

Prüfbericht - Nr.: 19617002 001 <i>Test Report No.:</i>		Seite 1 von 24 <i>Page 1 of 24</i>	
Auftraggeber: <i>Client:</i>	Diamond Systems Corporation 158 Commercial Street Sunnyvale CA 94086, USA		
Gegenstand der Prüfung: <i>Test item:</i>	EPS-12000-CM 12-port gigabit Ethernet switch within Sabre enclosure		
Bezeichnung: <i>Identification:</i>	SabreNet 12000	Serien-Nr.: <i>Serial No.:</i>	D885148
Wareneingangs-Nr.: <i>Receipt No.:</i>	1803373721	Eingangsdatum: <i>Date of receipt:</i>	2018.12.04
Prüfart: <i>Testing location:</i>	ENVITEST LABORATORIES PVT LTD No.14-1510, Shamanna Reddy Layout, Garvebhavi Palya, Hosur Road, Bangalore – 560068		
Prüfgrundlage: <i>Test specification:</i>	As per customer specification w.r.t MIL-STD-810G w/Change 1		
Prüfresultat: <i>Test Result:</i>	Refer section " Summary of testing"		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B, 2nd Cross Road, Electronic City Phase-1 Bangalore- 560100		
geprüft/ tested by:	kontrolliert/ reviewed by:		
2018.12.27	Vinayak VH / Engineer	2018.12.27	Basavant Magadum / Asst. Manager
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
			Name/Stellung <i>Name/Position</i>
			Unterschrift <i>Signature</i>
Sonstiges/Other Aspects:			
This report consists of 24 pages including the following attachments: Attachment 1: Photo Document Attachment 2: Functional Check			
Abkürzungen:	P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet	Abbreviations:	P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested
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Environmental Tests

TEST REPORT ENVIRONMENTAL TESTING

Report reference No : 19617002 001

 Tested by
 (printed name and signature)..... : (see cover page)

 Approved by
 (printed name and signature)..... : (see cover page)

Date of issue : (see cover page)

Testing Laboratory Name : TÜV Rheinland (India) Pvt. Ltd.

 Address : 27/B, 2nd Cross Road, Electronic City Phase-1
 Bangalore- 560100

Applicant's Name : Happiest Minds Technologies Private Limited

Address : #53/1,2,3,4, Hosur Main Road, Madivala, Bangalore - 560068

Test specification :

Standard : Refer section " Summary of testing"

Test procedure : QMA 36.201.01

Non-standard test method : N/A

Test Report Form No. : TUVR_ENV_R2

TRF originator : TUVR

Master TRF : 2009.08.20

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Test item description : EPS-12000-CM 12-port gigabit Ethernet switch within Sabre enclosure

Manufacturer : Diamond Systems Corporation

Model and/or type reference : SabreNet 12000

Serial Number : D885148

Rating(s) : 6-34VDC Input, ~10W

Environmental Tests

Copy of marking plate: N/A

General product information:

The EUT under test is "EPS-12000-CM 12-port gigabit Ethernet switch within Sabre enclosure".

Environmental Tests

Summary of testing:

Below is the environmental test performed on EPS-12000-CM 12-port gigabit Ethernet switch within Sabre enclosure.

All the test was conducted as per customer specification w.r.t MIL-STD-810G w/Change 1

1. Composite Wheeled Vehicle Vibration Exposure:- Test was performed in Functional state.

Table 514.7C-V. Category – 4 – Composite wheeled vehicle vibration exposure. (Break points for curves of Figure 514.7C-4.)

Vertical		Transverse		Longitudinal	
Frequency, Hz	ASD, g ² /Hz	Frequency, Hz	ASD, g ² /Hz	Frequency, Hz	ASD, g ² /Hz
5	0.12765	5	0.04070	5	0.01848
6	0.12926	6	0.04415	6	0.02373
7	0.30000	7	0.11000	7	0.05000
8	0.30000	8	0.11000	8	0.05000
9	0.10000	9	0.04250	9	0.02016
12	0.10000	12	0.04250	12	0.02016
14	0.15000	14	0.07400	14	0.05000
16	0.15000	16	0.07400	16	0.05000
19	0.04000	19	0.02000	19	0.01030
90	0.00600	100	0.00074	23	0.01030
125	0.00400	189	0.00130	25	0.00833
190	0.00400	350	0.00400	66	0.00114
211	0.00600	425	0.00400	84	0.00107
440	0.00600	482	0.00210	90	0.00167
500	0.00204	500	0.00142	165	0.00151
				221	0.00333
				455	0.00296
				500	0.00204
rms = 2.24 g		rms = 1.45 g		rms = 1.32 g	

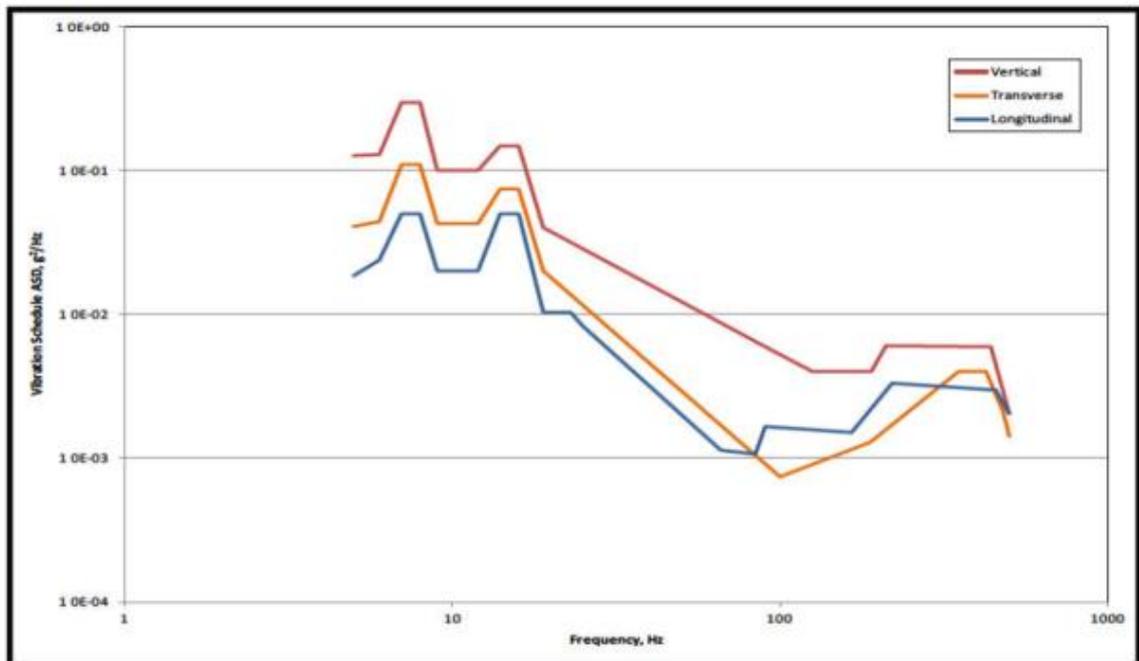


Figure 514.7C-4. – Category 4 – Composite wheeled vehicle vibration exposure.

Environmental Tests

2. Shock Test

- a. Functional Shock Test :- As per customer requirement w.r.t MIL-STD-810G, Method 516.7, Procedure I:
 - i. Test Specification :- 40G 11ms, Waveform:- Terminal Peak Sawtooth, Number of shocks:- 3 (Positive and negative), Total Shocks:- 18
- b. Crash Hazard Shock Test :- As per customer requirement w.r.t MIL-STD-810G, Method 516.7, Procedure V :
 - i. Test Specification :- 75G 6ms, Waveform:- Terminal Peak Sawtooth, Number of shocks:- 2 (Positive and negative), Total Shocks:- 12

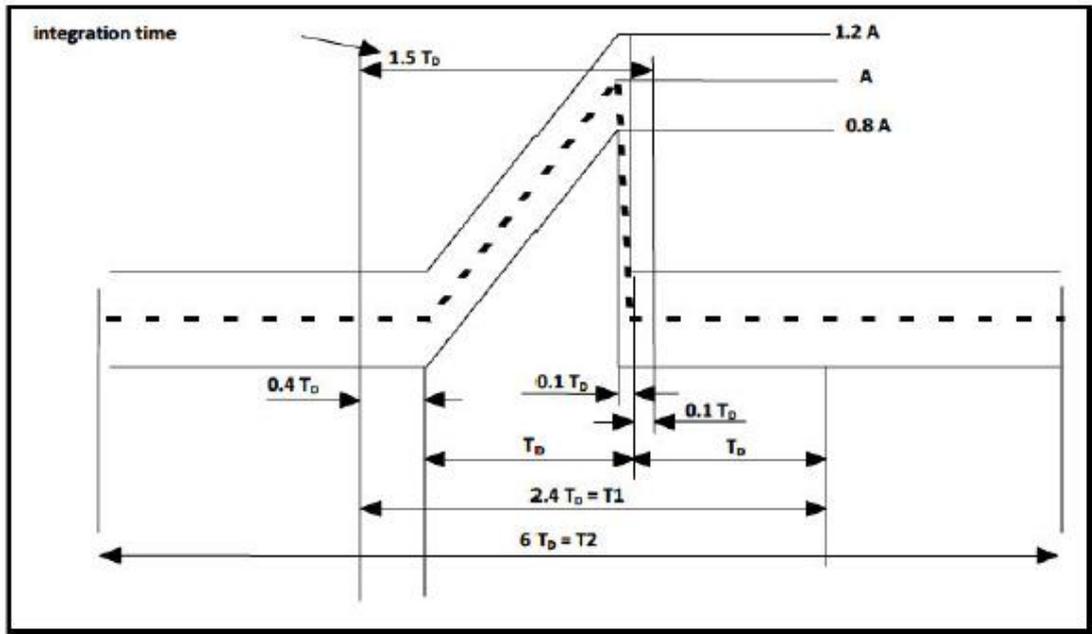


Figure 516.7-10. Terminal peak sawtooth shock pulse configuration and its tolerance limits (for use when shock response spectrum analysis capability is not available in conduct of Procedures I, II, and V).

Table 516.7-IV. Terminal peak sawtooth default test parameters for Procedures I -Functional Test, and Procedure V – Crash Hazard (refer to Figure 516.7-10).

TEST	Minimum Peak Value and Pulse Duration					
	A _m (G-Pk) & T _D (msec)					
	Flight Vehicle Materiel ¹		Weapon Launch ^{1,2} Captive Carry		Ground Materiel ^{1,3}	
Functional Test	20 G	11 ms	30 G	11 ms	40 G	11 ms

Note 1. For materiel that is shock-mounted or weighing more than 136 kg (300 lbs), an 11 ms half-sine pulse of such amplitude that yields an equivalent velocity to the default terminal peak sawtooth may be employed.

Note 2. Launch Shock is considered as a special case of Functional Shock (paragraph 6.1 reference k)

Note 3. For materiel mounted only in trucks and semi-trailers, use a 20G peak value.

TEST	Minimum Peak Value and Pulse Duration			
	A _m (G-Pk) & T _D (msec)			
	Flight Vehicle Materiel ¹		Ground Materiel ¹	
Crash Hazard	40 G	11 ms	75 G	6 ms

Note 1. For materiel that is shock-mounted or weighing more than 136 kg (300 lbs), an 11 ms half-sine pulse of such amplitude that yields an equivalent velocity to the default terminal peak sawtooth may be employed.

Environmental Tests

Functional Checks :- (See attachment -2:- Functional Check)

- a. Composite Wheeled Vehicle Vibration Exposure: - EUT was in Powered ON condition in all three axes and the EUT was functioning fine.
- b. Shock Test:-
 - a. Functional Shock Test: - EUT was in Power ON condition and the EUT was working fine.
 - b. Crash Hazard Shock Test :- EUT was in Power OFF condition and the EUT was working fine after the Crash hazard Test.

Environmental Tests

Particulars: test item vs. Test requirements

Equipment orientation : As per respective Axis
 Operating condition : As mentioned in the "Summary of Testing"
 Dimensions (L x W x H) (inch) : 6.4 x6.4 x 2.6
 Condition of the equipment at the time of receipt : Good

Test case verdicts

Test case does not apply to the test object . : N/A
 Test item does meet the requirement : P(Pass)
 Test item does not meet the requirement : F(Fail)

Testing

Date of receipt of test item : 2018.12.04
 Date(s) of performance of test : 2018.12.04 and 2018.12.05

General remarks

The test result presented in this report relate only to the object(s) tested.
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
 "(See appended table)" refers to a table appended to the report.
 Throughout this report a point is used as the decimal separator.

Test equipment list

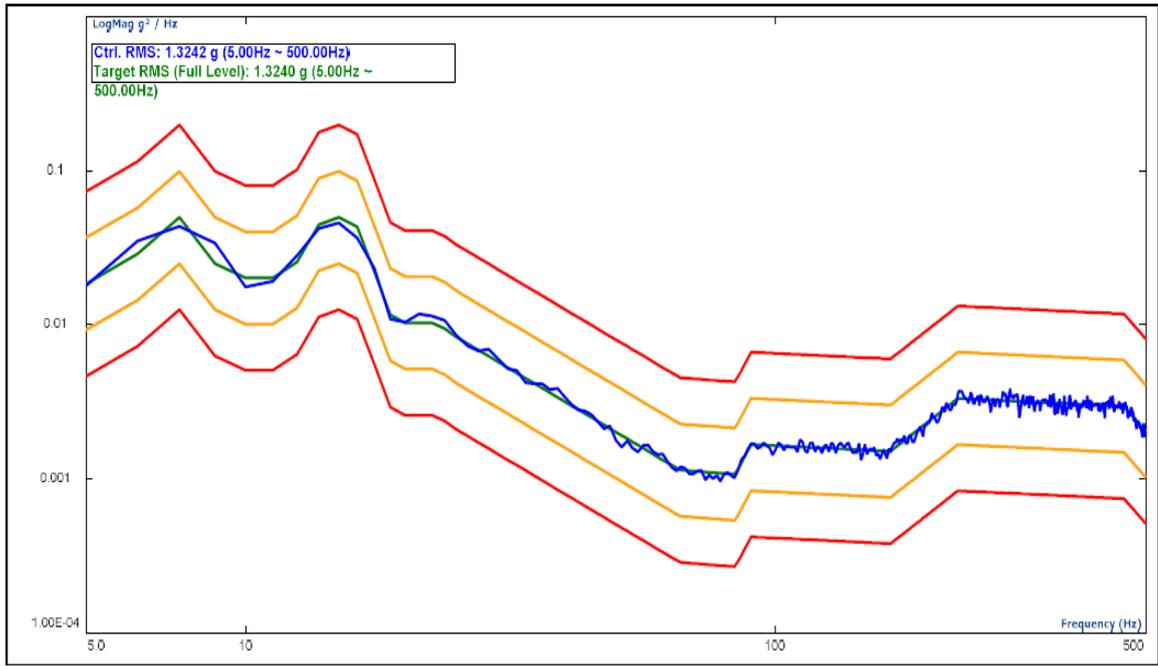
Item	Type	Make / Model	Equipment No. / Sl. No.	Calibration due date
01	Electrodynamic shaker	DESPL / DEV-400	E180301	02/04/2019
02	Vibration Controller	Crystal / Spider-80X	2589408	09/04/2019
03	Accelerometer	Dytran / 3255A1	11669	27/02/2019

Environmental Tests

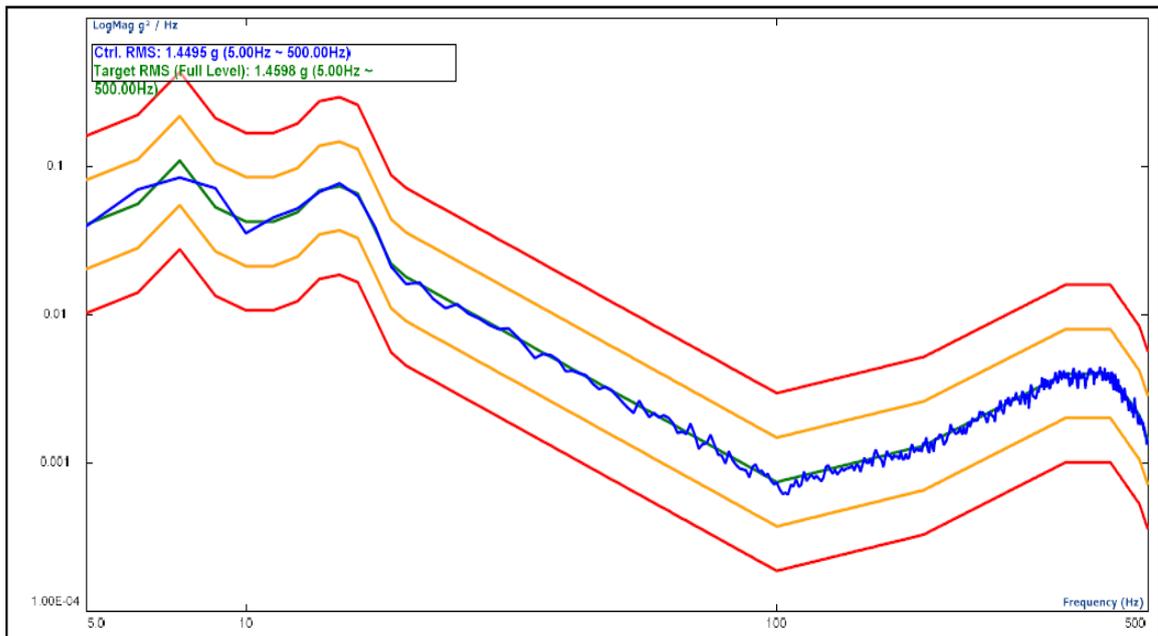
Clause	Requirement + Test	Result - Remark	Verdict
1	Random Vibration Test		P
1.1	Pre-checks		P
	Physical checks	No physical damages observed before Vibration test.	P
	Functional checks	All the Functional check was performed by customer and witnessed by TÜVR and EUT was working fine before start of the test.	P
1.2	Random Vibration test - Test Requirement		
	Test Specification	Refer summary of testing	-
	Operation condition	ON	-
	Duration	40 min/ axis	-
	No. of Axis	XX, YY & ZZ	-
1.3	Post check:		P
	Physical checks	No physical damages observed after Random Vibration test.	P
	Functional checks	All the Functional check was performed by customer and witnessed by TÜVR (See attachment – 2) and EUT was working fine after Random test.	P

Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict

1.4	Test Graphs		
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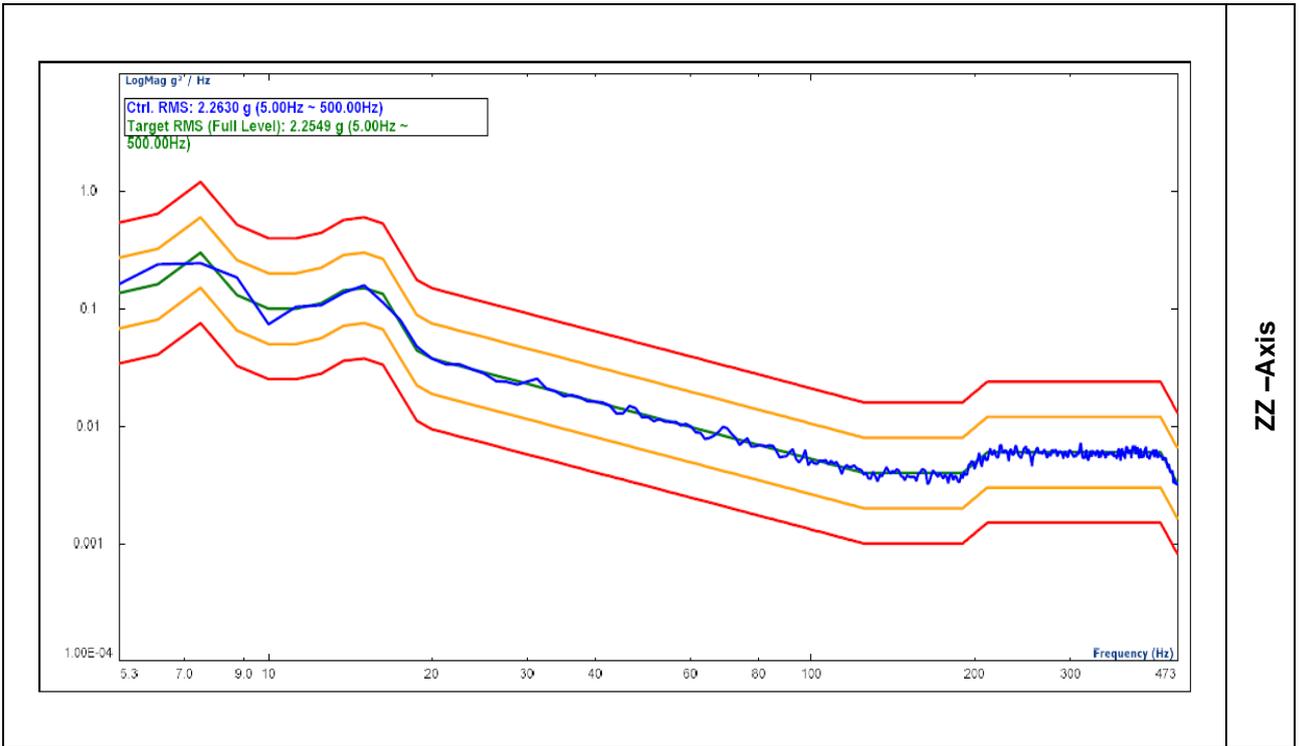


XX -Axis



YY -Axis

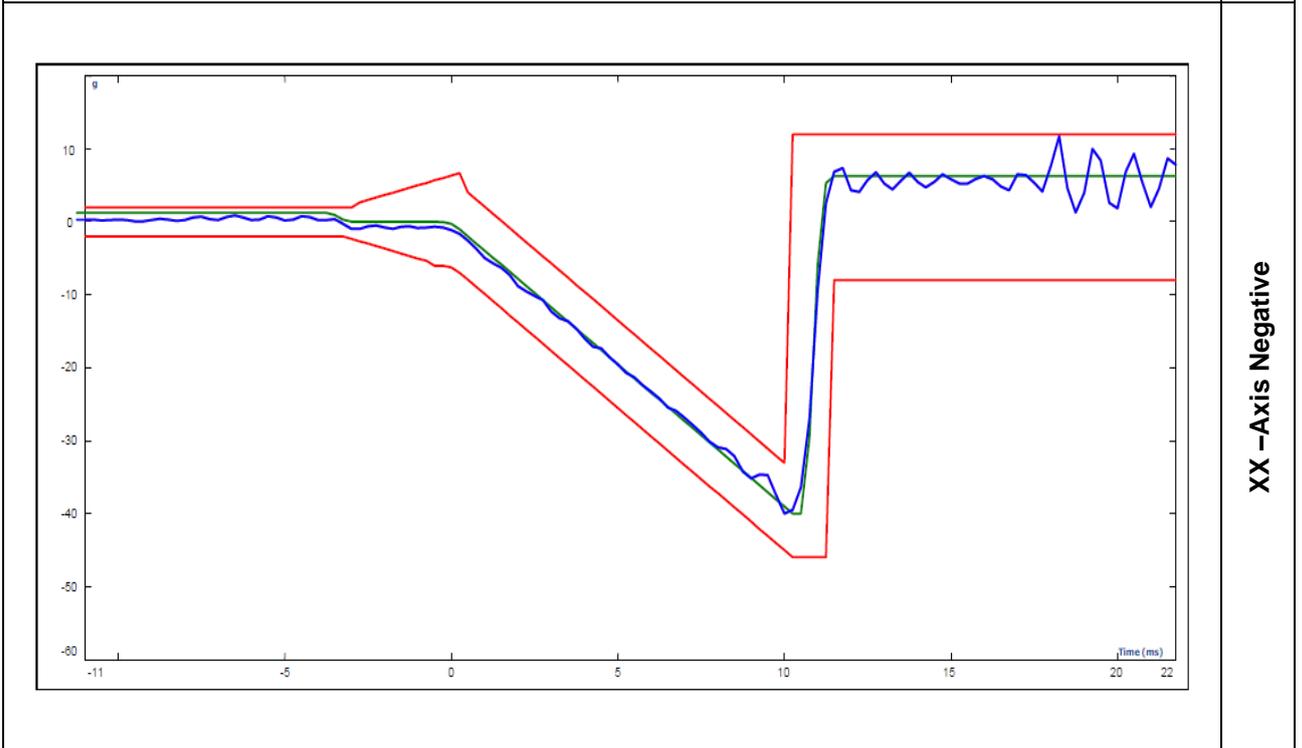
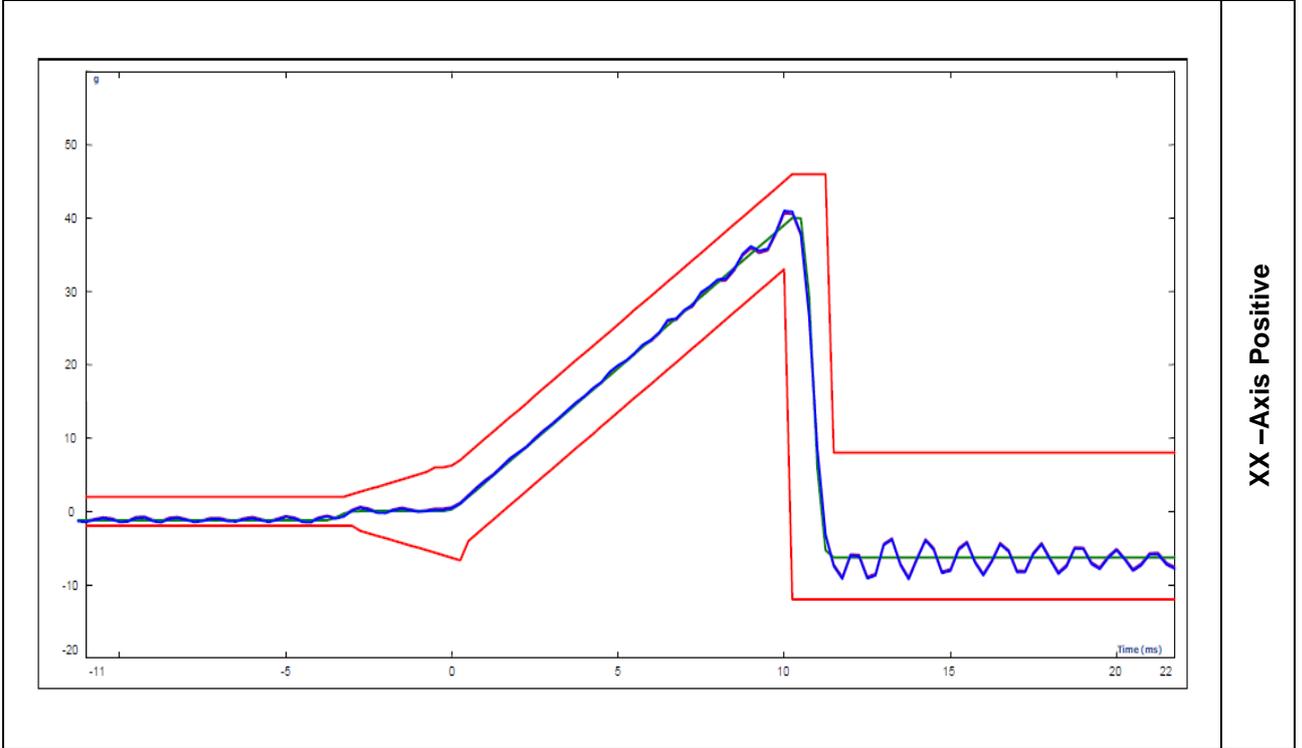
Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict



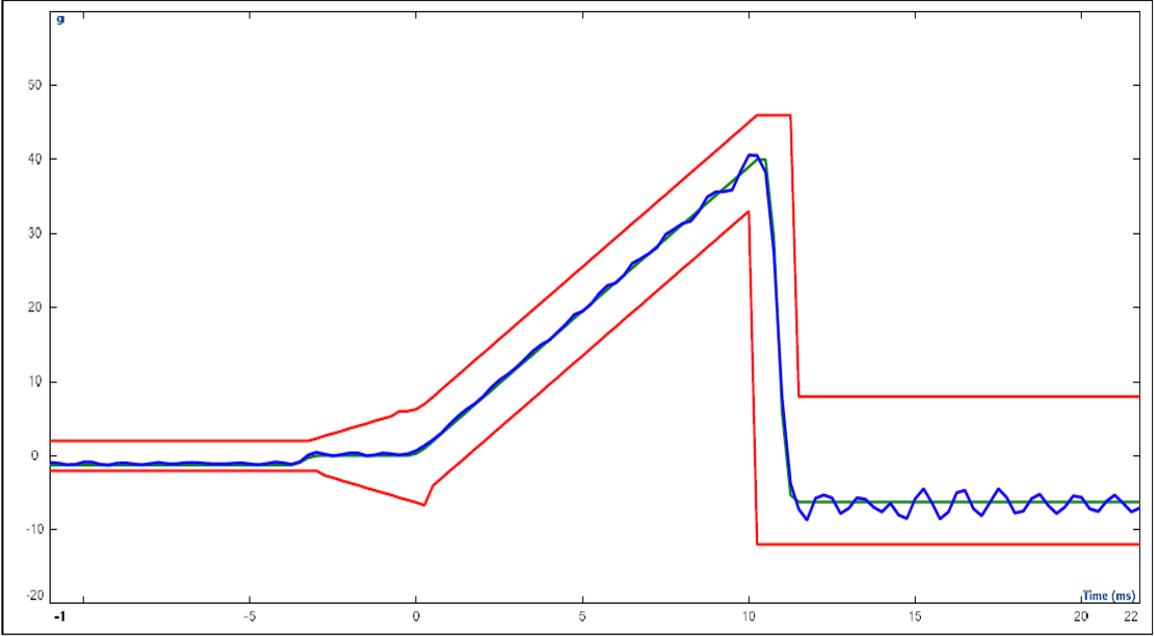
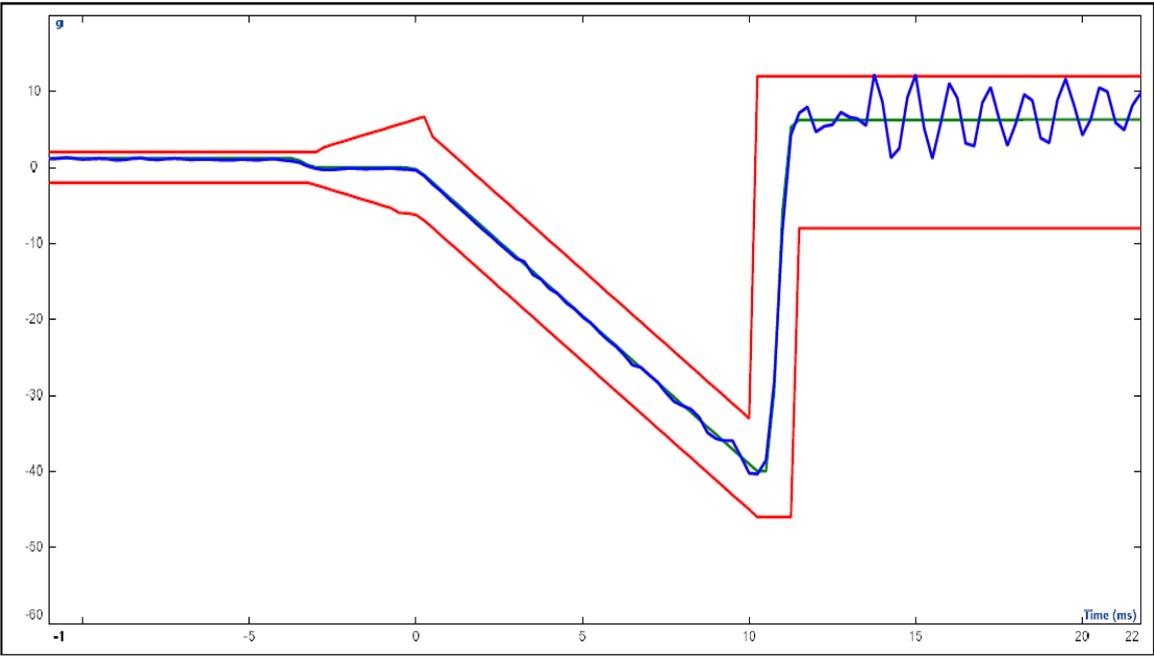
Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict
2	Functional Shock Test		P
2.1	Pre-checks		P
	Physical checks	No physical damages observed before Shock test.	P
	Functional checks	All the Functional check was performed by customer and witnessed by TÜVR and EUT was working fine before Shock test.	P
2.2	Functional Shock Test - Test Requirement		
	Waveform	Terminal Peak Sawtooth	-
	Test Specification	Shock Level	-
		Shock Duration	
		40 g	11 ms
	Operation Condition	ON	-
	No. of Axis	X, Y & Z	-
	No. of Shocks	18	-
2.3	Post check:		P
	Physical checks	No physical damages observed after Shock test.	P
	Functional checks	All the Functional check was performed by customer and witnessed by TÜVR (See attachment – 2) and EUT was working fine after Shock test.	P

Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict

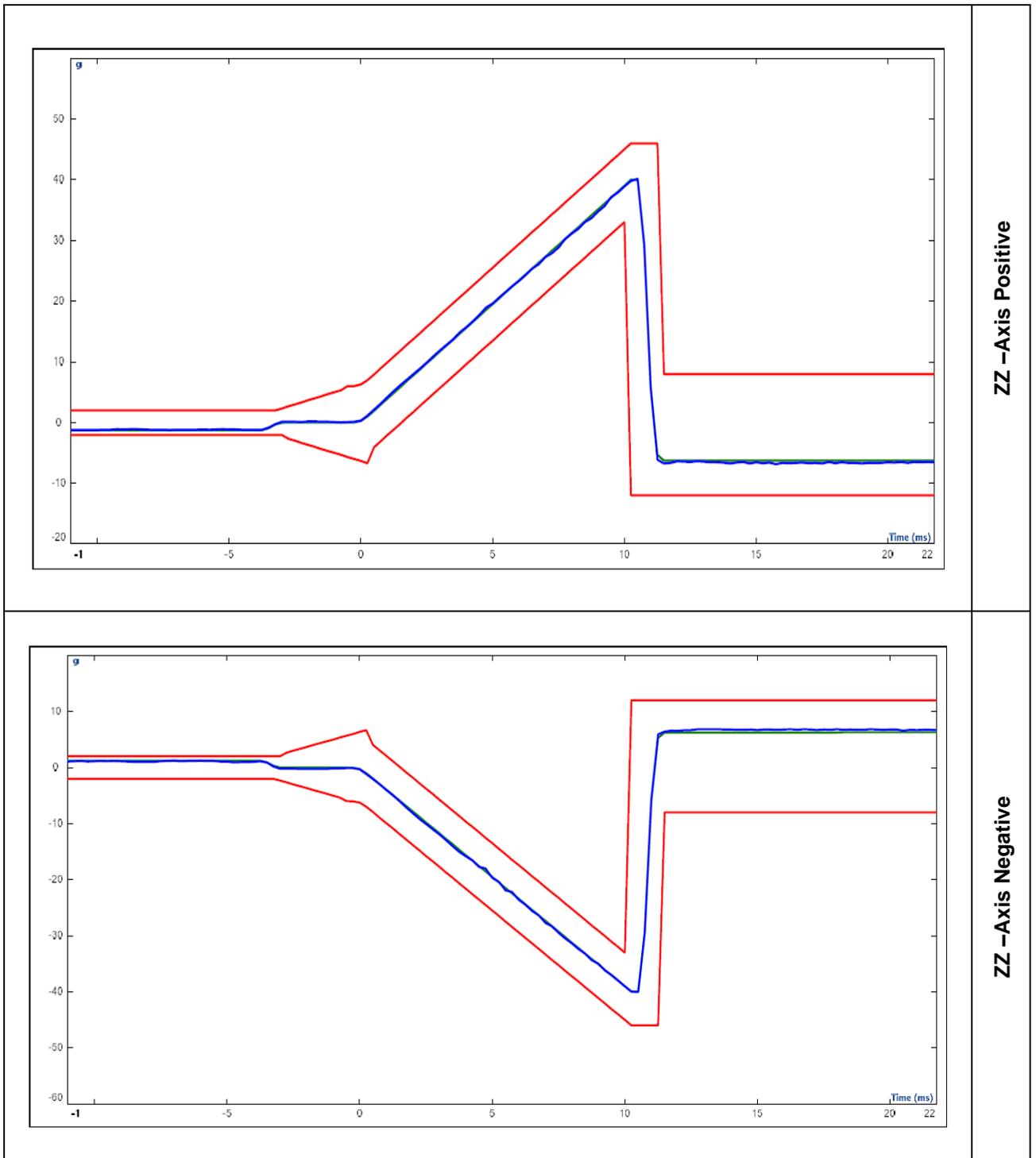
2.4	Test Graphs		
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Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict

	<p>YY -Axis positive</p>
	<p>YY -Axis Negative</p>

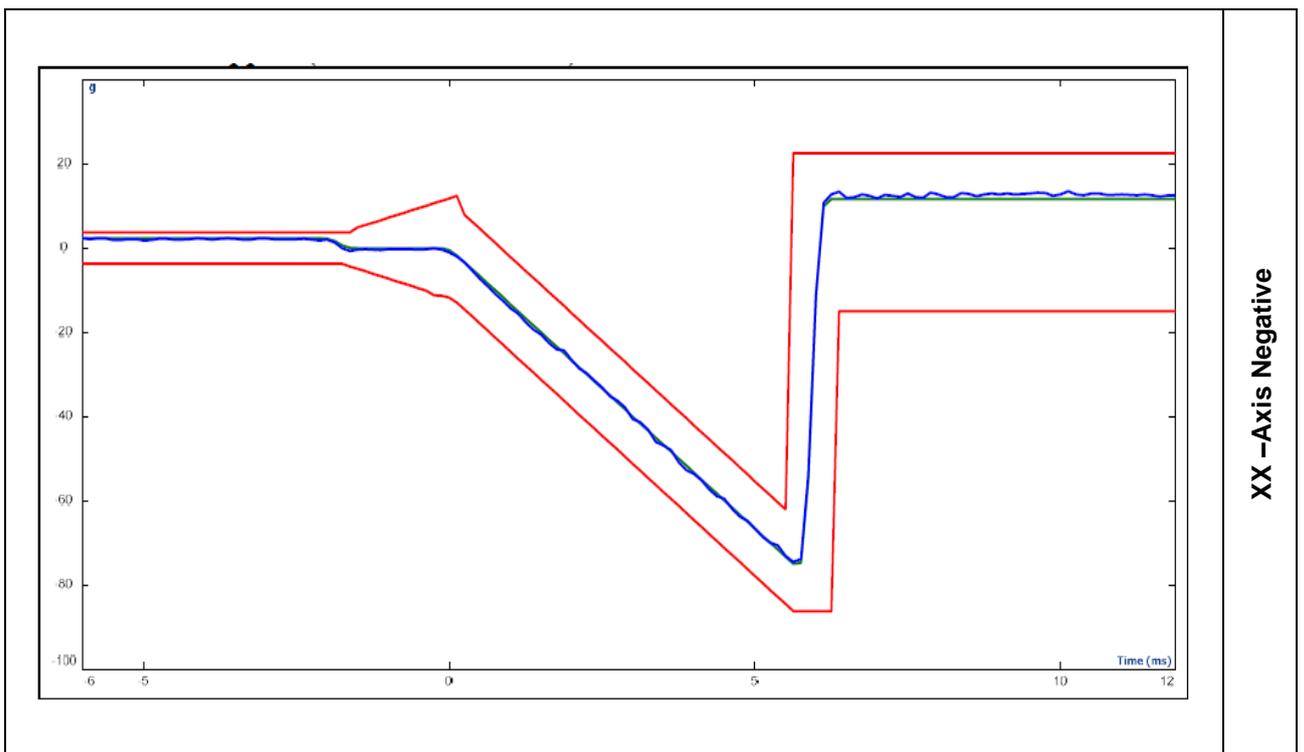
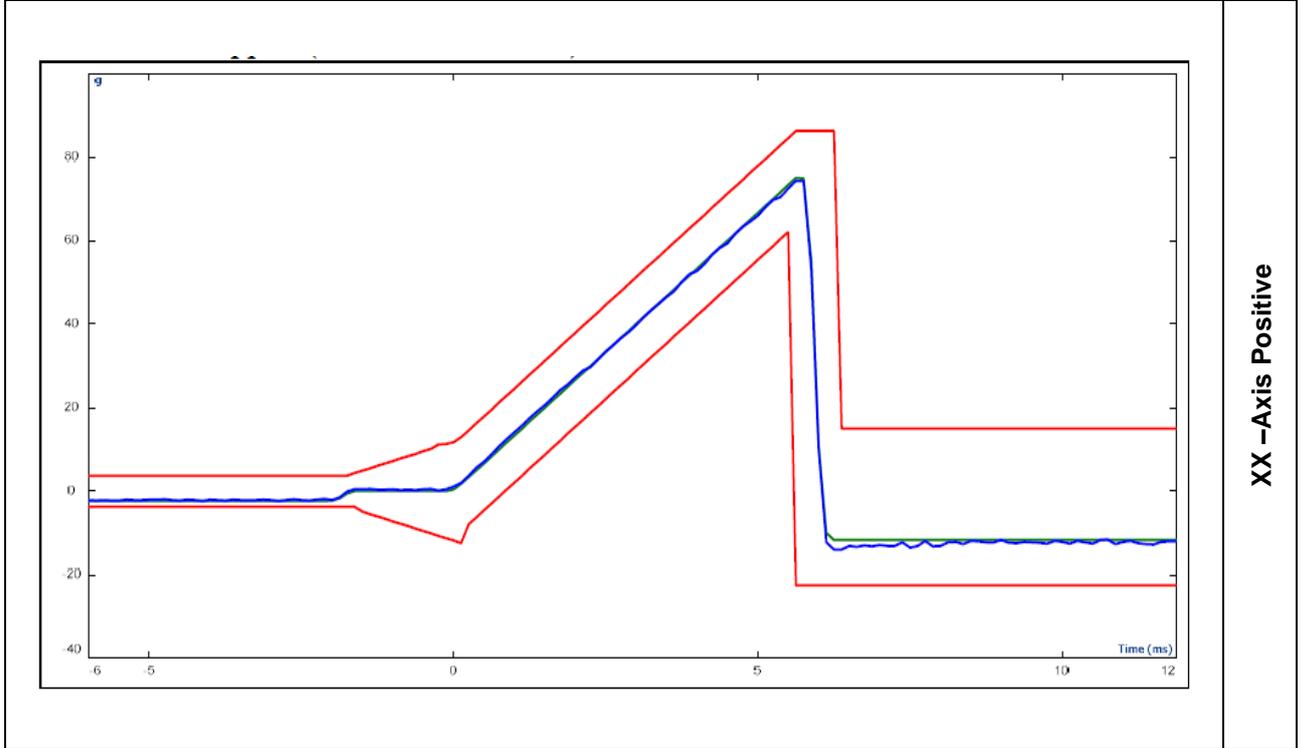
Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict



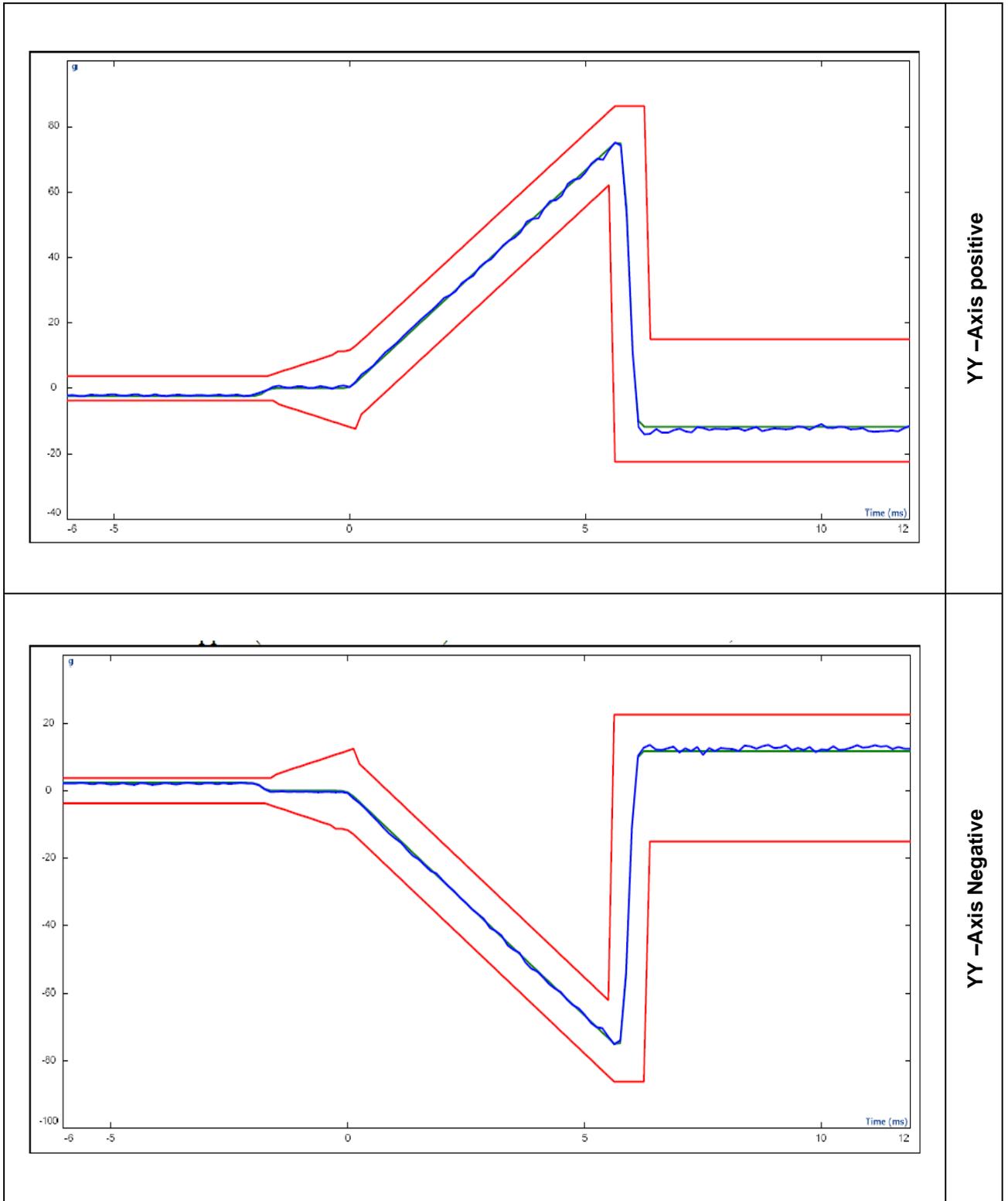
Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict
3	Crash Hazard Shock Test		P
3.1	Pre-checks		P
	Physical checks	No physical damages observed before Shock test.	P
	Functional checks	All the Functional check was performed by customer and witnessed by TÜVR and EUT was working fine before Shock test.	P
3.2	Crash Hazard Shock Test - Test Requirement		
	Waveform	Terminal Peak Sawtooth	-
	Test Specification	Shock Level	-
		Shock Duration	
		75 g	6 ms
	Operation Condition	OFF	-
	No. of Axis	X, Y & Z	-
	No. of Shocks	12	-
3.3	Post check:		P
	Physical checks	No physical damages observed after Shock test.	P
	Functional checks	All the Functional check was performed by customer and witnessed by TÜVR (See attachment – 2) and EUT was working fine after Shock test.	P

Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict

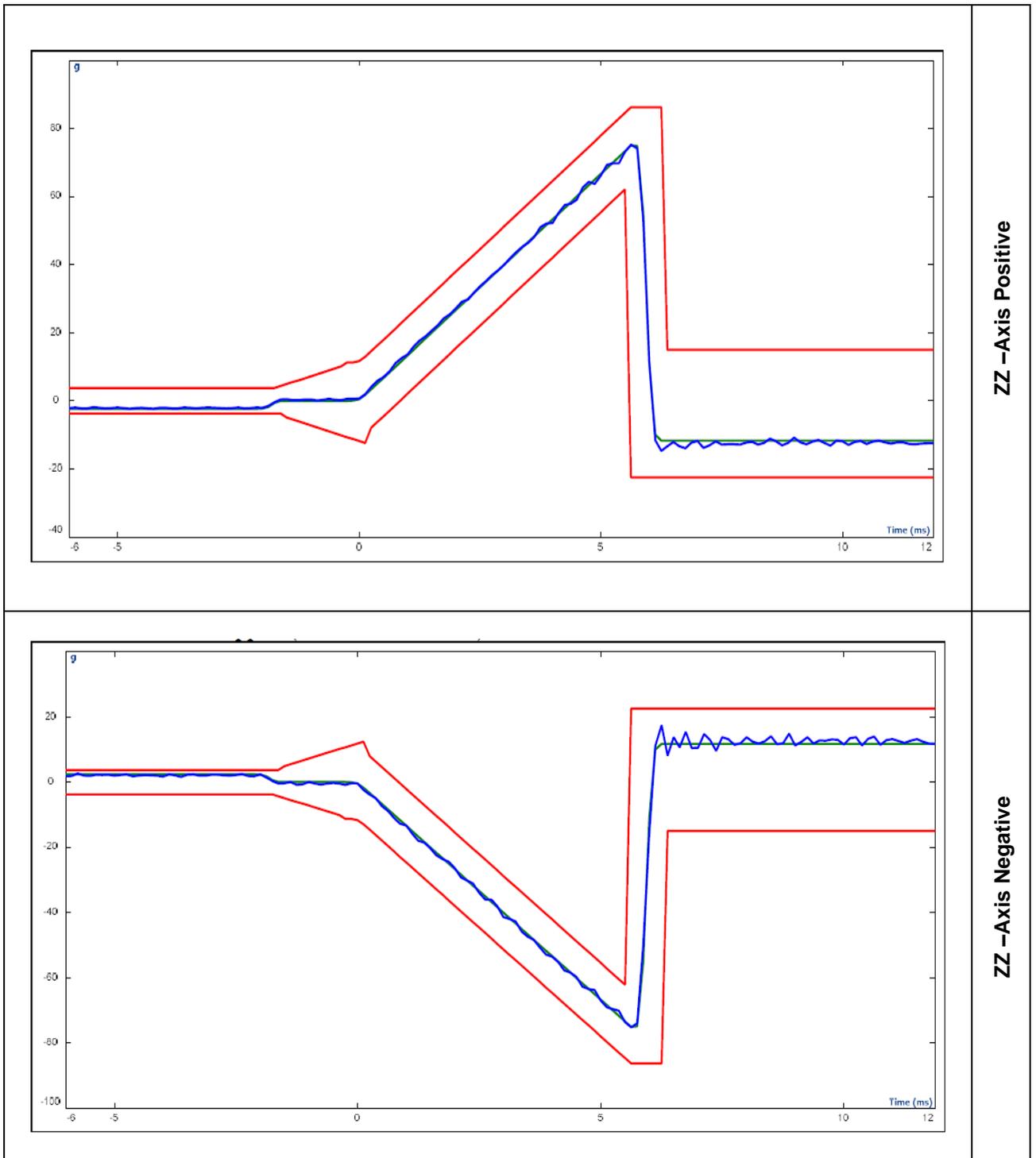
3.4	Test Graphs		
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Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict



Environmental Tests			
Clause	Requirement + Test	Result - Remark	Verdict



Attachment -1: Photo Document

	<p>Test set-up</p>
	<p>Functional Vibration and shock test - XX Axis</p>

Attachment -1: Photo Document

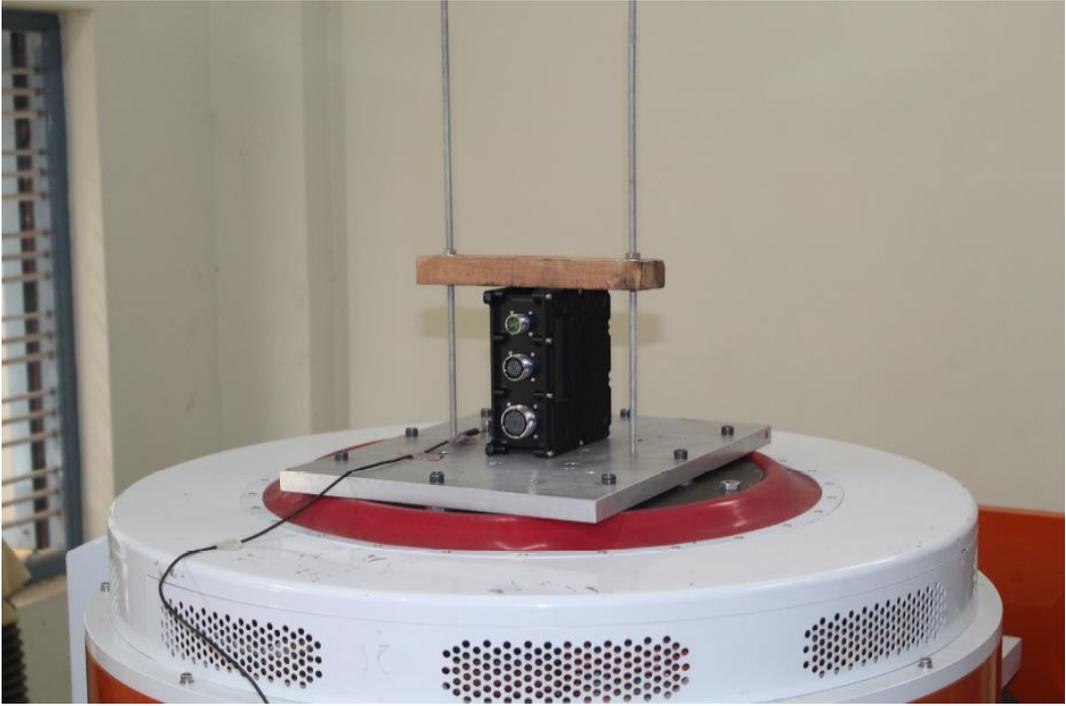
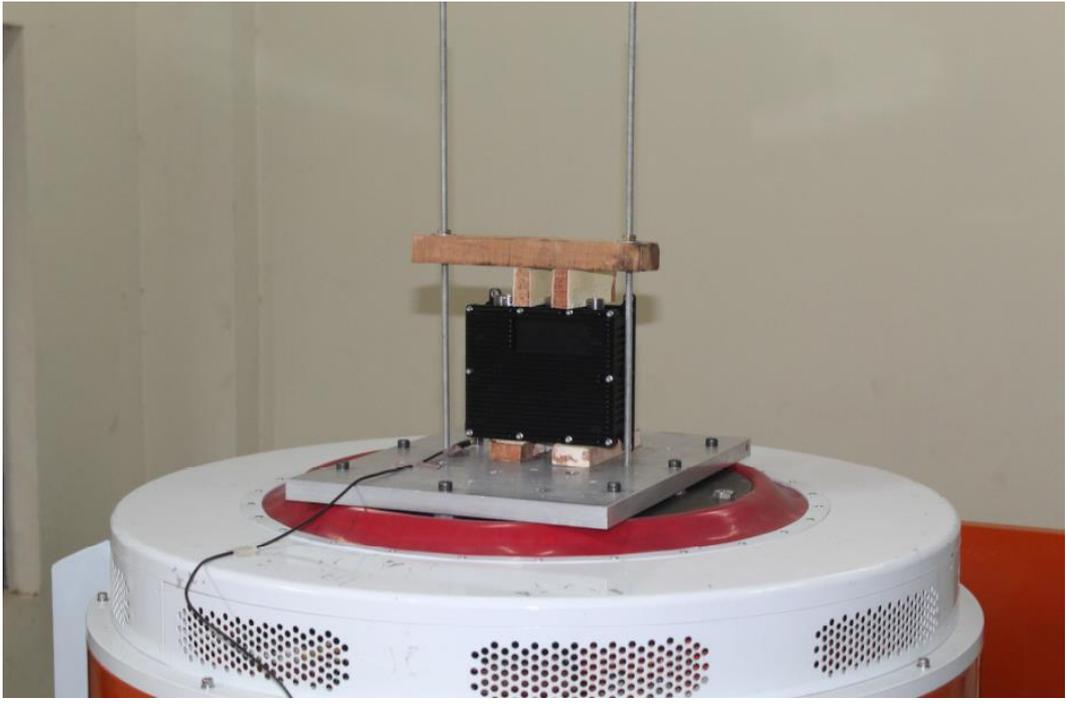


Functional Vibration and shock test - YY Axis

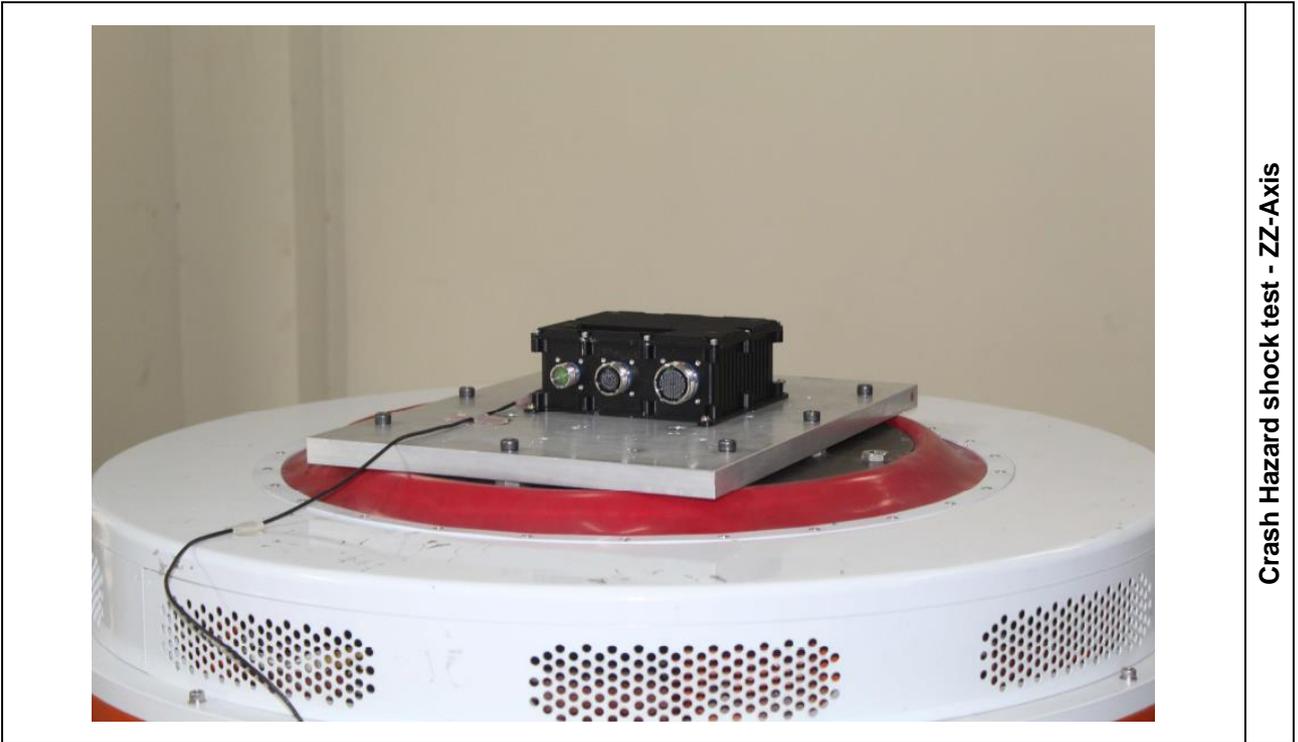


Functional Vibration and shock test - ZZ Axis

Attachment -1: Photo Document

	<p>Crash Hazard shock test - XX-Axis</p>
	<p>Crash Hazard shock test - YY-Axis</p>

Attachment -1: Photo Document



Attachment - 2: Functional Check

Port State Overview

State	Disabled	Down	Link
2			
4			
6			
8			
10			
12			

BurnInTest V7.1 Pro Results for HMECL001383

Test configuration file: LastUsed.bitcfg Status: IDLE
 Start time: Tue Dec 04 10:55:16 2018 Stop time: Tue Dec 04 12:06:24 2018 Duration: 001h 11m 08s

Test Name	Cycle	Operations	Errors	Last Error De...
Network 1: TP-LINK Gigabit Ethernet USB Adapter	3682	147 Million	0	No errors
Network 10: TP-LINK Gigabit Ethernet USB Adapter #17	3680	147 Million	0	No errors
Network 11: TP-LINK Gigabit Ethernet USB Adapter #7	2639	105 Million	0	No errors
Network 2: TP-LINK Gigabit Ethernet USB Adapter #2	3567	142 Million	0	No errors
Network 3: TP-LINK Gigabit Ethernet USB Adapter #3	3641	145 Million	0	No errors
Network 4: TP-LINK Gigabit Ethernet USB Adapter #4	3688	147 Million	0	No errors
Network 5: TP-LINK Gigabit Ethernet USB Adapter #6	3617	144 Million	0	No errors
Network 6: TP-LINK Gigabit Ethernet USB Adapter #8	3708	148 Million	0	No errors
Network 7: TP-LINK Gigabit Ethernet USB Adapter #10	3638	145 Million	0	No errors
Network 8: TP-LINK Gigabit Ethernet USB Adapter #11	3591	143 Million	0	No errors
Network 9: TP-LINK Gigabit Ethernet USB Adapter #12	3559	142 Million	0	No errors

Functional Vibration and shock test - XX Axis

Port State Overview

State	Disabled	Down	Link
2			
4			
6			
8			
10			
12			

BurnInTest V7.1 Pro Results for HMECL001383

Test configuration file: LastUsed.bitcfg Status: RUNNING
 Start time: Tue Dec 04 12:32:04 2018 Stop time: - Duration: 00h 50m 01s

Stop BIT

Test Name	Cycle	Operations	Errors	Last Error Description
Network 1: TP-LINK Giga...	3265	130 Million	0	No errors
Network 10: TP-LINK Giga...	3247	129 Million	0	No errors
Network 11: TP-LINK Giga...	2484	99,370 Million	0	No errors
Network 2: TP-LINK Giga...	3279	131 Million	0	No errors
Network 3: TP-LINK Giga...	3323	132 Million	0	No errors
Network 4: TP-LINK Giga...	3308	132 Million	0	No errors
Network 5: TP-LINK Giga...	3309	132 Million	0	No errors
Network 6: TP-LINK Giga...	3355	134 Million	0	No errors
Network 7: TP-LINK Giga...	3231	129 Million	0	No errors
Network 8: TP-LINK Giga...	3139	125 Million	0	No errors
Network 9: TP-LINK Giga...	3242	129 Million	0	No errors

BurnInTest - Network Test

TP-LINK Gigabit Ethernet USB Adapter
 Network adapter: 192.168.1.2 (Ethernet)
 Server: 192.168.1.65
 Packets sent/sec: 1632792 / 1632753
 Current delay: 1.72 ms
 Ave. |Max. delay: 1.74 ms / >4000.00 ms
 Bytes sent: 130622560 bytes
 Flow Rate: 544.3 pkt/s
 Errors: 0 (0.002%)

Functional Vibration and shock test - YY Axis

Attachment - 2: Functional Check

Port State Overview

State	Disabled	Down	Link
2			
4			
6			
8			
10			
12			

BurnInTest - Network Test

TP-LINK Gigabit Ethernet USB Adapter #3
 Network adapter: 192.168.1.4 (Ethernet)
 Server: 192.168.1.65
 Packets sent/rec: 1189592 / 1189573
 Current delay: 1.35 ms
 Ave.\Max. delay: 1.67 ms / >4000.00 ms
 Bytes sent: 95166560 bytes
 Flow Rate: 580.6 pkt/s
 Errors: 0 (0.001%)

Results for HMECL001383

Test configuration file: LastUsed.bitcfg
 Start time: Wed Dec 05 10:27:08 2018 Stop time: -
 Status: RUNNING
 Duration: 000h 34m 10s

Test Name	Cycle	Operations	Errors	Last Error Description
Network 1: TP-LINK Giga...	2301	95.251 Million	0	No errors
Network 10: TP-LINK Gga...	2311	92.475 Million	0	No errors
Network 11: TP-LINK Giga...	2324	92.980 Million	0	No errors
Network 2: TP-LINK Giga...	2379	95.166 Million	0	No errors
Network 3: TP-LINK Giga...	2388	95.526 Million	0	No errors
Network 4: TP-LINK Giga...	2354	94.196 Million	0	No errors
Network 5: TP-LINK Giga...	1490	59.602 Million	0	No errors
Network 6: TP-LINK Giga...	2440	97.607 Million	0	No errors
Network 7: TP-LINK Giga...	2301	92.058 Million	0	No errors
Network 8: TP-LINK Giga...	2318	92.730 Million	0	No errors
Network 9: TP-LINK Giga...	2330	93.219 Million	0	No errors

Functional Vibration and shock test - ZZ Axis

Port State Overview

State	Disabled	Down	Link
2			
4			
6			
8			
10			
12			

BurnInTest - Network Test

TP-LINK Gigabit Ethernet USB Adapter #3
 Network adapter: 192.168.1.2 (Ethernet)
 Server: 192.168.1.65
 Packets sent/rec: 37790 / 37787
 Current delay: 1.06 ms
 Ave.\Max. delay: 1.70 ms / >4000.00 ms
 Bytes sent: 3023200 bytes
 Flow Rate: 510.7 pkt/s
 Errors: 0 (0.005%)

Results for HMECL001383

Test configuration file: LastUsed.bitcfg
 Start time: Wed Dec 05 12:42:14 2018 Stop time: -
 Status: RUNNING
 Duration: 000h 01m 14s

Test Name	Cycle	Operations	Errors	Last Error Description
Network 1: TP-LINK Giga...	75	3.005 Million	0	No errors
Network 10: TP-LINK Gga...	73	2.943 Million	0	No errors
Network 11: TP-LINK Gga...	44	1.774 Million	0	No errors
Network 2: TP-LINK Giga...	70	2.817 Million	0	No errors
Network 3: TP-LINK Giga...	70	2.820 Million	0	No errors
Network 4: TP-LINK Giga...	72	2.903 Million	0	No errors
Network 5: TP-LINK Giga...	72	2.900 Million	0	No errors
Network 6: TP-LINK Giga...	73	2.921 Million	0	No errors
Network 7: TP-LINK Giga...	63	2.553 Million	0	No errors
Network 8: TP-LINK Giga...	72	2.884 Million	0	No errors
Network 9: TP-LINK Giga...	72	2.904 Million	0	No errors

Post-Crash Hazard Shock Test

*** End of Test Report ***