Pre-compliance Test Results

Client	APTENER MECHATRONICS PRIVATE LIMITED
Protocol	Propreitary
Product Name	HM01Main_Board_V1.0
Channel Frequency(MHz)	2402(MHz) & 2480(MHz)

Note: Testing performed as per client requirement and the results could not be used for Compliance, or show compliance with regulatory requirement; as it's partial

Part No.: HM01-BT ANT (FOR BT Atenna), HM01-nRF ANT (FOR nRF Atenna),
Antenna Type: PCB antenna (FOR BT Atenna), Dipole antenna (FOR nRF Atenna)

Table of Contents

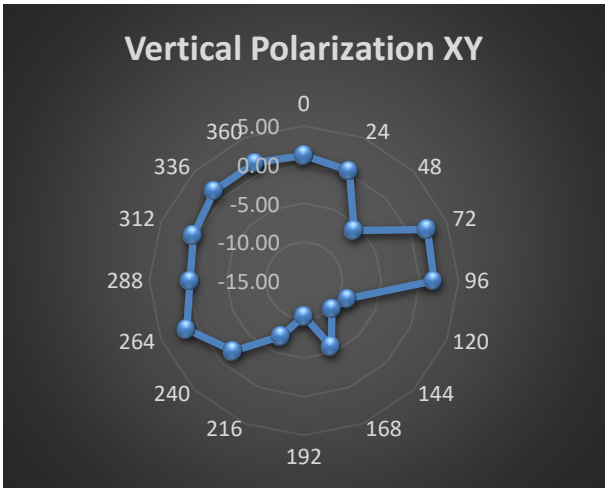
1 Antenna Radiation Pattern 3
1.1Orientation: XY_RG-Ant 3
1.2Orientation: XY_BT-Ant 6
2 Test Setup Photos: 9

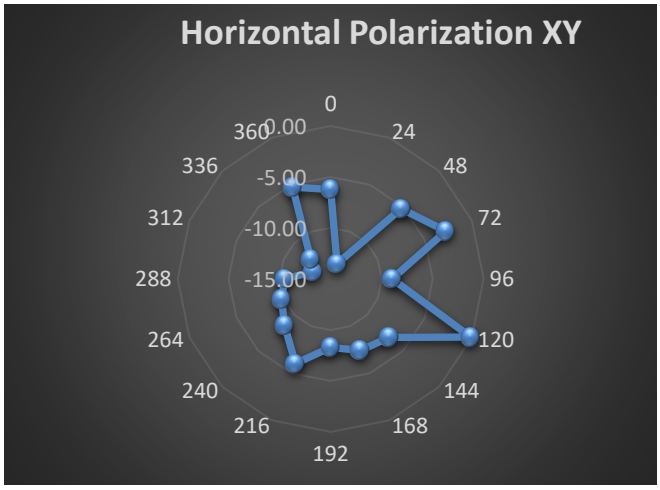
1 Antenna Radiation Pattern

1.1 Orientation: XY_RG-Ant (nRF Antenna)

Vertical Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2402	0	1.20
2402	24	0.39
2402	48	-5.80
2402	**72**	**2.29**
2402	96	1.82
2402	120	-8.86
2402	144	-9.87
2402	168	-5.78
2402	192	-10.43
2402	216	-7.25
2402	240	-2.12
2402	264	1.41
2402	288	-0.27
2402	312	0.46
2402	336	1.43
2402	360	1.50

Horizontal Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2402	0	-6.22
2402	24	-13.38
2402	48	-5.25
2402	72	-2.75
2402	96	-8.97
2402	**120**	**-0.12**
2402	144	-6.91
2402	168	-7.40
2402	192	-8.29
2402	216	-6.02
2402	240	-8.60
2402	264	-9.79
2402	288	-10.49
2402	312	-13.17
2402	336	-12.27
2402	360	-5.25

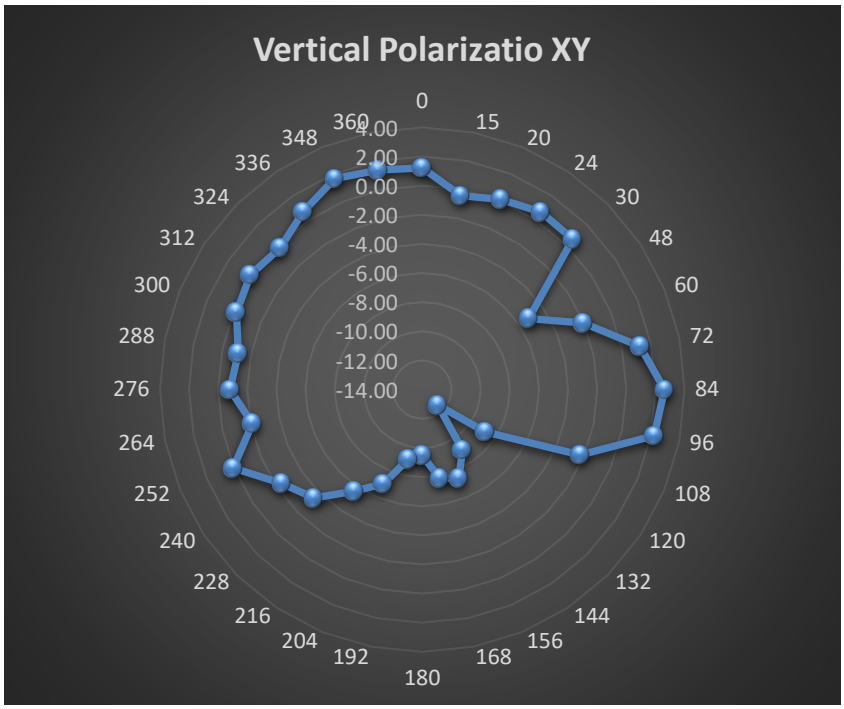




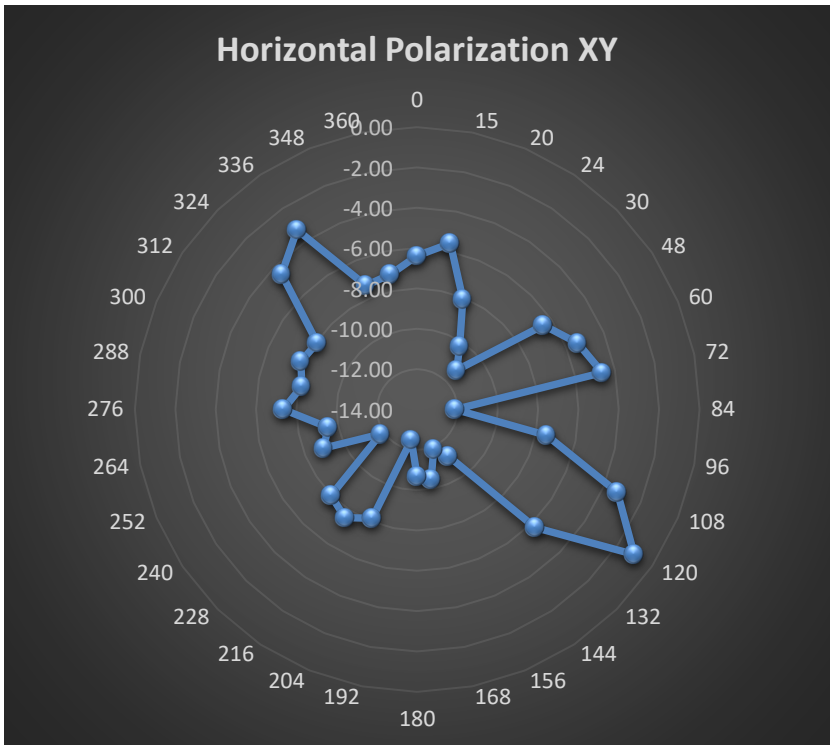
Pre-compliance Test Results

Vertical Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2480	0	1.22
2480	15	-0.43
2480	20	0.12
2480	24	0.67
2480	30	0.61
2480	48	-5.20
2480	60	-2.03
2480	72	1.24
2480	**84**	**2.64**
2480	96	2.23
2480	108	-2.26
2480	120	-8.80
2480	132	-12.50
2480	144	-9.03
2480	156	-7.41
2480	168	-7.82
2480	180	-9.47
2480	192	-9.13
2480	204	-7.01
2480	216	-5.62
2480	228	-3.48
2480	240	-2.40
2480	252	0.05
2480	264	-2.12
2480	276	-0.80
2480	288	-1.12
2480	300	-0.18
2480	312	0.19
2480	324	-0.22
2480	336	0.69
2480	348	1.68
2480	360	1.38

Horizontal Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2480	0	-6.37
2480	15	-5.59
2480	20	-8.07
2480	24	-10.21
2480	30	-11.23
2480	48	-6.47
2480	60	-5.39
2480	72	-4.63
2480	84	-12.12
2480	96	-7.45
2480	108	-3.25
2480	**120**	**-1.06**
2480	132	-5.73
2480	144	-11.21
2480	156	-11.86
2480	168	-10.47
2480	180	-10.71
2480	192	-12.46
2480	204	-8.16
2480	216	-7.55
2480	228	-7.96
2480	240	-11.81
2480	252	-8.98
2480	264	-9.50
2480	276	-7.35
2480	288	-8.16
2480	300	-7.76
2480	312	-8.04
2480	324	-4.49
2480	336	-3.28
2480	348	-7.35
2480	360	-7.17



Vertical Polarization

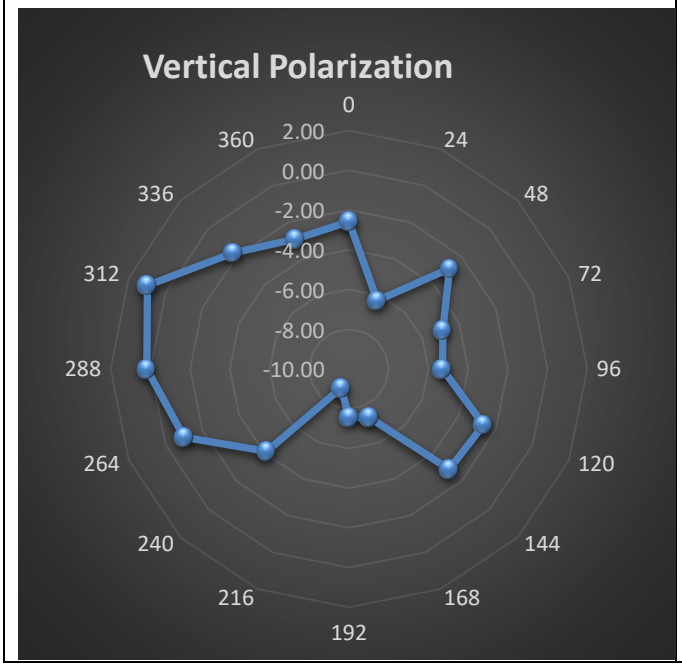


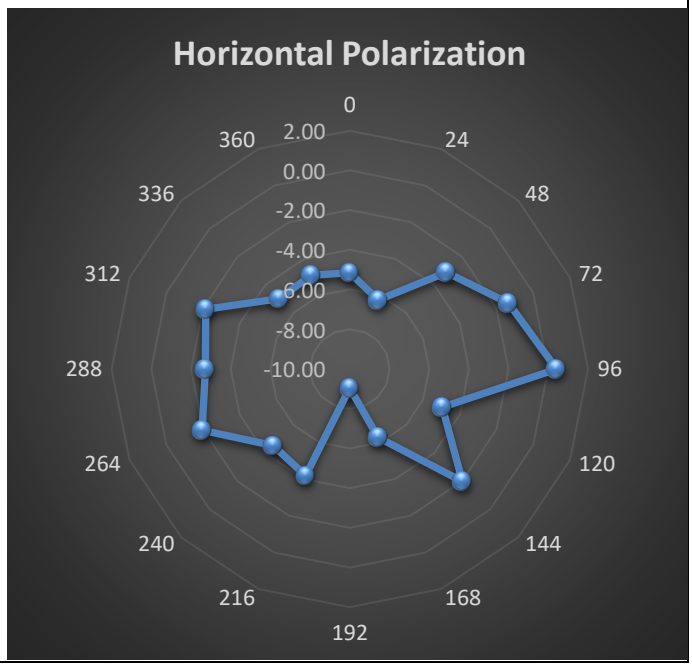
Horizontal Polarization

1.2 Orientation: XY_BT-Ant (BT Antenna)

Vertical Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2402	0	-2.58
2402	24	-6.27
2402	48	-2.84
2402	72	-4.88
2402	96	-5.29
2402	120	-2.66
2402	144	-2.85
2402	168	-7.35
2402	192	-7.58
2402	216	-8.97
2402	240	-4.14
2402	264	-1.02
2402	288	0.18
2402	**312**	**0.99**
2402	336	-1.74
2402	360	-2.92

Vertical Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2402	0	-5.15
2402	24	-6.24
2402	48	-3.12
2402	72	-1.34
2402	**96**	**0.42**
2402	120	-4.95
2402	144	-1.98
2402	168	-6.28
2402	192	-9.05
2402	216	-4.18
2402	240	-4.55
2402	264	-1.95
2402	288	-2.73
2402	312	-2.15
2402	336	-4.99
2402	360	-4.90

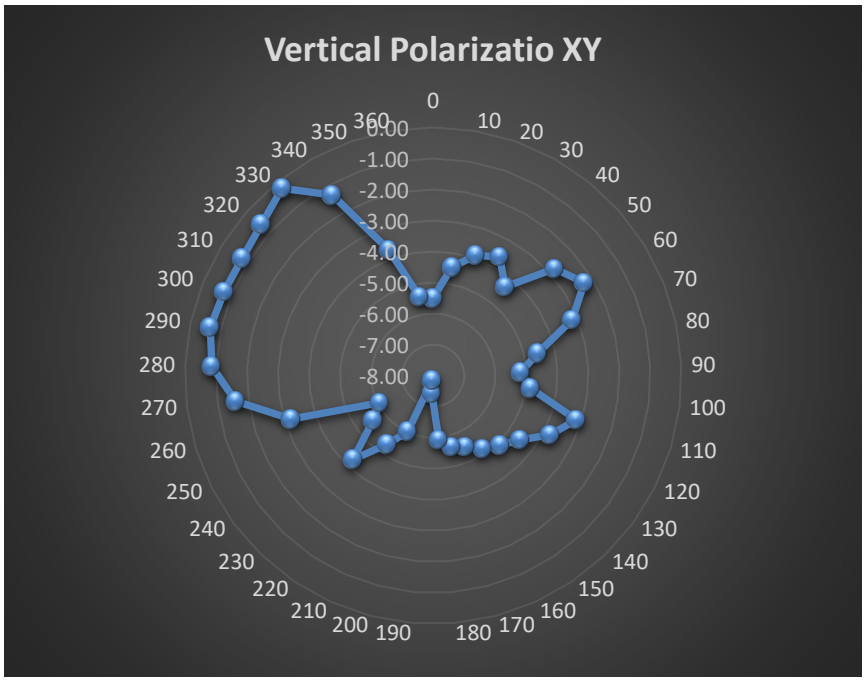




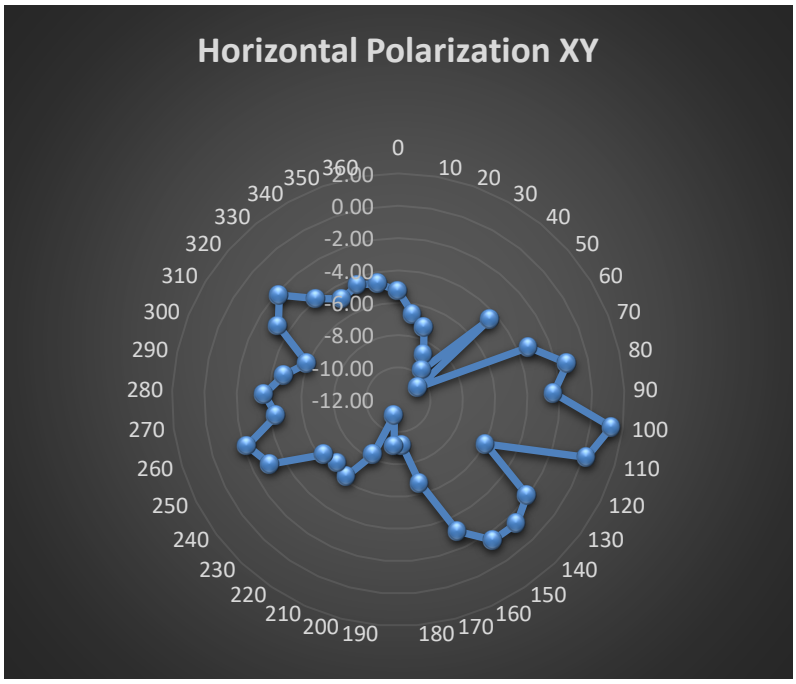
Pre-compliance Test Results

Vertical Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2480	0	-5.50
2480	10	-4.45
2480	20	-3.89
2480	30	-3.61
2480	40	-4.32
2480	50	-2.78
2480	60	-2.28
2480	70	-3.18
2480	80	-4.55
2480	90	-5.18
2480	100	-4.83
2480	110	-3.17
2480	120	-3.78
2480	130	-4.52
2480	140	-4.89
2480	150	-5.16
2480	160	-5.48
2480	170	-5.64
2480	180	-5.92
2480	190	-7.44
2480	200	-7.85
2480	210	-6.02
2480	220	-5.33
2480	230	-4.26
2480	240	-5.59
2480	250	-6.07
2480	260	-3.21
2480	270	-1.58
2480	280	-0.86
2480	290	-0.65
2480	300	-0.73
2480	310	-0.77
2480	320	-0.63
2480	**330**	**-0.24**
2480	340	-1.33
2480	350	-3.69
2480	360	-5.42

Horizontal Polarization		
Frequency (MHz)	**Azimuth (° deg)**	**Measured Antenna Gain (dBi)**
2480	0	-5.26
2480	10	-6.61
2480	20	-7.24
2480	30	-8.76
2480	40	-9.62
2480	50	-4.44
2480	60	-10.54
2480	70	-3.30
2480	80	-1.29
2480	90	-2.37
2480	**100**	**1.30**
2480	110	0.20
2480	120	-5.94
2480	130	-2.08
2480	140	-1.40
2480	150	-1.51
2480	160	-3.07
2480	170	-6.68
2480	180	-9.15
2480	190	-9.14
2480	200	-11.02
2480	210	-8.27
2480	220	-6.31
2480	230	-6.59
2480	240	-6.29
2480	250	-3.13
2480	260	-2.22
2480	270	-4.41
2480	280	-3.70
2480	290	-4.78
2480	300	-5.93
2480	310	-3.29
2480	320	-2.20
2480	330	-3.96
2480	340	-4.86
2480	350	-4.47
2480	360	-4.71



Vertical Polarization



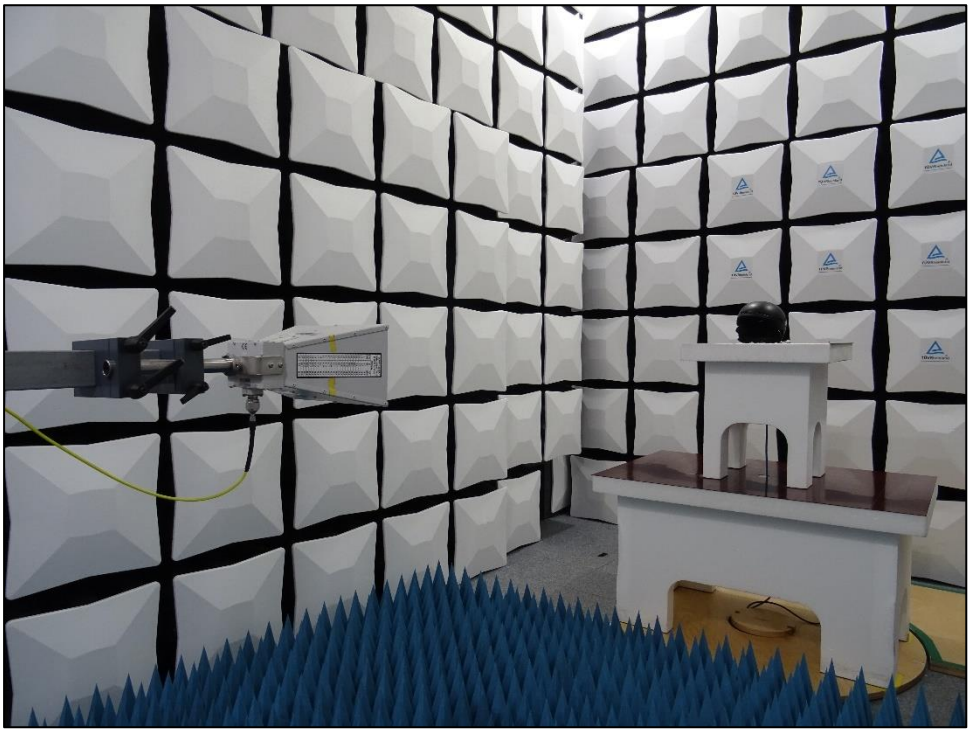
Horizontal Polarization

Note :

Antenna Type	Antenna Polarization	Antenna Height (Mtr)
Horn Antenna	Vertical	1.5
	Horizontal	1.5

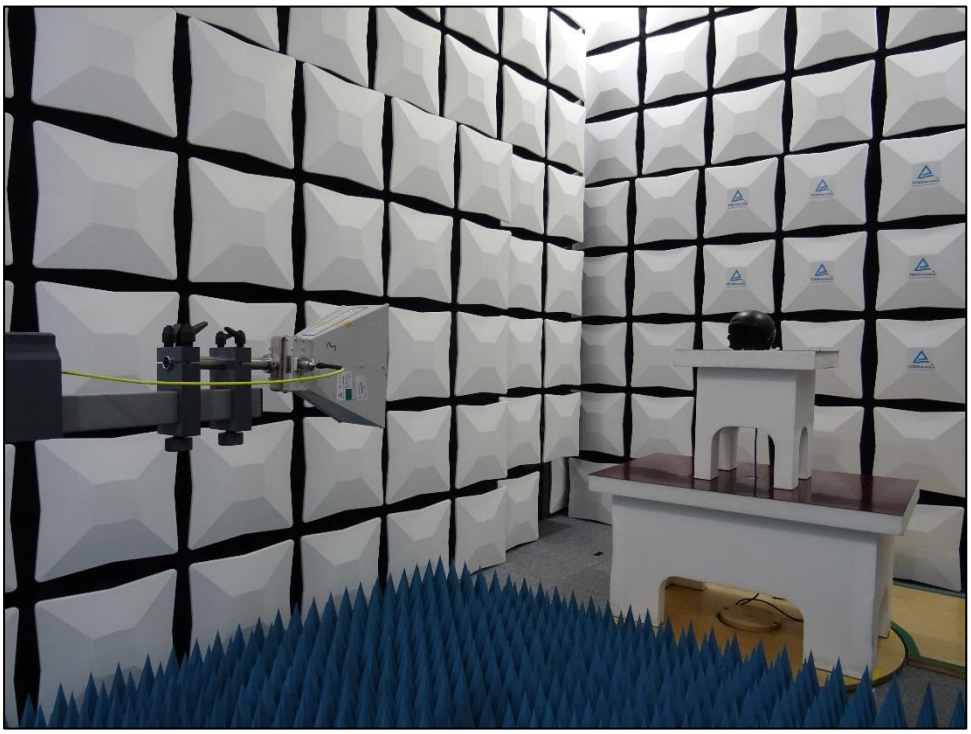
2 Test Setup Photos:

Image1:Test EUT



Vertical Polarization: XY

Pre-compliance Test Results



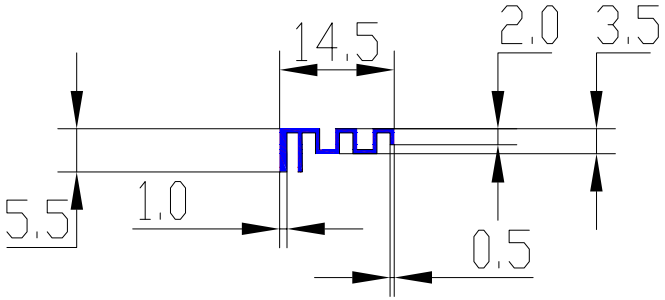
Horizontal Polarization: XY

Note:

Room Temperature : 21.6
Humidity : 62 %

Project Engineer: Naveen K
Test Engineer: Vaibhav Lohar

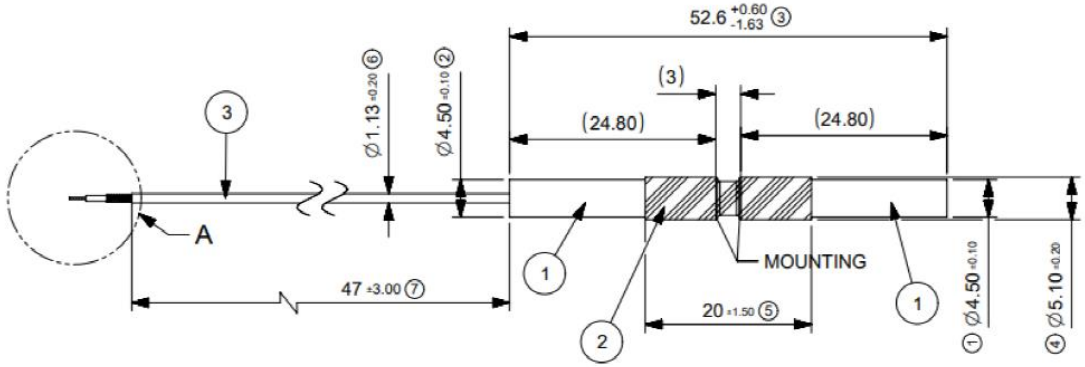
***** End of Test Results *****

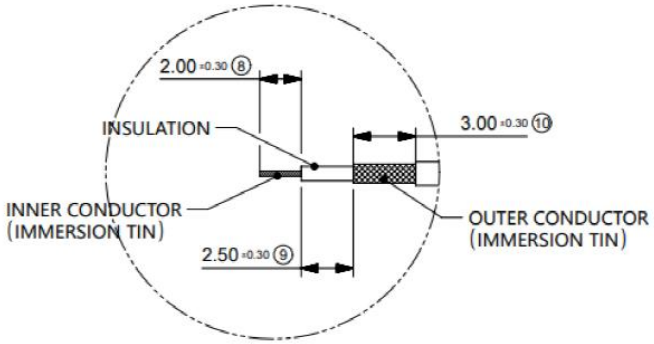

14.5
2.0
3.5
5.5
1.0
0.5

nRF ANT

BOM		
LTEM	MATERIAL	DESCRIPTION
1	COPPER PIPE	∅4.5MM (PLATING NI)
2	HEAR SHRINK TUBE	∅5.1MM BLACK IN COLOR
3	CABLE	∅1.13MM BLACK IN COLOR

REV	DATE	DESCRIPTION
1	2021/11/11	NEW RELEASE
2	2021/12/20	UPDATE COPPER LENGTH
A	2022/03/10	UPDATE TOLERANCES&NOTES
B	2022/03/29	UPDATE CABLE CONDUCTOR DIMENSION





DETAIL A
SCALE 5:1

NOTES:
1.MATERIAL REFERENCE BOM;
2.DIMENSIONS ARE WITHIN THE RANGE OF SPECIFICATIONS;
3.THE CABLE TINNED SPOT IS FULL OF BRIGHTNESS;
4.UNDER NORMAL CONDITIONS OF ANTENNA FUNCTION, IT IS NORMAL FOR THE TWO COPPER TUBES TO BEND AT A HORIZONTAL ANGLE (LESS THAN 180°).
5. COPPER PIPE NEED PLATING NI.

THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX ELECTRONIC TECHNOLOGIES, LLC AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

DIMENSION UNITS: mm | SCALE: 1:1

GENERAL TOLERANCES (UNLESS SPECIFIED)
ANGULAR TOL ± 1.0°
4 PLACES ±
3 PLACES ± 0.5
2 PLACES ± 1.0
1 PLACE ± 1.5
0 PLACES ± 2.0

DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS

CURRENT REV DESC:
EC NO: 701795
DRWN: KCHENG06 2022/03/29
CHKD: HORACM1 2022/06/10
APPR: HORACM1 2022/06/10
INITIAL REVISION:
DRWN: KCHENG06 2021/12/21
APPR: HORACM1 2022/03/28

THIRD ANGLE PROJECTION | DRAWING: A3-SIZE | SCALE: 218941 | MATERIAL NUMBER: 2189410011 | CUSTOMER

molex

DIPOLE WIFI ANTENNA WITH 47MM CABLE

RESTRICTED PRODUCT CUSTOMER DRAWING

DOCUMENT NUMBER	DOC TYPE	DOC PART	REVISION
2189410011	PSD	001	B

SHEET NUMBER: 1 OF 1

DOCUMENT STATUS	P1	RELEASE DATE	2022/06/10 07:19:46