QUINEL
QUALITY IN ELECTRONICS

TEST REPORT

Environmental Testing
EN 60068-2-27:2009
Test Ea: "mechanical Shock"

Report reference no:	**U2243-26a-18**
Simulation carried out by:	B. Belegu
Approved by management:	D. Vonarburg, Technical Manager
Date of issue:	28 May 2018
Number of pages:	5 pages
Testing laboratory:	**QUINEL AG**
Address:	Elsihof 3, CH-6035 Perlen
Testing location:	QUINEL Perlen
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

STS 0037

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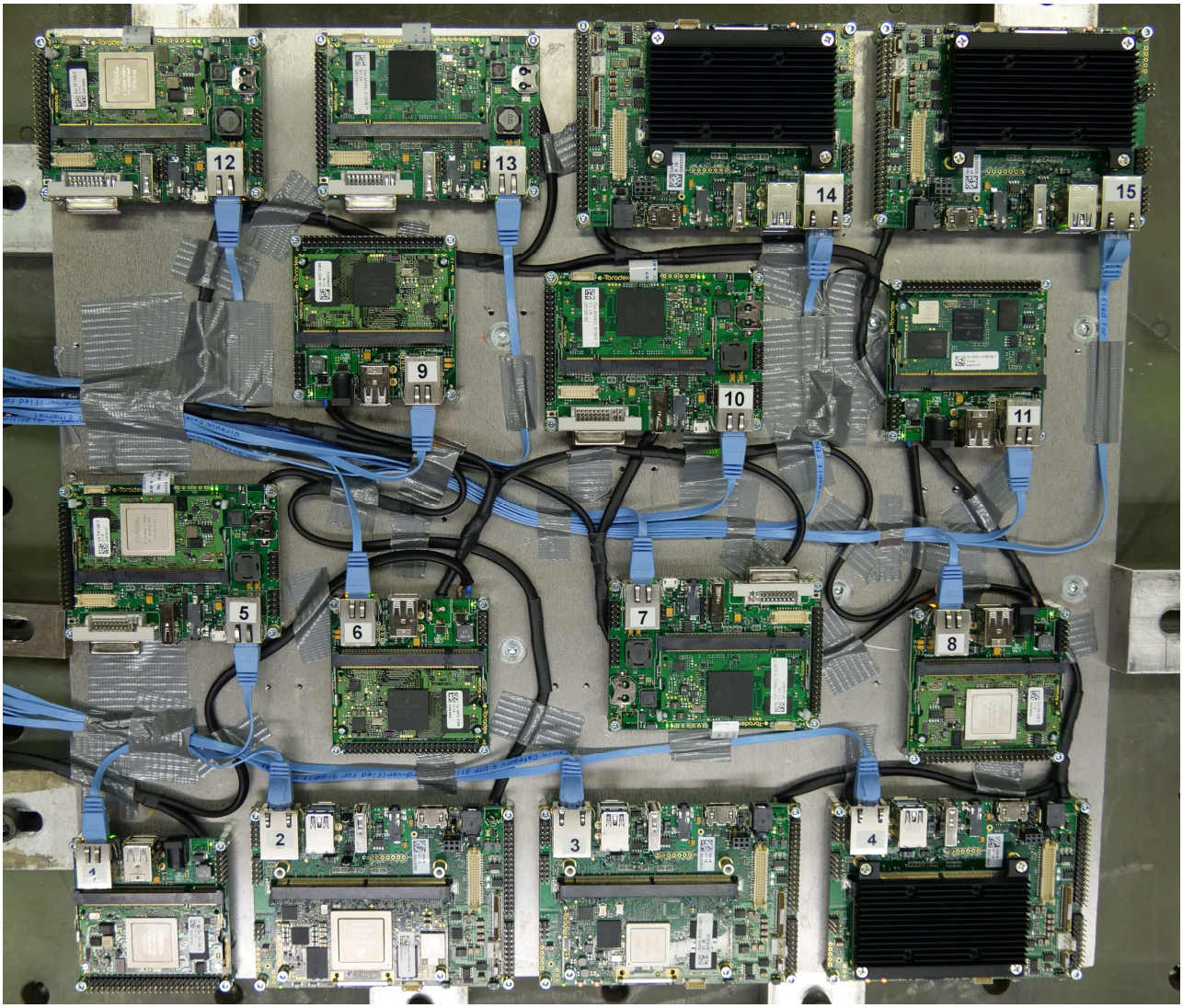
Swiss testing service

Test specification:	
Standards:	EN 60068-2-27:2009
Test purpose:	Type testing for Swiss and EU legal requirements
Procedure deviation:	none
Pulse shape and tolerances:	half sine
Number and direction of shocks:	200 shocks in each direction of the 3 mutually perpendicular axes (total 1200 shocks)
Severity: peak acceleration and duration of nominal pulse:	$500ms^{-2}$ (50g) 20ms
Specimen is operating:	no
Specimen:	unpacked
Pre-conditioning procedure:	Temperature stabilised at ambient temperature during 2h
Recovery procedure: (before the final measurements)	none
Test procedure and measurements:	
Date of testing:	25 May 2018
Details of mounting or supports: (see also IEC 60068-2-47)	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:	None
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	Calibration next
Shock machine	AVCO USA SM 110, ED0023	23734	Oct. 16	Oct. 18
Acceleration meter	EE LTD. EE1009, A0221	500163	Jun 16	Jun 18
Voltmeter	Brüel + Kjaer Type 2425	316320	Nov 17	Nov 18
Amplifier	Brüel + Kjaer Type 2626	316319	Nov 17	Nov 18
Oscilloscope	Philips PM3335	327776	Feb 16	Feb 18

Photograph of the tested item:

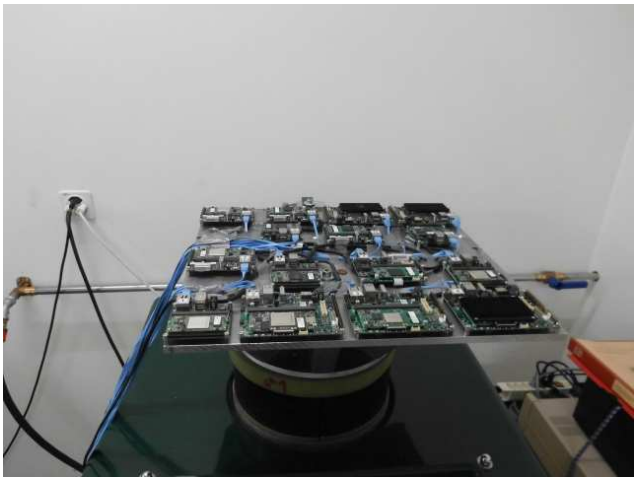


General Remarks:
The test results presented in this test report relate only to the tested objects.
This test report shall not be reproduced except in full.
We returned the test item together with the test report to the applicant.

Photographs:

Shock axes:

Axis 1:

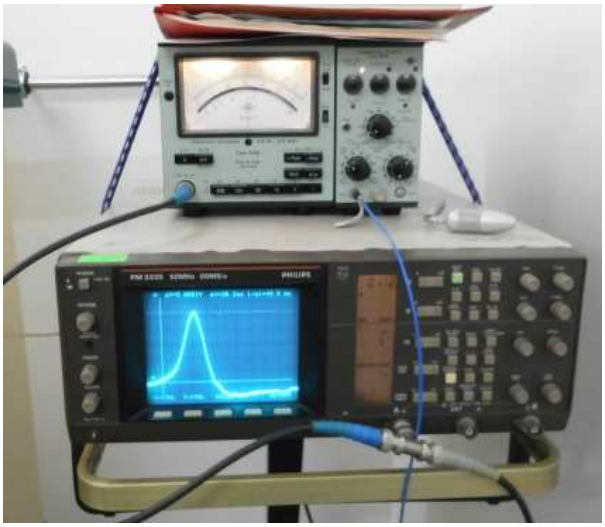


Axis 2:

Axis 3:

Diagrams:

Reference 50g, 20ms



Test arrangement:

Shock diagram: 50g/20ms, 100mV/div, Sensor=10mV/g, 5Div=ΔV=50g

Shock level=50g, skala (0-100)g, (0-1)V, 1V=100g, 0.5V =50g, Sensor Sens.=10mV/g