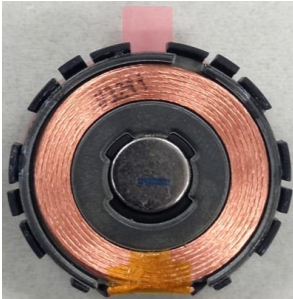
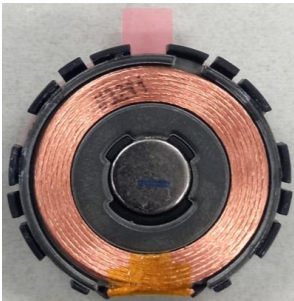


Customer	HAEM	Date	2023. 03. 10
		Version	Rev. 04

0QA-2049 준수

REQUEST FOR APPROVAL

제품명	Tx Module for Wireless Charger			제품 사진
Part Number	F03010042			
Application Model	EP-OR900(하엠向) Watch5 Coil Ass'y			
Specification	Inductance		11.1uH ± 5% @1V,100KHz	
	Rs_Resistance		140mΩ ± 20% @1V,100KHz	
	Rdc_Resistance		Max 100mΩ	
	Ass'y	Width	27.57 ± 0.5mm	
		Length	25.5 ± 0.5mm	
		Thickness	Max 4.85 mm	
		Weight	7.0g±5%	



Customer		Drawing	Reviewer	Reviewer 2	Approver
HAEM	Department / Name				
	Data				
	Sign				
Supplier		Drawing	Reviewer	Reviewer	Approver
Wits	Department / Name	Development Team S.J Kwon	Development Team D.M Moon	Development Team E.G Jung	Development Team Y.S Kang
	Data	2023. 03. 10	2023. 03. 10	2023. 03. 10	2023. 03. 10
	Sign				

MAKER		WITS CO., LTD	TEL	070-4925-9512
ADD	H.Q	35, hyungje-ro Namsa-myeon, Choin-gu, Yongin-si, Gyeonggi-do		
	Research Center	Floor 3, block B9, Maeyoung-ro, Yongtong-gu, Suwon-si, Gyeonggi-do		
	Factroy	LOT CN7, DIEM THUY IP(A AREA), HONG TIEN COMMUNE, PHO YEN TOWN, THAI NGUYEN PROVINCE, VIETNAM 24709		

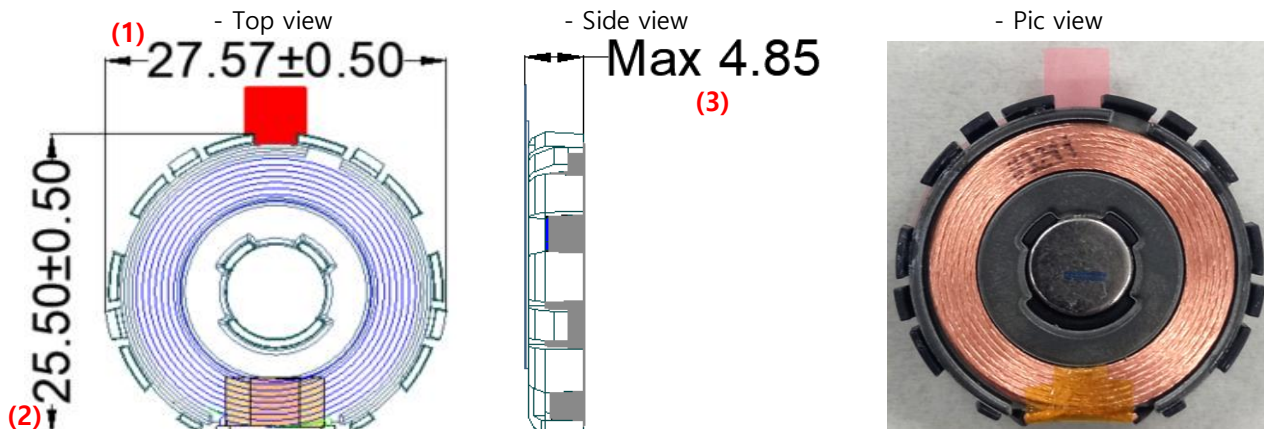
Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 제품 규격

2.1 도면



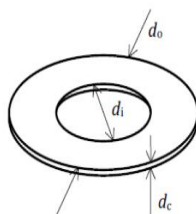
2.2 제품의 전기적 규격

관리항목	측정항목			규격
CTQ	CTQ 기계적 특성	(1)	Width	27.57 ± 0.5 mm
		(2)	Length	25.50 ± 0.5 mm
		(3)	Thickness	Max 4.85 mm
CTQ	CTQ 전기적 특성	L (Inductance)		11.1uH ± 5% @1V,100KHz
		Rs_Resistance		140mΩ ± 20% @1V,100KHz
		Rdc_Resistance		Max 100mΩ

- LCR Meter - 1) Tong Hui TH2837LX (@ 1V, 100kHz)

2) HIOKI LCR Meter (@ 1V, 100kHz)

2.3 Coil Spec(Alpha Coil)



Parameter	Symbol	Value
Outer Diameter	d_o	22.6±0.5mm
Inner Diameter	d_i	15.5+0.3/-0.1mm
Thickness	d_c	1.45 +0.1/-0.05mm
Number of Turns	N	14 (Top : 7T / Bot 7T)
Number of Layers	-	2 Layer

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 7 Parts List

No.	Part Code	Descriptoin	Specification	Q'ty	Vender	Harmful Substances
1		Coil	0.05x105가닥, Litz Wire 15.5x22.6x1.45mmT	1EA	Wits	Pass
2		폴림방지 Tape	PI Tape Thickness 20 μ m ,Width 4.0mm	12mm	NIUPAI	Pass
3		폴림방지 Tape	PI Tape Thickness 20 μ m ,Width 8.0mm	8mm	NIUPAI	Pass
4		Tube	HF Heat Shrinkable Tube ID:Φ1.0mm,300V,Black Length 5.0mm	2EA	한경컴포넌트 Woer	Pass
5		Ferrite	Mn-Zn Φ25.13x2.89mmT	1EA	Hualin KRY	Pass
6		Bracket	PC / Φ27.57x4.35mmT	1EA	GU VINA	Pass
7		FPCB	FPCB / 1.0 Oz / Au Plating REV0.3 / 19.1x6.45x0.15mmT	1EA	멀티텍 LIM	Pass
8		Chip Capacitor	1005 Chip Capacitor 1.5nF, 50V, 10%, X7R	2EA	Murata Taiyo-yuden SEM Samhwa	Pass
9		Coil Tape	KW-5100F Φ21.5xΦ16.5x0.1mmT	1EA	K-WON	Pass
10		Bracket Tape	KW-5150F 22.32x17.36x0.3mmT	1EA	K-WON	Pass
11		Magnet Plate	SPCC / Φ9.4x0.5mmT	1EA	삼흥하이텍	Pass
12		Magnet Plate Tape	AD100 Φ9.0xΦ2.0x0.1mmT	1EA	애니원	Pass
13		MAGNET	Nd-Fe-B N52M Φ7.8x3.6mmT	1EA	대한특수금속 Huizhou Ciyuan 노바텍	Pass
14		Tape Lower	93020LE Φ24.6x0.2mmT	1EA	3M	Pass
15		Ferrite Tape	KW-5150F Φ14.93xΦ10.50x0.3mmT	1EA	K-WON	Pass
16		Wire Solder	HSE-04 HGF32 SUPER Halogen-FREE , Φ0.8mm	60mg	LT소재	Pass
17		Dipping Solder	Lead Free BarSolder	-	BNF Corp HONGTAI	Pass
18		Ferrite PI Tape	HM PI - TYPE Thickness 50 μ m ,8.0*6.0mm	1EA	IHO	Pass
19		Bond	AF06	0.05g	Bostik	Pass
20		Label Marking	V705-D / V410-D Marking Ink	-	VIDEOJET	Pass

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 1 Alpha Coil

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2021.12.20
01	플럼방지 Tape 삭제	S.J Kwon	E.G Jung	2021.12.27
02	Lead 길이 변경. (11.0mm→8.0mm)	S.J Kwon	E.G Jung	2022.02.23
03	Lead 간격 변경. (7.0mm→9.0mm)	S.J Kwon	E.G Jung	2022.02.28
04	Lead 길이 변경. (7.0mm→6.5mm) Lead 간격 변경. (9.0mm→8.0mm)	S.J Kwon	E.G Jung	2022.03.10
05	수축 튜브 2ea 추가	S.J Kwon	E.G Jung	2022.03.17
06	플럼방지 Tape 추가	S.J Kwon	E.G Jung	2022.05.06
07	두께 공차 변경. ($\pm 0.1 \rightarrow +0.1/-0.05$)	S.J Kwon	E.G Jung	2022.11.18

- MATERIAL INFORMATION

a. Wire Spec : 0.05 x 105 Strand Litz Wire

b. Thickness : 1.45mm + 0.1/ - 0.05mm

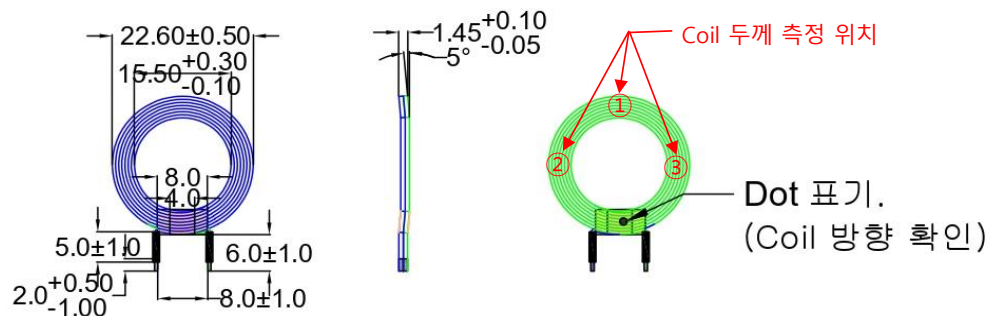
c. Turns : 14Turns

d. Measurement Location : Coil Size - Measure the width / length of the inner / outer diameter.

Coil Thickness - Measure the 2-Layer thickness of the winding coil.

e. Heat-Shrinkable Tubing : $\Phi 1.0\text{mm}/0.6 - 5.0\text{mm} \times 2\text{EA}$

f. PI TAPE Thickness : 0.02mm (4*12mm / 8x8mm)



CTQ / Thickness	
Coil 외각 크기	$\Phi 22.6 + 0.50/-0.50 \text{ mm}$
Coil 내경 크기	$\Phi 15.50 + 0.3/-0.1 \text{ mm}$
Coil 두께	$1.45 + 0.1/-0.05\text{mm}$

Part List

ERP Code	SPEC	Q'Ty

Stock Number

Data 2021. 12. 20.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

Alpha Coil

Drawing Size

A4

Drawing Number

1

Of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

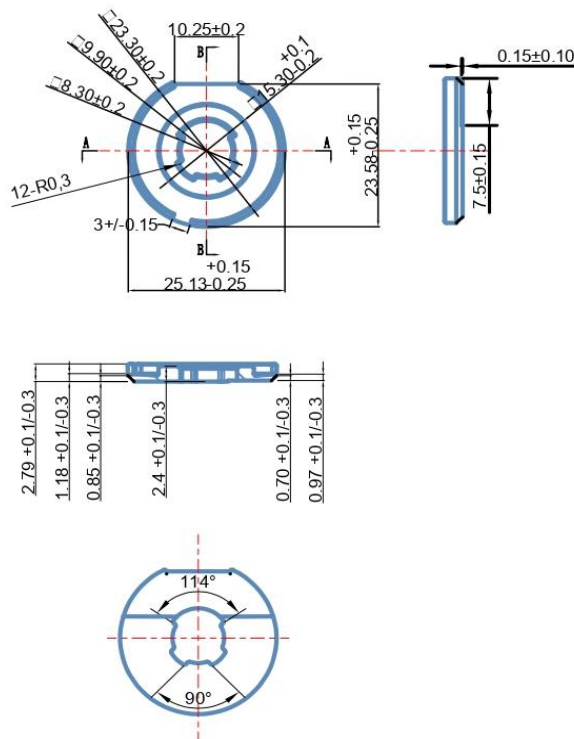
2. 8. 2 Ferrite

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2021.12.20
01	Ferrite 상단 0.7mm 삭제	S.J Kwon	E.G Jung	2021.12.28
02	Ferrite 형상 및 Size 변경	S.J Kwon	E.G Jung	2022.01.06
03	Ferrite 형상 및 Size 변경	S.J Kwon	E.G Jung	2022.01.19

- MATERIAL INFORMATION

- a. Material : Mn-Zn
b. Thickness : 2.79 +0.1/-0.3
c. Color : Dark Gray



Part List

ERP Code	SPEC	Q'Ty

Stock Number

Data 2021. 12. 20.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

Ferrite Sheet

Drawing Size

A4

Drawing Number

1

of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 3 Bracket

CHANGED CONTENT

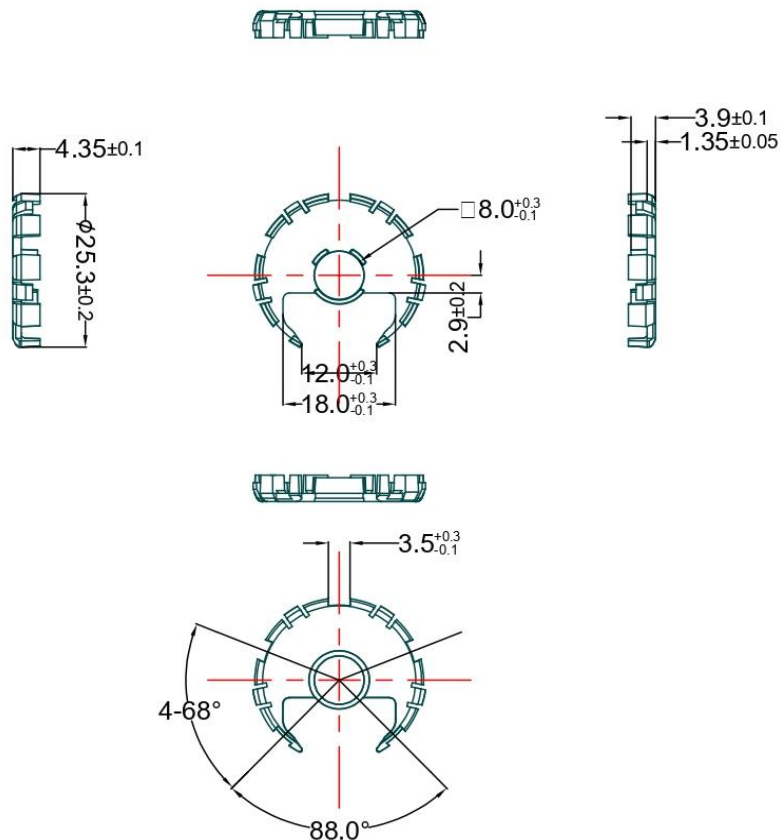
Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.05.25
01	Material Changed : Zn → PC	S.J Kwon	E.G Jung	2022.05.25

- MATERIAL INFORMATION

a. Material : PC

b. Thickness : 4.35 mm ± 0.1mm

c. Tolerance of dimensions not indicated is 0.1mm.



Part List

ERP Code	SPEC	Q'Ty

Stock Number

Data 2022. 05. 25.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

Bracket

Drawing Size

A4

Drawing Number

1

Of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

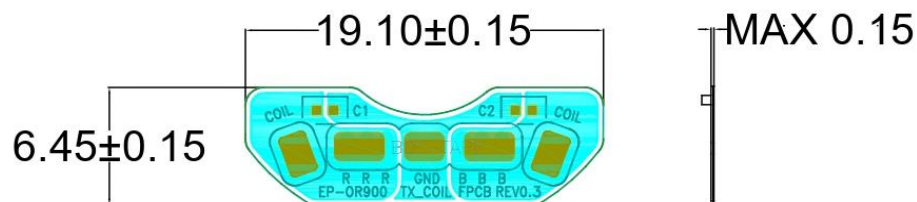
2. 8. 4 FPCB

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2021.12.20
01	Change PCB Material.(FR4 → FPCB)	S.J Kwon	E.G Jung	2022.01.19
02	PAD 사양 변경	S.J Kwon	E.G Jung	2022.03.11
03	R/B PAD 통합 변경	S.J Kwon	E.G Jung	2022.07.14

- MATERIAL INFORMATION

- a. MATERIAL : FPCB
- b. Revision : REV0.3
- c. THICKNESS : Max 0.15mmT(PCB Tape included.)
- d. Copper Thickness : 1.0 Oz
- e. PAD Plating : Gold(Au) Plating
- f. Silk Color : White
- g. Capacitor : 1.5nF, 50V, 10%, X7R, 1005(mm)



Part List

Data 2021. 12. 20.

WITS

ERP Code	SPEC	Q'Ty

Approved Department

Approver

Reviewer

Drafter

Department

Stock Number

Scale 3/1 Unit mm Weight

Drawing Name

FPCB

Drawing Size

A4

Drawing Number

1 of 1

Part Number : F03010042

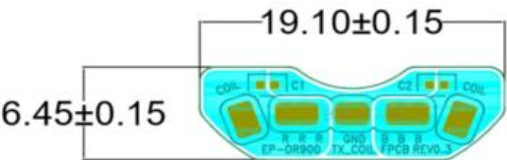
Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing
2. 8. 4 FPCB

EP-OR900 TX_COIL FPCB REV0.3

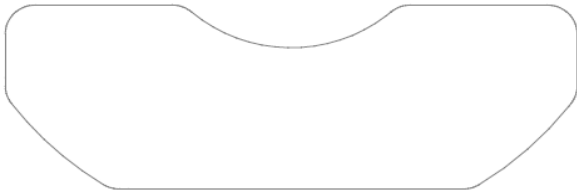
FPCB SPEC



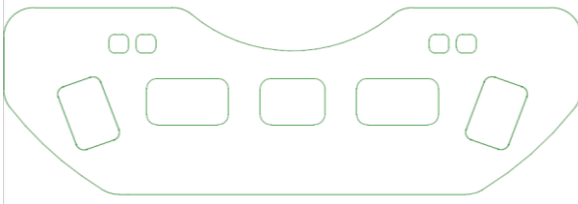
MAX 0.15

- MATERIAL INFORMATION**
- a. MATERIAL : FPCB
 - b. Revision : REV0.3
 - c. THICKNESS : Max 0.15mmT(PCB Tape included.)
 - d. Copper Thickness : 1.0 Oz
 - e. PAD Plating : Gold(Au) Plating
 - f. Silk Color : White
 - g. Capacitor : 1.5nF, 50V, 10%, X7R, 1005(mm)

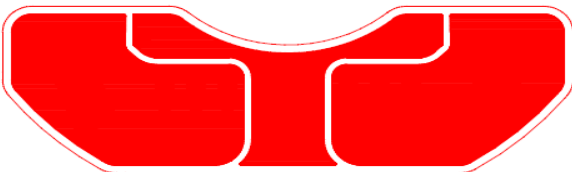
OUT



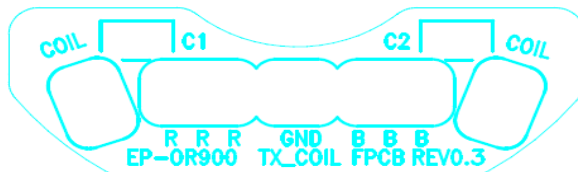
TOP-COV



TOP-PAT



TOP-SILK



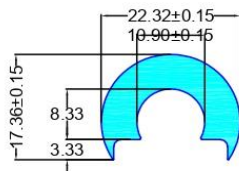
Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8. 5 Bracket Tape

CHANGED CONTENT				
Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.03.16

Thickness – After removing release liner measure the thickness of the tape.



Part List			Data 2022. 03. 16.			WITS	
ERP Code	SPEC	Q'Ty	Approved Department				
			Approver			Drawing Name Bracket Tape	
			Reviewer				
			Drafter				
			Department				
Stock Number			Scale 1/1	Unit mm	Weight	Drawing Size A4	Drawing Number 1 of 1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 6 Coil Tape

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.03.16

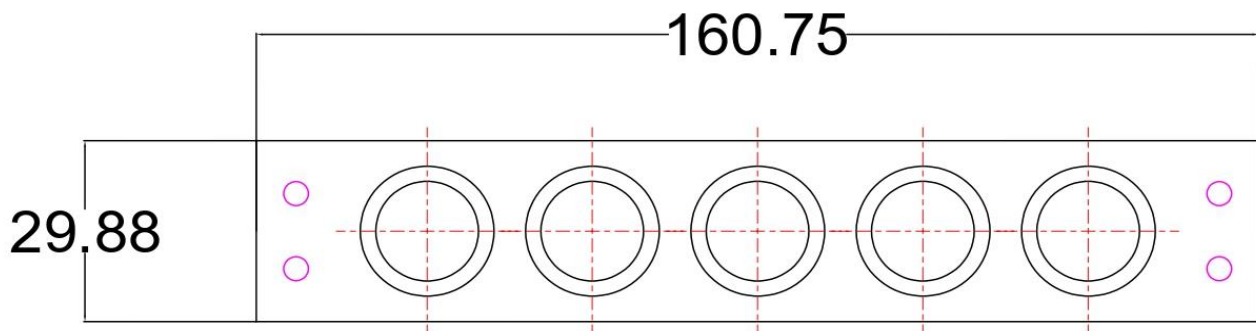
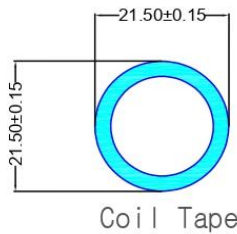
- MATERIAL INFORMATION

a. Material : KW-5100F

c. Thickness : 0.1 ± 0.01 mmT

d. Measurement Location : Size - Measure the width / length of the outer diameter.

Thickness - After removing release liner measure the thickness of the tape.



Part List

ERP Code	SPEC	Q'Ty

Stock Number

Data 2022. 03. 16.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

Coil Tape

Drawing Size

A4

Drawing Number

1

of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 7 Lower Tape

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.05.25

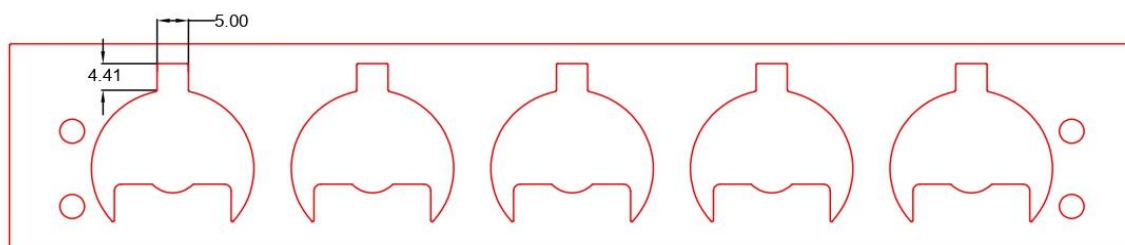
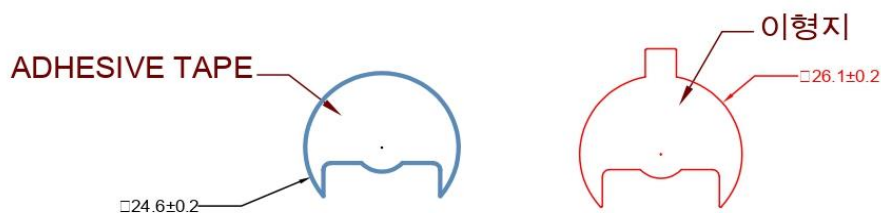
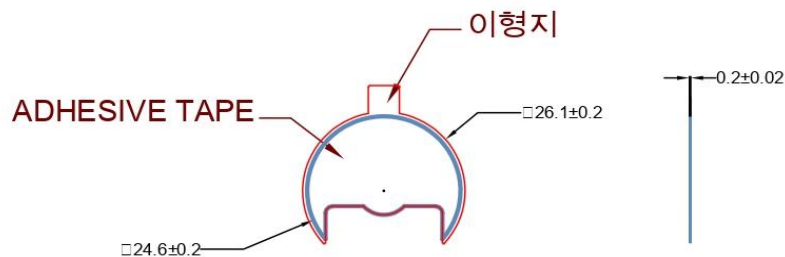
- MATERIAL INFORMATION

a. Material : 3M 93020LE

b. Thickness : $0.2 \pm 0.02 \text{mm}$

c. Measurement Location : Size - Measure the width / length of the outer diameter.

Thickness - After removing release liner measure the thickness of the tape.



Lower Tape 연배 사양

Part List

ERP Code	SPEC	Q'Ty

Stock Number

Data 2022. 05. 25.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

Tape Lower

Drawing Size

A4

Drawing Number

1

Of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

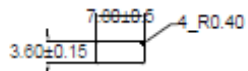
2. 8. 8 Magnet

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.01.19

- MATERIAL INFORMATION

a. Material : Nd-Fe-B(N52M)

b. Thickness : 3.6 ± 0.15 mmTc. Measurement Location : Size – Measure the width / length of the outer diameter.
Thickness – Measure of Magnet thickness.

Part List

ERP Code	SPCO	Q'ty
Stock Number		

Date 2022. 01. 19.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

MAGNET

Drawing Size

A4

Drawing Number

1

of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 9 Magnet Plate Tape

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.01.19

- MATERIAL INFORMATION

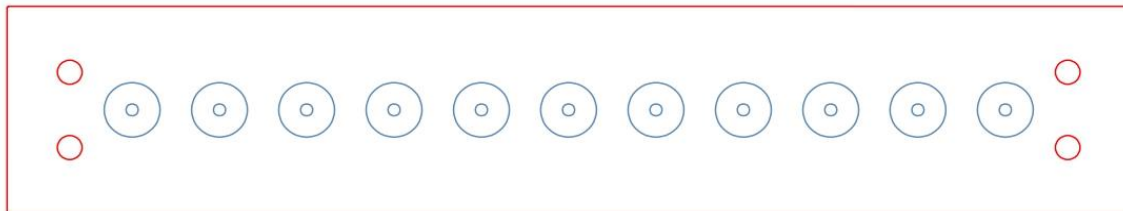
a. Material : AD100

b. Thickness : $0.1 \pm 0.01 \text{ mm}$

c. Measurement Location : Size - Measure the width / length of the outer diameter.

Thickness - After removing release liner measure the thickness of the tape.

ADHESIVE TAPE

 $\square 9.00 \pm 0.10$  $\square 2.00 \pm 0.10$ -0.10 ± 0.01 

Part List

ERP Code	SPEC	Q'Ty

Stock Number

Data 2022. 01. 19.

Approved Department

Approver

Reviewer

Drafter

Department

Scale 1/1

Unit mm

Weight

WITS

Drawing Name

Marnet Plate Tape

Drawing Size

A4

Drawing Number

1

of

1

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 10 Magnet Plate

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.01.19

- MATERIAL INFORMATION

a. Material : SPCC

b. Thickness : $0.5 \pm 0.05 \text{ mm}$ c. Measurement Location : Size – Measure the width / length of the outer diameter.
Thickness – Measure of Magnet plate thickness.

Part List

Data 2022. 01. 19.

WITS

ERP Code	SPEC	Q'Ty

Approved Department	
Approver	
Reviewer	
Drafter	
Department	

Drawing Name

Magnet Plate

Drawing Size

A4

Drawing Number

1 of 1

Stock Number

Scale 1/1 Unit mm Weight

Part Number : F03010042

Application Model : EP-OR900(하옴向) Watch5 Coil Ass'y



2. 8 Detail drawing

2. 8. 11 Ferrite PI Tape

CHANGED CONTENT

Rev	Content	Drafted	Approved	Date.
00	INITIAL RELEASE	S.J Kwon	E.G Jung	2022.10.04

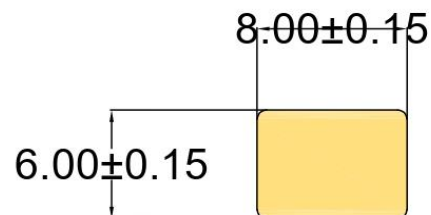
- MATERIAL INFORMATION

a. Material : HM PI-TYPE

c. Thickness : $0.05 \pm 0.005 \text{ mm}$

d. Measurement Location : Size – Measure the width / length of the outer diameter.

Thickness – After removing release liner measure the thickness of the tape.



Part List

Data 2022. 10. 04.

WITS

ERP Code	SPEC	Q'Ty

Approved Department

Approver

Reviewer

Drafter

Department

Drawing Name

Ferrite PI Tape

Drawing Size

A4

Drawing Number

1

of

1

Stock Number

Scale 1/1

Unit mm

Weight