

TEST REPORT

Environmental Testing

EN 60068-2-6:2008

Test Fc: "Vibration (sinusoidal)"

Report reference no: U2243-23a-18

Simulation carried out by: B. Belegu

Approved by management: D. Vonarburg, Technical Manager

Date of issue: 28 May 2018

Number of pages: 7 pages

Testing laboratory: QUINEL AG

Address: Elsihof 3, CH-6035 Perlen

Testing location: QUINEL Bern



STS 0037

S Schweizerischer Prüfstellendienst
T Service Suisse d'essai
S Servizio di prova in Svizzera
S Swiss testing service

Applicant's name: Toradex AG, Mr Diego Petracca

Address: Altsagenstrasse 5, CH-6048 Horw

Manufacturer: Toradex AG

Address: Altsagenstrasse 5, CH-6048 Horw

Test Report Form originator: QUINEL (Copyright reserved to QUINEL)

Test specimen description: Computer Modules and Carrier Boards

Trademark: Toradex AG

Model and/or type reference:

- Apalis TK1 2GB mounted on Ixora with the Apalis Heatsink
- Colibri T30 1GB IT mounted on Viola Plus with screws
- Colibri T30 1GB IT mounted on Iris with Colibri Fasteners
- Colibri iMX6ULL 512MB WB IT mounted on Viola Plus with screws
- Colibri iMX6DL 512MB IT mounted on Iris with no additional fastening
- Colibri iMX6DL 512MB IT mounted on Iris with Colibri Fasteners
- Colibri iMX7D 512MB mounted on Viola Plus with screws
- Apalis iMX6Q 1GB mounted on Ixora with the Apalis Heatsink
- Apalis iMX6D 1GB IT mounted on Ixora with screws
- Apalis iMX8QM 4GB WB mounted on Ixora with screws

Rating: 12V/5VDC

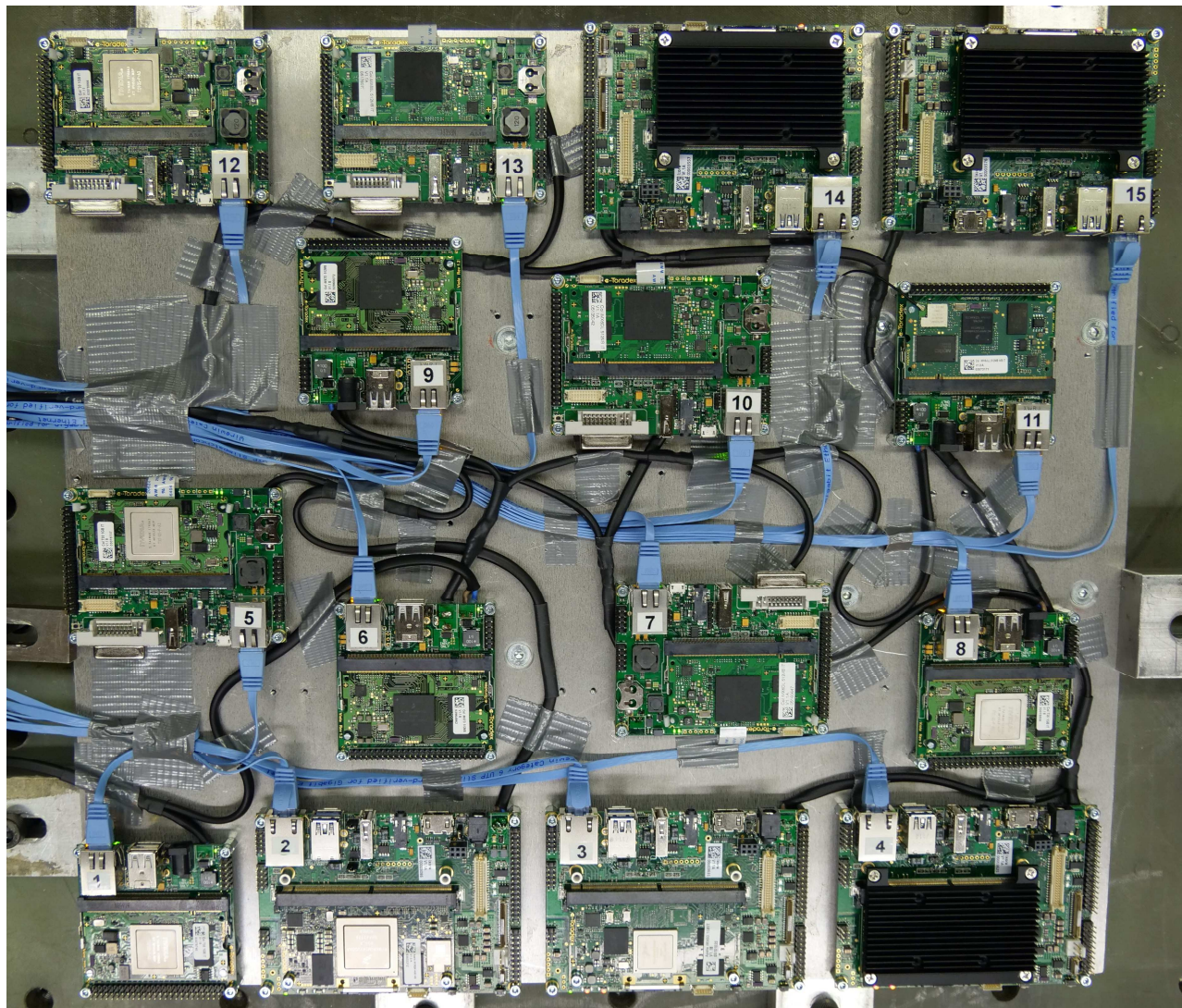
Number of tested specimens: 15 specimens

Date of receipt of the test specimen(s): 16 May 2018

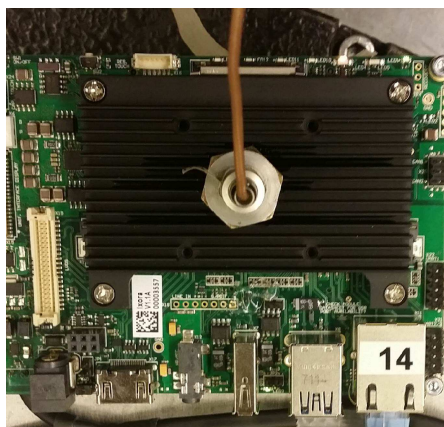
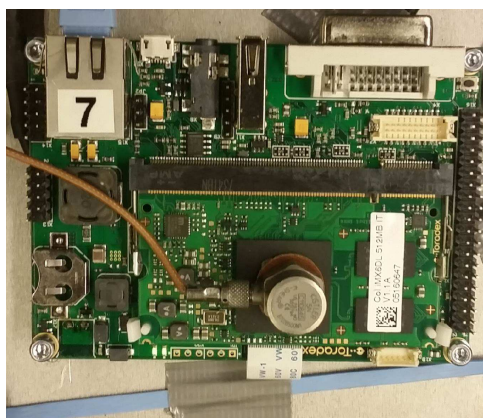
Test specification:	
Standards:	EN 60068-2-6:2008
Test purpose:	Type testing for Swiss and EU legal requirements
Procedure deviation:	none
Specimen:	unpacked
Frequency range:	10Hz.....300Hz
Vibration amplitude: (displacement or/and acceleration)	(10-20)Hz constant amplitude, (20-300)Hz constant acceleration 39m/s ²
Endurance procedure:	at resonance frequency 206.89 Hz (Colibri) and 231 Hz (Apalis)
Specimen is operating:	yes
Duration of endurance:	10 Minutes / resonance frequency
Sweep rate (exponential):	1 octave per min.
Axes of vibration:	in all 3 main axes
Single or multiple control:	single
Choice of control points:	see photograph
Vibration response investigation:	none
Test procedure and measurements:	
Date of testing:	24 May 2018
Details of mounting or supports:	see photographs
Initial test: - visual inspection: - mechanical and electrical measurements:	Passed All the DUTs have been tested by the customer with the default functional testing (FCT): no issues detected.
Intermediate measurements:	While the DUTs are exposed to vibrations the devices execute software to detect discontinuities in the edge connector or failures on the module and carrier boards. This is achieved by detecting GPIOs interrupts, network issues, UART communication loopback problems.
Final test: - visual inspection: - comparison initial/final tests:	Passed Several investigations have been carried by the customer to identify effects of the test on the module - carrier board interface: no issues detected. Computer modules have been tested with the default functional testing (FCT): no issues detected.
Relevant specifications to be met during/after the test (acceptance criteria):	
The module – carrier board interface is not affected at all from the vibration test. The computer modules have no damage and worked correctly during and after the test (verified by visual inspection and default functional testing FCT).	
Conclusion:	Test Passed

Used test equipment:

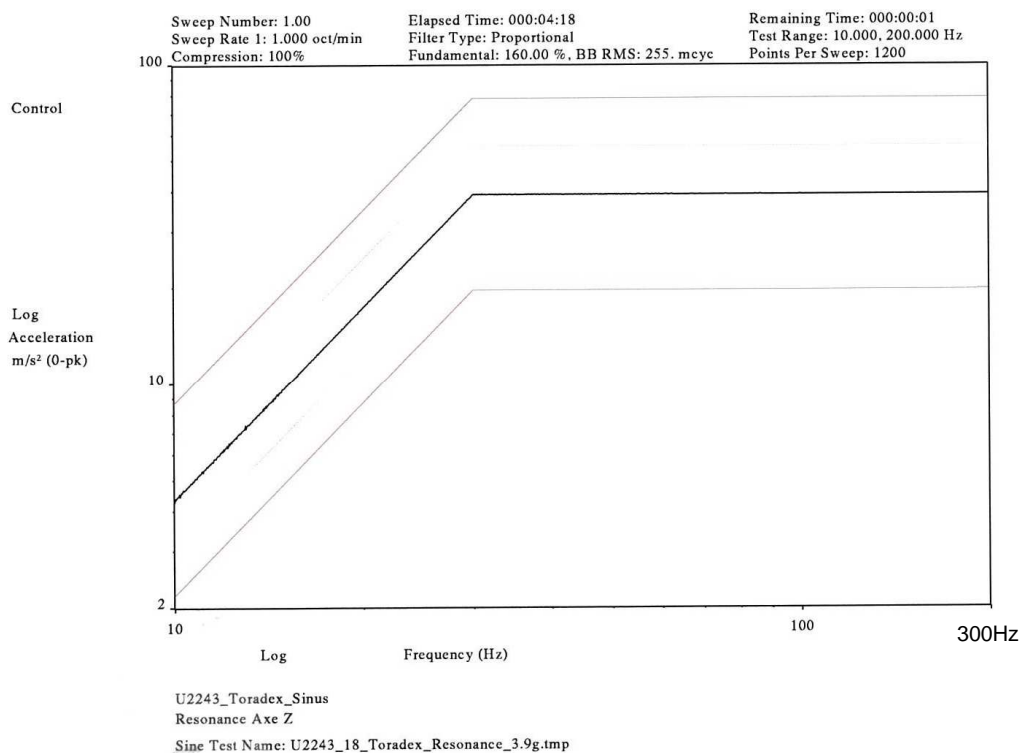
Test equipment	Manufacturer / Type	QUINEL Inventory No.	Calibration	
			last	next
Vibrator	RMS SW 8100	903682/00	Oct 16	Oct 18
Acceleration meter	Kistler 8702B500M1 and 5134	C110844	Sep 16	Sep 18

Photograph of the tested item:**General Remarks:**

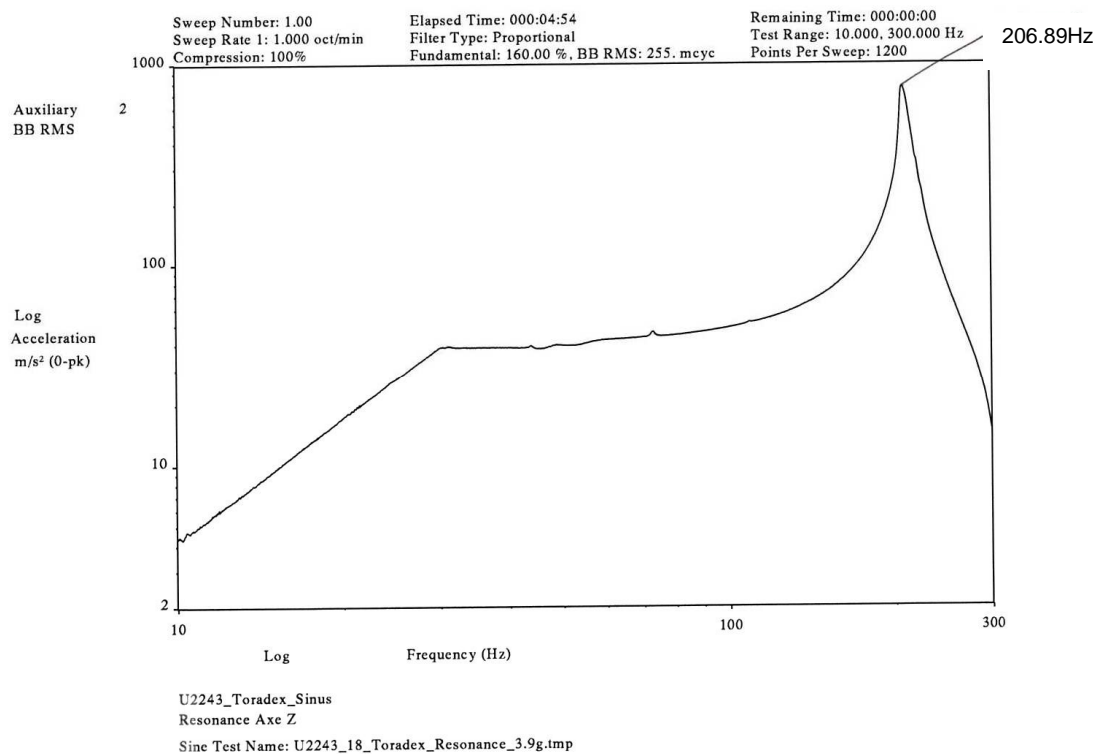
The test results presented in this test report relate only to the tested objects.
This test report shall not be reproduced except in full.
We returned the test item together with the test report to the applicant.

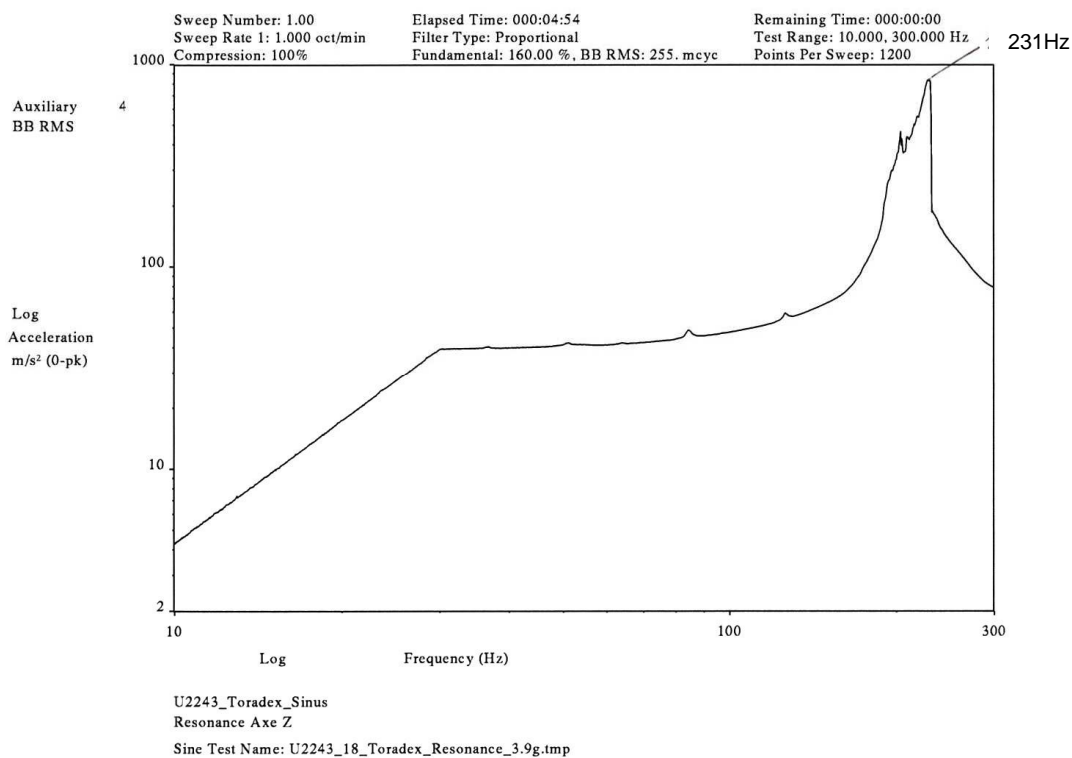
Photographs:**Resonance point at module 14: $f=231\text{Hz}$** **Resonance point at DUT No. 6: $f=206.89\text{Hz}$** **Resonance point at DUT No. 7: $f=206.89\text{Hz}$** 

Reference

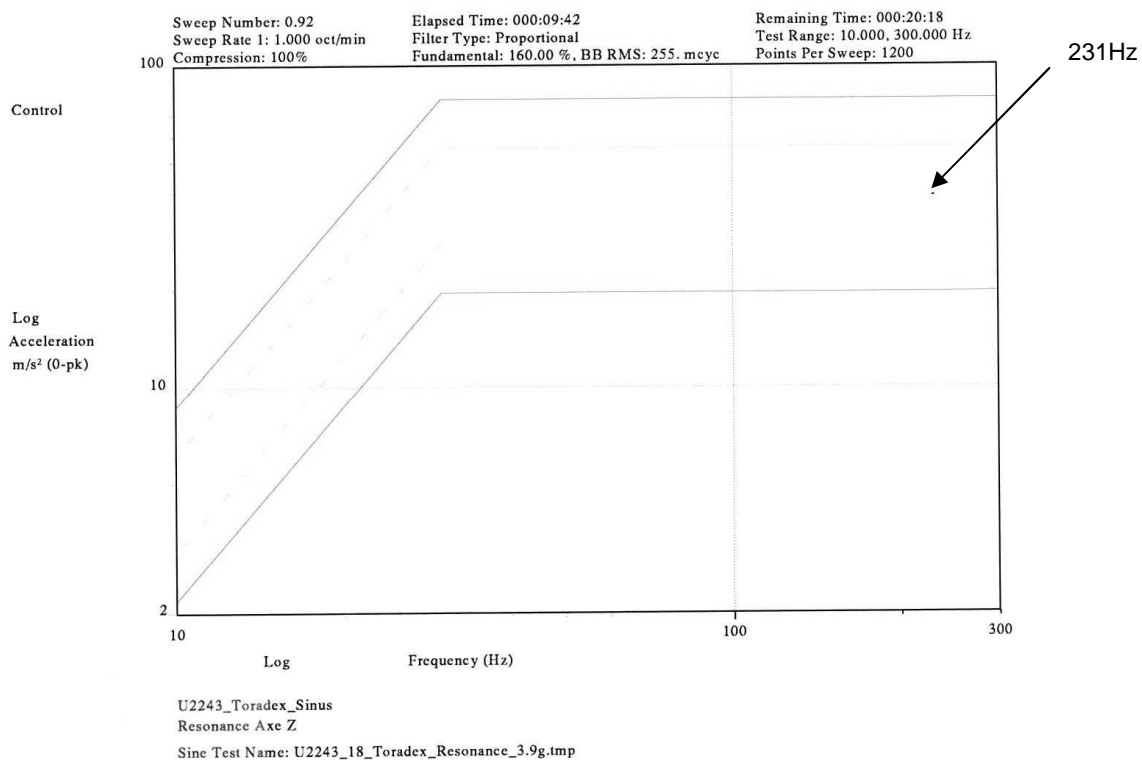


Test





Vibration at resonance frequency 231Hz



Vibration at resonance frequency 206Hz

