

CENELEC/AREMA Qualification Test Plan
MEMS Accelerometer Model JMA-100-1G

Plan	Standard	Test Description
1	AREMA Part 11.5.1 (2009)	Exploratory Sine Sweep , Class I, para. D4b, 0.05" pk-pk, 5-14 Hz; 0.5g pk 14-200 Hz. Test in accordance with MIL-STD-810 (non-operating)
2	AREMA Part 11.5.1 (2009)	Sinusoidal Vibration , Class I, para. D4a, sine sweep twenty (20) cycles from 5 to 200 to 5 Hz in each of three orthogonal axes. Test in accordance with MIL-STD-810 (operating)
3	AREMA Part 11.5.1 (2009)	Mechanical Shock , Class I, para. D5, 10g's at 11 milliseconds, three shocks positive and negative per axis, 18 shocks total. Test in accordance with MIL-STD-810 (operating)
4	EN 50155:2007 AREMA Part 11.5.1 (2009)	Dry Heat , EN 50155 para 12.2.4. Test in accordance with EN60068-2-2, Test Bd High Temperature Operational , AREMA Part 11.5.1, Class I, para. D2. Test in accordance with MIL-STD-810 Combined test: 72 hours at 70 °C after stabilization (operating)
5	AREMA Part 11.5.1 (2009)	High Temperature Storage , Class I, para. 2.5, two 2-hour soak at 85 °C. Test in accordance with MIL-STD-810 (non-operating)
6	EN 50155:2007 AREMA Part 11.5.1 (2009)	Cooling , EN 50155 para. 12.2.3. Test in accordance with EN60068-2-1, Test Ad Low Temperature Operation , AREMA Para. 11.5.1, Class I, para. D2. Test in accordance with MIL-STD-810 Combined test: 8 hours at -40 °C after stabilization (non-operating)
7	AREMA Part 11.5.1 (2009)	Cold Storage , Class I, para. 2.1, two two-hour soaks at -55 °C. Test in accordance with MIL-STD-810 (non-operating)
8	AREMA Part 11.5.1 (2009)	Humidity , Class I, para. D3, five 48-hour cycles, 20 to 60 °C, 95 % RH min. Test in accordance with MIL-STD-810 (non-operating, except operating each cycle during hours 24 to 28 and 43 to 48)
9	EN 50155:2007	Functional Random Vibration , EN 50155 para. 12.2.11, V-axis 0.1 grms, T-axis 0.05 grms, L-axis 0.05 grms for 10 min. per axis. Test in accordance with EN-61373, Category 1, Class B (operating)
10	EN 50155:2007	Simulated Long Life Vibration , EN 50155 para. 12.2.11. Test in accordance with EN-61373, Category 1, Class B (operating)
11	EN 50155:2007	Mechanical Shock , EN 50155 para. 12.2.11, three shocks positive and negative per axis, 18 shocks total. Test in accordance with EN-61373, Category 1, Class B. (operating)
12	EN 50155:2007	Damp Heat, Cyclic , EN 50155 para. 12.2.5, two 24-hour temperature cycles between 25 °C and 55 °C / RH 95 %. Test in accordance with of EN60068-2-30, Test Db. (non-operating)
13	EN 50155:2007	Low Temperature Storage , EN 50155 para. 12.2.14, sixteen (16) hours at -40 °C. Test in accordance with EN60068-2-1, Test Db (non-operating)
Note: Tests listed above shall be performed in the order given. The following tests listed below may be performed in any sequence.		
14	EN 50155:2007 / EN 50121-3-2:2015 / EN 55011:2009+A1:2010	Conducted Emissions (DC Power ports), EN 50155 para. 5.5; EN 50121-3-2 Table 1 150kHz to 500kHz, 99dBuV (QP) 86 (AV); 500kHz to 30MHz, 93dBuV (QP) 80 (AV) Test in accordance with EN 55011 para. 7.7.2
15	EN 50155:2007 / EN 50121-3-2:2015 (Table 2 limits) / EN 55011:2009+A1:2010	Radiated Emissions , EN 50155 para. 5.5; EN 50121-3-2 Table 3 30MHz to 230MHz, 40dBuV @ 10 Meters (QP) 230MHz to 1GHz, 47dBuV @ 10 Meters (QP) Test in accordance with EN 55011 para. 7.7.3 and Table 4
16	EN 50155:2007 / EN 50121-3-2:2015 / EN 61000-4-2	Electrostatic Discharge Immunity , EN 50155 para. 5.4; EN 50121-3-2 Table 6 +/- 6kV Contact Discharge Test n accordance with EN 61000-4.2 para. 8.3.2 and Table 1 Note: Air Discharge method is not applicable since the EUT chassis and connector have no non-conductive accessible parts.
17	EN 50155:2007 / EN 50121-3-2:2015 / EN 61000-4-3	Radiated Electromagnetic Field Immunity , EN 50155 para. 5.5; EN 50121-3-2 Table 6 80MHz to 800MHz @ 20V/m; 800MHz to 1GHz @ 20V/m; 1.4GHz to 2GHz @ 10V/m; 2GHz to 2.7GHz @ 5V/m; 5.1GHz to 6GHz @ 3V/m Test in accordance with EN 61000-4-3 para. 8 and Table 1
18	EN 50155:2007 / EN 50121-3-2:2015 / EN 61000-4-4	Fast Transient/Burst Immunity , (Power & I/O), EN 50155 para. 5.4; EN 50121-3-2 Table 5 +/-2kV, 5kHz Rep. Freq. Test in accordance with EN 61000-4-4, para. 8 and Table 1
19	EN 50155:2007 / EN 50121-3-2:2015 / EN 61000-4-5	Surge Immunity , (DC Ports), EN 50155 para. 5.4; EN 50121-3-2 Table 4 +/-2 kV, 42 Ohms, 0.5 µF (L-G); +/-1 kV, 42 Ohms, 0.5 µF (L-L) Test in accordance with EN 61000-4-5, para. 8 and Table A.1
20	EN 50155:2007 / EN 50121-3-2:2015 / EN 61000-4-6	Conducted RF Immunity , (Power & I/O), EN 50155 para. 5.5; EN 50121-4-6 Table 5 150kHz to 80MHz @ 10Vrms (80% AM, 1kHz) Test in accordance with EN 61000-4-6 para. 8 and Table 1
21	EN 50155:2007	Supply Overvoltage , EN 50155 para. 12.2.6 1.4 U _n , d = 0.1 s, D = 1.0 s, R = 1 Ω, 5 applications Test in accordance with EN 50155 Figure 2
22	EN 61000-4-8:2010	Magnetic Field Immunity , EN 61000-4-8 Table 1, Level 4 30 A/m @ 50 Hz Test in accordance with EN 61000-4-8
23	AREMA Part 11.5.1 (2009)	EMI , Class I, para. D6, 50kHz to 88MHz @ 150uV/m 88MHz to 216MHz @ 250uV/m 216MHz to 1GHz @ 350uV/m