

GMA 34X Environmental Qualification Form

Nomenclature:

Garmin GMA 342 Audio Panel

Garmin GMA 345 Audio Panel

Type/Model/Part Number:

Garmin GMA 342 GPN 010-01319-1() (Includes 011-03520-1())

Garmin GMA 345 GPN 010-01319-0() (Includes 011-03520-0())

Garmin GMA 345 GPN 010-01319-2() (Includes 011-03520-2())

TSO Number:

TSO-C139a

See Installation Manual 190-01878-02 for any additional TSO or PMA authorizations.

Manufacturer's Specification and/or Other Applicable Specification:

004-00688-00

Manufacturer:

Garmin Ltd. or its subsidiaries

Address:

Garmin International Inc.
1200 East 151st Street
Olathe KS 66062
U.S.A

Date Tested:

August 2016 - December 2016

RTCA DO-160F Conditions	DO-160F Section	Description of Conducted Tests
Temperature and Altitude	4.0	Equipment tested to Category A1F1
In-Flight Loss of Cooling	4.5.5	Cooling Air Is Not Required
Temperature Variation	5.0	Equipment tested to Category C
Humidity	6.0	Equipment tested to Category A
Operational Shocks & Crash Safety	7.0	Equipment tested to Category B
Test Procedure 2 (Sustained)	7.3.3	Equipment tested to Aircraft Type 4, Test Type R
Vibration	8.0	Equipment tested to Category S, Test Curve M and Test Curve B (See Note 2, 4, 5, 6)
Explosive Atmosphere	9.0	Equipment tested to Category X, no test performed
Waterproofness	10.0	Equipment tested to Category X, no test performed
Fluids Susceptibility	11.0	Equipment tested to Category X, no test performed
Sand and Dust	12.0	Equipment tested to Category X, no test performed

RTCA DO-160F Conditions	DO-160F Section	Description of Conducted Tests
Fungus Resistance	13.0	Equipment tested to Category X, no test performed
Salt Fog	14.0	Equipment tested to Category X, no test performed
Magnetic Effect	15.0	Equipment tested to Category Z
Power Input	16.0	Equipment tested to Category BXX (See Note 7)
Voltage Spike	17.0	Equipment tested to Category A
Audio Frequency Conducted Susceptibility - Power Inputs	18.0	Equipment tested to Categories B
Induced Signal Susceptibility	19.0	Equipment tested to Categories AC
Radio Frequency Susceptibility(Radiated and Conducted)	20.0	Equipment tested to Category TT (See Note 1)
Emission of Radio Frequency Energy	21.0	Equipment tested to Category B
Lightning Induced Transient Susceptibility	22.0	Equipment tested to Category XXXXX, no test performed. (See Note 1, 3)
Lightning Direct Effects	23.0	Equipment tested to Category X, no test performed
Icing	24.0	Equipment tested to Category X, no test performed
Electrostatics Discharge (ESD)	25.0	Equipment tested to Category A
Fire, Flammability	26.0	Equipment tested to Category X, no test performed

Table 1

Notes and Remarks:

See Garmin Report 005-00329-06 *Supplemental Qualification Summary* for substantiating data.

1. Qualification to additional levels and configurations are shown in Garmin Report 005-00329-06 *Supplemental Qualification Summary*.
2. Vibration Test Curve M was increased as follows: 0.1 inches pk-pk double amplitude from 15Hz to 17Hz and 1.5g pk from 17Hz to 55Hz.
3. Aircraft Power input pins and hardware failsafe path tested to level A2XXX.
4. GMA 342 resonant frequency changes are noted below, per RTCA DO-160F 8.5.2.c Random Test Procedure Standard Vibration – Category S, Curve B

Axis	Sine Sweep Before Random Frequency (Hz)	Sine Sweep Before Random Acceleration (g)	Sine Sweep After Random Frequency (Hz)	Sine Sweep After Random Acceleration (g)
X	305.7	3.41	313.8	3.70
X	496.5	1.16	496.5	1.47
X	530.5	0.93	530.5	1.38
X	752.3	1.10	761.0	0.89
X	820.3	1.23	817.9	1.06
X	934.1	1.20	936.8	1.06
X	1051.4	1.08	1045.4	0.74
Y	218.7	2.01	219.4	2.34
Y	345.1	1.77	362.5	1.99

Axis	Sine Sweep Before Random Frequency (Hz)	Sine Sweep Before Random Acceleration (g)	Sine Sweep After Random Frequency (Hz)	Sine Sweep After Random Acceleration (g)
Y	514.0	2.55	508.1	1.89
Y	585.2	1.16	580.2	1.44
Z	152.9	4.58	125.0	6.62
Z	207.1	1.18	207.7	0.91
Z	264.6	1.87	266.2	1.42
Z	387.3	1.85	353.2	1.10
Z	524.4	0.88	524.4	2.03
Z	605.9	1.58	585.2	0.54
Z	640.0	1.61	636.3	1.86
Z	653.1	1.21	658.7	0.91
Z	745.8	2.16	701.9	1.50
Z	806.2	1.90	797.0	0.30

Table 2

5. GMA 345 resonant frequency changes are noted below, per RTCA DO-160F 8.5.1 Sinusoidal Test Procedure Standard Vibration – Category S, Curve M

Axis	First Sine Sweep Frequency (Hz)	First Sine Sweep Acceleration (g)	Last Sine Sweep Frequency (Hz)	Last Sine Sweep Acceleration (g)
X	382.5	3.35	359.2	3.14
Y	None	None	None	None
Z	112.3	6.01	107.9	6.02
Z	373.8	8.38	383.6	7.36

Table 3

6. GMA 345 resonant frequency changes are noted below, per RTCA DO-160F 8.5.2.c Random Test Procedure Standard Vibration – Category S, Curve B

Axis	Sine Sweep Before Random Frequency (Hz)	Sine Sweep Before Random Acceleration (g)	Sine Sweep After Random Frequency (Hz)	Sine Sweep After Random Acceleration (g)
X	377.4	2.69	379.6	2.25
X	706.0	1.68	718.3	1.09
X	1001.1	1.01	998.2	0.59
Y	223.2	1.21	220.6	1.39
Y	250.5	1.12	242.0	0.89
Y	357.3	1.97	346.1	2.07
Y	532.1	0.91	530.5	1.28
Y	629.0	1.99	643.7	1.85
Z	282.0	1.35	276.3	0.95
Z	396.4	2.56	390.7	2.89

Table 4

7. While operating below 11 Volts the Speaker output of the GMA 342 and the Speaker output and USB Jack of the GMA 345 are disabled.