SYDNEY PANEL ANTENNA MDVT Report

Presented by: YJ Teoh

Date: 26DEC23 – 25JAN24

Revision: 1.0

Project Number: PRJ-22-000902852

EVERY CONNECTION COUNTS

Project Number: PRJ-22-000902852
Finish Good Number(s): L000379
Description: SYDNEY PANEL ANTENNA MDVT REPORT
Report No.: 501-161228
Report Rev.: 1.0

Testing Overview

TEST #	TEST NAME	TEST METHOD	FAILURE CRITERIA	RESULT
1	Temperature cycling	-40°C to 85°C, 2 hour soak, 2°/min ramp, 15 Cycles, ramp up from ambient at beginning of cycle.	Mechanical /Electrical failure	PASS
2	Water Ingress	Test per IEC 60529, IPx7, submerge 1 meter deep, 30 minute duration.	Mechanical /Electrical failure	PASS
3	Dust Ingress IP6x	Talc Powder, Vacuum. IP6x, Category 1, per IEC 60529	Mechanical /Electrical failure	PASS
4	Humidity	98%±4% relative humidity, 24 hour cycle, 5 cycles.	Mechanical /Electrical failure	PASS
5	Thermal Shock	-30°C to +70°C, 1 hour soak, 5°/min minimum ramp, 5 Cycles, ramp up from ambient at beginning of cycle.	Mechanical /Electrical failure	PASS
6	Corrosive Atmosphere (Salt Fog/Mist)	5% Salt Solution, alternating 24 wet/24 dry for 2 cycles (total 96 hours), 35±2°C Temperature.	Mechanical /Electrical failure	PASS
7	Vibration, Random	IEC 60068-2-64, Stationary Installation, Category 3	Mechanical /Electrical failure	PASS
8	Mechanical Shock	IEC 60068-2-27, Structural Integrity of Mountings	Mechanical /Electrical failure	PASS
9	Wind Operational	Physical loading of 0° orientation and 90° orientation, 1 minute, based on flat plate load Calculation	Mechanical /Electrical failure	PASS
10	Wind Survival	Physical loading of 0° orientation and 90° orientation, 15 second, based on flat plate load Calculation	Mechanical /Electrical failure	PASS

Testing Overview

TEST #	TEST NAME	TEST METHOD	FAILURE CRITERIA	RESULT
11	Unpackaged Drop	Drop freely from a height of 1 meter to tile floor Omni: 1 drop on top (opposite connector) end, 4 drops on side, 5 drops total.	Mechanical /Electrical failure	PASS
12	Connector Pull Test	Fix antenna and apply axial force (pull) of 20lbs on cable for a duration of 30 seconds.	Mechanical /Electrical failure	PASS
13	Impact Test	IK08, drop 500g steel ball from 1 meter vertical height. 5 Impact Energy (Joules)	Mechanical /Electrical Failure	PASS
14	UV Test	Test exposed antenna housing/surfaces to ASTM-G-155, Xenon Arc Light Source, Irradiance: 0.35W/m2 @ 340nm, Daylight-Q Filters, 120 hours	Mechanical /Electrical failure	PASS

Temperature Cycling Test

Tested By:	YJ Teoh
Compiled By:	YJ Teoh, EC Lee, WS Beh
Verified By:	YJ Teoh, EC Lee, WS Beh
Date:	27DEC23~31DEC23

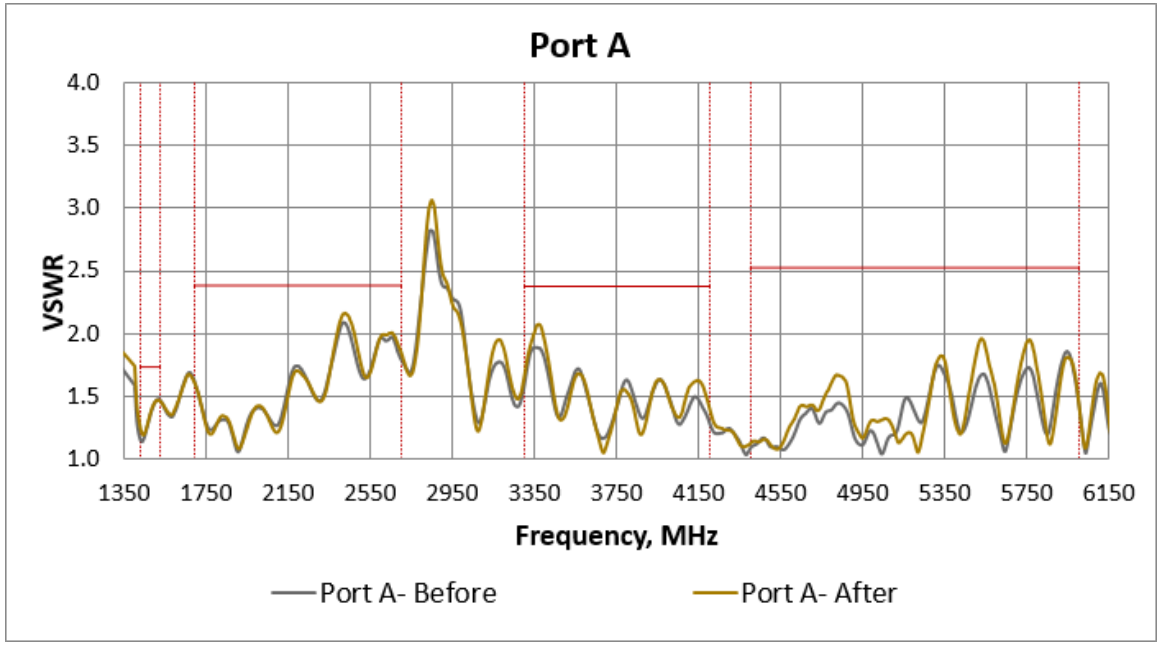
Temperature Cycling Test

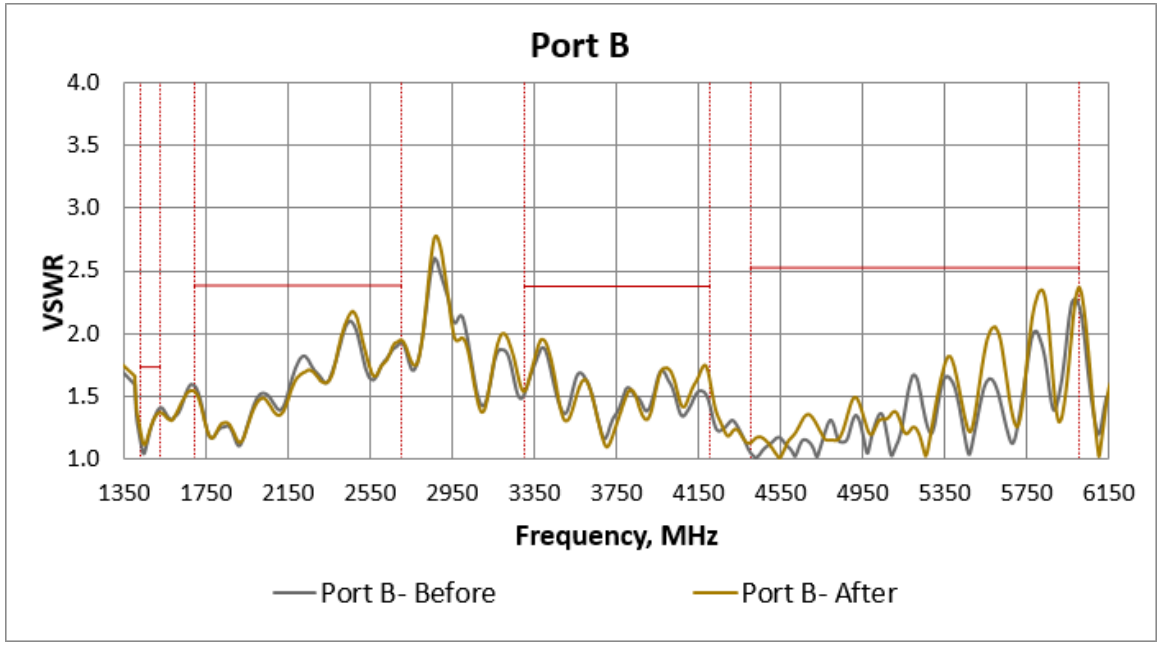
Specification:	The product shall be tested in accord with IEC 68-2-14
Test Parameter:	-40°C to 85°C, 2-hour soak
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	TE Connectivity Penang
Test Dates:	27DEC23~31DEC23
Test Equipment:	Manufacturer: Thermotron Model/ Type: SE-600
Number of Units Tested:	3
DUT label Numbers:	NF7, NF10, NF11

Temperature Cycling Test Setup

- -40°C to 85°C
- 2 hour soak
- 2°/min ramp
- 15 Cycles, ramp up from ambient at beginning of cycle.

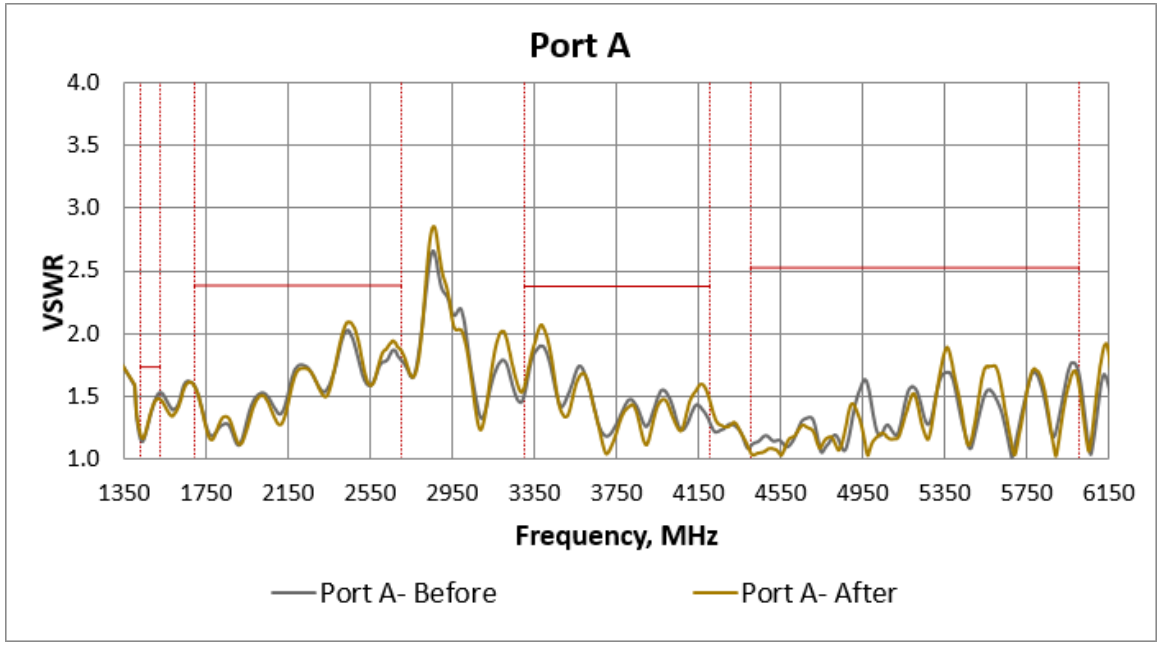
Temperature Cycling Test Results

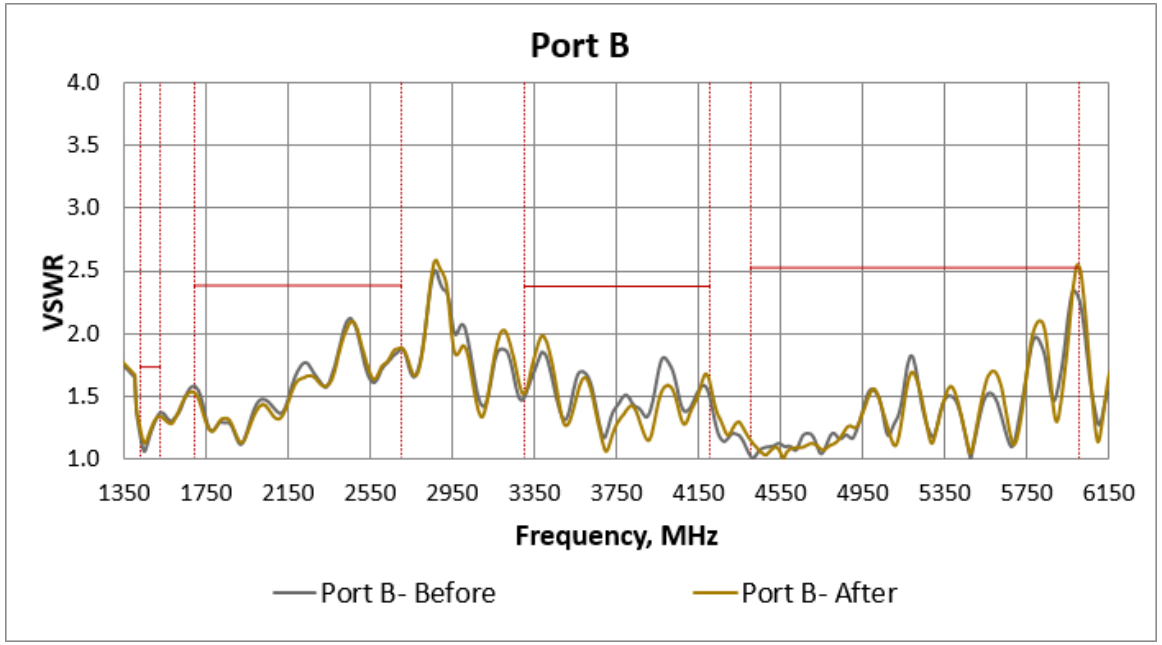




NF7

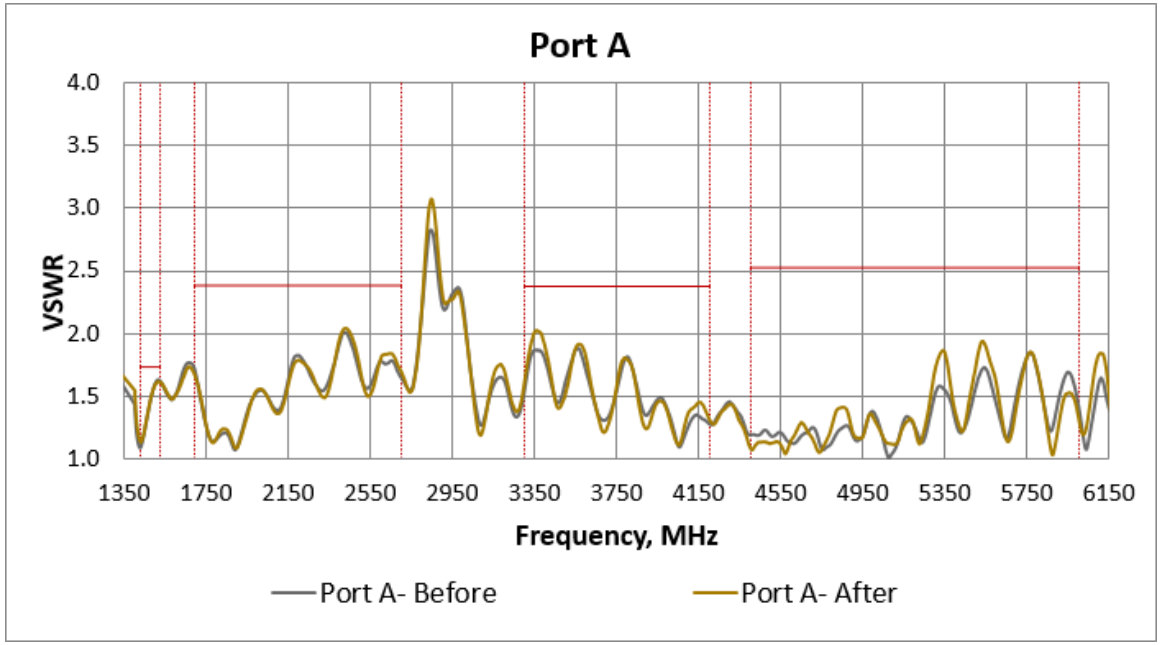
Temperature Cycling Test Results

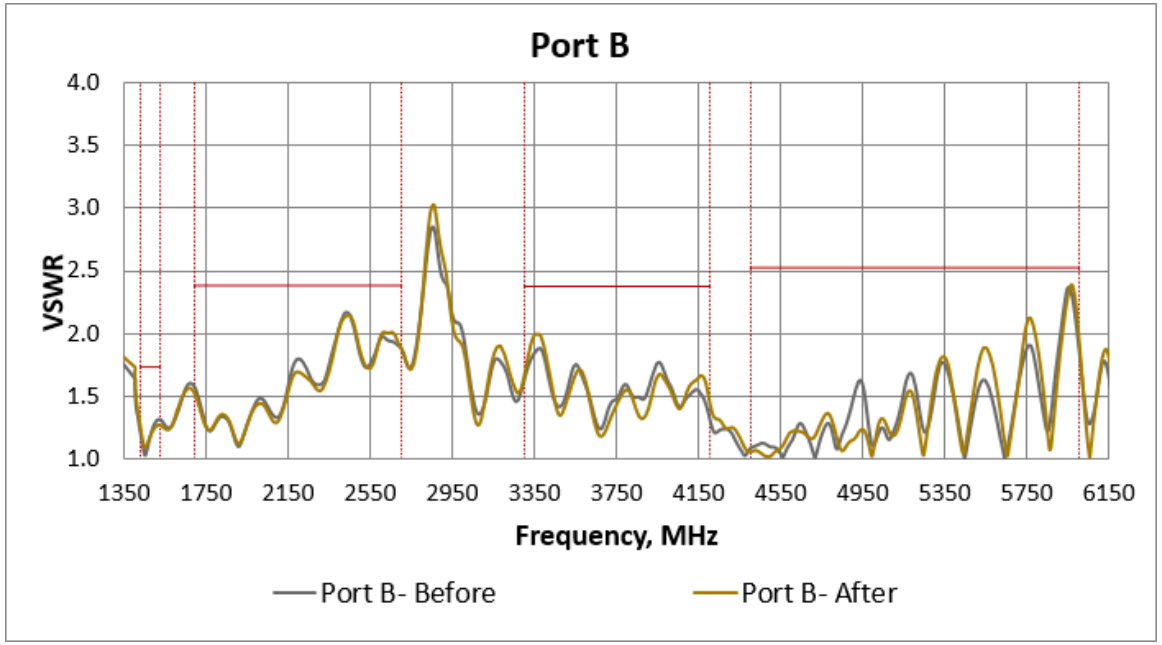




NF10

Temperature Cycling Test Results





NF11

Temperature Cycling Test Results

- Summary:

All the samples pass the Temperature Cycling Test.

Water Ingress IPX7 Test

Tested By: YJ Teoh

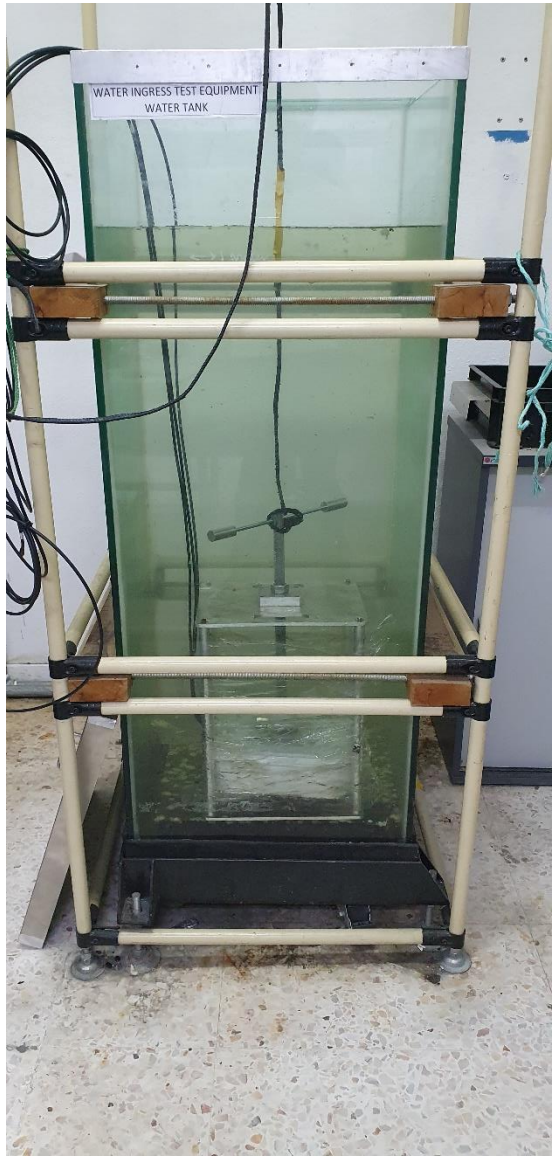
Compiled By: YJ Teoh, EC Lee, WS Beh

Verified By: YJ Teoh, EC Lee, WS Beh

Date: 04JAN24

Water Ingress IPX7 Test

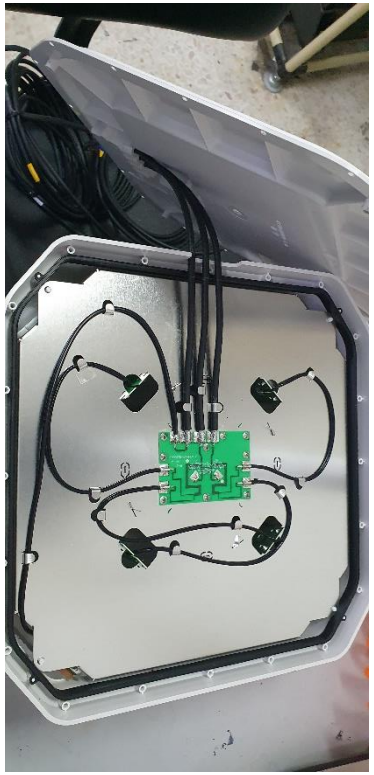
Specification:	Test per IEC 60529, IPx7
Test Parameter:	Submerge 1 meter deep, 30 minute duration.
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	TE Connectivity Penang
Test Dates:	04JAN24
Test Equipment:	Water Tank
Number of Units Tested:	3
DUT label Numbers:	M9, M10 & M11
Remarks:	



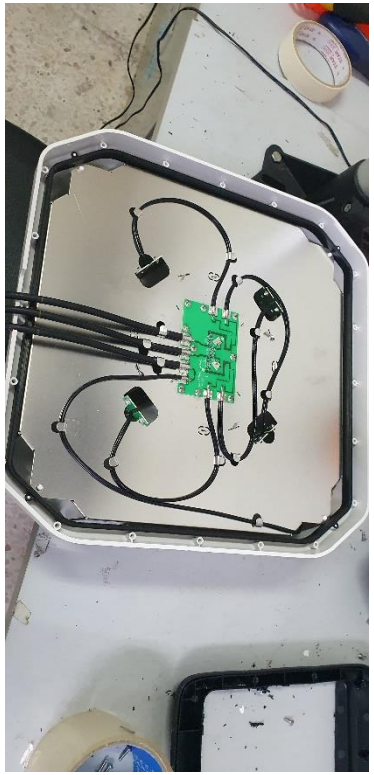
Water Ingression Test Setup

Submerge 1 meter deep, 30 minute duration.

Water Ingression Test Result



M9

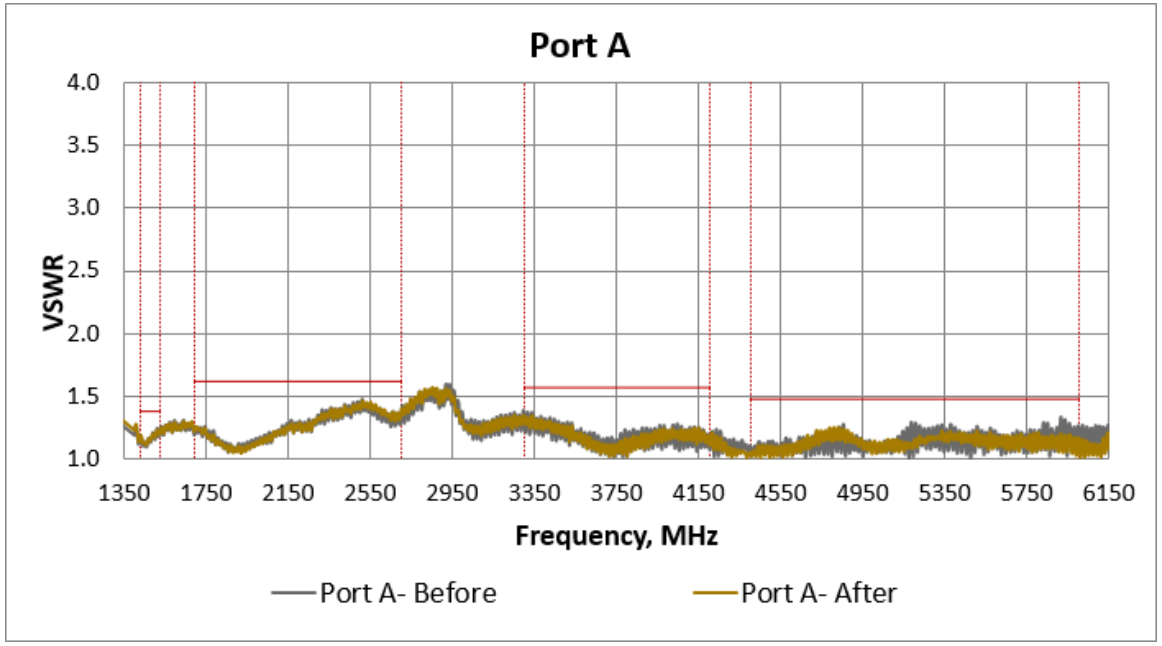


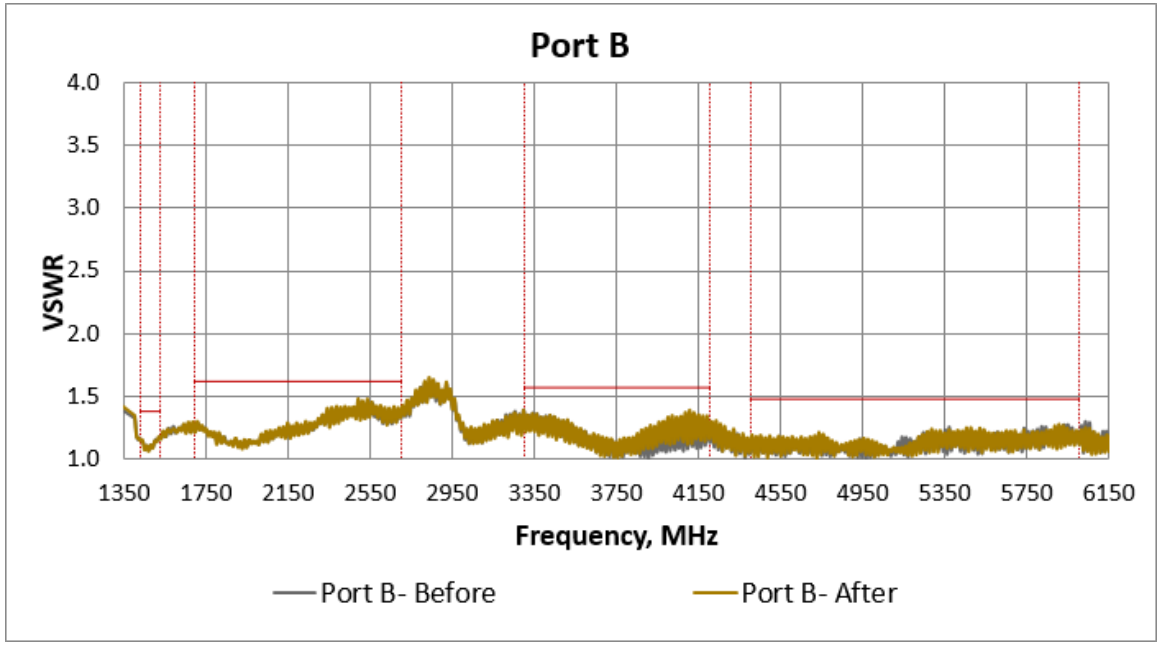
M10

M11

No water entry found in antenna

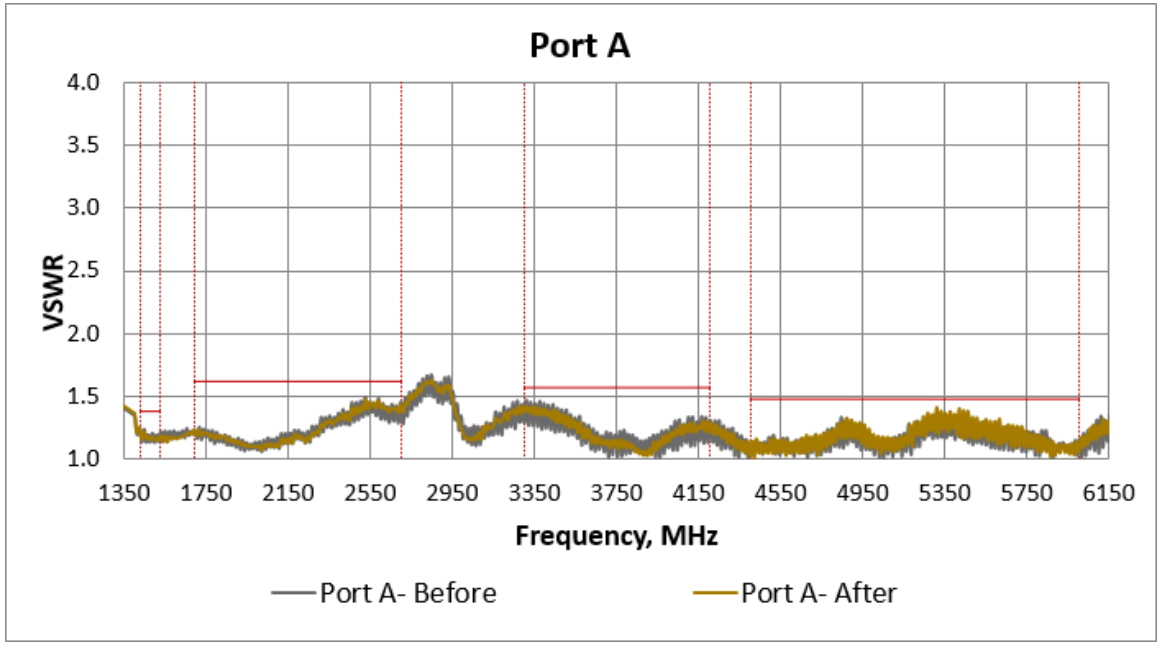
Water Ingress IPX7 Test Result

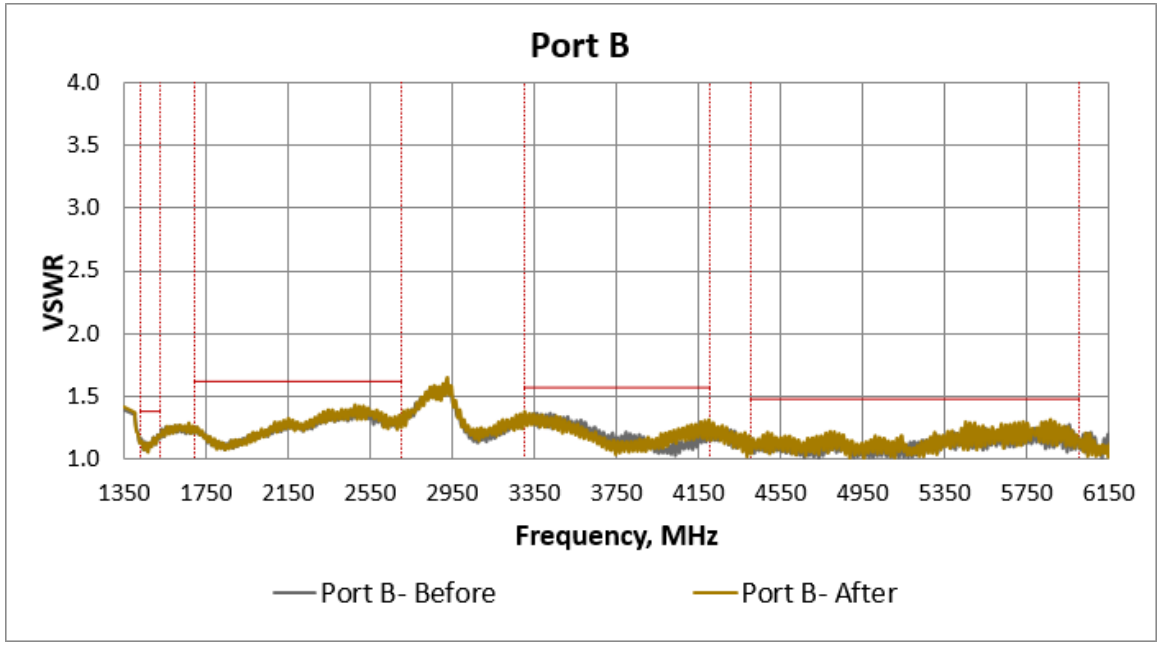




M10

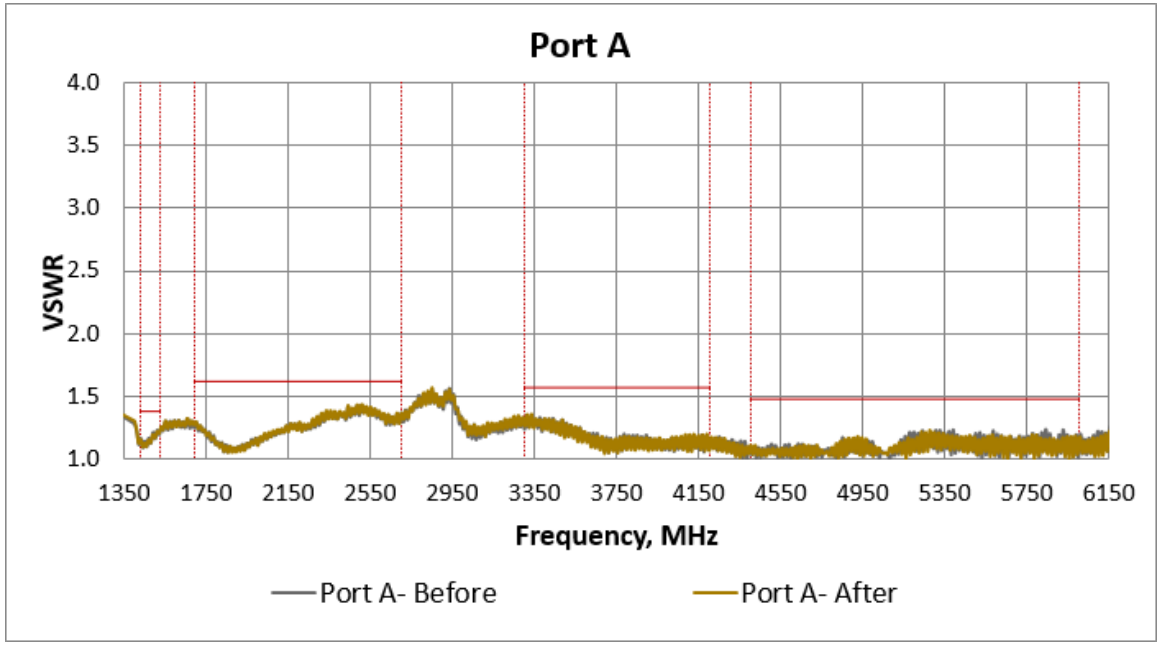
Water Ingress IPX7 Test Result

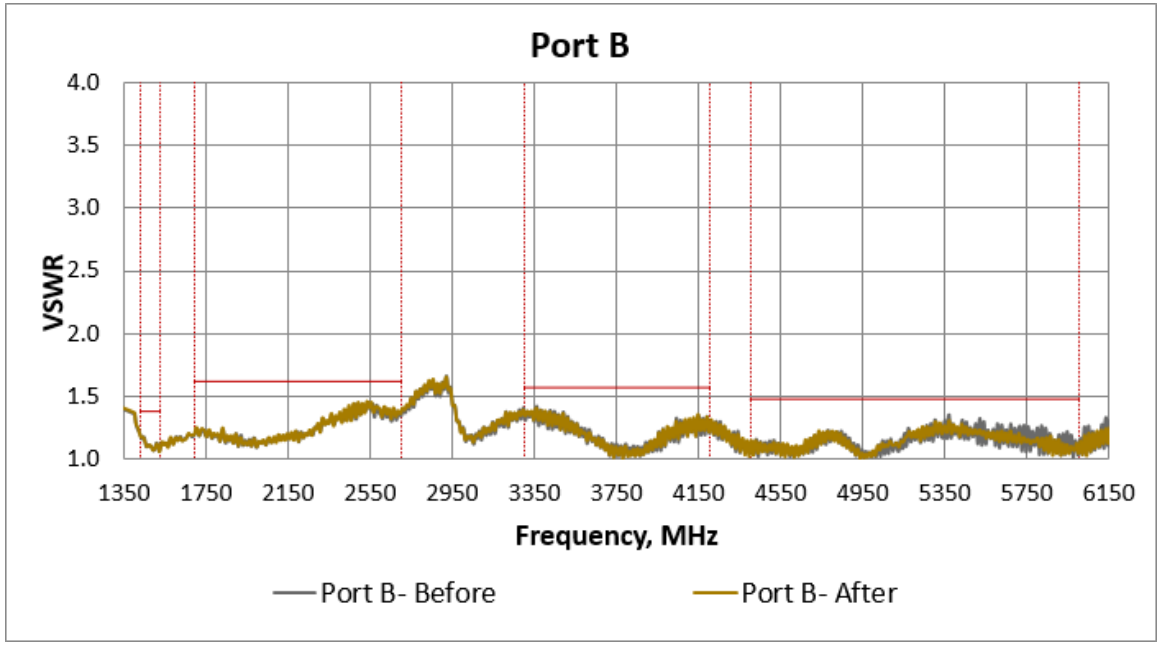




M11

Water Ingress IPX7 Test Result





M12

Water Ingress IPX7 Test Result

- Summary:

All the samples pass the water ingress IPX7.

Dust Ingress IP6X Test

Tested By: YJ Teoh

Compiled By: YJ Teoh, EC Lee, WS Beh

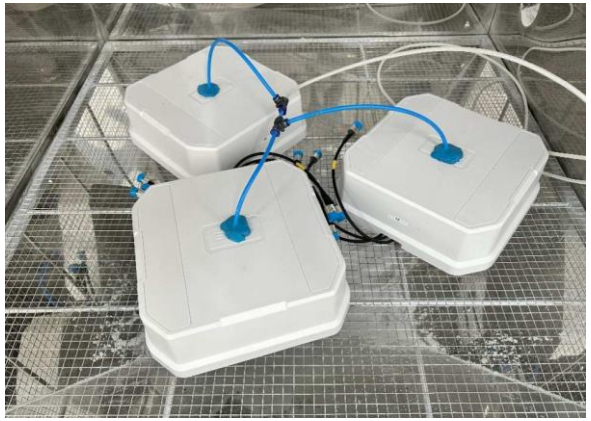
Verified By: YJ Teoh, EC Lee, WS Beh

Date: 02JAN24

Dust Ingress IP6X Test

Specification:	Test per IEC 60529, IP6x
Test Parameter:	Talc powder,vacuum
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	QAV Technologies (M) Sdn Bhd
Test Dates:	02JAN24
Test Equipment:	Dust Tester
Number of Units Tested:	3
DUT label Numbers:	NF17, NF18 & NF19
Remarks:	

Dust Ingress IP6X Test Setup

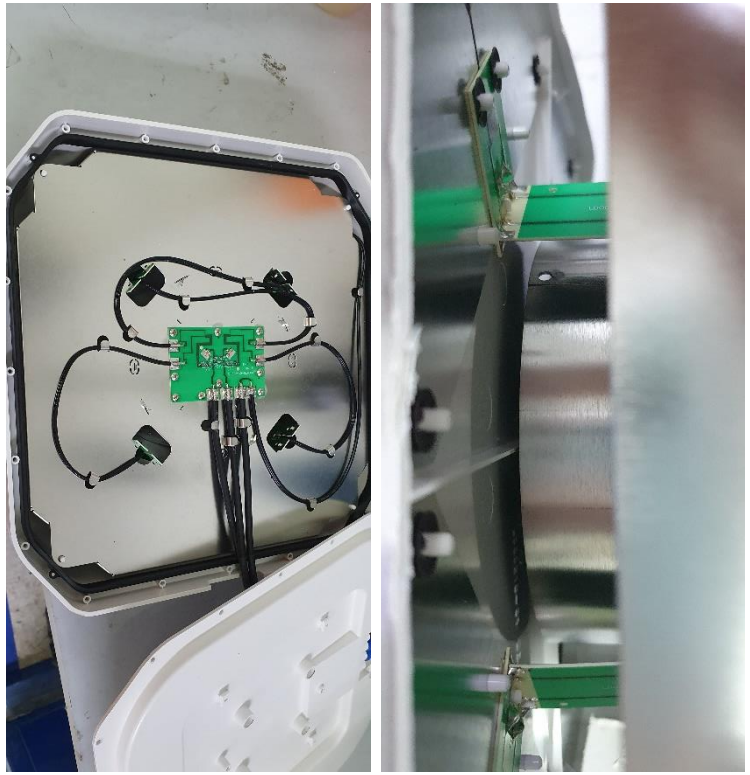


Dust Ingress IP6X Test Setup

Type of Test : Dust Test IP6X
Test Specification : IEC 60529
Category : Category -1
Test Time : 8 hours
Sample Quantity : 3 units

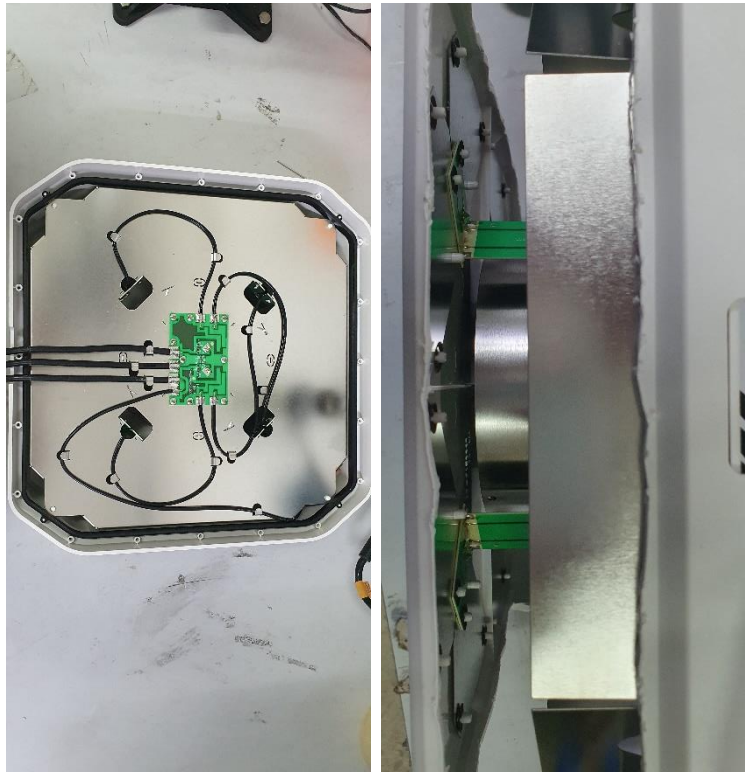
Machine : Dust Tester
Model : AUTO/2019032001
Calibration Due Date : 13th December 2022

Dust Ingress IP6X Test Result



N17

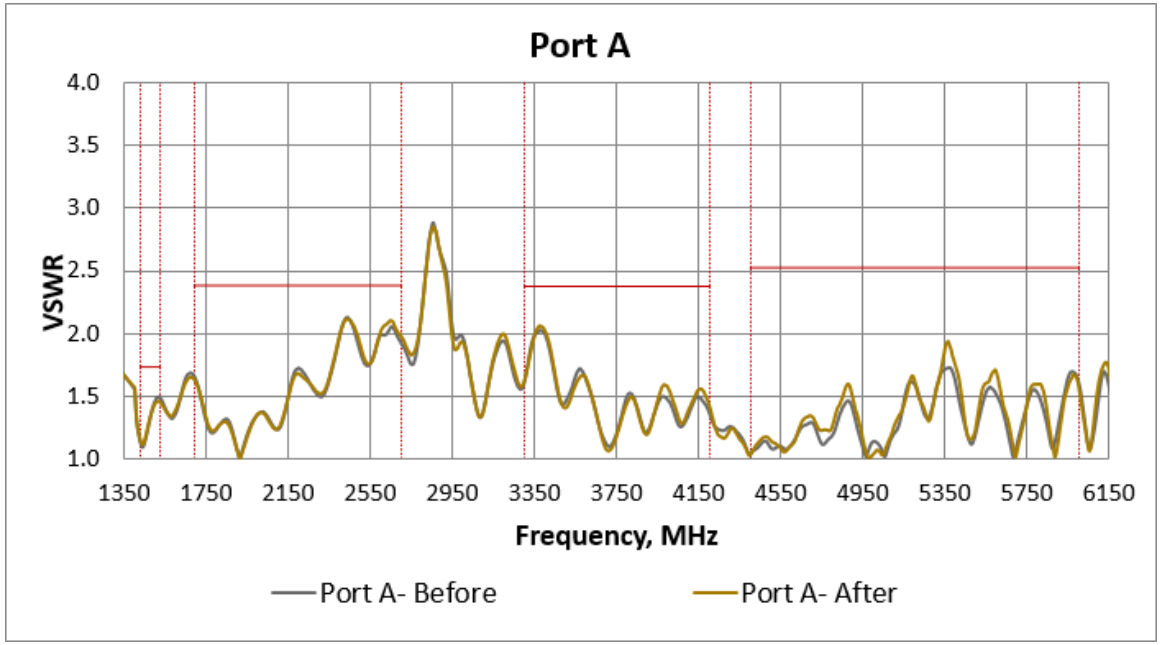
N18

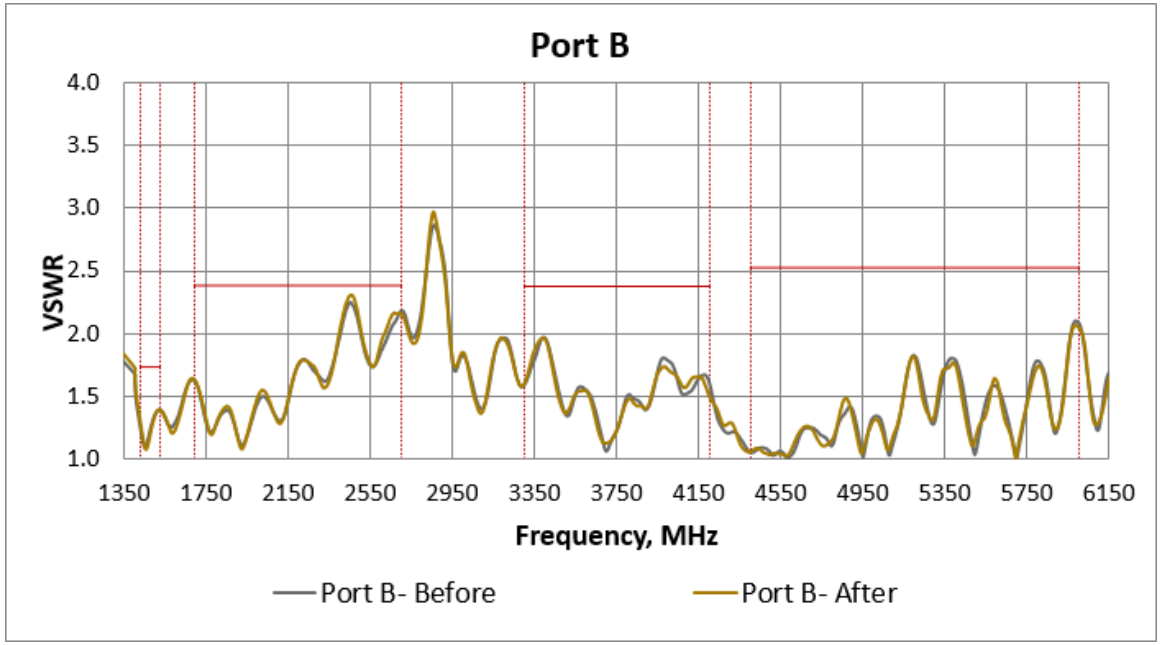


N19

No Ingress of Talc Powder
found in all 3 antenna

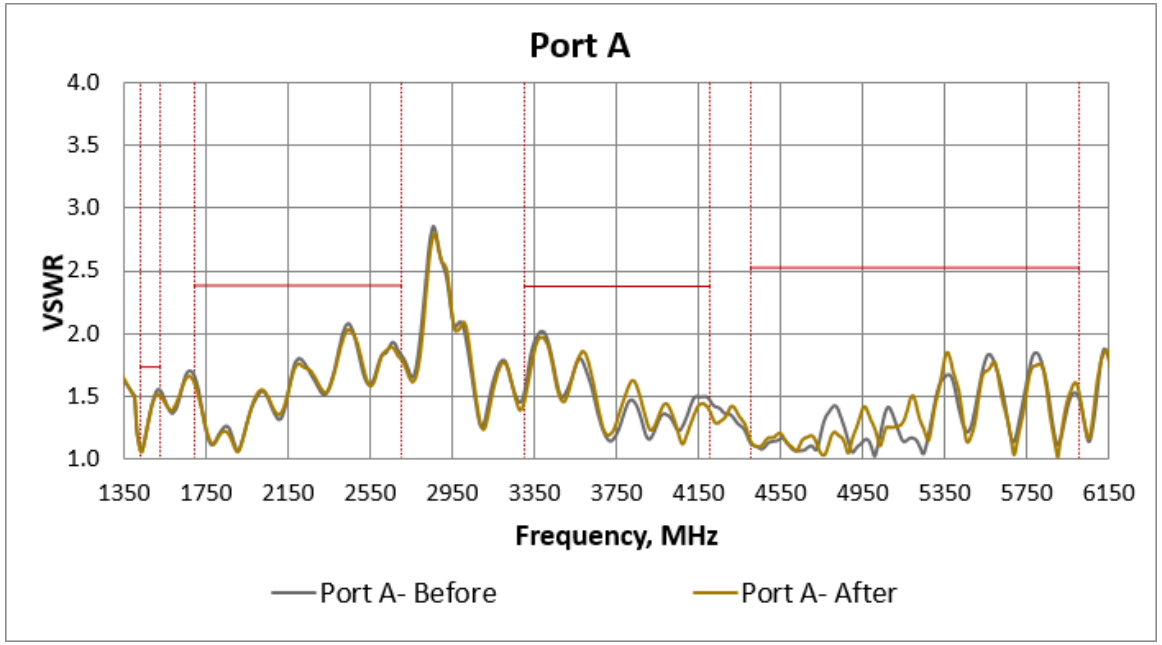
Dust Ingress IP6X Test Result

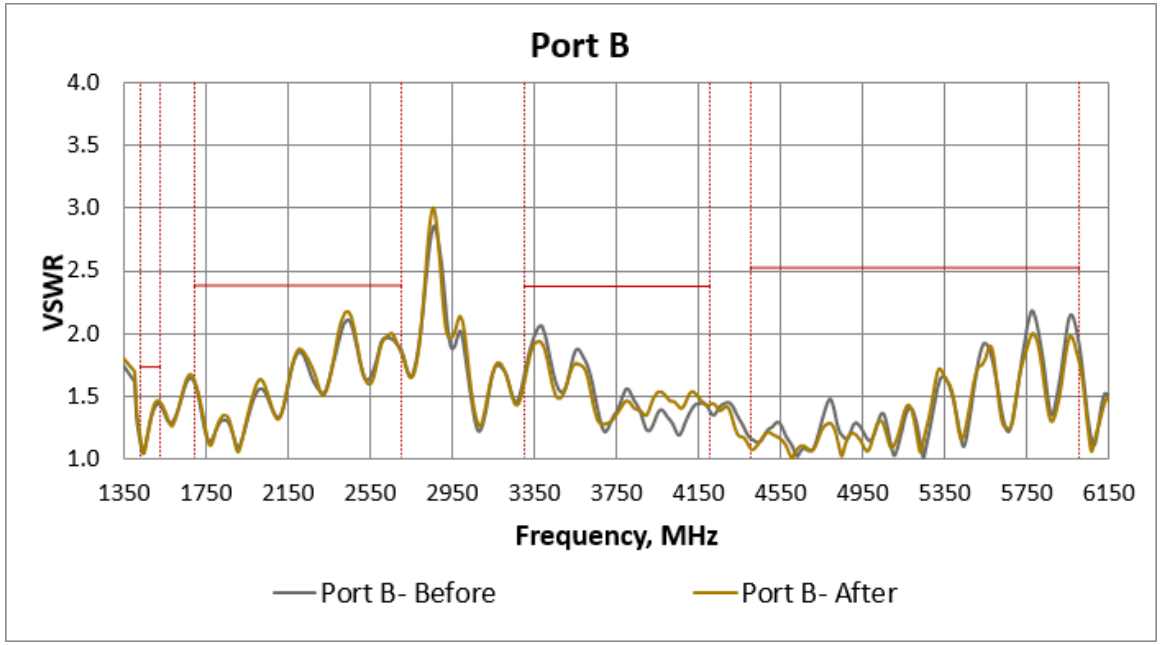




NF17

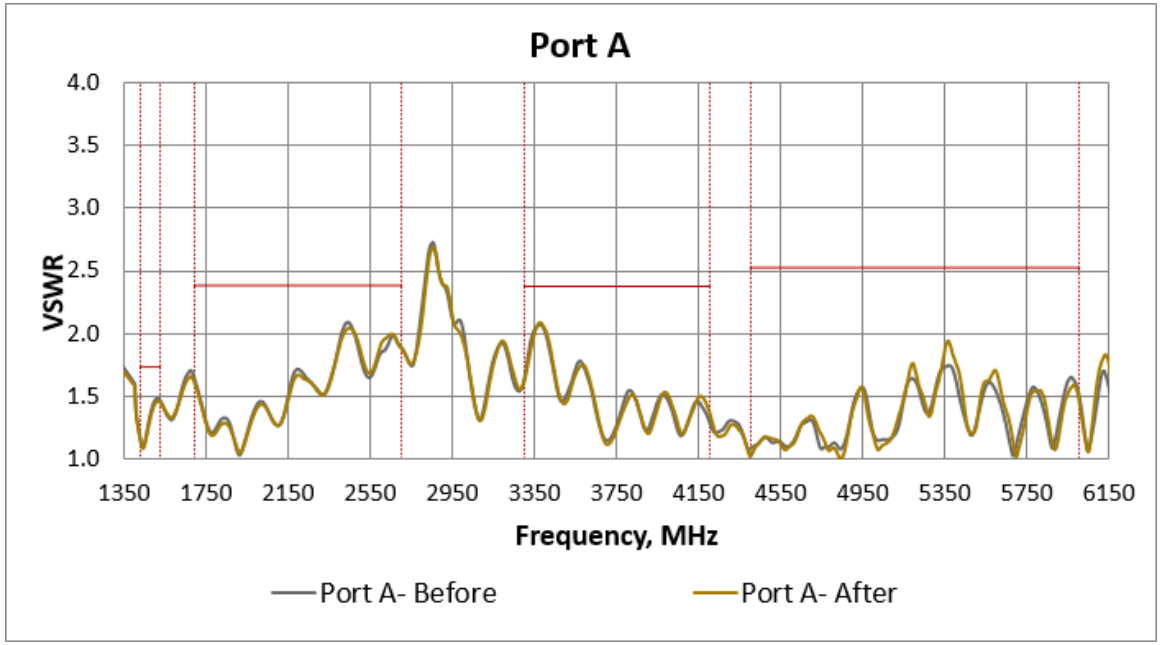
Dust Ingress IP6X Test Result

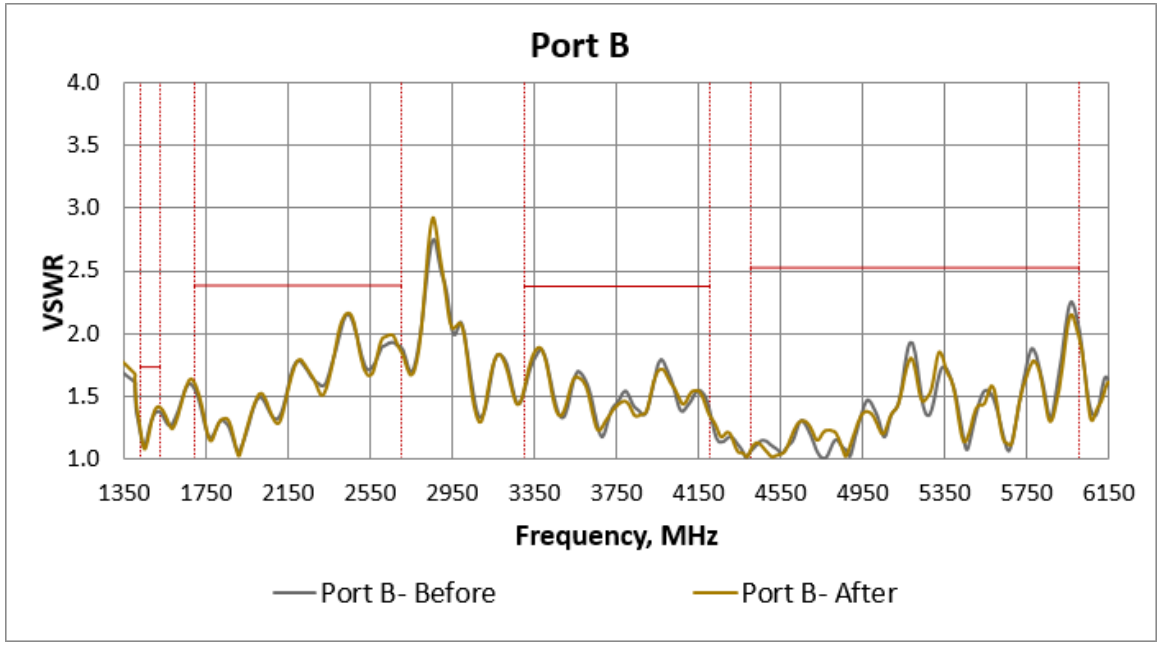




NF18

Dust Ingress IP6X Test Result





NF19

Dust Ingress IP6X Test Result

- Summary:

All the samples pass the dust ingress IP6x test.

- No Ingress of Talc Powder found in test units.

Humidity

Tested By:	YJ Teoh
Compiled By:	YJ Teoh, EC Lee, WS Beh
Verified By:	YJ Teoh, EC Lee, WS Beh
Date:	02JAN24~07JAN24

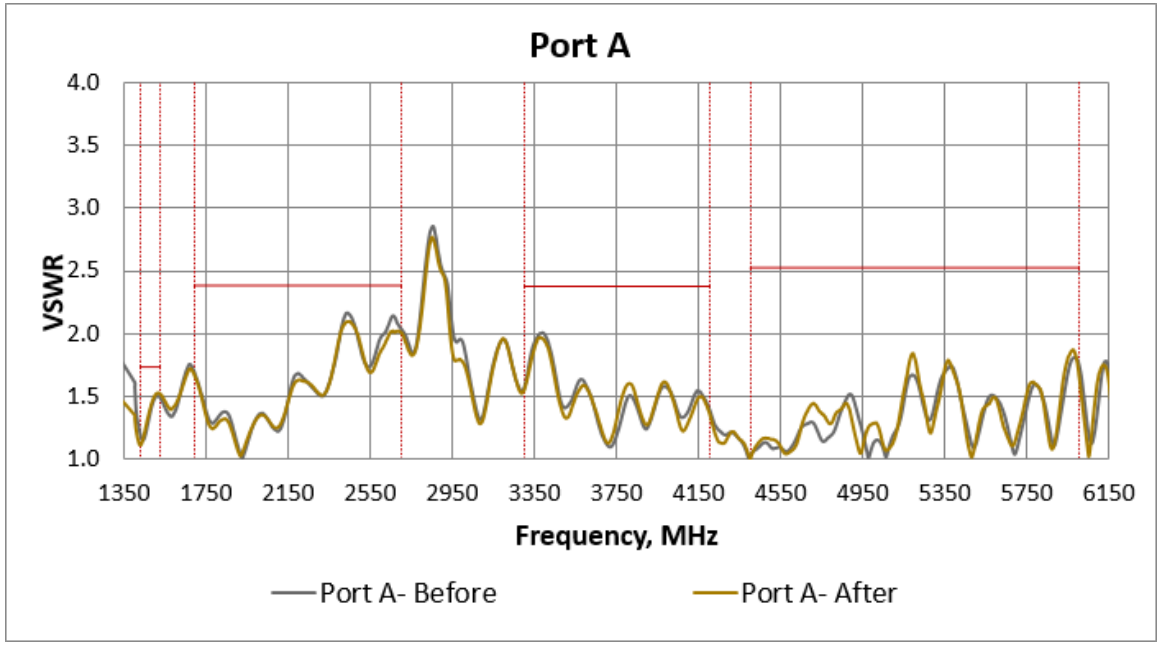
Humidity Test

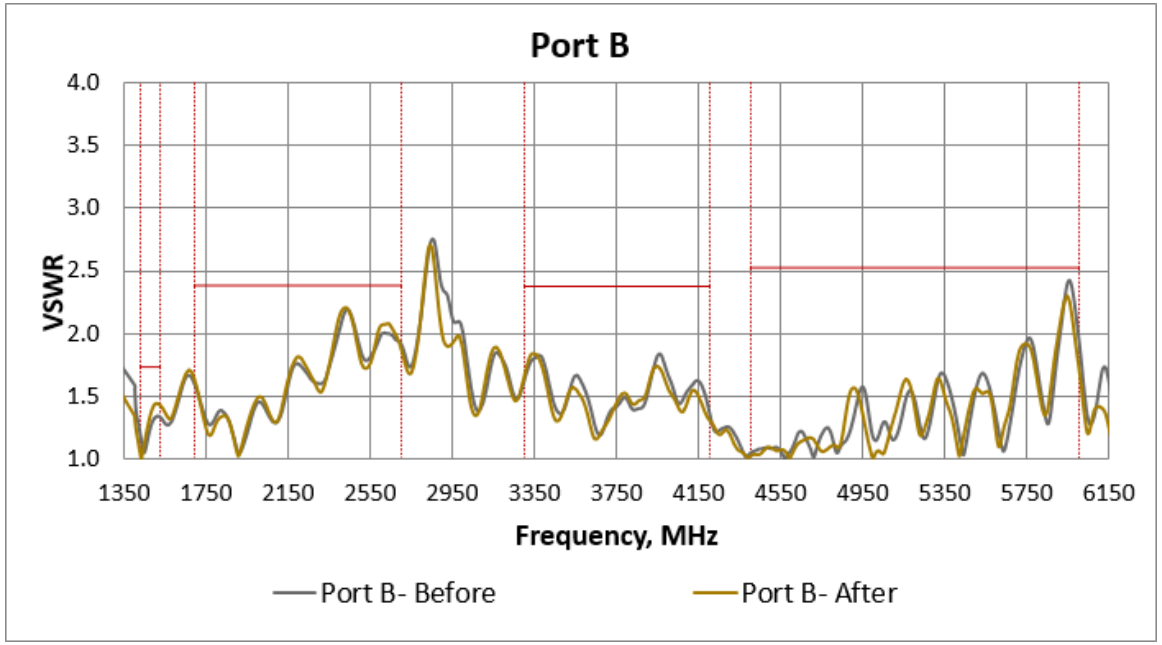
Specification:	Test per MIL-STD-810G, 507.5, Procedure II, Aggravated Humidity
Test Parameter:	95%±4% relative humidity, 24 hour cycle, 5 cycles
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	TE Connectivity Penang
Test Dates:	02JAN24~07JAN24
Test Equipment:	Manufacturer: Thermotron Model/ Type: SE-600
Number of Units Tested:	3
DUT label Numbers:	NF13, NF16 & NF23
Remarks:	

Humidity Test Setup

95%±4% relative humidity, 24 hour cycle, 5 cycles

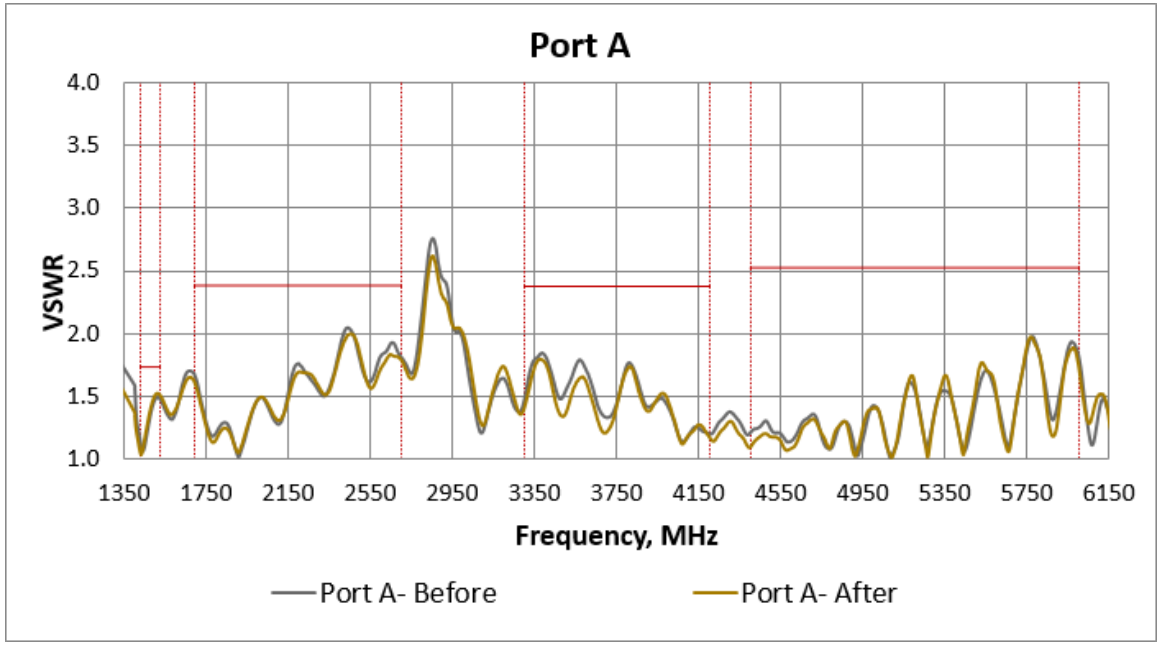
Humidity Test Result

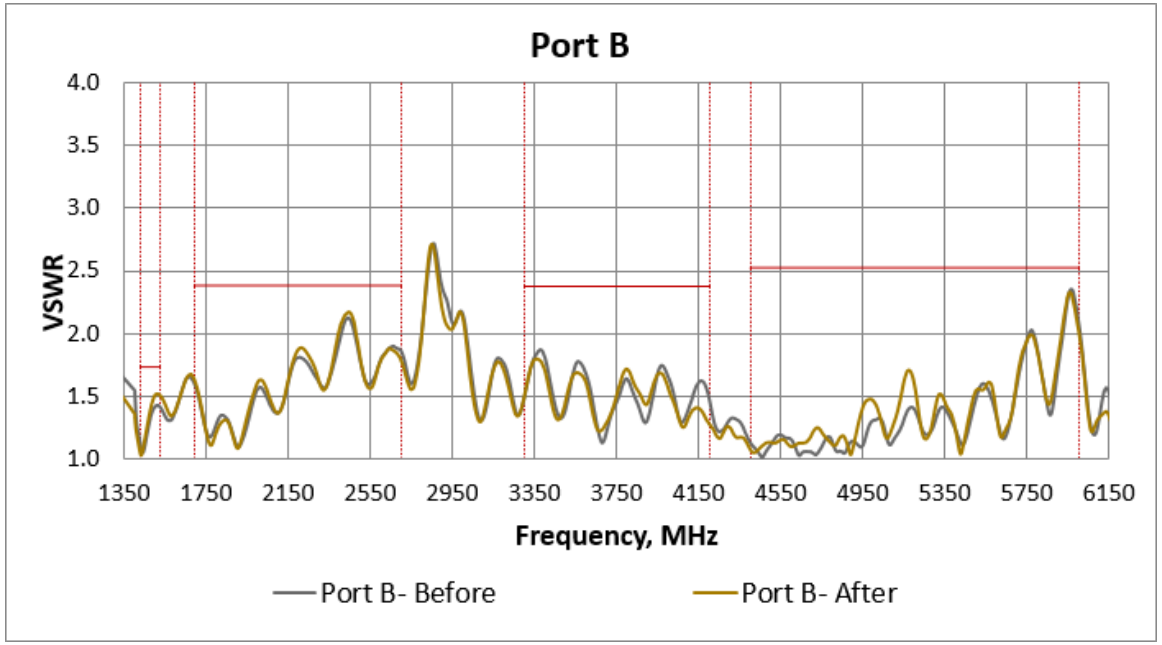




NF13

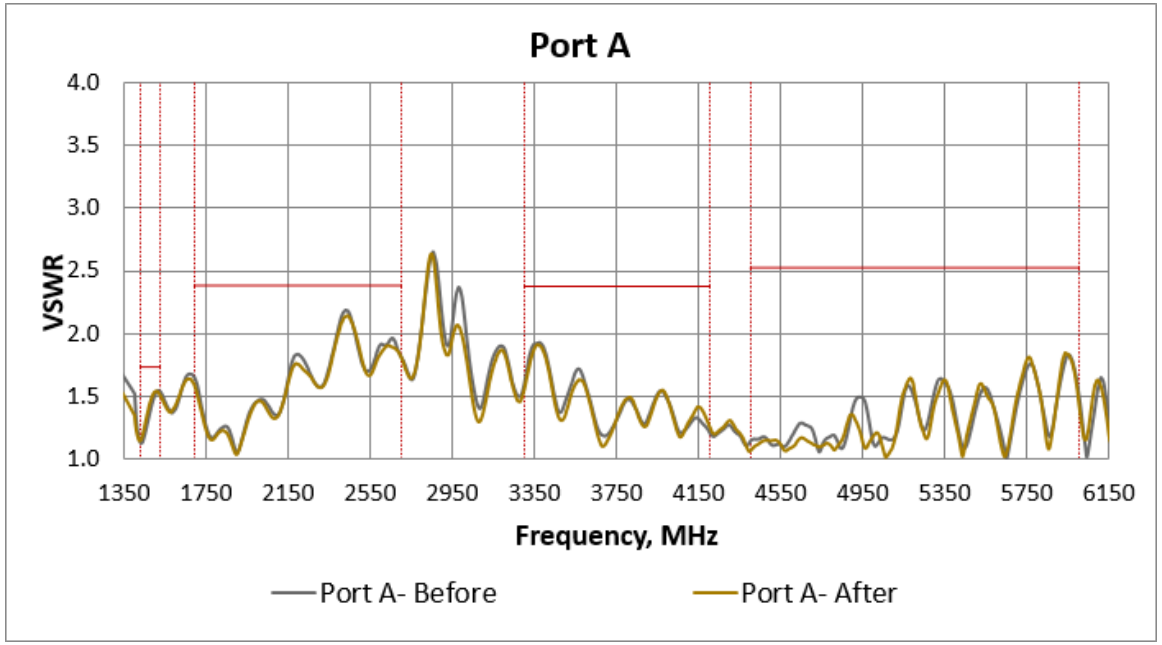
Humidity Test Result

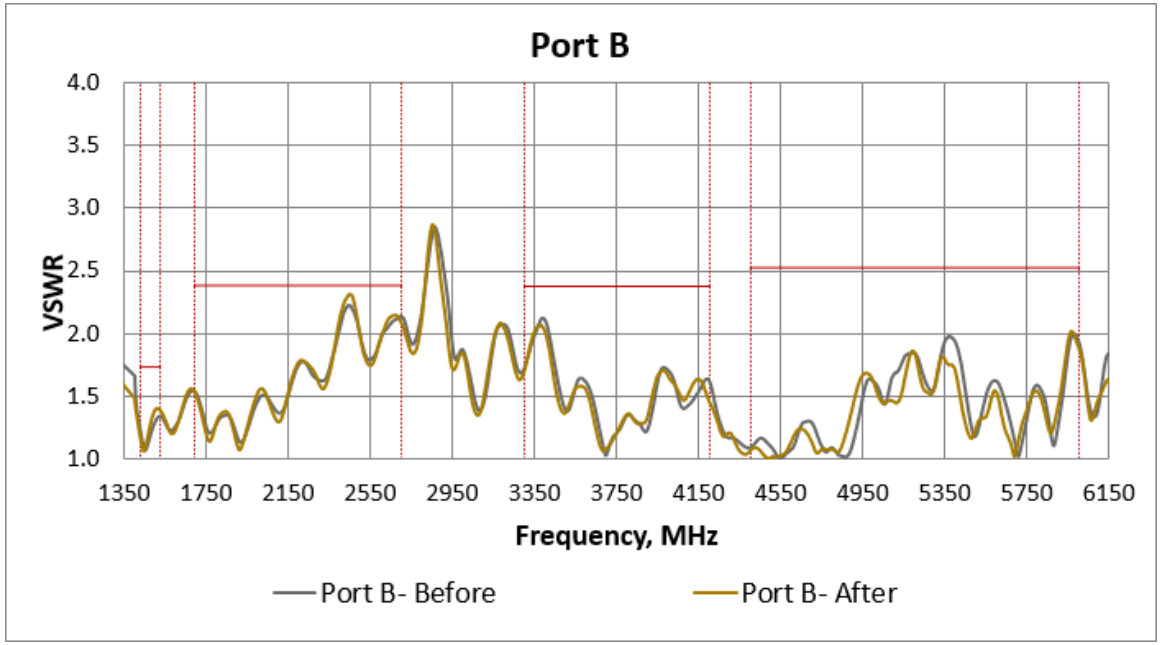




NF16

Humidity Test Result





NF23

Humidity Test Result

- Summary:

All the samples pass the humidity test with no significant of RF performance change.

Thermal Shock Test

Tested By: YJ Teoh

Compiled By: YJ Teoh, EC Lee, WS Beh

Verified By: YJ Teoh, EC Lee, WS Beh

Date: 26DEC24~27DEC24

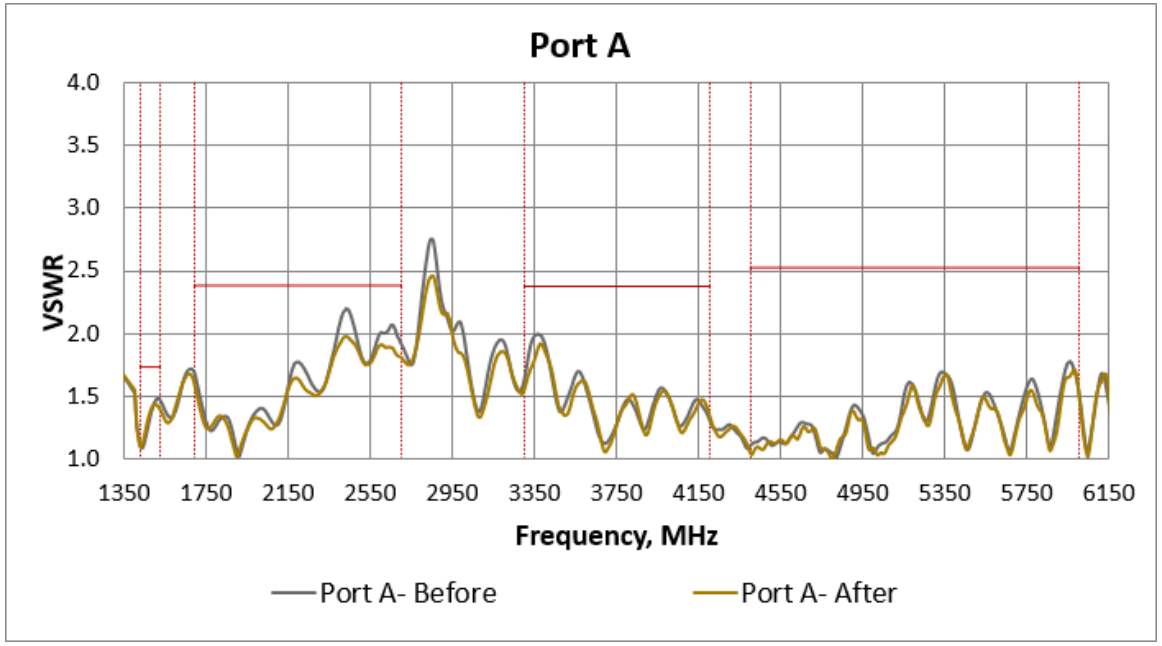
Thermal Shock Test

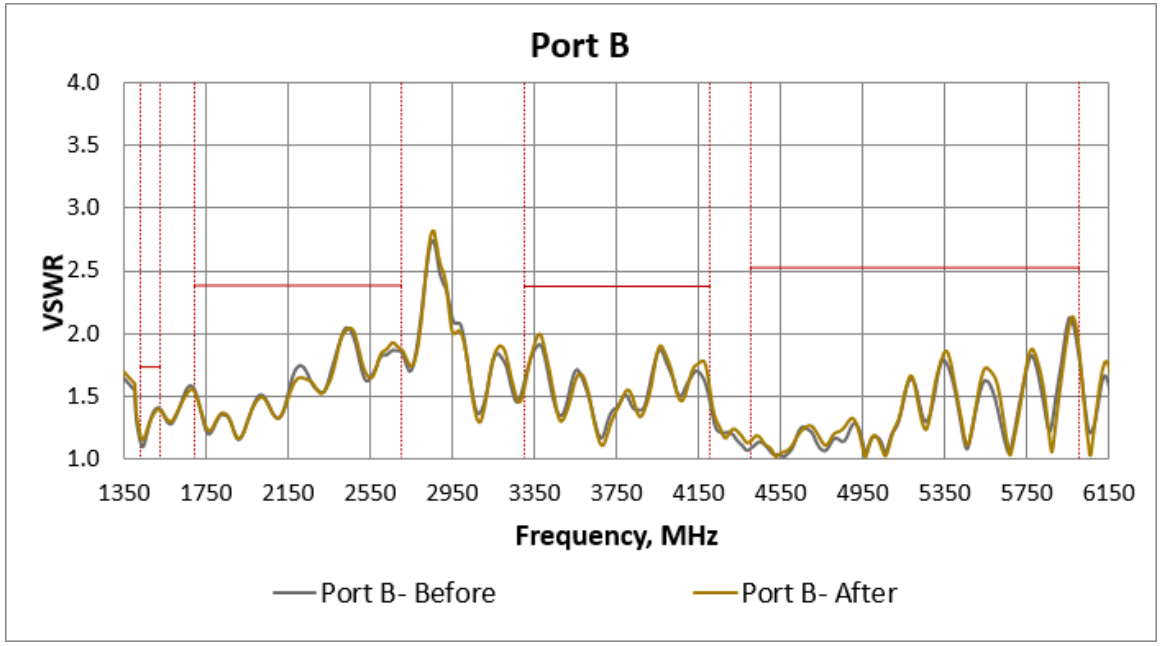
Specification:	Test per IEC 68-2-14
Test Parameter:	-30°C to +70°C, 1 hour soak, 5°/min minimum ramp, 5 Cycles, ramp up from ambient at beginning of cycle.
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	TE Connectivity Penang
Test Dates:	26DEC24~27DEC24
Test Equipment:	Manufacturer: Thermotron Model/ Type: SE-600
Number of Units Tested:	3
DUT label Numbers:	NF27, NF28, NF29
Remarks:	

Thermal Shock Test Setup

- -30°C to +70°C
- 1 hour soak
- 5°/min minimum ramp
- 5 Cycles, ramp up from ambient at beginning of cycle.

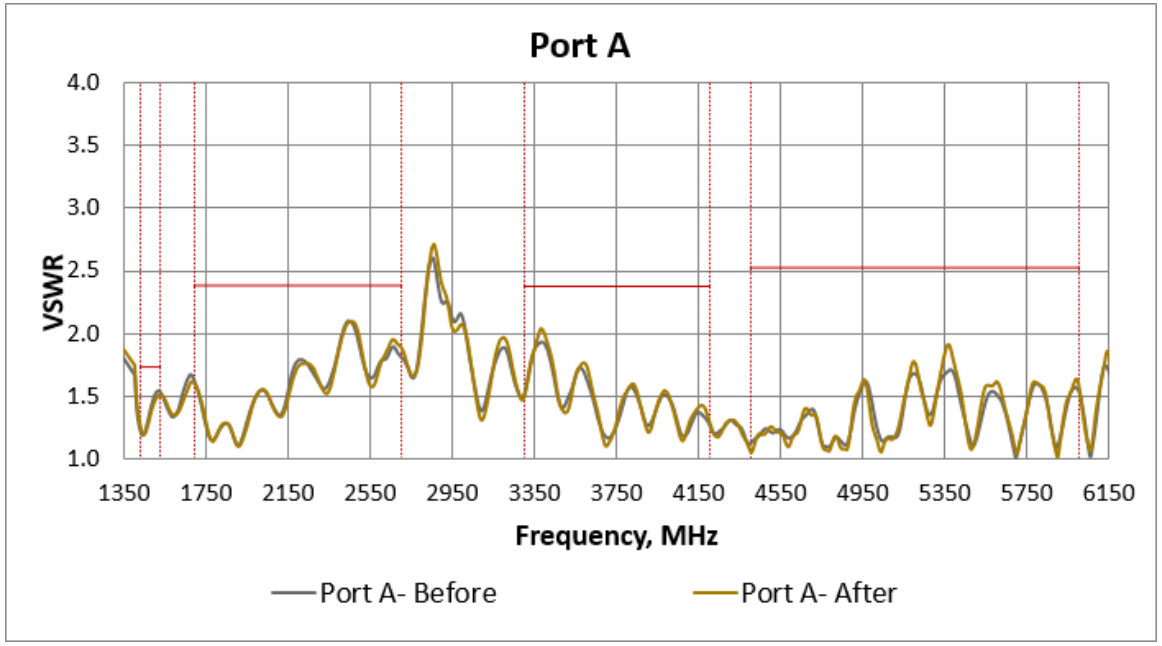
Thermal Shock Test Result

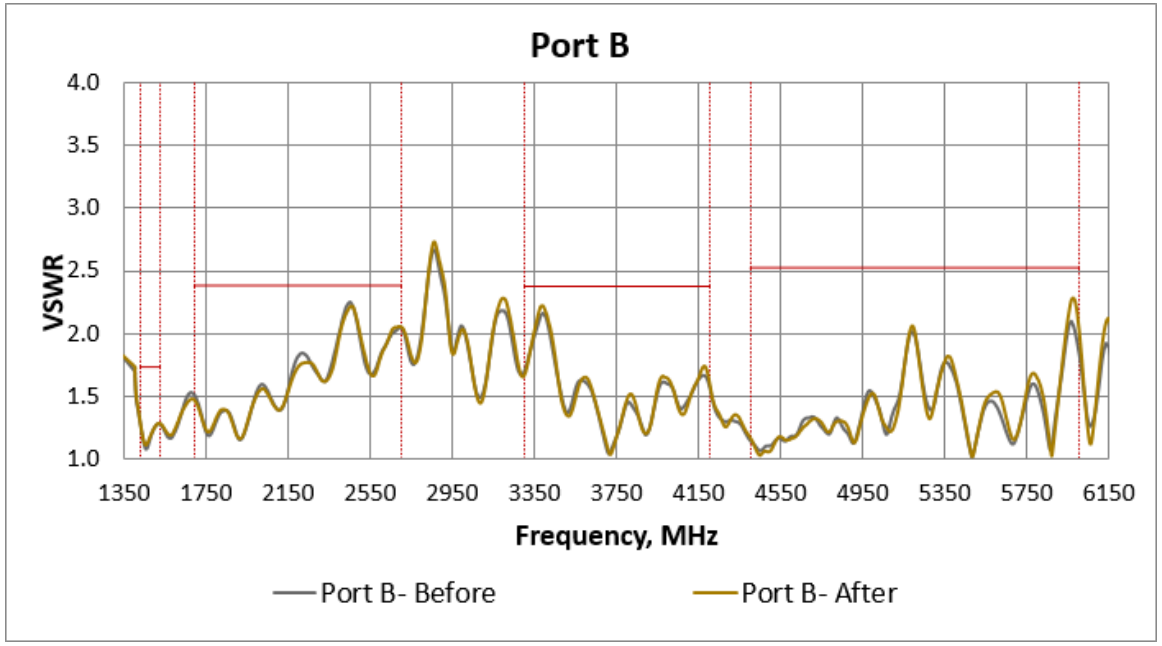




NF27

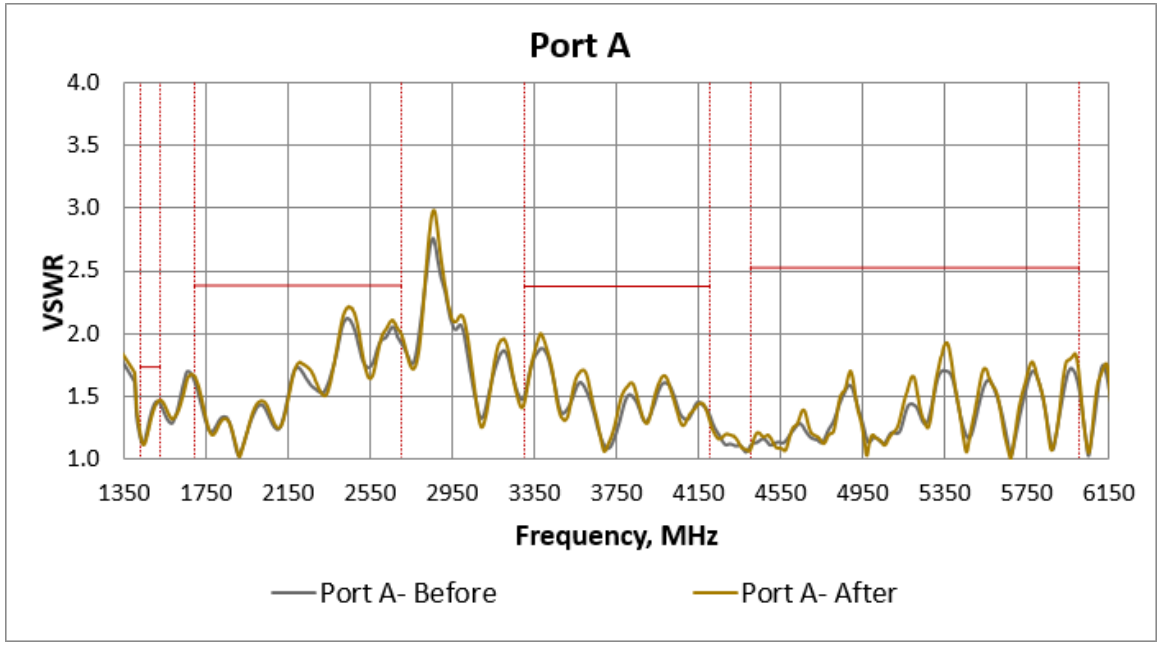
Thermal Shock Test Result

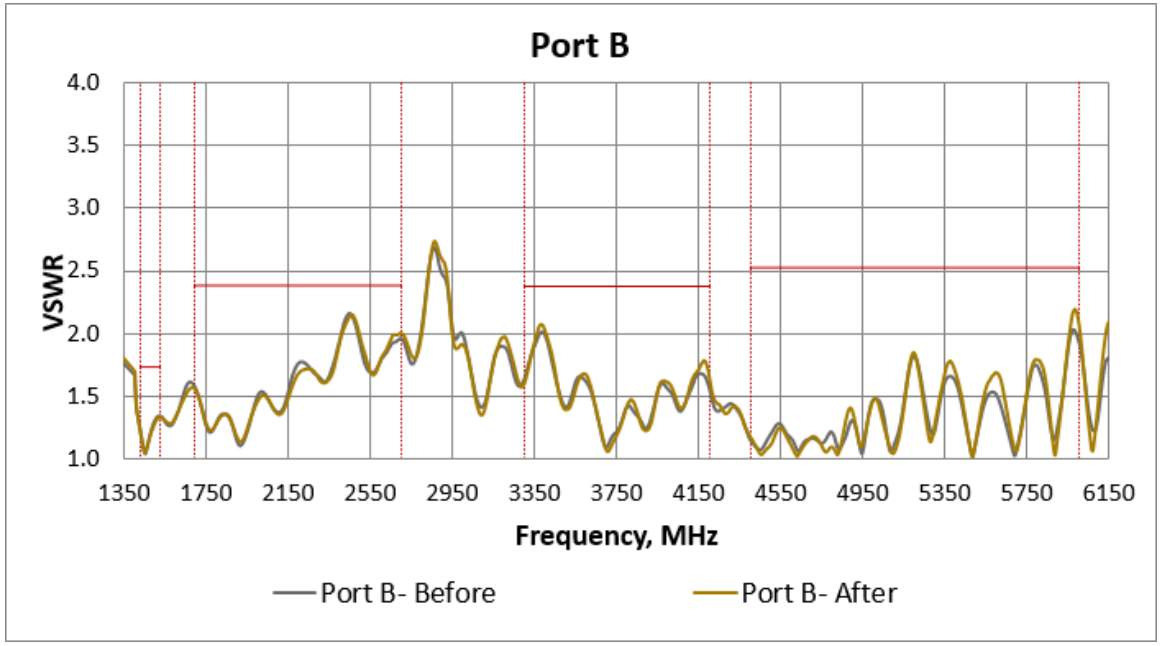




NF28

Thermal Shock Test Result





NF29

Thermal Shock Test

- Summary:

All the samples pass the thermal shock test with no significant of RF performance change.

Corrosive Atmosphere (Salt Mist) Test

Tested By: YJ Teoh

Compiled By: YJ Teoh, EC Lee, WS Beh

Verified By: YJ Teoh, EC Lee, WS Beh

Date: 03JAN24~07JAN24

Corrosive Atmosphere Test

Specification:	The product shall be tested in accord with MIL-STD-810G, Method 509.5
Test Parameter:	Alternate 24hr wet/dry , 2cycle (35±2°C)
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	QAV Technologies (M) Sdn Bhd
Test Dates:	03JAN24~07JAN24
Test Equipment:	Welltech Salt Spray Tester & Environmental Chamber
Number of Units Tested:	3
DUT label Numbers:	NF20, NF21, NF22
Remarks:	

Corrosive Atmosphere Test Setup

Chamber : Welltech Salt Spray Tester
Model : SP-110
Chamber Serial : 0505066

Chamber : Environmental Chamber
Manufacturer : Espec
Serial No : 13006667

Corrosive Atmosphere Test Setup

Test Spec	: MIL-STD-810G,Method 509.5
NaCl Concentration	: 5%± 1%
Pressured Tank Temperature	: 46°C - 49°C
Cabinet Temperature	: 33.3°C -36.1°C
PH Level	: 6.5-7.2
Test Cycle	: 24hr wet/24hr dry: total 2 cycles

Corrosive Test Result

Before Test

No rusty was observed after test.

After Test

Corrosive Test Result

Before Test

No rusty was observed after test.

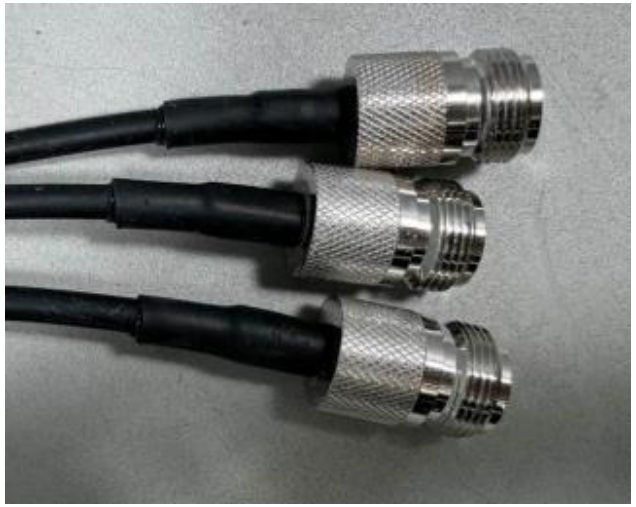
After Test

Corrosive Test Result

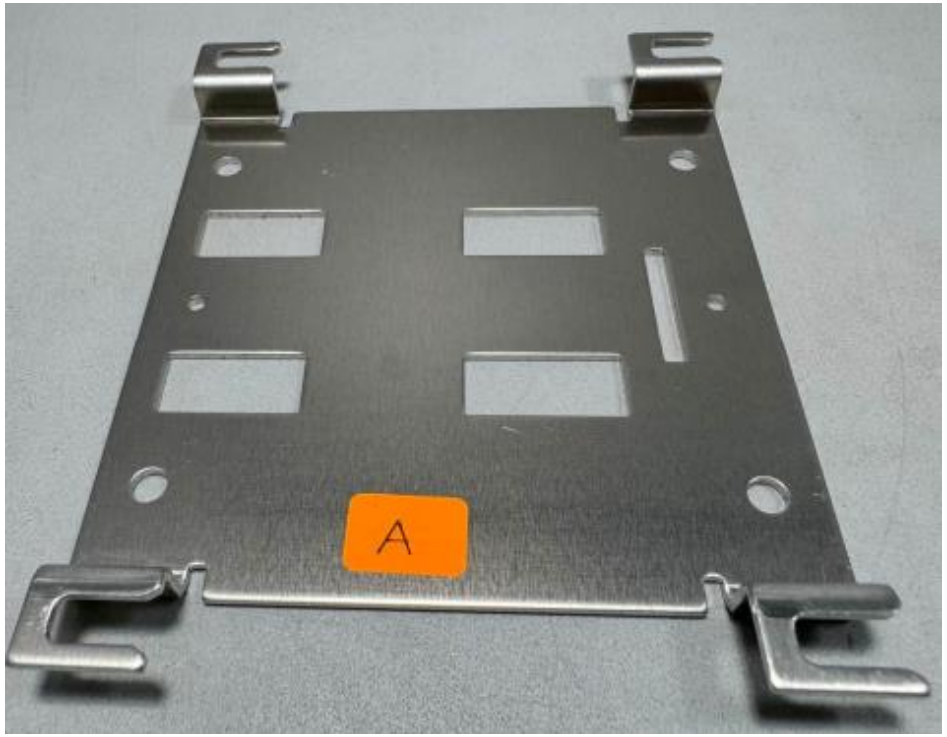
Before Test

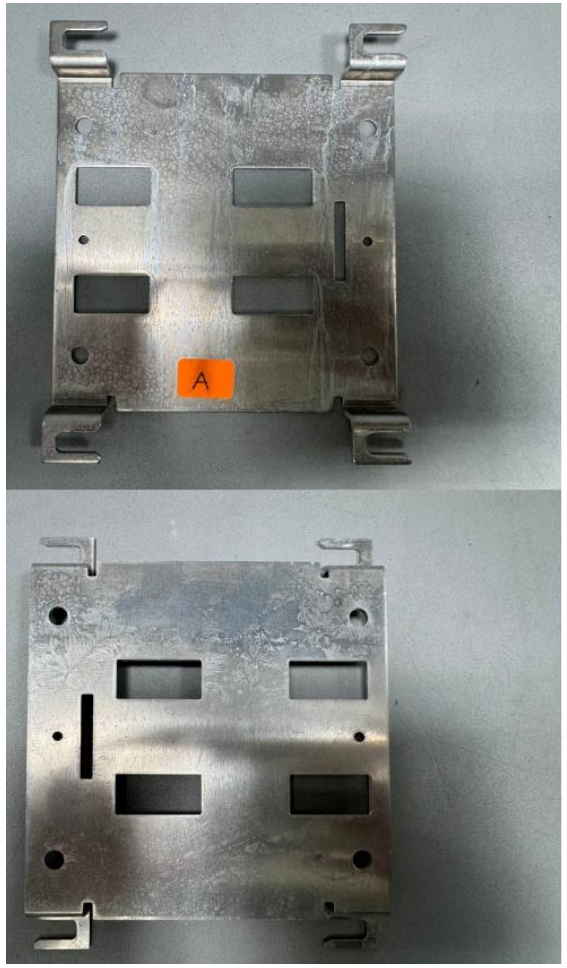
No rusty was observed after test.

After Test



Corrosive Test Result

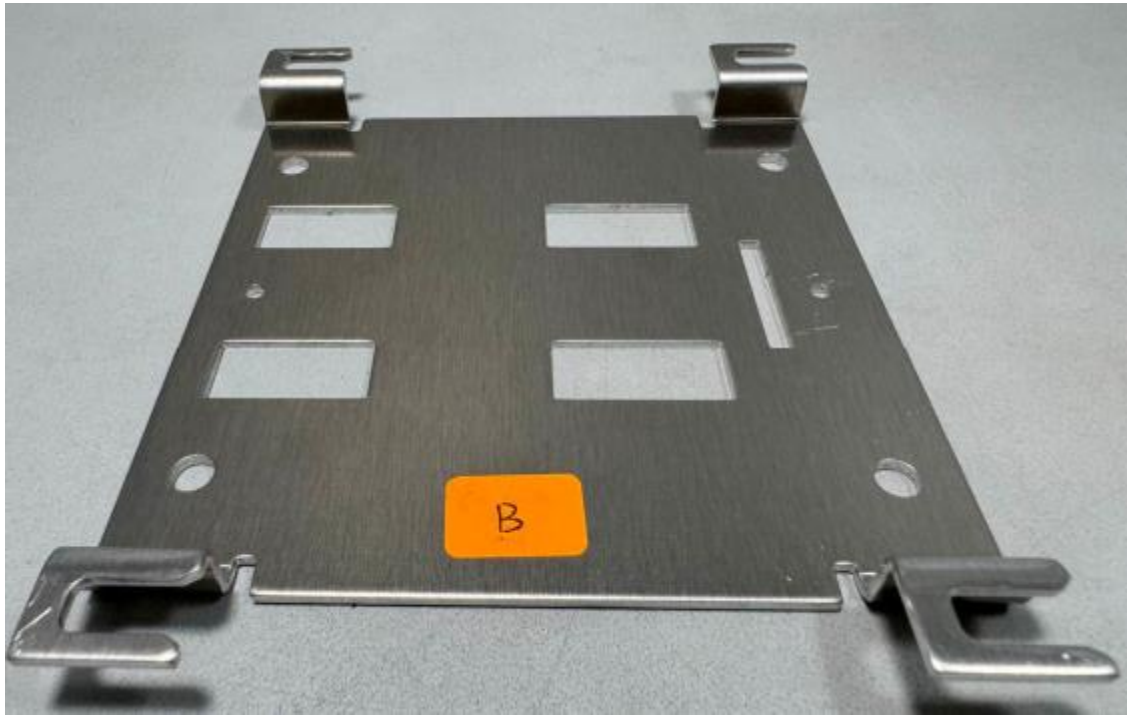


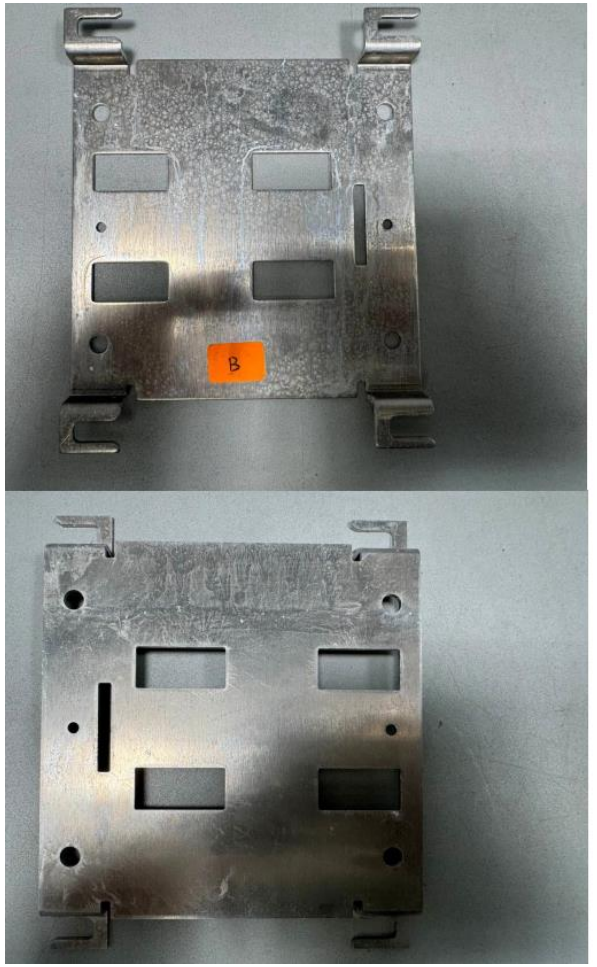


Before Test

After Test
No rusty was observed after test.

Corrosive Test Result





Before Test

After Test
No rusty was observed after test.

Corrosive Test Result

Before Test

After Test
No rusty was observed after test.

Corrosive Test Result

Before Test

After Test
No rusty was observed after test.

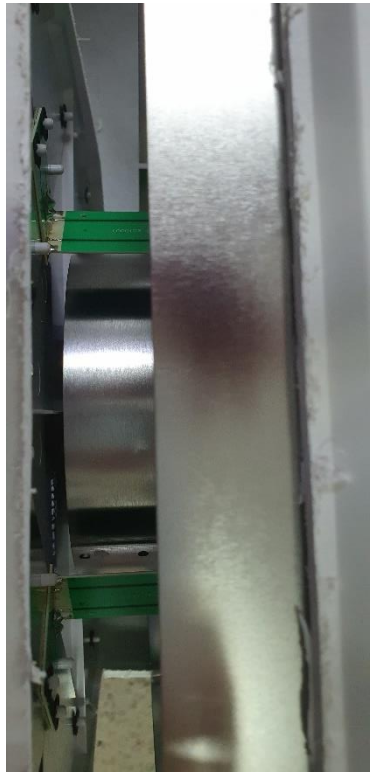
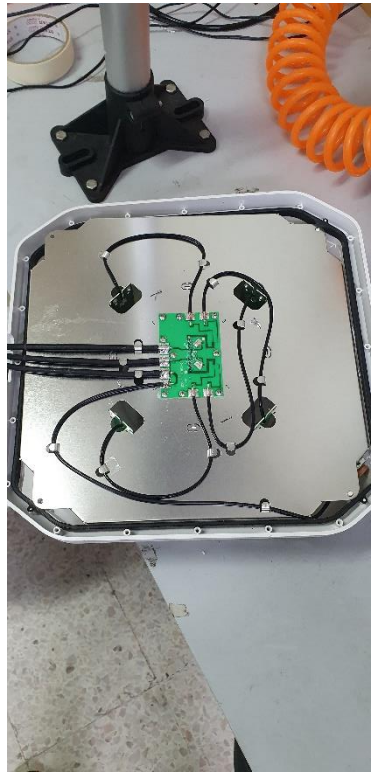
Corrosive Test Result

Before Test

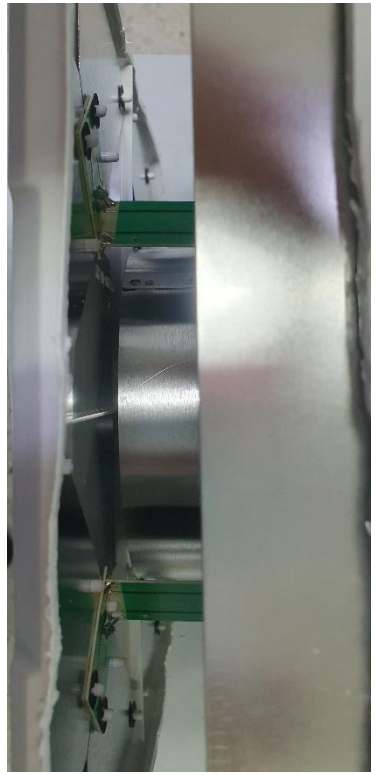
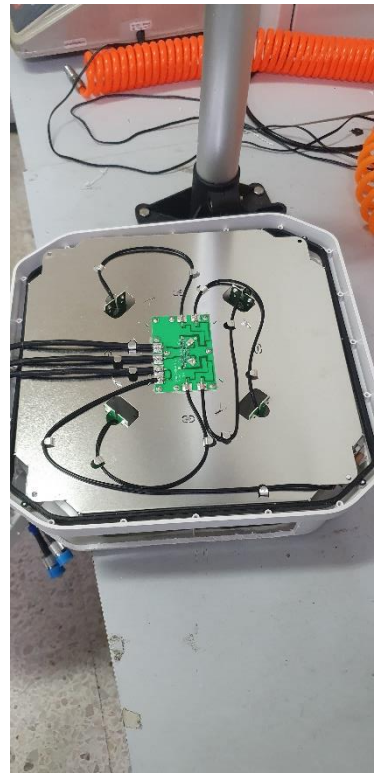
After Test
No rusty was observed after test.

Corrosive Test Result


NF20

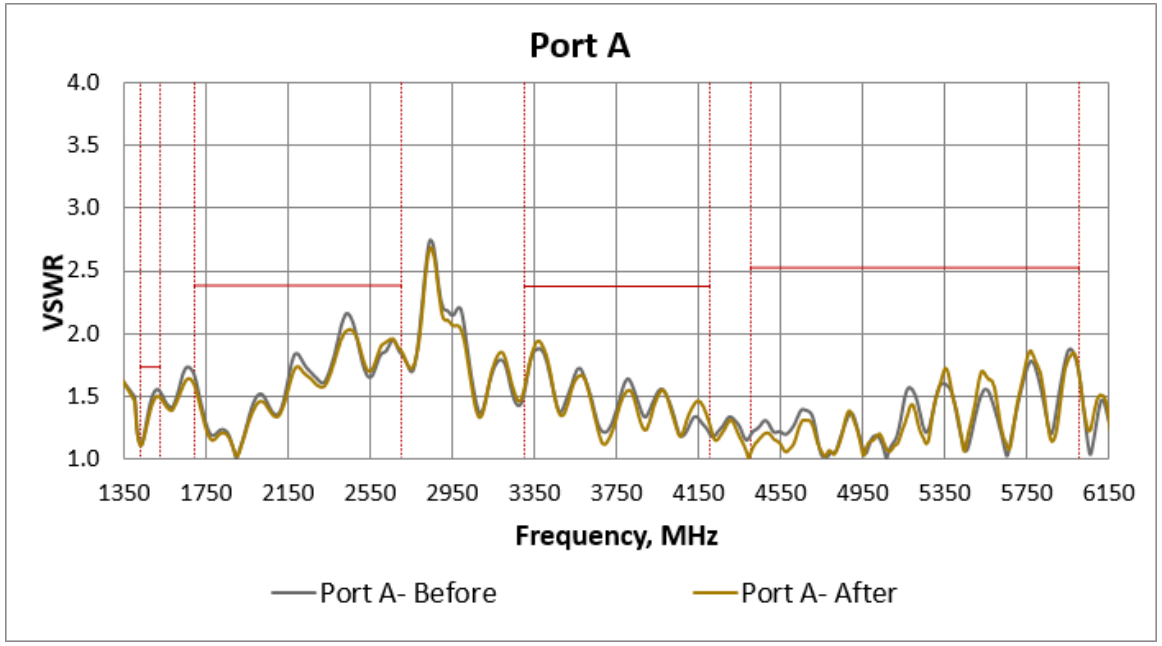
NF21

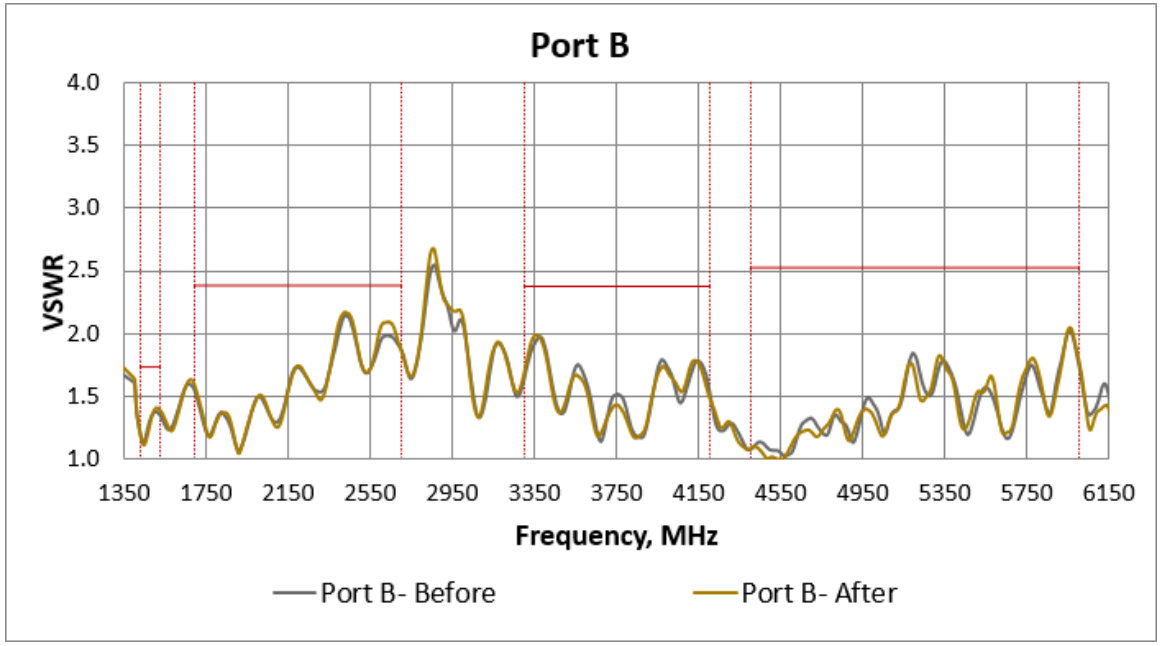



NF22

No rusty on internal components were observed after test.

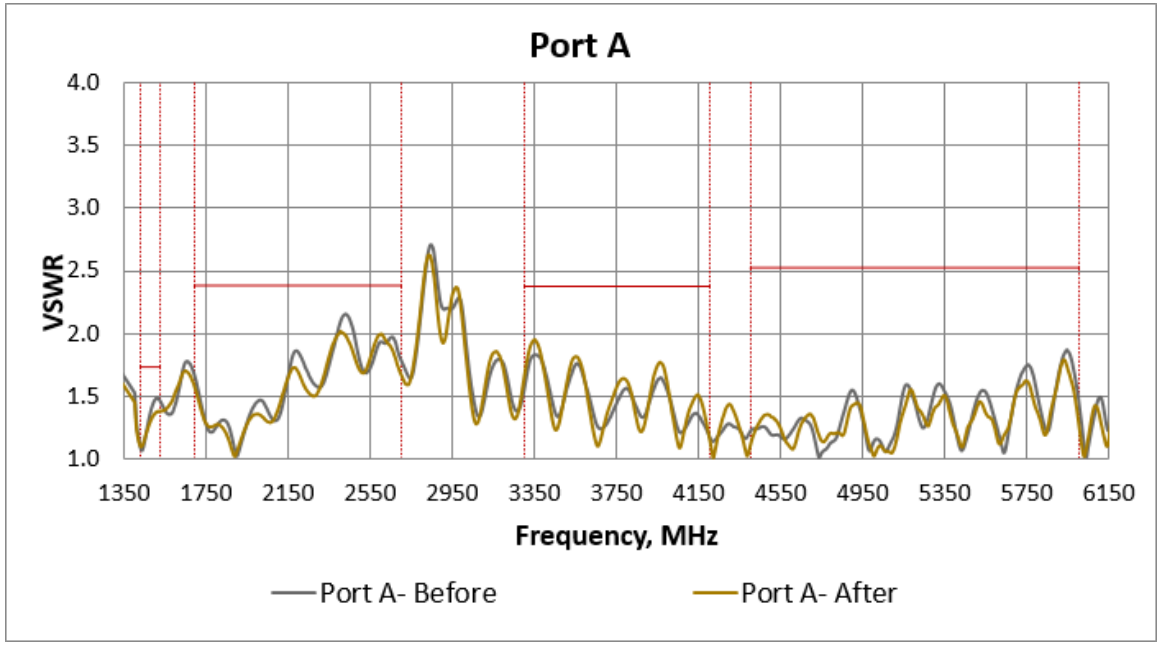
Corrosive Test Result

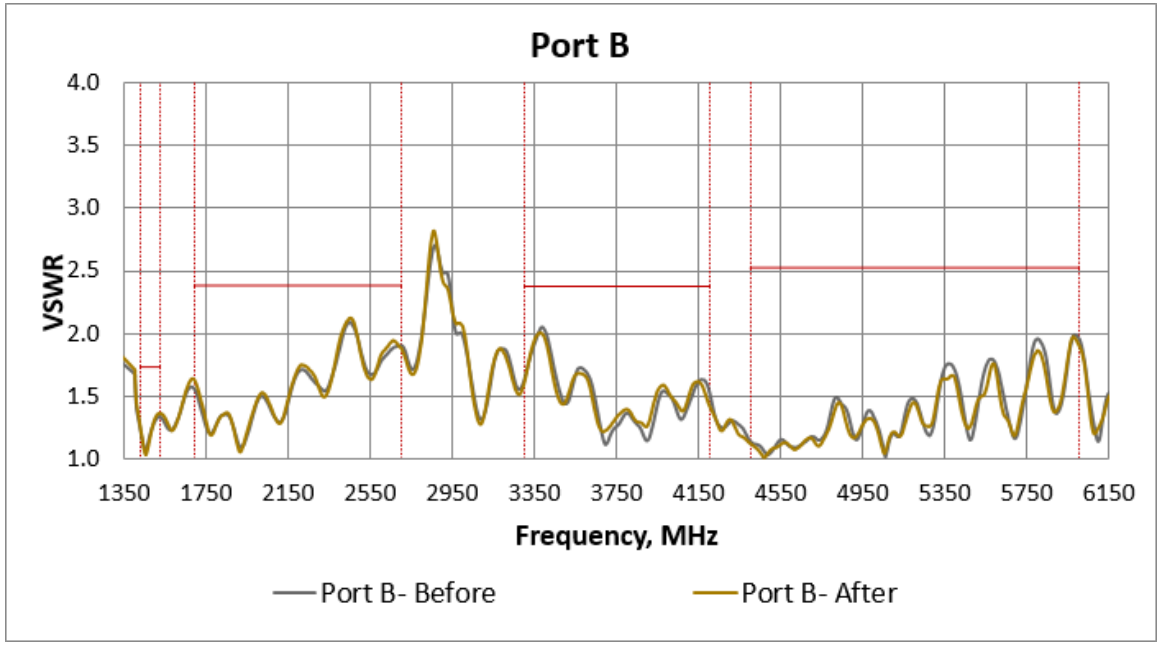




NF20

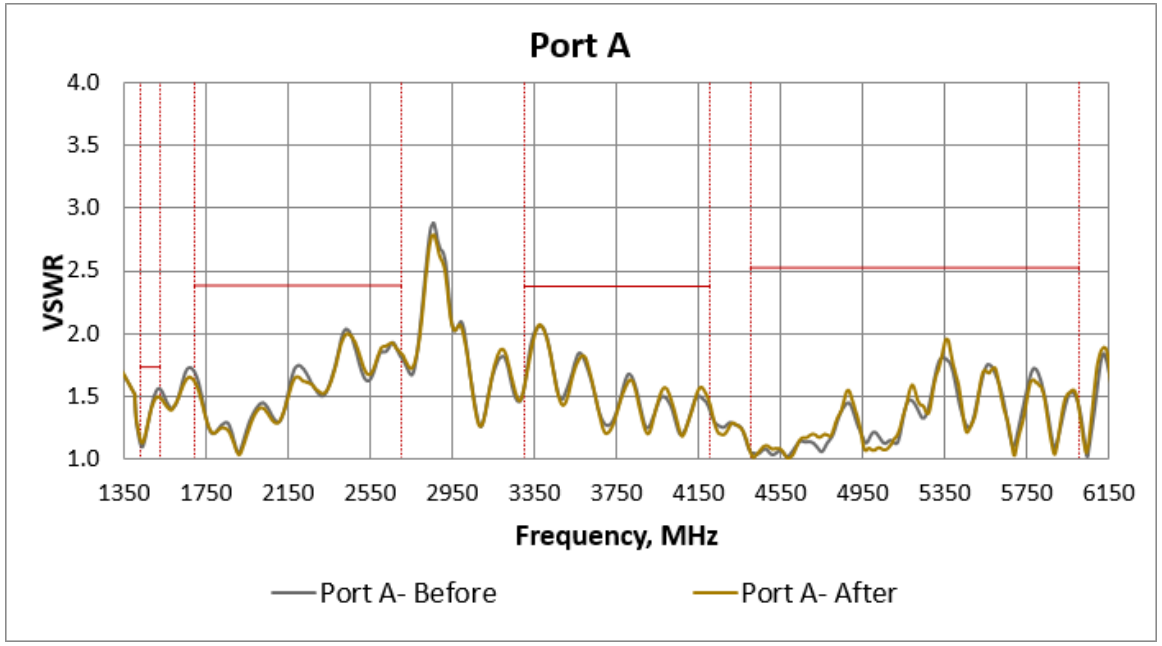
Corrosive Test Result

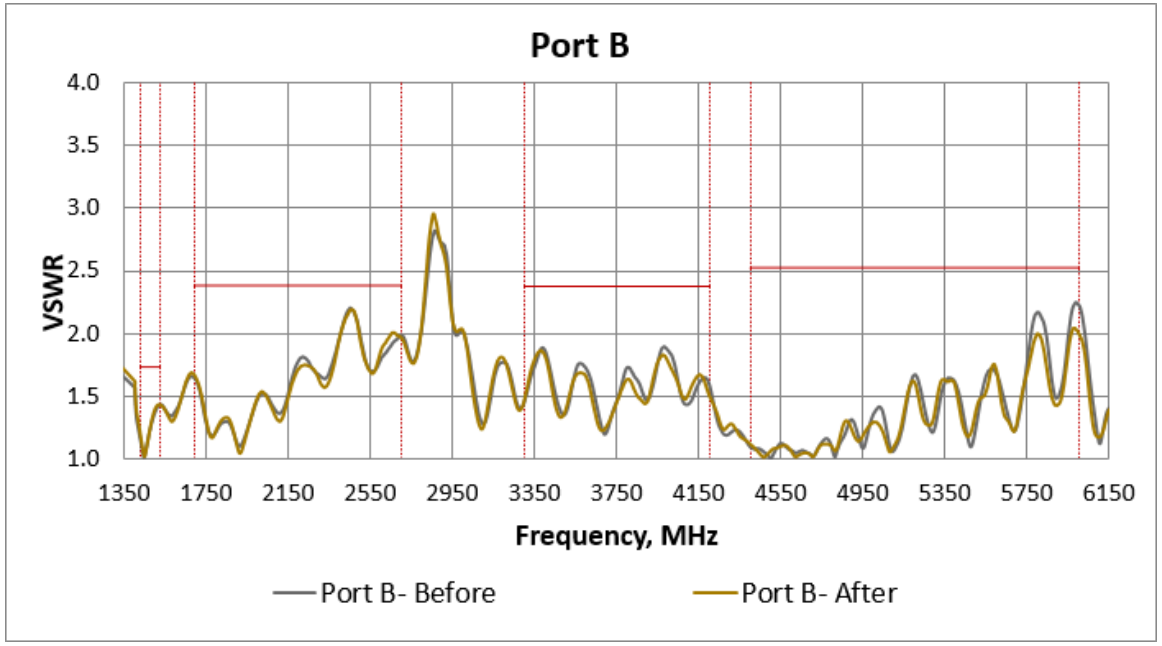




NF21

Corrosive Test Result





NF22

Corrosive Test Result

- Summary:

All the Antenna samples pass the corrosive test.

Vibration, Random

Tested By:	YJ Teoh
Compiled By:	YJ Teoh, TH Lee, WS Beh
Verified By:	YJ Teoh, TH Lee, WS Beh
Date:	29DEC23

Vibration, Random

Specification:	IEC 60068-2-64, Stationary Installation, Category 3
Test Parameter:	Grms 7.0m/s^2, 1hr per axis, 3 axis total
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	QAV Technologies (M) Sdn Bhd
Test Dates:	29DEC23
Test Equipment:	STI Vibration Tester
Number of Units Tested:	3
DUT label Numbers:	NF3, NF4, NF5, NF6
Remarks:	

Vibration, Random Test Setup

Test : Random Vibration Test
Specification : IEC 60068-2-64, Stationary Installation, Category 3
G Level : 7 Grms
Time Duration/Axis : 1 hour/Axis
Axis : 3 axis (Vertical,Transverse, Longitudinal)
Total Loading : 1 Loading

Equipment : STI Vibration Tester
Equipment Serial # : D-150-2

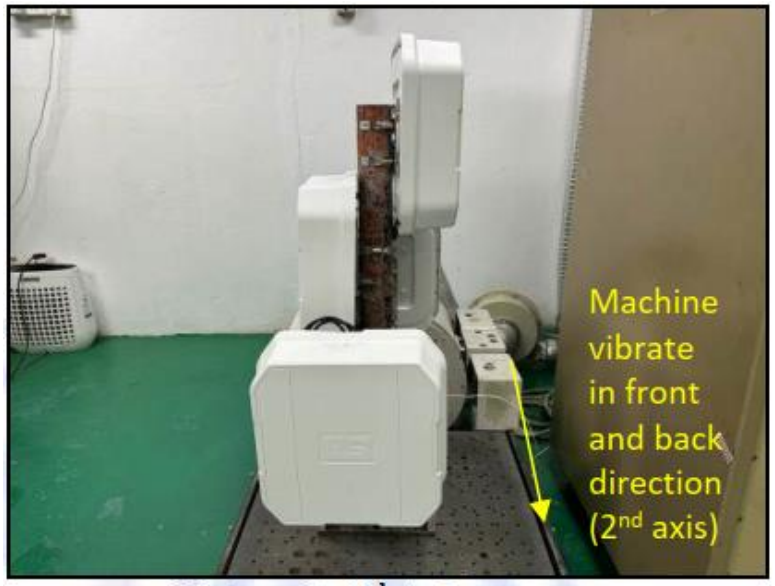
Accelerometers
Equipment : Charge Accelerometer
Model Number : 357B03
Equipment Serial # : LW56135
Sensitivity@100.0Hz: 9.98 pC/g

Frequency	PSD (G^2/Hz) / Slope (dB/Octave)
10	6 dB/Octave
30	0.2 $(m/s^2)^2$/Hz
200	0.2 $(m/s^2)^2$/Hz
500	-12 dB/Octave

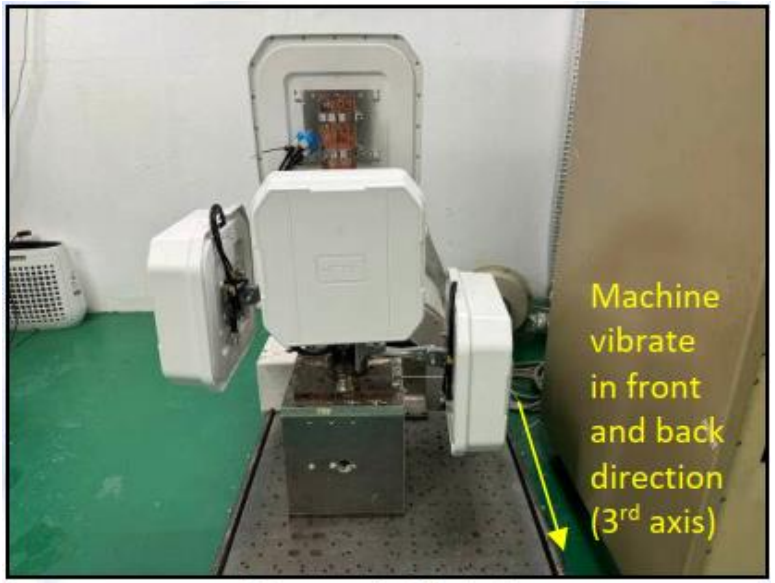
Table 1: Table above shows the PSD level for the test profile

Vibration, Random Test Setup

Picture 2: 1st Axis

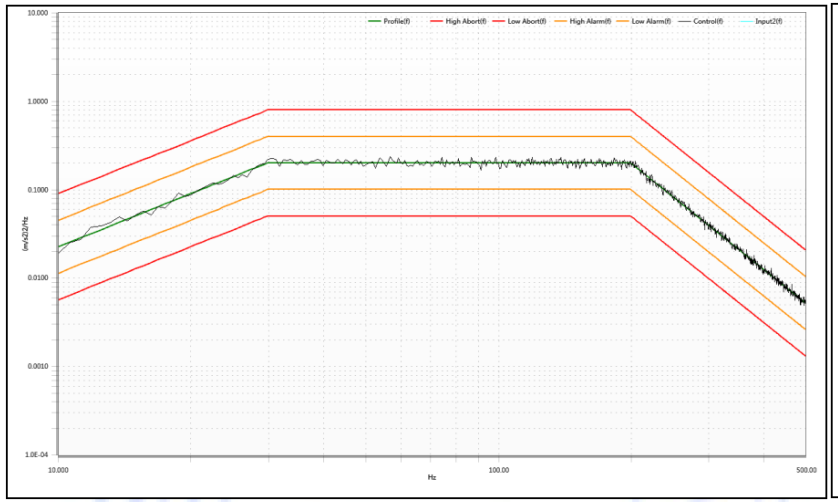


Picture 3: 2nd Axis

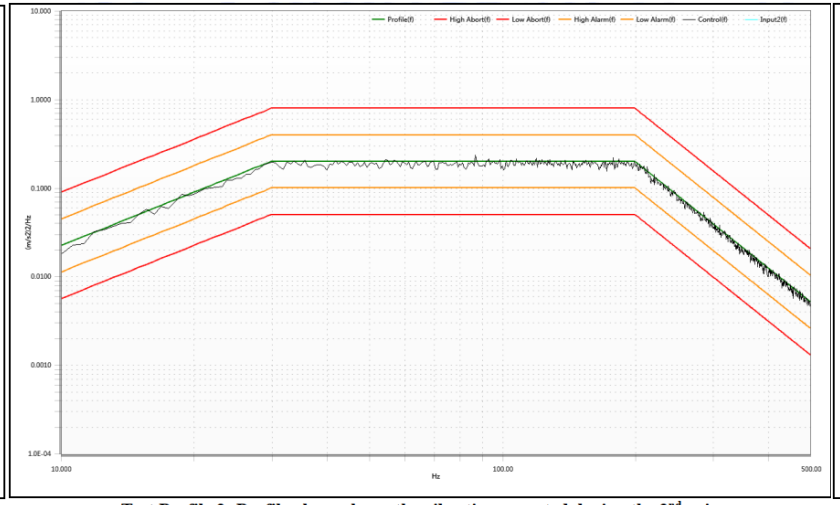


Picture 4: 3rd Axis

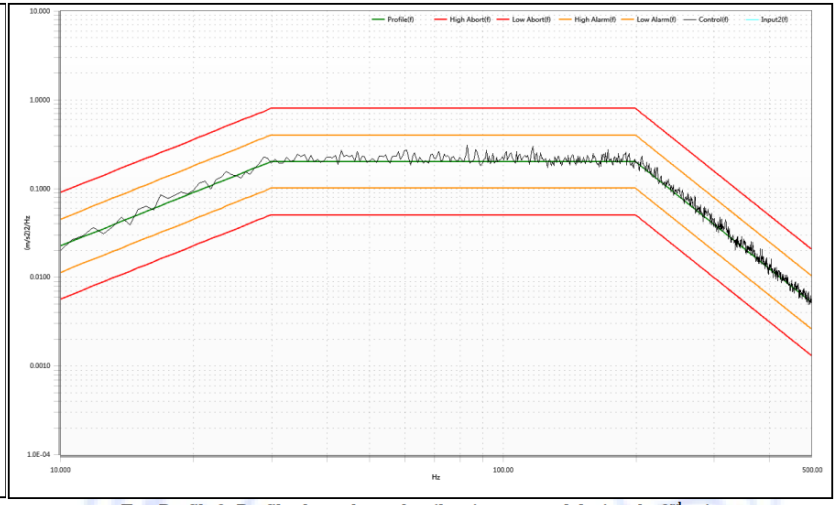
Vibration, Random Test Profile



Test Profile 1: Profile above shows the vibration executed during the 1st axis

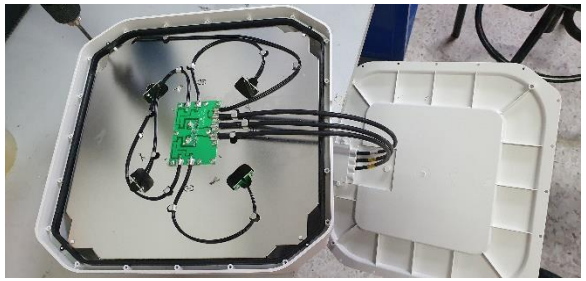
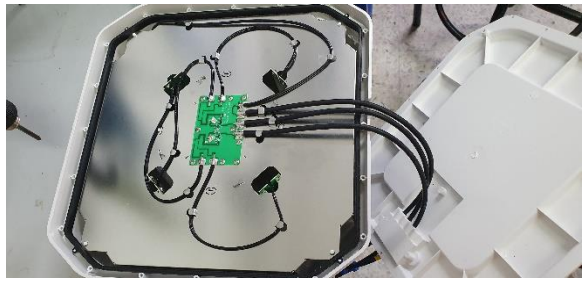
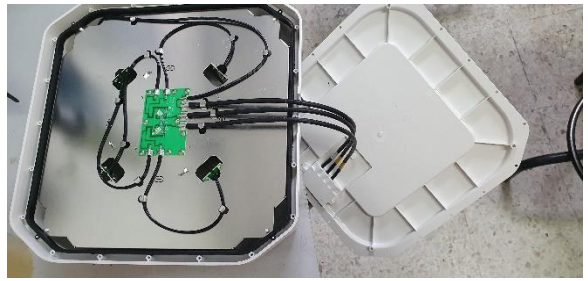
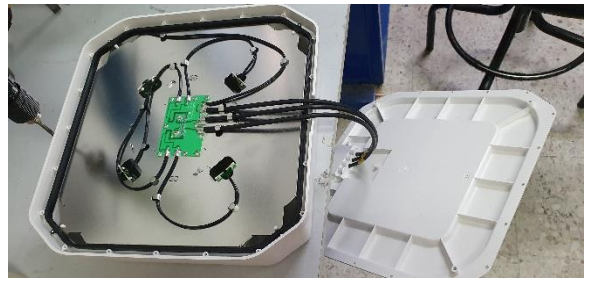


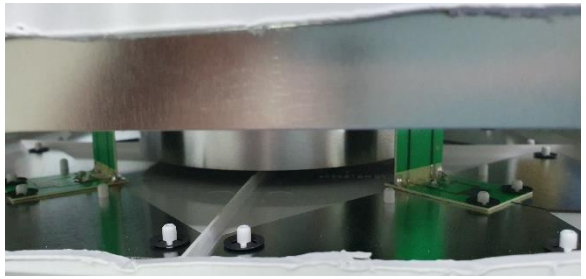
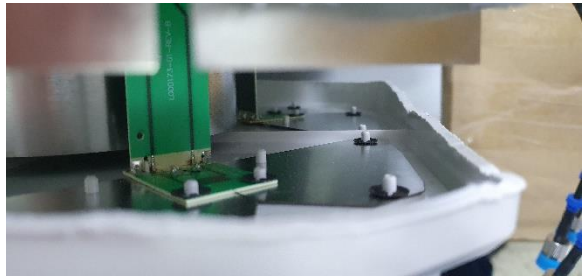
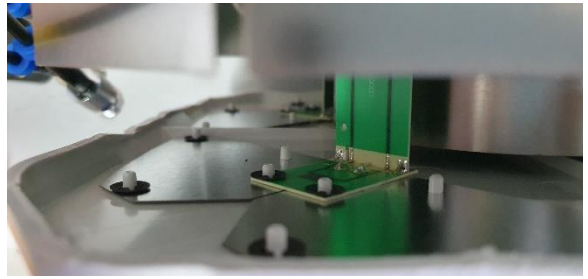
Test Profile 2: Profile above shows the vibration executed during the 2nd axis



Test Profile 3: Profile above shows the vibration executed during the 3rd axis

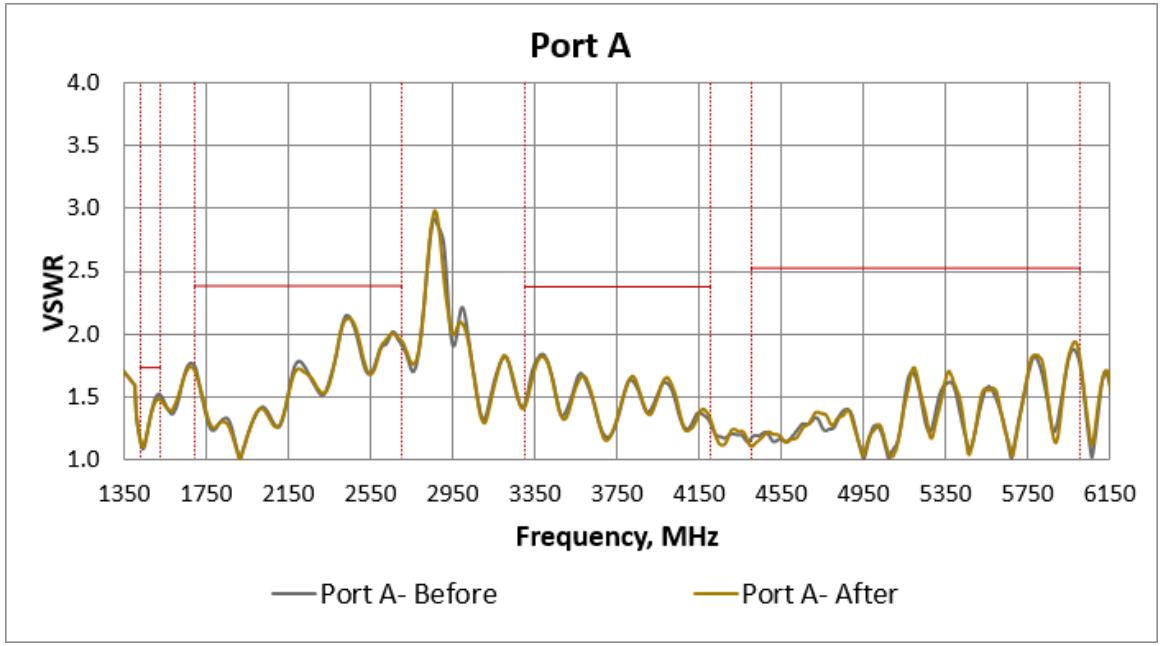
Vibration, Random Test Result

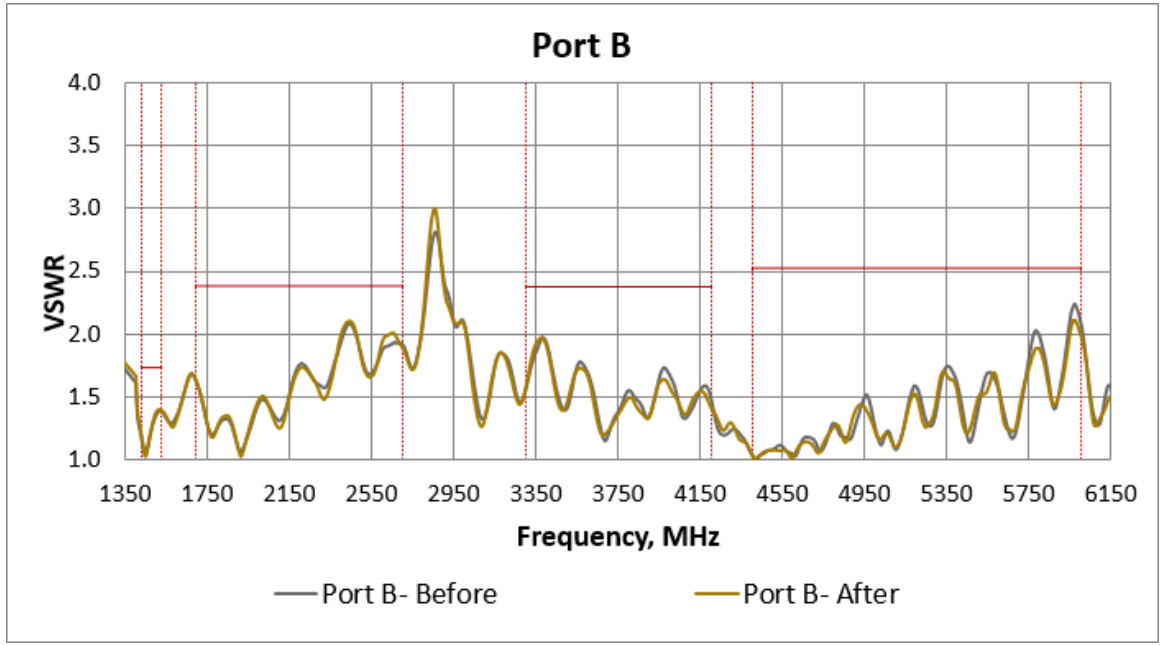






NF3 NF4 NF5 NF6

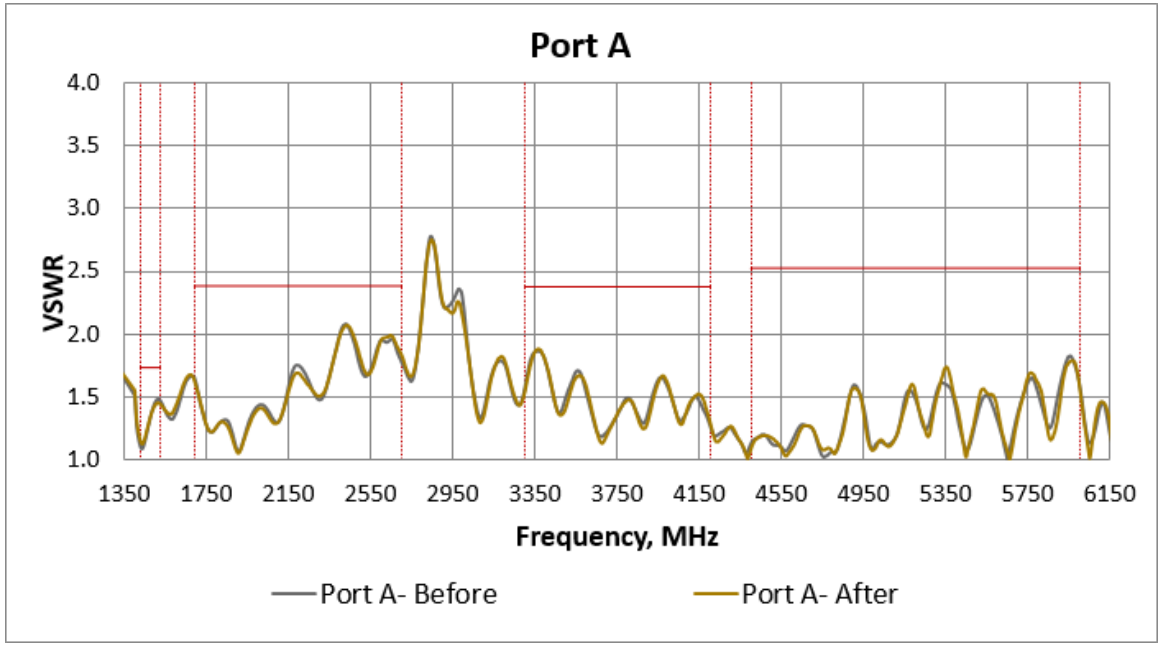
Vibration, Random Test Result

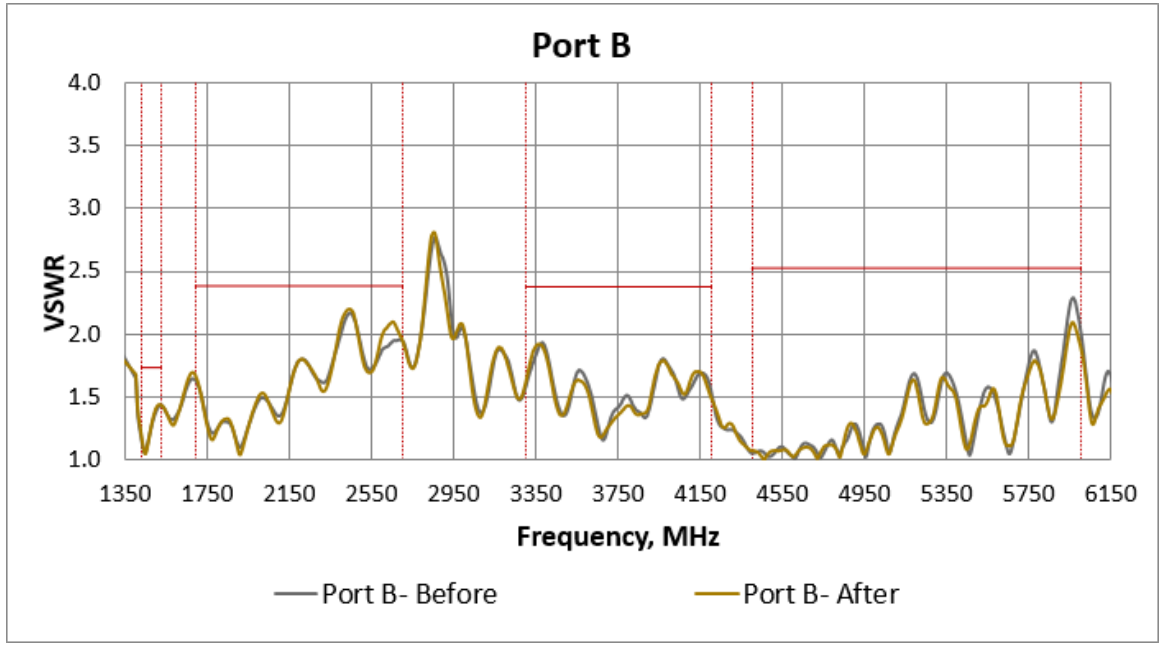




NF3

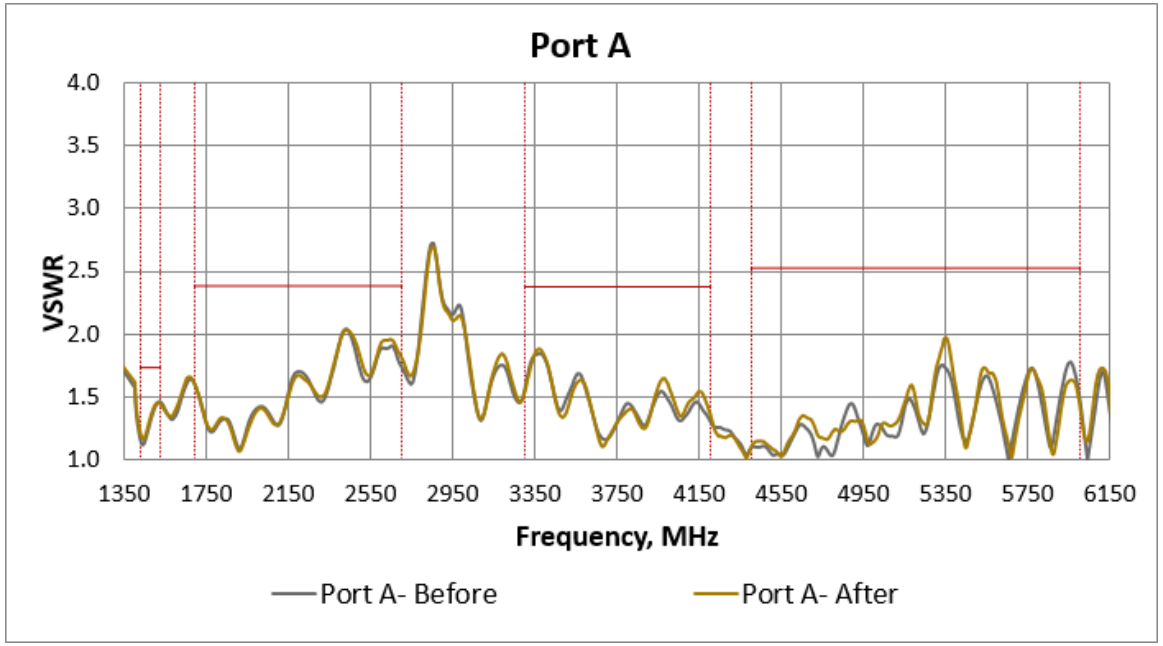
Vibration, Random Test Result

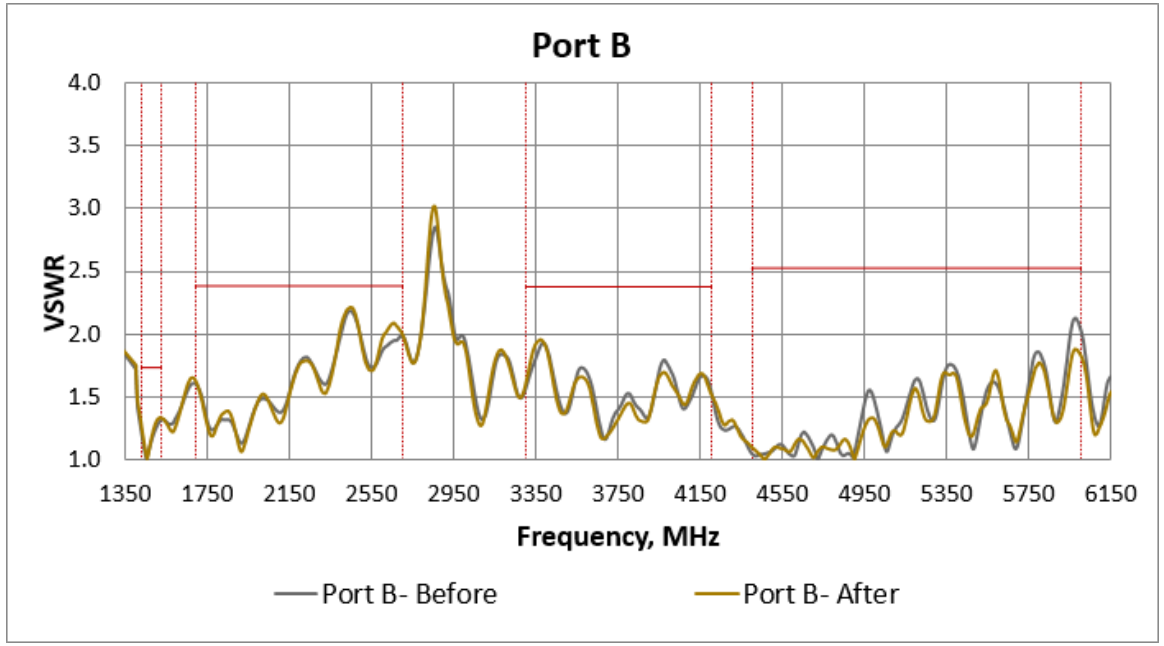




NF4

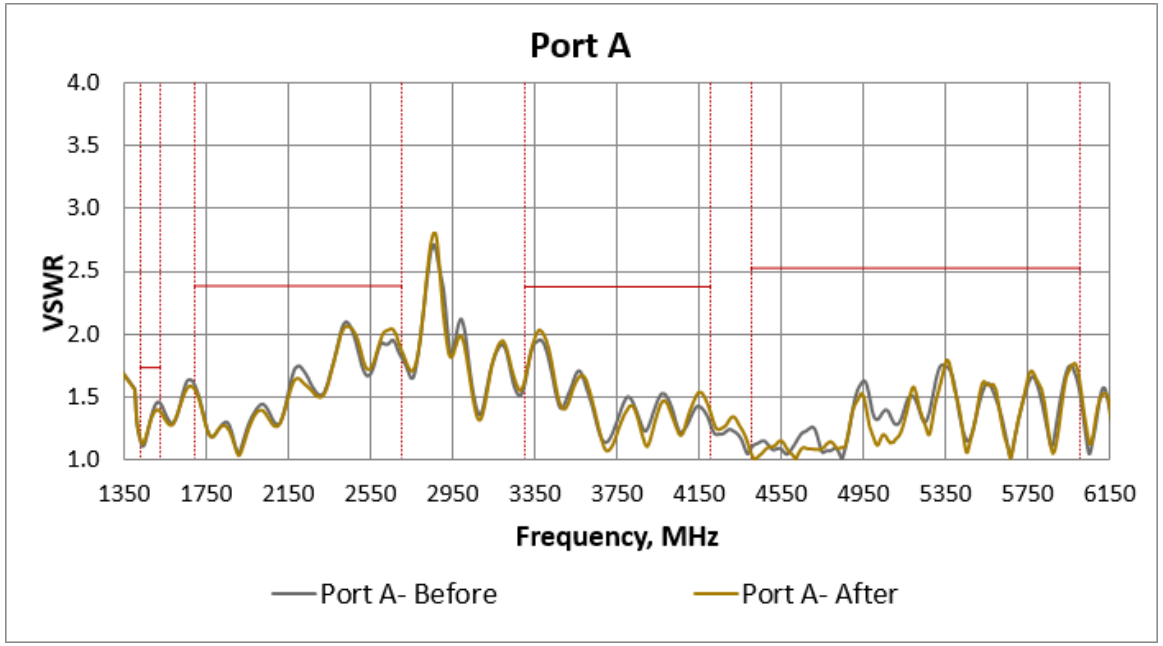
Vibration, Random Test Result

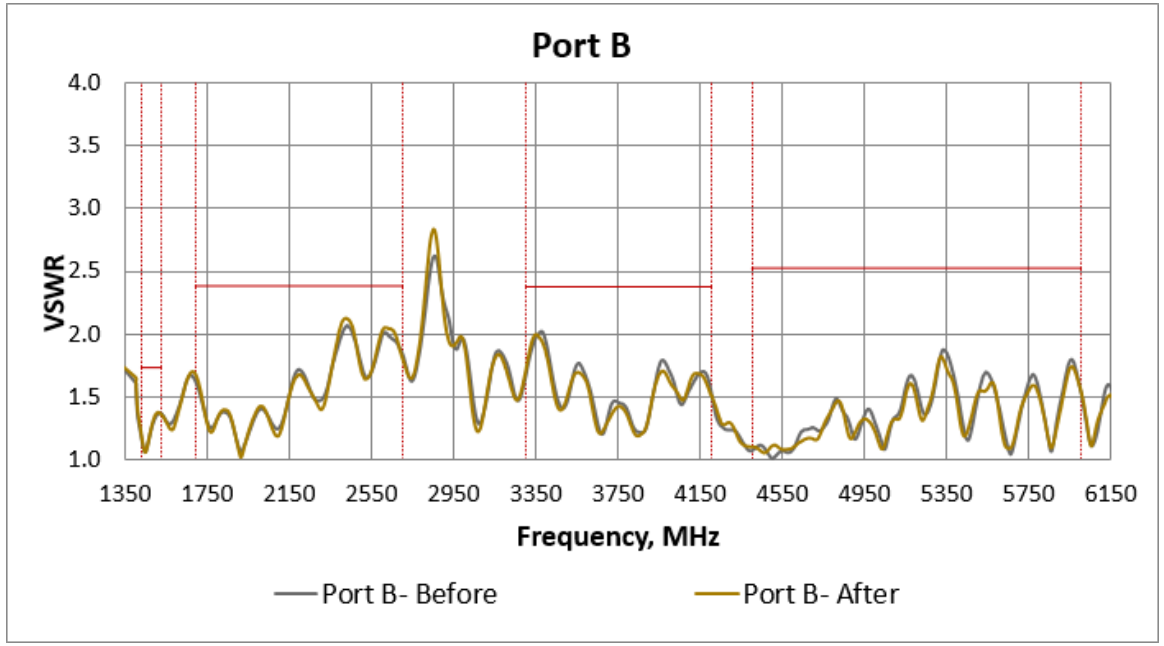




NF5

Vibration, Random Test Result





NF6

Vibration, Random Test Result

- Summary:

All the samples pass the vibration, random test.

Mechanical Shock

Tested By:	QAV Technologies
Compiled By:	YJ Teoh, TH Lee, WS Beh
Verified By:	YJ Teoh, TH Lee, WS Beh
Date:	29DEC23

Mechanical Shock

Specification:	The product shall be tested in accord with IEC 60068-2-27, Structural Integrity of Mountings
Test Parameter:	30g, 18ms, 1/2 sine, 3 pulses in positive, 3 pulses in negative, 3 axis total, 18 pulses total.
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	QAV
Test Dates:	29DEC23
Test Equipment:	STI Vibration Tester
Number of Units Tested:	3
DUT label Numbers:	NF8, NF9, NF12, NF14
Remarks:	

Mechanical Shock Test Setup

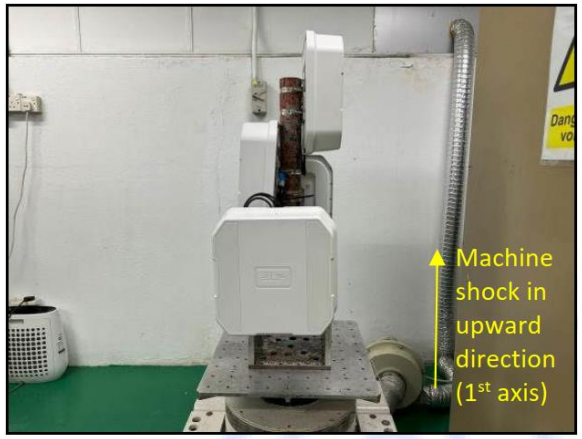
Equipment : STI Vibration Tester
Equipment Serial # : D-150-2

Accelerometers
Equipment : Charge Accelerometer
Model Number : 357B03
Equipment Serial # : LW56135
Sensitivity@100.0Hz: 9.98 pC/g

Test Information

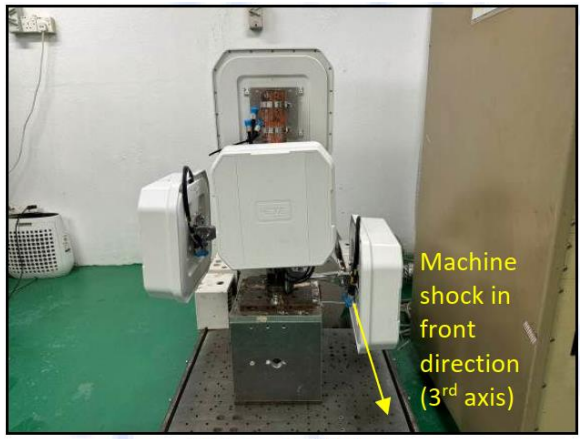
Test : Mechanical Shock
Specification : IEC60068-2-27
G Level : 30G
Pulse WIdth : 18ms
Shock Type : Half-sine
Axis : 6 axis (+x,+y,+z,-x,-y,-z)
Shock/Axis : 3 shocks/axis
Total Loading : 1 Loading

Mechanical Shock Test Setup

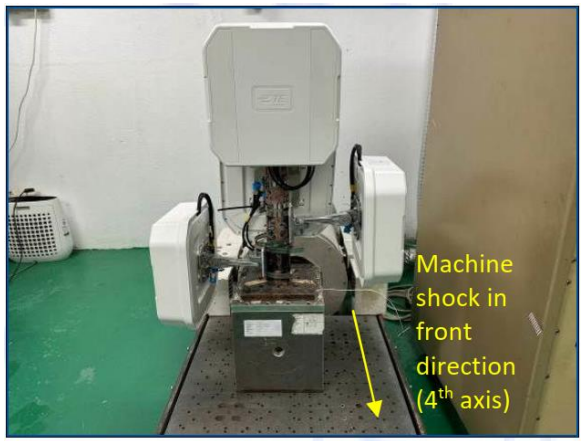


Picture 2: 1st Axis

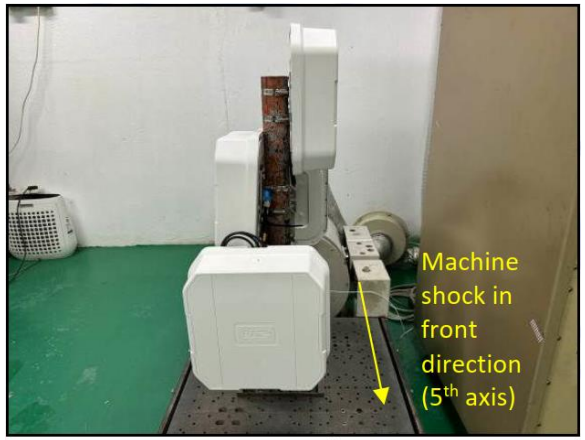
Picture 3: 2nd Axis



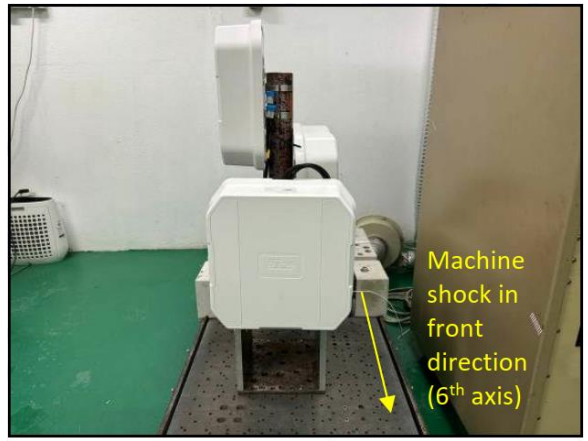
Picture 4: 3rd Axis



Picture 5: 4th Axis

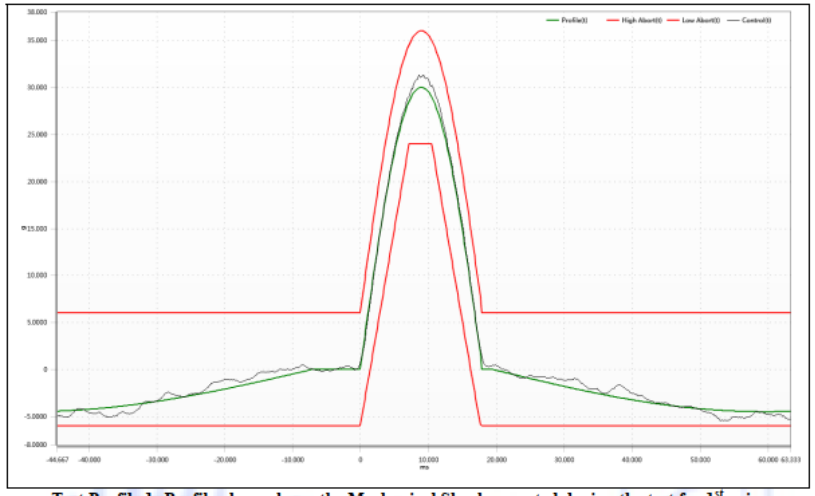


Picture 6: 5th Axis

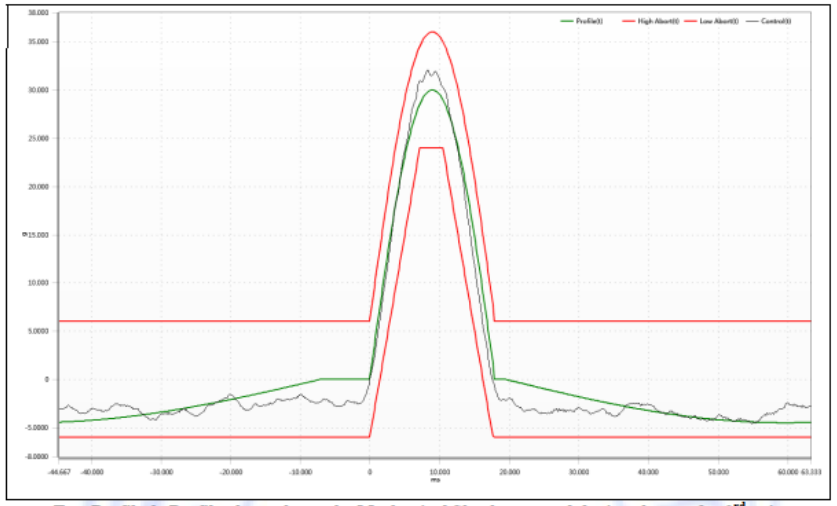


Picture 7: 6th Axis

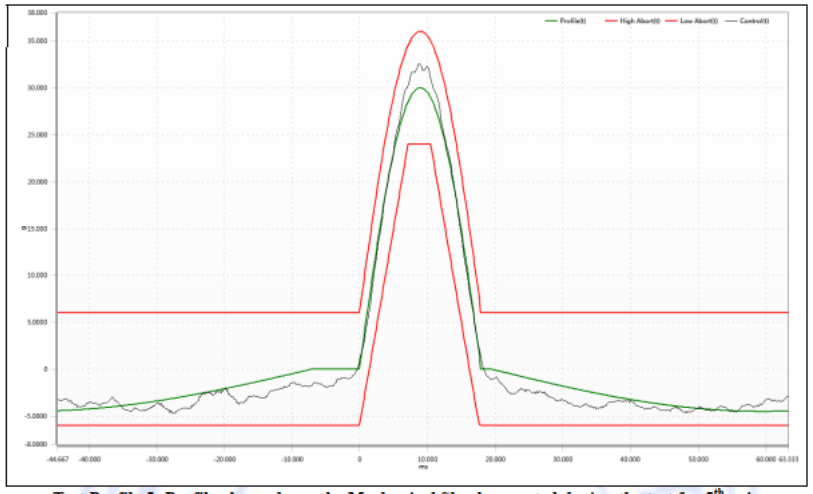
Mechanical Shock Test Profile



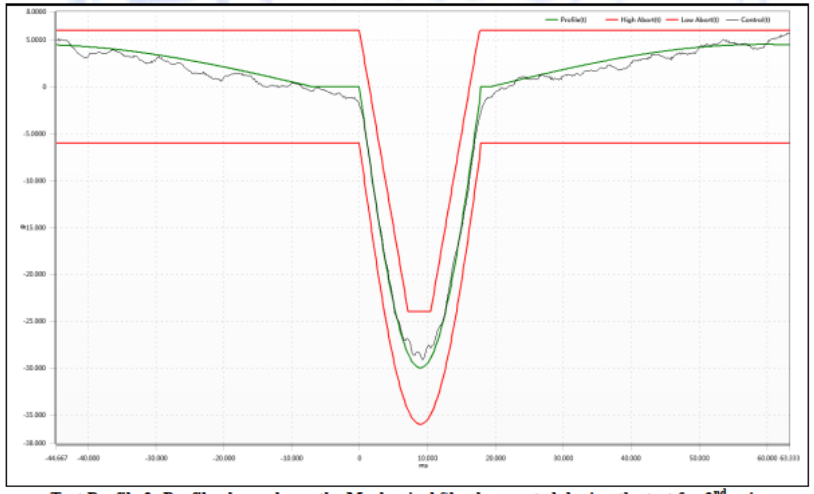
Test Profile 1: Profile above shows the Mechanical Shock executed during the test for 1st axis



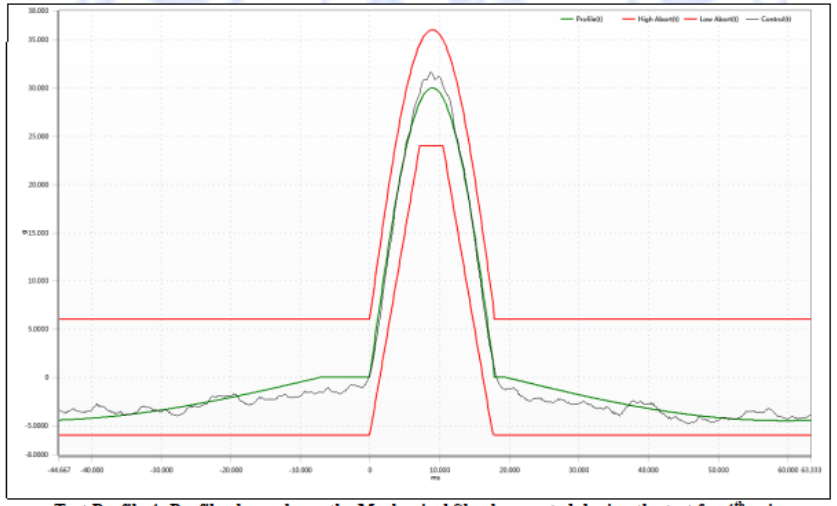
Test Profile 3: Profile above shows the Mechanical Shock executed during the test for 3rd axis



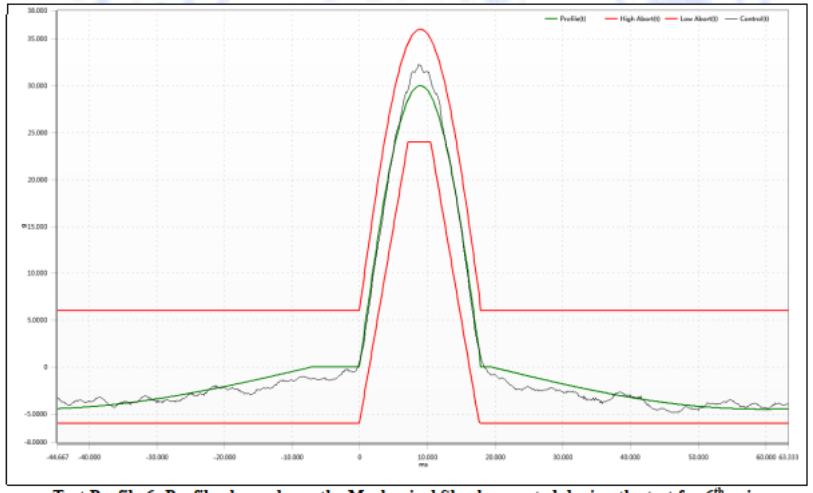
Test Profile 5: Profile above shows the Mechanical Shock executed during the test for 5th axis



Test Profile 2: Profile above shows the Mechanical Shock executed during the test for 2nd axis

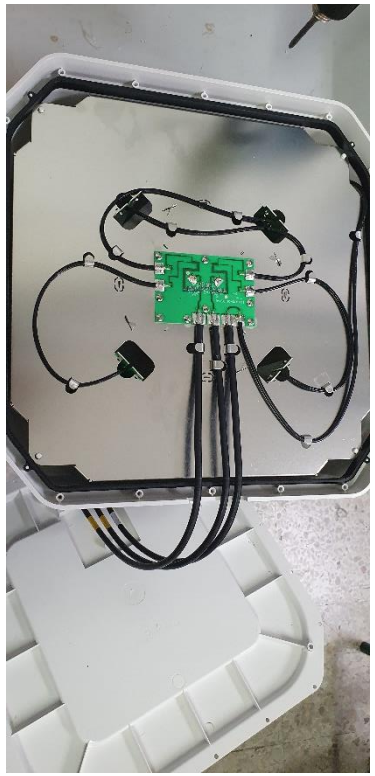


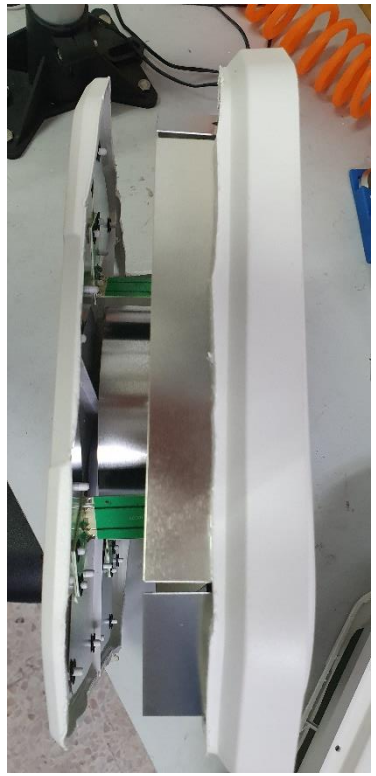
Test Profile 4: Profile above shows the Mechanical Shock executed during the test for 4th axis



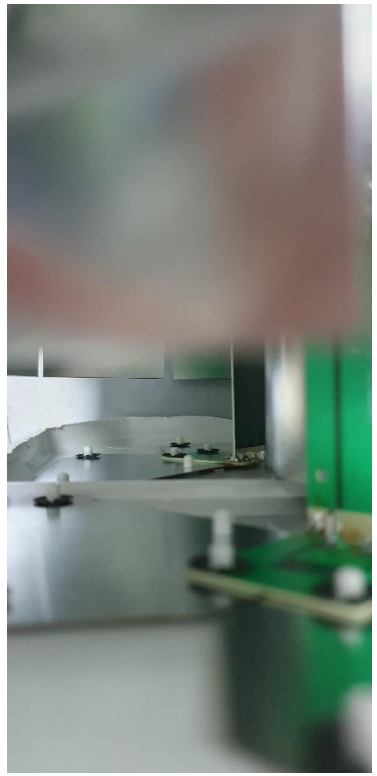
Test Profile 6: Profile above shows the Mechanical Shock executed during the test for 6th axis

Mechanical Shock Test Result





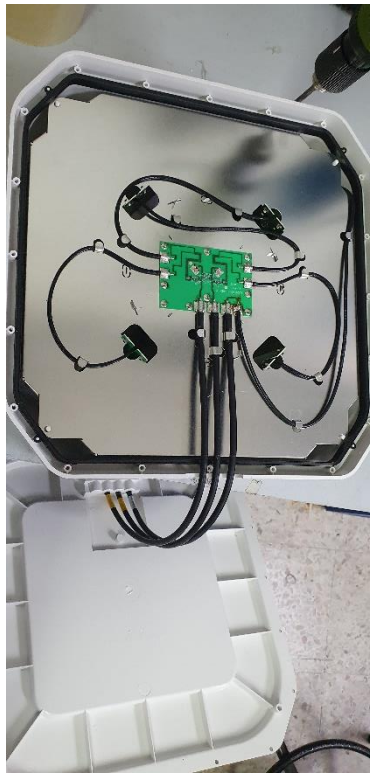
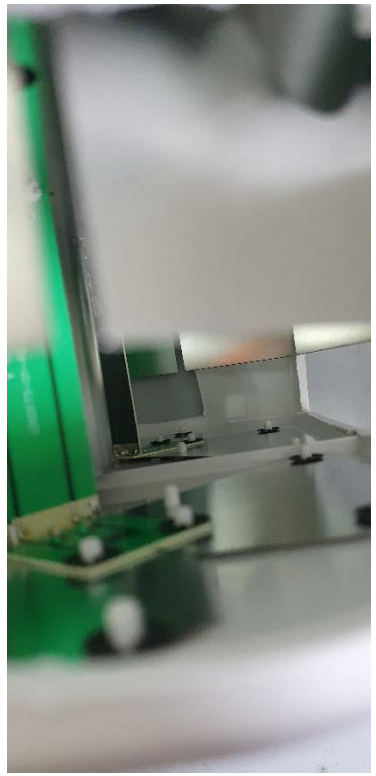
NF8



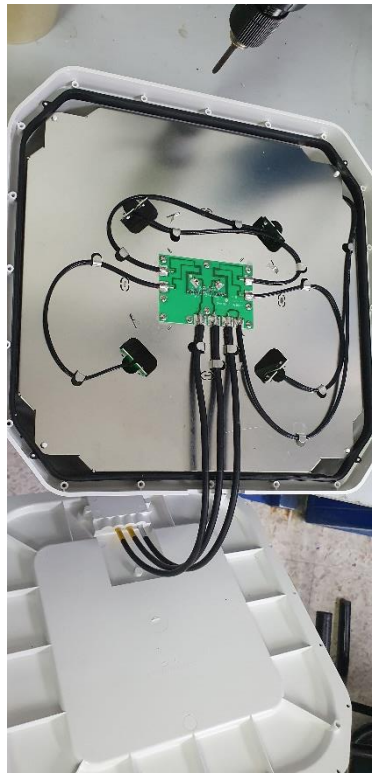
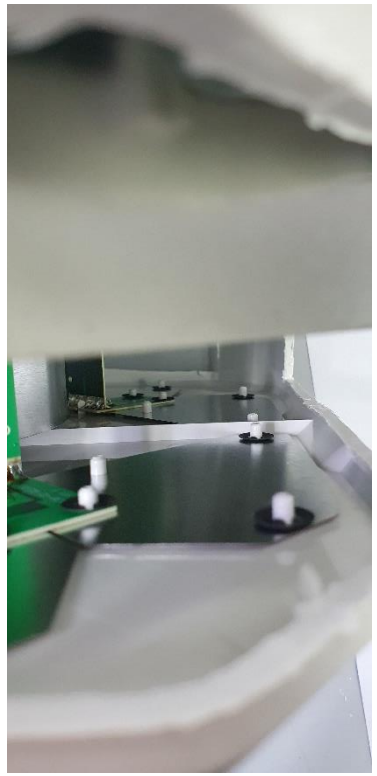
NF9

No physical damage was observed after test.

Mechanical Shock Test Result

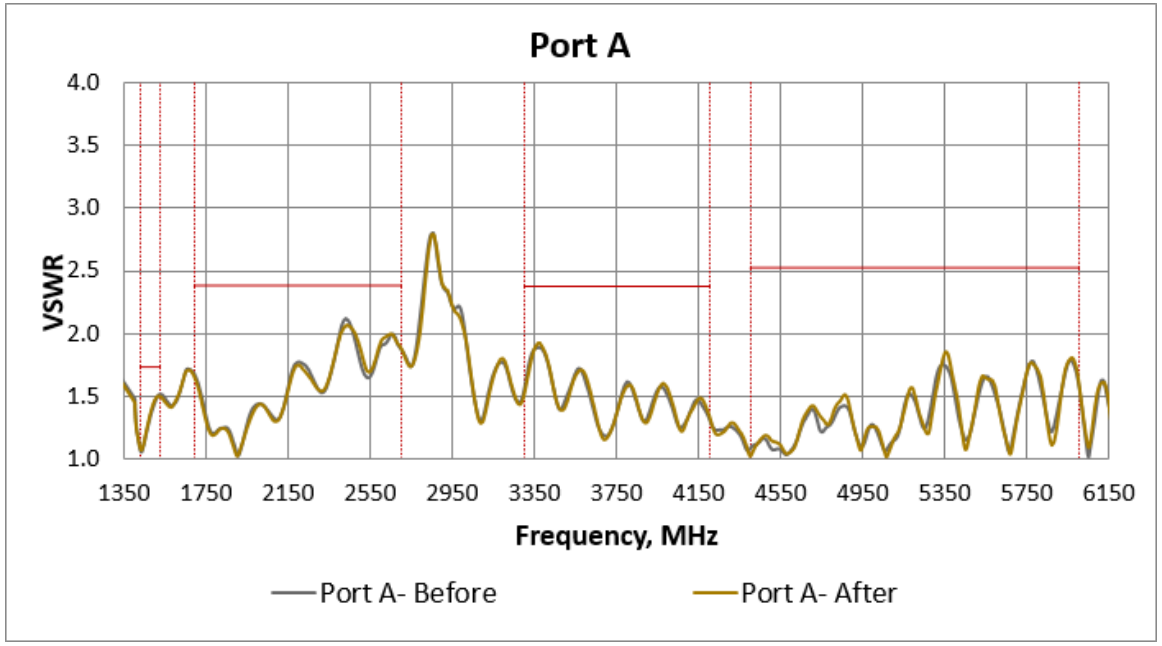
NF12

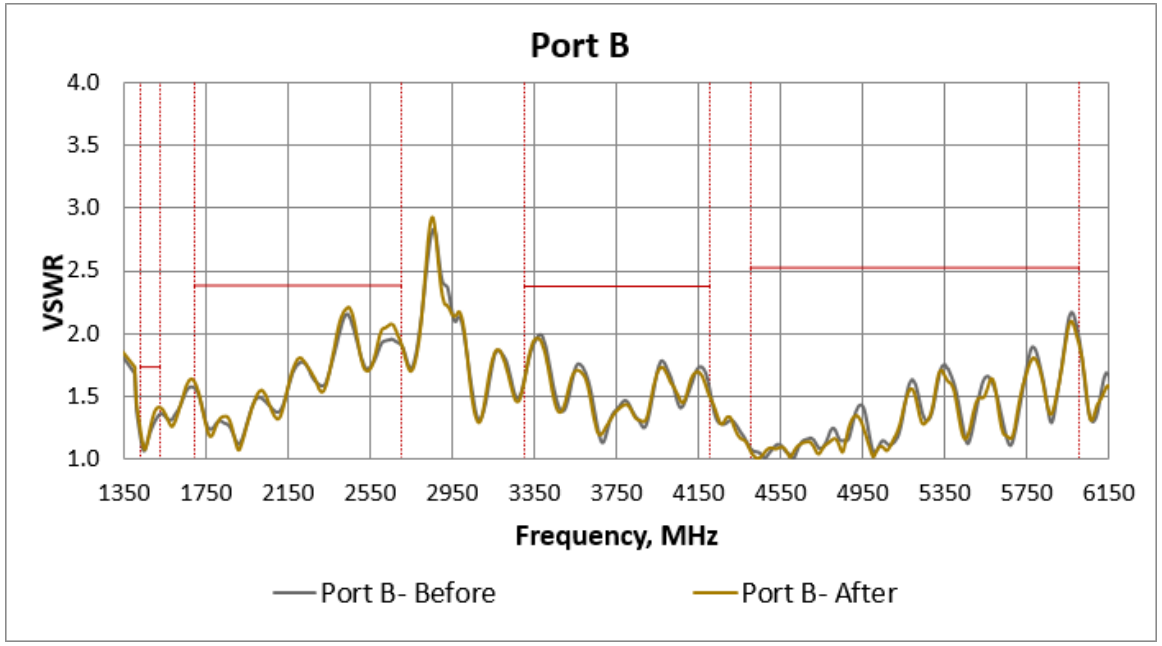



NF14

No physical damage was observed after test.

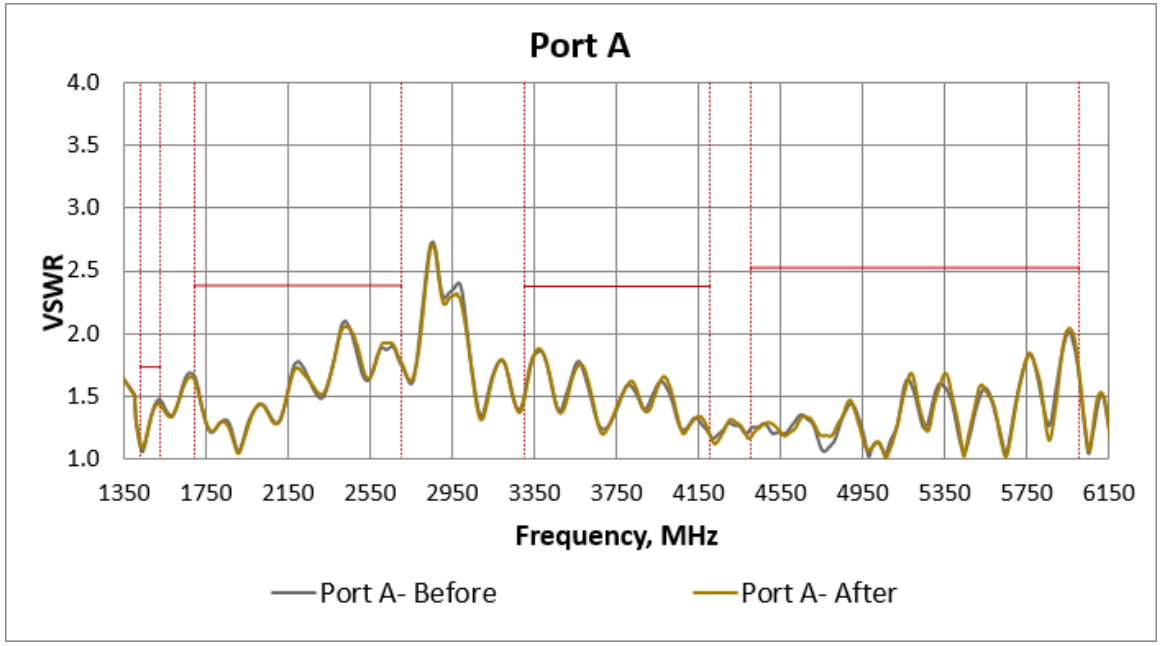
Mechanical Shock Test Result

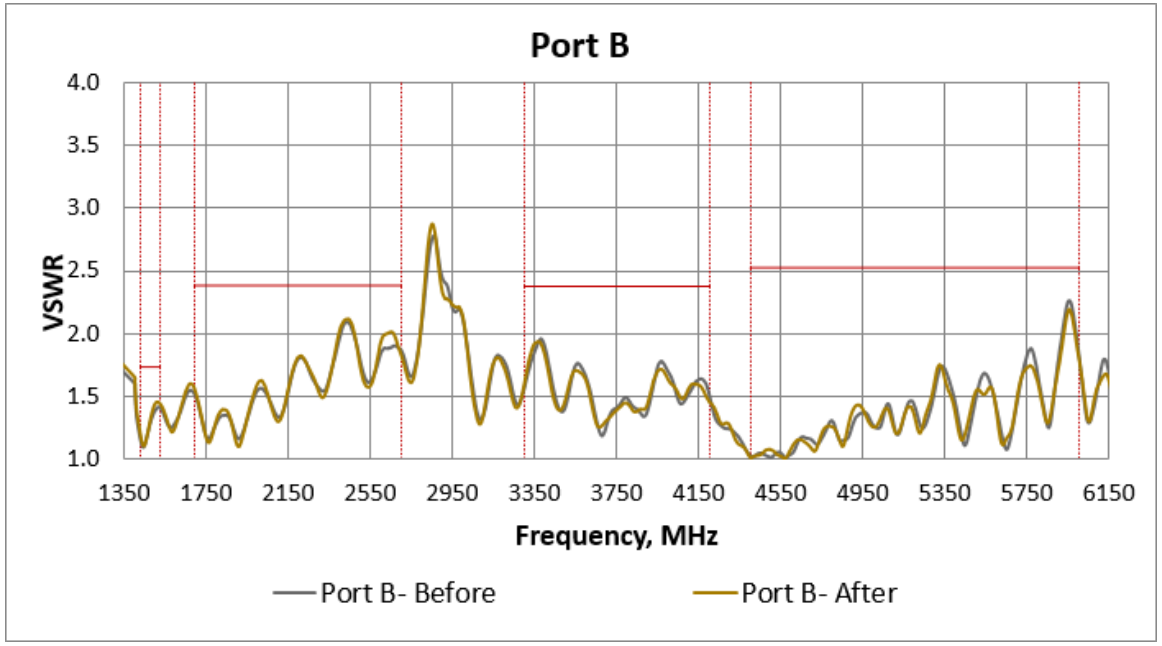




NF8

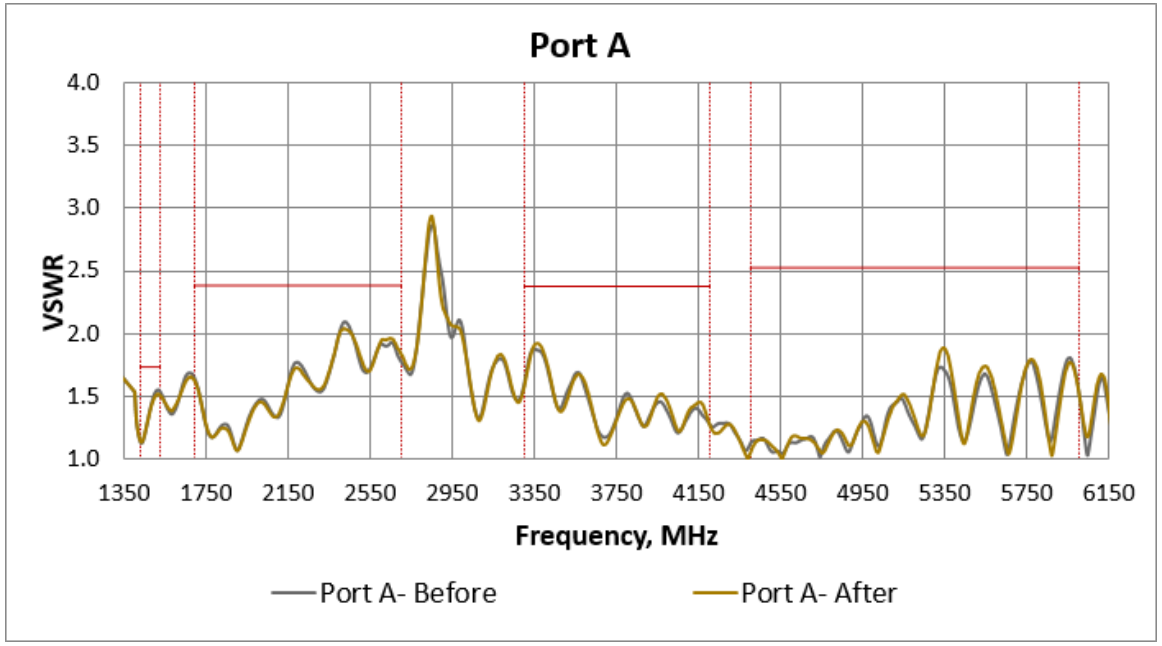
Mechanical Shock Test Result

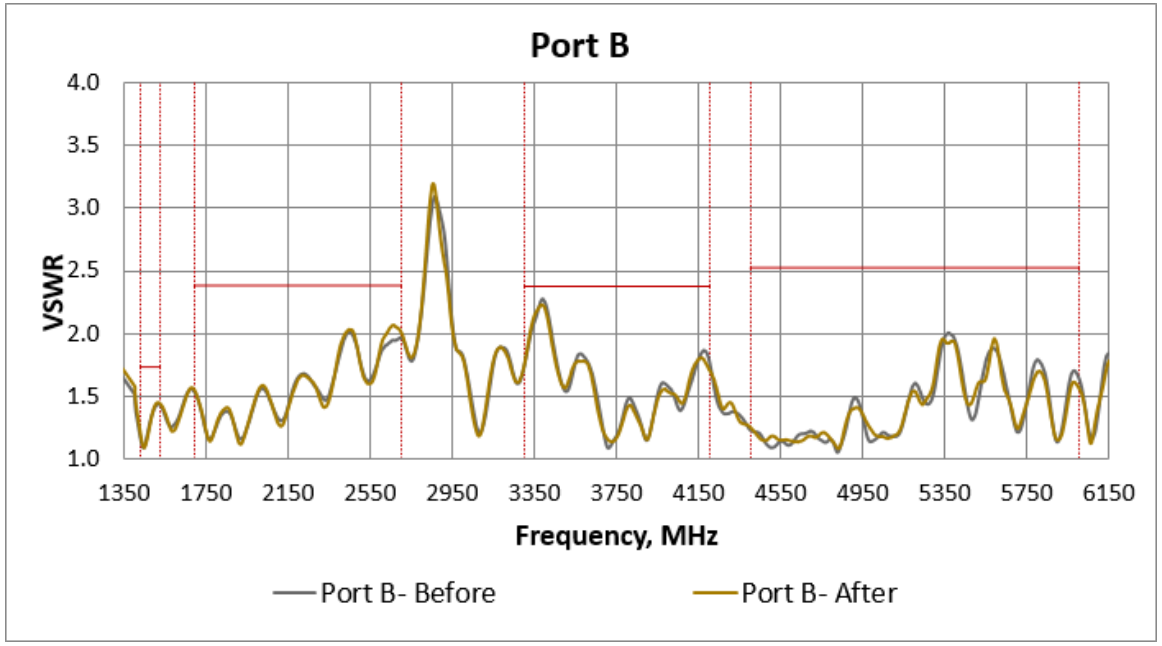




NF9

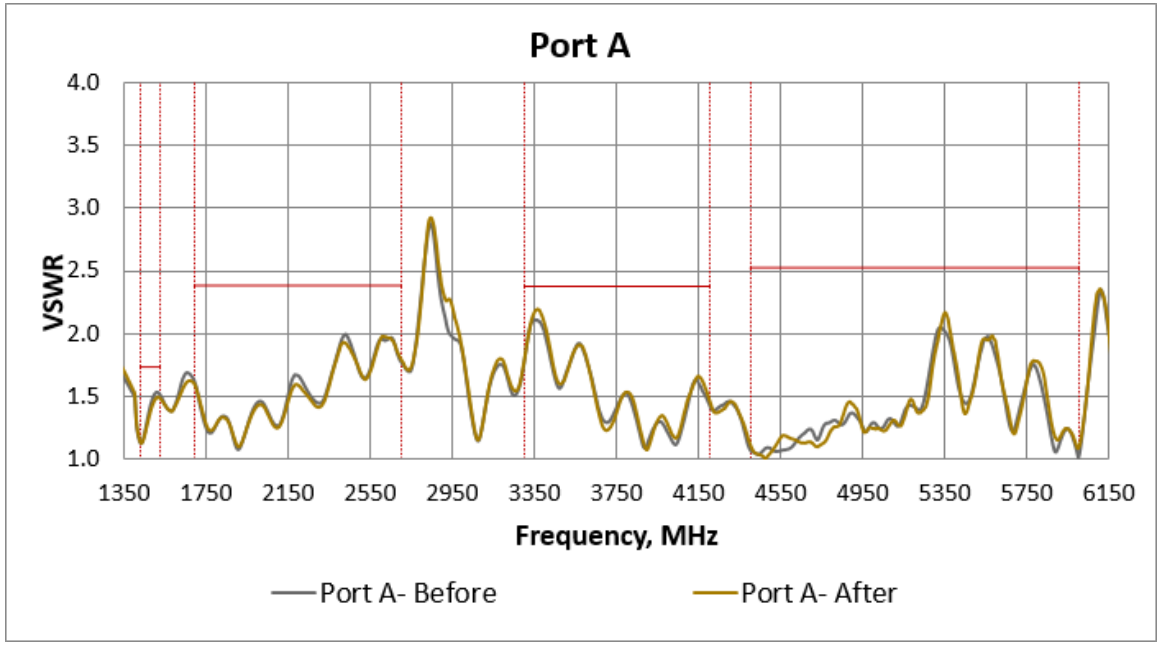
Mechanical Shock Test Result

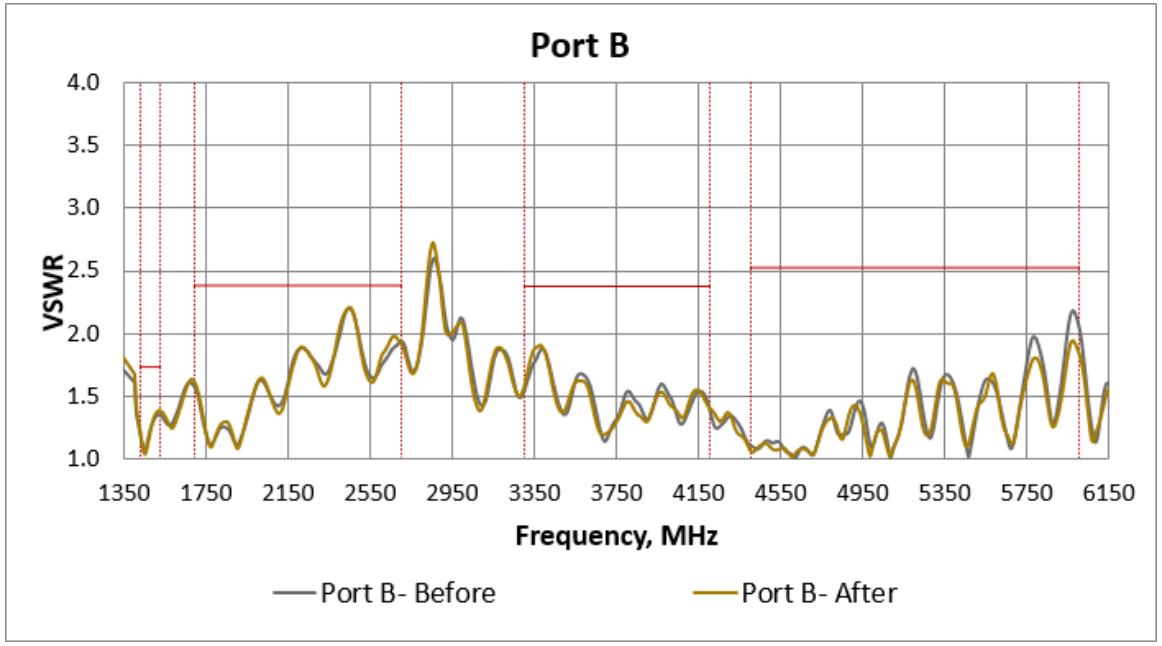




NF12

Mechanical Shock Test Result





NF14

Mechanical Shock Test Result

- Summary:

All the samples pass the mechanical shock test.

Wind Operational

Tested By: YJ Teoh

Compiled By: YJ Teoh, TH Lee, WS Beh

Verified By: YJ Teoh, TH Lee, WS Beh

Date: 03JAN24

Wind Operational

Specification:	Physical loading of 0° orientation and 90° orientation, 1 minutes, based on curved plate load calculation.
Test Parameter:	1 minutes
Failure Criteria:	Any movement
Test Site:	TE Connectivity Penang
Test Dates:	03JAN24
Test Equipment:	Load: Weight
Number of Units Tested:	3
DUT label Numbers:	NF47, NF49, NF50
Remarks:	

Wind Operational Test Setup

Duration: 1 minute
Weight load:

- 20.64 Kg on front surface
- 8.12 Kg on side surfaces

Wind Operational Test Setup

Duration: 1 minute
Weight: 20.64 Kg

Force = A × P × Cd

A = projected area of the item (ft2)
P = wind pressure (lb/ft2) = .00256 x V^2 (V= wind speed in mi/hr)
Cd = Drag coefficient = 2 for flat surface.

Force = 0.888 x [0.00256 x 100^2] x 2 = 45.5 lbs (20.64Kg)

Wind Operational Test Setup

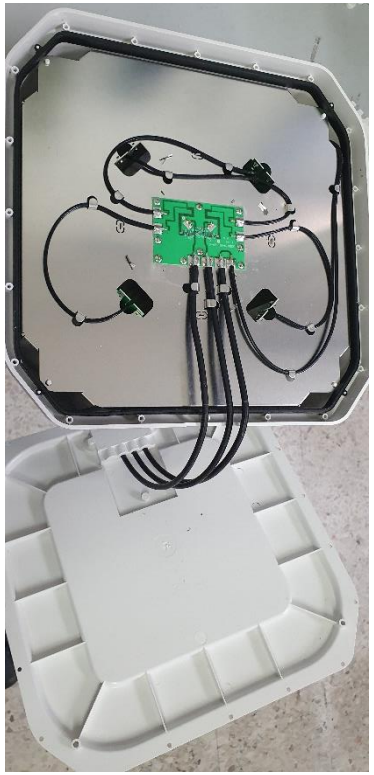
Duration: 1 minute
Weight: 8.12 Kg

Force = A × P × Cd

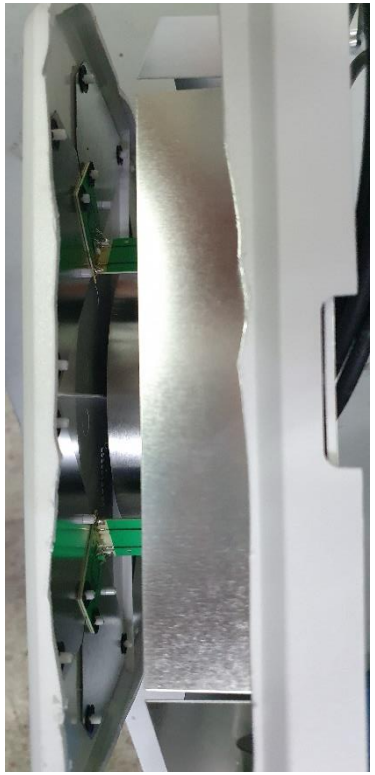
A = projected area of the item (ft2)
P = wind pressure (lb/ft2) = .00256 x V^2 (V= wind speed in mi/hr)
Cd = Drag coefficient = 2 for flat surface.

Force = 0.349 x [0.00256 x 100^2] x 2 = 17.9 lbs (8.12Kg)

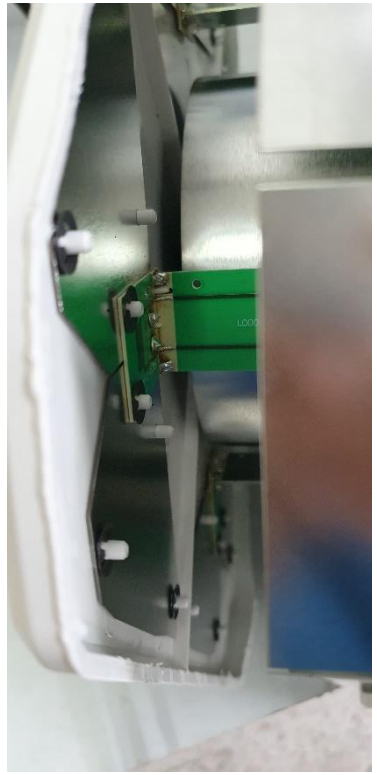
Wind Operational Test Result




NF47

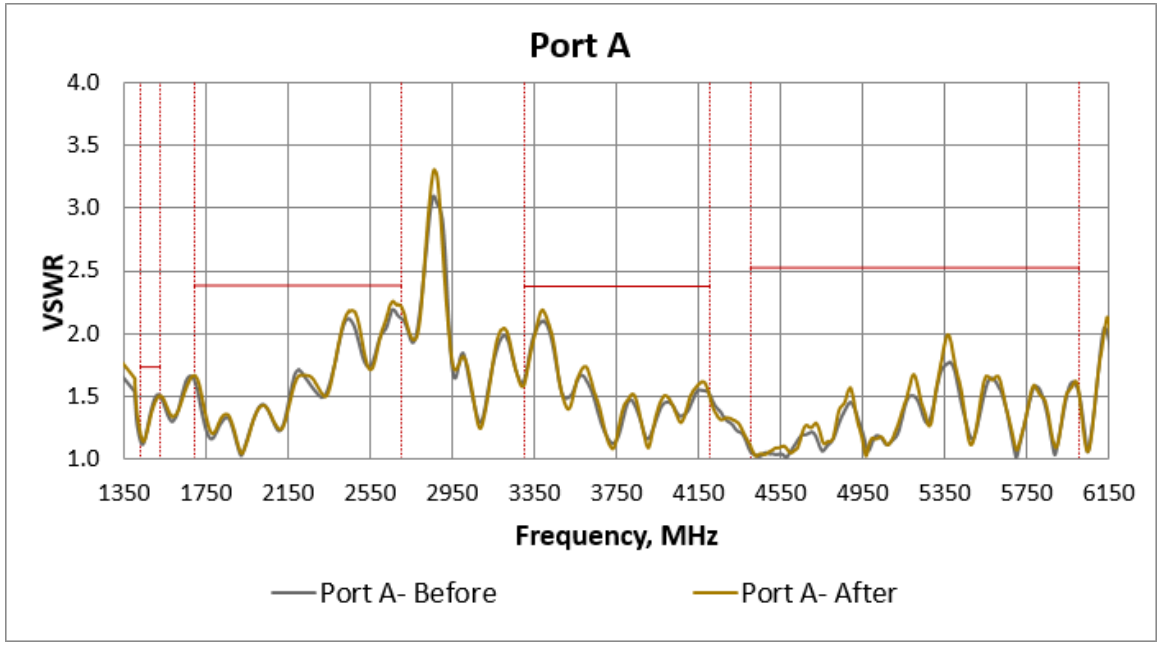



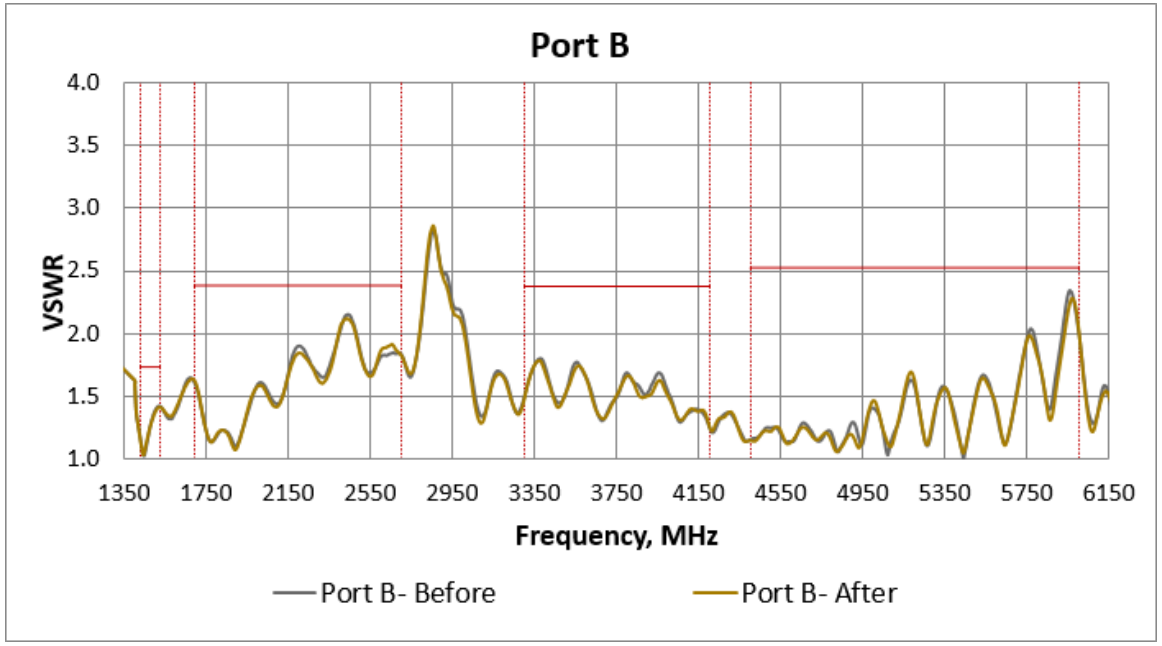
NF49

NF50

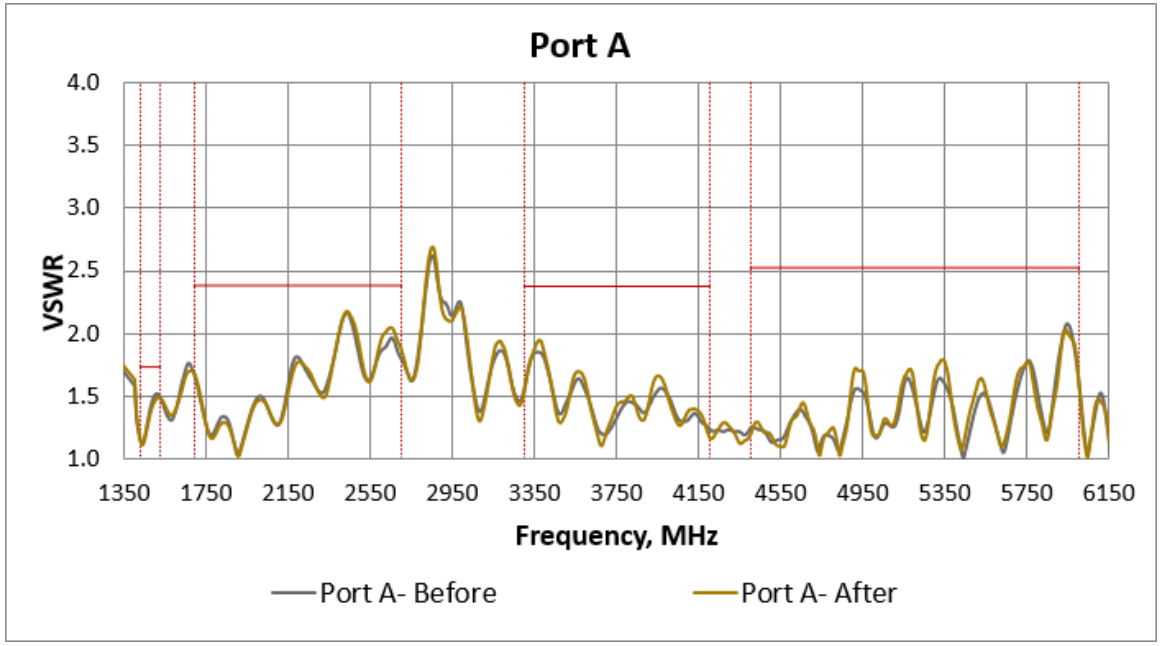
Wind Operational Test Result

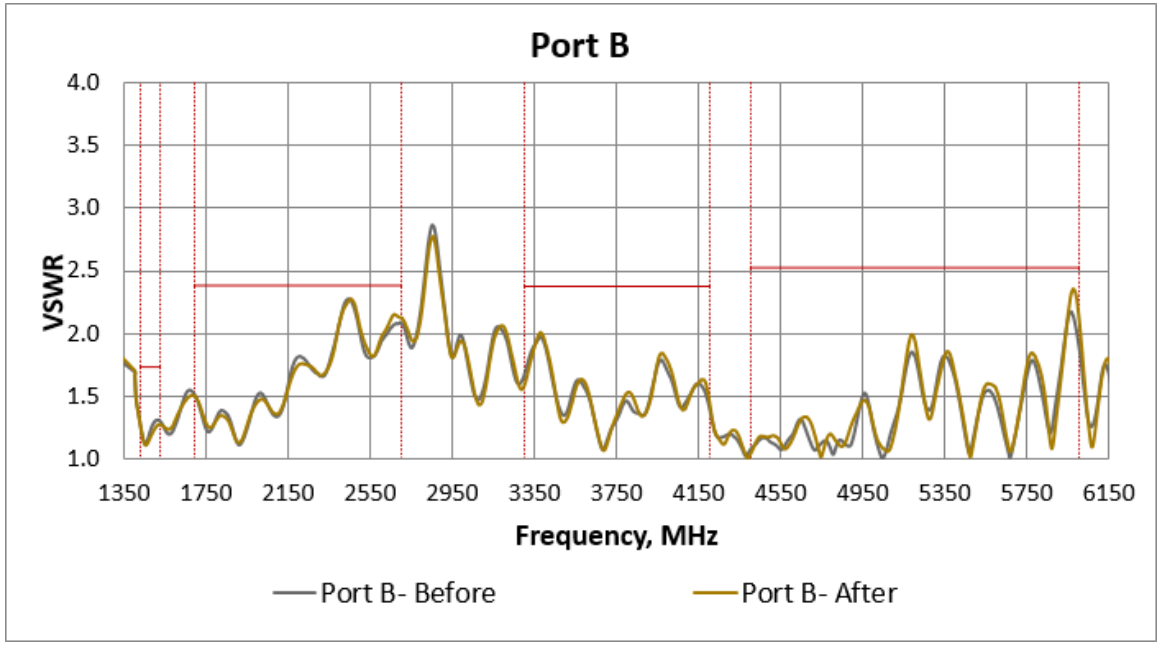




NF47

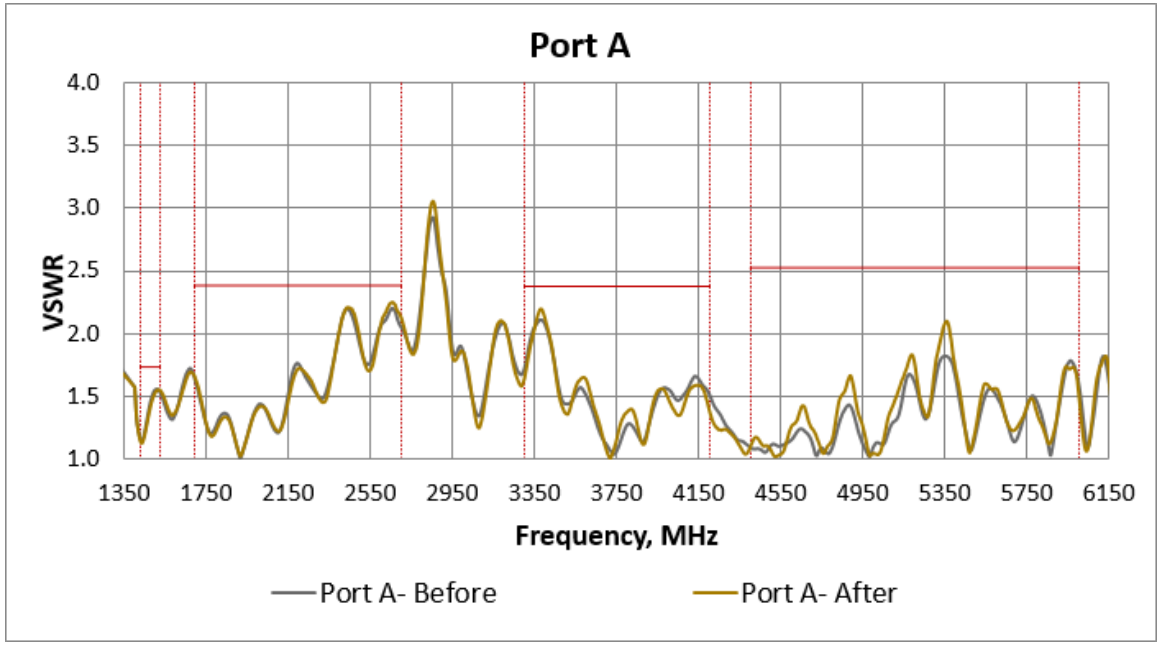
Wind Operational Test Result

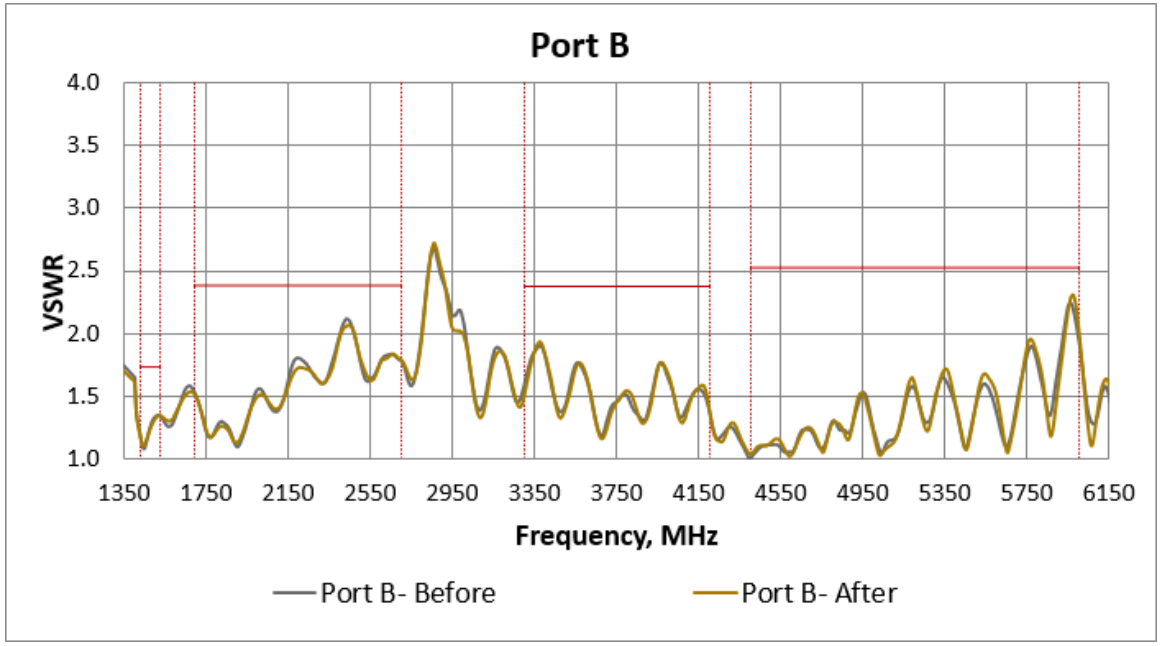




NF49

Wind Operational Test Result





NF50

Wind Operational Test Results

Summary:

All the samples pass the wind operational test.

- Antenna front surface able to withstand 45.5 lbs (20.64Kg) for 1 minute.
- Antenna side surfaces able to withstand 19.5 lbs (8.85Kg) for 1 minute.

Wind Survival

Tested By: YJ Teoh

Compiled By: YJ Teoh, TH Lee, WS Beh

Verified By: YJ Teoh, TH Lee, WS Beh

Date: 03JAN24

Wind Survival

Specification:	Physical loading of front, rear, and one side surface, 15 seconds, based on flat plate load Calculation
Test Parameter:	15 seconds
Failure Criteria:	Any movement
Test Site:	TE Connectivity Penang
Test Dates:	03JAN24
Test Equipment:	Load: Weight
Number of Units Tested:	3
DUT label Numbers:	NF47, NF49, NF50
Remarks:	

Wind Survival Test Setup

Duration: 15 seconds
Weight load:

- 49.55 Kg on front surface
- 19.47 Kg on side surfaces

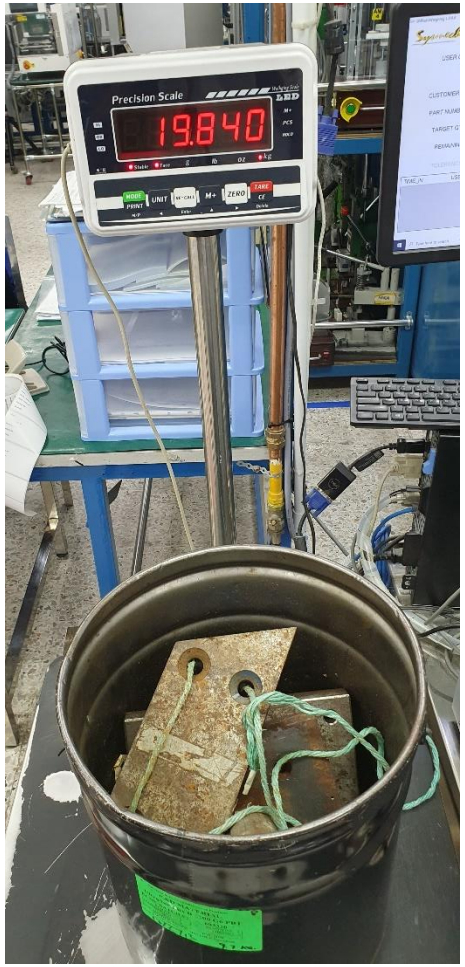
Wind Survival Test Setup

Duration: 15 Seconds
Weight: 49.55 Kg

Force = A × P × Cd

A = projected area of the item (ft2)
P = wind pressure (lb/ft2) = .00256 x V^2 (V= wind speed in mi/hr)
Cd = Drag coefficient = 2 for flat surface.

Force = 0.888 x [0.00256 x 155^2] x 2 = 109.23 lbs (49.55Kg)



Wind Survival Test Setup

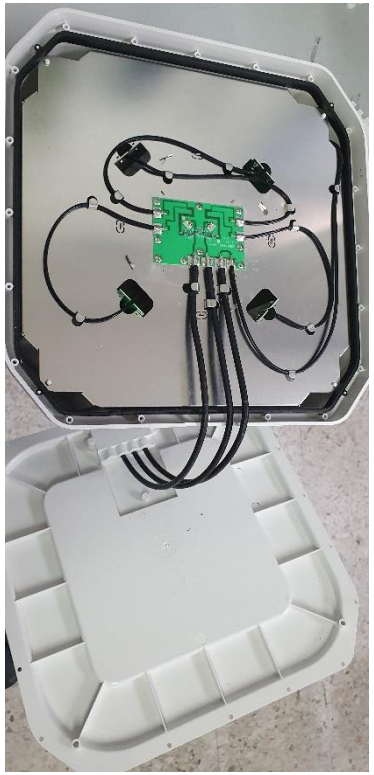
Duration: 15 Seconds
Weight: 19.47 Kg

Force = A × P × Cd

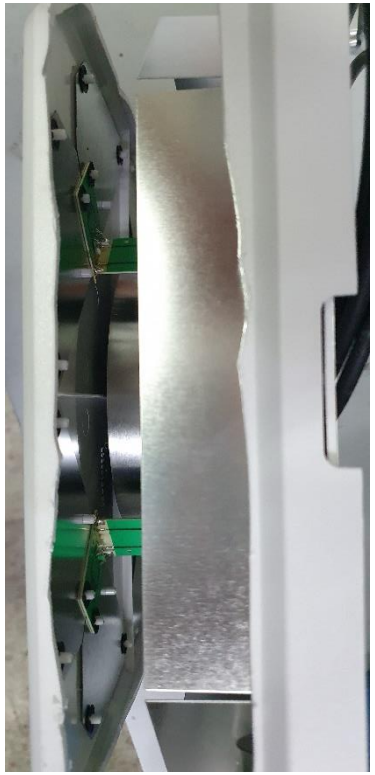
A = projected area of the item (ft2)
P = wind pressure (lb/ft2) = .00256 x V^2 (V= wind speed in mi/hr)
Cd = Drag coefficient = 2 for flat surface.

Force = 0.349 x [0.00256 x 155^2] x 2 = 42.93lbs (19.47Kg)

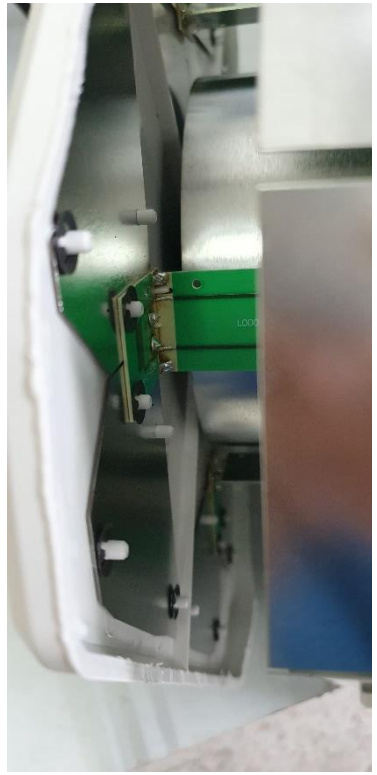
Wind Survival Test Result




NF47

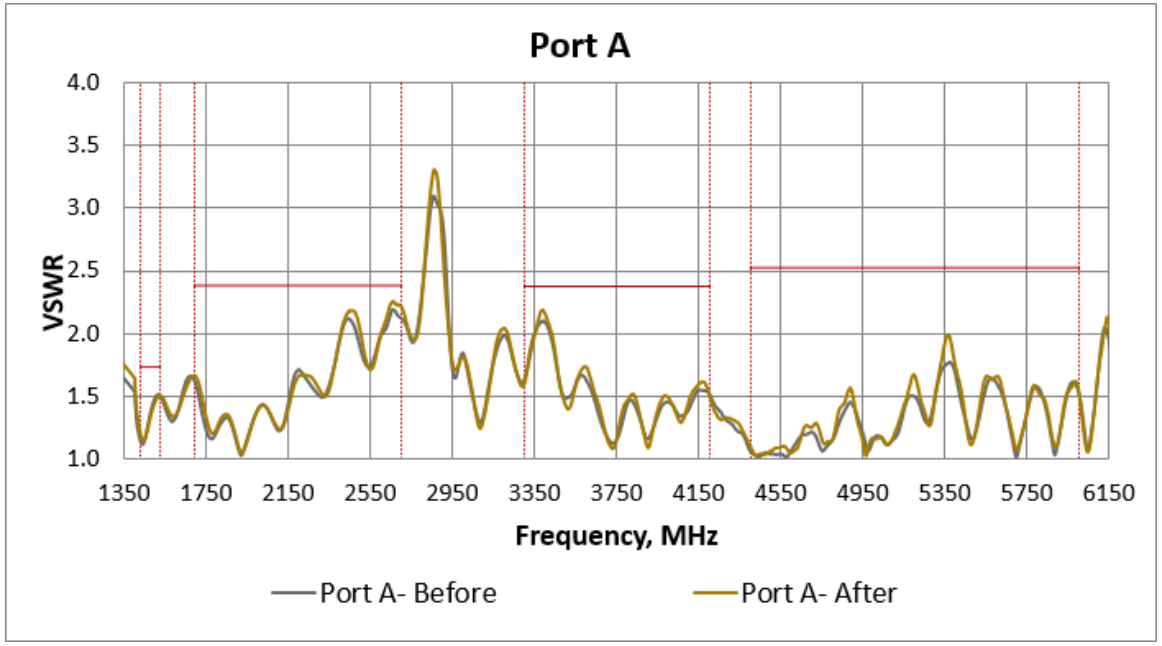



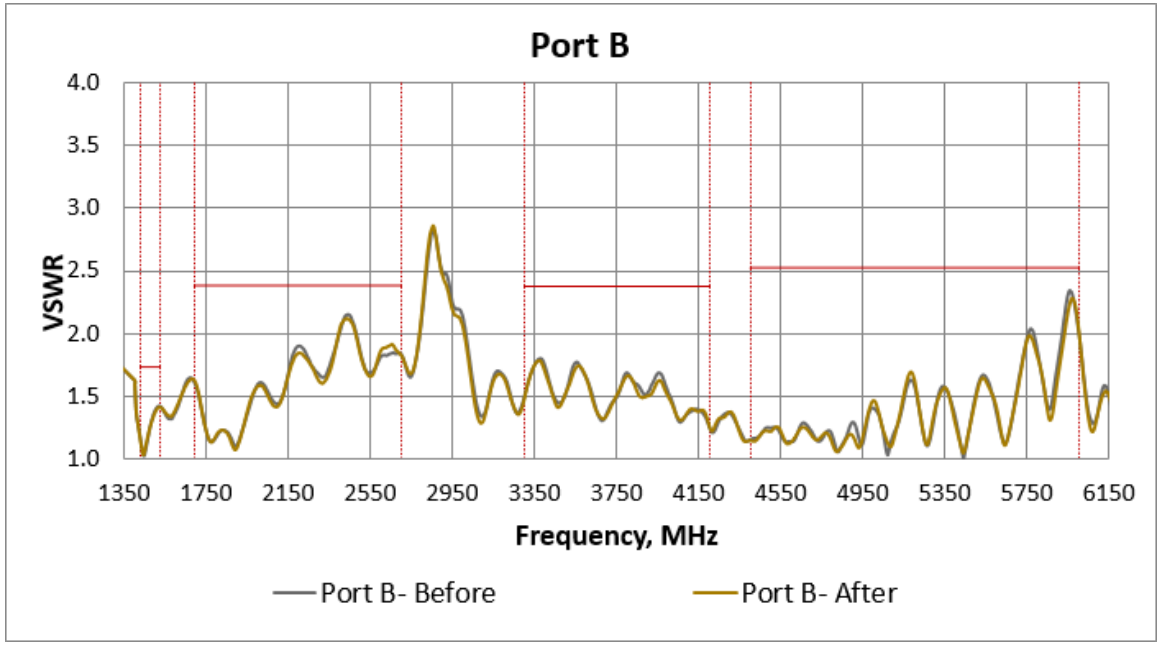
NF49

NF50

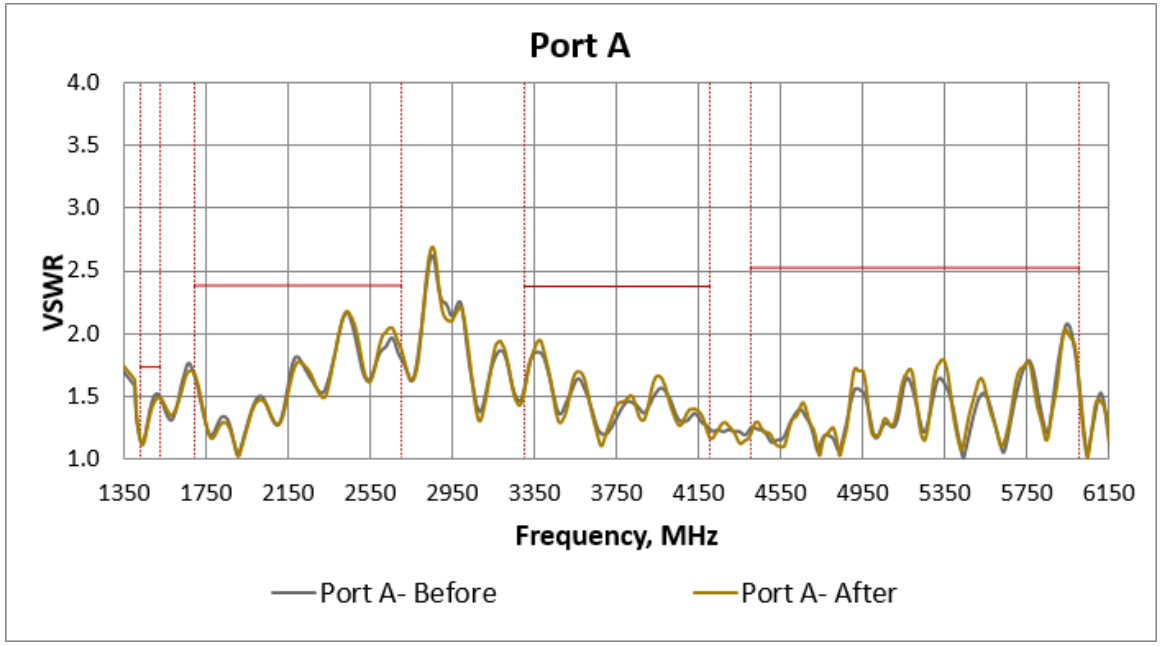
Wind Survival Test Result

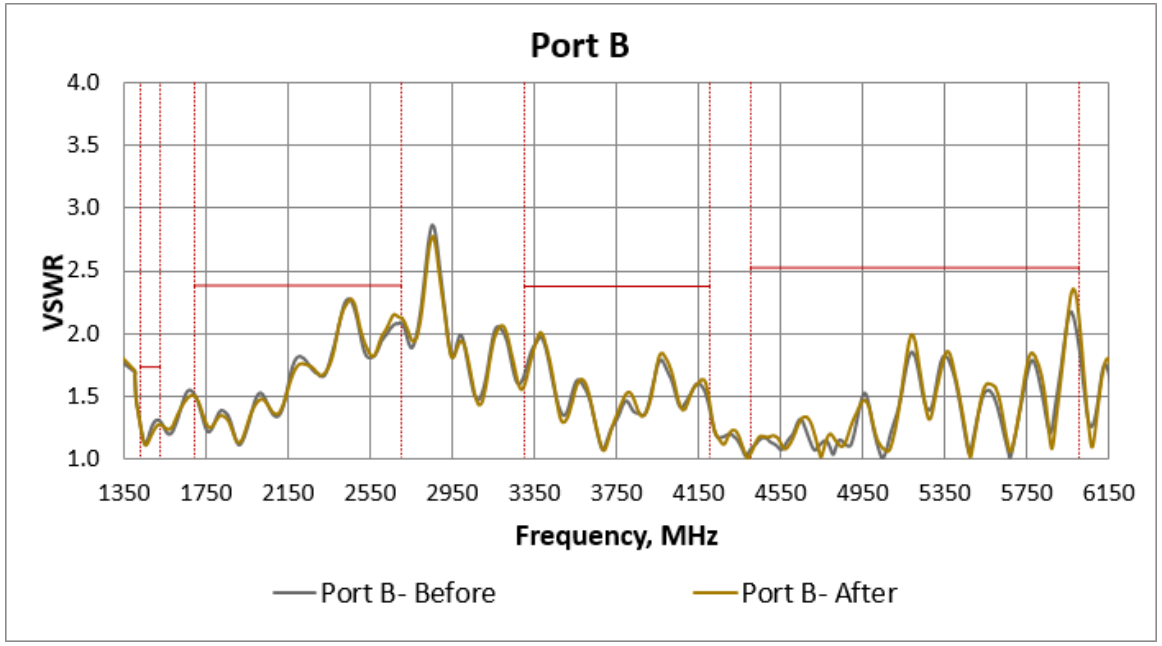




NF47

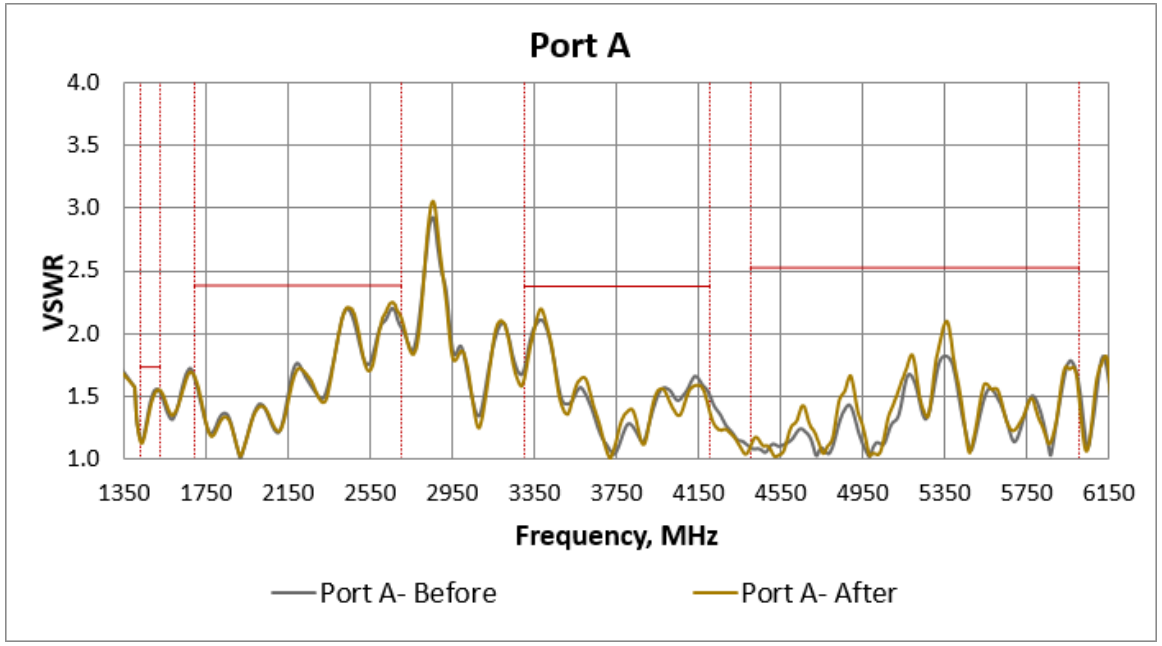
Wind Survival Test Result

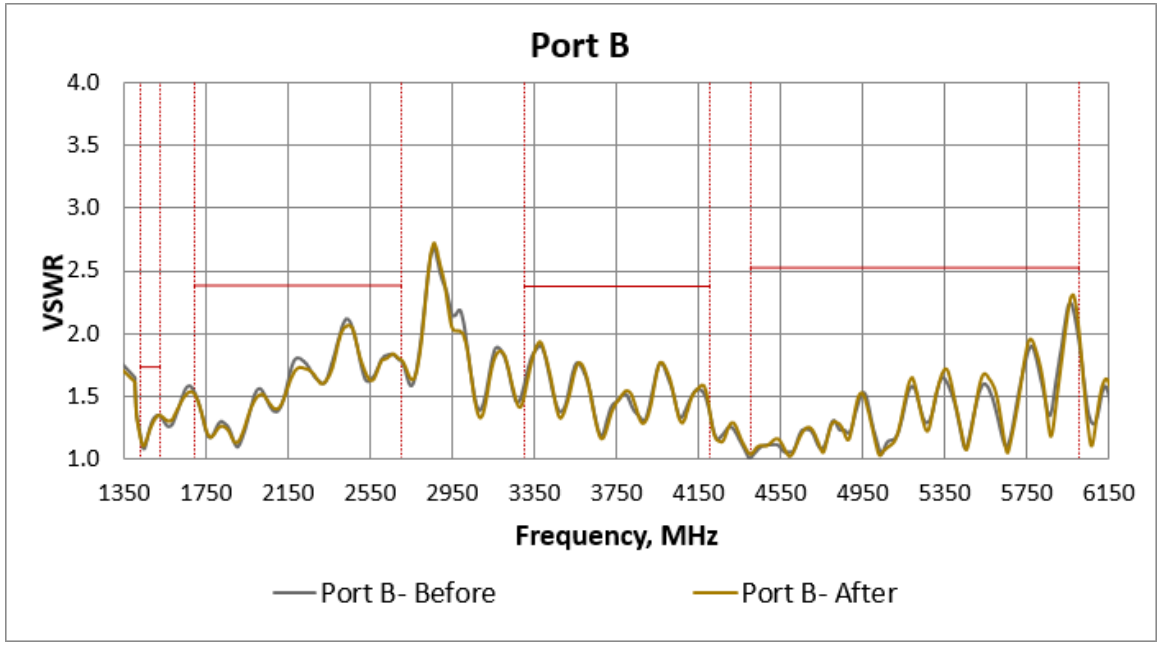




NF49

Wind Survival Test Result





NF50

Wind Survival Test Results

Summary:

All the samples pass the wind survival test.

- Antenna front surface able to withstand 45.5 lbs 109.23 lbs (49.55Kg)) for 15 second.
- Antenna side surfaces able to withstand 42.93lbs (19.47Kg) for 15 second.

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Unpackaged Drop

Tested By: YJ Teoh

Compiled By: YJ Teoh, TH Lee, WS Beh

Verified By: YJ Teoh, TH Lee, WS Beh

Date: 03JAN24

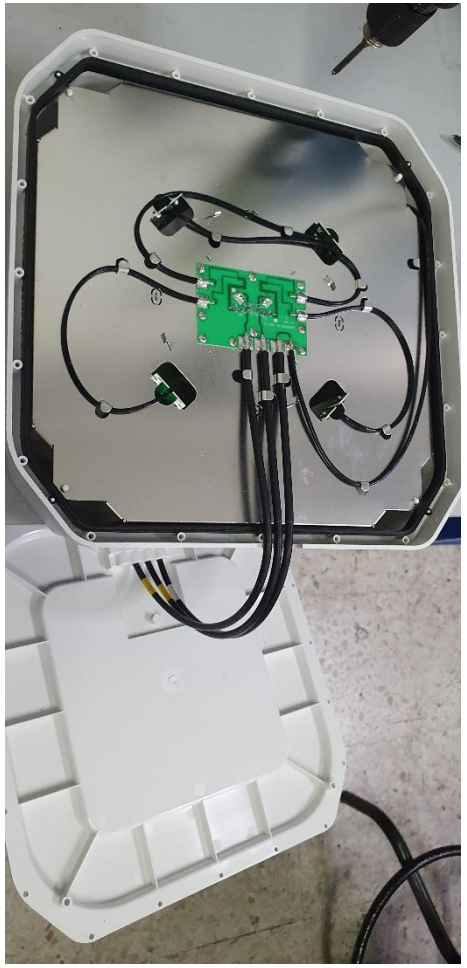
Unpackaged Drop

Specification:	The product shall drop at 1 Meter
Test Parameter:	1 drop on top & bottom end, 3 drops on side, 6 drops total
Failure Criteria:	Inspect unit's exterior and interior for any physical damage, any damage that would cause the unit unusable is consider a failure.
Test Site:	TE Connectivity Penang
Test Dates:	03JAN24
Test Equipment:	N/A
Number of Units Tested:	3
DUT label Numbers:	NF33, NF37, NF51
Remarks:	

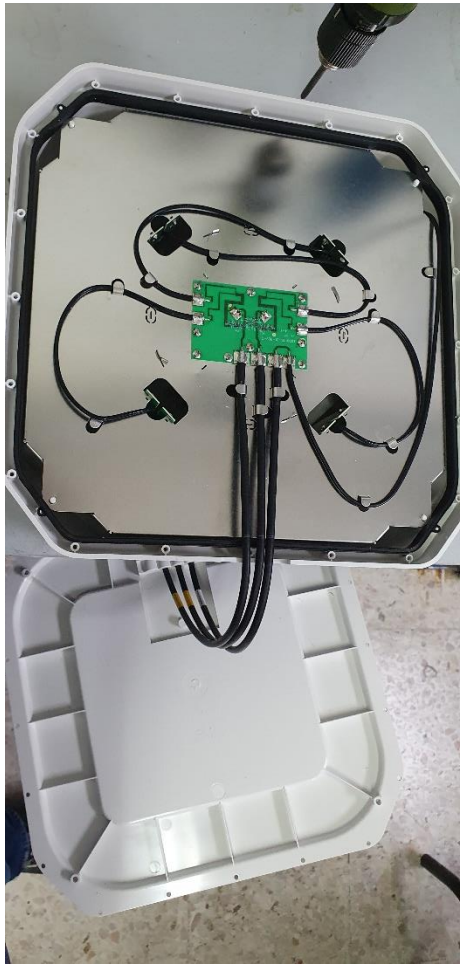
Unpackaged Drop Test Setup

Drop from a height of 1 Meter

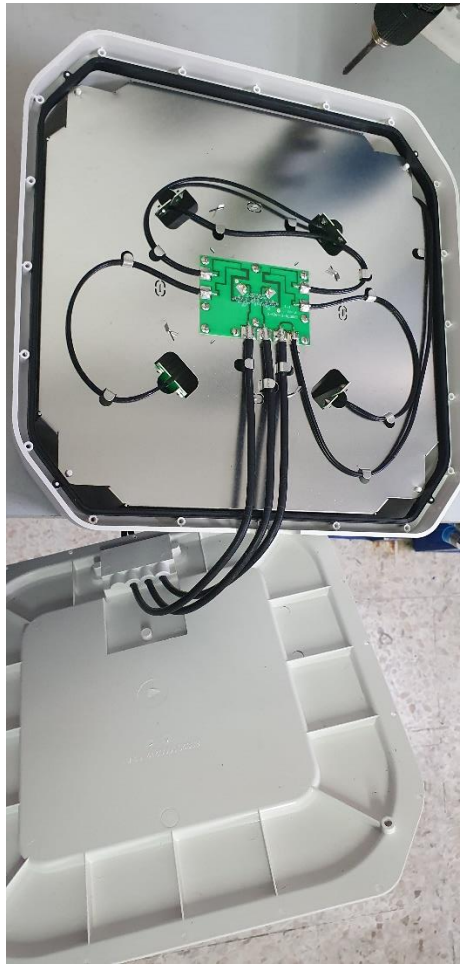
Unpackaged Drop Test Setup



NF33



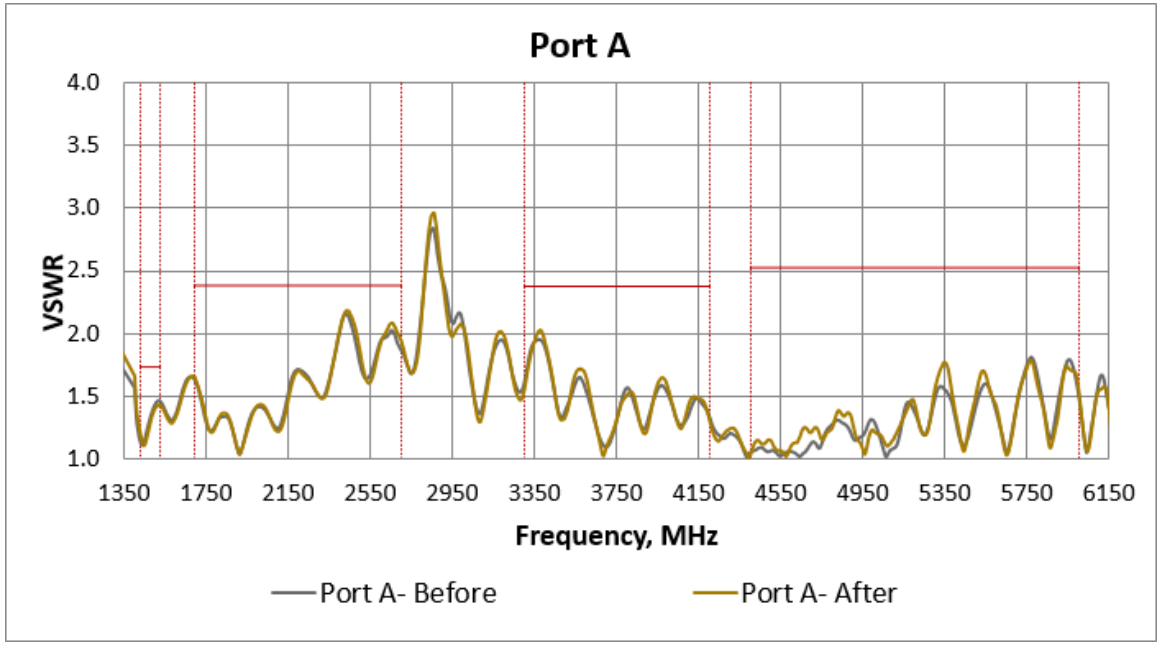
NF37

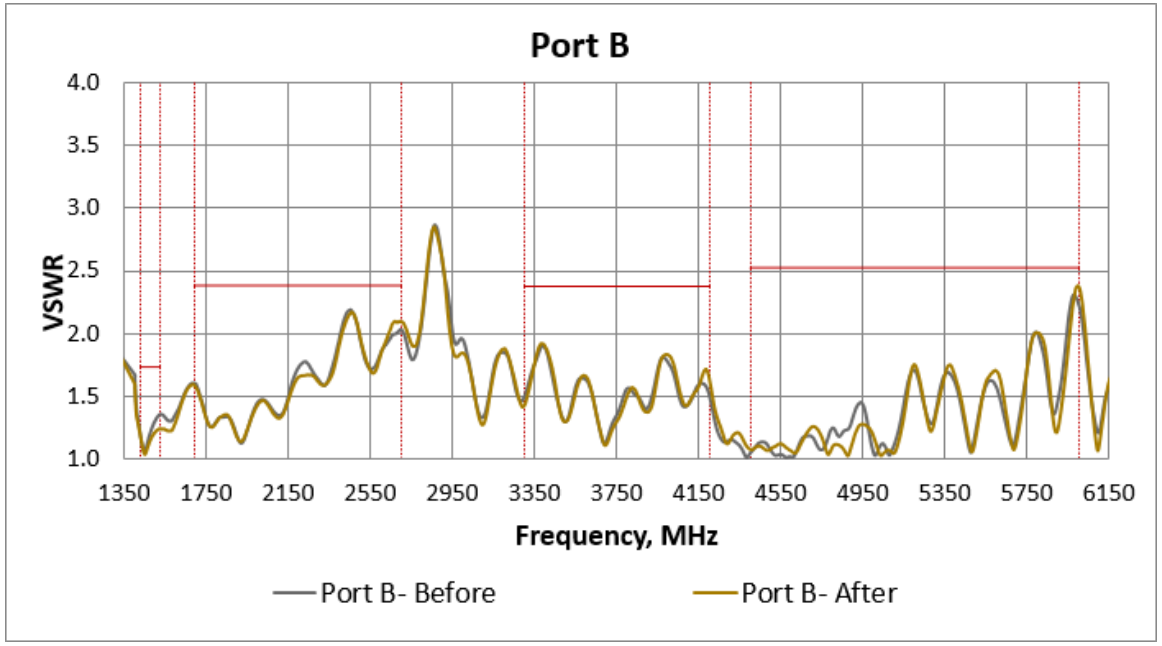


NF51

No damage on internal component observed.

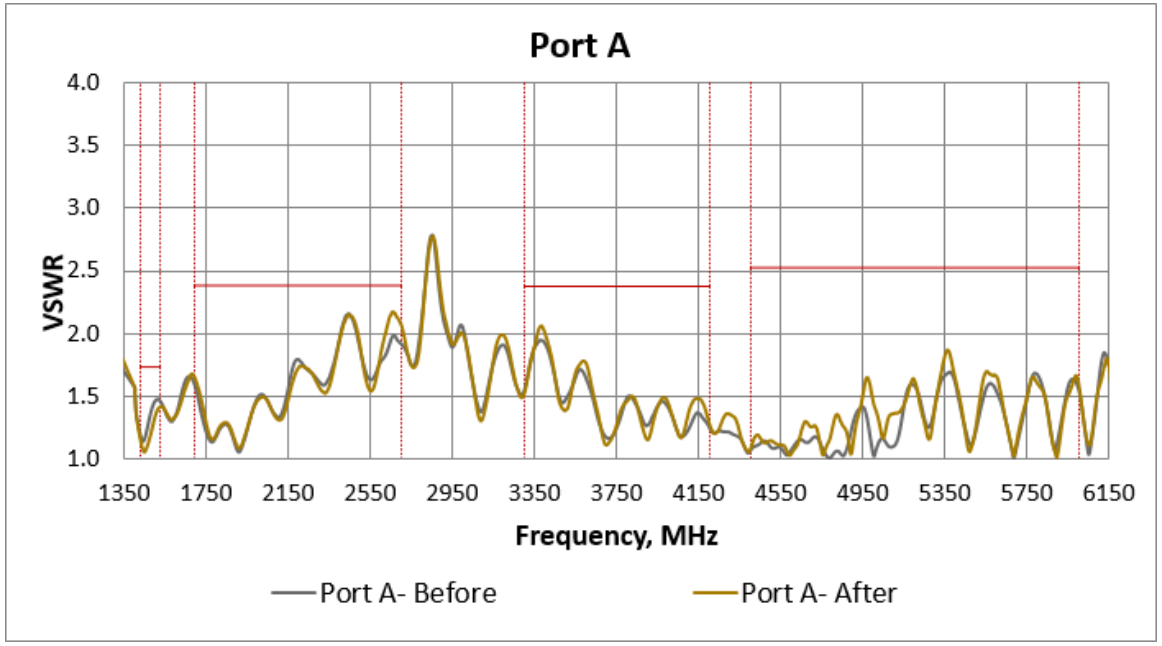
Unpackaged Drop Test Result

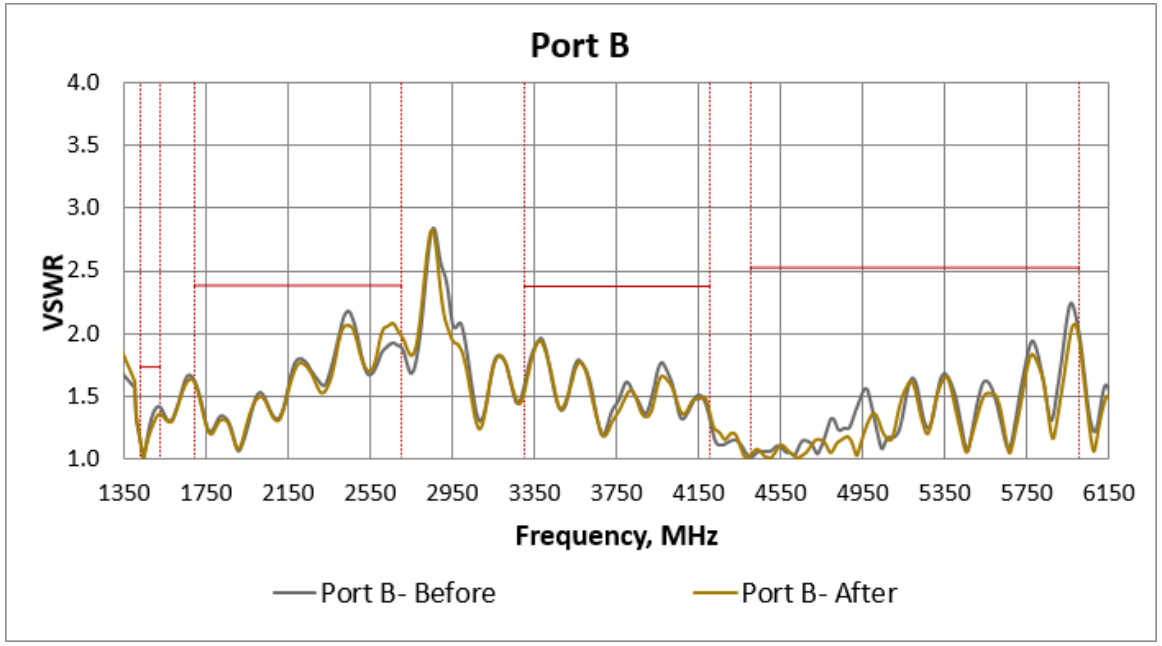




NF33

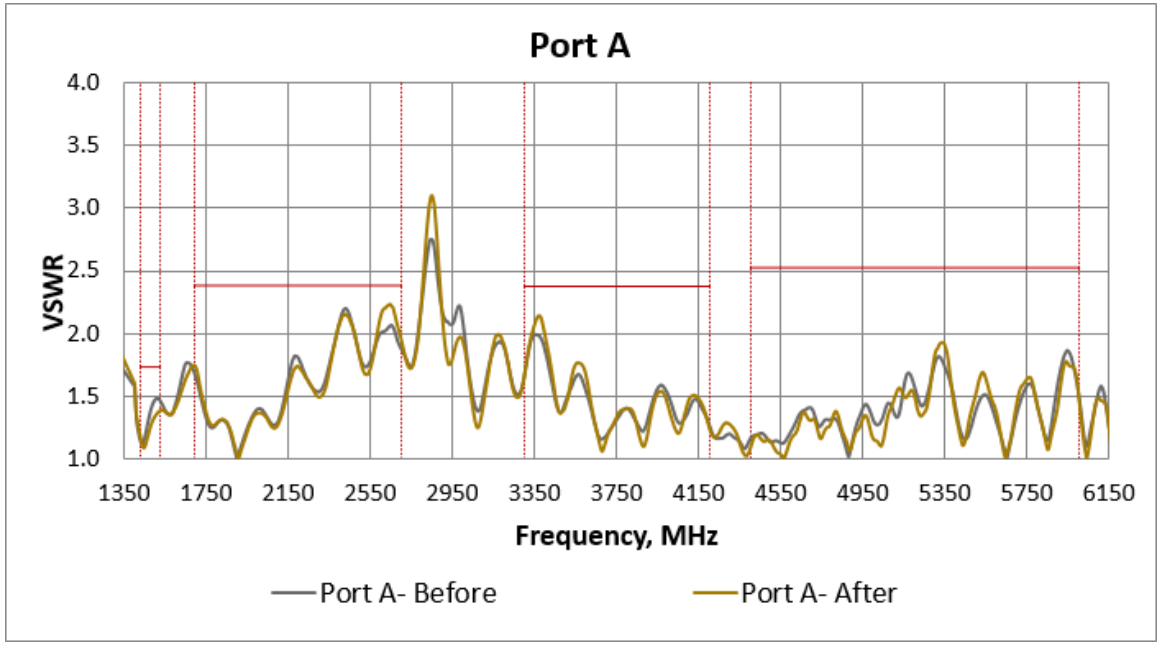
Unpackaged Drop Test Result

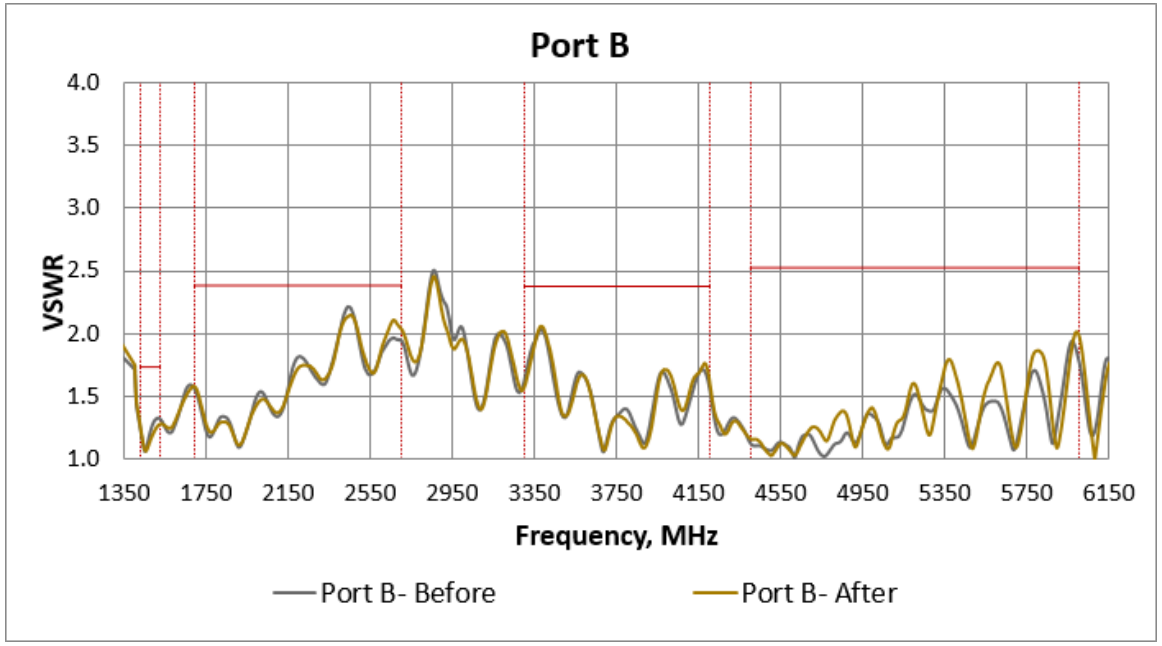




NF37

Unpackaged Drop Test Result





NF51

Unpackaged Drop Test Result

- Summary:

All the samples pass the drop test.

Pass RF performance with no significant of RF performance change.

Cable Pull Test

Tested By: YJ Teoh

Compiled By: YJ Teoh, TH Lee, WS Beh

Verified By: YJ Teoh, TH Lee, WS Beh

Date: 03JAN24

Cable Pull Test

Specification:	Apply axial force (pull) of 20lbs on connector/cable for a duration of 30 seconds.
Test Parameter:	30 seconds
Failure Criteria:	Failure of VSWR
Test Site:	TE Connectivity Penang
Test Dates:	02JAN24
Test Equipment:	Pull Gauge
Number of Units Tested:	6
DUT label Numbers:	NF38, NF39, NF40, M12, M13, M14
Remarks:	

Mate with dummy connector

Cable Pull Test Setup

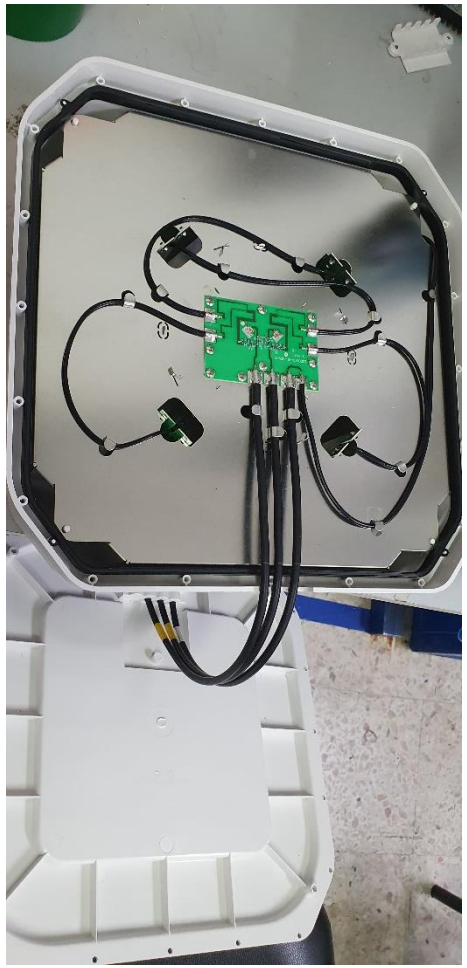
Duration: 30 seconds
Pull force: 20 lbs

Mate with dummy connector

Cable Pull Test Setup

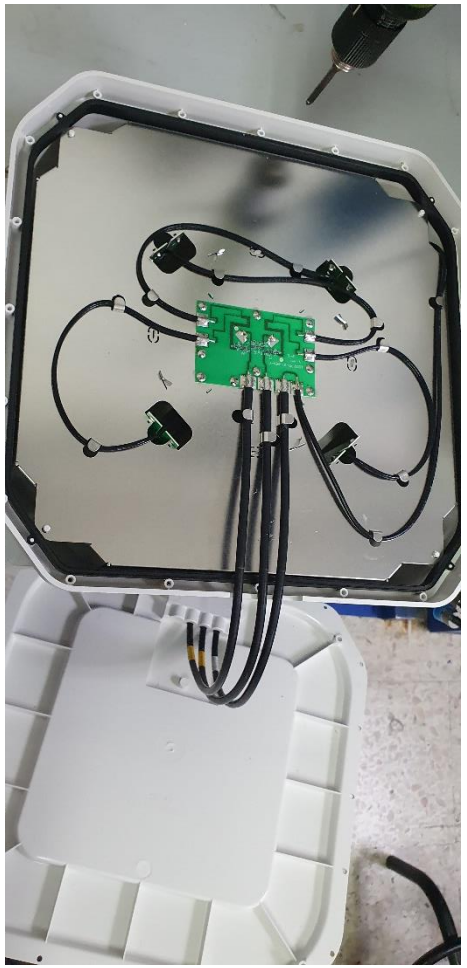
Duration: 30 seconds
Pull force: 20 lbs

Connector Pull Test Results



NF38

NF39



NF40

No damage on internal component observed.

Connector Pull Test Results

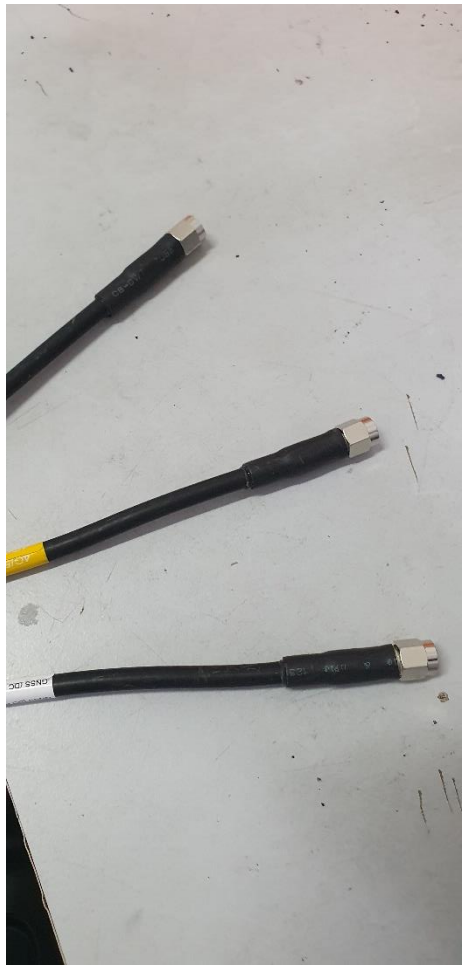
NF38

NF39

NF40

No damage
on connector

Connector Pull Test Results



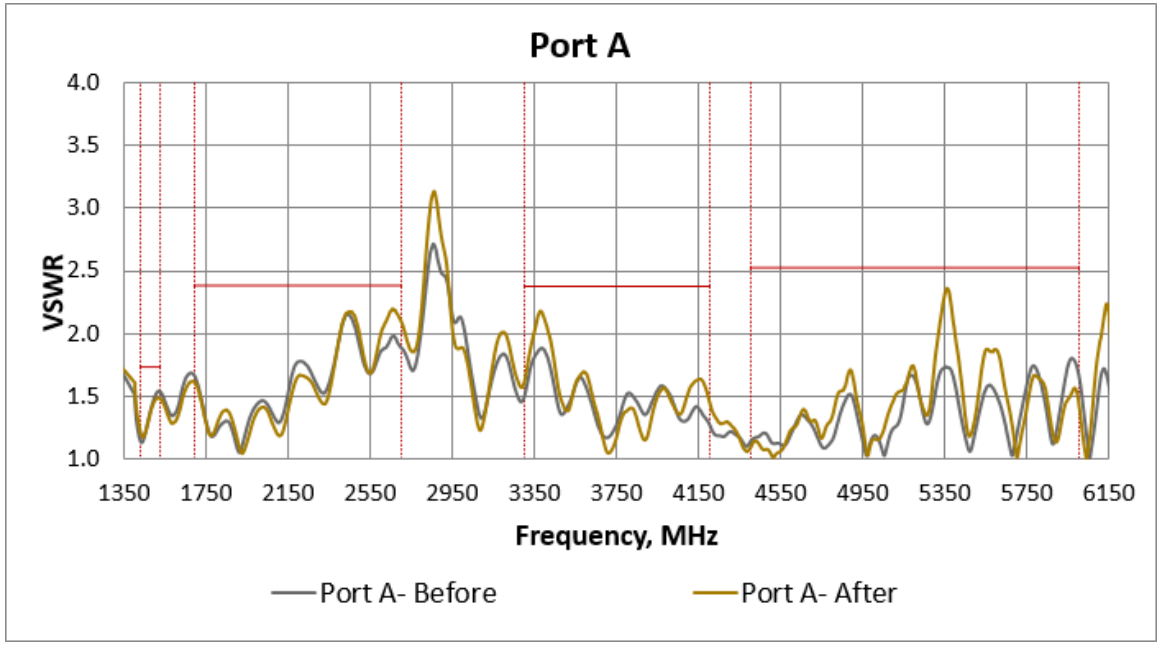
M12

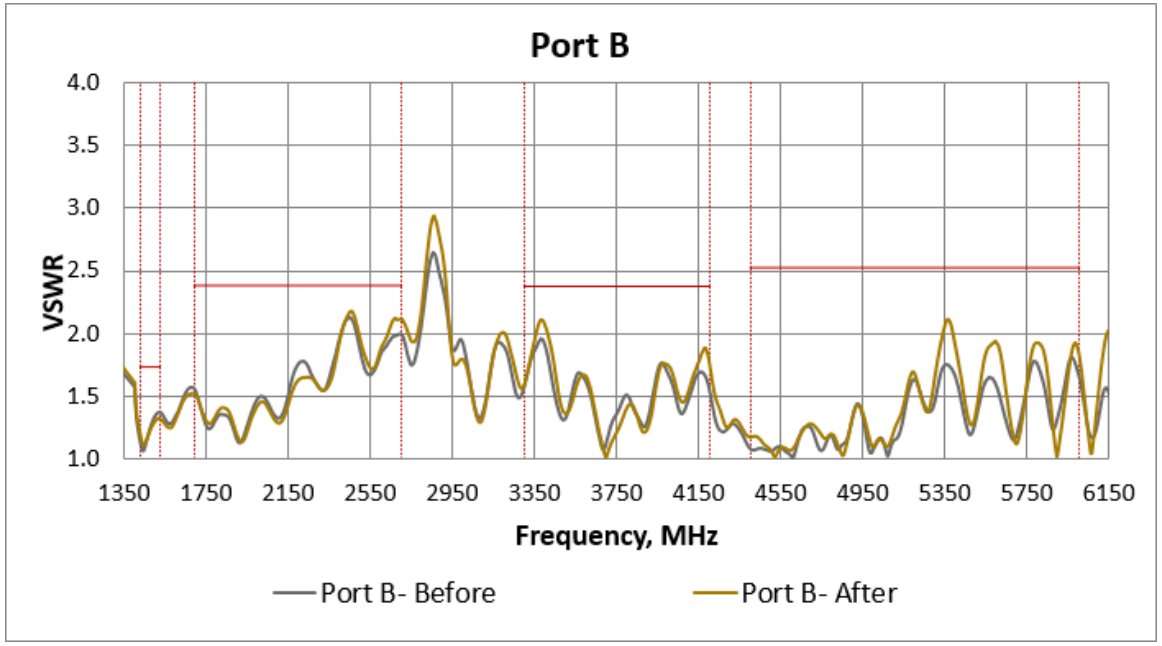
M13

M14

No damage
on connector

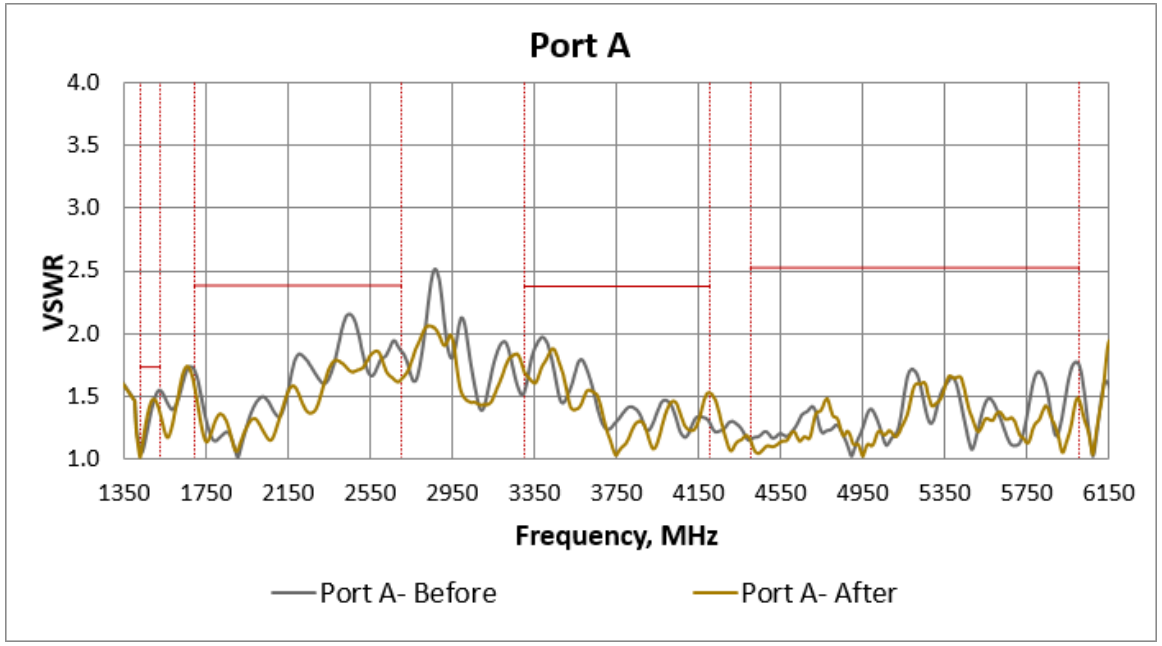
Connector Pull Test Results

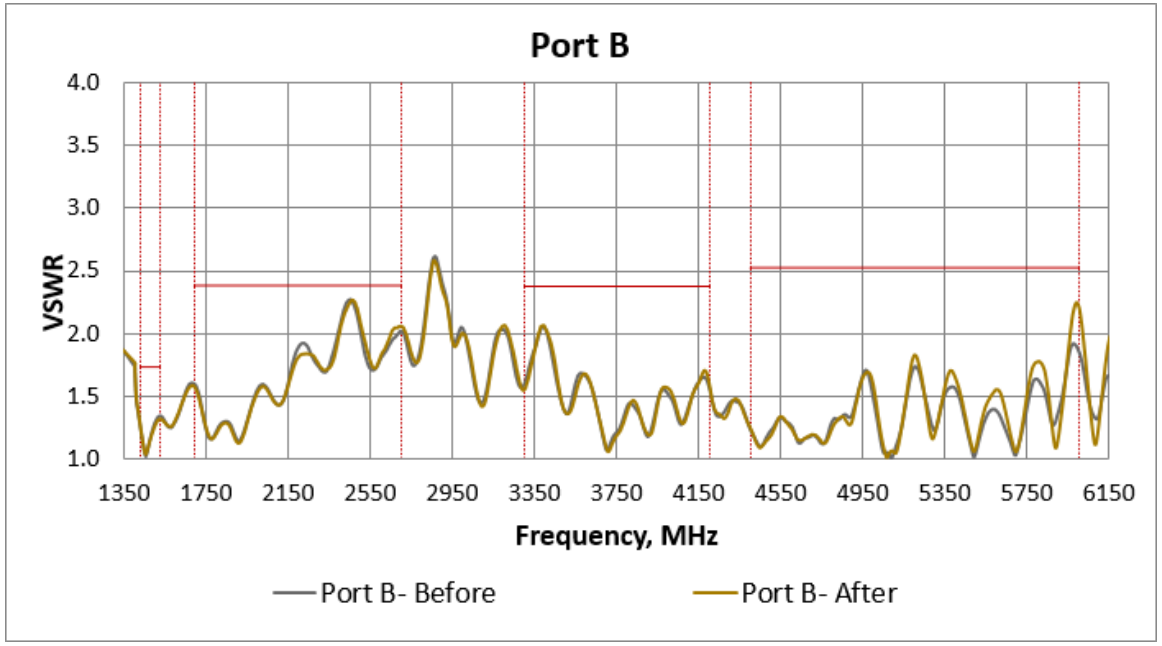




NF38

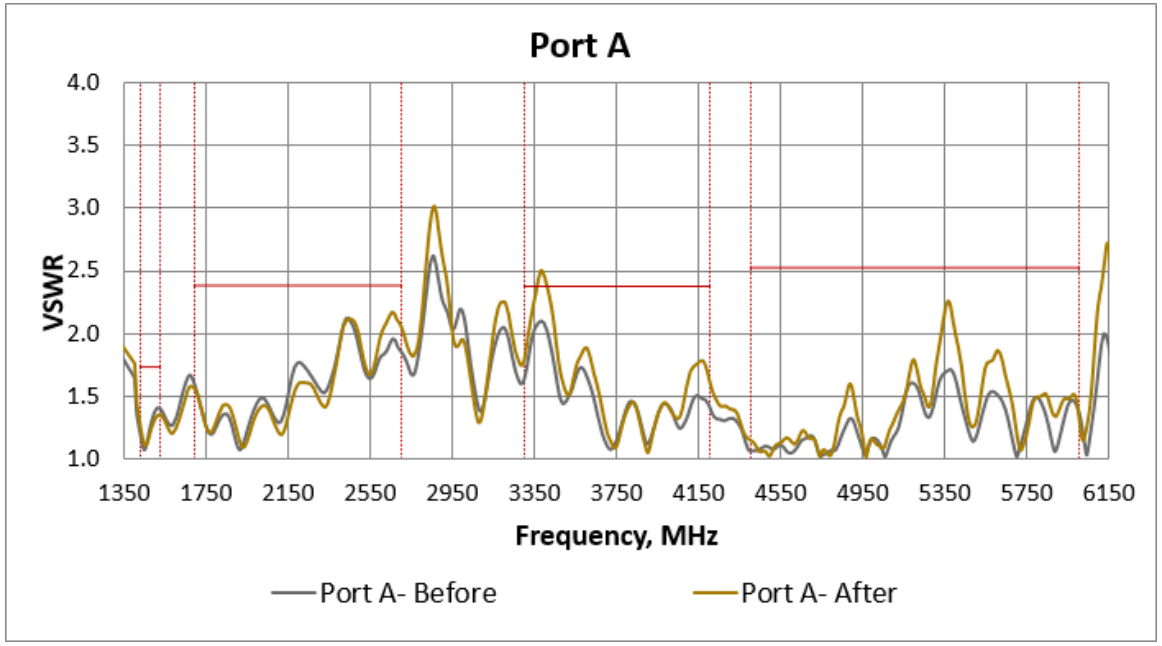
Connector Pull Test Results

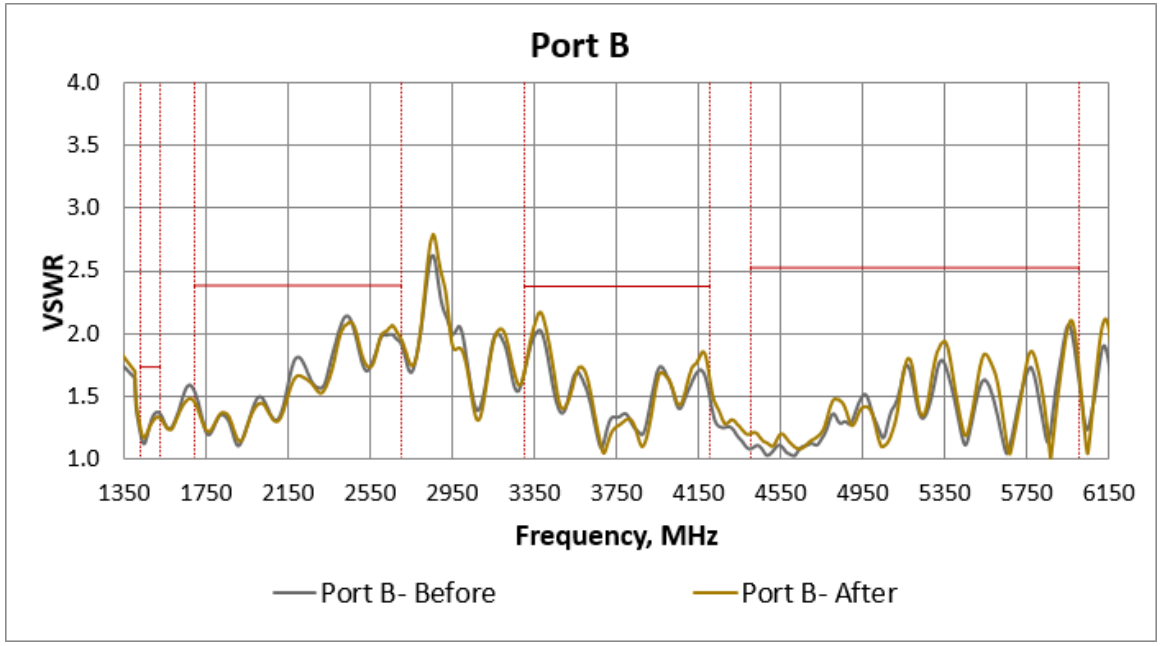




NF39

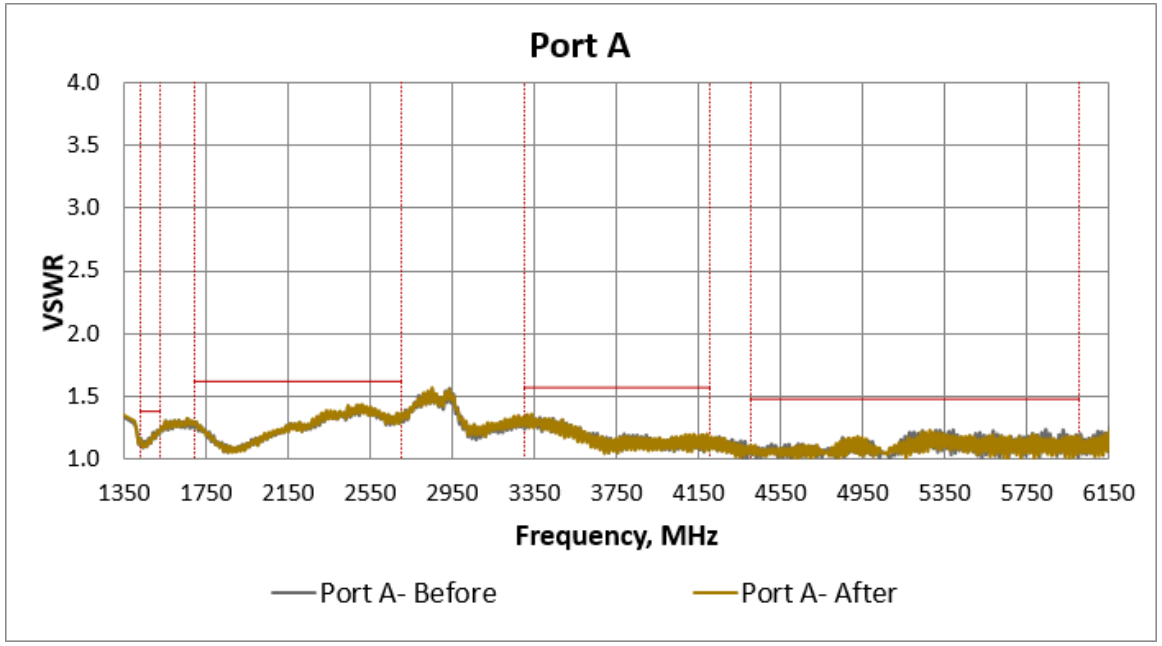
Connector Pull Test Results

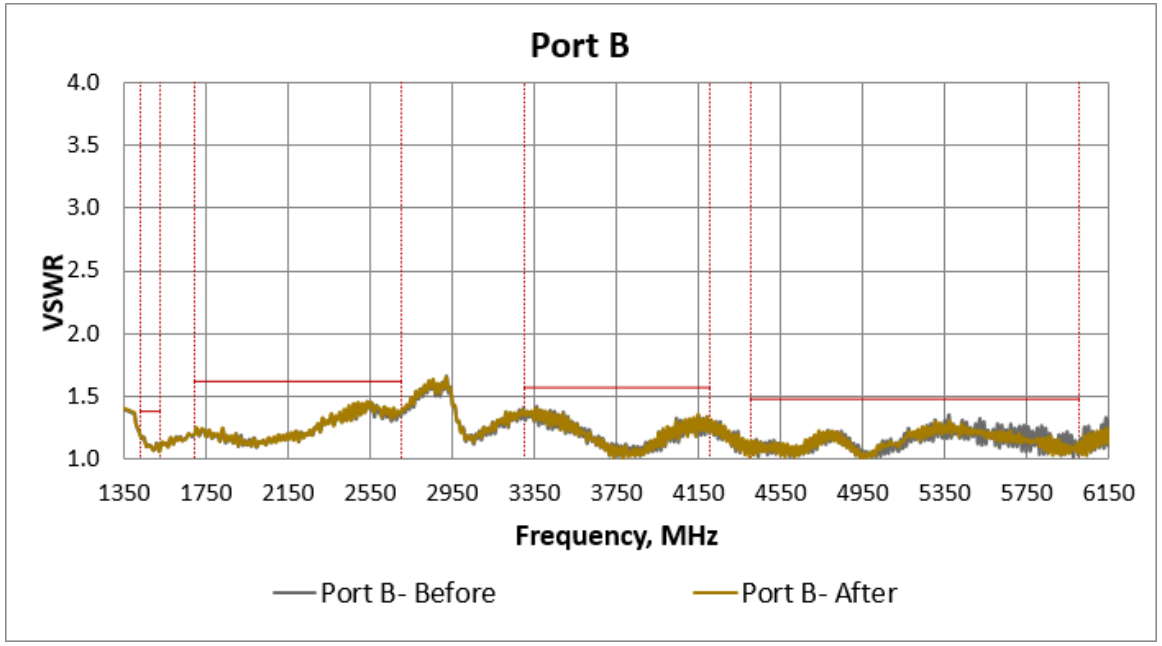




NF40

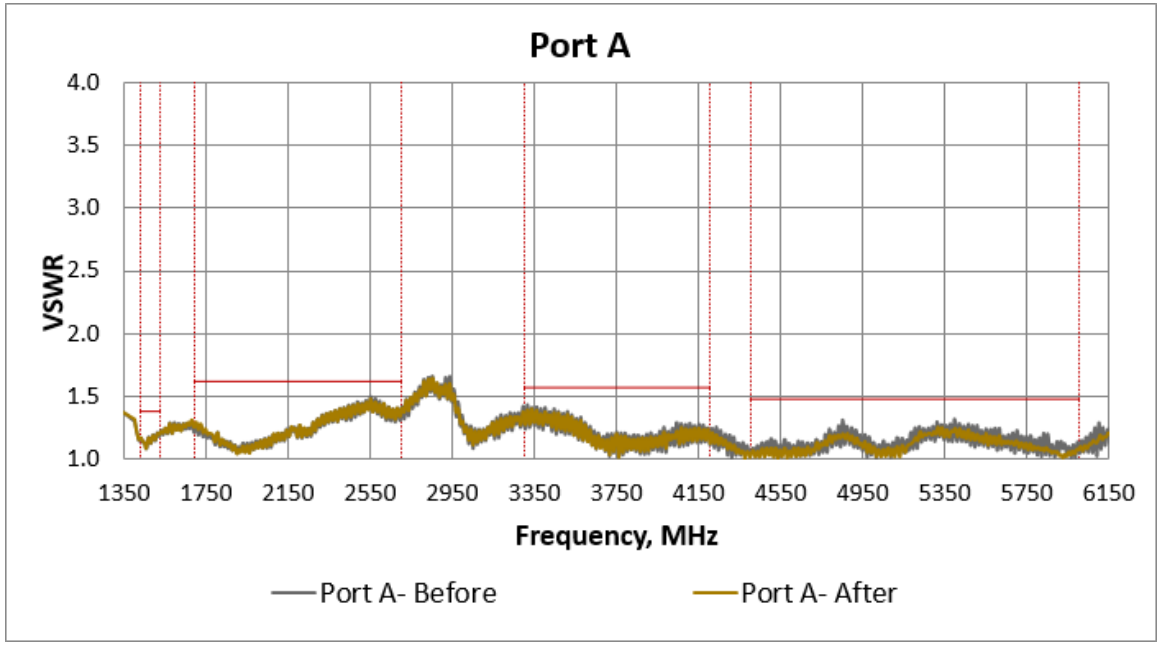
Connector Pull Test Results

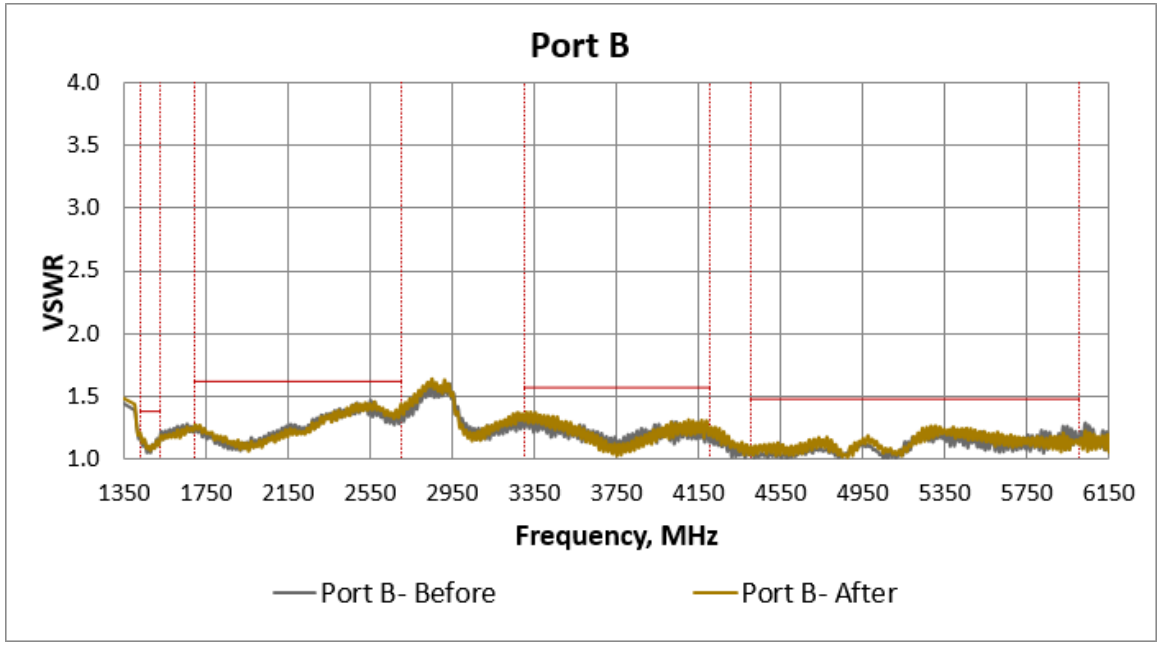




M12

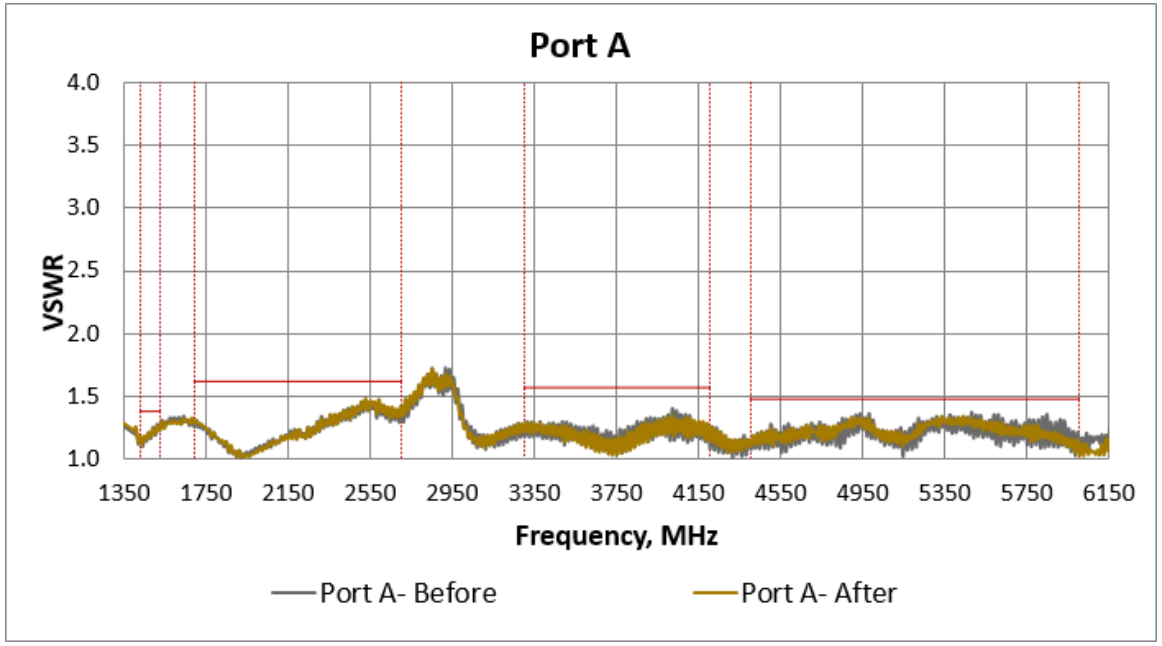
Connector Pull Test Results

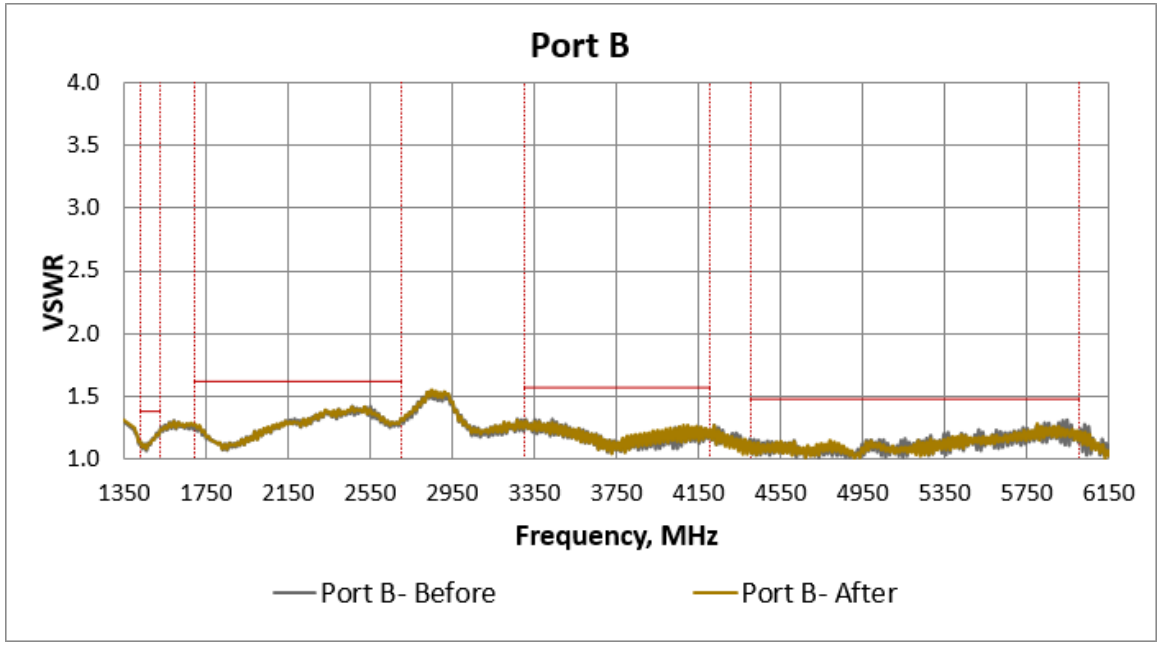




M13

Connector Pull Test Results





M14

Cable Pull Test Results

- Summary:

All the samples pass the Cable Pull Test.

Impact Test

Tested By: YJ Teoh

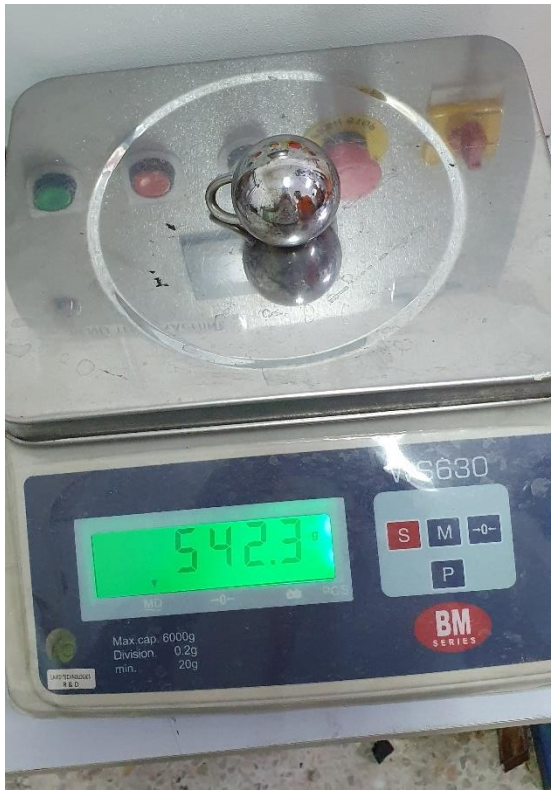
Compiled By: YJ Teoh, EC Lee, WS Beh

Verified By: YJ Teoh, EC Lee, WS Beh

Date: 03JAN24

Impact Test

Specification:	IK08
Test Parameter:	Mass of 542g, Height 1m
Failure Criteria:	1. Failure of any kind to the standard production functional test program 2. Mechanical damage not related to the handling of the samples 3. Failures that materially affect antenna reliability
Test Site:	TE Connectivity Penang
Test Dates:	03 JAN 2024
Test Equipment:	Mass (Steel Ball)
Number of Units Tested:	3
DUT label Numbers:	M15, M18, M19
Remarks:	

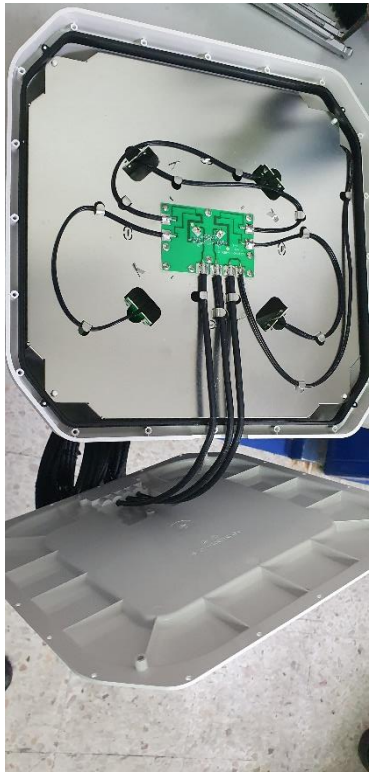


Impact Test Setup

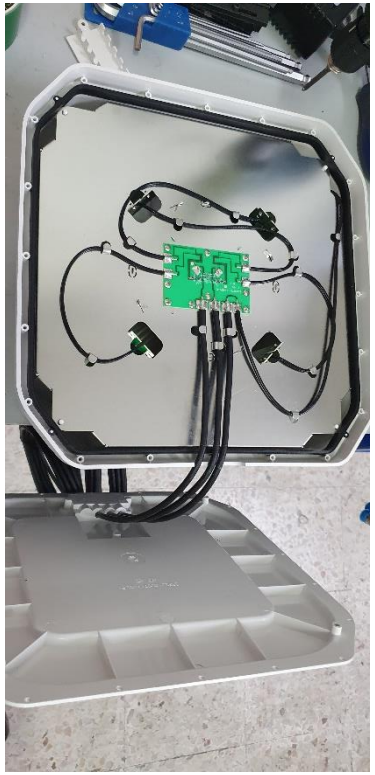
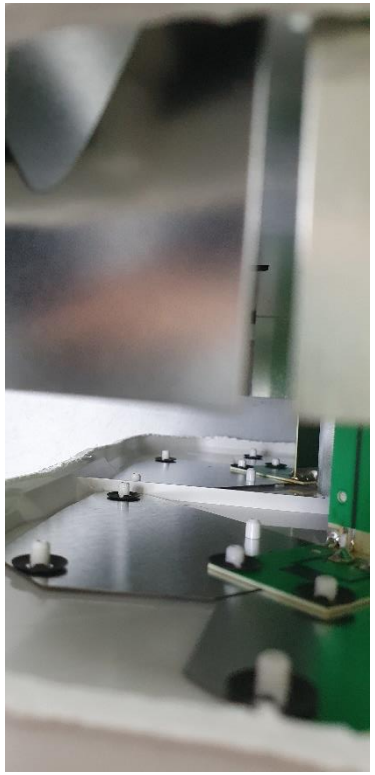
Mass Steel Ball: 542g
Height: 1m

Impact energy: 0.542*9.81*1 = 5.3 Joule

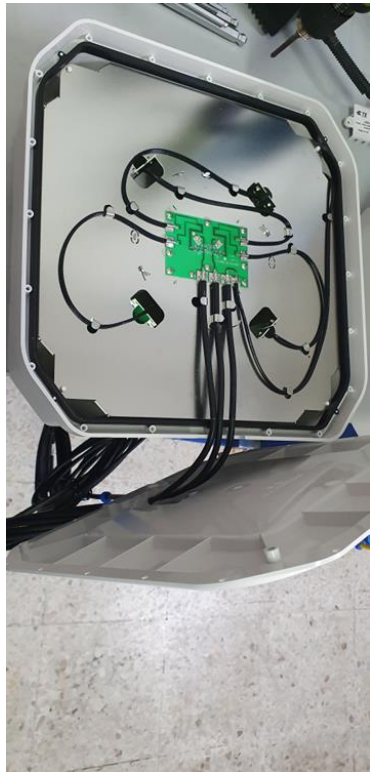
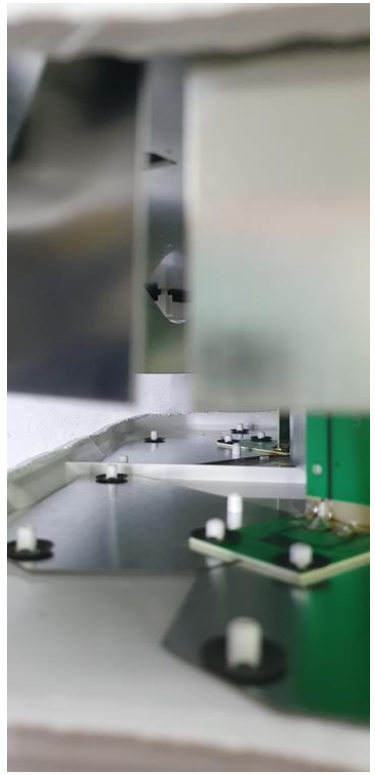
Impact Test Results




M15

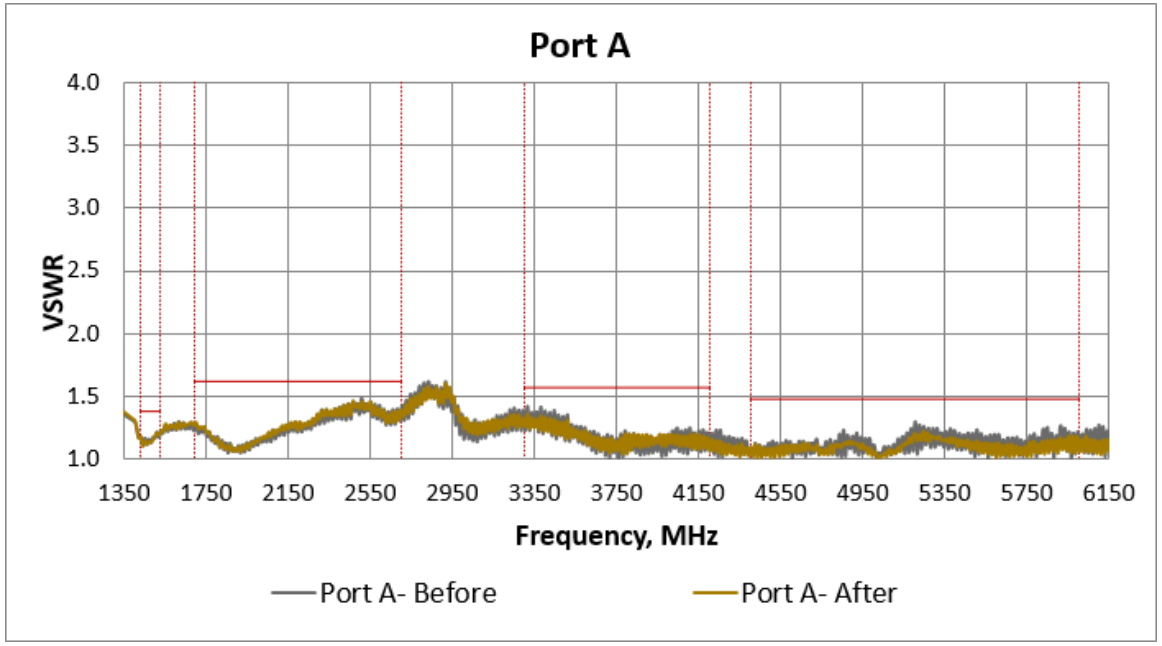



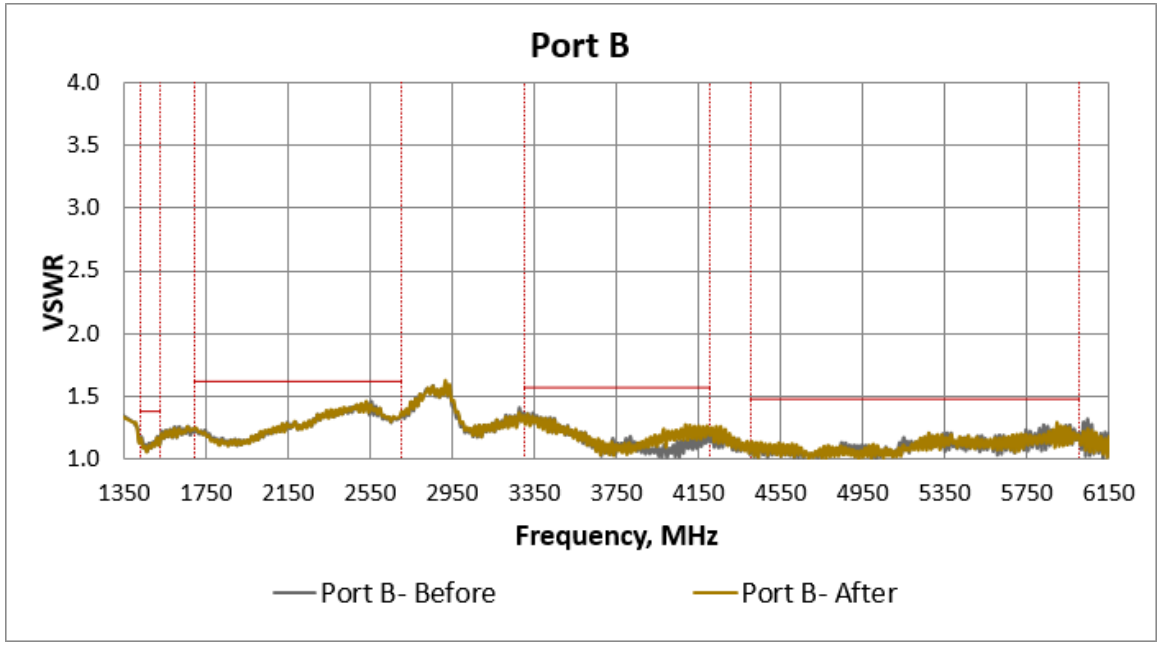
M18

M19

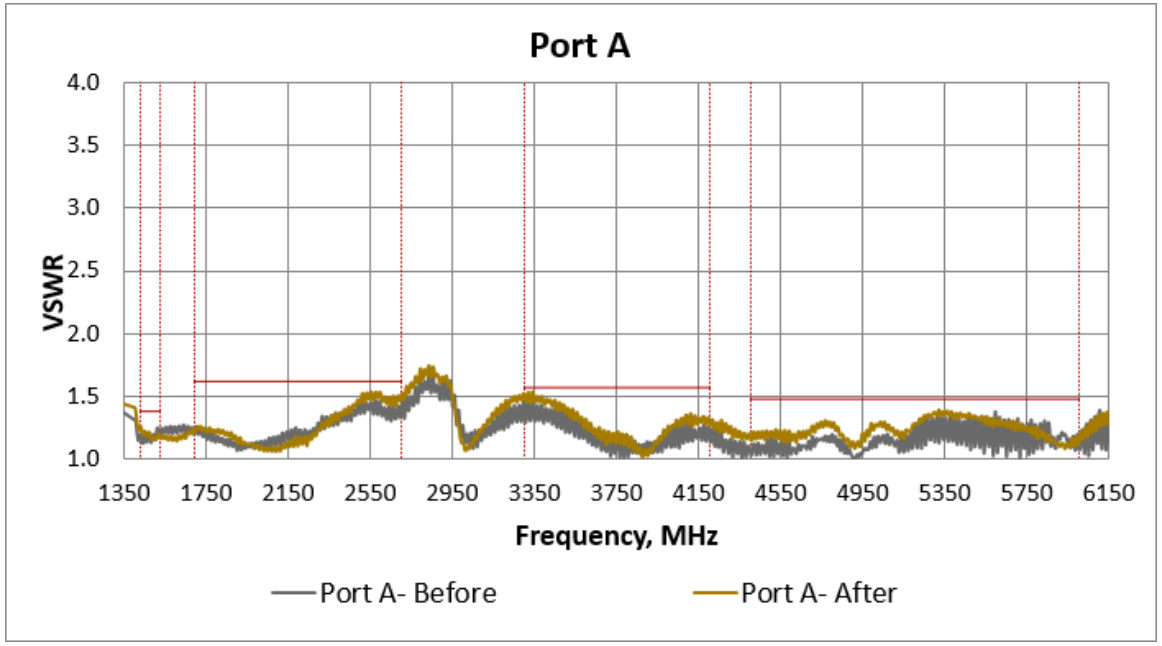
Impact Test Results

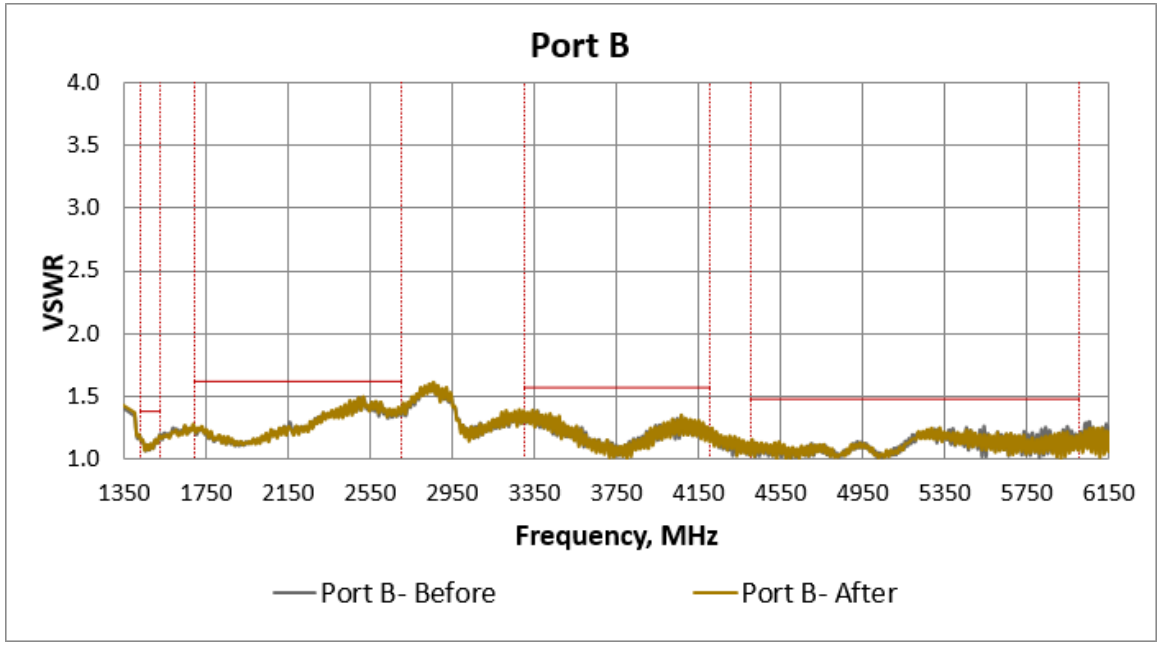




M15

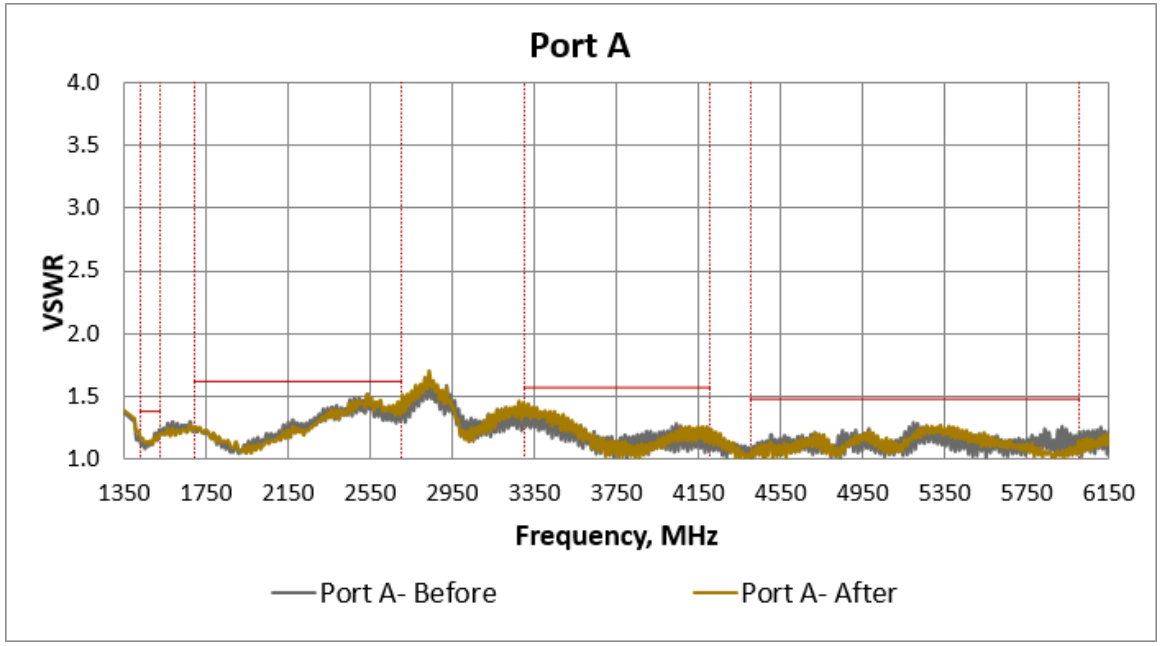
Impact Test Results

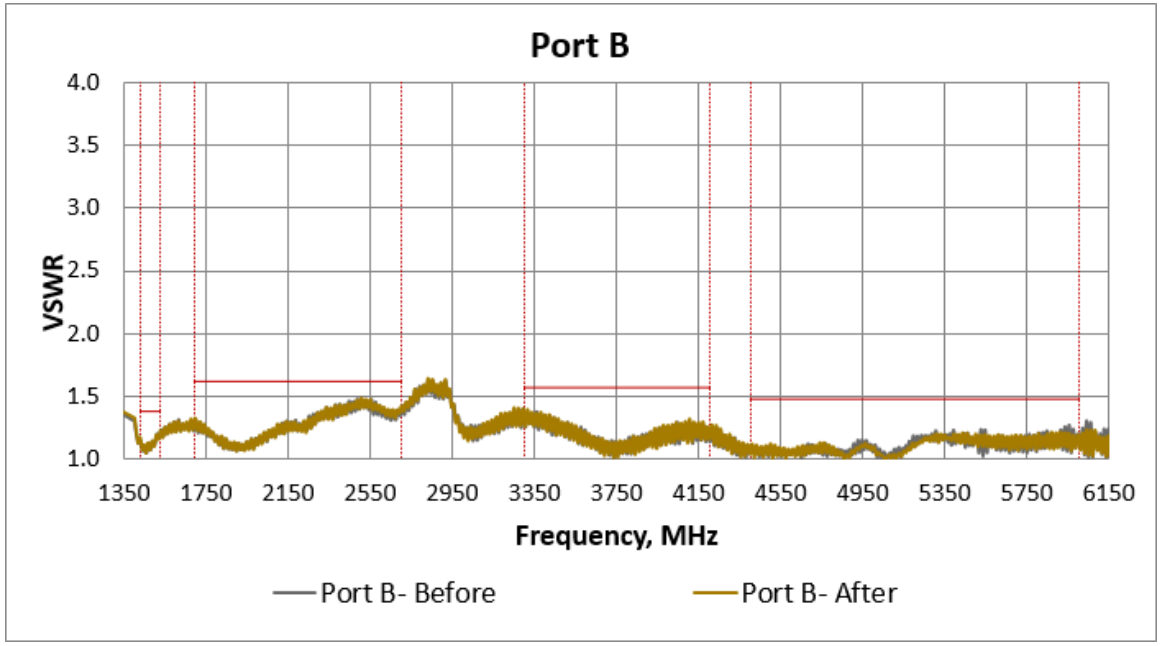




M18

Impact Test Results





M19

UV Test

Tested By: QAV Technologies

Compiled By: YJ Teoh, CY Hang

Verified By: YJ Teoh, CY Hang

Date: 23-Dec-14 & 15Jun – 20Jun 2016

UV Stability

Specification:	ASTM-G-4674			
Duration	100hrs			
Parameters:	Test exposed antenna housing/surfaces to ASTM-G-4674, Method III, F40T12 Cool Whites Light Source, Irradiance: 30K lux, 100 hours			
Failure Criteria:	Inspect unit for any signs of damage or excessive discoloration.			
Test Site:	QAV Technologies Sdn. Bhd.			
Test Dates:	15Jun – 20Jun 2016			
Test Equipment:	Q-Sun Xenon Test Chamber Xe-3HS			
Number of Units Tested:	4			
Serial Numbers:	CFS60383P-30NF0001	CFS60383P-30D43F0003	CFS69383P-30NF0010	CFS69383P-30D43F0004
Notes: RF testing cannot be performed during test for all operational tests, so VSWR will be recorded before and after test for comparison.				

UV Stability
UV Stability After test Image

UV Stability
After test reading (glossy meter)

Unit Description	Before			After			
	L	a	b	L	a	b	dE
CFS60383P-30NF0001	94.20	0.37	2.63	93.73	0.63	2.67	0.54
CFS60383P-30D43F0003	95.10	0.40	1.97	94.70	0.57	1.67	0.53
CFS69383P-30NF0010	95.00	0.43	1.97	94.70	0.67	1.57	0.55
CFS69383P-30D43F0004	94.80	0.43	2.13	94.77	0.60	1.67	0.50

UV Test

Specification:	ASTM D4674				
Test Parameter	38 °C, 240 hours				
Failure Criteria:	1. Any color change or abnormality found				
Test Site:	Penang Laird Connectivity				
Test Dates:	23-Dec-14				
Test Equipment:					
Number of Units Tested:	4				
Serial Numbers:	W1	W2	B1	B2	
Notes: Place any Notes, Observations, or Deviations in the Testing Here.					

UV Test:
Observation after test


W1


W2


B1


B2

No colour change observed after test

UV Test:
Observation after test

Unit	0 hr			240 hrs			Color Difference, ΔE	Visual Check after test
	L	a	b	L	a	b		
W1 Top	94.93	-0.03	2.07	94.87	0.17	2.23	0.27	No Color Changes
W1 Side	95.27	0.23	1.77	95.37	0.23	2.20	0.44	No Color Changes
W2 Top	95.10	0.00	2.00	94.93	0.23	2.10	0.30	No Color Changes
W2 Side	95.50	0.10	2.10	95.43	0.27	2.27	0.24	No Color Changes
B1 Top	10.90	-1.10	1.70	10.90	-1.10	1.70	0.00	No Color Changes
B1 Side	25.50	-0.20	1.80	26.00	-0.10	1.60	0.55	No Color Changes
B2 Top	10.90	-1.10	1.70	10.90	-1.10	1.70	0.00	No Color Changes
B2 Side	25.50	-0.20	1.80	26.00	-0.10	1.60	0.55	No Color Changes

No colour change observed after test

Results

Observations / Notes:

Radome (Black & White colour) Pass UV Test (Qualification by Similar).

ANY CONNECTION CAN CHANGE THE WORLD

EVERY CONNECTION COUNTS

TE connectivity