.630	1.825	2.064	0.095	1.637	1.833	2.070	0.095	0.046	0.862	1.465	0.249	Passed
		5B13VL042	1.677	1.834	2.047	0.097	1.681	1.835	2.059	0.100	0.541	0.926	1.399	0.224	Passed
		5B13VL043	1.703	1.865	2.038	0.103	1.725	1.868	2.020	0.095	0.408	0.867	1.351	0.218	Passed

350% Overload Test															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	210513 209507	5B13VL046	1.032	1.140	1.246	0.057	1.033	1.141	1.248	0.056	0.008	0.883	1.239	0.227	Passed
		5B13VL047	0.998	1.143	1.312	0.075	0.986	1.144	1.316	0.077	0.522	0.976	1.648	0.249	Passed
		5B13VL048	0.951	1.152	1.317	0.082	0.945	1.152	1.315	0.081	0.573	0.971	1.946	0.292	Passed

4. Short Circuit

Short Circuit													
Fuse Part Number	Test No.	Lot No.	Condition	Loose Resistance (Ω)				On-Board Resistance (Ω)				Remarks	
				Min	Ave	Max	Stdev	Min	Ave	Max	Stdev		
0440.250WR	209022	5B13VL041	50A 125VDC	1.698	1.880	2.116	0.102	1.704	1.887	2.123	0.102	Passed	
		5B13VL042		1.567	1.725	1.959	0.096	1.583	1.742	1.977	0.098	Passed	
		5B13VL043		1.586	1.735	1.931	0.082	1.600	1.750	1.946	0.082	Passed	
	209508	5B13VL041	50A 125VAC	1.678	1.850	2.050	0.104	1.680	1.852	2.054	0.103	Passed	
		5B13VL042		1.622	1.815	2.085	0.104	1.638	1.833	2.109	0.105	Passed	
		5B13VL043		1.548	1.715	1.883	0.080	1.560	1.728	1.894	0.080	Passed	

Short Circuit													
Fuse Part Number	Test No.	Lot No.	Condition	Loose Resistance (Ω)				On-Board Resistance (Ω)				Remarks	
				Min	Ave	Max	Stdev	Min	Ave	Max	Stdev		
0440.375WR	209025	5B13VL046	50A 125VDC	0.927	1.005	1.140	0.041	0.929	1.008	1.144	0.042	Passed	
		5B13VL047		0.925	1.007	1.156	0.060	0.935	1.015	1.168	0.061	Passed	
		5B13VL048		0.949	1.018	1.279	0.074	0.951	1.020	1.286	0.075	Passed	
	209508	5B13VL046	50A 125VAC	0.922	1.008	1.287	0.077	0.921	1.009	1.299	0.079	Passed	
		5B13VL047		0.927	1.004	1.262	0.070	0.934	1.013	1.275	0.072	Passed	
		5B13VL048		0.914	0.997	1.127	0.048	0.914	0.998	1.130	0.049	Passed	

V. Data and Test Results

B. Environmental Tests

1. Moisture Resistance

Moisture Resistance															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.763	2.011	2.291	0.145	1.749	1.994	2.278	0.144	1.745	1.991	2.274	0.144	Passed
		4H08VL022	1.708	2.011	2.297	0.138	1.691	1.996	2.279	0.138	1.688	1.993	2.276	0.138	Passed
		4H08VL023	1.839	2.126	2.286	0.103	1.821	2.116	2.289	0.103	1.821	2.111	2.270	0.102	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.771	1.988	2.257	0.152	Passed	0.095	0.245	0.462	0.118	Passed
		4H08VL022	1.696	1.953	2.167	0.130	Passed	0.090	0.212	0.348	0.076	Passed
		4H08VL023	1.825	2.114	2.233	0.126	Passed	0.074	0.200	0.329	0.063	Passed

Moisture Resistance															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.920	1.159	1.325	0.111	0.922	1.146	1.300	0.112	0.915	1.141	1.290	0.111	Passed
		4H08VL025	1.023	1.177	1.301	0.080	1.012	1.167	1.290	0.080	1.014	1.169	1.292	0.080	Passed
		4H08VL026	0.997	1.189	1.316	0.079	0.985	1.177	1.301	0.078	0.987	1.179	1.304	0.079	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.943	1.171	1.293	0.106	Passed	0.289	0.575	1.007	0.211	Passed
		4H08VL025	1.017	1.143	1.270	0.076	Passed	0.246	0.387	0.555	0.096	Passed
		4H08VL026	0.990	1.165	1.286	0.080	Passed	0.255	0.371	0.569	0.096	Passed

V. Data and Test Results

B. Environmental Tests 2. Thermal Shock

Thermal Shock															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.705	1.999	2.338	0.167	1.708	2.007	2.346	0.168	1.696	2.006	2.352	0.171	Passed
		4H08VL022	1.620	1.913	2.176	0.141	1.625	1.921	2.190	0.143	1.627	1.925	2.195	0.143	Passed
		4H08VL023	1.788	2.148	2.352	0.153	1.791	2.155	2.356	0.154	1.798	2.162	2.366	0.155	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.702	1.971	2.222	0.143	Passed	0.055	0.204	0.564	0.127	Passed
		4H08VL022	1.636	1.976	2.206	0.154	Passed	0.131	0.333	0.555	0.136	Passed
		4H08VL023	1.910	2.169	2.342	0.144	Passed	0.068	0.176	0.409	0.091	Passed

Thermal Shock															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.928	1.142	1.301	0.096	0.929	1.129	1.280	0.097	0.925	1.127	1.274	0.096	Passed
		4H08VL025	1.027	1.166	1.314	0.070	1.017	1.157	1.307	0.071	1.022	1.161	1.312	0.071	Passed
		4H08VL026	0.999	1.177	1.301	0.077	0.988	1.166	1.289	0.077	0.992	1.168	1.289	0.076	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.982	1.147	1.275	0.084	Passed	0.250	0.492	0.907	0.203	Passed
		4H08VL025	1.023	1.158	1.313	0.085	Passed	0.263	0.376	0.482	0.059	Passed
		4H08VL026	1.054	1.162	1.281	0.072	Passed	0.235	0.352	0.732	0.123	Passed

V. Data and Test Results

B. Environmental Test 3. Biased Humidity

Biased Humidity															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	202983	4H08VL021	1.586	2.005	2.292	0.174	1.604	2.029	2.318	0.177	1.593	2.017	2.304	0.176	Passed
		4H08VL022	1.729	1.959	2.321	0.147	1.745	1.982	2.360	0.150	1.734	1.970	2.345	0.149	Passed
		4H08VL023	1.712	2.161	2.348	0.151	1.726	2.185	2.374	0.154	1.716	2.172	2.363	0.154	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.250WR	202983	4H08VL021	1.836	2.029	2.200	0.104	Passed	0.082	0.269	0.698	0.194	Passed
		4H08VL022	1.814	2.013	2.355	0.174	Passed	0.103	0.271	0.514	0.112	Passed
		4H08VL023	1.924	2.200	2.344	0.116	Passed	0.082	0.193	0.567	0.122	Passed

Biased Humidity															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202982	4H08VL024	0.917	1.103	1.297	0.121	0.923	1.110	1.304	0.122	0.920	1.107	1.299	0.122	Passed
		4H08VL025	1.024	1.172	1.292	0.071	1.027	1.176	1.301	0.072	1.025	1.176	1.299	0.072	Passed
		4H08VL026	1.041	1.169	1.280	0.063	1.041	1.160	1.305	0.075	1.038	1.155	1.302	0.077	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.375WR	202982	4H08VL024	0.927	1.109	1.276	0.119	Passed	0.249	0.643	1.323	0.315	Passed
		4H08VL025	1.024	1.167	1.296	0.076	Passed	0.287	0.429	0.708	0.111	Passed
		4H08VL026	1.037	1.166	1.266	0.071	Passed	0.322	0.473	0.677	0.101	Passed

V. Data and Test Results

B. Environmental Test

4. Moisture Sensitivity Level 1

Moisture Sensitivity Level 1															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				3rd Reflow (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.714	2.005	2.275	0.167	1.715	2.013	2.279	0.168	1.723	2.024	2.292	0.169	Passed
		4H08VL022	1.645	1.964	2.257	0.133	1.647	1.972	2.275	0.134	1.652	1.984	2.283	0.130	Passed
		4H08VL023	1.669	2.140	2.375	0.162	1.927	2.160	2.364	0.127	1.930	2.159	2.365	0.128	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.715	1.966	2.272	0.174	Passed	0.073	0.203	0.462	0.100	Passed
		4H08VL022	1.647	2.002	2.275	0.143	Passed	0.141	0.216	0.401	0.073	Passed
		4H08VL023	1.927	2.169	2.363	0.131	Passed	0.083	0.174	0.242	0.048	Passed

Moisture Sensitivity Level 1															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				3rd Reflow (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.912	1.162	1.321	0.121	0.909	1.157	1.316	0.121	0.908	1.157	1.315	0.121	Passed
		4H08VL025	1.003	1.134	1.297	0.058	1.013	1.148	1.308	0.057	1.011	1.146	1.307	0.057	Passed
		4H08VL026	0.947	1.169	1.299	0.084	0.948	1.168	1.298	0.083	0.946	1.168	1.297	0.084	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.906	1.122	1.304	0.133	Passed	0.243	0.376	0.998	0.190	Passed
		4H08VL025	1.010	1.138	1.303	0.063	Passed	0.268	0.383	0.521	0.080	Passed
		4H08VL026	0.943	1.134	1.244	0.088	Passed	0.184	0.297	0.394	0.063	Passed

V. Data and Test Results

B. Environmental Test

5. High Temp Operational Life

High Temperature Operational Life															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	202983	4H08VL021	1.639	1.973	2.321	0.148	1.656	1.996	2.352	0.149	1.642	1.981	2.336	0.149	Passed
		4H08VL022	1.757	1.957	2.125	0.098	1.772	1.979	2.153	0.100	1.758	1.964	2.139	0.100	Passed
		4H08VL023	1.795	2.125	2.320	0.131	1.810	2.153	2.355	0.134	1.798	2.138	2.345	0.133	Passed

High Temperature Operational Life															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202982	4H08VL024	0.883	1.127	1.291	0.101	0.888	1.135	1.297	0.101	0.886	1.132	1.308	0.103	Passed
		4H08VL025	1.044	1.165	1.293	0.061	1.053	1.176	1.308	0.062	1.049	1.170	1.301	0.062	Passed
		4H08VL026	1.027	1.189	1.303	0.063	1.028	1.191	1.304	0.064	1.025	1.190	1.305	0.064	Passed

C. Mechanical Tests

1. Terminal Strength

Terminal Strength															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	203000	4H08VL021	1.755	2.059	2.358	0.163	1.758	2.061	2.354	0.162	1.763	2.068	2.363	0.163	Passed
		4H08VL022	1.673	1.982	2.154	0.135	1.640	1.986	2.159	0.140	1.647	1.992	2.166	0.139	Passed
		4H08VL023	1.759	2.138	2.362	0.134	1.769	2.155	2.372	0.133	1.773	2.161	2.378	0.133	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.250WR	203000	4H08VL021	1.762	2.013	2.292	0.160	Passed	0.074	0.189	0.575	0.127	Passed
		4H08VL022	1.645	2.000	2.162	0.139	Passed	0.166	0.288	0.700	0.143	Passed
		4H08VL023	1.878	2.179	2.375	0.128	Passed	0.099	0.211	0.507	0.106	Passed

V. Data and Test Results

C. Mechanical Tests

1. Terminal Strength

Terminal Strength															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202996	4H08VL024	0.924	1.142	1.294	0.094	0.924	1.142	1.297	0.094	0.927	1.154	1.361	0.102	Passed
		4H08VL025	1.030	1.141	1.299	0.068	1.031	1.143	1.299	0.067	1.041	1.146	1.309	0.068	Passed
		4H08VL026	1.015	1.197	1.304	0.072	1.016	1.197	1.306	0.072	1.018	1.200	1.309	0.073	Passed

Post-tests													
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results	
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev		
0440.375WR	202996	4H08VL024	0.936	1.140	1.301	0.099	Passed	0.251	0.426	0.950	0.166	Passed	
		4H08VL025	1.086	1.158	1.253	0.049	Passed	0.045	0.397	0.642	0.164	Passed	
		4H08VL026	1.016	1.205	1.306	0.076	Passed	0.242	0.336	0.455	0.062	Passed	

2. Mechanical Shock

Mechanical Shock															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	203000	4H08VL021	1.502	2.009	2.265	0.189	1.517	2.024	2.279	0.191	1.508	2.013	2.264	0.190	Passed
		4H08VL022	1.768	1.952	2.269	0.124	1.776	1.966	2.301	0.127	1.765	1.955	2.287	0.127	Passed
		4H08VL023	1.919	2.117	2.324	0.092	1.945	2.139	2.361	0.093	1.933	2.126	2.346	0.092	Passed

Post-tests													
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results	
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev		
0440.250WR	203000	4H08VL021	1.513	1.997	2.266	0.227	Passed	0.074	0.248	0.654	0.161	Passed	
		4H08VL022	1.795	1.950	2.290	0.129	Passed	0.091	0.266	0.462	0.133	Passed	
		4H08VL023	1.937	2.148	2.350	0.104	Passed	0.141	0.229	0.355	0.059	Passed	

V. Data and Test Results

C. Mechanical Tests

2. Mechanical Shock

Mechanical Shock															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202996	4H08VL024	0.989	1.139	1.292	0.084	0.995	1.143	1.295	0.084	0.990	1.138	1.289	0.083	Passed
		4H08VL025	0.987	1.168	1.273	0.070	0.990	1.173	1.283	0.070	0.986	1.169	1.278	0.070	Passed
		4H08VL026	1.016	1.168	1.274	0.063	1.022	1.173	1.280	0.063	1.019	1.171	1.276	0.063	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.375WR	202996	4H08VL024	0.996	1.131	1.287	0.086	Passed	0.344	0.596	0.769	0.156	Passed
		4H08VL025	0.993	1.179	1.286	0.085	Passed	0.364	0.469	0.662	0.097	Passed
		4H08VL026	1.025	1.161	1.283	0.077	Passed	0.241	0.433	0.574	0.092	Passed

3. Low frequency vibration

Low Frequency Vibration															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	203000	4H08VL021	1.623	2.004	2.330	0.190	1.631	2.018	2.350	0.192	1.623	2.006	2.336	0.191	Passed
		4H08VL022	1.712	1.977	2.175	0.120	1.728	1.993	2.204	0.121	1.716	1.981	2.190	0.121	Passed
		4H08VL023	1.818	2.162	2.345	0.121	1.832	2.185	2.376	0.124	1.819	2.169	2.356	0.122	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.250WR	203000	4H08VL021	1.739	2.040	2.339	0.211	Passed	0.108	0.346	0.800	0.218	Passed
		4H08VL022	1.721	1.959	2.192	0.140	Passed	0.120	0.225	0.411	0.080	Passed
		4H08VL023	1.821	2.164	2.325	0.142	Passed	0.128	0.192	0.364	0.067	Passed

V. Data and Test Results

C. Mechanical Tests

3. Low frequency vibration

Low Frequency Vibration															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202996	4H08VL024	0.926	1.145	1.293	0.103	0.929	1.142	1.295	0.102	0.925	1.137	1.290	0.102	Passed
		4H08VL025	1.015	1.154	1.282	0.071	1.019	1.160	1.290	0.072	1.015	1.155	1.284	0.072	Passed
		4H08VL026	1.012	1.168	1.300	0.077	1.020	1.175	1.307	0.077	1.016	1.170	1.302	0.077	Passed

Post-tests													
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results	
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev		
0440.375WR	202996	4H08VL024	0.925	1.121	1.272	0.122	Passed	0.322	0.432	0.617	0.092	Passed	
		4H08VL025	1.049	1.152	1.285	0.078	Passed	0.259	0.405	0.715	0.112	Passed	
		4H08VL026	1.016	1.168	1.302	0.080	Passed	0.231	0.378	0.600	0.098	Passed	

4. High Frequency Vibration

High Frequency Vibration															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	203000	4H08VL021	1.736	1.996	2.282	0.144	1.746	2.012	2.306	0.146	1.735	2.000	2.292	0.145	Passed
		4H08VL022	1.812	1.951	2.194	0.101	1.820	1.967	2.208	0.102	1.810	1.956	2.196	0.102	Passed
		4H08VL023	1.870	2.137	2.348	0.130	1.889	2.159	2.365	0.132	1.878	2.146	2.353	0.131	Passed

Post-tests													
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results	
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev		
0440.250WR	203000	4H08VL021	1.738	2.042	2.297	0.147	Passed	0.156	0.305	0.507	0.122	Passed	
		4H08VL022	1.813	1.950	2.103	0.094	Passed	0.156	0.286	0.471	0.104	Passed	
		4H08VL023	1.971	2.164	2.355	0.115	Passed	0.103	0.225	0.424	0.105	Passed	

V. Data and Test Results

C. Mechanical Tests

4. High Frequency Vibration

High Frequency Vibration															
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				On-Board Resistance (Ω)				Post Test Resistance (Ω)				Test Results
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	202996	4H08VL024	0.947	1.142	1.300	0.104	0.951	1.145	1.303	0.104	0.953	1.147	1.305	0.104	Passed
		4H08VL025	1.043	1.155	1.259	0.059	1.051	1.161	1.263	0.059	1.052	1.162	1.264	0.059	Passed
		4H08VL026	1.069	1.177	1.296	0.068	1.074	1.183	1.301	0.069	1.075	1.184	1.303	0.069	Passed

Post-tests												
Fuse Part Number	Test No.	Lot No.	Post Life Test Resistance (Ω)				Test Result	OL Opening Time (sec)				Test Results
			Min	Ave	Max	Stdev		Min	Ave	Max	Stdev	
0440.375WR	202996	4H08VL024	0.947	1.127	1.295	0.111	Passed	0.224	0.474	0.877	0.158	Passed
		4H08VL025	1.047	1.142	1.237	0.047	Passed	0.246	0.389	0.632	0.119	Passed
		4H08VL026	1.071	1.195	1.297	0.069	Passed	0.278	0.421	0.572	0.079	Passed

5. Physical Dimension

Physical Dimension															
Fuse Part Number	WO No.	Lot No.	Length (mm)				Width (mm)				Height (mm)				Remarks
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.250WR	QA-24-5282	4H08VL021	3.217	3.257	3.280	0.017	1.591	1.629	1.672	0.012	0.749	0.786	0.819	0.021	Passed
		4H08VL022	3.176	3.257	3.317	0.023	1.609	1.631	1.658	0.009	0.755	0.787	0.818	0.019	Passed
		4H08VL023	3.161	3.245	3.283	0.021	1.618	1.629	1.646	0.006	0.745	0.780	0.809	0.018	Passed



















Physical Dimension															
Fuse Part Number	WO No.	Lot No.	Length (mm)				Width (mm)				Height (mm)				Remarks
			Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	Min	Ave	Max	Stdev	
0440.375WR	QA-24-5282	4H08VL024	3.210	3.234	3.260	0.013	1.599	1.609	1.622	0.006	0.750	0.783	0.818	0.019	Passed
		4H08VL025	3.197	3.233	3.268	0.015	1.599	1.622	1.658	0.015	0.741	0.782	0.819	0.024	Passed
		4H08VL026	3.210	3.252	3.317	0.021	1.602	1.626	1.672	0.013	0.744	0.780	0.819	0.022	Passed

V. Data and Test Results

D. Application Tests

1. Resistance to Dissolution of Metallization

Resistance to Dissolution of Metallization							
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				Test Result
			Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.659	1.955	2.301	0.162	Passed
		4H08VL022	1.845	2.007	2.371	0.124	Passed
		4H08VL023	1.959	2.154	2.330	0.120	Passed



















Resistance to Dissolution of Metallization						
Fuse Part Number	Test No.	Lot No.	Sample Photo Before Test	Sample Photo After Test	Test Result	
0440.250WR	202992	4H08VL021			Passed	
						
						
	202992	4H08VL022			Passed	
						
						
			4H08VL023			Passed
						
						

V. Data and Test Results

D. Application Tests

1. Resistance to Dissolution of Metallization



















Resistance to Dissolution of Metallization							
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				Test Result
			Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.944	1.145	1.314	0.099	Passed
		4H08VL025	1.025	1.135	1.295	0.067	Passed
		4H08VL026	0.988	1.170	1.292	0.077	Passed

Resistance to Dissolution of Metallization					
Fuse Part Number	Test No.	Lot No.	Sample Photo Before Test	Sample Photo After Test	Test Result
0440.375WR	202986	4H08VL024			Passed
					
					
		4H08VL025			Passed
					
					
		4H08VL026			Passed
					
					

V. Data and Test Results

D. Application Tests
 2. Solderability









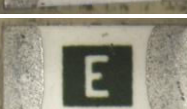









Solderability							
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				Test Result
			Min	Ave	Max	Stdev	
0440.250WR	202992	4H08VL021	1.686	1.959	2.259	0.153	Passed
		4H08VL022	1.723	1.975	2.231	0.130	Passed
		4H08VL023	2.007	2.195	2.358	0.115	Passed

Solderability					
Fuse Part Number	Test No.	Lot No.	Sample Photo Before Test	Sample Photo After Test	Test Result
0440.250WR	202992	4H08VL021			Passed
					
					
	202992	4H08VL022			Passed
					
					
	202992	4H08VL023			Passed
					
					

V. Data and Test Results

D. Application Tests
 2. Solderability

Solderability							
Fuse Part Number	Test No.	Lot No.	Loose Resistance (Ω)				Test Result
			Min	Ave	Max	Stdev	
0440.375WR	202986	4H08VL024	0.866	1.164	1.307	0.094	Passed
		4H08VL025	1.022	1.159	1.288	0.056	Passed
		4H08VL026	1.055	1.185	1.292	0.066	Passed

Solderability					
Fuse Part Number	Test No.	Lot No.	Sample Photo Before Test	Sample Photo After Test	Test Result
0440.375WR	202986	4H08VL024			Passed
					
					
	202986	4H08VL025			Passed
					
					
	202986	4H08VL026			Passed
					
					

VI. Conclusions

- All validation tests (Basic Electrical / Environment / Mechanical and Application related test) conducted have PASSING results.

VII. Appendix

	ETR Number / Test board no.
A. Electrical Tests	
1. Current Carrying Capacity/Life test	209028/209506/PHME-06-00230-S
2. Extended Current Carrying Capacity	203009/205041/203006/PHME-06-00230-S
3. Clearing Time Current Characteristic(Overload Test)	210513/209507/PHME-06-00230-S
4. Short Circuit	209022/209025/209508/PHME-06-00230-S
B. Environmental Tests	
1. Moisture Resistance	202992/202986/PHME-06-00230-S
2. Thermal Shock	202992/202986/PHME-06-00230-S
3. Biased Humidity	202983/202982/PHME-06-00230-S
4. Moisture Sensitivity Level 1	202992/202986/PHME-06-00230-S
5. High Temperature Operational Life	202983/202982 /PHME-06-00230-S
C. Mechanical Tests	
1. Terminal Strength	203000/202996/PHME-06-10029-S
2. Mechanical Shock	202996/203000/PHME-06-00230-S
3. Low Frequency Vibration	202996/203000/PHME-06-00230-S
4. High Frequency Vibration	202996/203000/PHME-06-00230-S
5. Physical Dimension	QA-24-5282/PHME-06-00230-S
D. Application Tests	
1. Resistance to Dissolution	202992/202986/PHME-06-00230-S
2. Solderability	202992/202986/PHME-06-00230-S

VIII. Revision History

REV. #	REVISION HISTORY	REASON OF CHANGE	ORIGINATOR (NAME/DATE)	EFFECTIVITY DATE (mm/dd/yyyy)	REMARKS
A	DCO-00001985 - Initial issue.	0440 250mA-375mA qualification	A. Manaig 04/21/2026	04/23/2026	PASSED
B	Change "0440 GT" to "0440 series" on the document title, 1st page and the headline on the other pages.	Revise in accordance with PM instruction	A. Manaig 05/07/2026		



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Expertise Applied | Answers Delivered

14th May. 2026

To: Valued Customers

From: Littelfuse Product Management

Subject: Start of shipment of Alternative construction for Thin Film 440 series fuses

This is a 60-day PCN.

Referenced to the above subject, Littelfuse has implemented an alternative construction of the following Thin Film Fuses for shipment over the existing fuses.

Affected fuses are the 440 series, specifically the 250mA and 375mA ratings. Part numbers affected are 0440.250WR and 0440.375WR.

There will be no changes to the part number. It will be a running change within production.

Please see the attachments for the

- Validation reports
- Comparison of the physical fuse itself and the electrical performance (i²t, resistance, dimension).

Timeframe

The effective date of this change is 14th Jul. 2026. We would be doing a running change in production on 14th Jul. 2026

Samples are available upon request.

Best Regards,

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