DESIGN VALIDATION REPORT

Design and Development Department

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Report Title : KBox A101 Temperature Test Report

This Validation Report Prepared by KONTRON ASIA PACIFIC DESIGN Sdn Bhd for *<KEU>*

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REVISION HISTORY

Rev	Change Number/Description	Date	Change Originator
1.0	Initial Revision	6.5.2014	Shahtishwaren

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2 Introduction

2.1 Executive Summary

The tested sample fully complies with the requirements set forth in

- IEC 60068-2-1
- IEC 60068-2-2
- IEC 60068-2-14

2.2 General, Purpose and objective

This document describes the environmental test procedures, test assembly and device under test (DUT) with the affiliated results and photographs.

2.3 Terminology, Definitions and Abbreviations

DUT Device under test
HDD Hard disk drive
OS Operating system
PSU Power supply
TDP Thermal Design Power

3 Performed tests and results

Test overview

No	Test	Parameters	Start Temp	End Temp	Duration
1	Low Temperature, Operating	Temperature:	-10°C	-10°C	16H
2	High Temperature, Operating	Temperature:	60°C	60°C	16H
3	Change of Temperature, Operating	Temperature:	-10°C	60°C	48H

No	Test	Results	Remark
1	Low Temperature, Operating	PASS	The complete DUT works as designed during and after the test.
2	High Temperature, Operating	PASS	The complete DUT works as designed during and after the test.
3	Change of Temperature, Operating	PASS	The complete DUT works as designed during and after the test.

4 Configuration

4.1 Test assembly

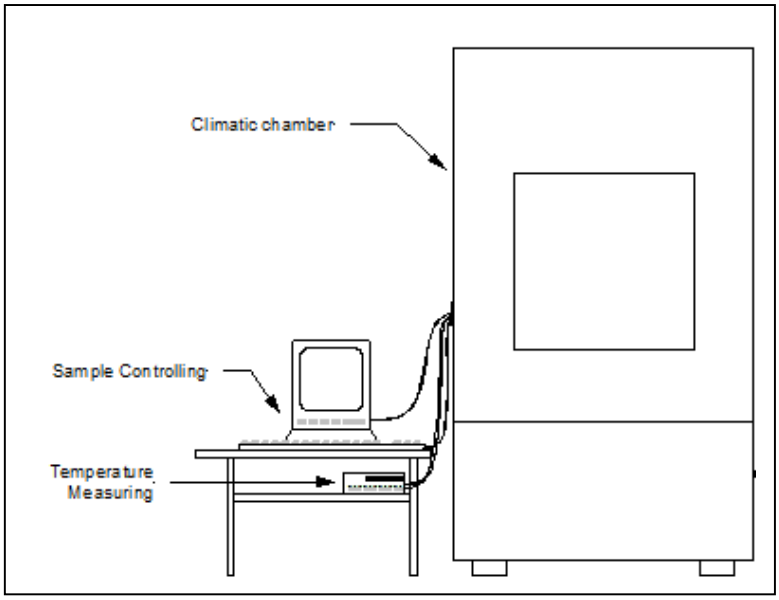

Figure 1: Test assembly

4.2 Test measurement equipment

Component	Model	Manufacturer	Ser No	Cal. Date
Climatic chamber	SE-600-10-10	Thermotron	34315	28.4.2015
Measurement module	34970A	Agilent	MY44043308	18.3.2015
20 Channel Multiplexer	34901A	Agilent	MY41026121	18.3.2015
Test software	BurnIn TestV7.1 Pro SIW	Passmark	-	-

4.3 Device under Test

Name	KBox A-101
Part number	2-A0CR-2001
Product Number	483710148
Hardware	CPU: Intel Atom D2550 1.86GHz MB: B749 Memory: 2GB DDR3-SODIMM Ethernet: 10/100/1000 Mbps USB: 4x Cooling: Passive/Fan-less Power: 24V DC IN
Software	Bios: American Megatrends Bios version: 4.6.5.3 OS: Win 7

Interfaces

Interface	Attached devices
Power In	Power supply, 24V
Display Port	Display via DP cable
USB	Mouse, Keyboard
LAN	LAN cable

4.4 Sensor Positions

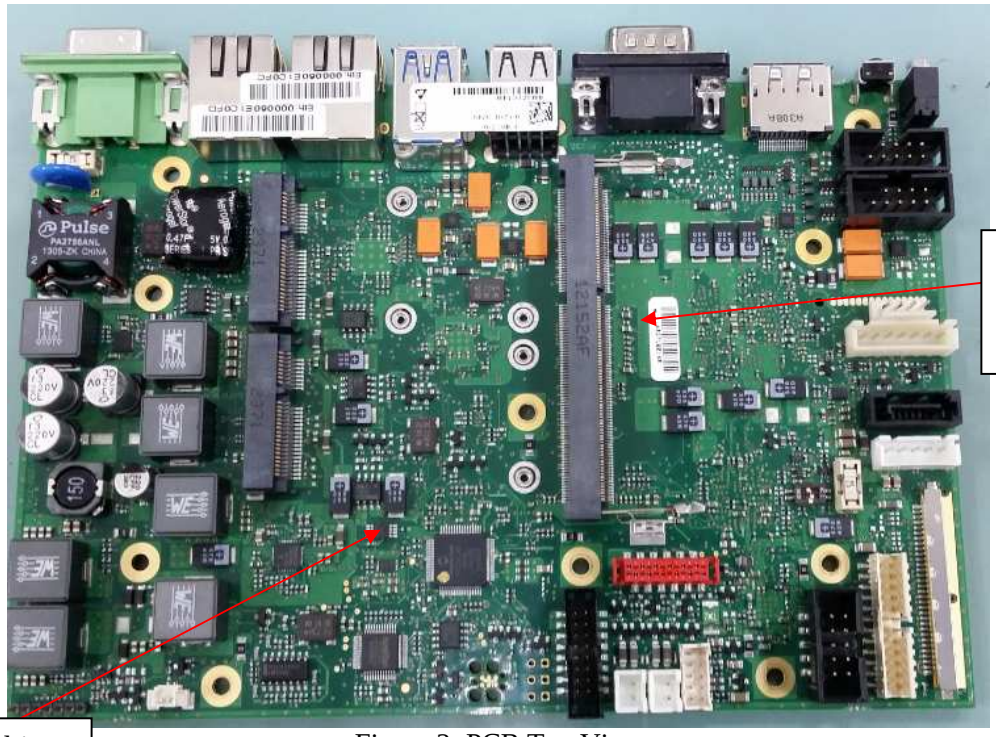

Figure 2: PCB Top View

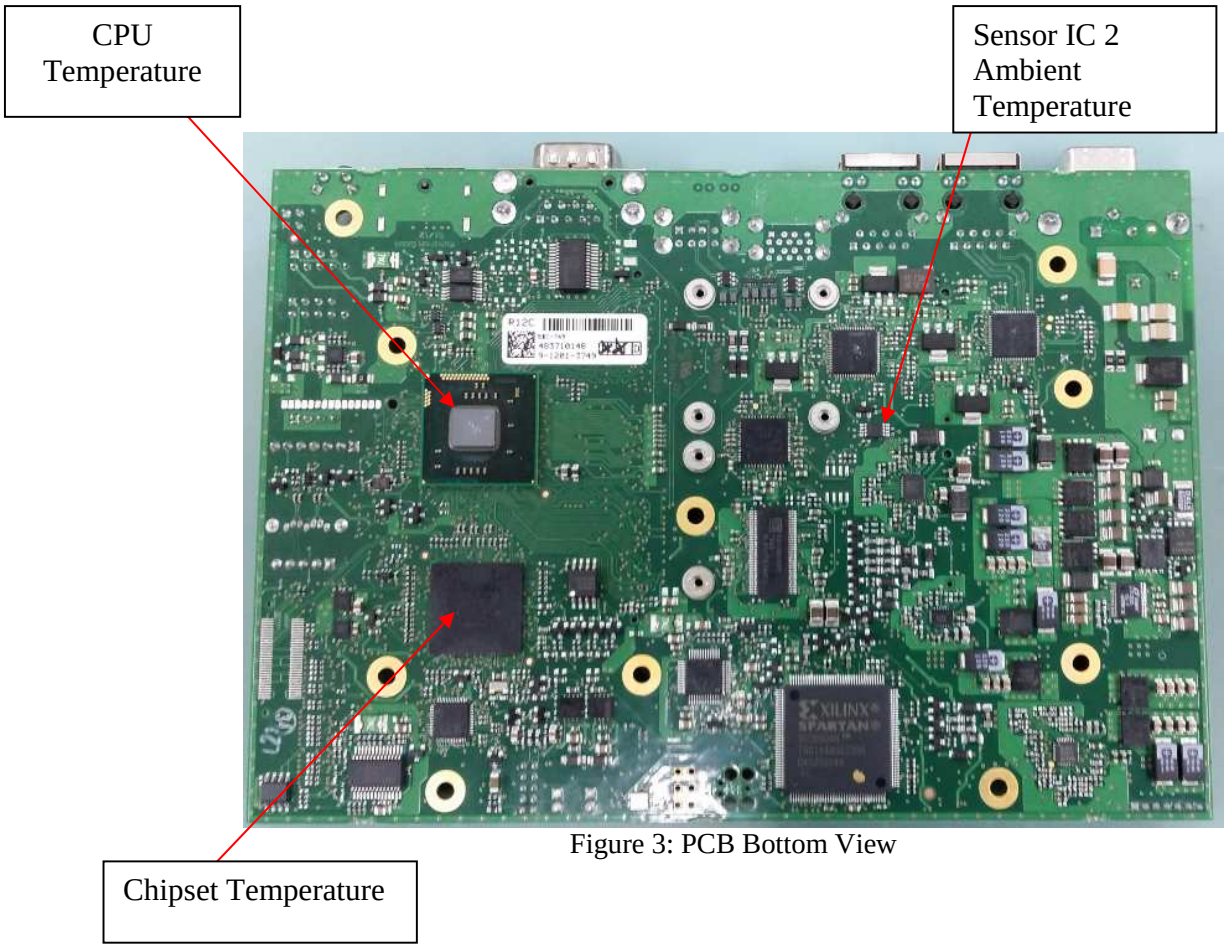

Figure 3: PCB Bottom View

Sensor No	Sensor Position
1	CPU
2	Chipset
3	Memory
4	Memory Ambient Temperature
5	HDD
6	HDD Ambient Temperature
7	Sensor IC 1
8	Sensor IC 2
9	Heat Sink
10	Ambient Temperature Inside DUT
11	Chamber Ambient Temperature
12	Chamber Ambient Temperature

4.5 Test programs
4.5.1 BurnIn Test(v.7.1 Pro)

Preferences

Menu	Configuration
USB	Max. number of USB ports=4
LAN	Max. number of LAN ports=2
CPU	Intel Atom D2550

Tests selected

Test	Configuration
CPU	50%
RAM	50%
2D Graphics	50%
3D Graphics	50%
Ethernet	50%

5 Test Procedures and Results
5.1 Low Temperature, Operating

Pre-test parameter

Parameter	Values (References)	Results	Status
Checks, measurements	Visual inspection		
	BurnIn Test	 -10DegBIT_log_140424_115808.zip	PASS
	SIW	 SIW_FREEWARE_UUT3-PC_20140424_1513	PASS

Test parameters

Parameter	Values (References)	Status
Conditions	Temperature: -10°C Duration (1cycle): 16h	
Sample status	Operating (Running BurnIn Test) Position: Vertical	
BurnIn Test Results	 -10DegBIT_log_14042 4_175550.zip	PASS
SIW	 SIW_FREEWARE_UUT 3-PC_20140425_1032	PASS

Post-test parameter

Parameter	Values (References)	Results	Status
Checks, measurements	Visual inspection		
	BurnIn Test	 -10DegBIT_log_14042 5_110154.zip	PASS
	SIW	 SIW_FREEWARE_UUT 3-PC_20140428_1031	PASS

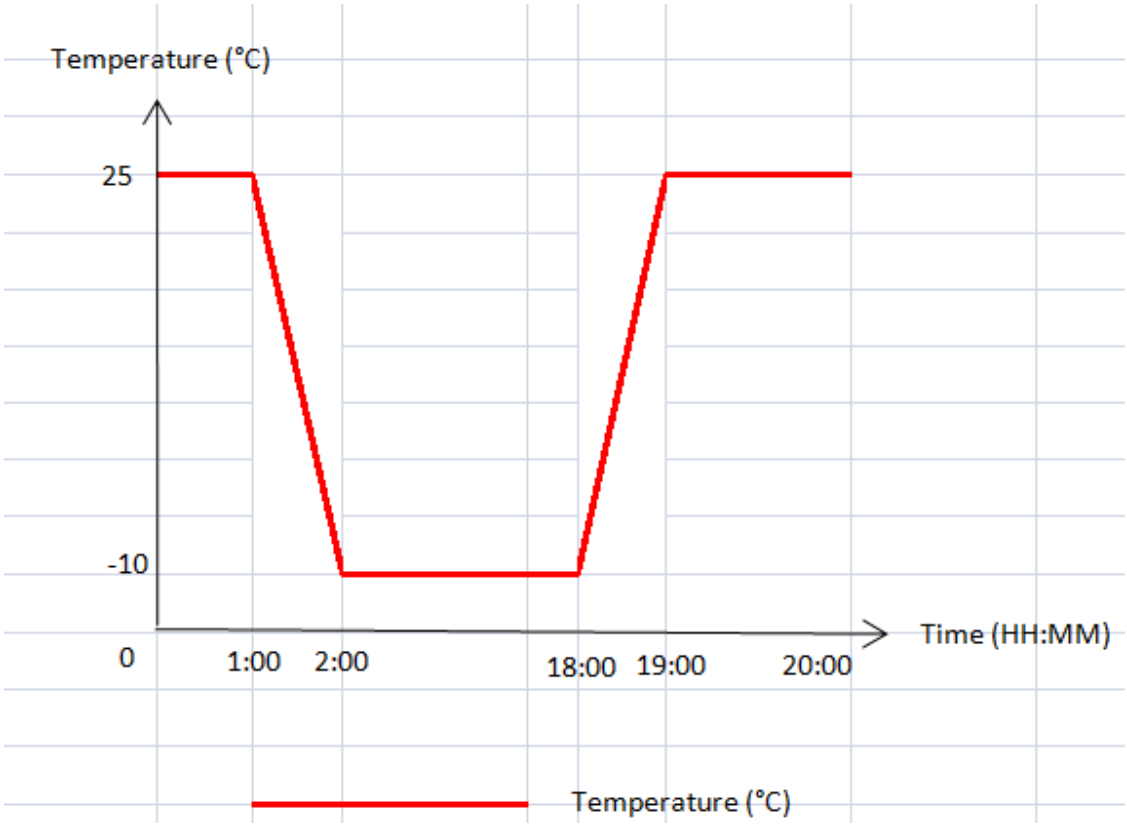

Figure 4: Temperature Diagram, Low temperature, Operating

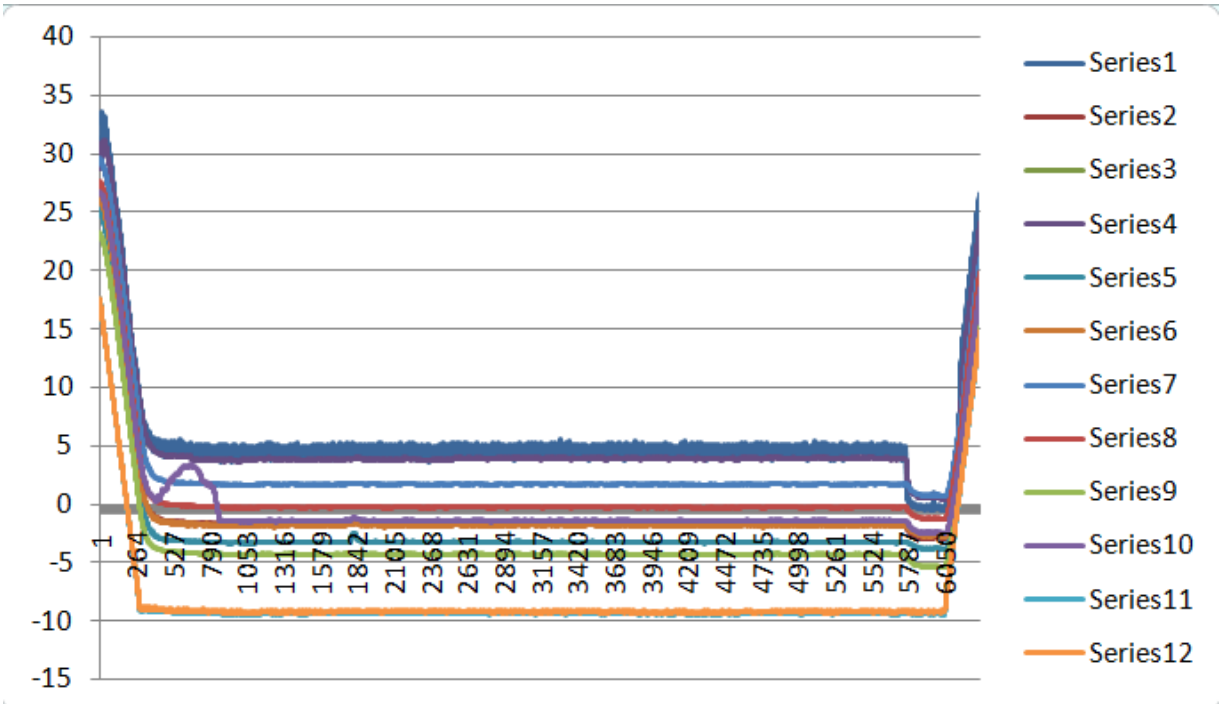

Figure 5: Measurement diagram, Low temperature, Operating

5.2 High Temperature, Operating

Pre-test parameter

Parameter	Values (References)	Results	Status
Checks, measurements	Visual inspection		
	BurnIn Test	60DegBIT_log_140428_100752.zip	PASS
	SIW	SIW_FREEWARE_UUT3-PC_20140428_1037	PASS

Test parameters

Parameter	Values (References)	Status
Conditions	Temperature: 60°C Duration (1cycle): 16h	
Sample status	Operating (Running BurnIn Test) Position: Vertical	
BurnIn Test Results	 60DegBIT_log_14042 8_110939.zip	PASS
SIW	 SIW_FREEWARE_UUT 3-PC_20140429_1038	PASS

Post-test parameter

Parameter	Values (References)	Results	Status
Checks, measurements	Visual inspection		
	BurnIn Test	 60DegBIT_log_14042 9_073721.zip	PASS
	SIW	 SIW_FREEWARE_UUT3-PC_20140429_103657.zip	PASS

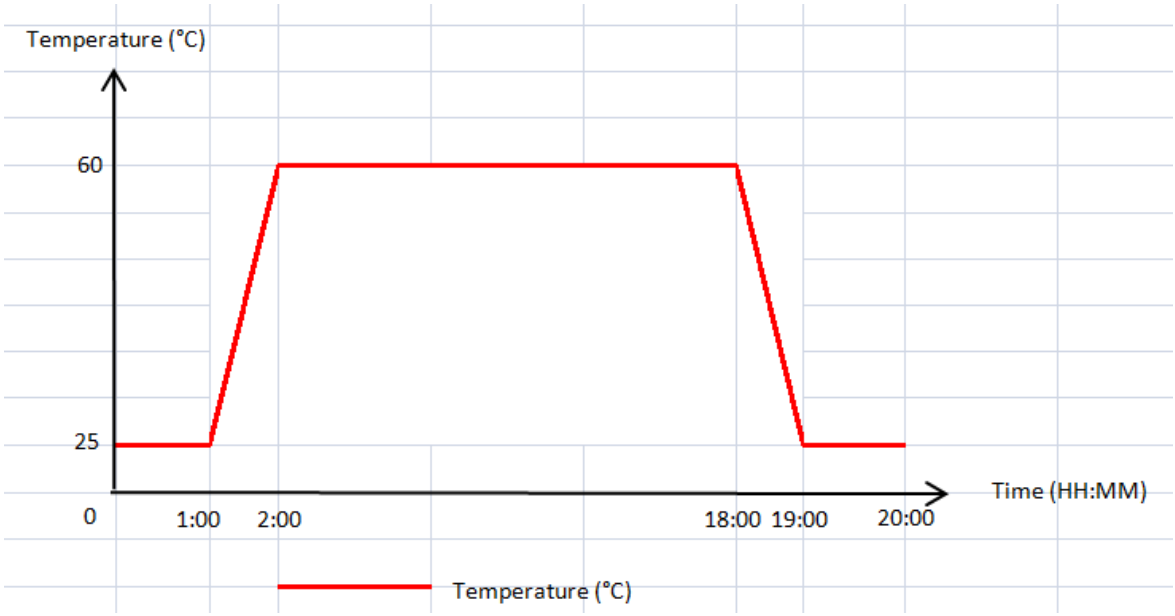

Figure 6: Temperature Diagram, High temperature, Operating

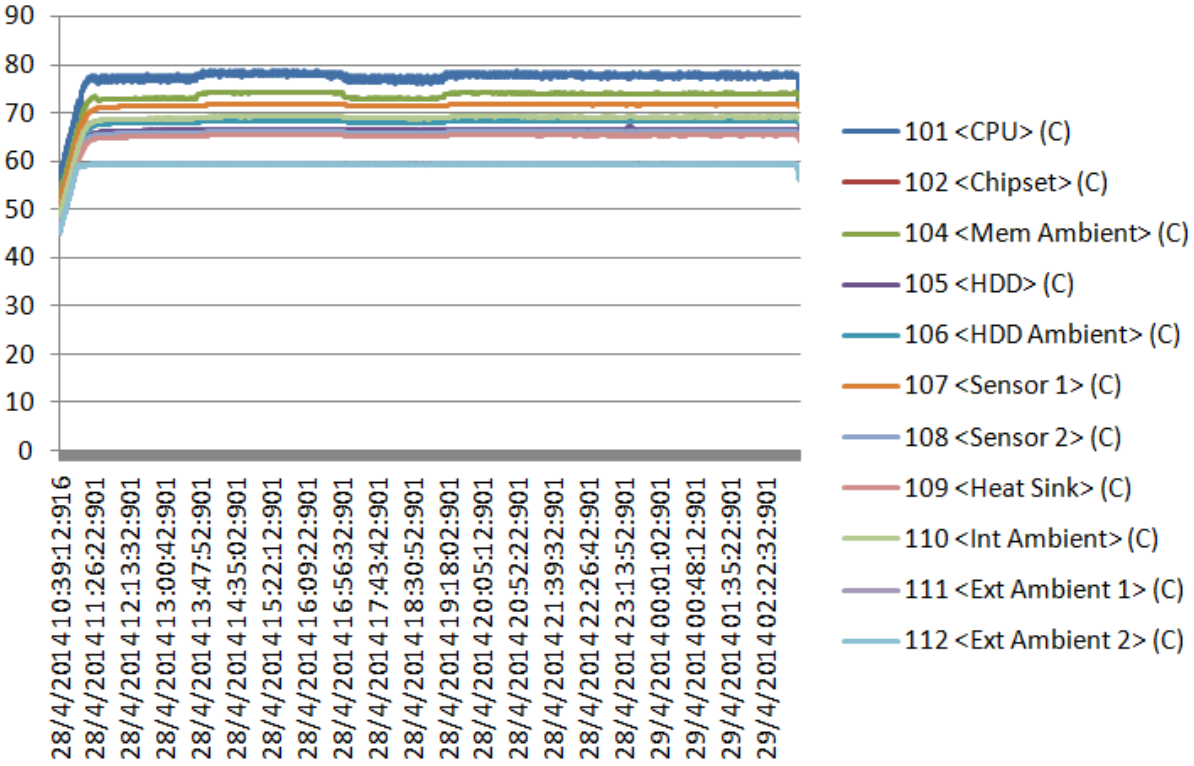

Figure 7: Measurement diagram, High temperature, Operating

Temperature chamber temperature deg C	Sensor No	Sensor Position	Maximum Sensor temperature deg C	Component maximum operating temperature deg C
60	1	CPU	78.7	100
60	2	Chipset	68.9	115
60	3	Memory	76.8	95
60	4	Memory Ambient Temperature	74.3	
60	5	HDD	67.4	70
60	6	HDD Ambient Temperature	68.5	
60	7	Sensor IC 1	71.7	125
60	8	Sensor IC 2	66.1	125
60	9	Heat Sink	65.6	
60	10	Ambient Temperature Inside DUT	69.4	
60	11	Chamber Ambient Temperature	59.6	
60	12	Chamber Ambient Temperature	59.7	

5.3 Change of temperature, Operating

Pre-test parameter

Parameter	Values (References)	Results	Status
Checks, measurements	Visual inspection		
	BurnIn Test	 HighLowBIT_log_140425_110154_PreTest.zi	PASS

	SIW	SIW_FREEWARE_UUT 3-PC_20140428_1035	PASS

Test parameters

Parameter	Values (References)	Status
Conditions	Temperature: -10°C - 60°C Duration (4cycle): 24h	
Sample status	Operating (Running BurnIn Test) Position: Vertical	
BurnIn Test Results	HighLowBIT_log_140425_172211.zip	PASS
SIW	SIW_FREEWARE_UUT 3-PC_20140426_1036	PASS

Post-test parameter

Parameter	Values (References)	Results	Status
Checks, measurements	Visual inspection		
	BurnIn Test	HighLowBIT_log_140428_075200.zip	PASS
	SIW	SIW_FREEWARE_UUT 3-PC_20140428_1034	PASS

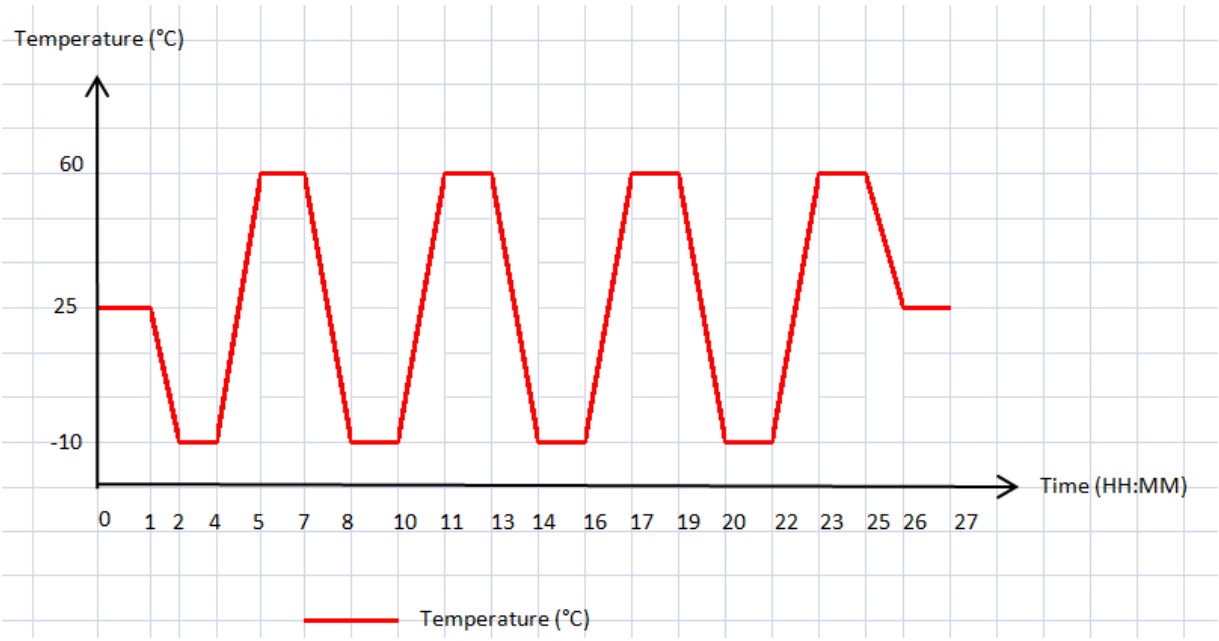

Figure 8: Temperature Diagram, Change of temperature, Operating

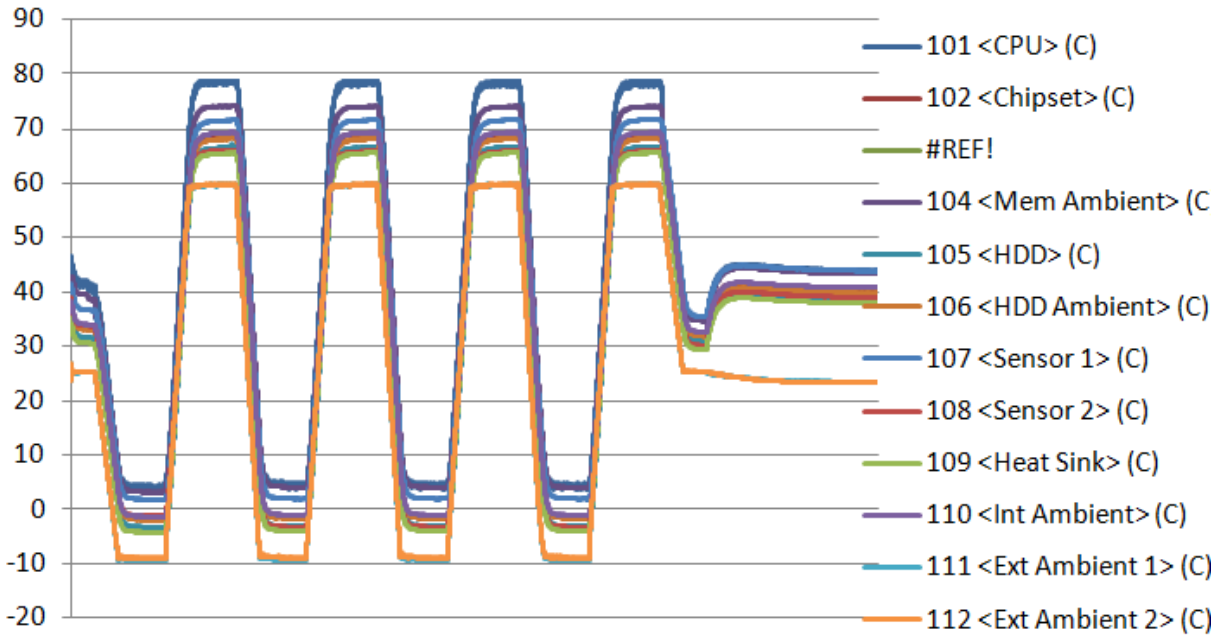

Figure 9: Measurement diagram, Change of temperature, Operating

6 Appendix

6.1 Photographs

Figure 10: Climatic chamber

Figure 11: Test assembly (Temp-Data Logger)

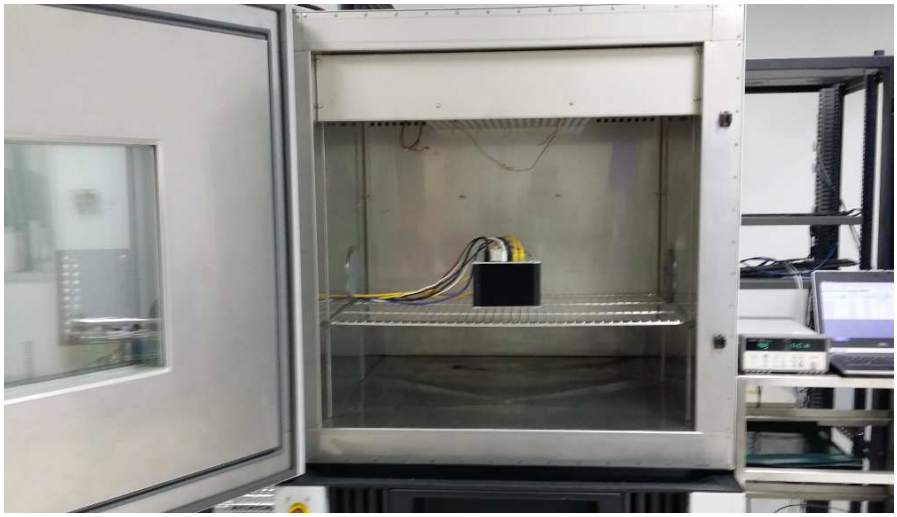

Figure 12: DUT in climatic chamber