TP-TR50-6576

TEST PROTOCOL

Vibration and Shock Tests on one Computer System KISS 1U PCI 960

Ottobrunn, 09.05.2008

Points of Contact:

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PROJECT / CONTRACT INFORMATION

CUSTOMER:	Kontron Embedded Computers GmbH Oscar-von-Miller-Str. 1 85386 Eching
IABG ORDER NO.:	353 5911 180
TEST PERIOD:	08.05.2008
TEST ARTICLE:	Computer System KISS 1U PCI 960
TYPE OF TEST:	Vibration and Shock
TEST FACILITY:	50 kN Vibration System
TEST PROCEDURE:	IEC / EN 60068
PRESENT:	CUSTOMER: Mr. Hensel Mr. Durisch IABG: Mr. Alonso

	Name	Signature	Date
Author	E. Alonso		09.05.2008
Released	R. Baumgartl		9.5.08

RESULT

The specified vibration and shock levels have been verified in the three axes X, Y and Z of the test object.

The results of the acceleration measurements are shown on the attached plots.
After test completion no mechanical damages have been detected at the test item.

Results of the functional checks performed by customer's personnel are reported separately

TEST CONDITIONS / GENERAL INFORMATION

The vibration tests and the shocks specified below have to be applied along each of the three orthogonal axes X, Y and Z of the specimen.

The test parameters are:

- Vibration (operating)

Frequency:		10 - 500 Hz
Level:	10 Hz	0.1 g
	58 Hz	± 0.075 mm
	500 Hz	1 g
	Sweep rate:	1.0 oct/min
	Duration:	45 min (8 sweeps) per axis

- Vibration (non operating)

Frequency:		10 - 500 Hz
Level:	10 Hz	0.1 g
	57.5 Hz	± 0.15 mm
	500 Hz	2 g
	Sweep rate:	1.0 oct/min
	Duration:	23 min (4 sweeps) per axis

- Shock (operating) in z-axis only

Shape:	half-sine
Acceleration:	5 g
Duration:	11 ms
Number of shocks:	100 per direction (total 200 shocks)

- Shock (non operating)

Shape:	half-sine
Acceleration:	30 g
Duration:	11 ms
Number of shocks:	3 per direction (total 18 shocks)

During the test runs the control signal in the corresponding excitation direction shall be measured and recorded.

TEST PERFORMANCE

For the vibration and shock tests the test item was fixed via girders and threaded rods directly to the shaker and slip table, in correspondence to the desired excitation direction.

The vibration and the shock levels were applied as specified along each of the three orthogonal axes Z, X and Y of the test object. In order to verify the specified input the shaker was controlled by the signal of two pilot accelerometers which were attached in excitation direction to the shaker table. During shock only one of the pilot signals was taken as the reference.

The measurement accelerometers MP1 (PCI 960), MP2 (HD 3.5” frame) and MP3 (Chassis backside) were fixed in the KISS 1U in the corresponding excitation axis (see pictures on the pages 8-9).

For the test run 11z a 3.5” HD was installed instead of two 2.5” HDs (see picture on page 9).

The test sequence and all test parameters are listed in the table on the page 6.

Pictures of the test set-ups are shown on pages 7 - 9.

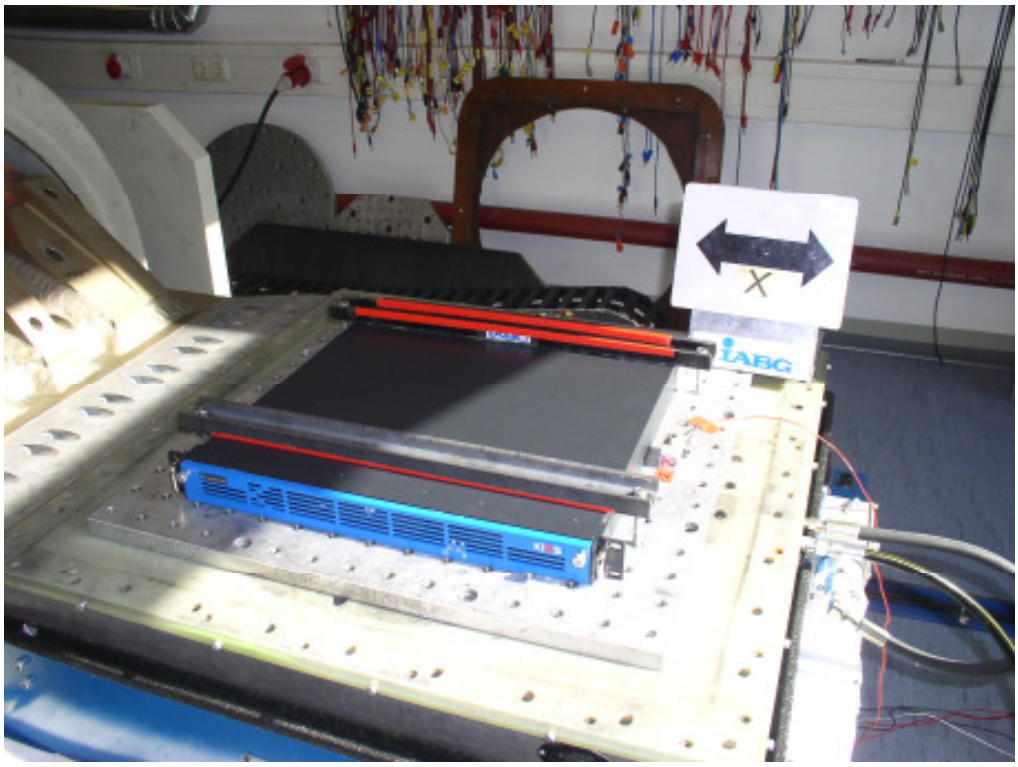
Equipment used for Testing and Measurement

EQUIPMENT	MANUFACTURER	TYPE	MAINTENANCE / CALIBRATION LAST	NEXT
Shaker	Ling EL	L 540	11.2007	11.2008
Power Amplifier	Ling EL	DMA 12	11.2007	11.2008
Control System	M&P	Vib Runner	01.2008	01.2009
Accelerometer	Endevco	7251-10	02.2008	02.2009
Scale Amplifier	IABG	MV 100	01.2008	01.2009

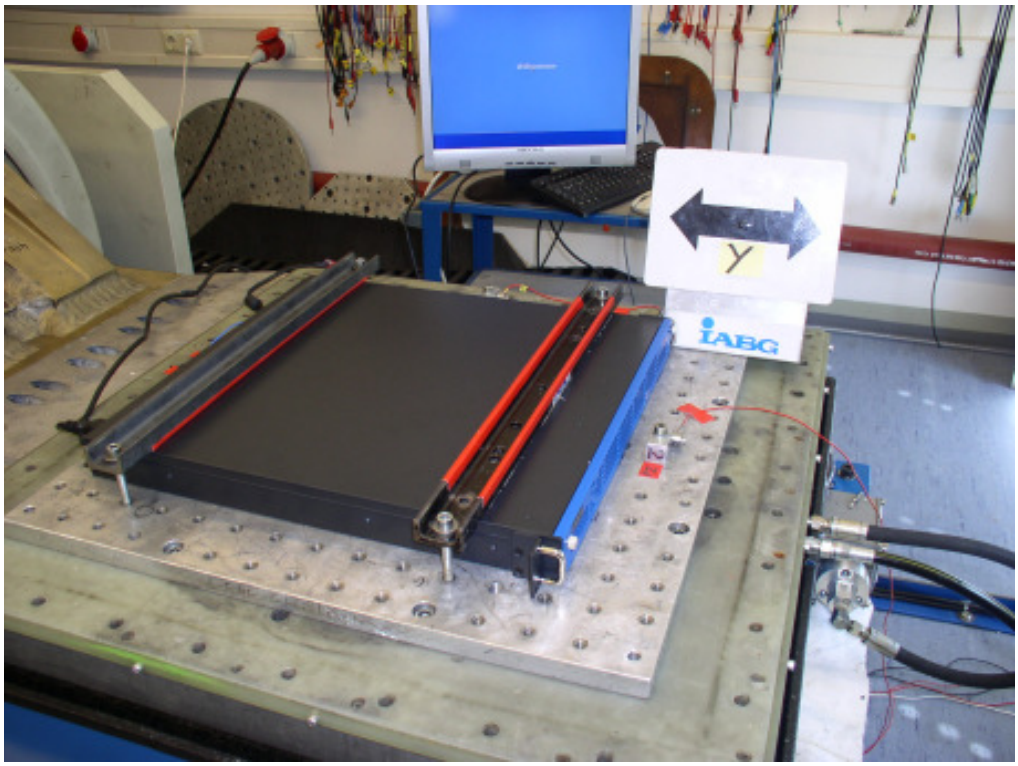
PERFORMED TEST RUNS

RUN NO:	CONTROL METHOD	SWEEP RATE / TIME	FREQUENCY [Hz]	INPUT LEVEL	REMARKS
1x	Maximum Pilot 1 and 2	1 oct/min (8 sweeps) 45 min	10 58 500	0,1 g ± 0.075 mm 1 g	**Sine Vibration** operating mode
2x	Maximum Pilot 1 and 2	1 oct/min (4 sweeps) 23 min	10 57.5 500	0,1 g ± 0.15 mm 2 g	**Sine Vibration** non operating mode
3x	Pilot x	Half-sine 3 shocks in positive direction 3 shocks in negative direction	30 g;	11 ms	**Shock** non operating mode
4y	Maximum Pilot 1 and 2	1 oct/min (8 sweeps) 45 min	10 58 500	0,1 g ± 0.075 mm 1 g	**Sine Vibration** operating mode
5y	Maximum Pilot 1 and 2	1 oct/min (4 sweeps) 23 min	10 57.5 500	0,1 g ± 0.15 mm 2 g	**Sine Vibration** non operating mode
6y	Pilot y	Half-sine 3 shocks in positive direction 3 shocks in negative direction	30 g;	11 ms	**Shock** non operating mode
7z	Maximum Pilot 1 and 2	1 oct/min (8 sweeps) 45 min	10 58 500	0,1 g ± 0.075 mm 1 g	**Sine Vibration** operating mode
8z	Maximum Pilot 1 and 2	1 oct/min (4 sweeps) 23 min	10 57.5 500	0,1 g ± 0.15 mm 2 g	**Sine Vibration** non operating mode
9z	Pilot z	Half-sine 100 shocks in positive direction 100 shocks in negative direction	5 g;	11 ms	**Shock** operating mode
10z	Pilot z	Half-sine 3 shocks in positive direction 3 shocks in negative direction	30 g;	11 ms	**Shock** non operating mode
11z	Maximum Pilot 1 and 2	1 oct/min (8 sweeps) 45 min	10 58 500	0,1 g ± 0.075 mm 1 g	**Sine Vibration** operating mode 3.5” HD instead of 2x 2.5” HD

PICTURES OF THE SET-UP

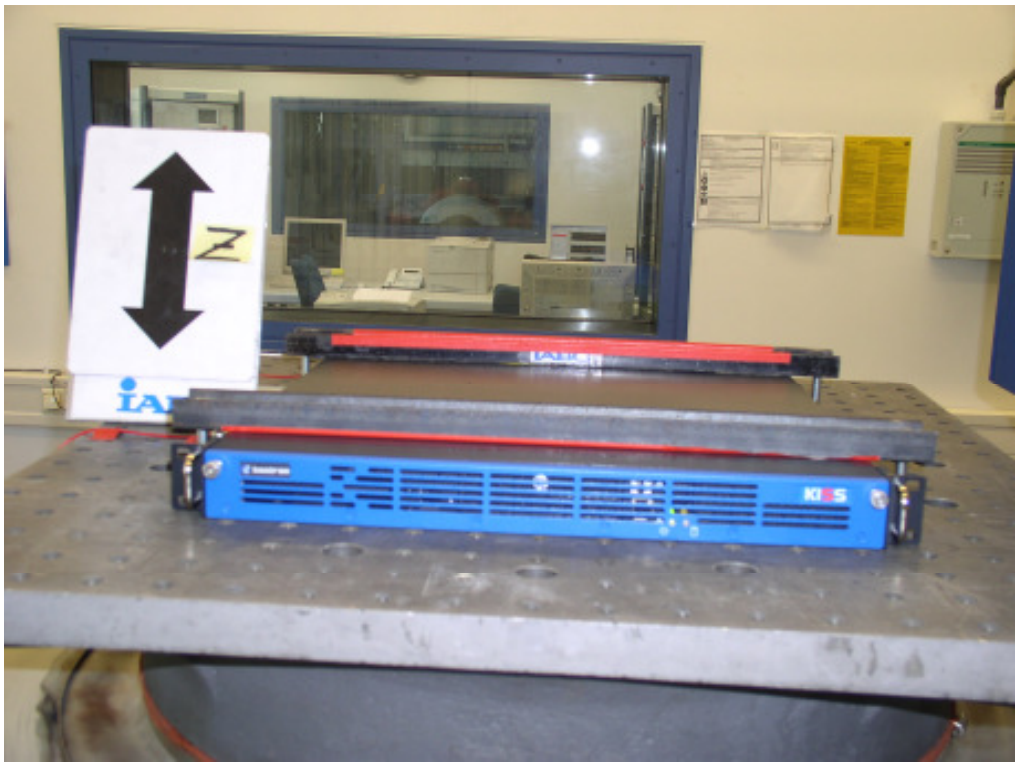


x - axis

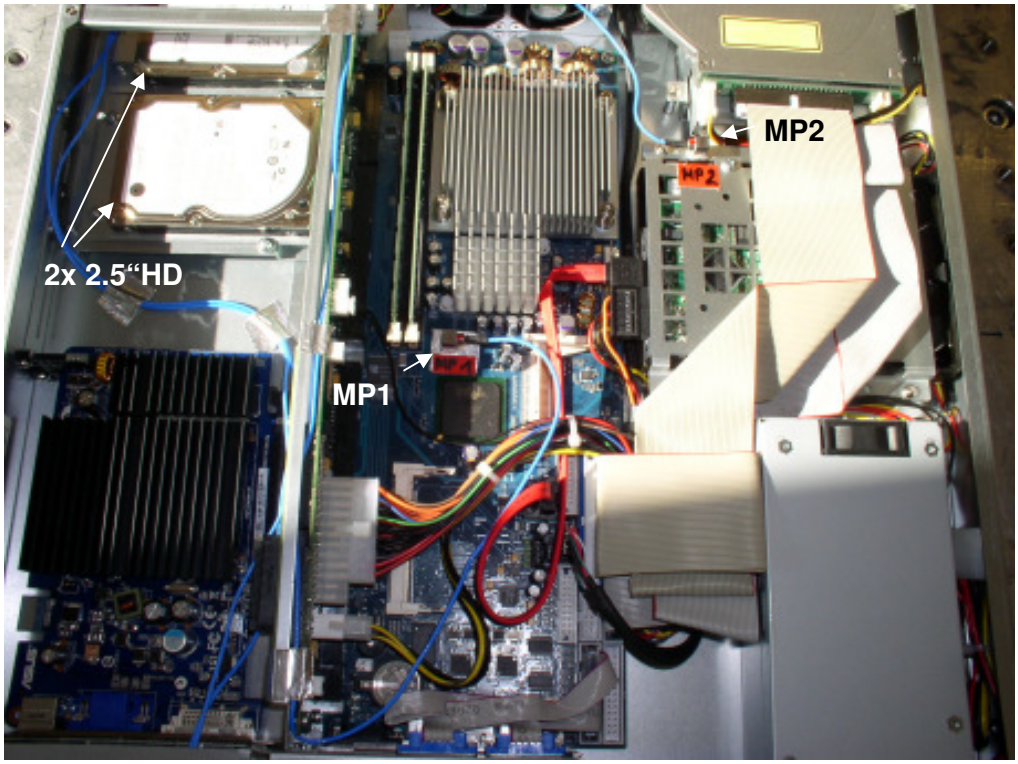


y - axis

PICTURES OF THE SET-UP

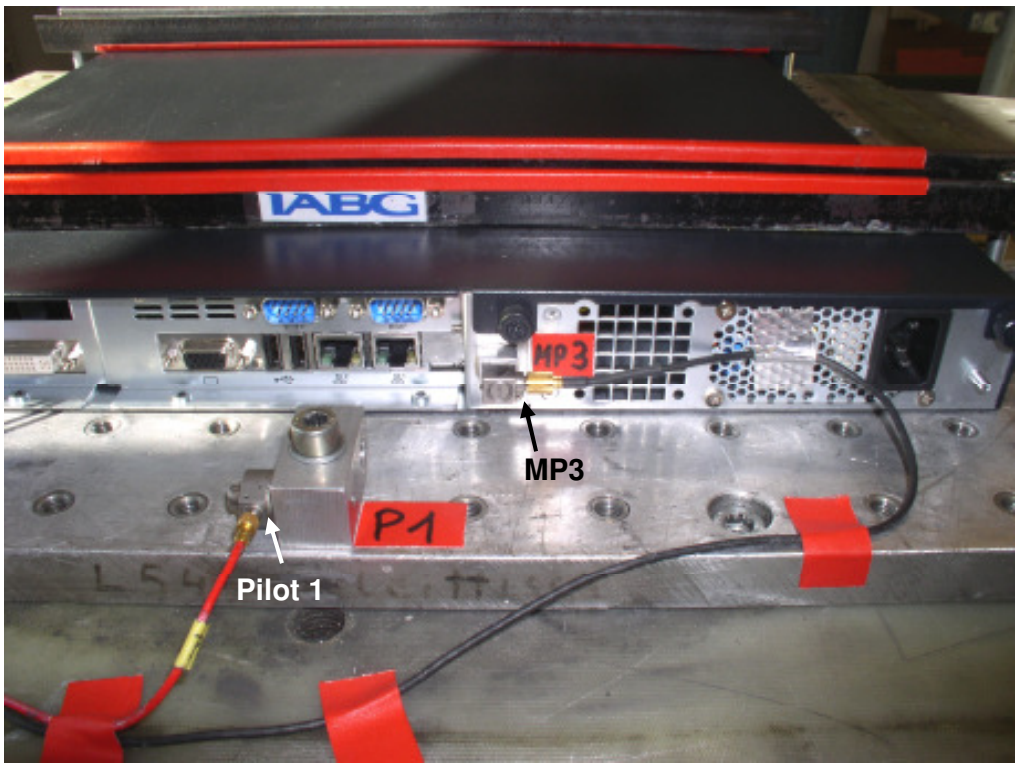


z - axis

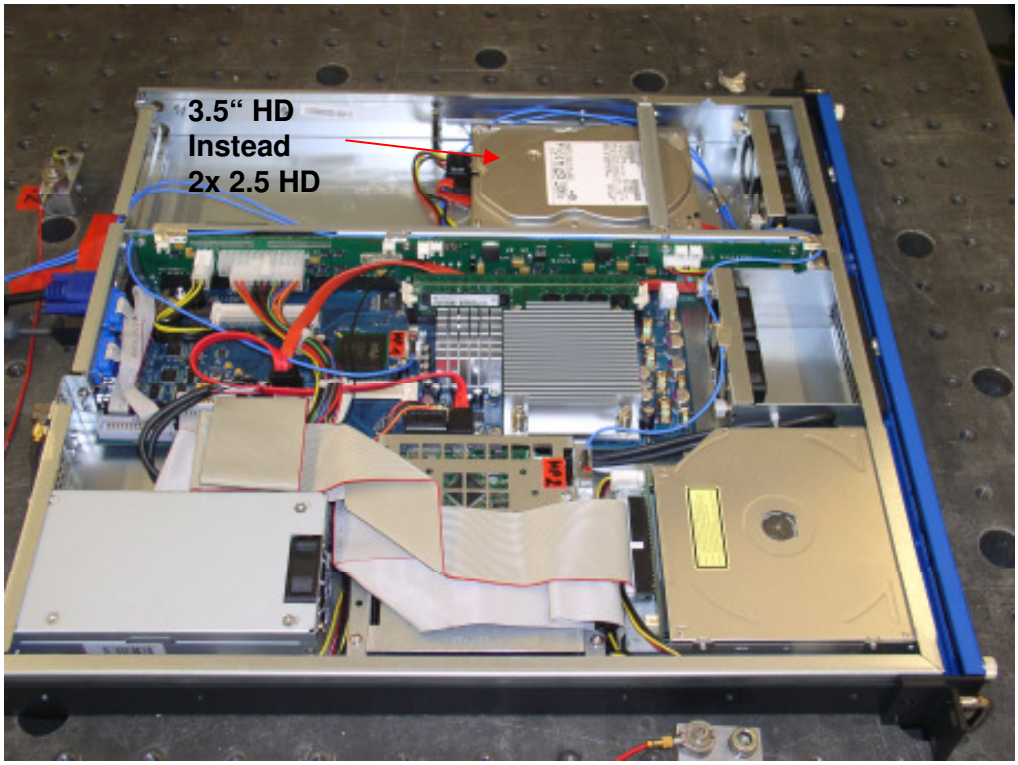


MP1 + 2

PICTURES OF THE SET-UP



MP3 + Pilot 1



Test Run 11z (3.5”HD instead of 2x 2.5”HD)