CISPR Pre-Compliance Test Report
AIT1L

Version	1.0
Status	Baselined
Date	21-Dec-2021

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FIGURES

TABLES

1 DOCUMENT DETAILS

1.1 Document History

Version	Author		Reviewer		Approver	
	Name	Date (DD-MM-YYYY)	**Name**	**Date (DD-MMM-YYYY)**	**Name**	**Date (DD-MM-YYYY)**
Rev 0.1	Hiren Patel	23-Nov-2021	Mahesh Gohil	23-Nov-2021		
Baselined 1.0	Hiren Patel	20-Dec-2021	Mahesh Gohil	21-Dec-2021	Kalpesh Balar	21-Dec-2021

Table 1 : Document History

Version	Description of Change
Rev 0.1	First Draft created.
Baselined 1.0	Test Result updated in draft 0.2 after testing. Rev 0.2 is baselined after internal review.

Table 2 : Change Description

1.2 Definition, Acronyms and Abbreviation

Definition/ Acronym/ Abbreviation	Description
dBuV/m	Decibel-microvolt per meter
EMI	Electromagnetic Interference
CISPR	International Special Committee on Radio Interference
RE	Radiated Emission

Table 3 : Acronyms & Abbreviations

1.3 References

#	Document	Version	Remarks

Table 4 : References

2 REGULATORY VERIFICATION REQUIREMENT

2.1 Radiated Emission Test

2.1.1 Purpose

To test AIT1L device for Radiated Emissions for the CISPR part 22 class A limits

CISPR Requirements:
The EUT shall be tested as per CISPR-22 class-A Radiated emission specifications and emission shall not exceed the specifications given below.

Frequency Range (MHz)	Limit (dBuV/m) @ 3m distance	Limit (dBuV/m) @ 10m distance
30-230	50	40
230-1000	57	47

Table 5: Radiated Emission Limit Class-A

Frequency Range (MHz)	Limit (dBuV/m) @ 3m distance	Limit (dBuV/m) @ 10m distance
30-230	40	30
230-1000	47	37

Table 6: Radiated Emission Limit Class-B optional

2.1.2 Setup

Test setup requirement is as below,

a) Test equipment as per the RE standard
b) AIT1L devices- (2 pcbs)
c) Type-C to Type-A USB cable – (2 nos)
d) Ethernet straight/cross cable – to connect with Linux Laptop (2 nos)
e) 10Base T1L Harting cable (0.5m) – to connect 2 boards back-to-back
f) Linux Test Laptop – (2 nos)

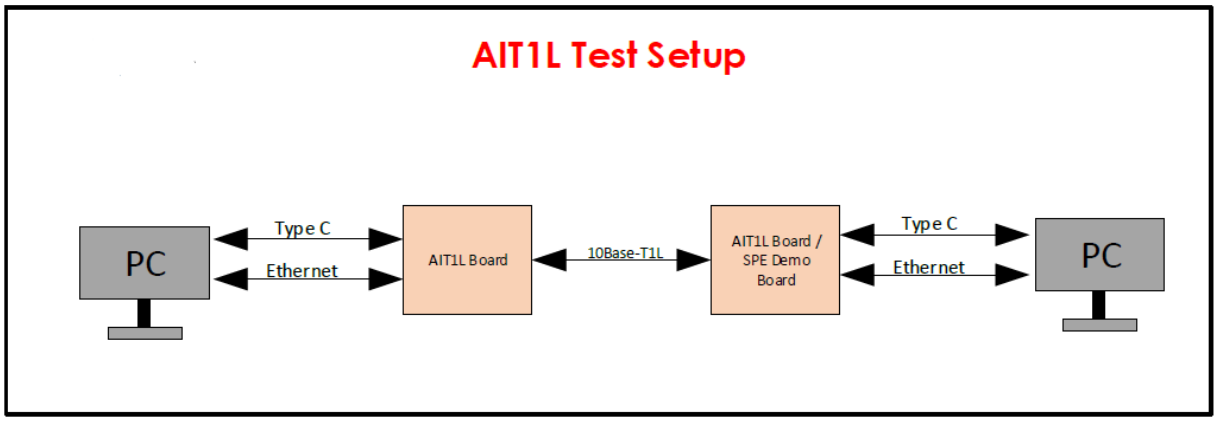
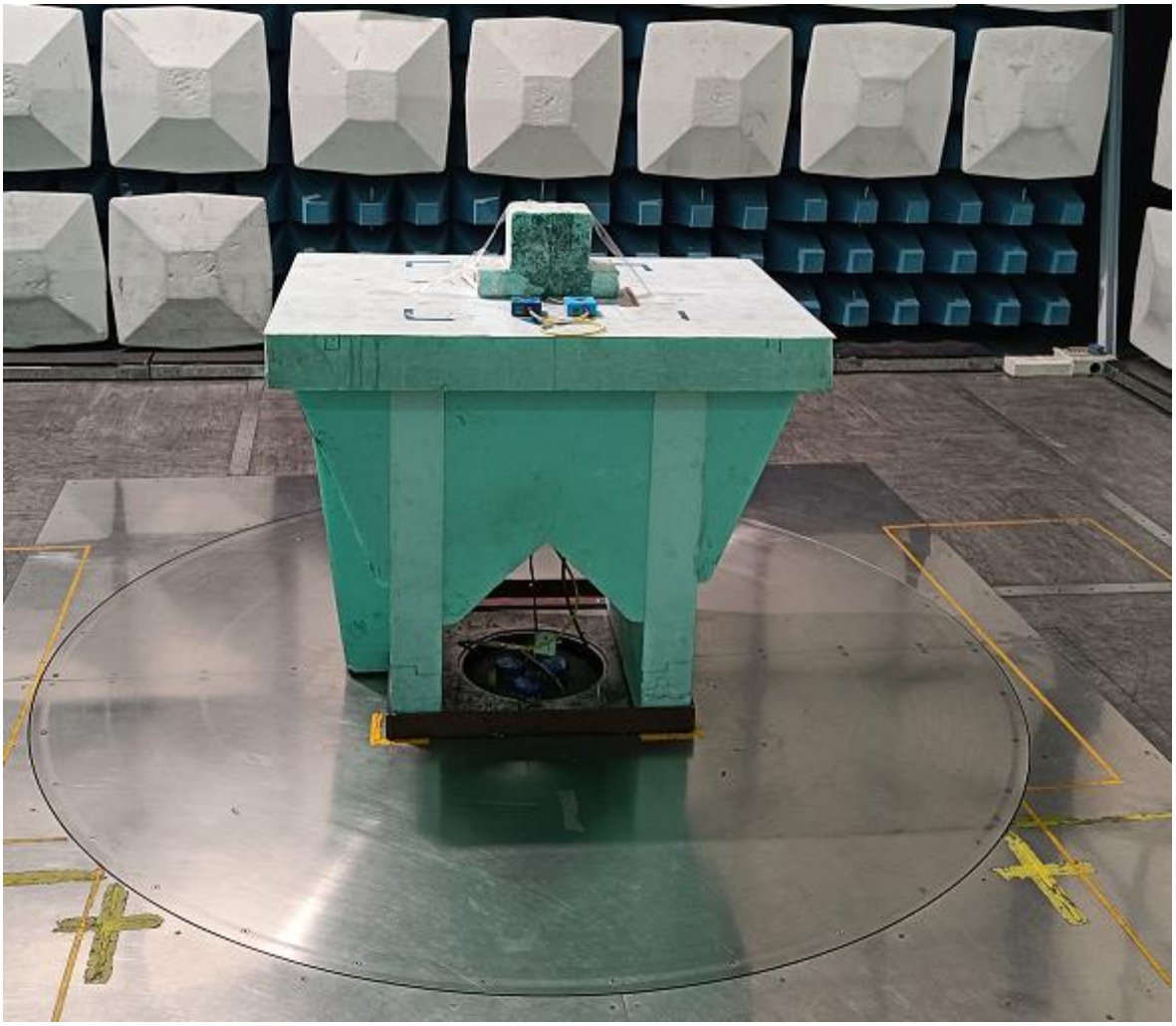


Figure 1: AIT1L Test Setup Block Diagram



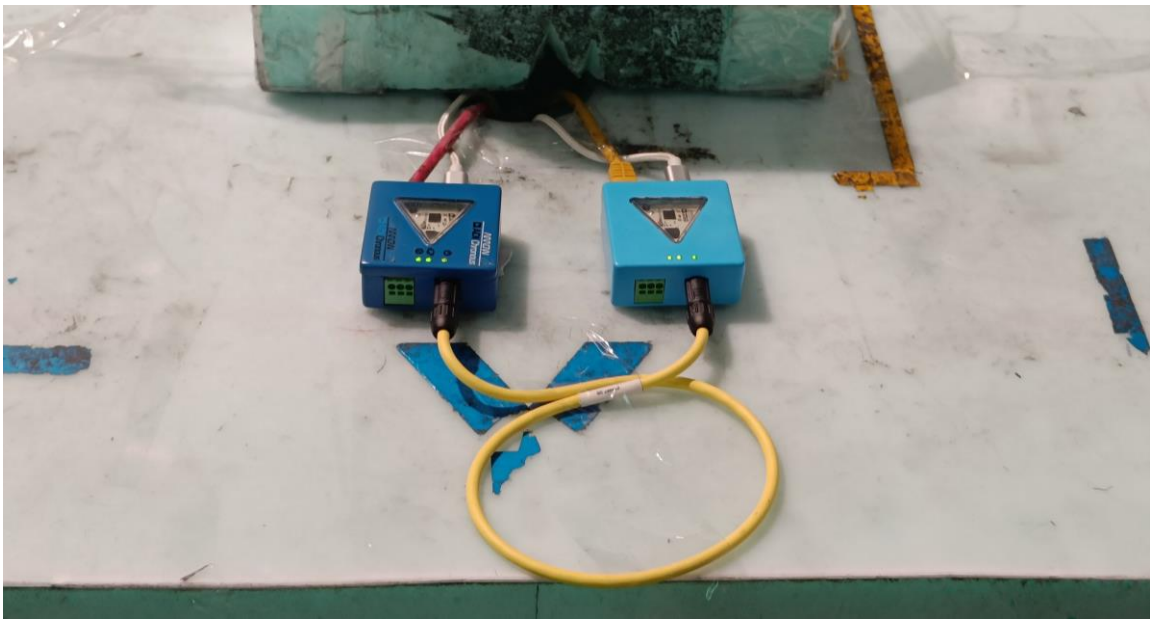


Figure 2: Test Set-up in Anechoic Chamber

2.1.3 Test Procedure

1. Connect the two AIT1L boards back-to-back using 10BaseT1L cable on Harting connectors.
2. Connect ethernet port of each AIT1L device with test laptops.
3. Connect Type-C USB port of each device with test laptops to power on the device.
4. Assign static IP address to both the test laptops.
5. Run iperf3 client/server command on both laptops.
6. Both the devices are required to be on turn the table.
7. Add the limit line in spectrum for class A and Class B.
8. Perform the scan from 30Mhz to 1GHz to see emissions from the EUT if any for both polarizations of antenna.
9. Note down the frequencies, which have high emissions.

2.1.4 Acceptance criteria

All the Radiated emissions generated by the EUT shall have a 5dB margin from limits specified above for CISPR-22 verifications.

2.1.5 Test Cases

Waveform#	Test Condition	Test Set up	Observation	Scan	Pass/Fail
1	30Mhz - 1Ghz	10BaseT1L communication over Harting connector.	-	Full Scan	Pass

Table 7: Test Results

2.1.6 Test waveform: Test with Single Pair Haring Cable at 10Base T1L Port

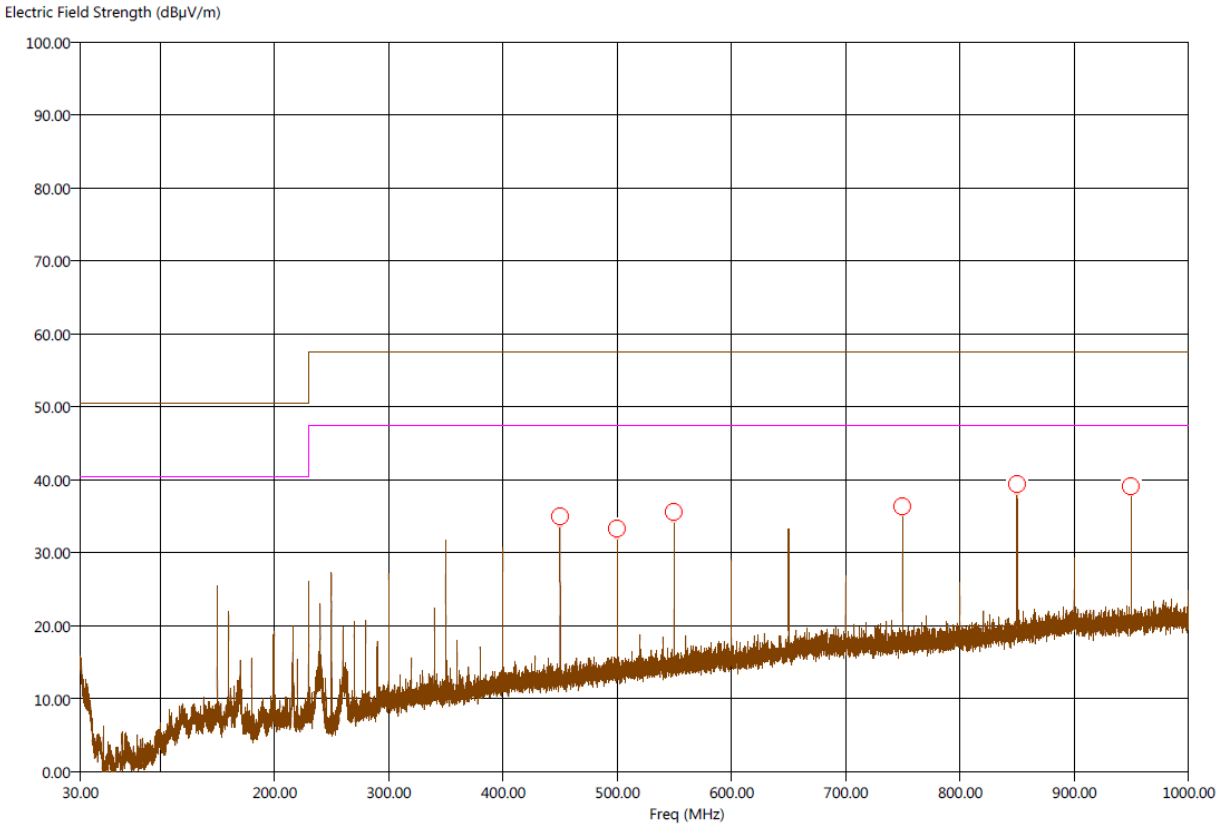


Figure 3: Test Waveform- Horizontal Scan

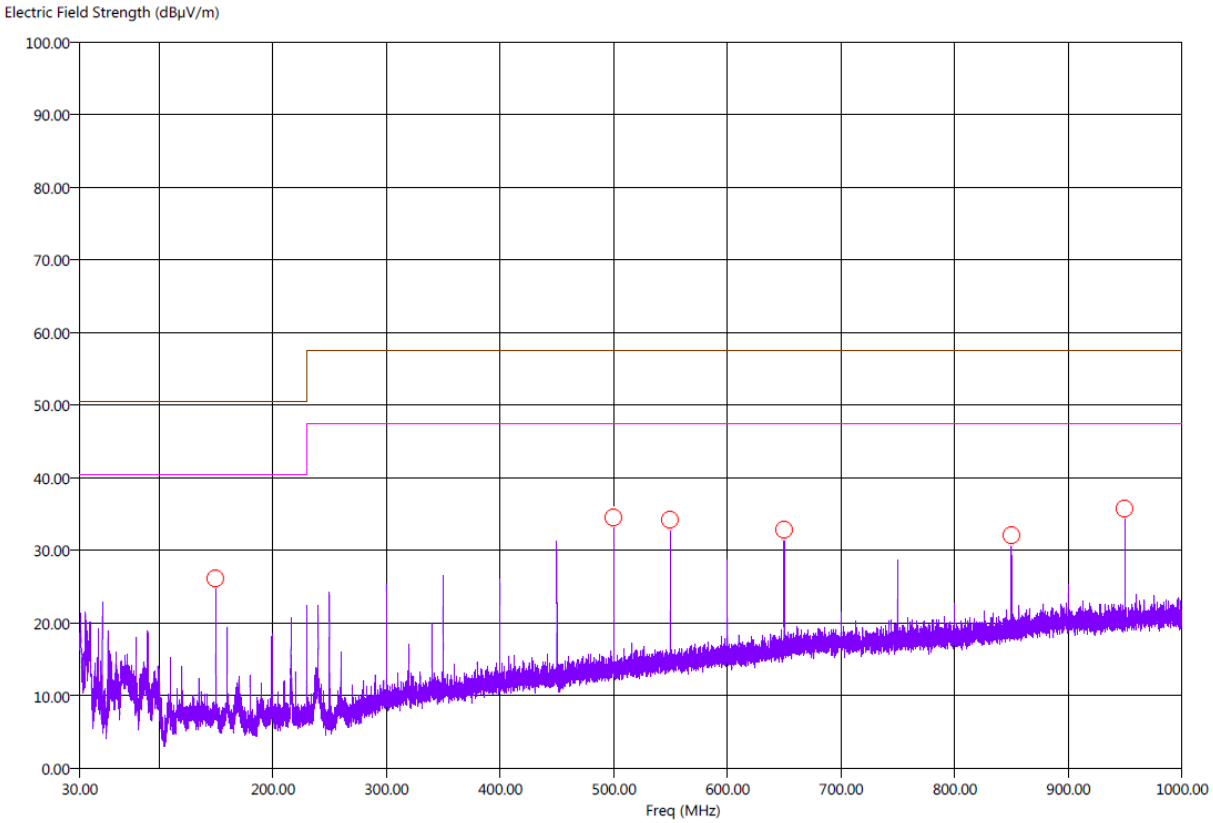


Figure 4: Test Result- Vertical Scan

2.1.7 Test Result / summary.

AIT1L EUTs are passing CISPR-22 Class-A with >18dB margin and Class-B with >8dB margin.