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东莞市优比电子有限公司
Dongguan Youbi Electronics Co.,Ltd

承　认　书

APPROVAL　SHEET

客 户 名 称　　熵基科技股份有限公司

CUSTOMER NAME:　　ZKTECO CO.,LTD

产 品 名 称

PRODUCT　NAME:　2.4G FPC　L=120mm

客 户 料 号

CUSTOMER　P/N:

优比电子料号

Youbi　P/N:　UB01C120F2D2331A　REV: A

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
CHECKED BY:	Yongxin.Liu	
APPROVED BY:	Changxing.Liu	
DATE:	2021/09/25	

东莞市优比电子有限公司 工程专用章

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Modification History

Version	Content Revision	Issued by	Date
A	Original version	Yongxin.Lu	2021-09-25

Content

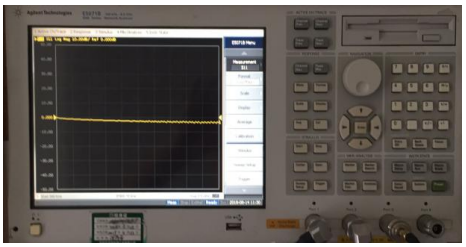
ltem ***Description***

1. Electrical Specification:

Characteristics	Specifications	Unit
Outline Dimensions	28.4x29,L120	mm
Frequency	2400-2500	MHz
Impedance	50	Ω
VSWR	≤2.0	dB
Polarization	Linear Polarization	
Gain	2.5±0.5	dBi
Efficiency	>40	%
Connector Type	1.13 MHF-1-Plug	
Operating temperature	-20℃~+65℃	
Storage Temp	-20℃~+50℃	

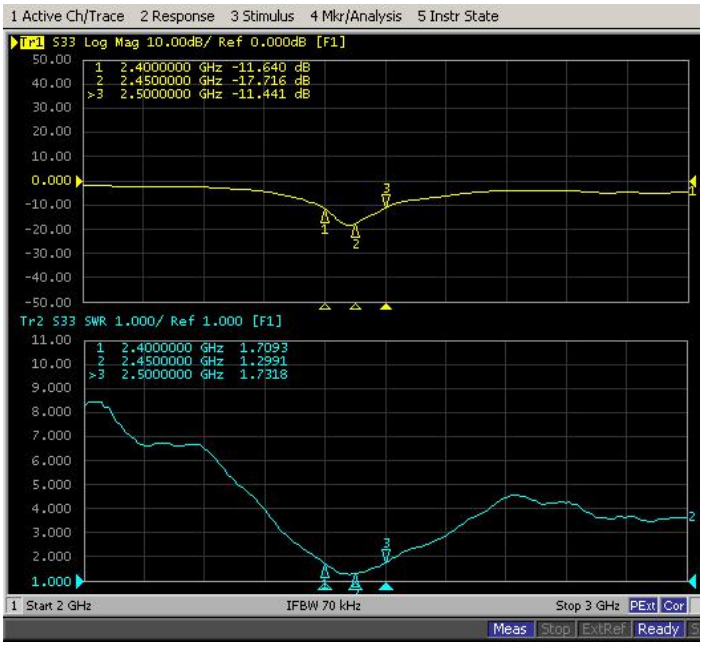
2.Test Items and Equipment

	Test items	Test equipment
S Parameter	1.Return Loss 2.VSWR	Network analyzer (Agilent E5071B)
The whole machine of Passive parameters	1.Frequency 2.Gain 3.Radiation Pattern	1.3D microwave darkroom (5m*5m*5m) 2.Network analyzer (Agilent E5071B)
The whole machine of Active parameters	1.TRP 2.TIS	1.3D microwave darkroom (5m*5m*5m) 2.Comprehensive test instrument (CMW500)


3. S Parameter

Frequency (MHz)	Retuen Loss(dB)	VSWR
2400	-11.64	1.70
2450	-17.71	1.29
2500	-11.44	1.73



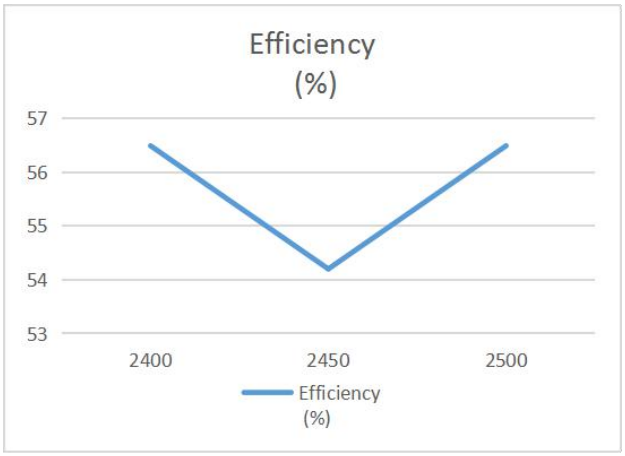
* Voltage Standing Wave Ratio(VSWR)

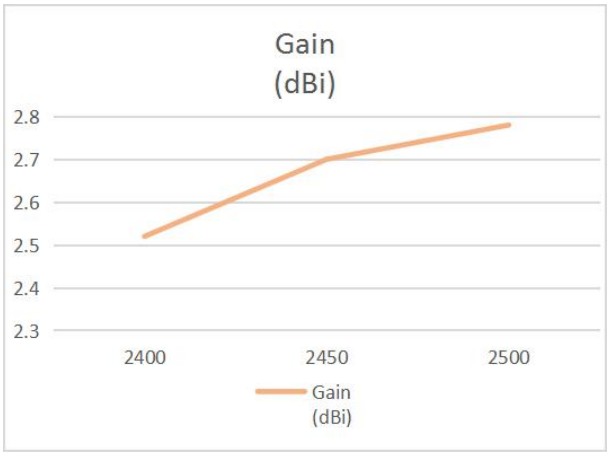
Return Loss(RL)

RL=20*log10[(VSWR+1)/(VSWR-1)

4. Efficiency and Gain

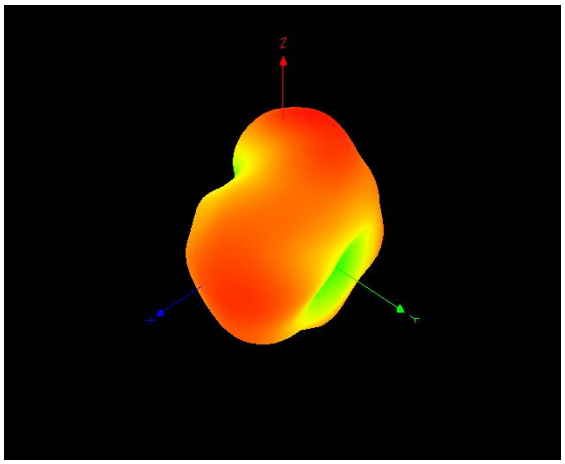
Frequency (MHz)	2400	2450	2500
Efficiency (%)	56.49	54.2	56.49
Gain (dBi)	2.52	2.7	2.78



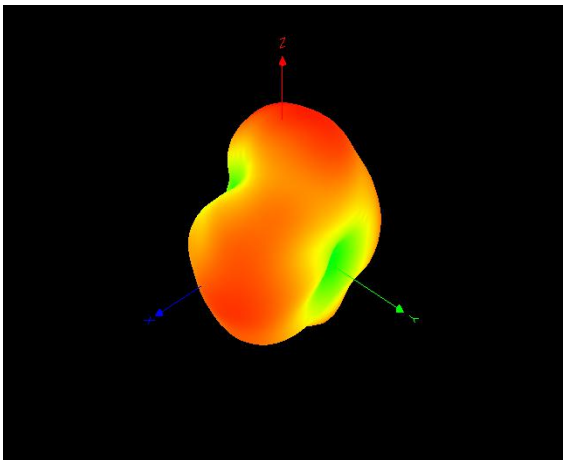


5. Radiation Pattern

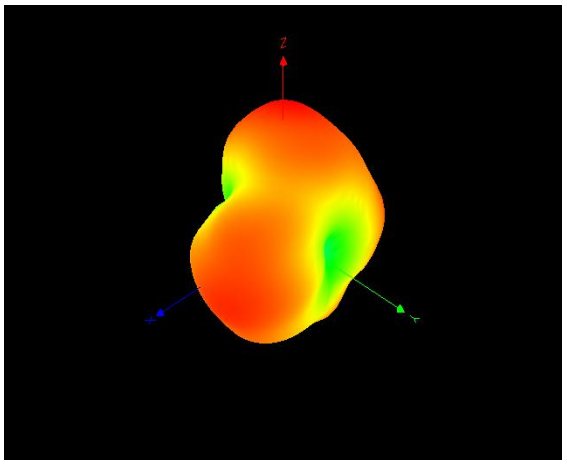
5-1 Antenna 3D Radiation Pattern



700MHz

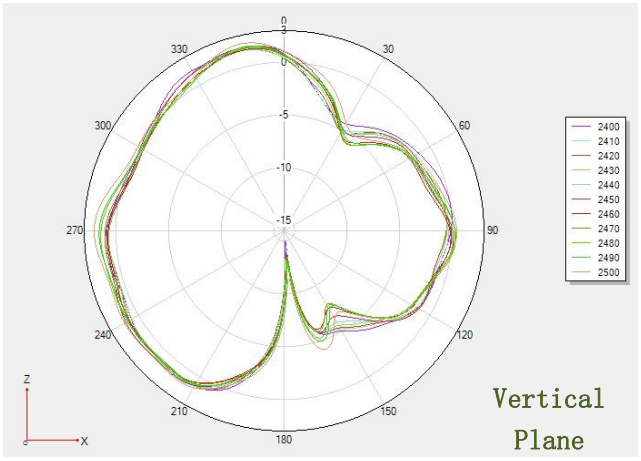


800MHZ

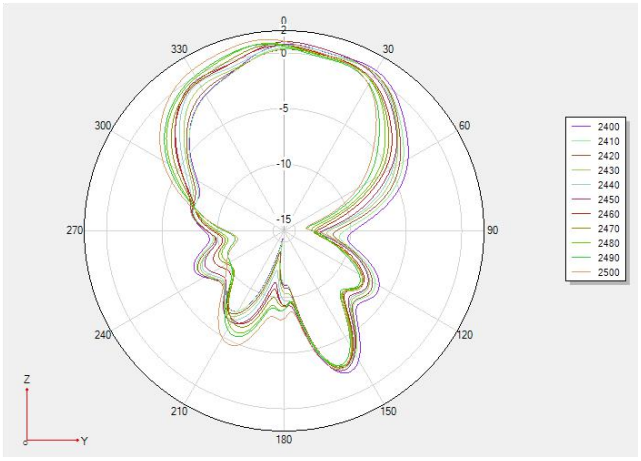


960MHZ

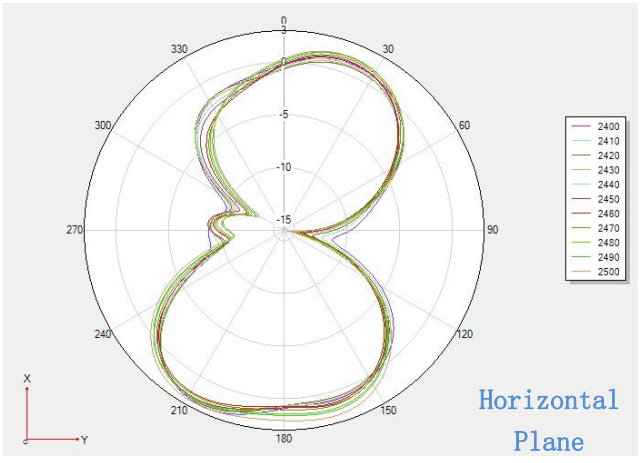
5-2 Antenna 2D Radiation Pattern



Phi 0 2D



Phi 90 2D



Theta 90 2D

6.Active test data

Antenna complete machine test

Item	Measurement	Azimuths	Elevations	Standard	Band	Channel	Frequency	Total
1	TRP	Every30	Every30	WIFI (AP)	WIFI_B (11M)	1	2412	14.02
2	TRP	Every30	Every30	WIFI (AP)	WIFI_B (11M)	6	2437	13.61
3	TRP	Every30	Every30	WIFI (AP)	WIFI_B (11M)	11	2462	13.29
4	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_B (11M)	1	2412	85.23
5	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_B (11M)	6	2437	85.72
6	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_B (11M)	11	2462	85.6
7	TRP	Every30	Every30	WIFI (AP)	WIFI_G (54M)	1	2412	12.74
8	TRP	Every30	Every30	WIFI (AP)	WIFI_G (54M)	6	2437	13.38
9	TRP	Every30	Every30	WIFI (AP)	WIFI_G (54M)	11	2462	13.2
10	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_G (54M)	1	2412	71.4
11	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_G (54M)	6	2437	72.32
12	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_G (54M)	11	2462	72.44
13	TRP	Every30	Every30	WIFI (AP)	WIFI_N_ISM (65M)	1	2412	13.75
14	TRP	Every30	Every30	WIFI (AP)	WIFI_N_ISM (65M)	6	2437	13.28
15	TRP	Every30	Every30	WIFI (AP)	WIFI_N_ISM (65M)	11	2462	13.01
16	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_N_ISM (65M)	1	2412	68.08
17	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_N_ISM (65M)	6	2437	68.11
18	TIS(EIRP)	Every30	Every30	WIFI (AP)	WIFI_N_ISM (65M)	11	2462	68.13

7. Antenna installation diagram:

8. Mechanical Specification: