

PART NO. 28709372		SHT. 0 OF 12	APTIV ADVANCED SAFETY & USER EXPERIENCE			
DATE	SYMBOL	REVISION - UPDATE DOCUMENTATION ONLY		AUTHORITY	DR.	AP.
19AP21	A	RELEASED-PRODUCTION		1080654278	KS	KA

REFERENCE INFORMATION (add sheets if necessary)

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NON-STANDARD DRAWING REVISION SYMBOL(S): 2021.04.12
(Include revision for all sheets)

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NUMBER OF NON-STANDARD DRAWING SHEETS: 11

NUMBER OF ADDITIONS TO COVER SHEET: 0

TOTAL NUMBER OF SHEETS: 12

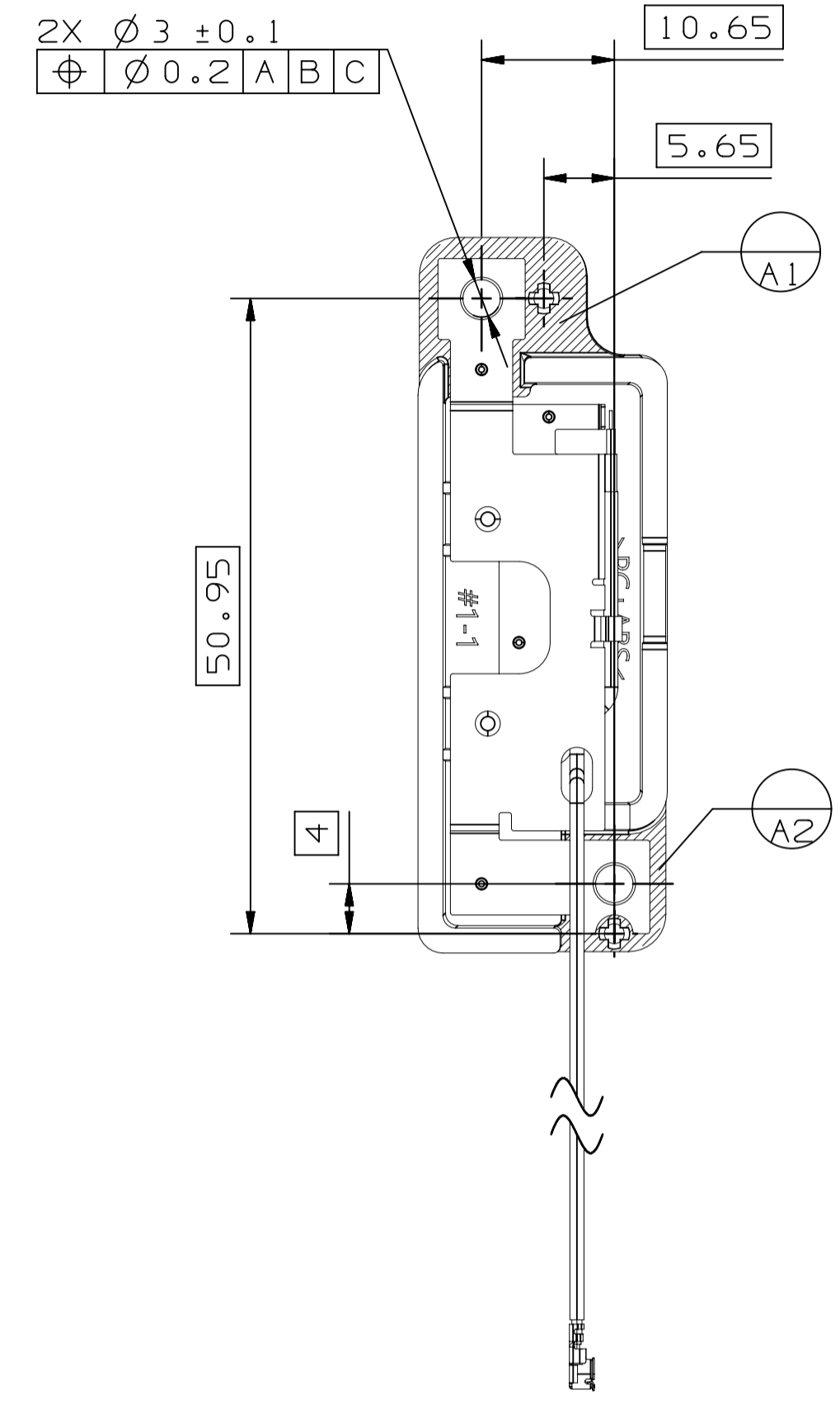
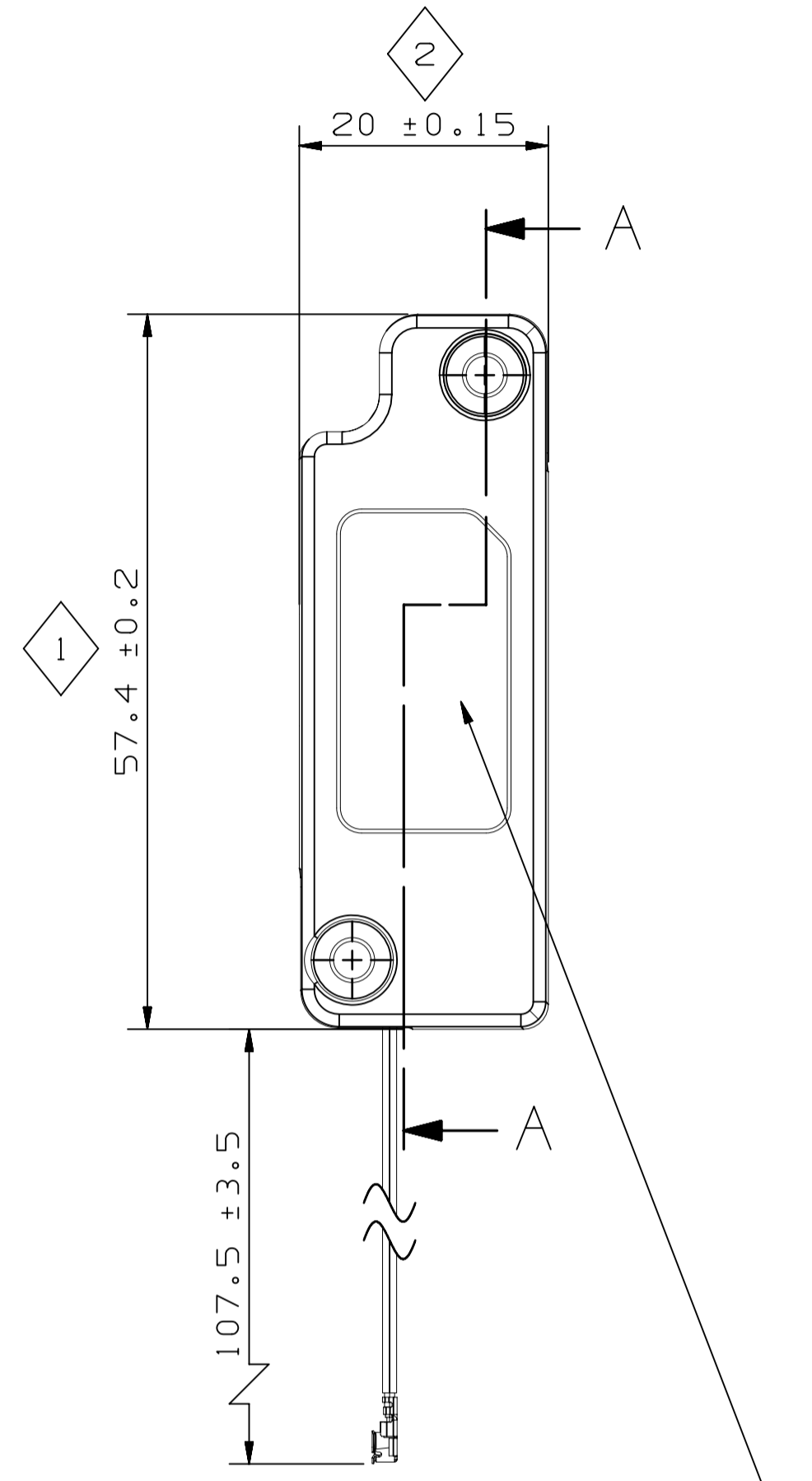
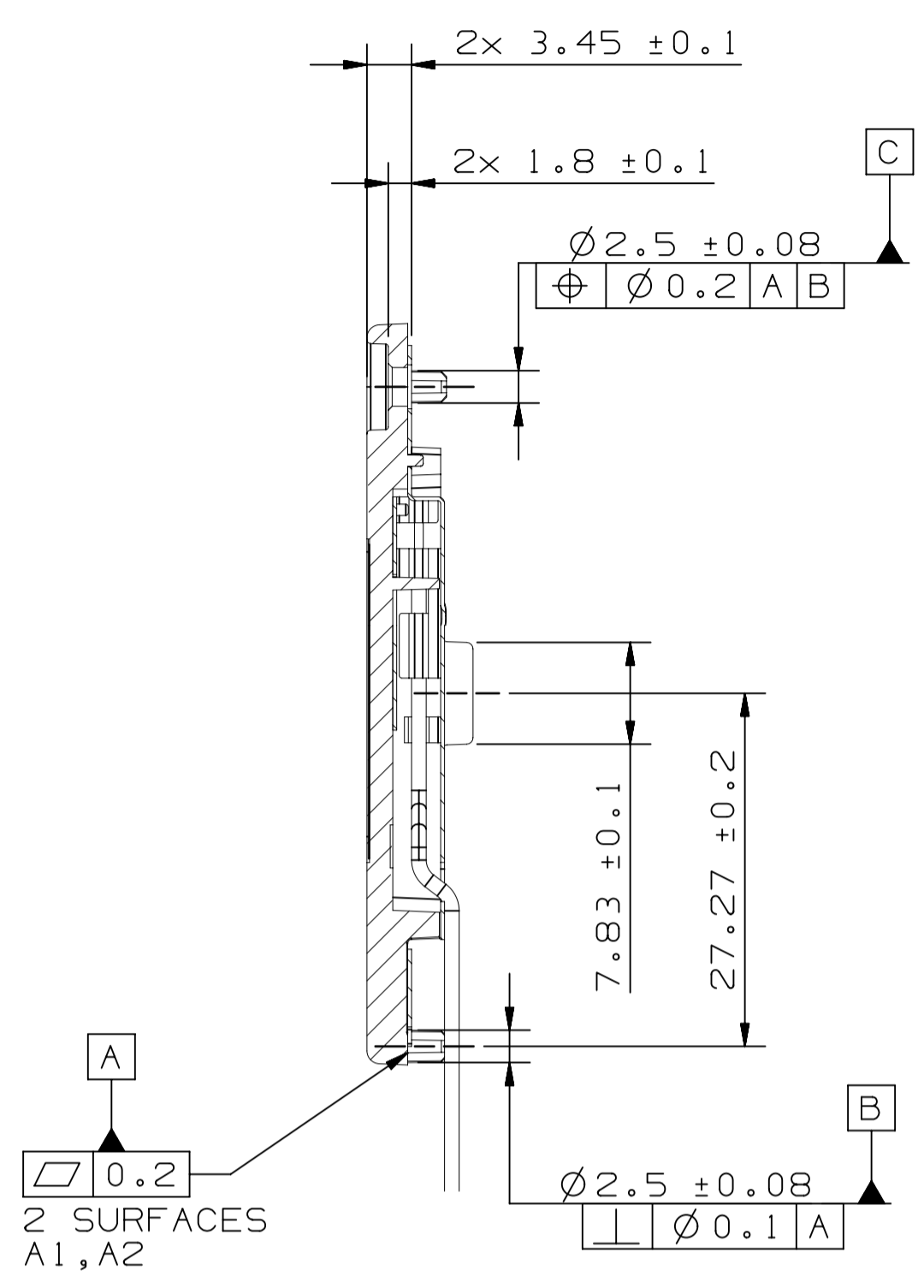
NON-STANDARD DRAWING SOURCE (IF CSD, ENTER CUSTOMER) AMOTECH

ADDITIONAL INFORMATION:

KEY CHARACTERISTICS		DR KRZYSZTOF STARZYK		DATE 19AP21
YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		Appv KRZYSZTOF ADAMCZYK		DATE 19AP21
<p align="center">• APTIV •</p> <p align="center">ADVANCED SAFETY & USER EXPERIENCE</p>		Appv SIMON LI		DATE 19AP21
		Appv SYLWESTER SZCZACHOR		DATE 19AP21
		FIRST USED		
DOCUMENT DATA STORAGE:		DOC. MAN.		28749780
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		<p align="center">ANT-DHU1.0 BT</p>		
		PART NO		SHT OF
		<u>28709372</u>		0 12

DESIGNATED CHARACTERISTICS				QC1	KPC		
0	LAST NO USED	K OR Q	FIT/FUNCTION	CI	FF		
2	0	TOTAL ON DRAWING					
KPC	QC1		SAFETY/COMPLIANCE	SC			
NO	NO	TYPE	DESCRIPTION	RATIONALE	ZONE	SH	PTS
1		FF	LENGHT	PROCESS METRIC	F9	-	-
2		FF	LENGHT	PROCESS METRIC	GB	-	-

DWG STATUS					ZONE	REVISION HISTORY			AUTH	DR	APVD1	APVD2
DATE	STG	REV	N/P	CHG								
19AP21	-	A	-	-	-	RELEASED-PRODUCTION			108065 4278	KS	KA	SL



SECTION A - A
SCALE 2:1

PART MARKING / LABEL
ACCORDING TO THE TABLE 1

MARKING REQUIREMENTS:

MARKING MUST BE PERMANENT.
MARKING MUST BE READABLE.
MARKING SHALL BE PRE-APPROVED BY APTIV ENGINEERING.

TABLE 1 - LABEL SPECIFICATION (LASER MARKING/LABEL)

ATTRIBUTE	DESCRIPTION	FORMAT	STANDARD
HUMAN READABLE INFORMATION	APTIV P/N P P P P P P P (REF. PER DRAWING)	CHARACTER SIZE MIN 1.2 mm	
CODE	CONTENT: "P P P P P P P D D M M Y Y S S S S" - "P P P P P P P" APTIV P/N - "DD" DAY OF ASSEMBLY - "MM" MONTH OF ASSEMBLY - "YY" THE LAST TWO DIGIT OF CALENDAR YEAR - "SSSS" SERIAL NUMBER RESET EVERY DAY TO 0001 (0001-9999)	P P P P P P P D D M M Y Y S S S S	DATA MATRIX ECC200
	QUIET ZONE CIRCUMFERENCIAL	MIN. 2 CELL WIDTH	
	CELL SIZE	0.25-0.35 mm	
	SYMBOL SIZE	16 x 16 SQUARE MATRIX	
LABEL BODY	SERIAL NUMBER APTIV PART NUMBER DATA MATRIX CODE	DDMMYYSSSS P P P P P P P P	

ALL JOINTS FORMED BY STAKING NEED TO BE TIGHT MAKING INTIMATE CONTACT WITH THE MATING PARTS.
JOINTS NEED TO BE OF SUFFICIENT CONTACT TO NOT CREATE SQUEAKS OR OTHER NOISE.
ALL JOINTS NEED TO BE UNIFORM IN SIZE, SHAPE, STRENGTH AND ARE NOT TO EXCEED TOLERANCES NOTED ON THE DRAWING.
FLASH IS PERMISSIBLE AS LONG AS IT DOESN'T EXCEED TOLERANCES NOTED ON THE DRAWING.
THE STAKING PROCESS SHALL NOT LEAVE MATERIAL STRINGS OR ANY OTHER DEBRIS.
ALL JOINTS MUST BE COMPLETED WITHOUT DAMAGE.
THE STAKING PROCESS CANNOT DAMAGE THE RETAINER, DECORATIVE RING, GRAD RING, OR FRONT SHOW SURFACE IN ANYWAY.

FIRST USED
28706747
REFERENCE
N/A
REPLACES
DK 332711
REPLACED BY
N/A

UNLESS OTHERWISE SPECIFIED
THIS DOCUMENT IS IN ACCORDANCE WITH ASME Y14.5-2009.

ALL DIMENSIONS ARE IN MILLIMETERS
ZERO PLACE DECIMALS ±N/A
ONE PLACE DECIMALS ±N/A
TWO PLACE DECIMALS ±N/A

ANGLES ±N/A DEGREE

THIRD ANGLE PROJECTION

DO NOT SCALE

USE MATH DATA

NX
NX V11.0

• APTIV •

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DR	DATE
KRZYSZTOF STARZYK	19AP21
APVD1 KRZYSZTOF ADAMCZYK	19AP21
APVD2 SIMON LI	19AP21
APVD3 SYLWESTER SZCZACHOR	19AP21
APVD4	
APVD5	

SUBSTANCES OF CONCERN AND RECYCLED CONTENT PER APTIV 10949001

MATERIAL

SEE ITEM LIST

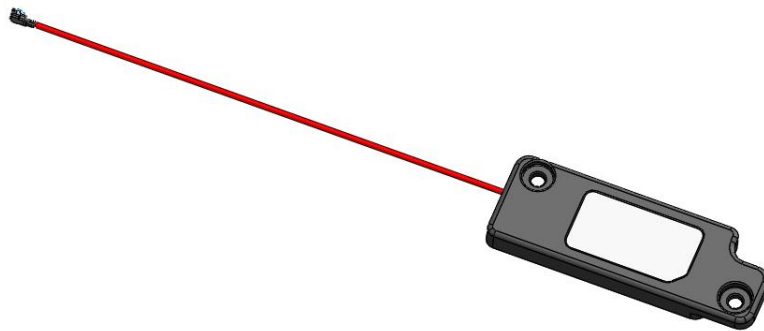
DRAWING NAME
ANT-DHU1.0 BT

DRAWING NUMBER
28709372

SIZE	SCALE	FRAME NO	SHEET NO	STG	REV	N/P
A1	(2:1)	1 OF 1	1 OF 1	-	A	-

DATASHEET

Type	Cable assembly antenna
Application	Bluetooth
Customer P/N	28709372
AMOTECH P/N	AMO-MHA-AP003



2021. 04. 12

History

Rev. No	Date	Title	Contents	Page
0	2021.04.12		New published	

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1. Specification

1.1 Electrical Specifications

No	Item	Specification			Unit
		Min	Typical	Max	
1	Operating Frequency	2400		2485	MHz
2	VSWR	1	1.6	3.0	
3	Efficiency		46		%
4	Peak gain		1.6		dBi
5	Polarization	Linear			
6	Impedance [Ω]	Nominal 50			

※ Notice

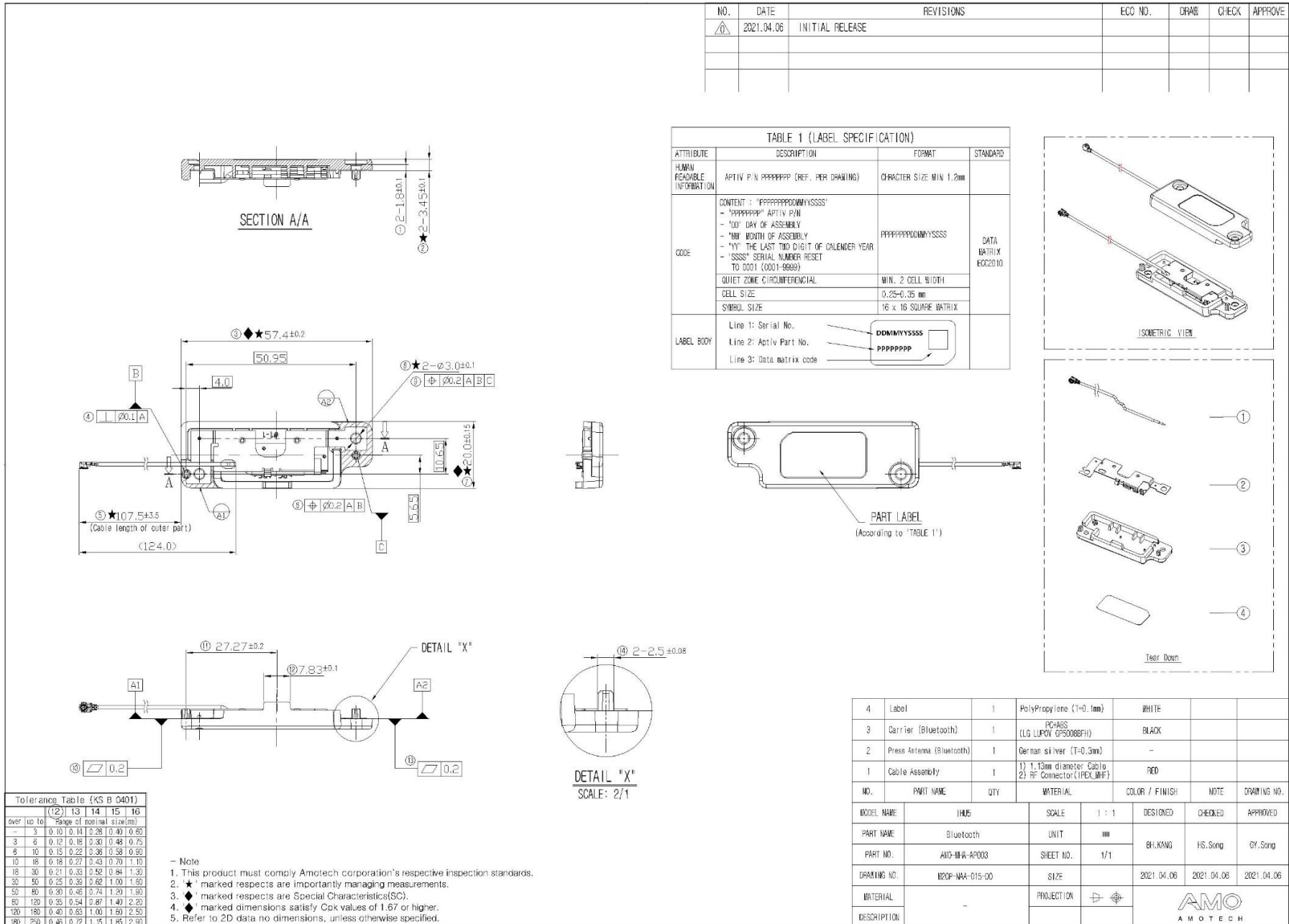
- a. Measured data is based on Customer's SET, DHU1 unit.
- b. Antenna could be changed to applied other SET condition.

1.2 Mechanical Specifications

No	Item	Specification	Remark
1	Dimensions (L x W x H)	164.9 mm x 20 mm x 8.5 mm	
2	Cable	Ø1.13 mm, 151.5 mm, Red color	
3	RF connector	IPEX MHF I	
3	Unit weight	6 g	

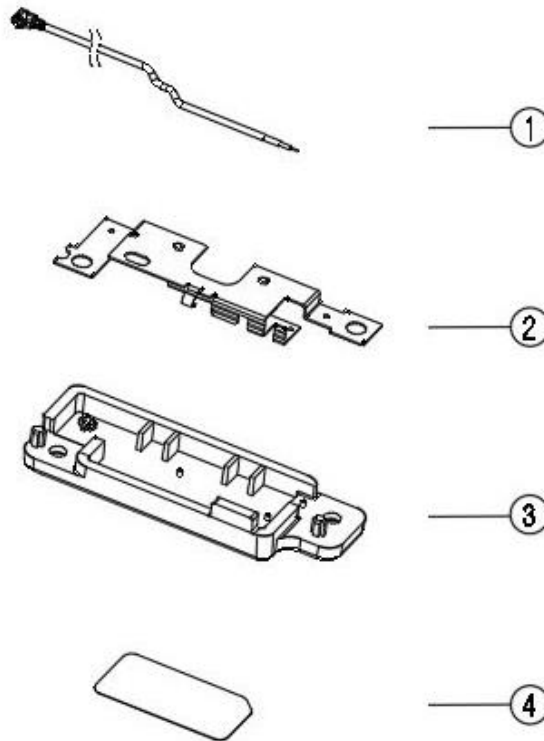
- a. Total dimension include carrier and RF cable of antenna.

1.3 Appearance & material
- Drawing



- Material information

No	Description	Material
①	RF Cable	RF Cable & connector
②	Press antenna	German silver (Thickness 0.3 mm)
③	Carrier	PC+ABS (LG LUPOY GP5008BFH)
④	Label	PolyPropylene (Thickness 0.1 mm)



- Product label information



DD	MM	YY	SSSS
[A] _____	_____	_____	_____
Date	Month	Year	Serial number

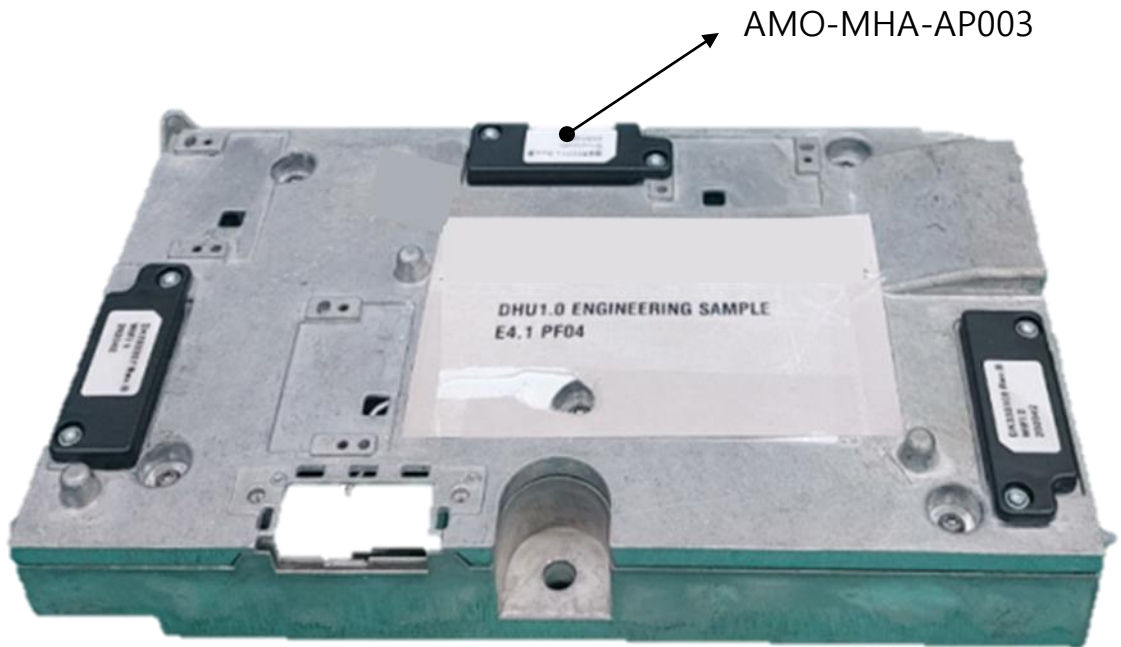
[B] Customer P/N

[C] Data Matrix Code

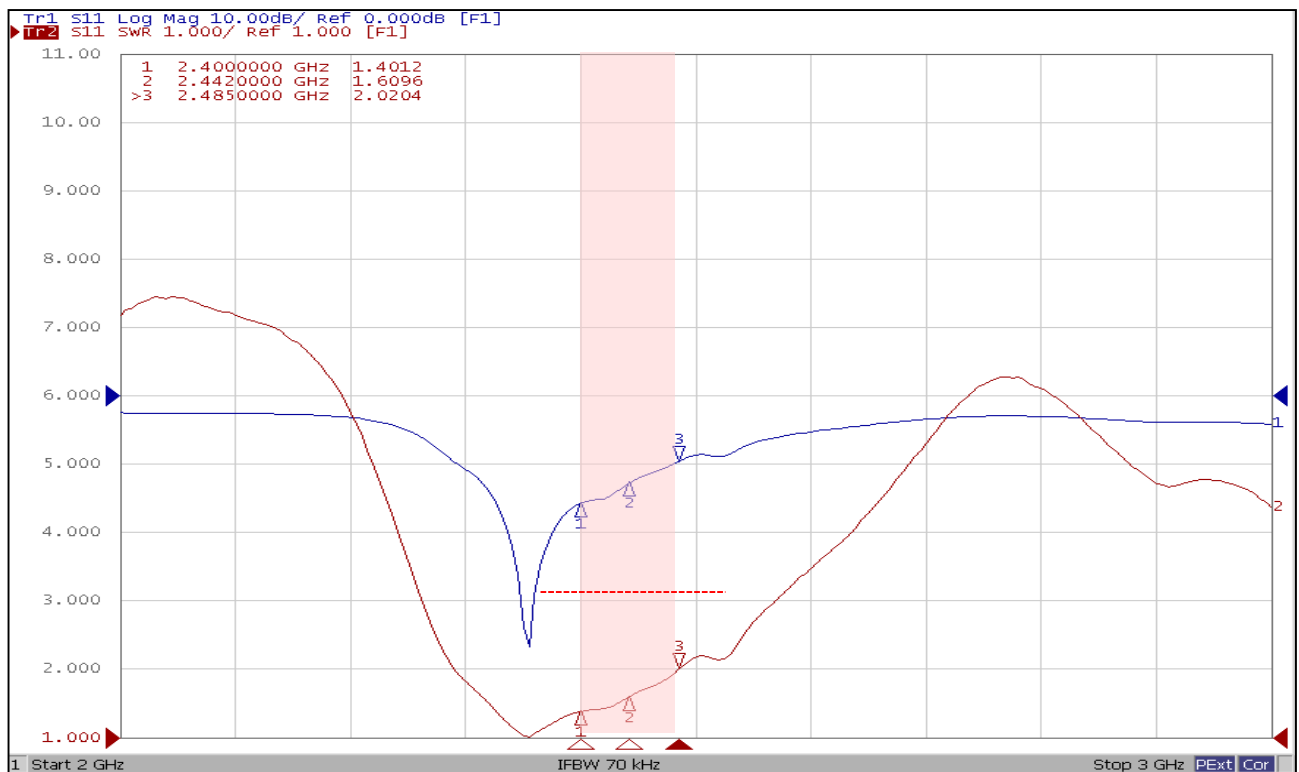
※ Matrix code will contain [B]+[A].

2. Measurement

2.1 Measured VSWR



Antenna on the customer's SET



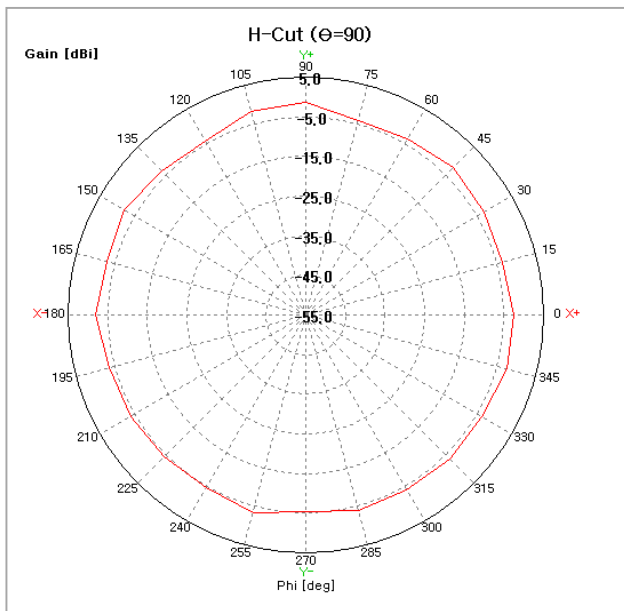
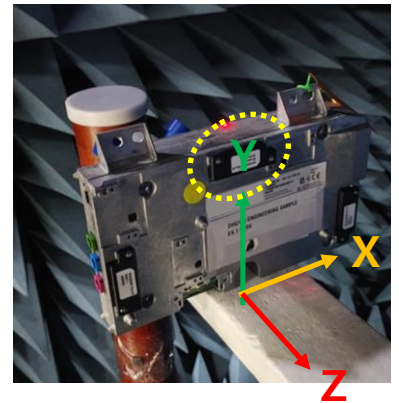
Measured VSWR on the customer's SET

2.2 Measured data of Radiation Gain

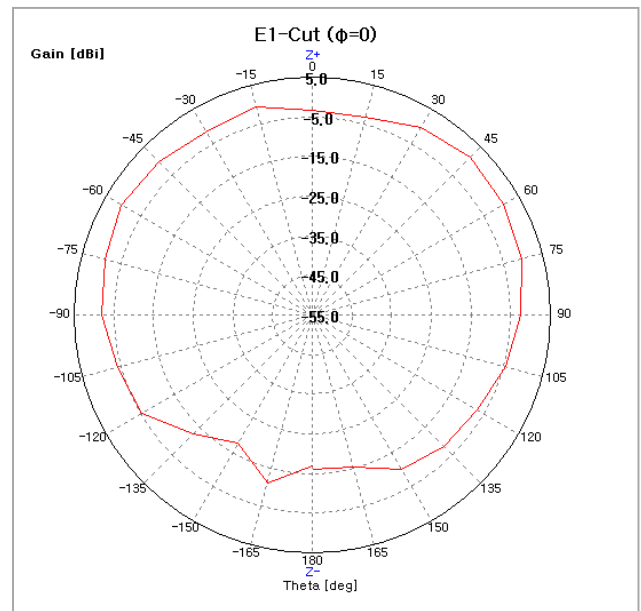
- Antenna gain table on the SET

Frequency [MHz]	Efficiency [%]	Avg. Gain [dBi]	Peak Gain [dBi]
2400	42.4	-3.7	0.8
2442	46.8	-3.3	1.6
2485	33.4	-4.8	0.2

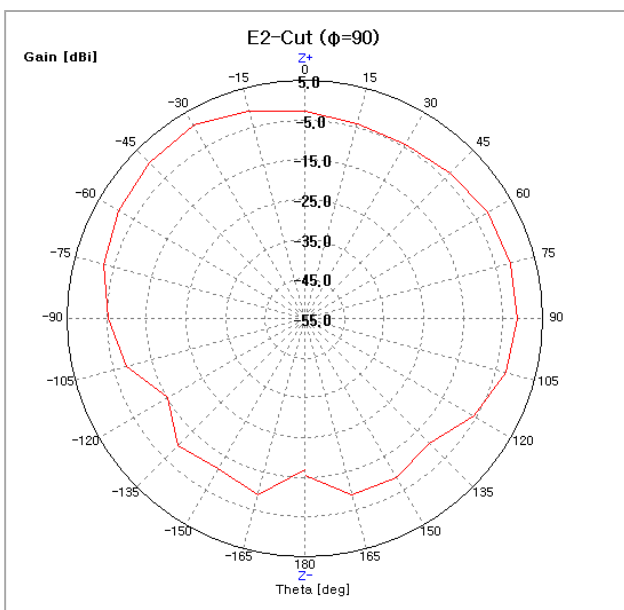
Measured SET @3D chamber



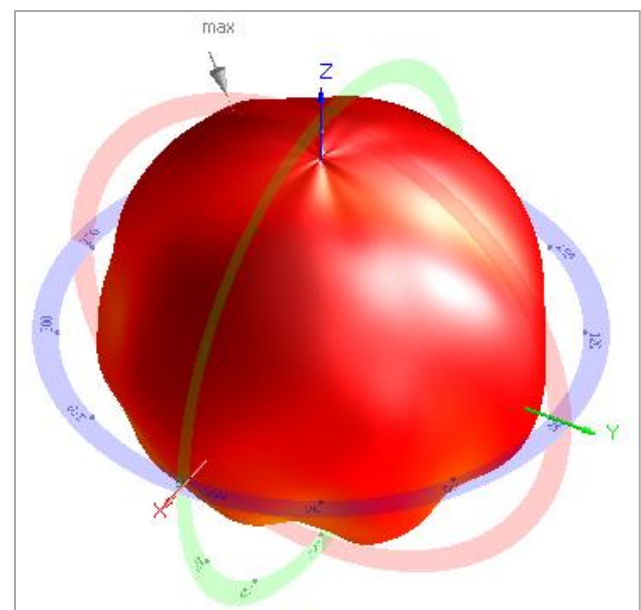
XY plane @2442 MHz



ZX plane @2442 MHz



YZ plane @2442 MHz

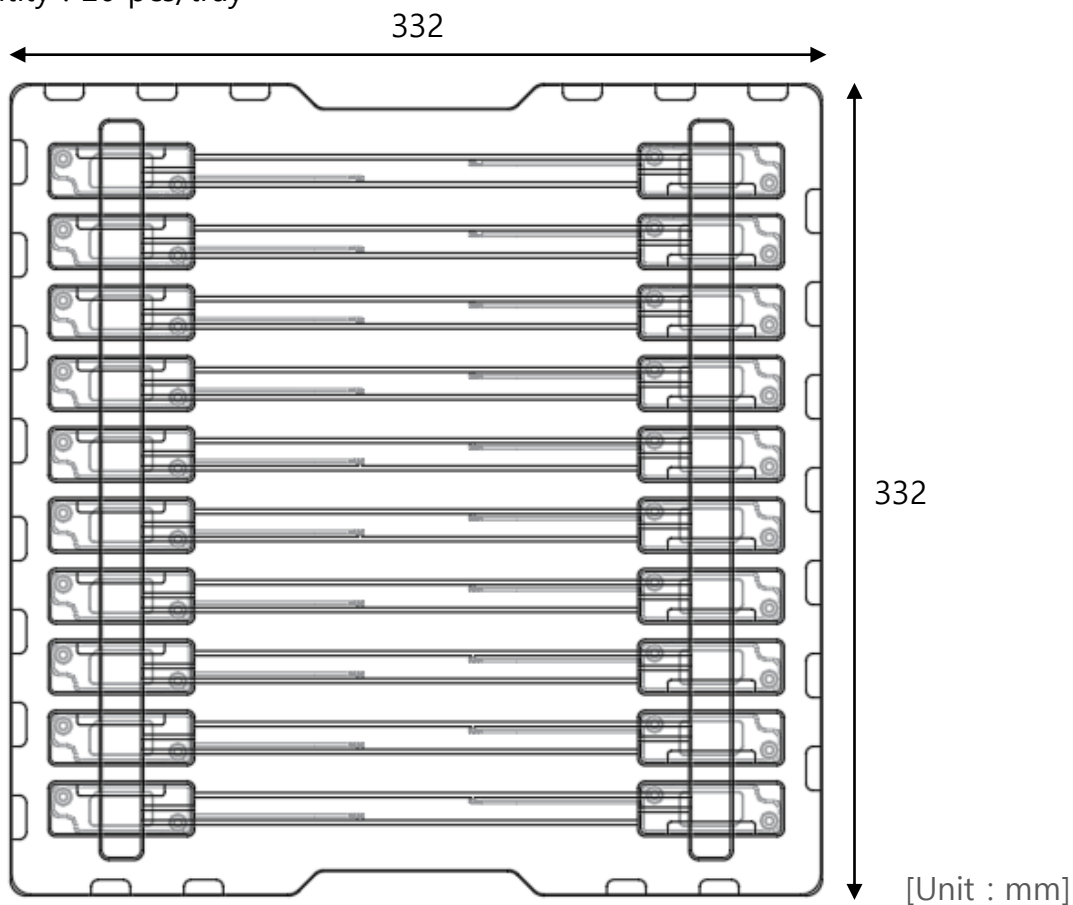


3D radiation pattern @2442 MHz

3. Packaging

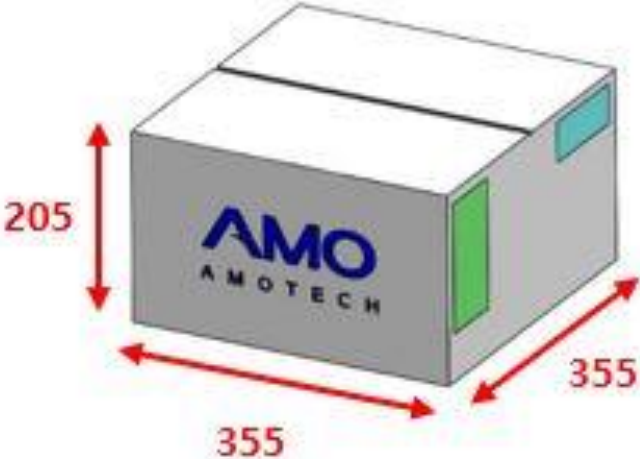
3.1 Tray Packing

- Tray size : 332 x 332 mm
- Material : PET
- Quantity : 20 pcs/tray



3.2 Carton box

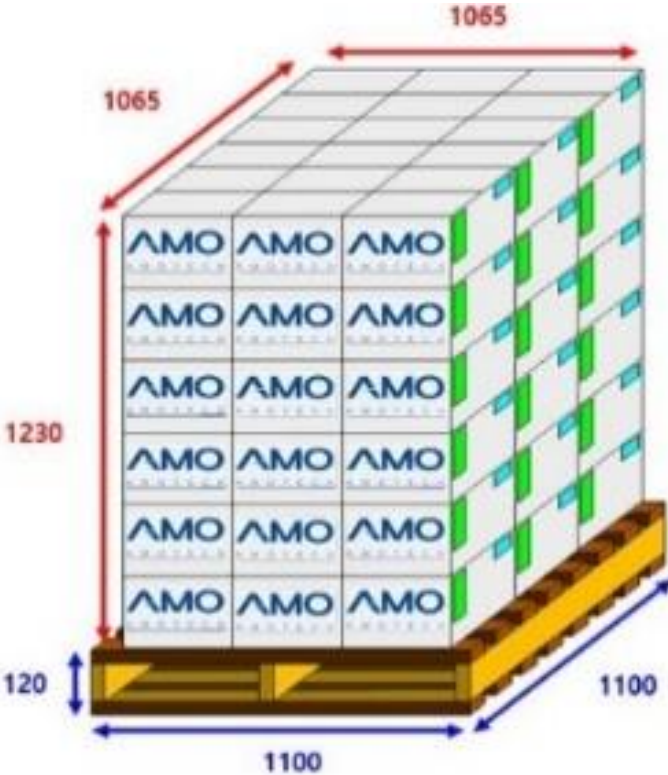
- Box size : 355 x 355 x 205 mm
- Quantity : 340 pcs/box



[Unit : mm]

3.3 Pallet

- Pallet size : 1,100 x 1,100 x 120 mm
- Quantity : 18,360 pcs/pallet



[Unit : mm]

4. Reliability Test Conditions

No	Item	Test Condition	Test Requirements
1	High temperature storage	1. Temperature : +85 °C 2. Time : 504 hours	1. No visual damage 2. Within electric spec (VSWR)
2	Low temperature storage	1. Temperature : -40 °C 2. Time : 24 hours	1. No visual damage 2. Within electric spec (VSWR)
3	Temperature cycling	1. Step 1 : +85 °C, 20 min Step 2 : -40 °C, 20 min 2. Number of cycle : 200	1. No visual damage 2. Within electric spec (VSWR)
4	Humidity	1. Step 1 : -10 °C, 24 hours Step 2 : +65 °C, 24 hours 2. Humidity : 93 %RH 3. Number of cycle : 10	1. No visual damage 2. Within electric spec (VSWR)
5	Free fall (=drop)	1. Drop height : 1 m 2. Impact surface : concrete 3. Test cycle : for each of 3 DUTs one drop in both direction of each dimensional axis (1st DUT : ±X, 2nd DUT : ±Y, 3rd DUT : ±Z)	1. No visual damage 2. Within electric spec (VSWR)
6	Vibration	1. Step : 5-55-5 Hz 1octave/min 2. Amplitude = 1.5 mm 3. Acceleration = 2 g 4. Hold time = 2 hours 5. Direction : Z direction (up & Down)	1. No visual damage 2. Within electric spec (VSWR)