

## SPECIFICATION

Part No. : **FXP70.07.0053A**

Product Name : FXP70 Freedom 2.4GHz  
Multi Standard Antenna

Feature : Low profile antenna  
High performance magnetic field antenna  
RoHS Compliant



## 1. Overview

The FXP70 Freedom 2.4GHz Antenna works on WiFi, ZigBee, Bluetooth and ISM band at 2.4GHz. This antenna has been designed as a general solution to cover the current market applications, with easy installation through a cable connection. The antenna has been designed to work on different plastics material and thickness. We have selected a piece of ABS plastic with 1.5 mm of thickness as a baseline for testing.

Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free-space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance.

Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas' peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2dBi in free-space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be

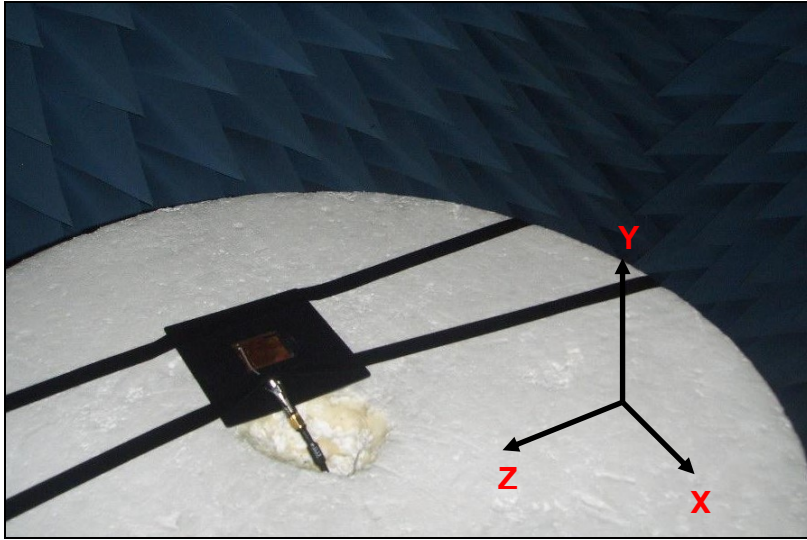
absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

## 2. Antenna Characteristics

Parameter	Multi-Standard			
Communication System	Bluetooth	WiFi	ZigBee	2.4GHz ISM
	2401-2480	2412-2462	2410-2480	2400-2483.5
Efficiency (%)	80%			
Gain	5dBi			
Free Space Peak Gain	1.5dBi			
Return Loss	- 20dB			
Impedance	50 Ohms			
VSWR	≤1.5:1			
Polarization	Linear			
Power Handled	5 W			
Operation Temperature	-40 °C ~ +85 °C			
Storage Temperature	-40 °C ~ +85 °C			
Dimensions	27 X 25 X 0.08 mm			
Weight	1.2 g			
Connector	MHFI (U.FL Compatible)			
Cable Standard	Mini-Coax 1.13 mm			
Cable Length and color	53 mm, Black			
RoHS Compliant	Yes			
Adhesive	3M 467			

### 3. TEST SET UP

A Satimo SG24 3D Scan System with Anechoic Chamber.



**Figure 1.** Satimo System.

Agilent 8753ES Vector Network Analyzer.

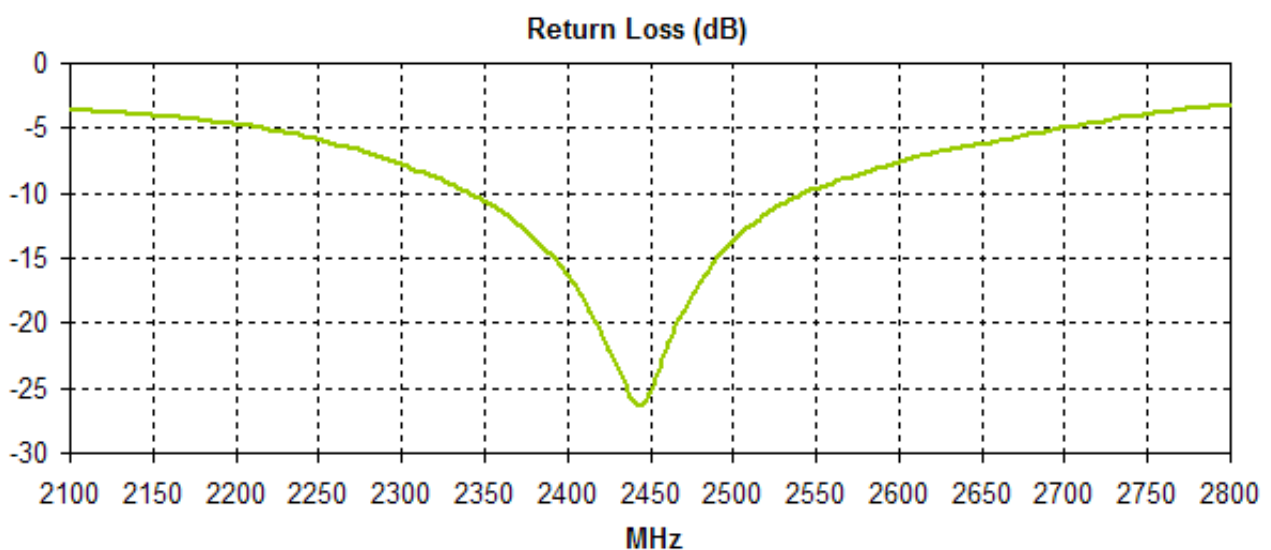


**Figure 2.** Network Analyzer.

## 4. ANTENNA PARAMETERS

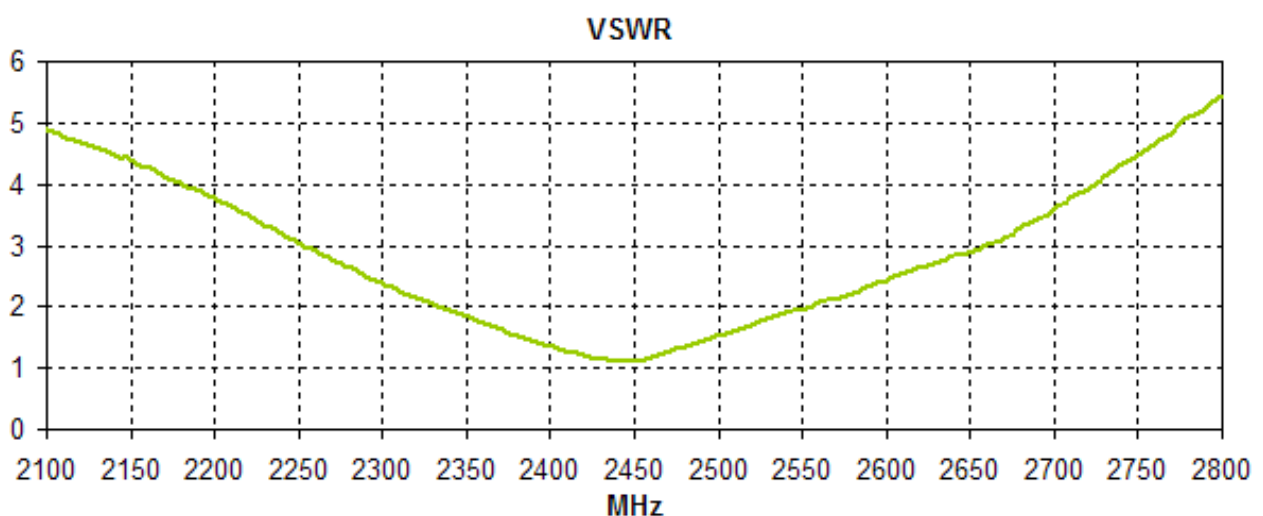
The next antenna parameter graphs like Return Loss, Smith Chart and VSWR were measured in the Agilent 8753ES Vector Network Analyzer. The Gain, Efficiency and Radiation Patterns were measured in the reliable Satimo 3D Scan System.

### 4.1 Return Loss Data



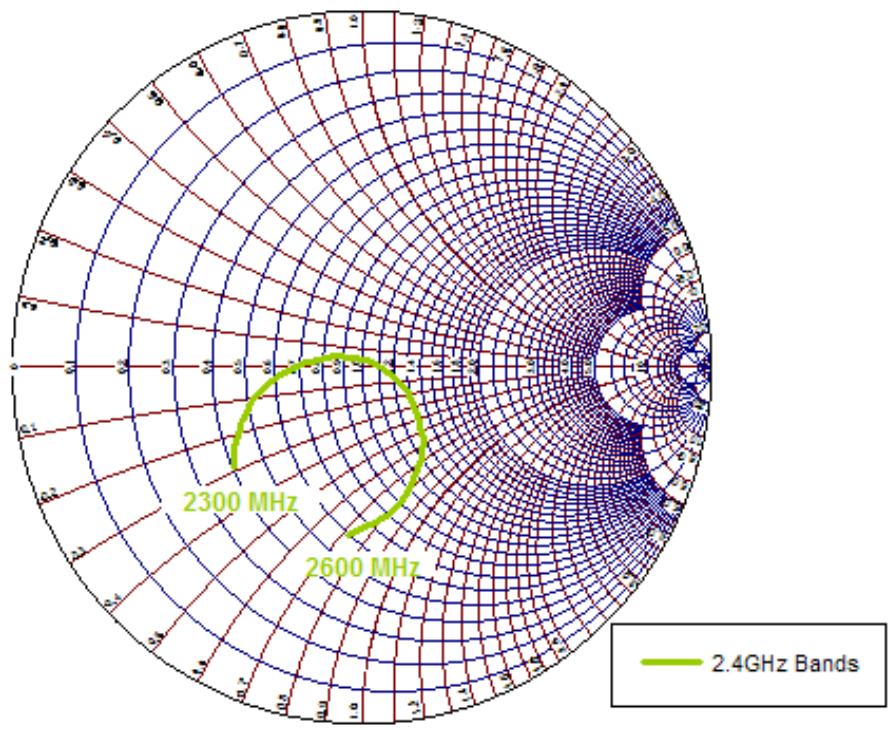
**Figure 3.** Return Loss for the FXP70 Antenna.

### 4.2 VSWR Data



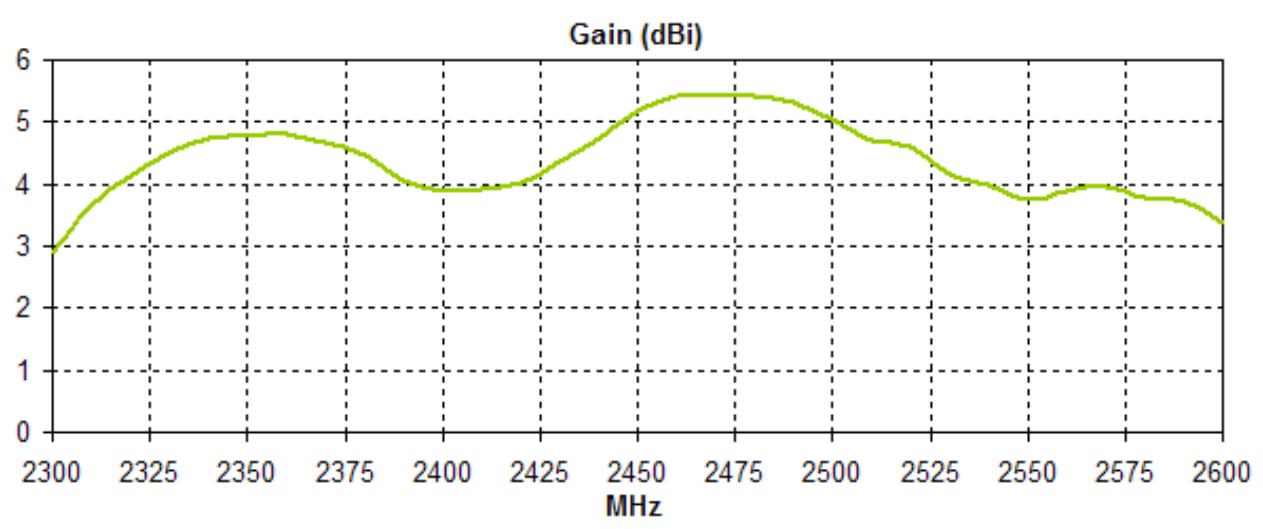
**Figure 4.** VSWR for the FXP70 Antenna.

### 4.3 Smith Chart Data



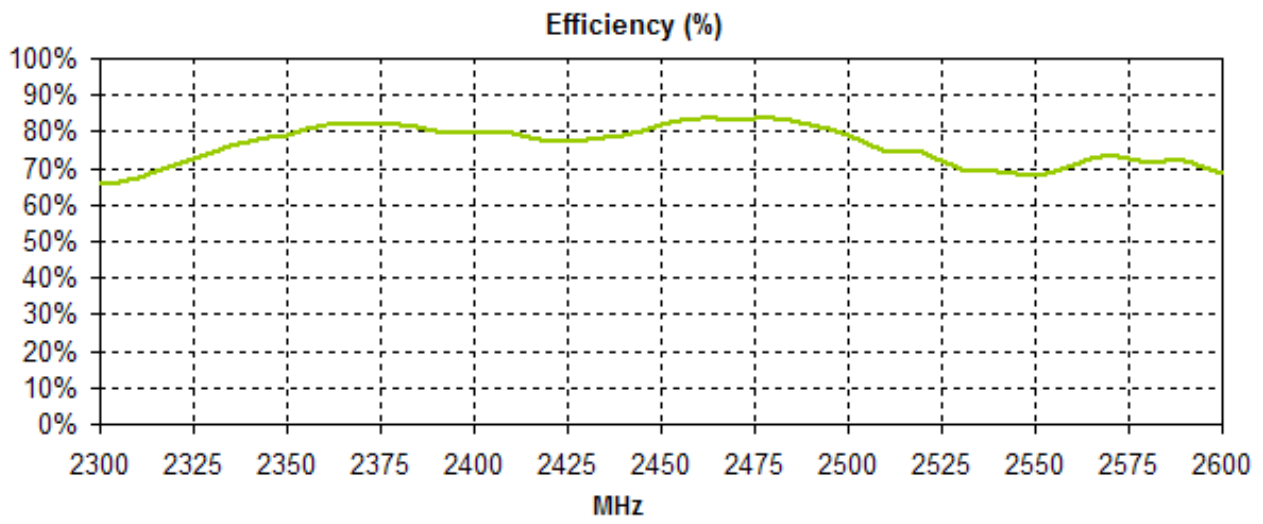
**Figure 5.** Smith Chart for the FXP70 Antenna.

### 4.4 Gain Data



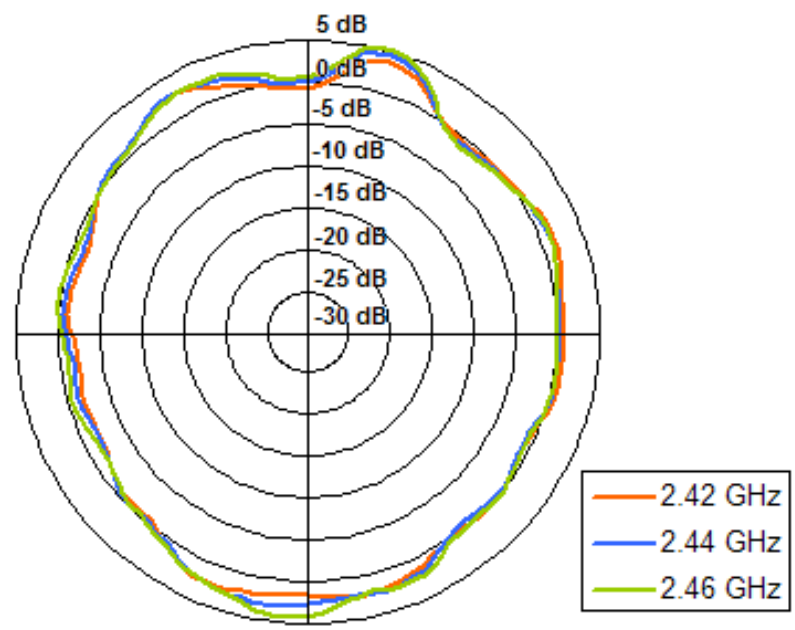
**Figure 6.** Gain for the FXP70 Antenna.

### 4.5 Efficiency Data

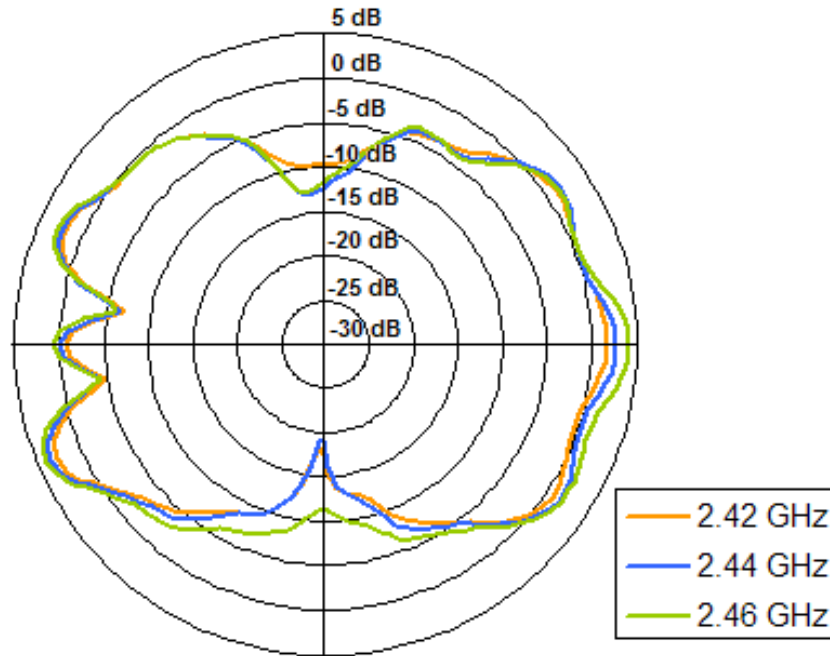


**Figure 7.** Efficiency for the FXP70 Antenna.

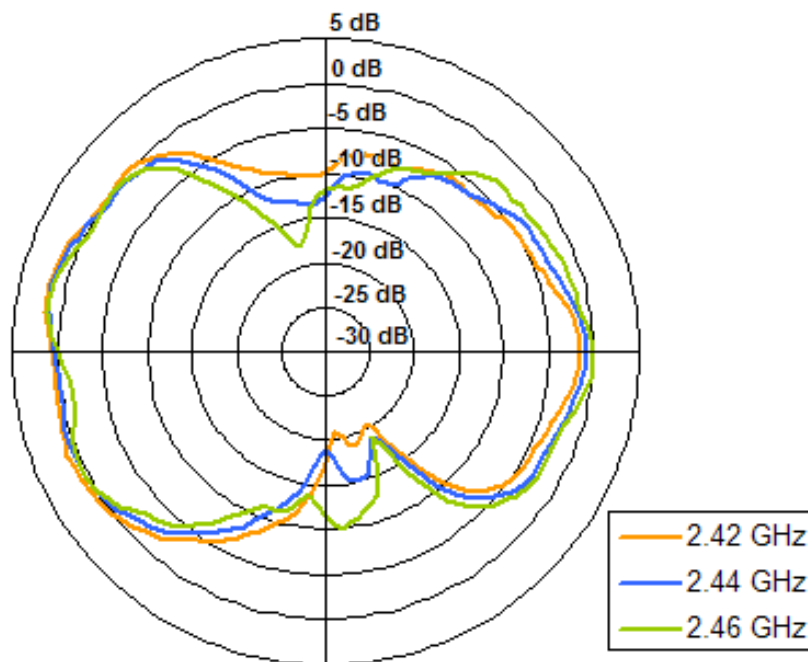
### 4.6. Radiation Pattern Data.



**Figure 8.** Radiation pattern XZ Plane, Figure 1 as reference (dB).



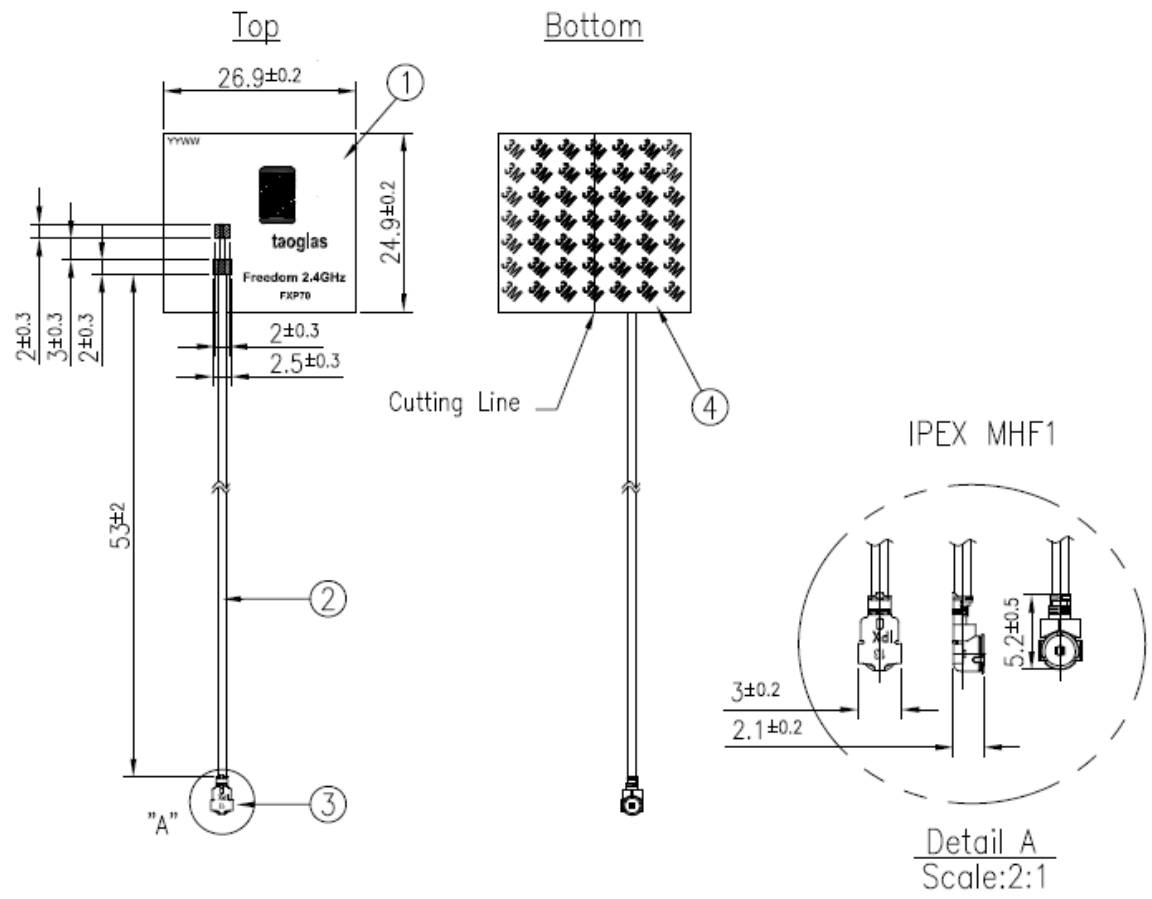
**Figure 9.** Radiation pattern YZ Plane, Figure 1 as reference (dB).



**Figure 10.** Radiation pattern XY plane, Figure 1 as reference (dB).



## 5. MECHANICAL DRAWING

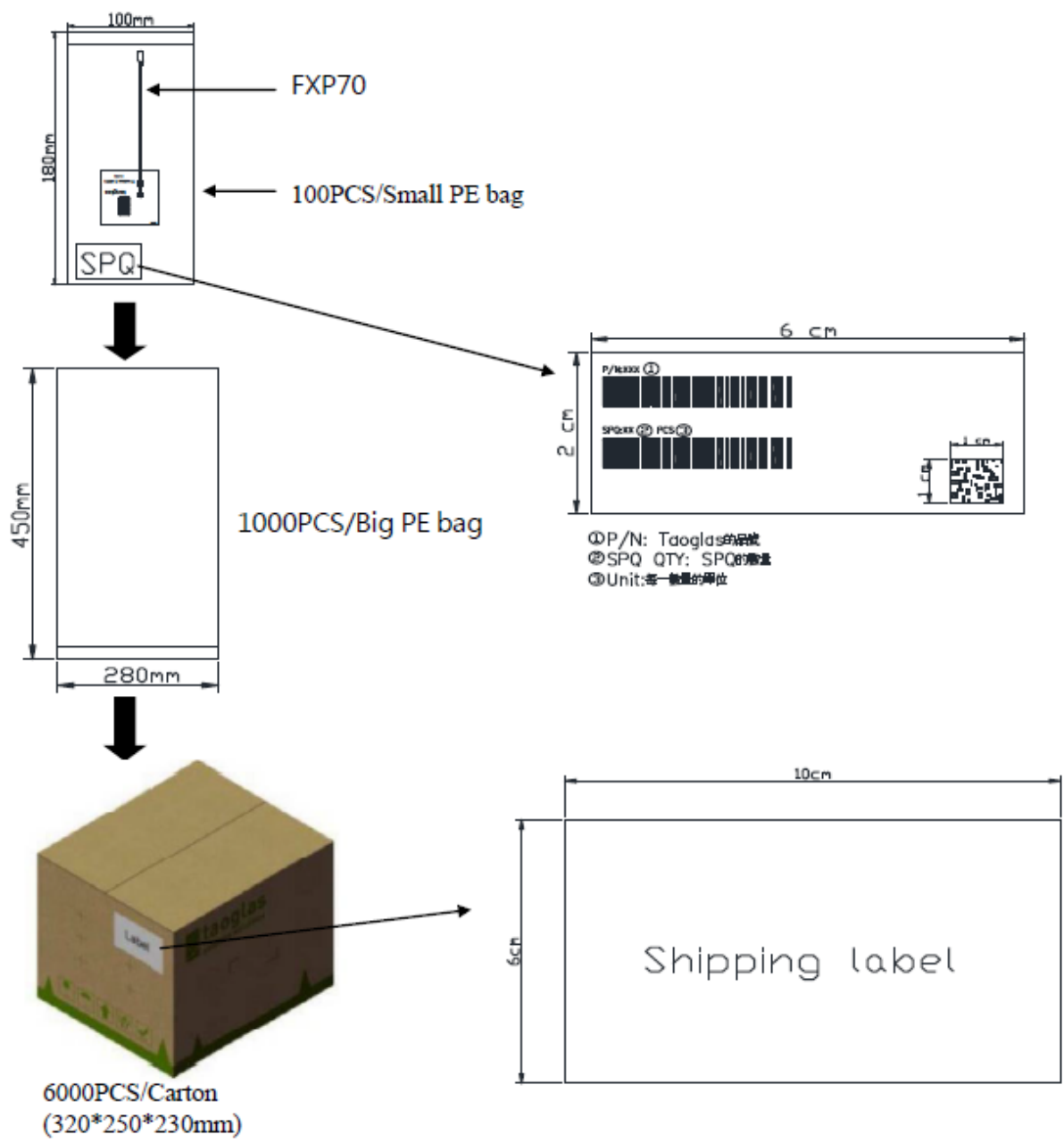


**NOTES:**

1. No dregs or insufficient soldering. Solder thickness 0.3~1.7mm
2. The solder must be smooth and full to the edges of the pad.  
The solder must not extend outside of the pad area.
3. The connector position has special orientation to the PCB as per drawing.
4. All material must be RoHS compliant.
5. Open/short QC, VSWR required.
6. Soldered area.

	Name	P/N	Material	Finish	QTY
1	FXP70 PCB	100111C020024A	Polymer 0.24t	Black	1
2	1.13 Coaxial Cable	300215C020000A	FEP	Black	1
3	IPEX MHF1	204111G000013A	Brass	Au Plated	1
4	Double-Sided Adhesive	100111C020024A	3M 467	Brown Liner	1

## 6. Packaging



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