



AEC-Q200

Reliability Test Report of MMS-P 50A

Start of Qualification Test: 2017-5-24

End of Qualification Test: 2017-9-05

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Approved by: Angus Hsiao

Date: 2017-11- 06

1.0 Sample information

The customer requested fuses to be tested are shown in the table below.

CONQUER Part number	Lot number
MMS-P 50A 60V	MMS7080050

2.0 Requested tests and Test result

The test items and test conditions are listed as table below:

NO.	Test Item	Sample size	Test condition	Criteria	Test result
1	Visual inspection	Perform to all parts before test	Visual examination	Meet the requirements specified	Passed
2	Precondition	Perform to all parts before test	Dry ->Humidity ->Three Cycle Reflow. (Dry / Humidity condition : Based on MSL. MSL1 : 125°C/24hours ->85°C/85%R.H./168 hours)	DCR change within $\pm 10\%$	Passed
3	High temperature storage	77 PCS	Subject fuses to 125°C for 1000 hours	DCR change within $\pm 10\%$, no damage	Passed
4	Low temperature storage	77 PCS	Subject fuses to -65°C for 1000 hours	DCR change within $\pm 10\%$, no damage	Passed
5	Temperature Cycling	77 PCS	1000 cycles (-65°C to 150°C), and 30 min. maximum dwell time at each temperature extreme	DCR change within $\pm 10\%$, no damage	Passed
6.	Biased Humidity	77 PCS	Subject fuses to 85°C/85%RH with 10% rated current for 1000 hours	DCR change within $\pm 10\%$, no excessive corrosion	Passed
7.	High Temperature Operating Life	77 PCS	125°C for 1000 hours. Load setting: 75% (current de-rating)* 65% (temp. de-rating)* Rated current	DCR change within $\pm 10\%$, no damage	Passed
8.	Physical Dimension	30 PCS	Verify physical dimensions to the applicable device specification	Meet the dimensional requirements specified	Passed



9.	Mechanical Vibration	30 PCS	5g's for 20 minutes, 12 cycles each of 3 orientations. Test from 10-2000 Hz.	DCR change within $\pm 10\%$, no mechanical damage	Passed
10.	Mechanical Shock	30 PCS	1500G, 0.5 ms, half sine shocks in 6 major directions along 3 mutually perpendicular axes	DCR change within $\pm 10\%$, no mechanical damage	Passed
11	Resistance to Soldering Heat	30 PCS	One dip at 260 °C for 60 seconds	DCR change within $\pm 10\%$, no mechanical damage, new solder coverage $\geq 75\%$	Passed
12.	Salt spray	30 PCS	5% salt solution, 48 hour exposure	DCR change within $\pm 10\%$, no excessive corrosion	Passed
13.	Solderability	30 PCS	One dip at 245 °C for 5 seconds	New solder coverage $\geq 95\%$	Passed
14.	Terminal Strength	30 PCS	Gradually apply a 5.0 N force to the side of the part for 60 seconds.	DCR change within $\pm 10\%$, no mechanical damage	Passed
15.	Board Flex	30 PCS	Apply a force that will bend the board distance of $x=3\text{mm}$, and the duration of the applied forces shall be 60 seconds	DCR change within $\pm 20\%$ of $> 5A$ or $\pm 10\%$ of $\leq 5A$, no mechanical damage	Passed
16.	Pull test	30 PCS	Pull the samples to failure	No termination pull off	Passed
17.	Electrical Characterization	30 PCS	Verify electrical characterization to the applicable device specification	Meet the requirements specified in specification	Passed
18.	Pressure cooker or Autoclave	77 PCS	121 °C, 100% R/H, 29.7 psia Condition B , Duration 48 hours (-0, +2)	DCR change within $\pm 10\%$, no damage	Passed
19.	Endurance Test	77 PCS	25 °C \pm 5 °C, 100% rated current (3A) for 1 hour, stop current for 15mins. Repeat this 1 cycle 100 times. Test the voltage drop across the fuse to determine max power dissipation.	DCR change within $\pm 10\%$, no damage	Passed

3.0 Test data

Please see the attached data file.

4.0 Discussion and Conclusion

According to test results above, the samples can meet these requirements from the AEC-Q200 specifications.

High Temperature storage test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR 1-2%	ΔDCR 2-3%	Inspection for sample appearance
						DCR change ≤ ±10%		
MMS-P 50A 60V	MMS7080050	1	0.72	0.72	0.74	0.00%	2.70%	Pass
		2	0.70	0.71	0.73	1.41%	2.74%	Pass
		3	0.70	0.71	0.73	1.41%	2.74%	Pass
		4	0.72	0.73	0.75	1.37%	2.67%	Pass
		5	0.70	0.72	0.73	2.78%	1.37%	Pass
		6	0.71	0.73	0.76	2.74%	3.95%	Pass
		7	0.72	0.71	0.74	-1.41%	4.05%	Pass
		8	0.70	0.69	0.72	-1.45%	4.17%	Pass
		9	0.70	0.72	0.74	2.78%	2.70%	Pass
		10	0.71	0.72	0.73	1.39%	1.37%	Pass
		11	0.72	0.72	0.73	0.00%	1.37%	Pass
		12	0.70	0.71	0.72	1.41%	1.39%	Pass
		13	0.71	0.73	0.73	2.74%	0.00%	Pass
		14	0.72	0.72	0.72	0.00%	0.00%	Pass
		15	0.71	0.71	0.73	0.00%	2.74%	Pass
		16	0.73	0.73	0.74	0.00%	1.35%	Pass
		17	0.69	0.71	0.74	2.82%	4.05%	Pass
		18	0.71	0.72	0.75	1.39%	4.00%	Pass
		19	0.71	0.72	0.76	1.39%	5.26%	Pass
		20	0.70	0.71	0.72	1.41%	1.39%	Pass
		21	0.71	0.71	0.71	0.00%	0.00%	Pass
		22	0.71	0.72	0.72	1.39%	0.00%	Pass
		23	0.72	0.73	0.72	1.37%	-1.39%	Pass
		24	0.69	0.7	0.72	1.43%	2.78%	Pass
		25	0.71	0.71	0.74	0.00%	4.05%	Pass
		26	0.72	0.72	0.75	0.00%	4.00%	Pass
		27	0.70	0.72	0.74	2.78%	2.70%	Pass
		28	0.71	0.71	0.72	0.00%	1.39%	Pass
		29	0.71	0.71	0.72	0.00%	1.39%	Pass
		30	0.71	0.72	0.73	1.39%	1.37%	Pass
		31	0.70	0.7	0.74	0.00%	5.41%	Pass
		32	0.72	0.73	0.72	1.37%	-1.39%	Pass
		33	0.71	0.71	0.75	0.00%	5.33%	Pass
		34	0.70	0.71	0.74	1.41%	4.05%	Pass
		35	0.72	0.72	0.76	0.00%	5.26%	Pass
		36	0.70	0.71	0.73	1.41%	2.74%	Pass
		37	0.71	0.71	0.73	0.00%	2.74%	Pass
		38	0.71	0.71	0.72	0.00%	1.39%	Pass
		39	0.71	0.72	0.73	1.39%	1.37%	Pass
		40	0.71	0.73	0.75	2.74%	2.67%	Pass
		41	0.70	0.71	0.72	1.41%	1.39%	Pass
		42	0.71	0.71	0.72	0.00%	1.39%	Pass
		43	0.71	0.71	0.74	0.00%	4.05%	Pass
		44	0.71	0.72	0.73	1.39%	1.37%	Pass
		45	0.72	0.72	0.73	0.00%	1.37%	Pass
		46	0.71	0.72	0.73	1.39%	1.37%	Pass
		47	0.70	0.71	0.75	1.41%	5.33%	Pass
		48	0.72	0.73	0.72	1.37%	-1.39%	Pass
		49	0.72	0.73	0.74	1.37%	1.35%	Pass
		50	0.71	0.71	0.74	0.00%	4.05%	Pass
		51	0.69	0.7	0.74	1.43%	5.41%	Pass
		52	0.72	0.71	0.73	-1.41%	2.74%	Pass
		53	0.71	0.71	0.73	0.00%	2.74%	Pass
		54	0.71	0.71	0.72	0.00%	1.39%	Pass
		55	0.69	0.69	0.71	0.00%	2.82%	Pass
		56	0.71	0.7	0.7	-1.43%	0.00%	Pass
		57	0.70	0.7	0.71	0.00%	1.41%	Pass
		58	0.70	0.7	0.71	0.00%	1.41%	Pass
		59	0.71	0.71	0.72	0.00%	1.39%	Pass
		60	0.70	0.7	0.73	0.00%	4.11%	Pass
		61	0.70	0.7	0.72	0.00%	2.78%	Pass
		62	0.70	0.72	0.72	2.78%	0.00%	Pass
		63	0.71	0.71	0.71	0.00%	0.00%	Pass
		64	0.70	0.71	0.73	1.41%	2.74%	Pass
		65	0.73	0.73	0.73	0.00%	0.00%	Pass
		66	0.70	0.7	0.73	0.00%	4.11%	Pass
		67	0.71	0.71	0.71	0.00%	0.00%	Pass
		68	0.70	0.71	0.71	1.41%	0.00%	Pass
		69	0.72	0.72	0.73	0.00%	1.37%	Pass
		70	0.70	0.72	0.73	2.78%	1.37%	Pass
		71	0.73	0.73	0.73	0.00%	0.00%	Pass
		72	0.70	0.71	0.72	1.41%	1.39%	Pass
		73	0.71	0.71	0.72	0.00%	1.39%	Pass
		74	0.71	0.71	0.72	0.00%	1.39%	Pass
		75	0.70	0.72	0.71	2.78%	-1.41%	Pass
		76	0.71	0.72	0.71	1.39%	-1.41%	Pass
		77	0.72	0.72	0.73	0.00%	1.37%	Pass

Low Temperature storage test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR _{1-2%}	ΔDCR _{2-3%}	Inspection for sample appearance
						DCR change ≤ ±10%		
MMS-P 50A 60V	MMS7080050	1	0.71	0.73	0.71	2.74%	-2.82%	Pass
		2	0.72	0.72	0.71	0.00%	-1.41%	Pass
		3	0.70	0.73	0.72	4.11%	-1.39%	Pass
		4	0.70	0.70	0.70	0.00%	0.00%	Pass
		5	0.72	0.71	0.70	-1.41%	-1.43%	Pass
		6	0.72	0.73	0.72	1.37%	-1.39%	Pass
		7	0.72	0.74	0.73	2.70%	-1.37%	Pass
		8	0.72	0.73	0.71	1.37%	-2.82%	Pass
		9	0.72	0.73	0.71	1.37%	-2.82%	Pass
		10	0.72	0.72	0.72	0.00%	0.00%	Pass
		11	0.71	0.73	0.70	2.74%	-4.29%	Pass
		12	0.72	0.72	0.72	0.00%	0.00%	Pass
		13	0.73	0.71	0.72	-2.82%	1.39%	Pass
		14	0.72	0.72	0.70	0.00%	-2.86%	Pass
		15	0.71	0.73	0.72	2.74%	-1.39%	Pass
		16	0.72	0.74	0.73	2.70%	-1.37%	Pass
		17	0.71	0.72	0.72	1.39%	0.00%	Pass
		18	0.71	0.74	0.70	4.05%	-5.71%	Pass
		19	0.71	0.72	0.70	1.39%	-2.86%	Pass
		20	0.71	0.74	0.71	4.05%	-4.23%	Pass
		21	0.71	0.73	0.71	2.74%	-2.82%	Pass
		22	0.71	0.72	0.71	1.39%	-1.41%	Pass
		23	0.69	0.72	0.72	4.17%	0.00%	Pass
		24	0.70	0.72	0.70	2.78%	-2.86%	Pass
		25	0.71	0.72	0.70	1.39%	-2.86%	Pass
		26	0.73	0.71	0.72	-2.82%	1.39%	Pass
		27	0.72	0.72	0.69	0.00%	-4.35%	Pass
		28	0.72	0.73	0.70	1.37%	-4.29%	Pass
		29	0.72	0.72	0.72	0.00%	0.00%	Pass
		30	0.73	0.72	0.71	-1.39%	-1.41%	Pass
		31	0.73	0.70	0.72	-4.29%	2.78%	Pass
		32	0.71	0.72	0.72	1.39%	0.00%	Pass
		33	0.71	0.72	0.71	1.39%	-1.41%	Pass
		34	0.71	0.73	0.69	2.74%	-5.80%	Pass
		35	0.72	0.71	0.71	-1.41%	0.00%	Pass
		36	0.71	0.73	0.70	2.74%	-4.29%	Pass
		37	0.72	0.74	0.70	2.70%	-5.71%	Pass
		38	0.72	0.74	0.71	2.70%	-4.23%	Pass
		39	0.72	0.73	0.70	1.37%	-4.29%	Pass
		40	0.71	0.72	0.72	1.39%	0.00%	Pass
		41	0.71	0.73	0.71	2.74%	-2.82%	Pass
		42	0.71	0.72	0.71	1.39%	-1.41%	Pass
		43	0.72	0.74	0.70	2.70%	-5.71%	Pass
		44	0.70	0.73	0.71	4.11%	-2.82%	Pass
		45	0.73	0.72	0.70	-1.39%	-2.86%	Pass
		46	0.71	0.72	0.72	1.39%	0.00%	Pass
		47	0.71	0.73	0.71	2.74%	-2.82%	Pass
		48	0.71	0.72	0.71	1.39%	-1.41%	Pass
		49	0.72	0.71	0.69	-1.41%	-2.90%	Pass
		50	0.71	0.72	0.69	1.39%	-4.35%	Pass
		51	0.72	0.72	0.70	0.00%	-2.86%	Pass
		52	0.71	0.72	0.69	1.39%	-4.35%	Pass
		53	0.71	0.72	0.70	1.39%	-2.86%	Pass
		54	0.71	0.73	0.71	2.74%	-2.82%	Pass
		55	0.72	0.70	0.70	-2.86%	0.00%	Pass
		56	0.72	0.72	0.71	0.00%	-1.41%	Pass
		57	0.72	0.73	0.72	1.37%	-1.39%	Pass
		58	0.72	0.73	0.71	1.37%	-2.82%	Pass
		59	0.72	0.70	0.68	-2.86%	-2.94%	Pass
		60	0.71	0.71	0.72	0.00%	1.39%	Pass
		61	0.71	0.70	0.71	-1.43%	1.41%	Pass
		62	0.71	0.72	0.70	1.39%	-2.86%	Pass
		63	0.72	0.73	0.72	1.37%	-1.39%	Pass
		64	0.71	0.74	0.71	4.05%	-4.23%	Pass
		65	0.72	0.74	0.72	2.70%	-2.78%	Pass
		66	0.72	0.72	0.71	0.00%	-1.41%	Pass
		67	0.69	0.75	0.72	8.00%	-4.17%	Pass
		68	0.71	0.72	0.70	1.39%	-2.86%	Pass
		69	0.72	0.72	0.69	0.00%	-4.35%	Pass
		70	0.72	0.74	0.73	2.70%	-1.37%	Pass
		71	0.71	0.75	0.71	5.33%	-5.63%	Pass
		72	0.69	0.72	0.69	4.17%	-4.35%	Pass
		73	0.69	0.72	0.71	4.17%	-1.41%	Pass
		74	0.71	0.73	0.72	2.74%	-1.39%	Pass
		75	0.74	0.73	0.72	-1.37%	-1.39%	Pass
		76	0.71	0.70	0.71	-1.43%	1.41%	Pass
		77	0.72	0.73	0.70	1.37%	-4.29%	Pass

Temperature Cycling test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□ Ω	ΔDCR 1-2%	ΔDCR 2-3%	Inspection for sample appearance
						DCR change ≤ ±10%		Test criteria: no mechanical damage
MMS-P 50A 60V	MMS7080050	1	0.76	0.75	0.76	-1.33%	1.32%	Pass
		2	0.74	0.76	0.75	2.63%	-1.33%	Pass
		3	0.77	0.76	0.76	-1.32%	0.00%	Pass
		4	0.75	0.75	0.77	0.00%	2.60%	Pass
		5	0.76	0.76	0.77	0.00%	1.30%	Pass
		6	0.74	0.77	0.75	3.90%	-2.67%	Pass
		7	0.76	0.80	0.80	5.00%	0.00%	Pass
		8	0.77	0.75	0.76	-2.67%	1.32%	Pass
		9	0.77	0.78	0.76	1.28%	-2.63%	Pass
		10	0.77	0.75	0.77	-2.67%	2.60%	Pass
		11	0.76	0.78	0.76	2.56%	-2.63%	Pass
		12	0.75	0.73	0.76	-2.74%	3.95%	Pass
		13	0.75	0.78	0.78	3.85%	0.00%	Pass
		14	0.76	0.74	0.72	-2.70%	-2.78%	Pass
		15	0.75	0.79	0.79	5.06%	0.00%	Pass
		16	0.73	0.75	0.74	2.67%	-1.35%	Pass
		17	0.77	0.75	0.76	-2.67%	1.32%	Pass
		18	0.78	0.77	0.76	-1.30%	-1.32%	Pass
		19	0.77	0.79	0.79	2.53%	0.00%	Pass
		20	0.75	0.75	0.77	0.00%	2.60%	Pass
		21	0.75	0.76	0.75	1.32%	-1.33%	Pass
		22	0.76	0.79	0.78	3.80%	-1.28%	Pass
		23	0.75	0.74	0.73	-1.35%	-1.37%	Pass
		24	0.76	0.77	0.78	1.30%	1.28%	Pass
		25	0.74	0.78	0.78	5.13%	0.00%	Pass
		26	0.74	0.77	0.75	3.90%	-2.67%	Pass
		27	0.75	0.75	0.76	0.00%	1.32%	Pass
		28	0.77	0.76	0.77	-1.32%	1.30%	Pass
		29	0.76	0.78	0.79	2.56%	1.27%	Pass
		30	0.76	0.79	0.78	3.80%	-1.28%	Pass
		31	0.77	0.78	0.76	1.28%	-2.63%	Pass
		32	0.72	0.76	0.74	5.26%	-2.70%	Pass
		33	0.76	0.76	0.79	0.00%	3.80%	Pass
		34	0.75	0.79	0.76	5.06%	-3.95%	Pass
		35	0.75	0.77	0.77	2.60%	0.00%	Pass
		36	0.74	0.77	0.78	3.90%	1.28%	Pass
		37	0.78	0.76	0.77	-2.63%	1.30%	Pass
		38	0.77	0.77	0.76	0.00%	-1.32%	Pass
		39	0.75	0.79	0.76	5.06%	-3.95%	Pass
		40	0.76	0.79	0.77	3.80%	-2.60%	Pass
		41	0.73	0.77	0.77	5.19%	0.00%	Pass
		42	0.75	0.78	0.79	3.85%	1.27%	Pass
		43	0.74	0.78	0.77	5.13%	-1.30%	Pass
		44	0.77	0.77	0.78	0.00%	1.28%	Pass
		45	0.75	0.78	0.79	3.85%	1.27%	Pass
		46	0.74	0.77	0.80	3.90%	3.75%	Pass
		47	0.75	0.77	0.79	2.60%	2.53%	Pass
		48	0.72	0.76	0.77	5.26%	1.30%	Pass
		49	0.74	0.77	0.79	3.90%	2.53%	Pass
		50	0.70	0.76	0.76	7.89%	0.00%	Pass
		51	0.74	0.77	0.76	3.90%	-1.32%	Pass
		52	0.76	0.75	0.75	-1.33%	0.53%	Pass
		53	0.77	0.76	0.77	-1.32%	1.30%	Pass
		54	0.76	0.75	0.76	-1.33%	1.32%	Pass
		55	0.76	0.76	0.78	0.00%	2.56%	Pass
		56	0.77	0.77	0.78	0.00%	1.28%	Pass
		57	0.75	0.77	0.80	2.60%	3.75%	Pass
		58	0.74	0.76	0.78	2.63%	2.56%	Pass
		59	0.73	0.75	0.76	2.67%	1.32%	Pass
		60	0.74	0.76	0.76	2.63%	0.00%	Pass
		61	0.76	0.76	0.73	0.00%	-4.11%	Pass
		62	0.75	0.77	0.76	2.60%	-1.32%	Pass
		63	0.77	0.78	0.76	1.28%	-2.63%	Pass
		64	0.75	0.76	0.76	1.32%	0.00%	Pass
		65	0.77	0.76	0.76	-1.32%	0.00%	Pass
		66	0.76	0.76	0.73	0.00%	-4.11%	Pass
		67	0.76	0.77	0.76	1.30%	-1.32%	Pass
		68	0.73	0.74	0.74	1.35%	0.00%	Pass
		69	0.75	0.74	0.74	-1.35%	0.00%	Pass
		70	0.73	0.74	0.76	1.35%	2.63%	Pass
		71	0.75	0.76	0.77	1.32%	1.30%	Pass
		72	0.73	0.74	0.75	1.35%	1.33%	Pass
		73	0.75	0.75	0.78	0.00%	3.85%	Pass
		74	0.73	0.73	0.76	0.00%	3.95%	Pass
		75	0.74	0.74	0.76	0.00%	2.63%	Pass
		76	0.74	0.74	0.77	0.00%	3.90%	Pass
		77	0.74	0.76	0.76	2.63%	0.00%	Pass

Temperature Cycling test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR 1-2%	ΔDCR 2-3%	Inspection for sample appearance
						DCR change ≤ ±10%		Test criteria: no mechanical damage
MMS-P 50A 60V	MMS7080050	1	0.76	0.75	0.76	-1.33%	1.32%	Pass
		2	0.74	0.76	0.75	2.63%	-1.33%	Pass
		3	0.77	0.76	0.76	-1.32%	0.00%	Pass
		4	0.75	0.75	0.77	0.00%	2.60%	Pass
		5	0.76	0.76	0.77	0.00%	1.30%	Pass
		6	0.74	0.77	0.75	3.90%	-2.67%	Pass
		7	0.76	0.80	0.80	5.00%	0.00%	Pass
		8	0.77	0.75	0.76	-2.67%	1.32%	Pass
		9	0.77	0.78	0.76	1.28%	-2.63%	Pass
		10	0.77	0.75	0.77	-2.67%	2.60%	Pass
		11	0.76	0.78	0.76	2.56%	-2.63%	Pass
		12	0.75	0.73	0.76	-2.74%	3.95%	Pass
		13	0.75	0.78	0.78	3.85%	0.00%	Pass
		14	0.76	0.74	0.72	-2.70%	-2.78%	Pass
		15	0.75	0.79	0.79	5.06%	0.00%	Pass
		16	0.73	0.75	0.74	2.67%	-1.35%	Pass
		17	0.77	0.75	0.76	-2.67%	1.32%	Pass
		18	0.78	0.77	0.76	-1.30%	-1.32%	Pass
		19	0.77	0.79	0.79	2.53%	0.00%	Pass
		20	0.75	0.75	0.77	0.00%	2.60%	Pass
		21	0.75	0.76	0.75	1.32%	-1.33%	Pass
		22	0.76	0.79	0.78	3.80%	-1.28%	Pass
		23	0.75	0.74	0.73	-1.35%	-1.37%	Pass
		24	0.76	0.77	0.78	1.30%	1.28%	Pass
		25	0.74	0.78	0.78	5.13%	0.00%	Pass
		26	0.74	0.77	0.75	3.90%	-2.67%	Pass
		27	0.75	0.75	0.76	0.00%	1.32%	Pass
		28	0.77	0.76	0.77	-1.32%	1.30%	Pass
		29	0.76	0.78	0.79	2.56%	1.27%	Pass
		30	0.76	0.79	0.78	3.80%	-1.28%	Pass
		31	0.77	0.78	0.76	1.28%	-2.63%	Pass
		32	0.72	0.76	0.74	5.26%	-2.70%	Pass
		33	0.76	0.76	0.79	0.00%	3.80%	Pass
		34	0.75	0.79	0.76	5.06%	-3.95%	Pass
		35	0.75	0.77	0.77	2.60%	0.00%	Pass
		36	0.74	0.77	0.78	3.90%	1.28%	Pass
		37	0.78	0.76	0.77	-2.63%	1.30%	Pass
		38	0.77	0.77	0.76	0.00%	-1.32%	Pass
		39	0.75	0.79	0.76	5.06%	-3.95%	Pass
		40	0.76	0.79	0.77	3.80%	-2.60%	Pass
		41	0.73	0.77	0.77	5.19%	0.00%	Pass
		42	0.75	0.78	0.79	3.85%	1.27%	Pass
		43	0.74	0.78	0.77	5.13%	-1.30%	Pass
		44	0.77	0.77	0.78	0.00%	1.28%	Pass
		45	0.75	0.78	0.79	3.85%	1.27%	Pass
		46	0.74	0.77	0.80	3.90%	3.75%	Pass
		47	0.75	0.77	0.79	2.60%	2.53%	Pass
		48	0.72	0.76	0.77	5.26%	1.30%	Pass
		49	0.74	0.77	0.79	3.90%	2.53%	Pass
		50	0.70	0.76	0.76	7.89%	0.00%	Pass
		51	0.74	0.77	0.76	3.90%	-1.32%	Pass
		52	0.76	0.75	0.75	-1.33%	0.53%	Pass
		53	0.77	0.76	0.77	-1.32%	1.30%	Pass
		54	0.76	0.75	0.76	-1.33%	1.32%	Pass
		55	0.76	0.76	0.78	0.00%	2.56%	Pass
		56	0.77	0.77	0.78	0.00%	1.28%	Pass
		57	0.75	0.77	0.80	2.60%	3.75%	Pass
		58	0.74	0.76	0.78	2.63%	2.56%	Pass
		59	0.73	0.75	0.76	2.67%	1.32%	Pass
		60	0.74	0.76	0.76	2.63%	0.00%	Pass
		61	0.76	0.76	0.73	0.00%	-4.11%	Pass
		62	0.75	0.77	0.76	2.60%	-1.32%	Pass
		63	0.77	0.78	0.76	1.28%	-2.63%	Pass
		64	0.75	0.76	0.76	1.32%	0.00%	Pass
		65	0.77	0.76	0.76	-1.32%	0.00%	Pass
		66	0.76	0.76	0.73	0.00%	-4.11%	Pass
		67	0.76	0.77	0.76	1.30%	-1.32%	Pass
		68	0.73	0.74	0.74	1.35%	0.00%	Pass
		69	0.75	0.74	0.74	-1.35%	0.00%	Pass
		70	0.73	0.74	0.76	1.35%	2.63%	Pass
		71	0.75	0.76	0.77	1.32%	1.30%	Pass
		72	0.73	0.74	0.75	1.35%	1.33%	Pass
		73	0.75	0.75	0.78	0.00%	3.85%	Pass
		74	0.73	0.73	0.76	0.00%	3.95%	Pass
		75	0.74	0.74	0.76	0.00%	2.63%	Pass
		76	0.74	0.74	0.77	0.00%	3.90%	Pass
		77	0.74	0.76	0.76	2.63%	0.00%	Pass

Biased Humidity test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR 1-2%	ΔDCR 2-3%	Inspection for sample appearance Test criteria: no excessive corrosion
						DCR change ≤ ±10%		
MMS-P 50A 60V	MMS7080050	1	0.77	0.76	0.76	-1.32%	0.00%	Pass
		2	0.75	0.75	0.76	0.00%	1.32%	Pass
		3	0.75	0.77	0.77	2.60%	0.00%	Pass
		4	0.76	0.76	0.76	0.00%	0.00%	Pass
		5	0.76	0.75	0.75	-1.33%	0.00%	Pass
		6	0.74	0.77	0.77	3.90%	0.00%	Pass
		7	0.74	0.74	0.76	0.00%	2.63%	Pass
		8	0.73	0.75	0.76	2.67%	1.32%	Pass
		9	0.76	0.76	0.76	0.00%	0.00%	Pass
		10	0.76	0.76	0.76	0.00%	0.00%	Pass
		11	0.77	0.77	0.77	0.00%	0.00%	Pass
		12	0.74	0.76	0.76	2.63%	0.00%	Pass
		13	0.75	0.77	0.77	2.60%	0.00%	Pass
		14	0.73	0.75	0.76	2.67%	1.32%	Pass
		15	0.76	0.76	0.77	0.00%	1.30%	Pass
		16	0.73	0.75	0.75	2.67%	0.00%	Pass
		17	0.71	0.73	0.73	2.74%	0.00%	Pass
		18	0.75	0.76	0.76	1.32%	0.00%	Pass
		19	0.76	0.75	0.75	-1.33%	0.00%	Pass
		20	0.75	0.76	0.76	1.32%	0.00%	Pass
		21	0.77	0.75	0.76	-2.67%	1.32%	Pass
		22	0.77	0.75	0.77	-2.67%	2.60%	Pass
		23	0.77	0.76	0.78	-1.32%	2.56%	Pass
		24	0.74	0.74	0.75	0.00%	1.33%	Pass
		25	0.75	0.73	0.76	-2.74%	3.95%	Pass
		26	0.74	0.73	0.74	-1.37%	1.35%	Pass
		27	0.75	0.75	0.75	0.00%	0.00%	Pass
		28	0.75	0.76	0.76	1.32%	0.00%	Pass
		29	0.75	0.77	0.76	2.60%	-1.32%	Pass
		30	0.76	0.77	0.77	1.30%	0.00%	Pass
		31	0.75	0.76	0.75	1.32%	-1.33%	Pass
		32	0.76	0.76	0.74	0.00%	-2.70%	Pass
		33	0.74	0.75	0.76	1.33%	1.32%	Pass
		34	0.74	0.75	0.77	1.33%	2.60%	Pass
		35	0.77	0.75	0.77	-2.67%	2.60%	Pass
		36	0.77	0.76	0.79	-1.32%	3.80%	Pass
		37	0.77	0.77	0.78	0.00%	1.28%	Pass
		38	0.76	0.77	0.80	1.30%	3.75%	Pass
		39	0.74	0.76	0.79	2.63%	3.80%	Pass
		40	0.75	0.74	0.77	-1.35%	3.90%	Pass
		41	0.73	0.74	0.77	1.35%	3.90%	Pass
		42	0.72	0.73	0.75	1.37%	2.67%	Pass
		43	0.75	0.75	0.76	0.00%	1.32%	Pass
		44	0.75	0.76	0.78	1.32%	2.56%	Pass
		45	0.76	0.77	0.78	1.30%	1.28%	Pass
		46	0.76	0.77	0.75	1.30%	-2.67%	Pass
		47	0.75	0.76	0.76	1.32%	0.00%	Pass
		48	0.74	0.75	0.77	1.33%	2.60%	Pass
		49	0.77	0.75	0.76	-2.67%	1.32%	Pass
		50	0.77	0.75	0.76	-2.67%	1.32%	Pass
		51	0.72	0.74	0.74	2.70%	0.00%	Pass
		52	0.72	0.73	0.75	1.37%	2.67%	Pass
		53	0.74	0.73	0.75	-1.37%	2.67%	Pass
		54	0.75	0.75	0.76	0.00%	1.32%	Pass
		55	0.75	0.76	0.75	1.32%	-1.33%	Pass
		56	0.76	0.77	0.75	1.30%	-2.67%	Pass
		57	0.76	0.77	0.75	1.30%	-2.67%	Pass
		58	0.76	0.77	0.77	1.30%	0.00%	Pass
		59	0.76	0.76	0.77	0.00%	1.30%	Pass
		60	0.75	0.76	0.77	1.32%	1.30%	Pass
		61	0.77	0.76	0.78	-1.32%	2.56%	Pass
		62	0.75	0.76	0.79	1.32%	3.80%	Pass
		63	0.76	0.74	0.75	-2.70%	1.33%	Pass
		64	0.74	0.73	0.75	-1.37%	2.67%	Pass
		65	0.73	0.72	0.72	-1.39%	0.00%	Pass
		66	0.73	0.73	0.75	0.00%	2.67%	Pass
		67	0.75	0.75	0.76	0.00%	1.32%	Pass
		68	0.74	0.76	0.76	2.63%	0.00%	Pass
		69	0.75	0.77	0.77	2.60%	0.00%	Pass
		70	0.76	0.76	0.75	0.00%	-1.33%	Pass
		71	0.74	0.75	0.78	1.33%	3.85%	Pass
		72	0.74	0.73	0.76	-1.37%	3.95%	Pass
		73	0.76	0.75	0.77	-1.33%	2.60%	Pass
		74	0.76	0.74	0.76	-2.70%	2.63%	Pass
		75	0.75	0.75	0.75	0.00%	0.00%	Pass
		76	0.74	0.76	0.76	2.63%	0.00%	Pass
		77	0.74	0.77	0.76	3.90%	-1.32%	Pass

High temperature operating life test

Part No.	Lot No.	Sample NO.	Initial DCR1	DCR2 after precondition test	DCR3 after test	Δ DCR 1-2%	Δ DCR 2-3%	Inspection for sample appearance
			■mΩ/□Ω	■mΩ/□Ω	■mΩ/□Ω	DCR change $\leq \pm 10\%$		Test criteria: no damage
MMS-P 50A 60V	MMS7080050	1	0.74	0.74	0.76	0.00%	2.63%	Pass
		2	0.72	0.72	0.74	0.00%	2.70%	Pass
		3	0.73	0.74	0.75	1.35%	1.33%	Pass
		4	0.72	0.74	0.76	2.70%	2.63%	Pass
		5	0.73	0.74	0.73	1.35%	-1.37%	Pass
		6	0.75	0.74	0.77	-1.35%	3.90%	Pass
		7	0.73	0.74	0.76	1.35%	2.63%	Pass
		8	0.75	0.73	0.75	-2.74%	2.67%	Pass
		9	0.76	0.74	0.74	-2.70%	0.00%	Pass
		10	0.72	0.74	0.76	2.70%	2.63%	Pass
		11	0.72	0.73	0.76	1.37%	3.95%	Pass
		12	0.73	0.71	0.75	-2.82%	5.33%	Pass
		13	0.75	0.75	0.77	0.00%	2.60%	Pass
		14	0.75	0.73	0.75	-2.74%	2.67%	Pass
		15	0.74	0.73	0.77	-1.37%	5.19%	Pass
		16	0.73	0.75	0.76	2.67%	1.32%	Pass
		17	0.73	0.72	0.75	-1.39%	4.00%	Pass
		18	0.76	0.75	0.74	-1.33%	-1.35%	Pass
		19	0.73	0.74	0.74	1.35%	0.00%	Pass
		20	0.74	0.72	0.74	-2.78%	2.70%	Pass
		21	0.73	0.74	0.75	1.35%	1.33%	Pass
		22	0.75	0.74	0.75	-1.35%	1.33%	Pass
		23	0.75	0.75	0.78	0.00%	3.85%	Pass
		24	0.73	0.72	0.75	-1.39%	4.00%	Pass
		25	0.75	0.74	0.75	-1.35%	1.33%	Pass
		26	0.74	0.73	0.76	-1.37%	3.95%	Pass
		27	0.73	0.74	0.75	1.35%	1.33%	Pass
		28	0.73	0.75	0.74	2.67%	-1.35%	Pass
		29	0.75	0.72	0.75	-4.17%	4.00%	Pass
		30	0.74	0.74	0.77	0.00%	3.90%	Pass
		31	0.72	0.74	0.74	2.70%	0.00%	Pass
		32	0.72	0.75	0.76	4.00%	1.32%	Pass
		33	0.75	0.72	0.74	-4.17%	2.70%	Pass
		34	0.73	0.74	0.74	1.35%	0.00%	Pass
		35	0.74	0.74	0.75	0.00%	1.33%	Pass
		36	0.72	0.74	0.75	2.70%	1.33%	Pass
		37	0.74	0.74	0.77	0.00%	3.90%	Pass
		38	0.73	0.73	0.75	0.00%	2.67%	Pass
		39	0.74	0.74	0.76	0.00%	2.63%	Pass
		40	0.74	0.74	0.75	0.00%	1.33%	Pass
		41	0.73	0.73	0.77	0.00%	5.19%	Pass
		42	0.73	0.74	0.75	1.35%	1.33%	Pass
		43	0.74	0.70	0.73	-5.71%	4.11%	Pass
		44	0.75	0.74	0.75	-1.35%	1.33%	Pass
		45	0.75	0.72	0.76	-4.17%	5.26%	Pass
		46	0.72	0.74	0.75	2.70%	1.33%	Pass
		47	0.74	0.72	0.76	-2.78%	5.26%	Pass
		48	0.75	0.75	0.76	0.00%	1.32%	Pass
		49	0.73	0.76	0.76	3.95%	0.00%	Pass
		50	0.72	0.74	0.76	2.70%	2.63%	Pass
		51	0.73	0.75	0.75	2.67%	0.00%	Pass
		52	0.73	0.75	0.76	2.67%	1.32%	Pass
		53	0.75	0.73	0.76	-2.74%	3.95%	Pass
		54	0.73	0.72	0.76	-1.39%	5.26%	Pass
		55	0.75	0.73	0.74	-2.74%	1.35%	Pass
		56	0.72	0.73	0.75	1.37%	2.67%	Pass
		57	0.74	0.72	0.76	-2.78%	5.26%	Pass
		58	0.76	0.74	0.74	-2.70%	0.00%	Pass
		59	0.75	0.74	0.74	-1.35%	0.00%	Pass
		60	0.75	0.72	0.76	-4.17%	5.26%	Pass
		61	0.75	0.74	0.76	-1.35%	2.63%	Pass
		62	0.76	0.75	0.78	-1.33%	3.85%	Pass
		63	0.74	0.75	0.76	1.33%	1.32%	Pass
		64	0.72	0.75	0.76	4.00%	1.32%	Pass
		65	0.75	0.74	0.75	-1.35%	1.33%	Pass
		66	0.72	0.74	0.77	2.70%	3.90%	Pass
		67	0.75	0.76	0.79	1.32%	3.80%	Pass
		68	0.73	0.72	0.74	-1.39%	2.70%	Pass
		69	0.75	0.74	0.77	-1.35%	3.90%	Pass
		70	0.75	0.72	0.75	-4.17%	4.00%	Pass
		71	0.72	0.74	0.75	2.70%	1.33%	Pass
		72	0.74	0.74	0.76	0.00%	2.63%	Pass
		73	0.72	0.73	0.75	1.37%	2.67%	Pass
		74	0.75	0.72	0.76	-4.17%	5.26%	Pass
		75	0.73	0.73	0.77	0.00%	5.19%	Pass
		76	0.73	0.74	0.76	1.35%	2.63%	Pass
		77	0.75	0.74	0.78	-1.35%	5.13%	Pass

Physical Dimension test

Part No.	Lot No.	Sample NO.	Length (mm)	Width (mm)	Thickness (mm)
			7.0~7.6	5.6~6.0	3.8~4.2
MMS-P 50A 60V	MMS7080050	1	7.26	5.82	3.96
		2	7.25	5.83	3.96
		3	7.26	5.82	3.97
		4	7.24	5.86	3.95
		5	7.26	5.81	3.96
		6	7.26	5.82	3.95
		7	7.26	5.87	3.93
		8	7.25	5.78	3.95
		9	7.26	5.82	3.96
		10	7.25	5.82	3.97
		11	7.25	5.81	3.96
		12	7.26	5.83	3.97
		13	7.25	5.85	3.96
		14	7.25	5.89	3.96
		15	7.23	5.80	3.95
		16	7.23	5.83	3.93
		17	7.24	5.78	3.95
		18	7.26	5.77	3.95
		19	7.26	5.78	3.95
		20	7.26	5.78	3.96
		21	7.26	5.82	3.97
		22	7.27	5.83	3.98
		23	7.25	5.82	3.92
		24	7.24	5.81	3.92
		25	7.26	5.83	3.92
		26	7.25	5.85	3.94
		27	7.25	5.81	3.92
		28	7.23	5.78	3.96
		29	7.23	5.83	3.97
		30	7.25	5.82	3.95

Salt spray test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR _{1-2%}	ΔDCR _{2-3%}	Inspection for sample appearance
						DCR change ≤ ±10%		Test criteria: no excessive corrosion
MMS-P 50A 60V	MMS7080050	1	0.76	0.76	0.78	0.00%	2.56%	Pass
		2	0.76	0.76	0.76	0.00%	0.00%	Pass
		3	0.75	0.75	0.77	0.00%	2.60%	Pass
		4	0.77	0.77	0.77	0.00%	0.00%	Pass
		5	0.76	0.77	0.78	1.30%	1.28%	Pass
		6	0.76	0.76	0.78	0.00%	2.56%	Pass
		7	0.75	0.77	0.77	2.60%	0.00%	Pass
		8	0.73	0.74	0.74	1.35%	0.00%	Pass
		9	0.73	0.74	0.75	1.35%	1.33%	Pass
		10	0.75	0.75	0.75	0.00%	0.00%	Pass
		11	0.75	0.76	0.76	1.32%	0.00%	Pass
		12	0.76	0.77	0.78	1.30%	1.28%	Pass
		13	0.76	0.77	0.77	1.30%	0.00%	Pass
		14	0.74	0.76	0.76	2.63%	0.00%	Pass
		15	0.75	0.76	0.76	1.32%	0.00%	Pass
		16	0.76	0.77	0.77	1.30%	0.00%	Pass
		17	0.76	0.75	0.76	-1.33%	1.32%	Pass
		18	0.77	0.76	0.76	-1.32%	0.00%	Pass
		19	0.76	0.75	0.76	-1.33%	1.32%	Pass
		20	0.76	0.76	0.76	0.00%	0.00%	Pass
		21	0.74	0.75	0.77	1.33%	2.60%	Pass
		22	0.73	0.75	0.76	2.67%	1.32%	Pass
		23	0.75	0.76	0.77	1.32%	1.30%	Pass
		24	0.75	0.77	0.78	2.60%	1.28%	Pass
		25	0.75	0.76	0.77	1.32%	1.30%	Pass
		26	0.73	0.74	0.76	1.35%	2.63%	Pass
		27	0.75	0.75	0.75	0.00%	0.00%	Pass
		28	0.75	0.75	0.76	0.00%	1.32%	Pass
		29	0.75	0.76	0.77	1.32%	1.30%	Pass
		30	0.76	0.77	0.77	1.30%	0.00%	Pass

Salt spray test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR 1-2%	ΔDCR 2-3%	Inspection for sample appearance
						DCR change ≤ ±10%		Test criteria: no excessive corrosion
MMS-P 50A 60V	MMS7080050	1	0.76	0.76	0.78	0.00%	2.56%	Pass
		2	0.76	0.76	0.76	0.00%	0.00%	Pass
		3	0.75	0.75	0.77	0.00%	2.60%	Pass
		4	0.77	0.77	0.77	0.00%	0.00%	Pass
		5	0.76	0.77	0.78	1.30%	1.28%	Pass
		6	0.76	0.76	0.78	0.00%	2.56%	Pass
		7	0.75	0.77	0.77	2.60%	0.00%	Pass
		8	0.73	0.74	0.74	1.35%	0.00%	Pass
		9	0.73	0.74	0.75	1.35%	1.33%	Pass
		10	0.75	0.75	0.75	0.00%	0.00%	Pass
		11	0.75	0.76	0.76	1.32%	0.00%	Pass
		12	0.76	0.77	0.78	1.30%	1.28%	Pass
		13	0.76	0.77	0.77	1.30%	0.00%	Pass
		14	0.74	0.76	0.76	2.63%	0.00%	Pass
		15	0.75	0.76	0.76	1.32%	0.00%	Pass
		16	0.76	0.77	0.77	1.30%	0.00%	Pass
		17	0.76	0.75	0.76	-1.33%	1.32%	Pass
		18	0.77	0.76	0.76	-1.32%	0.00%	Pass
		19	0.76	0.75	0.76	-1.33%	1.32%	Pass
		20	0.76	0.76	0.76	0.00%	0.00%	Pass
		21	0.74	0.75	0.77	1.33%	2.60%	Pass
		22	0.73	0.75	0.76	2.67%	1.32%	Pass
		23	0.75	0.76	0.77	1.32%	1.30%	Pass
		24	0.75	0.77	0.78	2.60%	1.28%	Pass
		25	0.75	0.76	0.77	1.32%	1.30%	Pass
		26	0.73	0.74	0.76	1.35%	2.63%	Pass
		27	0.75	0.75	0.75	0.00%	0.00%	Pass
		28	0.75	0.75	0.76	0.00%	1.32%	Pass
		29	0.75	0.76	0.77	1.32%	1.30%	Pass
		30	0.76	0.77	0.77	1.30%	0.00%	Pass

Solderability test

Part No.	Lot No.	Sample NO.	Results
			Test criteria: Minimum 95% new solder coverage on any one surface.
MMS-P 50A 60V	MMS7080050	1	Pass
		2	Pass
		3	Pass
		4	Pass
		5	Pass
		6	Pass
		7	Pass
		8	Pass
		9	Pass
		10	Pass
		11	Pass
		12	Pass
		13	Pass
		14	Pass
		15	Pass
		16	Pass
		17	Pass
		18	Pass
		19	Pass
		20	Pass
		21	Pass
		22	Pass
		23	Pass
		24	Pass
		25	Pass
		26	Pass
		27	Pass
		28	Pass
		29	Pass
		30	Pass

Terminal strength

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR _{1-2%}	ΔDCR _{2-3%}	Inspection for sample appearance Test criteria: no mechanical damage
						DCR change ≤ ±10%		
MMS-P 50A 60V	MMS7080050	1	0.73	0.75	0.77	2.67%	2.60%	Pass
		2	0.70	0.71	0.73	1.41%	2.74%	Pass
		3	0.72	0.73	0.74	1.37%	1.35%	Pass
		4	0.75	0.75	0.77	0.00%	2.60%	Pass
		5	0.73	0.72	0.74	-1.39%	2.70%	Pass
		6	0.72	0.73	0.76	1.37%	3.95%	Pass
		7	0.73	0.71	0.72	-2.82%	1.39%	Pass
		8	0.73	0.74	0.72	1.35%	-2.78%	Pass
		9	0.73	0.74	0.72	1.35%	-2.78%	Pass
		10	0.73	0.74	0.76	1.35%	2.63%	Pass
		11	0.73	0.72	0.72	-1.39%	0.00%	Pass
		12	0.74	0.75	0.73	1.33%	-2.74%	Pass
		13	0.72	0.72	0.71	0.00%	-1.41%	Pass
		14	0.75	0.75	0.76	0.00%	1.32%	Pass
		15	0.73	0.71	0.73	-2.82%	2.74%	Pass
		16	0.74	0.72	0.74	-2.78%	2.70%	Pass
		17	0.75	0.75	0.76	0.00%	1.32%	Pass
		18	0.71	0.72	0.73	1.39%	1.37%	Pass
		19	0.71	0.72	0.73	1.39%	1.37%	Pass
		20	0.75	0.74	0.75	-1.35%	1.33%	Pass
		21	0.74	0.75	0.75	1.33%	0.00%	Pass
		22	0.74	0.75	0.76	1.33%	1.32%	Pass
		23	0.72	0.72	0.72	0.00%	0.00%	Pass
		24	0.72	0.72	0.74	0.00%	2.70%	Pass
		25	0.74	0.74	0.74	0.00%	0.00%	Pass
		26	0.73	0.72	0.73	-1.39%	1.37%	Pass
		27	0.74	0.73	0.74	-1.37%	1.35%	Pass
		28	0.73	0.72	0.74	-1.39%	2.70%	Pass
		29	0.73	0.73	0.73	0.00%	0.00%	Pass
		30	0.75	0.74	0.75	-1.35%	1.33%	Pass

Board Flex test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 being board flex ■mΩ/□Ω	DCR4 after board flex ■mΩ/□Ω	ΔDCR _{1-2%}	ΔDCR _{2-3%}	ΔDCR _{2-4%}	Inspection for sample appearance
MMS-P 50A 60V	MMS7080050	1	0.70	0.70	0.70	0.72	0.00%	0.00%	2.78%	Pass
		2	0.73	0.72	0.71	0.72	-1.39%	-1.41%	1.39%	Pass
		3	0.69	0.71	0.70	0.71	2.82%	-1.43%	1.41%	Pass
		4	0.72	0.72	0.71	0.71	0.00%	-1.41%	0.00%	Pass
		5	0.72	0.74	0.72	0.71	2.70%	-2.78%	-1.41%	Pass
		6	0.72	0.72	0.73	0.75	0.00%	1.37%	2.67%	Pass
		7	0.72	0.72	0.71	0.71	0.00%	-1.41%	0.00%	Pass
		8	0.73	0.71	0.72	0.72	-2.82%	1.39%	0.00%	Pass
		9	0.71	0.72	0.70	0.71	1.39%	-2.86%	1.41%	Pass
		10	0.71	0.72	0.74	0.75	1.39%	2.70%	1.33%	Pass
		11	0.69	0.69	0.72	0.74	0.00%	4.17%	2.70%	Pass
		12	0.72	0.72	0.70	0.71	0.00%	-2.86%	1.41%	Pass
		13	0.71	0.71	0.73	0.73	0.00%	2.74%	0.00%	Pass
		14	0.73	0.72	0.71	0.73	-1.39%	-1.41%	2.74%	Pass
		15	0.72	0.71	0.70	0.71	-1.41%	-1.43%	1.41%	Pass
		16	0.71	0.72	0.72	0.71	1.39%	0.00%	-1.41%	Pass
		17	0.70	0.72	0.71	0.74	2.78%	-1.41%	4.05%	Pass
		18	0.72	0.71	0.71	0.72	-1.41%	0.00%	1.39%	Pass
		19	0.72	0.72	0.71	0.71	0.00%	-1.41%	0.00%	Pass
		20	0.72	0.72	0.71	0.72	0.00%	-1.41%	1.39%	Pass
		21	0.72	0.72	0.70	0.72	0.00%	-2.86%	2.78%	Pass
		22	0.73	0.71	0.70	0.71	-2.82%	-1.43%	1.41%	Pass
		23	0.72	0.68	0.69	0.69	-5.88%	1.45%	0.00%	Pass
		24	0.71	0.71	0.71	0.71	0.00%	0.00%	0.00%	Pass
		25	0.72	0.70	0.72	0.73	-2.86%	2.78%	1.37%	Pass
		26	0.71	0.71	0.69	0.70	0.00%	-2.90%	1.43%	Pass
		27	0.73	0.72	0.72	0.71	-1.39%	0.00%	-1.41%	Pass
		28	0.73	0.71	0.70	0.73	-2.82%	-1.43%	4.11%	Pass
		29	0.71	0.71	0.71	0.71	0.00%	0.00%	0.00%	Pass
		30	0.72	0.71	0.71	0.74	-1.41%	0.00%	4.05%	Pass

Pull test

Part No.	Lot No.	Sample NO.	Results
			Test criteria: No termination pull off
MMS-P 50A 60V	MMS7080050	1	Pass
		2	Pass
		3	Pass
		4	Pass
		5	Pass
		6	Pass
		7	Pass
		8	Pass
		9	Pass
		10	Pass
		11	Pass
		12	Pass
		13	Pass
		14	Pass
		15	Pass
		16	Pass
		17	Pass
		18	Pass
		19	Pass
		20	Pass
		21	Pass
		22	Pass
		23	Pass
		24	Pass
		25	Pass
		26	Pass
		27	Pass
		28	Pass
		29	Pass
		30	Pass

Electrical Characterization test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	ΔDCR 1-2% DCR change ≤ ±10%	Clearing time @ 100%			Clearing time @ 250%, seconds Clear time = 60 seconds	Interrupting 300A at rated voltage	Inspection for sample appearance Test criteria: no damage
						4 hours min.		Temperature rise, °C			
						DCR3 after test, mΩ	ΔDCR 2-3% DCR change ≤ ±10%				
MMS-P 50A 60V	MMS7080050	1	0.72	0.73	1.37%	0.77	5.19%	114.7	/	/	Pass
		2	0.71	0.72	1.39%	0.76	5.26%	111.4	/	/	Pass
		3	0.73	0.73	0.00%	0.77	5.19%	109.7	/	/	Pass
		4	0.74	0.74	0.00%	0.76	2.63%	109.1	/	/	Pass
		5	0.72	0.73	1.37%	0.77	5.19%	108.2	/	/	Pass
		6	0.72	0.74	2.70%	0.78	5.13%	105.3	/	/	Pass
		7	0.72	0.74	2.70%	0.79	6.33%	112.8	/	/	Pass
		8	0.73	0.73	0.00%	0.78	6.41%	109.5	/	/	Pass
		9	0.73	0.75	2.67%	0.78	3.85%	107.7	/	/	Pass
		10	0.74	0.76	2.63%	0.80	5.00%	107.2	/	/	Pass
		11	0.75	0.76	1.32%	/	/	/	0.4	/	Pass
		12	0.75	0.75	0.00%	/	/	/	0.4	/	Pass
		13	0.75	0.77	2.60%	/	/	/	0.3	/	Pass
		14	0.76	0.77	1.30%	/	/	/	0.4	/	Pass
		15	0.76	0.76	0.00%	/	/	/	0.4	/	Pass
		16	0.76	0.76	0.00%	/	/	/	0.4	/	Pass
		17	0.76	0.77	1.30%	/	/	/	0.3	/	Pass
		18	0.75	0.77	2.60%	/	/	/	0.3	/	Pass
		19	0.75	0.77	2.60%	/	/	/	0.4	/	Pass
		20	0.75	0.75	0.00%	/	/	/	0.3	/	Pass
		21	0.75	0.76	1.32%	/	/	/	/	OK	Pass
		22	0.71	0.72	1.39%	/	/	/	/	OK	Pass
		23	0.74	0.73	-1.37%	/	/	/	/	OK	Pass
		24	0.73	0.73	0.00%	/	/	/	/	OK	Pass
		25	0.74	0.74	0.00%	/	/	/	/	OK	Pass
		26	0.73	0.74	1.35%	/	/	/	/	OK	Pass
		27	0.72	0.73	1.37%	/	/	/	/	OK	Pass
		28	0.72	0.73	1.37%	/	/	/	/	OK	Pass
		29	0.73	0.74	1.35%	/	/	/	/	OK	Pass
		30	0.71	0.72	1.39%	/	/	/	/	OK	Pass

Pressure cooker or Autoclave

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR 1-2% DCR change ≤ ±10%	ΔDCR 2-3%	Inspection for sample appearance Test criteria: no damage									
									MMS-P 50A 60V	MMS7080050	1	0.73	0.72	0.73	-1.39%	1.37%	Pass
											2	0.75	0.74	0.74	-1.35%	0.00%	Pass
3	0.72	0.75	0.76	4.00%	1.32%	Pass											
4	0.74	0.73	0.73	-1.37%	0.00%	Pass											
5	0.73	0.76	0.75	3.95%	-1.33%	Pass											
6	0.75	0.74	0.74	-1.35%	0.00%	Pass											
7	0.72	0.74	0.76	2.70%	2.63%	Pass											
8	0.74	0.75	0.73	1.33%	-2.74%	Pass											
9	0.72	0.72	0.73	0.00%	1.37%	Pass											
10	0.73	0.73	0.75	0.00%	2.67%	Pass											
11	0.72	0.73	0.74	1.37%	1.35%	Pass											
12	0.75	0.75	0.75	0.00%	0.00%	Pass											
13	0.73	0.73	0.75	0.00%	2.67%	Pass											
14	0.75	0.77	0.76	2.60%	-1.32%	Pass											
15	0.73	0.75	0.74	2.67%	-1.35%	Pass											
16	0.74	0.74	0.76	0.00%	2.63%	Pass											
17	0.74	0.75	0.74	1.33%	-1.35%	Pass											
18	0.71	0.72	0.74	1.39%	2.70%	Pass											
19	0.74	0.73	0.75	-1.37%	2.67%	Pass											
20	0.72	0.73	0.76	1.37%	3.95%	Pass											
21	0.73	0.72	0.73	-1.39%	1.37%	Pass											
22	0.73	0.75	0.74	2.67%	-1.35%	Pass											
23	0.74	0.73	0.75	-1.37%	2.67%	Pass											
24	0.73	0.72	0.72	-1.39%	0.00%	Pass											
25	0.75	0.75	0.74	0.00%	-1.35%	Pass											
26	0.73	0.76	0.76	3.95%	0.00%	Pass											
27	0.73	0.73	0.74	0.00%	1.35%	Pass											
28	0.74	0.72	0.74	-2.78%	2.70%	Pass											
29	0.74	0.75	0.73	1.33%	-2.74%	Pass											
30	0.73	0.72	0.74	-1.39%	2.70%	Pass											
31	0.73	0.76	0.76	3.95%	0.00%	Pass											
32	0.72	0.74	0.74	2.70%	0.00%	Pass											
33	0.74	0.71	0.74	-4.23%	4.05%	Pass											
34	0.75	0.73	0.75	-2.74%	2.67%	Pass											
35	0.74	0.72	0.76	-2.78%	5.26%	Pass											
36	0.75	0.74	0.75	-1.35%	1.33%	Pass											
37	0.73	0.75	0.76	2.67%	1.32%	Pass											
38	0.73	0.72	0.75	-1.39%	4.00%	Pass											
39	0.74	0.73	0.75	-1.37%	2.67%	Pass											
40	0.74	0.74	0.76	0.00%	2.63%	Pass											
41	0.73	0.73	0.74	0.00%	1.35%	Pass											
42	0.76	0.74	0.75	-2.70%	1.33%	Pass											
43	0.73	0.72	0.72	-1.39%	0.00%	Pass											
44	0.74	0.74	0.76	0.00%	2.63%	Pass											
45	0.76	0.71	0.75	-7.04%	5.33%	Pass											
46	0.73	0.73	0.74	0.00%	1.35%	Pass											
47	0.76	0.74	0.76	-2.70%	2.63%	Pass											
48	0.75	0.72	0.74	-4.17%	2.70%	Pass											
49	0.74	0.73	0.76	-1.37%	3.95%	Pass											
50	0.74	0.75	0.73	1.33%	-2.74%	Pass											
51	0.75	0.72	0.72	-4.17%	0.00%	Pass											
52	0.73	0.75	0.75	2.67%	0.00%	Pass											
53	0.72	0.72	0.74	0.00%	2.70%	Pass											
54	0.73	0.75	0.77	2.67%	2.60%	Pass											
55	0.75	0.73	0.76	-2.74%	3.95%	Pass											
56	0.73	0.75	0.76	2.67%	1.32%	Pass											
57	0.73	0.75	0.77	2.67%	2.60%	Pass											
58	0.76	0.74	0.76	-2.70%	2.63%	Pass											
59	0.74	0.74	0.74	0.00%	0.00%	Pass											
60	0.72	0.72	0.74	0.00%	2.70%	Pass											
61	0.73	0.71	0.73	-2.82%	2.74%	Pass											
62	0.74	0.73	0.74	-1.37%	1.35%	Pass											
63	0.73	0.75	0.76	2.67%	1.32%	Pass											
64	0.71	0.74	0.73	4.05%	-1.37%	Pass											
65	0.75	0.73	0.75	-2.74%	2.67%	Pass											
66	0.73	0.73	0.74	0.00%	1.35%	Pass											
67	0.74	0.73	0.75	-1.37%	2.67%	Pass											
68	0.74	0.76	0.74	2.63%	-2.70%	Pass											
69	0.73	0.76	0.75	3.95%	-1.33%	Pass											
70	0.74	0.72	0.76	-2.78%	5.26%	Pass											
71	0.71	0.75	0.74	5.33%	-1.35%	Pass											
72	0.74	0.73	0.73	-1.37%	0.00%	Pass											
73	0.72	0.74	0.75	2.70%	1.33%	Pass											
74	0.74	0.73	0.74	-1.37%	1.35%	Pass											
75	0.74	0.74	0.76	0.00%	2.63%	Pass											
76	0.73	0.73	0.74	0.00%	1.35%	Pass											
77	0.71	0.73	0.75	2.74%	2.67%	Pass											

Endurance Test

Part No.	Lot No.	Sample NO.	Initial DCR1 ■mΩ/□Ω	DCR2 after precondition test ■mΩ/□Ω	DCR3 after test ■mΩ/□Ω	ΔDCR 1-2%	ΔDCR 2-3%	Inspection for sample appearance
						DCR change ≤ ±10%		
MMS-P 50A 60V	MMS7080050	1	0.71	0.73	0.75	2.74%	2.67%	Pass
		2	0.70	0.72	0.74	2.78%	2.70%	Pass
		3	0.72	0.72	0.75	0.00%	4.00%	Pass
		4	0.73	0.75	0.76	2.67%	1.32%	Pass
		5	0.73	0.73	0.75	0.00%	2.67%	Pass
		6	0.72	0.72	0.75	0.00%	4.00%	Pass
		7	0.72	0.75	0.77	4.00%	2.60%	Pass
		8	0.73	0.74	0.75	1.35%	1.33%	Pass
		9	0.71	0.71	0.76	0.00%	6.58%	Pass
		10	0.73	0.73	0.76	0.00%	3.95%	Pass
		11	0.70	0.72	0.77	2.78%	6.49%	Pass
		12	0.72	0.74	0.75	2.70%	1.33%	Pass
		13	0.72	0.73	0.76	1.37%	3.95%	Pass
		14	0.72	0.73	0.74	1.37%	1.35%	Pass
		15	0.73	0.74	0.74	1.35%	0.00%	Pass
		16	0.73	0.75	0.76	2.67%	1.32%	Pass
		17	0.71	0.73	0.77	2.74%	5.19%	Pass
		18	0.73	0.73	0.78	0.00%	6.41%	Pass
		19	0.71	0.74	0.77	4.05%	3.90%	Pass
		20	0.73	0.72	0.76	-1.39%	5.26%	Pass
		21	0.72	0.72	0.76	0.00%	5.26%	Pass
		22	0.72	0.74	0.76	2.70%	2.63%	Pass
		23	0.72	0.72	0.75	0.00%	4.00%	Pass
		24	0.73	0.75	0.75	2.67%	0.00%	Pass
		25	0.72	0.73	0.77	1.37%	5.19%	Pass
		26	0.72	0.72	0.71	0.00%	-1.41%	Pass
		27	0.73	0.75	0.75	2.67%	0.00%	Pass
		28	0.73	0.74	0.75	1.35%	1.33%	Pass
		29	0.73	0.72	0.75	-1.39%	4.00%	Pass
		30	0.72	0.75	0.77	4.00%	2.60%	Pass
		31	0.72	0.74	0.76	2.70%	2.63%	Pass
		32	0.73	0.73	0.76	0.00%	3.95%	Pass
		33	0.72	0.74	0.76	2.70%	2.63%	Pass
		34	0.72	0.74	0.75	2.70%	1.33%	Pass
		35	0.75	0.75	0.75	0.00%	0.00%	Pass
		36	0.72	0.75	0.75	4.00%	0.00%	Pass
		37	0.72	0.73	0.76	1.37%	3.95%	Pass
		38	0.72	0.75	0.76	4.00%	1.32%	Pass
		39	0.74	0.75	0.76	1.33%	1.32%	Pass
		40	0.73	0.75	0.74	2.67%	-1.35%	Pass
		41	0.71	0.74	0.75	4.05%	1.33%	Pass
		42	0.75	0.77	0.77	2.60%	0.00%	Pass
		43	0.72	0.74	0.76	2.70%	2.63%	Pass
		44	0.72	0.72	0.76	0.00%	5.26%	Pass
		45	0.74	0.75	0.75	1.33%	0.00%	Pass
		46	0.72	0.75	0.75	4.00%	0.00%	Pass
		47	0.72	0.72	0.75	0.00%	4.00%	Pass
		48	0.73	0.72	0.75	-1.39%	4.00%	Pass
		49	0.72	0.72	0.74	0.00%	2.70%	Pass
		50	0.74	0.75	0.76	1.33%	1.32%	Pass
		51	0.71	0.74	0.75	4.05%	1.33%	Pass
		52	0.73	0.72	0.74	-1.39%	2.70%	Pass
		53	0.71	0.74	0.75	4.05%	1.33%	Pass
		54	0.74	0.76	0.76	2.63%	0.00%	Pass
		55	0.72	0.73	0.76	1.37%	3.95%	Pass
		56	0.71	0.72	0.76	1.39%	5.26%	Pass
		57	0.72	0.74	0.76	2.70%	2.63%	Pass
		58	0.72	0.73	0.75	1.37%	2.67%	Pass
		59	0.74	0.75	0.77	1.33%	2.60%	Pass
		60	0.72	0.72	0.74	0.00%	2.70%	Pass
		61	0.73	0.73	0.74	0.00%	1.35%	Pass
		62	0.71	0.72	0.76	1.39%	5.26%	Pass
		63	0.73	0.74	0.76	1.35%	2.63%	Pass
		64	0.72	0.71	0.74	-1.41%	4.05%	Pass
		65	0.72	0.72	0.76	0.00%	5.26%	Pass
		66	0.72	0.74	0.76	2.70%	2.63%	Pass
		67	0.75	0.74	0.76	-1.35%	2.63%	Pass
		68	0.72	0.73	0.75	1.37%	2.67%	Pass
		69	0.72	0.75	0.75	4.00%	0.00%	Pass
		70	0.73	0.72	0.75	-1.39%	4.00%	Pass
		71	0.72	0.74	0.74	2.70%	0.00%	Pass
		72	0.72	0.73	0.75	1.37%	2.67%	Pass
		73	0.72	0.73	0.75	1.37%	2.67%	Pass
		74	0.71	0.71	0.75	0.00%	5.33%	Pass
		75	0.72	0.74	0.74	2.70%	0.00%	Pass
		76	0.73	0.74	0.77	1.35%	3.90%	Pass
		77	0.73	0.73	0.76	0.00%	3.95%	Pass