

QA Test Report

Report Number : DVEA15030

Report Version : V1.0

Project Number : NR13101501-2

*Product Model : TN-5508A-8PoE-WV-T,
TN-5508A-8PoE-WV-CT-T
TN-5510A-8PoE-2GTX-WV-T,
TN-5510A-8PoE-2GTX-WV-CT-T
TN-5510A-8PoE-2GTXBP-WV-T,
TN-5510A-8PoE-2GTXBP-WV-CT-T
TN-5510A-8PoE-2GLSX-ODC-WV-T,
TN-5510A-8PoE-2GLSX-ODC-WV-CT-T*

Wide-Temperature Test Report

(Extended Operating Temperature Test)



QA Manager :

A blue ink signature of the QA Manager.

Approval :

A blue ink signature of Justin Nien.

Prepare By :

A blue ink signature of Steven Yang.

Revisory History :

Version	Revised description	Reason	Date	Reviser
1.0	New edition		06-10-15'	Steven

Test Result (Summary)

Test Item	Test Standard	Q'ty	Test Date	Judge	Page
Temperature Cycle Operating Test	IEC 60068-2-14	5	2015/02/10 ~ 2015/02/12	PASS	5
High Temperature High Humidity Operating Test	IEC 60068-2-3	5	2015/02/12 ~ 2015/02/13	PASS	9
High Temperature Operating Test	IEC 60068-2-2	5	2015/02/13 ~ 2015/02/13	PASS	13
Low Temperature Power ON/OFF Test	IEC 60068-2-1	5	2015/02/24 ~ 2015/02/26	PASS	16
Low Temperature Storage Test	IEC 60068-2-1	1	2015/05/26 ~ 2015/05/27	PASS	19
High Temperature High Humidity Storage Test	IEC 60068-2-3	1	2015/05/25 ~ 2015/05/26	PASS	22
Vibration Test	EN 50155, EN / IEC 61373	1	2015/02/25 ~ 2015/03/04	PASS	26
Shock Test	EN 50155, EN / IEC 61373	1	2015/03/04 ~ 2015/03/06	PASS	31
Package Vibration & Drop Test	IEC 60068-2-64 IEC 60068-2-32 ISTA-2A	3	2015/06/01 ~ 2015/06/03	PASS	36
IP 54 Test	EN60529	2	2015/05/11 ~ 2015/05/13	PASS	43

Product Specifications

1. Power Requirements :

Power Input	24 ~ 110 VDC
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2. Environmental :

Operating Temperature	- 40 ~ 75 °C
Storage Temperature	- 40 ~ 85 °C
Ambient Relative Humidity	5 ~ 95 % RH (non-condensing)



TN-5508A-8PoE Series



TN-5510A-8PoE Series

Temperature Cycle Operating Test

1. Test Date & Instruments :

Test Date	2015/02/10 ~ 2015/02/12		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Programmable Temperature & Humidity Chamber	KSON	THS-E5T-150-5A/ 7237KT	2015/05/20
Thermometer	TECPEL	DTM-319 / 141007968 DTM-319 / 141007969	2015/10/30 2015/10/30

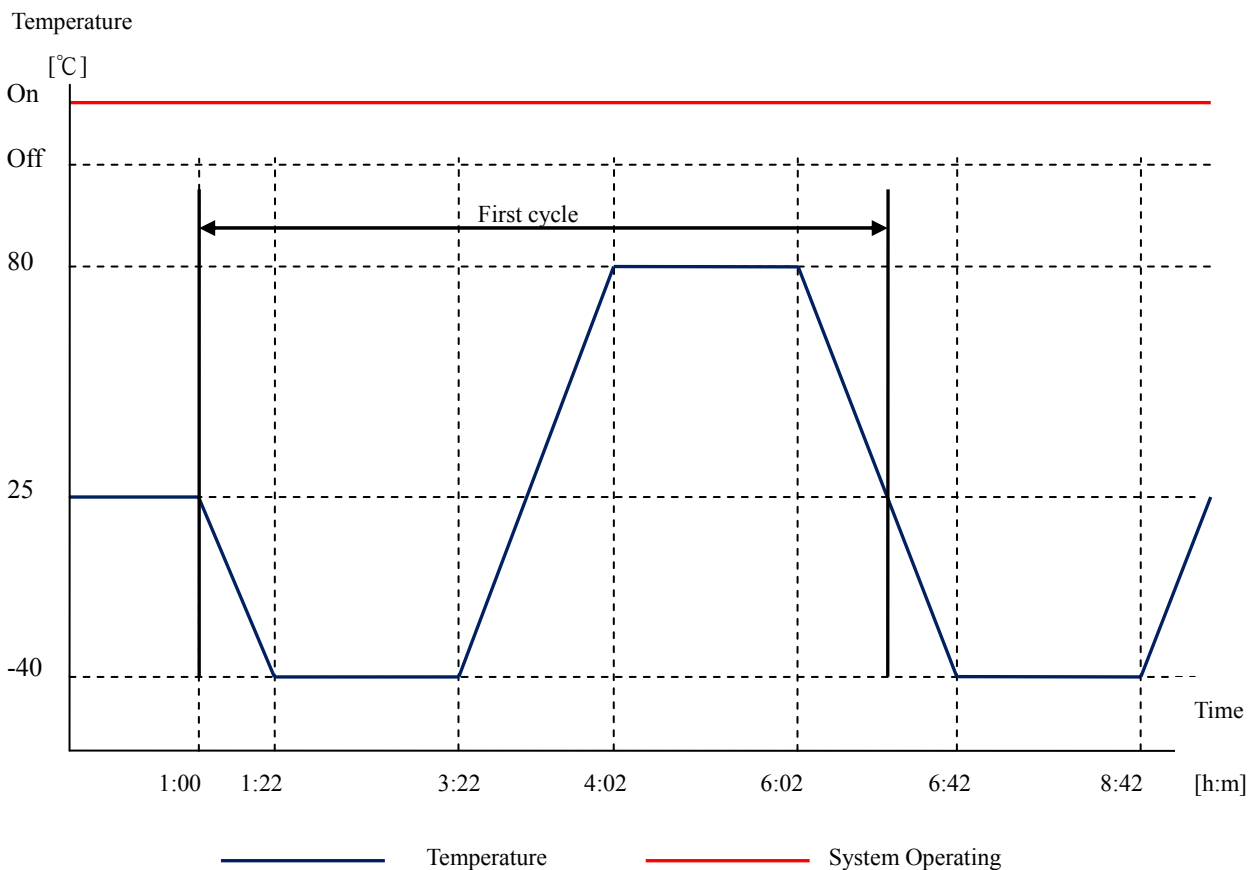
2. Sample Configuration & Quantity Under Test :

Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Engineering Sample
Total Quantity	6 Units
Sample S/N	TN-5510A-8PoE-2GTXPB-WV-T -01 TN-5510A-8PoE-2GTXPB-WV-T -02 TN-5510A-8PoE-2GTXPB-WV-T -03 TN-5510A-8PoE-2GLSX-ODC-WV-T -01 TN-5510A-8PoE-2GLSX-ODC-WV-T -02 TN-5510A-8PoE-2GLSX-ODC-WV-T -03

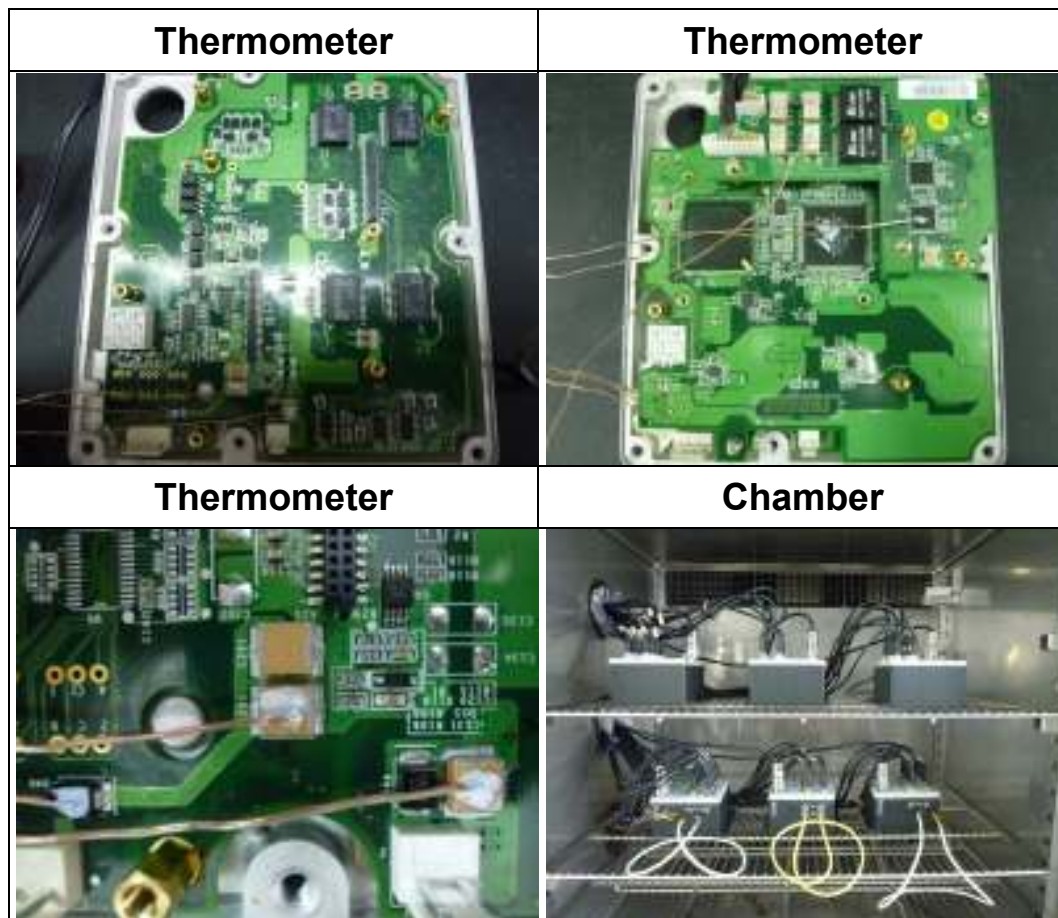
3. Test Parameter :

Parameter	Value
Conditions	Standard : IEC 60068-2-14
	Test category : Nb
	Low temperature / Humidity : -40 °C / NA
	High temperature / Humidity : 80 °C / 60 % RH
	Duration of exposure : 2 hrs at each temperature step
	Number of cycles : 8
	Rate of change of temperature : 3 °C / min
Sample status	Operating
Checks , measurements	1. Functional check: The functional check was carried out before, during and after the temperature cycle operating test. 2. Visual inspection: The visual inspection was carried out before and after the temperature cycle operating test.

4. Test Environmental Curve :



5. Test Photograph and Setting :



6. Proceedings :

Temperature / Humidity

DATE	2/10	2/10	2/11	2/11	2/12	2/12
Check Item						
Temperature (°C)	25 °C	-40 °C	80 °C	-40 °C	80 °C	25 °C
Humidity	60 %	0 %	60 %	0 %	60 %	60 %
Components & Location	Test ambient					
D46 (IO)	63.7	7.6	115.5	6.8	114.3	42.4
C136 (IO)	73.2	-10	107.9	-10.1	107.7	45.3
C290 (IO)	47.6	-11.9	102.5	-11.1	102.5	43.6
U21	53.3	-9.3	110.8	-9.4	110.5	44.3
U7	59	-2.2	115	-2.2	115	45.6
U9	55.9	-3.8	107.7	-3.9	107.6	50
T2	44.2	-12.2	100.7	-12.1	100.7	50.5
Inner Air	34	-28.4	90	-28.1	90.1	41.1

7. The Acceptance Requirements :

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

8. Test Result : PASS

Item	Spec.	Checks, measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	PASS	PASS
Visual inspection	Refer to QA-W-010 / Defect inspection criterion	OK	N/A	PASS
Remark				

High Temperature High Humidity Operating Test

1. Test Date & Instruments :

Test Date	2015/02/12 ~ 2015/02/13		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Programmable Temperature & Humidity Chamber	KSON	THS-E5T-150-5A/ 7237KT	2015/05/20

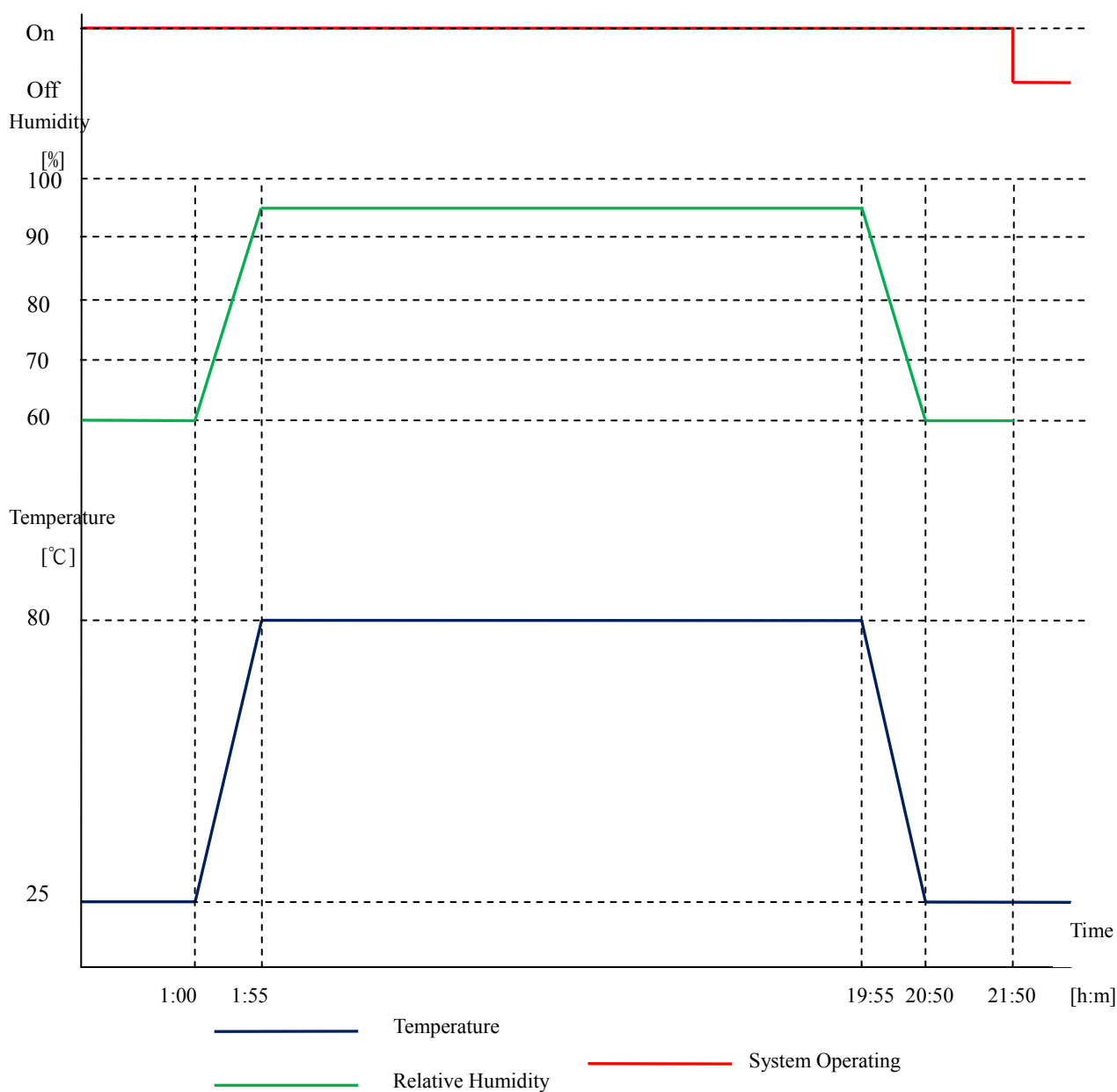
2. Sample Configuration & Quantity Under Test :

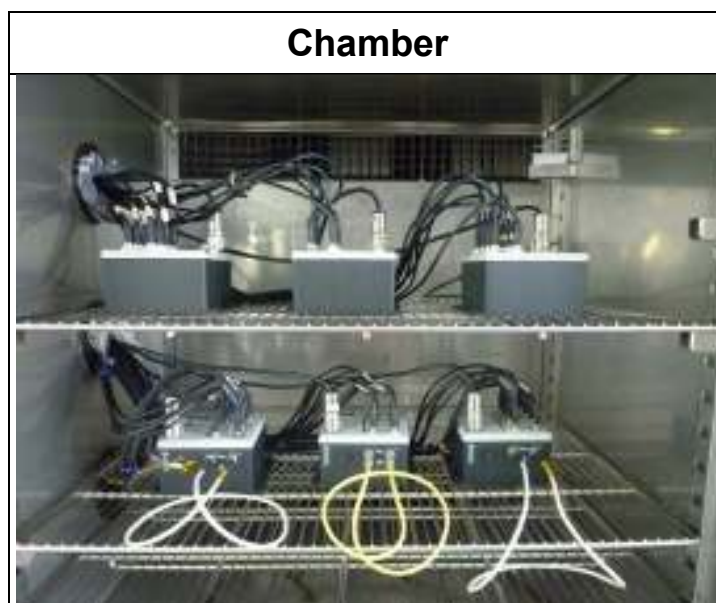
Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Engineering Sample
Total Quantity	6 Units
Sample S/N	TN-5510A-8PoE-2GTXPB-WV-T -01 TN-5510A-8PoE-2GTXPB-WV-T -02 TN-5510A-8PoE-2GTXPB-WV-T -03 TN-5510A-8PoE-2GLSX-ODC-WV-T -01 TN-5510A-8PoE-2GLSX-ODC-WV-T -02 TN-5510A-8PoE-2GLSX-ODC-WV-T -03

3. Test Parameter :

Parameter	Value
Conditions	Standard : IEC 60068-2-3 Test category : Ca Temperature : 80 °C Relative Humidity : 95 % RH Duration of exposure : 18 hrs Rate of change of temperature : 1 °C / min
Sample status	Operating
Checks , measurements	1. Functional check: The functional check was carried out before, during and after the high temperature high humidity operating test. 2. Visual inspection: The visual inspection was carried out before and after the high temperature high humidity operating test.

4. Test Environmental Curve :



5. Test Photograph :**6. The Acceptance Requirements :**

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks, measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	PASS	PASS
Visual inspection	Refer to QA-W-010 / Defect Inspection Criterion	OK	N/A	PASS
Remark				

High Temperature Operating Test

1. Test Date & Instruments :

Test Date	2015/02/13~ 2015/02/13		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Programmable Temperature & Humidity Chamber	KSON	THS-E5T-150-5A/ 7237KT	2015/05/20

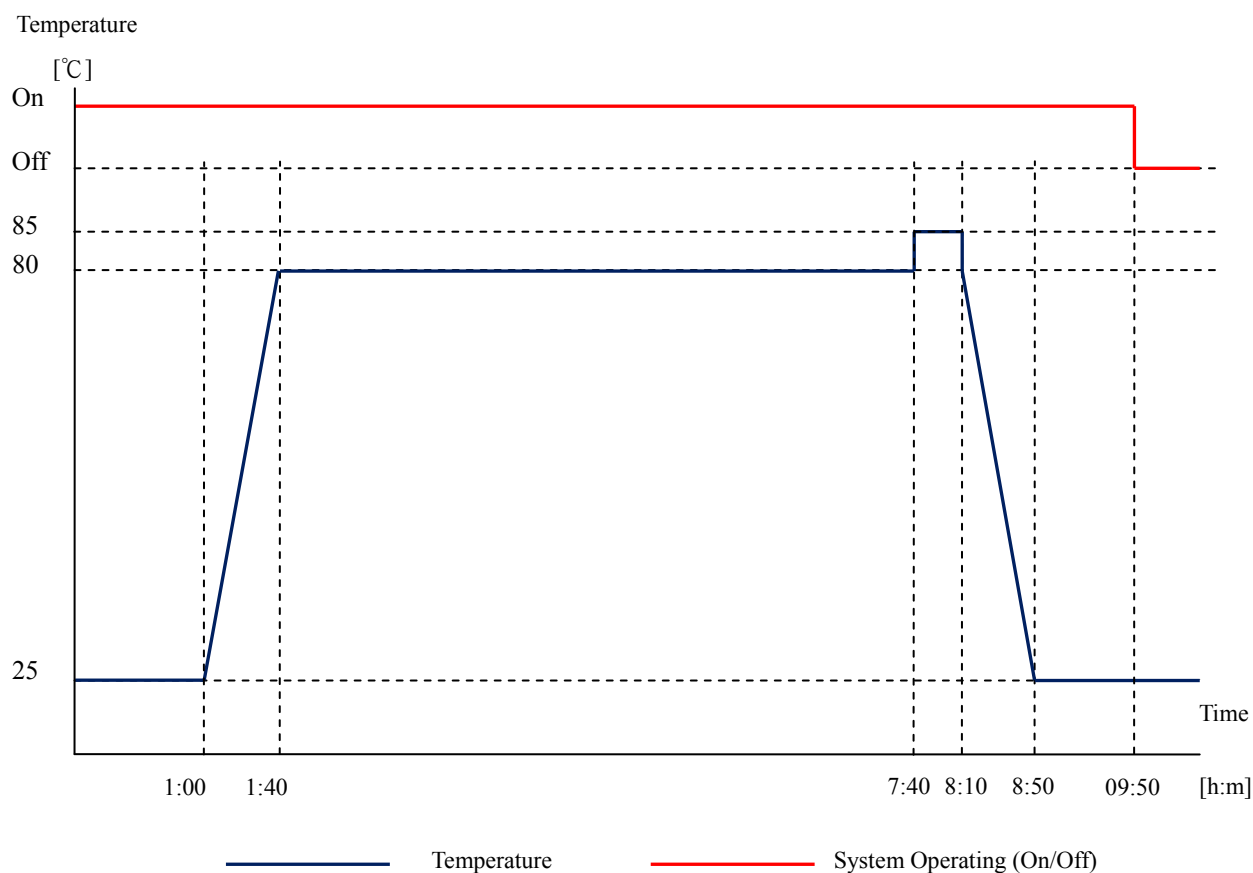
2. Sample Configuration & Quantity Under Test :

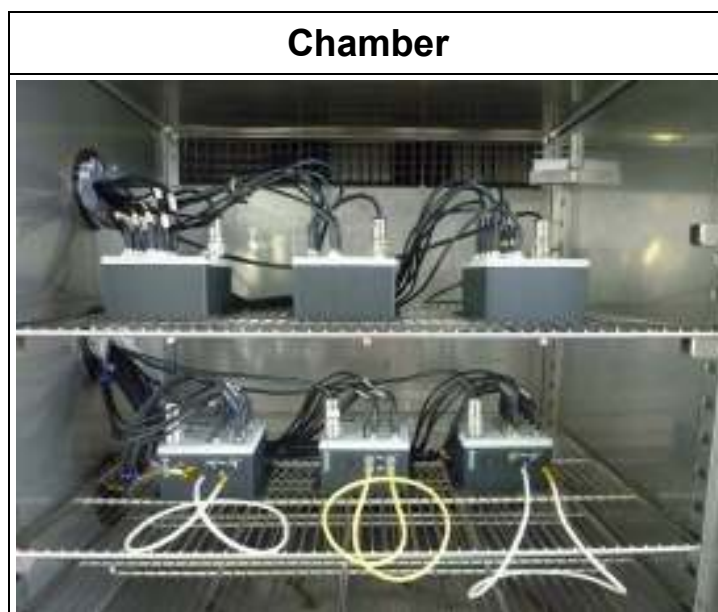
Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Engineering Sample
Total Quantity	6 Units
Sample S/N	TN-5510A-8PoE-2GTXPB-WV-T -01 TN-5510A-8PoE-2GTXPB-WV-T -02 TN-5510A-8PoE-2GTXPB-WV-T -03 TN-5510A-8PoE-2GLSX-ODC-WV-T -01 TN-5510A-8PoE-2GLSX-ODC-WV-T -02 TN-5510A-8PoE-2GLSX-ODC-WV-T -03

3. Test Parameter :

Parameter	Value
Conditions	Standard : IEC 60068-2-2
	Test category : Bd
	Temperature : 80 °C
	Over Temperature / Duration : 85 °C / 10 mins
	Duration of exposure : 6 hrs
	Rate of change of temperature : 1 °C / min
Sample status	Operating
Checks , measurements	1.Performance Check: The performance check was carried out before, during and after the high temperature operating test. 2.Visual inspection: The visual inspection was carried out before and after the high temperature operating test.

4. Test Environmental Curve :



5. Test Photograph :**6. The Acceptance Requirements :**

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks, measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	PASS	PASS
Visual inspection	Refer to QA-W-010 / Defect Inspection Criterion	OK	N/A	PASS
Remark				

Low Temperature Power ON/OFF Test

1. Test Date & Instruments :

Test Date	2015/02/24 ~ 2015/02/26		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Programmable Temperature & Humidity Chamber	KSON	THS-E5T-150-5A/7237KT	2015/05/20

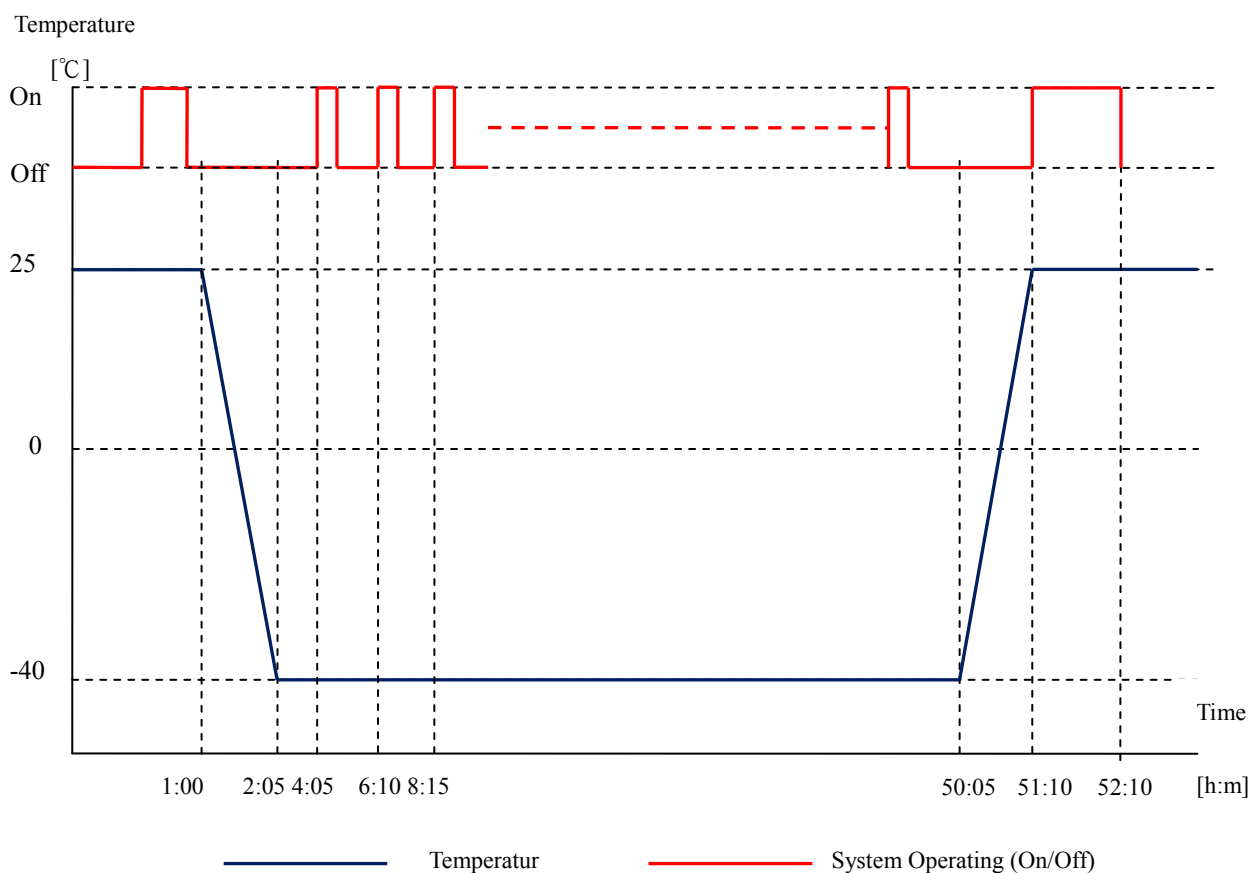
2. Sample Configuration & Quantity Under Test :

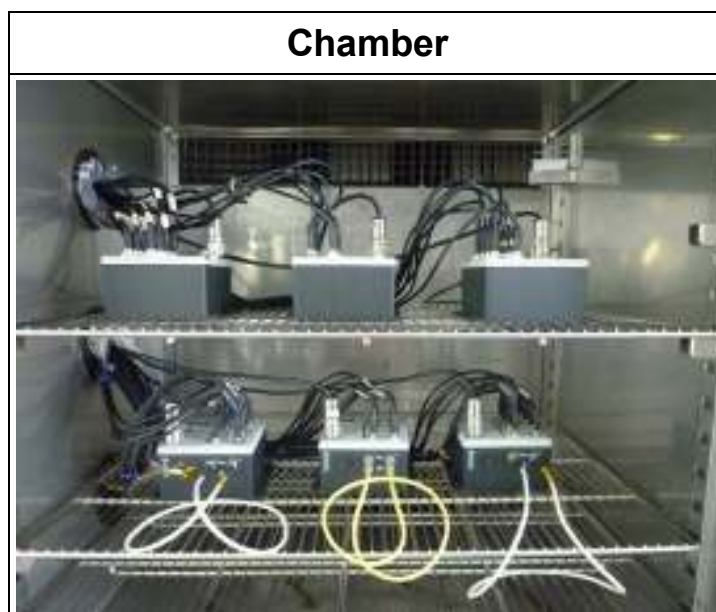
Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Engineering Sample
Total Quantity	6 Units
Sample S/N	TN-5510A-8PoE-2GTXBP-WV-T -01 TN-5510A-8PoE-2GTXBP-WV-T -02 TN-5510A-8PoE-2GTXBP-WV-T -03 TN-5510A-8PoE-2GLSX-ODC-WV-T -01 TN-5510A-8PoE-2GLSX-ODC-WV-T -02 TN-5510A-8PoE-2GLSX-ODC-WV-T -03

3. Test Parameter :

Parameter	Value
Conditions	Standard : IEC 60068-2-1
	Test category : Ad
	Temperature : -40 °C
	Duration of exposure : 48 hrs
	Power ON/OFF Time / Times : 5 mins / 2 hrs / 10 Times
	Rate of change of temperature : 1 °C / min
Sample status	Operating
Checks , measurements	1. Functional check: The functional check was carried out before, during and after the low temperature power on/off test. 2. Visual inspection: The visual inspection was carried out before and after the low temperature power on/off test.

4. Test Environmental Curve :



5. Test Photograph :**6. The Acceptance Requirements :**

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks, measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	PASS	PASS
Visual inspection	Refer to QA-W-010 / Defect Inspection Criterion	OK	N/A	PASS
Remark				

Low Temperature Storage Test

1. Test Date & Instruments :

Test Date	2015/05/26 ~ 2015/05/27		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Programmable Temperature & Humidity Chamber	KSON	THS-E5T-150-5A/ 7237KT	2016/05/19

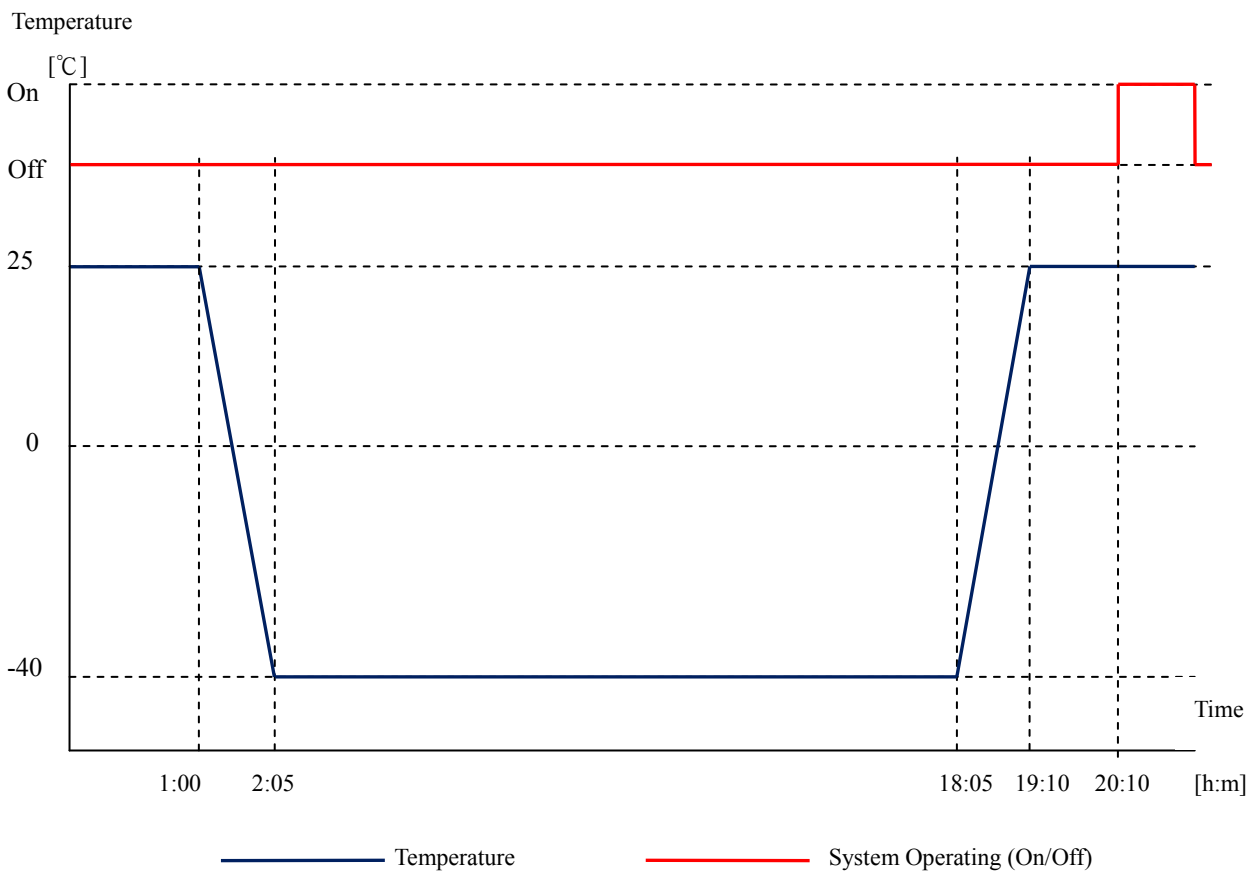
2. Sample Configuration & Quantity Under Test :

Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Finished Product
Total Quantity	1 Unit
Sample S/N	TN-5510A-8PoE-2GTXBP-WV-T -01-F

3. Test Parameter :

Parameter	Value
Conditions	Standard : IEC 60068-2-1
	Test category : Ab
	Temperature : -40 °C
	Duration of exposure : 16 hrs
	Rate of change of temperature : 1 °C / min
Sample status	Non-Operating
Checks , measurements	1. Functional check: The functional check was carried out before and after the low temperature storage test. 2. Visual inspection: The visual inspection was carried out before and after the low temperature storage test.

4. Test Environmental Curve :



5. Test Photograph :**6. The Acceptance Requirements :**

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks, measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	N/A	PASS
Visual inspection	Refer to QA-W-010 / Defect Inspection Criterion	OK	N/A	PASS
Remark				

High Temperature High Humidity Storage Test

1. Test Date & Instruments :

Test Date	2015/05/25 ~ 2015/05/26		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Programmable Temperature & Humidity Chamber	KSON	THS-E5T-150-5A/ 7237KT	2016/05/19

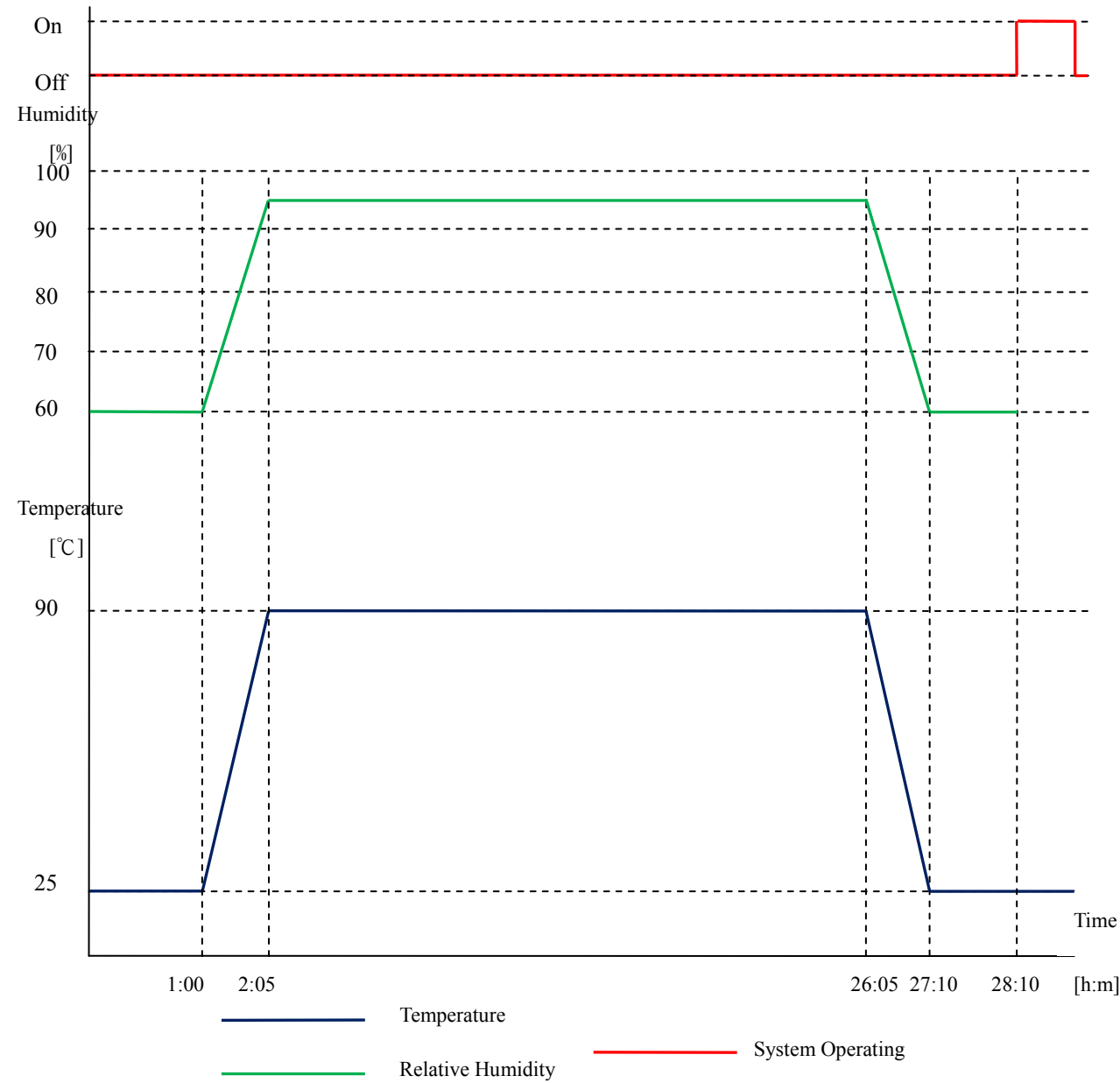
2. Sample Configuration & Quantity Under Test :

Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Finished Product
Total Quantity	1 Unit
Sample S/N	TN-5510A-8PoE-2GTXPB-WV-T -01-F

3. Test Parameter :

Parameter	Value
Conditions	Standard : IEC 60068-2-3 Test category : Ca Temperature : 90 °C Relative Humidity : 95 % RH Duration of exposure : 24 hrs Rate of change of temperature : 1 °C / min
Sample status	Non-Operating
Checks , measurements	1. Functional check: The functional check was carried out before and after the high temperature high humidity storage test. 2. Visual inspection: The visual inspection was carried out before and after the high temperature high humidity storage test.

4. Test Environmental Curve :



5. Test Photograph :**6. The Acceptance Requirements :**

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks, measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	N/A	PASS
Visual inspection	Refer to QA-W-010 / Defect Inspection Criterion	OK	N/A	PASS
Remark				

Vibration Test

1. Test Date & Instruments :

Test Date	2015/02/25 ~ 2015/03/04		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Vibration Tester	KING DESIGN	KD-9363EM-1000F2K-50N250 / NX108226200	2015/07/11
Controller	DACTRON	LASER USB / 11812803	2015/07/11
Control Accelerometer	WILCOXON RESEARCH	WR-784A / 28972	2015/07/11

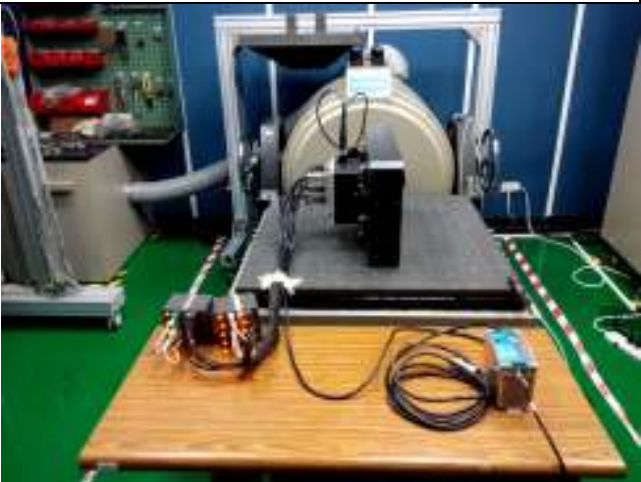
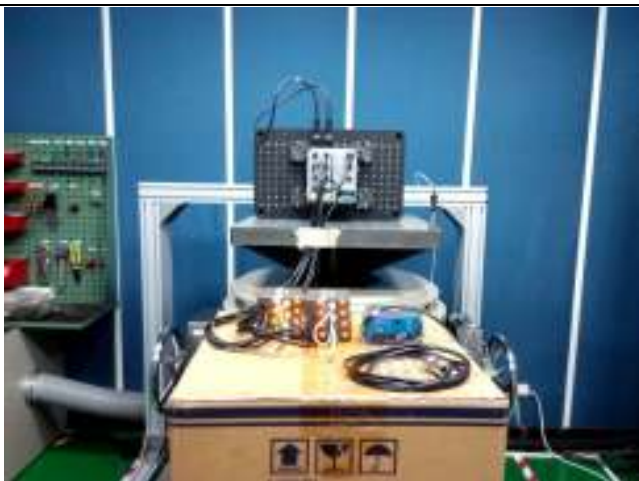
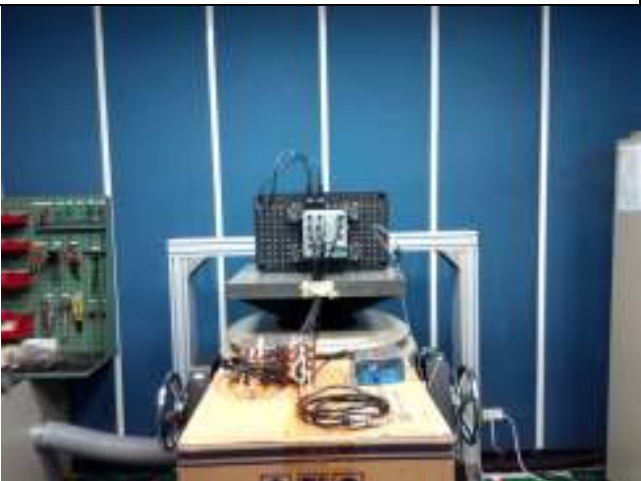
2. Sample Configuration & Quantity Under Test :

Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Engineering Sample
Total Quantity	1 Units
Sample S/N	TN-5510A-8PoE-2GLSX-ODC-WV-T -04

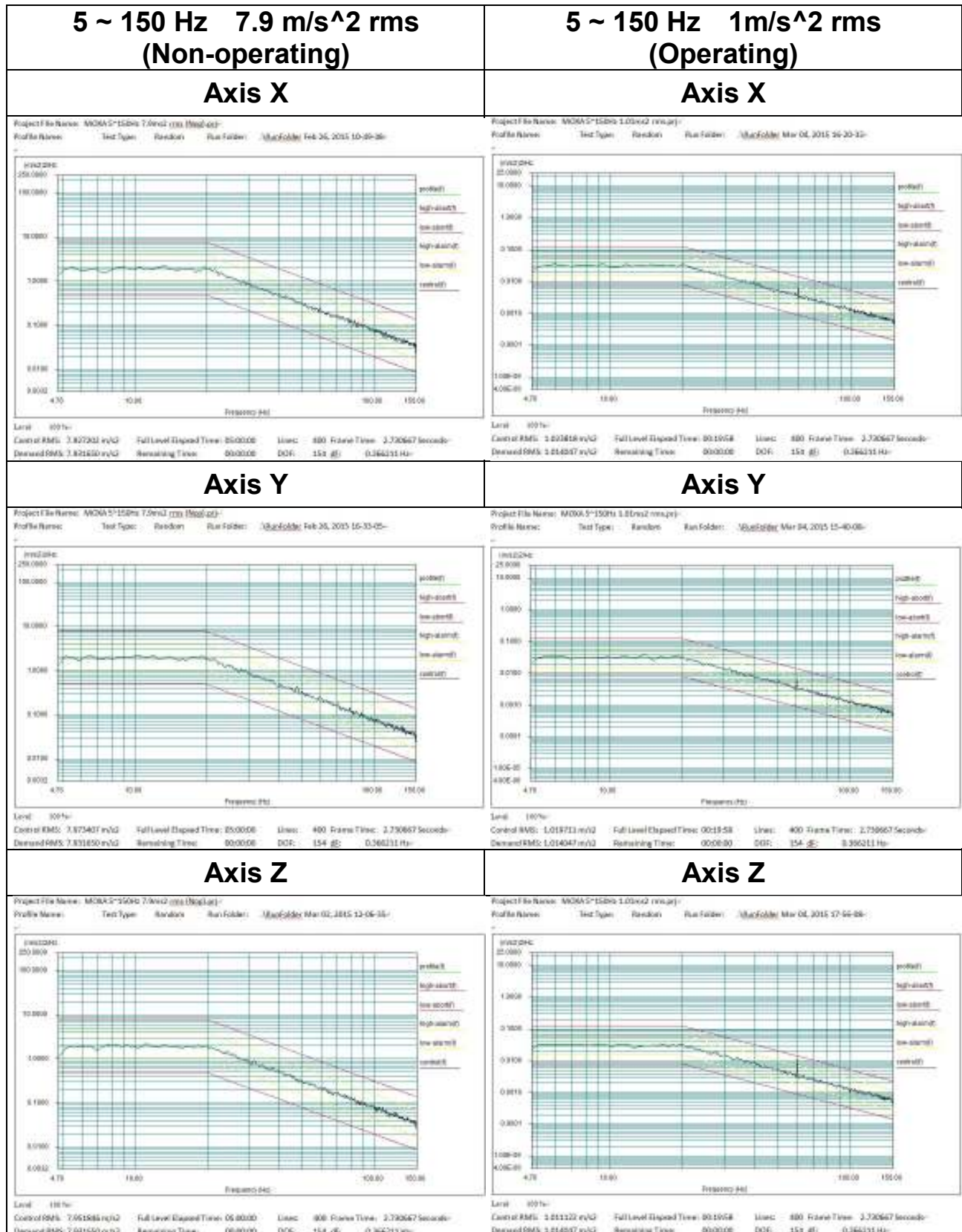
3. Test Parameter :

Parameter	Value
Conditions	Standard : EN 50155, EN / IEC 61373, Test category : Category 1, Class B (1) Simulated long-life random vibration test : Frequency : 5 ~ 150 Hz Acceleration : 7.9m/s ² rms P.S.D : 1.857 (m/s ²) ² /Hz (5 Hz to 20Hz) -6dB/oct (20 Hz to 150 Hz) Test Axis : X, Y, Z axis Test Time : 5 hrs (Each axis) Total Test Time : 15 hrs (2) Performance random vibration test : Frequency : 5 ~ 150 Hz Acceleration : 1.0 m/s ² rms P.S.D : 0.0298 (m/s ²) ² /Hz (5 Hz to 20Hz) -6dB/oct (20 Hz to 150 Hz) Test Axis : X, Y, Z axis Test Time : 20 mins (Each axis) Total Time : 1 hr
Sample status	(1) Non-Operating (2) Operating
Checks , measurements	1. Functional Check: The functional check was carried out before, during and after the vibration test. 2. Visual Inspection: The visual inspection was carried out before and after the vibration test.

4. Test Photograph :

Random vibration test (Non-Operating)	Random vibration test (Operating)
Axis X	Axis X
	
Axis Y	Axis Y
	
Axis Z	Axis Z
	

5. Vibration Test Frequency Curve :



6. The Acceptance Requirements :

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks , measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	PASS	PASS
Visual inspection	Refer to QA-W-010/Defect Inspection Criterion	OK	N/A	PASS
Remark				

Shock Test

1. Test Date & Instruments :

Test Date	2015/03/04 ~ 2015/03/06		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Vibration Tester	KING DESIGN	KD-9363EM-1000F2K-50N250 / NX108226200	2015/07/11
Controller	DACTRON	LASER USB / 11812803	2015/07/11
Control Accelerometer	WILCOXON RESEARCH	WR-784A / 28972	2015/07/11

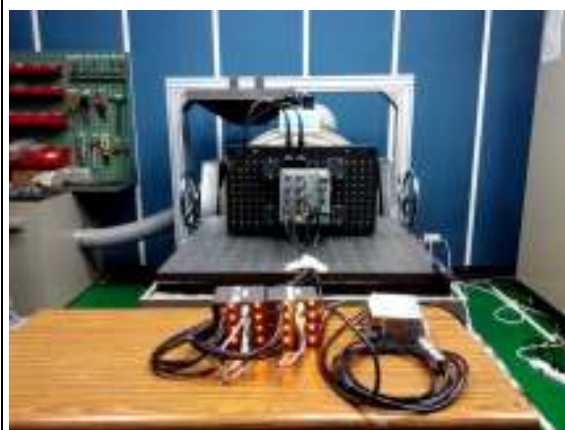
2. Sample Configuration & Quantity Under Test :

Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Engineering Sample
Total Quantity	1 Units
Sample S/N	TN-5510A-8PoE-2GLSX-ODC-WV-T -04

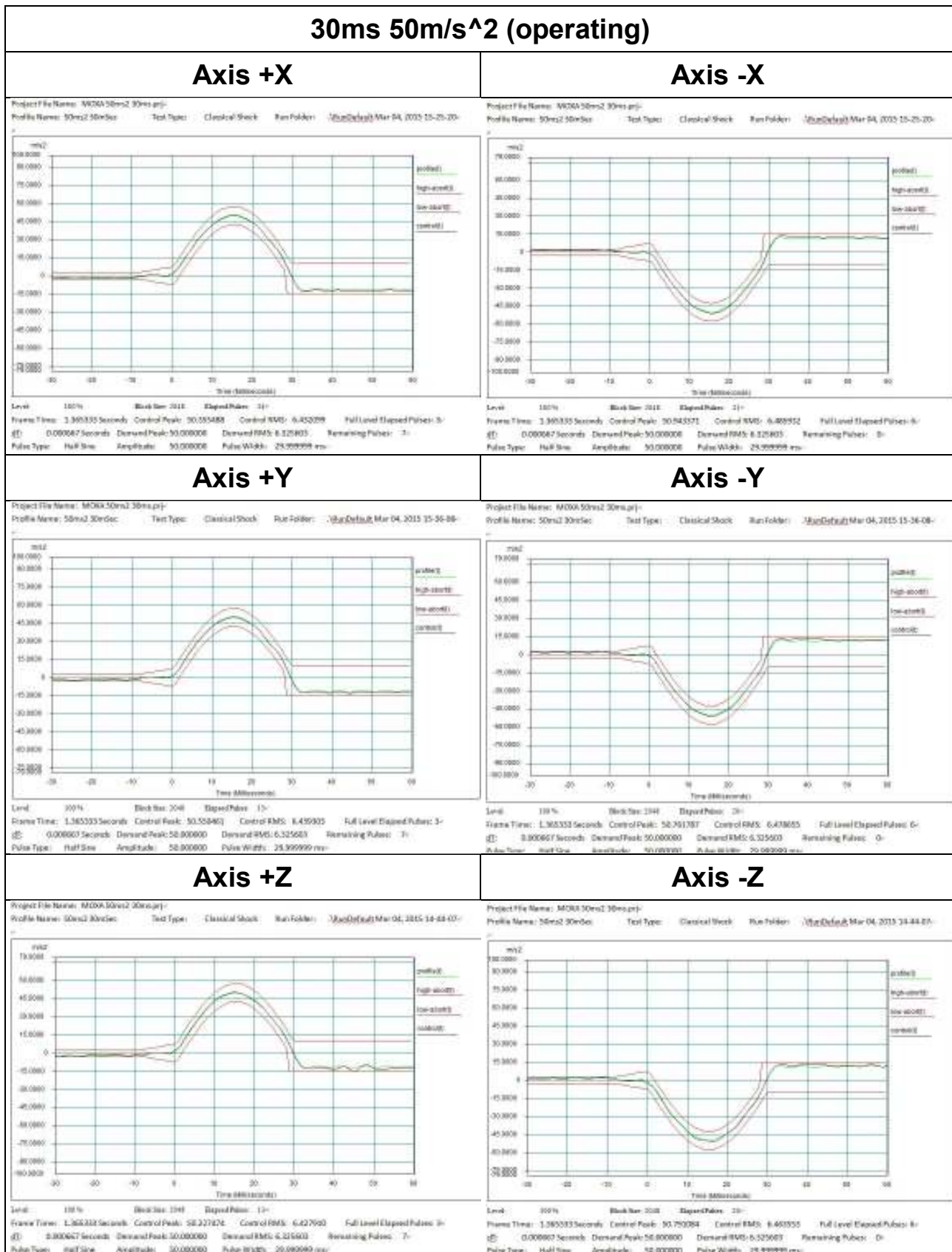
3. Test Parameter :

Parameter	Value
Conditions	Standard : EN 50155, EN / IEC 61373, Test category : Category 1, Class B Half Sine Wave : Acceleration : 50 m/s ² Duration Time: 30 ms Test Axis : ±X, ±Y, ±Z Test Times : 3 shocks each axis Total Test Times : 18
Sample status	Operating
Checks , measurements	1. Functional check: The functional check was carried out before, during and after the shock test. 2. Visual inspection: The visual inspection was carried out before and after the shock test.

4. Test Photograph :

Shock Test (Operating)**Axis $\pm X$** **Axis $\pm Y$** **Axis $\pm Z$** 

5. Test Frequency Curve :



6. The Acceptance Requirements :

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance

7. Test Result : PASS

Item	Spec.	Checks , measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	PASS	PASS
Visual inspection	Refer to QA-W-010 / Defect Inspection Criterion	OK	N/A	PASS
Remark				

Package Vibration & Drop Test

1. Test Date & Instruments :

Test Date	2015/06/01 ~ 2015/06/03		
Instrument	Manufacturer	Model / Serial No.	Next Cal. Date
Vibration Tester	KING DESIGN	KD-9363EM-1000F 2K-50N250 / NX108226200	2015/07/11
Controller	DACTRON	LASER USB / 11812803	2015/07/11
Control Accelerometer	WILCOXON RESEARCH	WR-784A / 28972	2015/07/11
Drop Tester	KING DESIGN	KD-128AS / NX103222001	N/A

2. Sample Configuration & Quantity Under Test :

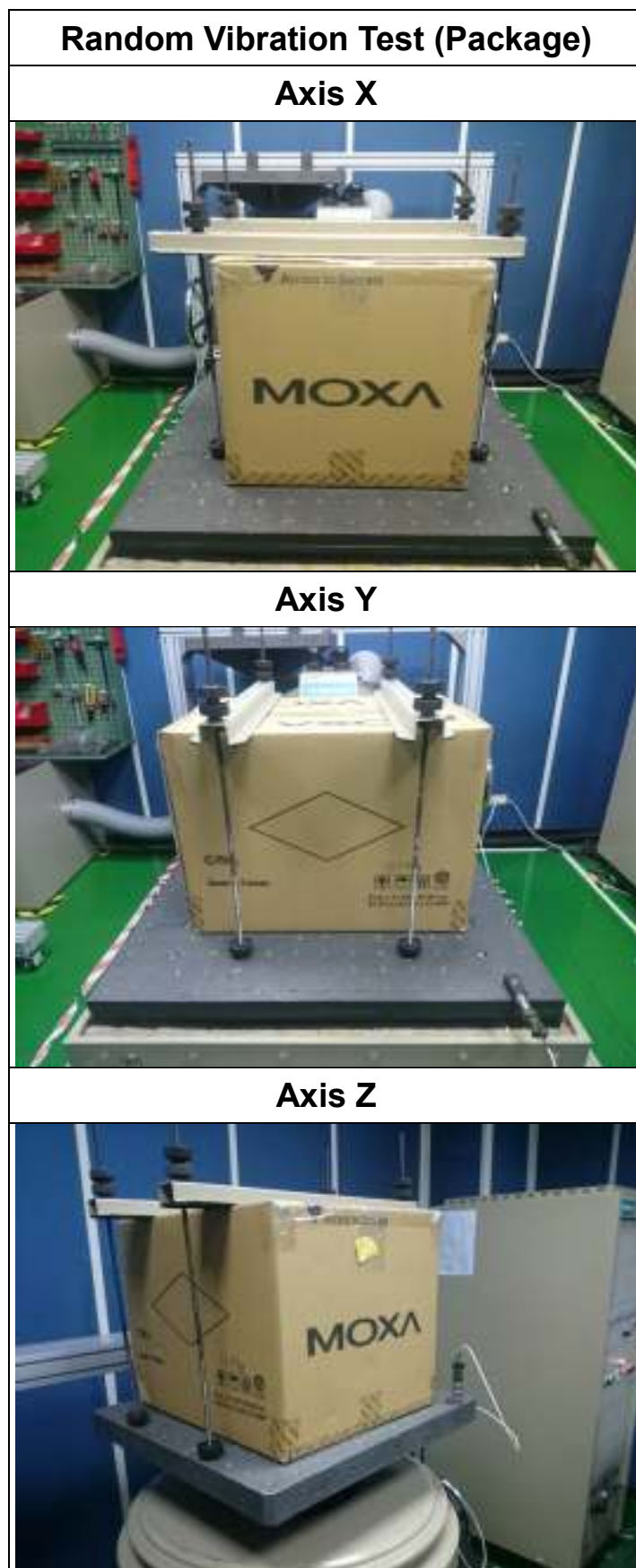
Product Model	TN-5508A-8PoE / TN-5510A-8PoE Series
Sample Source	Finished Product
Total Quantity	3 Units
Sample S/N	TN-5510A-8PoE-2GTXPB-WV-T-01-F TN-5510A-8PoE-2GTXPB-WV-T-02-F TN-5510A-8PoE-2GTXPB-WV-T-03-F

3. Test Parameter :**Vibration**

Parameter	Value
Conditions	Standard : IEC 60068-2-64 Random Wave : Frequency : 5 ~ 500 Hz Accelerate : 3 g rms P.S.D : 0.018 g ² /Hz Test Axis : X, Y, Z Test Time : 1 hr (Each axis) Total Test Time: 3 hrs
Sample status	Non-Operating
Checks , measurements	1. Functional check: The functional check was carried out before and after the package vibration test. 2. Visual inspection: The visual inspection was carried out before and after the package vibration test.

Drop

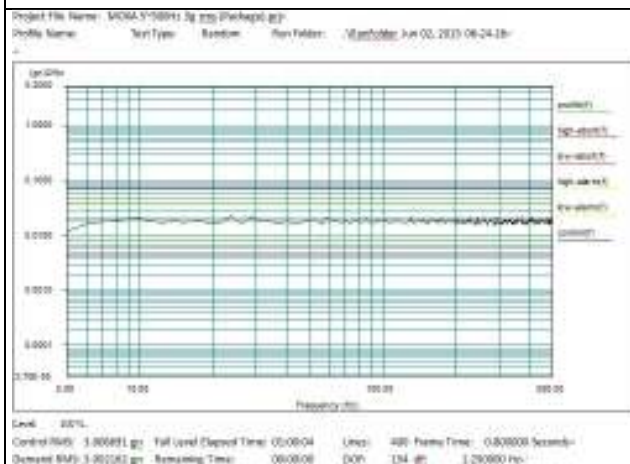
Parameter	Value
Conditions	Standard : IEC 60068-2-32, ISTA-2A One Corner Phase : Three Edges Six Faces Height : 100 cm Package Weight : 13.17 Kg Package Dimension : 518 x 418 x 405 (mm)
Sample status	Non-Operating
Checks , measurements	1. Functional check: The functional check was carried out before and after the package drop test. 2. Visual inspection: The visual inspection was carried out before and after the package drop test.

4. Vibration Test Photograph :

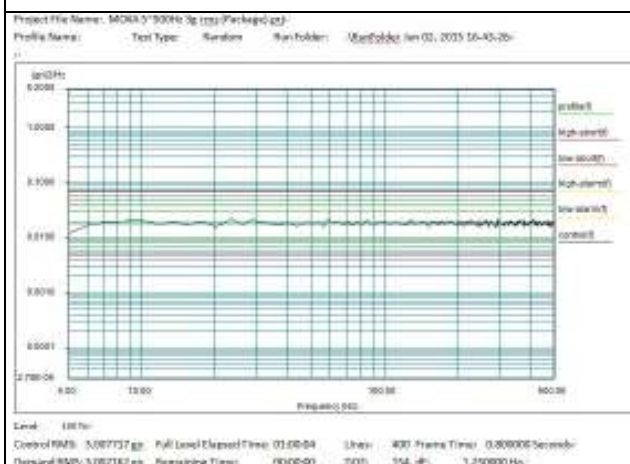
5. Vibration Test Frequency Curve :

3 ~ 100 Hz 1 g rms (Package)

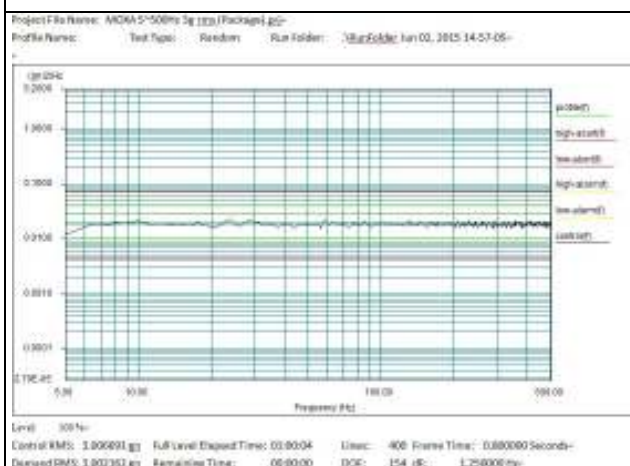
Axis X



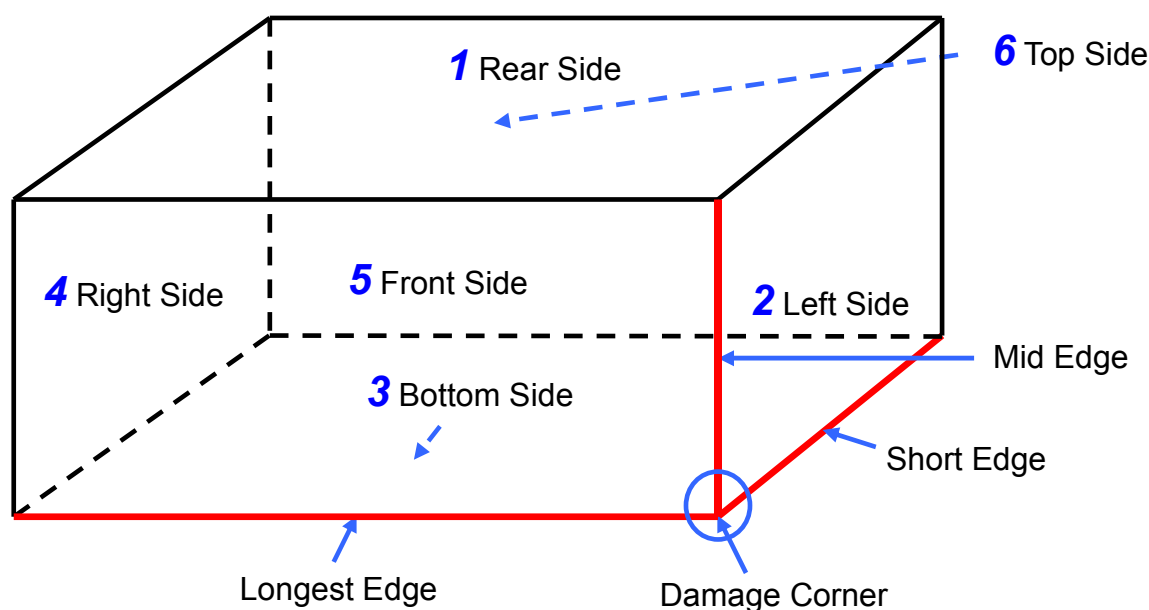
Axis Y



Axis Z



6. Drop Test Drawing :



7. Drop Test Sequence :

No.	Orientation	Specific corner, edge or face
a	Corner	most fragile face-3 corner
b	Edge	shortest edge radiating from the corner tested
c	Edge	next longest edge radiating from the corner tested
d	Edge	longest edge radiating from the corner tested
e	Face	one of the smallest faces
f	Face	opposite small face
g	Face	one of the medium faces
h	Face	opposite medium face
i	Face	one of the largest faces
j	Face	opposite large face

8. Drop Test Photograph :

Package	Package	Corner
		
Three Edges		
		
Six Faces		
		
		

9. The Acceptance Requirements:

- a) no failure or damage shall occur
- b) the functional check shall not show any failure or damage nor any results which are beyond the specified tolerance⁴

10. Test Result : PASS

Item	Spec.	Checks , measurements		
		Before	During	After
Functional check	Refer to Hardware engineering specification	OK	N/A	PASS
Visual inspection	Refer to QA-W-010/Defect Inspection Criterion	OK	N/A	PASS
Remark				

IP 54 Test

1. Test Date & Instruments & steps :

Please refer to the following SGS IP54 Test Report

Test Date	2015/05/11 ~ 2015/05/13
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2. The Acceptance Requirements:

IP5X : No dust into the enclosure.

IPX4 : No water into the enclosure.

3. Test Result : **PASS**

Item	Spec.	Checks , measurements		
		Before	During	After
No dust into the enclosure.	IEC 60529 Ed.2.2 : 2013	OK	N/A	PASS
No water into the enclosure.	IEC 60529 Ed.2.2 : 2013	OK	N/A	PASS
Functional check	Refer to Hardware engineering specification	OK	N/A	PASS
Visual inspection	Refer to QA-W-010/Defect Inspection Criterion	OK	N/A	PASS
Remark				