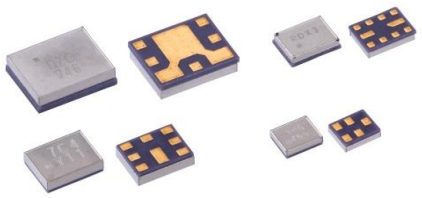
TAIYO YUDEN

Datasheet



SAW Duplexer

Application : Band5 / BC0 Duplexer

P/N : FSDCSQ8T881MK2E4
D5DA881M5K2E4

Version : 3.6

Date : February 9th, 2022

Features

- Size : 1.8 mm x 1.4 mm
- High Power Durability (+30.0 dBm)

Pb-free
* Pb Free Part

RoHS H/F G MSL1

TAIYO YUDEN CO., LTD.

Customer Name	Standard	TAIYO YUDEN Mobile Technology Co., Ltd.	
System	Band5 / BC0 Duplexer	Date	Feb. 09, 2022
Part Number	FSDCSQ8T881MK2E4 / D5DA881M5K2E4	Version 3.6	Final

History

Version No.	Date	Description
3.6	Feb. 09, 2022	Datasheet Format Revised
		Changed to New P/N

1. Absolute Maximum Ratings

Table-1

Item	Symbol	Ratings	Unit	Remarks
Operating Temperature Range	Ta	-30 to +85	℃	
Device Storage Temperature	Tstg1	-40 to +100	℃	
Carrier Tape Storage Temperature Range	Tstg2	-5 to +40	℃	Shelter from the Direct Sunlight
Maximum Input Power	Pin	29.0	dBm	824 - 849 MHz Continuous Wave Ta = +50 ℃ Ant, Rx Port : Loaded at 50 Ω Input Time : 50000 hmax.
		29.0	dBm	824 - 849 MHz LTE 5MHz 1RB Ta = +50 ℃ Ant, Rx Port : Loaded at 50 Ω Input Time : 50000 hmax.
		30.0	dBm	824 - 849 MHz Continuous Wave Ta = +50 ℃ Ant, Rx Port : Loaded at 50 Ω Input Time : 5000 hmax.
		30.0	dBm	24 - 849 MHz LTE 5MHz 1RB Ta = +50 ℃ Ant, Rx Port : Loaded at 50 Ω Input Time : 5000 hmax.
Maximum DC Voltage	-	+/-5	V	Device Only

2. Evaluation Circuit

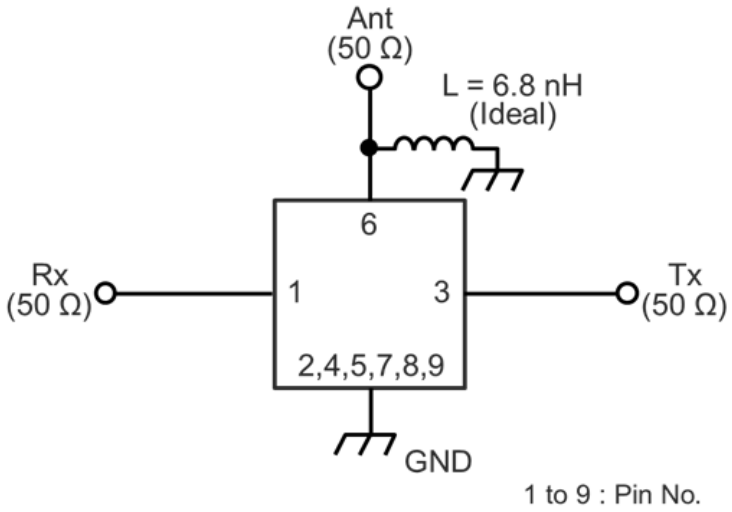


Figure-1

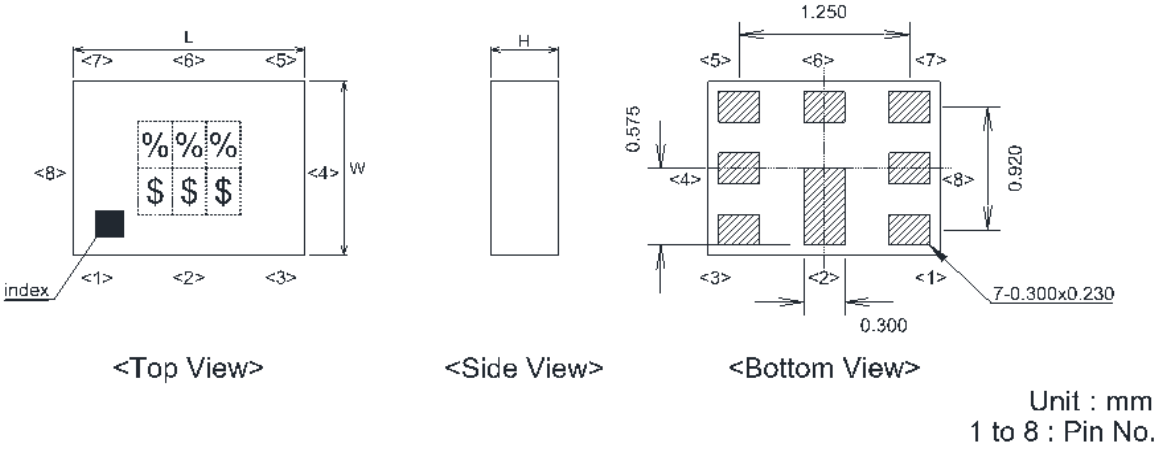
3. Electrical Specification

Table-2

Item			Condition (MHz)	Specification			Unit	Remarks
				Min.	Typ.	Max.		
Tx to Ant	Insertion Loss		824 - 849	-	1.4	1.9	dB	
	Ripple		824 - 849	-	0.3	1.2	dB	
	VSWR	Tx	824 - 849	-	1.9	2.2	-	
		Ant	824 - 849	-	1.6	2.0	-	
	Absolute Attenuation		DC - 750	25	40	-	dB	
			779 - 804	30	45	-	dB	
			860 - 870	3	7	-	dB	
			869 - 894	52	58	-	dB	
			1574 - 1577	40	51	-	dB	
			1648 - 1698	40	53	-	dB	
			2400 - 2494	35	45	-	dB	
			2494 - 2547	30	43	-	dB	
Ant to Rx	Insertion Loss		869 - 894	-	1.7	2.3	dB	
	Ripple		869 - 894	-	0.4	1.3	dB	
	VSWR	Ant	869 - 894	-	1.7	2.0	-	
		Rx	869 - 894	-	1.7	2.0	-	
	Absolute Attenuation		779 - 804	50	57	-	dB	
			824 - 849	50	60	-	dB	
Tx to Rx	Isolation		824 - 849	55	58	-	dB	
			869 - 894	54	59	-	dB	
Terminating Impedance			Tx port	50			Ω	
			Rx port	50			Ω	
			Ant port	50//6.8nH			Ω	
DC impedance to ground				100			MΩ	Device only

*Typical Value at +25 +/- 2 ℃

4. Dimensions & Marking Information



<Top View> <Side View> <Bottom View>

Unit : mm
1 to 8 : Pin No.

Figure-2

%%% : 7E4 (Part Symbol)
$$$: Product Trace Code

L = 1.8 +0.0/-0.2 mm
W = 1.4 +0.0/-0.2 mm
H = 0.50 mm Max

Note) This Marking Information is not applied to products before production.

5. Pin Configuration

Table-3

Pin No.	Symbol	Function
1	Rx	Receiver
2	GND	Ground
3	Tx	Transmitter
4	GND	Ground
5	GND	Ground
6	Ant	Antenna
7	GND	Ground
8	GND	Ground

6. Recommended Foot Print Pattern

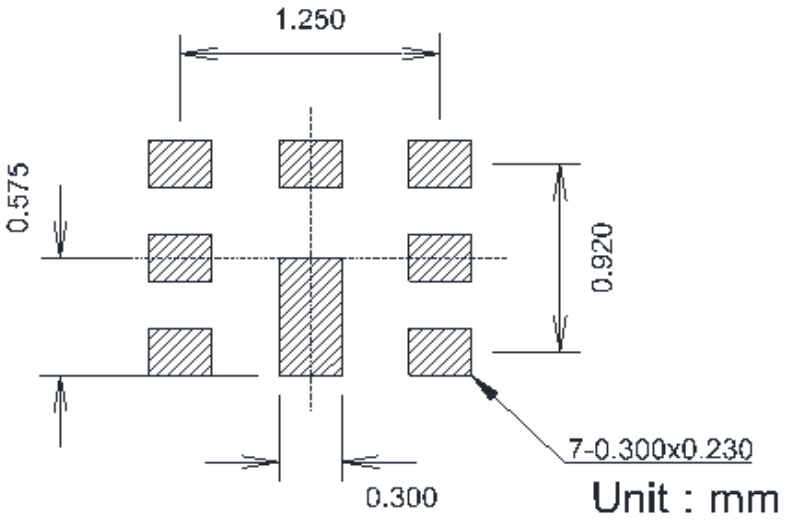


Figure-3

7. Electrical Characteristics

Tx to Ant

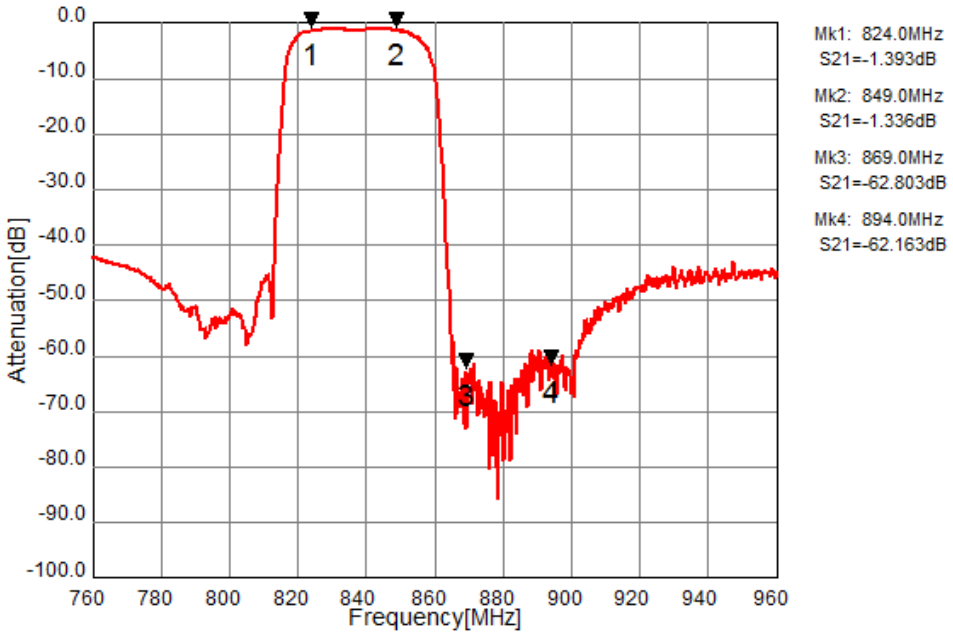


Figure-4-1

Ant to Rx

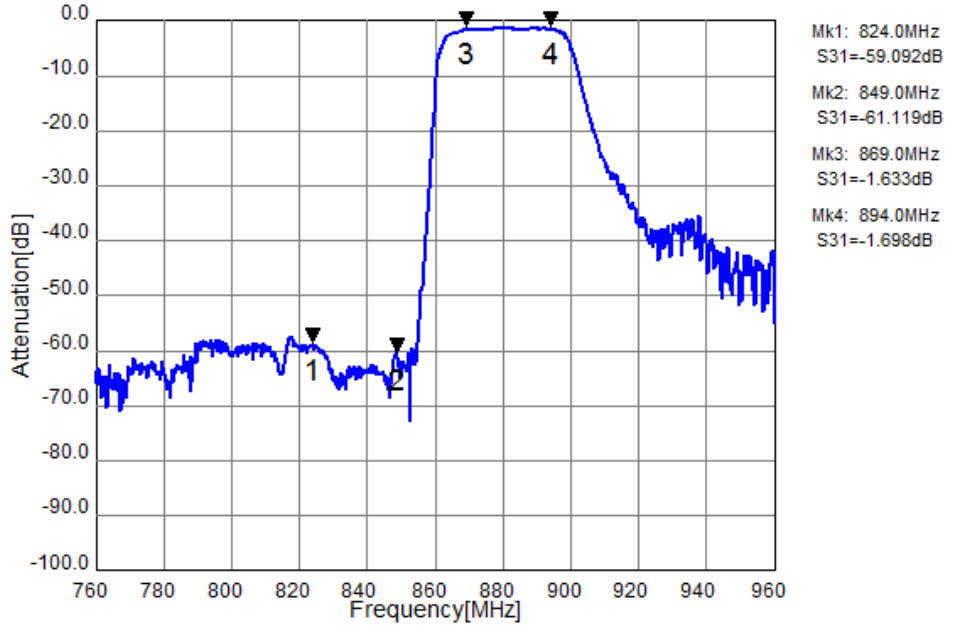


Figure-4-2

Tx to Ant, Ant to Rx

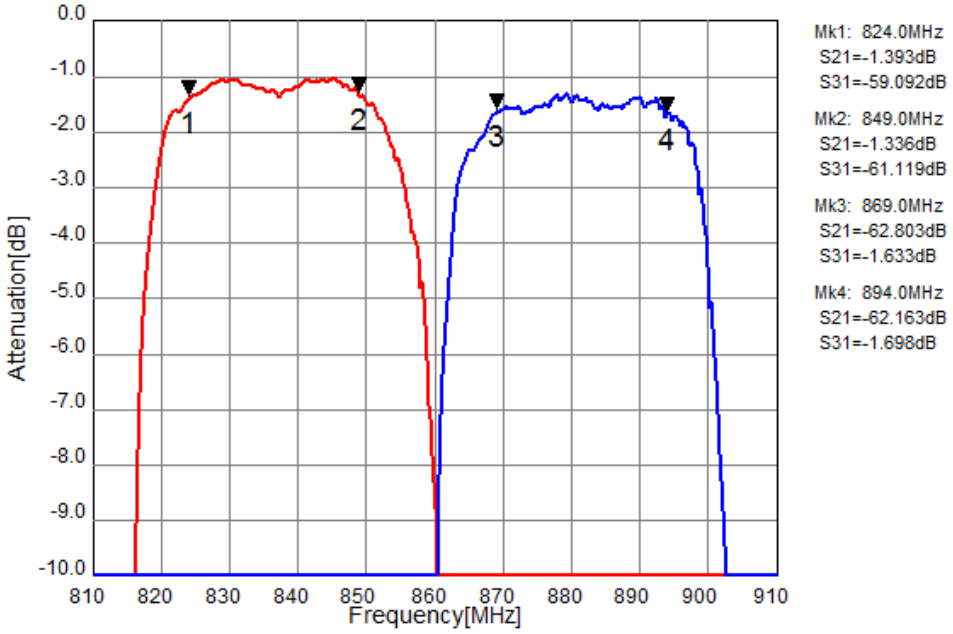


Figure-4-3

Tx to Rx Isolation

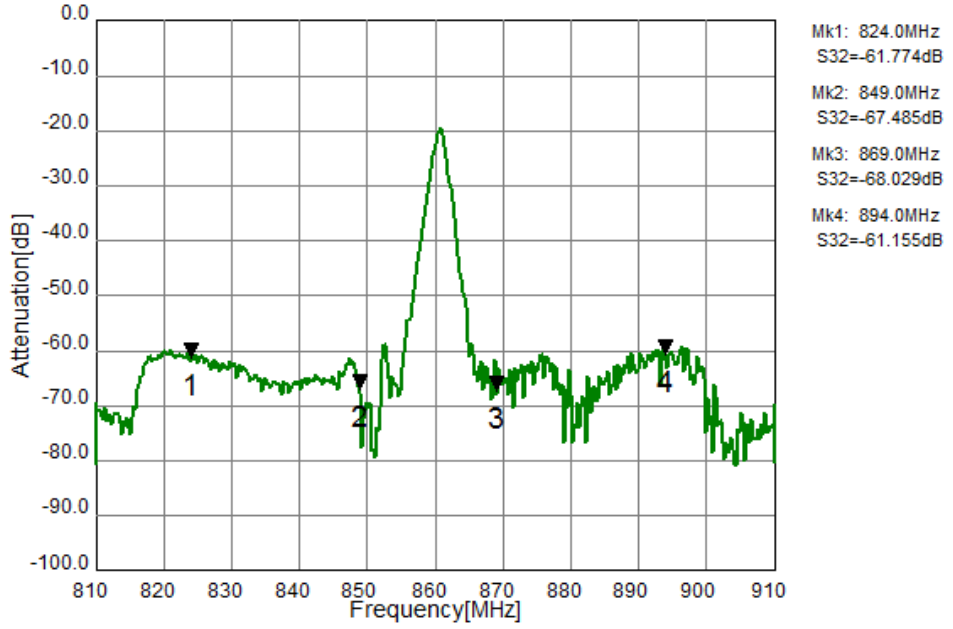


Figure-4-4

Tx Port

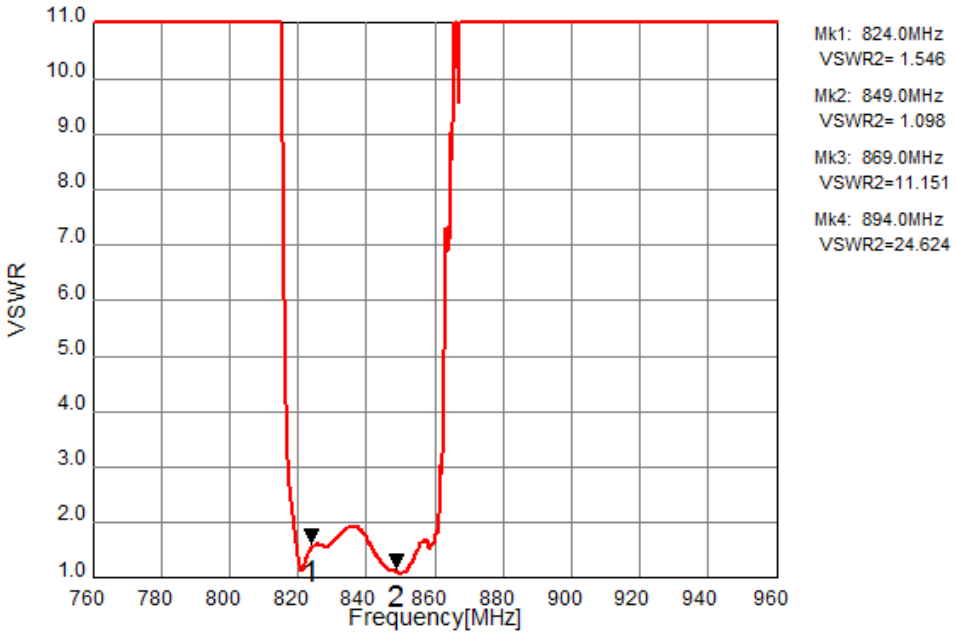


Figure-4-5

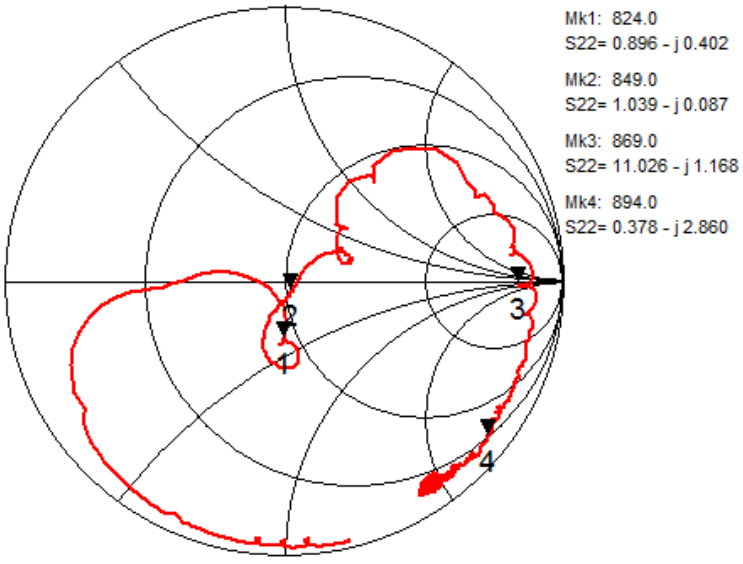


Figure-4-6

Rx Port

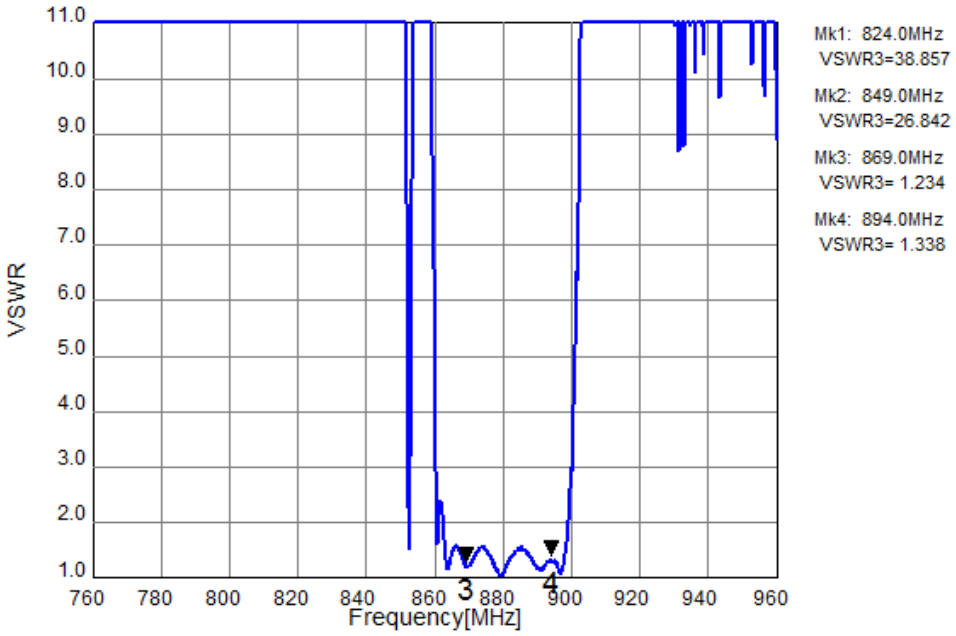


Figure-4-7

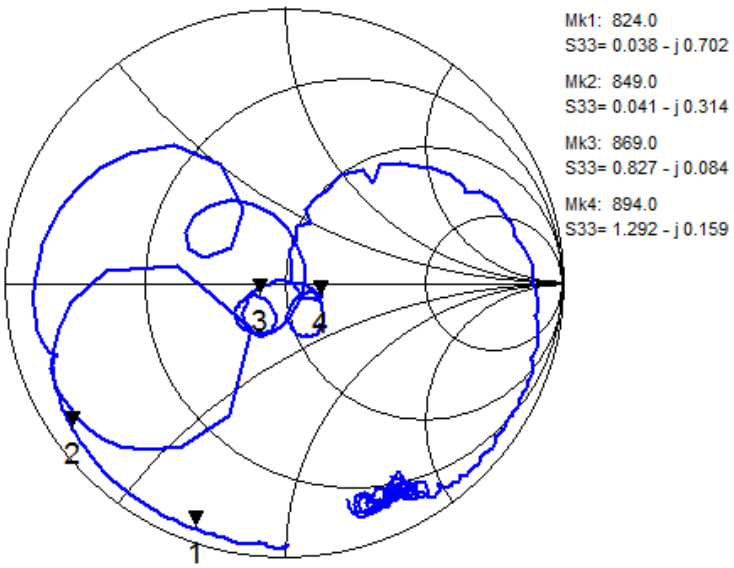


Figure-4-8

Ant Port

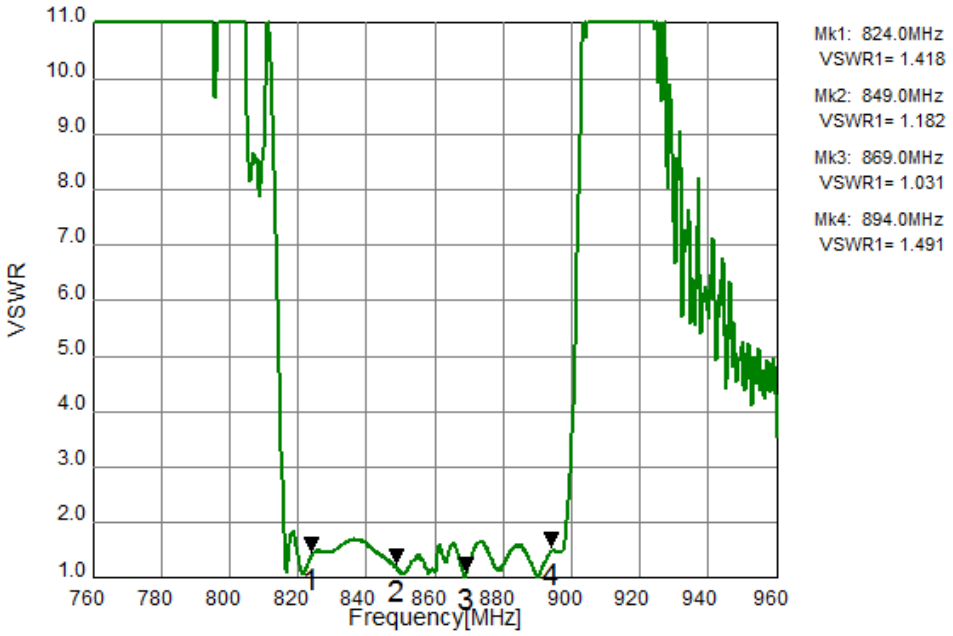


Figure-4-9

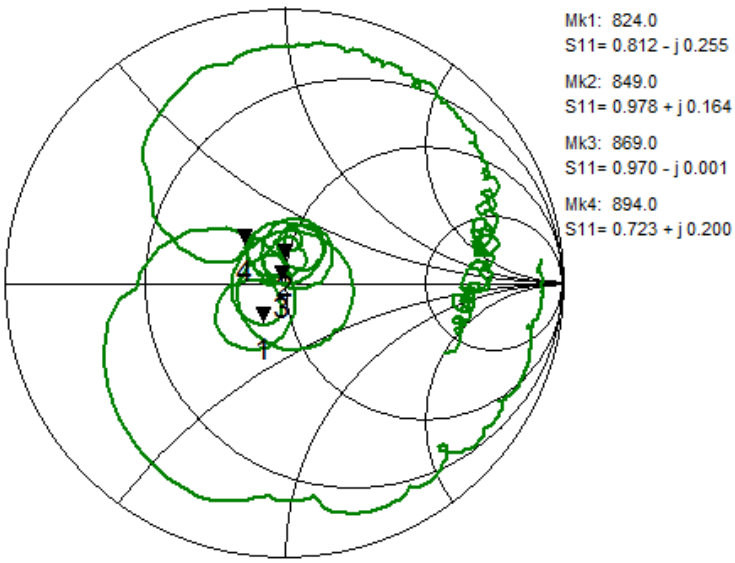


Figure-4-10

Tx to Ant(Wide span)

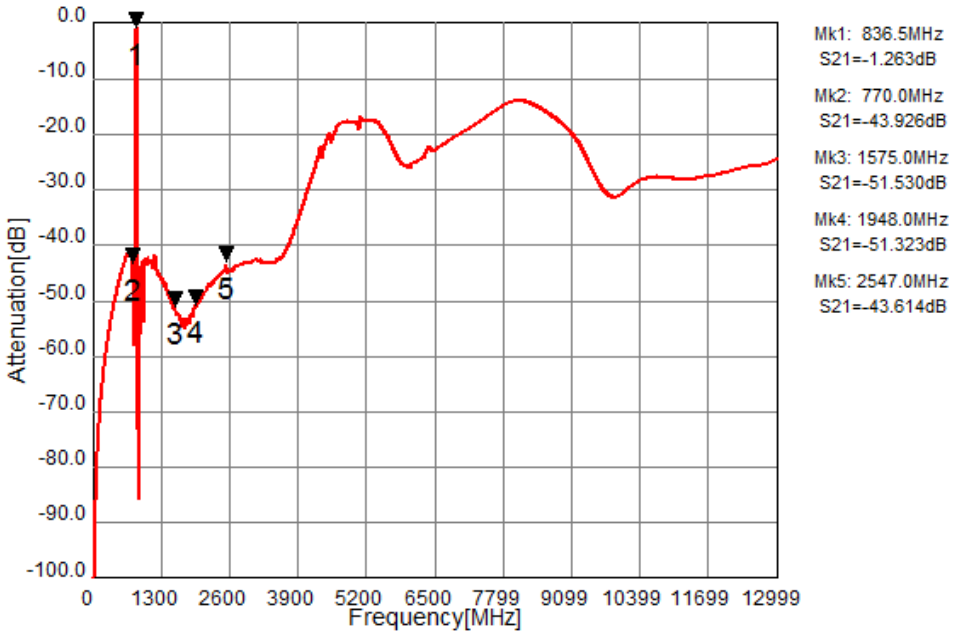


Figure-4-11

Ant to Rx(Wide span)

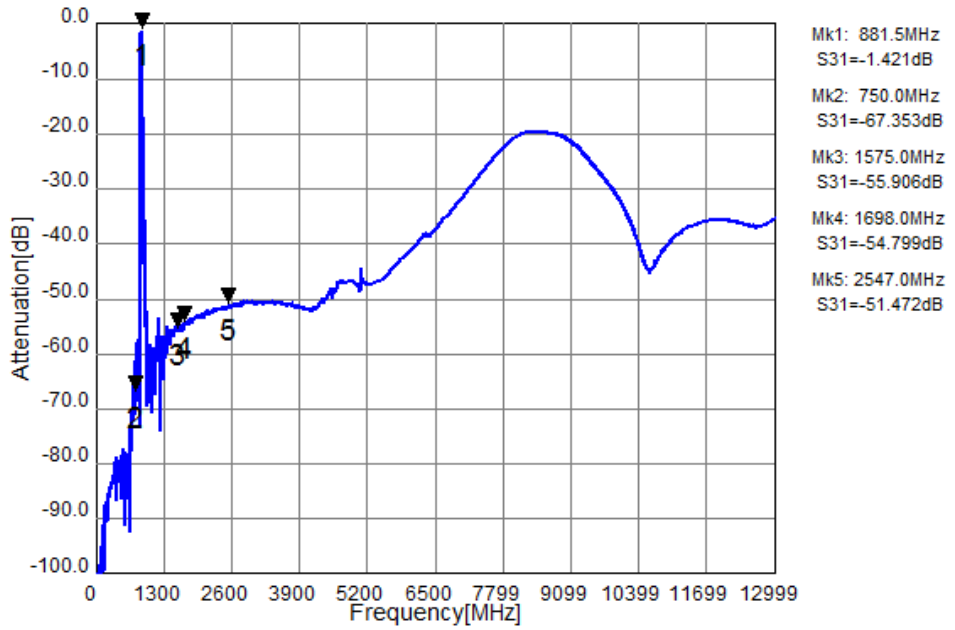


Figure-4-12

8. Ordering Code

Table-4

Standard Ordering Code	Packing	Reel Size	Status
FSDCSQ8T881MK2E4-AY	Tape & Reel	15,000 pcs.	MP
D5DA881M5K2E4-Y	Tape & Reel	15,000 pcs.	MP

Option Ordering Code	Packing	Reel Size	Status
FSDCSQ8T881MK2E4-AYA	Tape & Reel	less than 15,000 pcs.	MP
FSDCSQ8T881MK2E4-AZ	Tape & Reel	3,000 pcs.	MP
FSDCSQ8T881MK2E4-AZA	Tape & Reel	less than 3,000 pcs.	MP
FSDCSQ8T881MK2E4-AQ	Bulk	few pcs.	MP
D5DA881M5K2E4-YA	Tape & Reel	less than 15,000 pcs.	MP
D5DA881M5K2E4-Z	Tape & Reel	3,000 pcs.	MP
D5DA881M5K2E4-ZA	Tape & Reel	less than 3,000 pcs.	MP
D5DA881M5K2E4-Q	Bulk	few pcs.	MP

*Minimum order quantity (MOQ) is assigned for each inquiry, Please contact to Sales Representatives.

*MP : Mass Production

9. Tape and Reel Information

Dimensions of Tape (Standard)

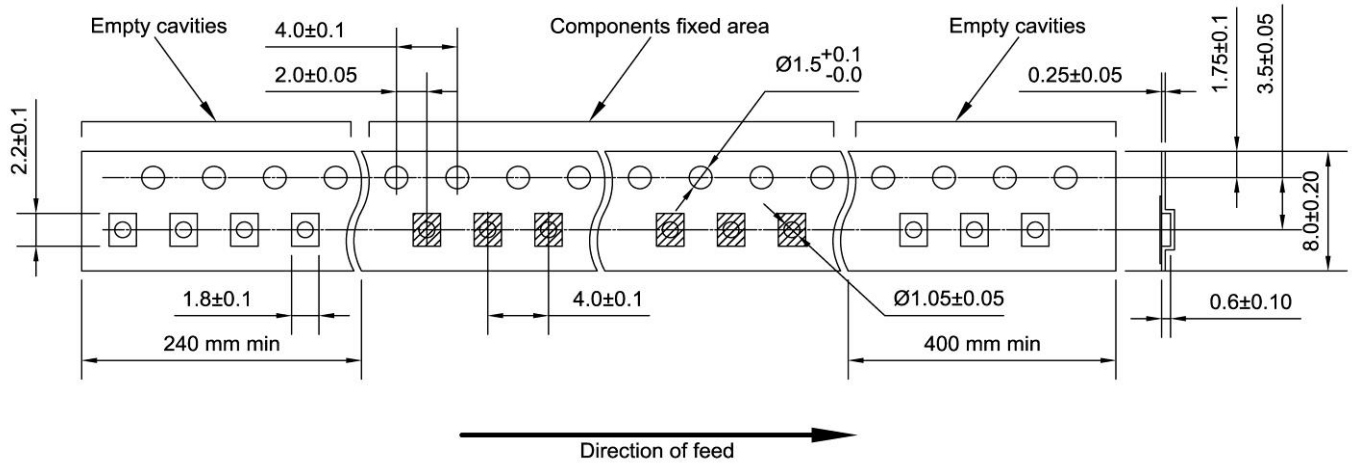


Figure-5

Dimensions of Reel

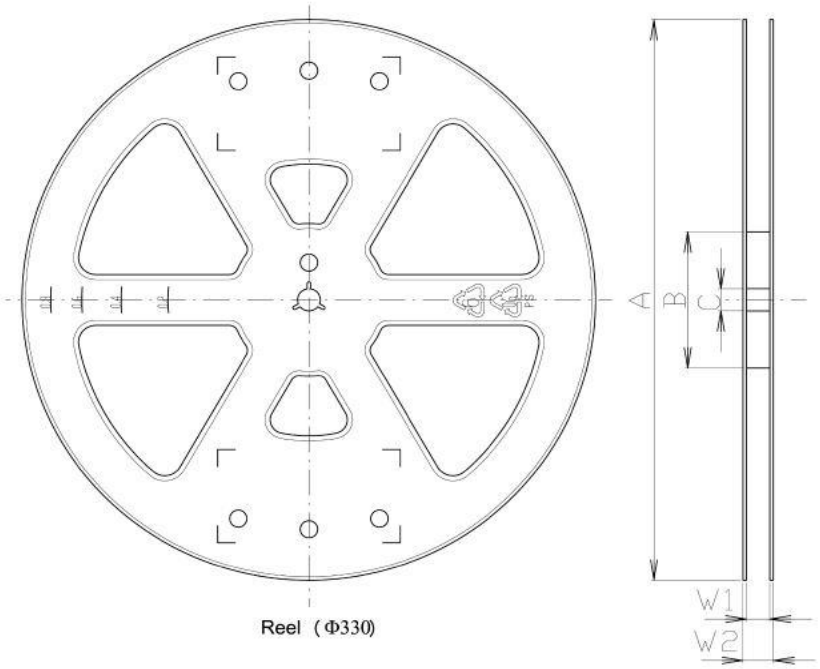


Figure-6

Table-5

Order	Code	Quantity (pcs./reel)	A	B	C	W1	W2	Tape Pitch
Standard	Y	15,000	φ330	φ100	φ13 ±0.2	9.4 ±1.0	13.4 ±1.0	4.0 ±0.1
Option	Z	3,000	φ180	φ60	φ13 ±0.2	9 +1.0/-0.0	11.4 ±1.0	4.0 ±0.1

Unit:mm

Notice

- Please conduct validation and verification of our products in actual condition of mounting and operating environment before using our products.

- The products listed in this specification are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC). Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment, disaster prevention equipment, medical equipment classified as Class I, II or III by IMDRF, highly public information network equipment including, without limitation, telephone exchange, and base station).
  Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment, medical equipment classified as Class IV by IMDRF, nuclear control equipment, undersea equipment, military equipment).
  When our products are used even for high safety and/or reliability-required devices or circuits of general electronic equipment, it is strongly recommended to perform a thorough safety evaluation prior to use of our products and to install a protection circuit as necessary.
  Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this specification for any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

- Information contained in this specification is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of TAIYO YUDEN or any third parties nor grant any license under such rights.

- Please note that the scope of warranty for our products is limited to the delivered our products themselves and TAIYO YUDEN shall not be in any way responsible for any damages resulting from a fault or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by TAIYO YUDEN and your company, TAIYO YUDEN will warrant our products in accordance with such agreement.

- The contents of this specification are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter “TAIYO YUDEN’s official sales channel”). Please note that the contents of this specification are not applicable to our products purchased from any seller other than TAIYO YUDEN’s official sales channel.

- Caution for Export
  Some of our products listed in this specification may require specific procedures for export according to “U.S. Export Administration Regulations”, “Foreign Exchange and Foreign Trade Control Law” of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

1814 size Band 5 Duplexer

Application Note

Rev.A03

P/N. :FSDCSQ8T881MK2E4

(D5DA881M5K2E4)

TAIYO YUDEN Mobile Technology Co.,Ltd.

Revision History

Revision	Date	Description
A01	01 - May - 2017	Initial release
A02	14 - Feb - 2020	Updated Matching Circuit
A03	23 - Feb - 2022	P/N Change

Contents

Recommended Printed Circuit Board Layout for 1814 sized Band 5 Duplexer

For 1814 size Band 5 duplexer (D5DA881M5K2E4) ,recommended PCB Layout are shown in Fig.1 and 2.

Devices location, ground pattern layout , PCB layer thickness and through-holes' location around duplexer are important for duplexer's characteristics, especially isolation.

Layer thickness (PCB structure) is described in the next page .

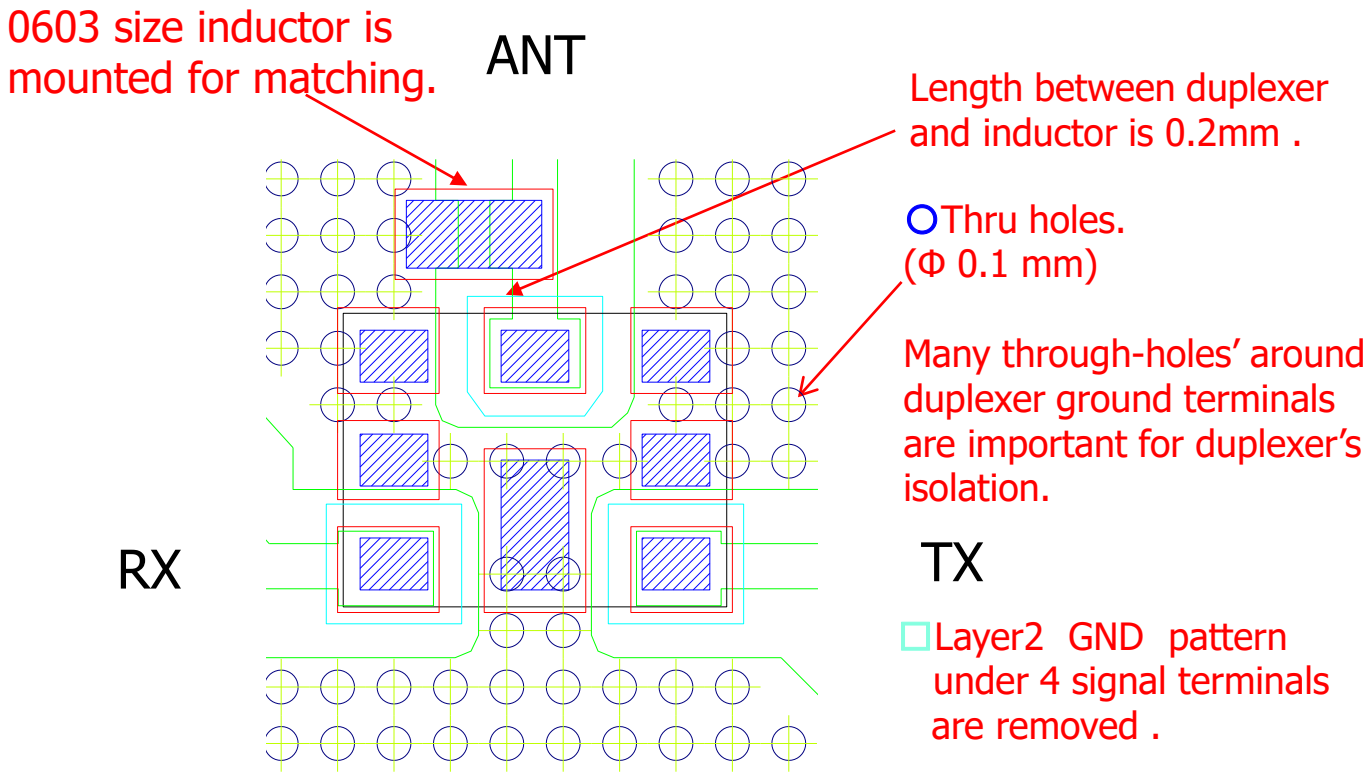


Fig. 1. Recommended Printed Circuit Board Layout.

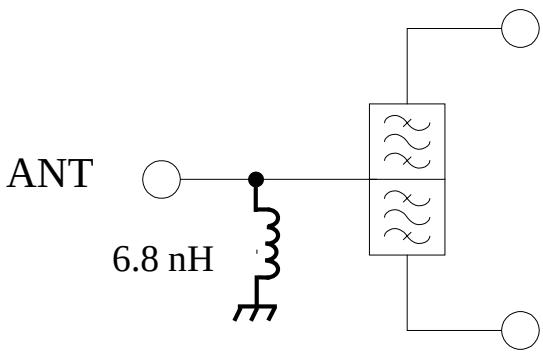


Fig. 2. Matching Circuit

Printed Circuit Board Structure

Fig. 3 and Table 1 show recommended PCB structure.
Ground pattern parasitic inductance depends on layer thickness.
Duplexer isolation is very sensitive to ground pattern parasitic inductance variation.

Test results of this PCB are shown in page 6,7 and 8.

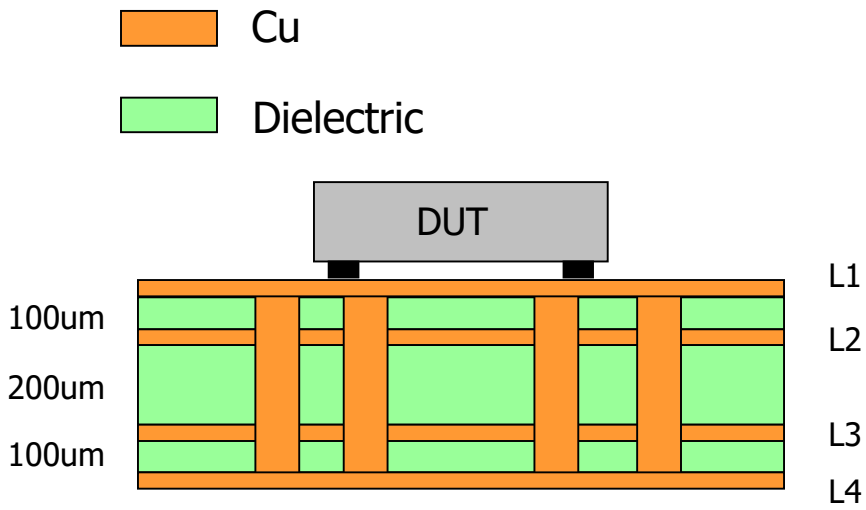


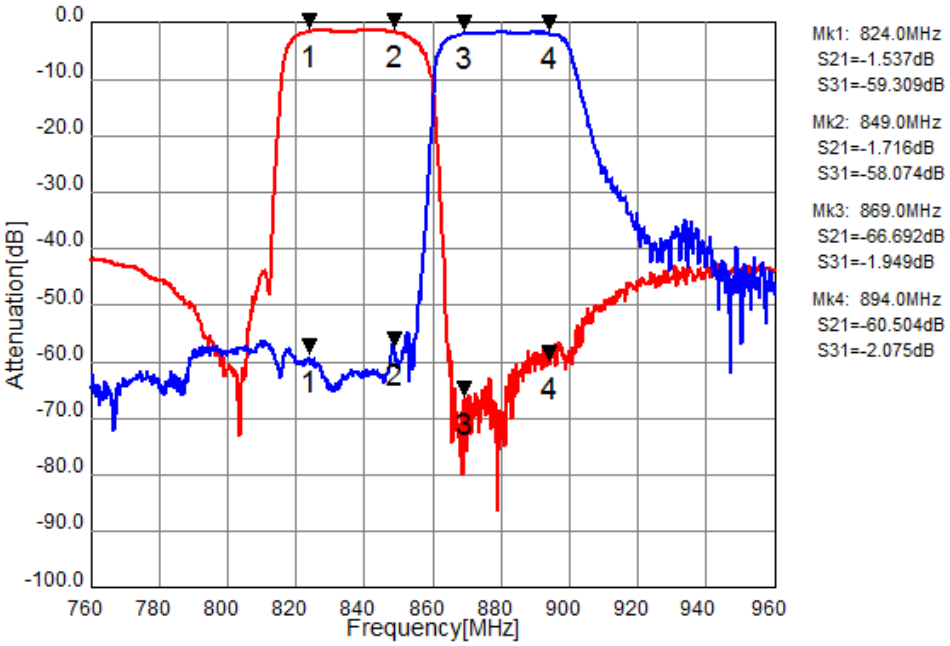
Fig. 3. Recommended PCB Structure

Description	Specification	Material
Dielectric Core material	Thickness: 200 μm	Dielectric Constant typical: 3.4 @ 2GHz
Dielectric Prepreg	Thickness: 100 μm (L1-L2,L3-L4)	Dielectric Constant typical: 3.4 @ 2GHz
Cu thickness (layers 1 to 4)	18 μm	
Buried via size	100 μm diameter	

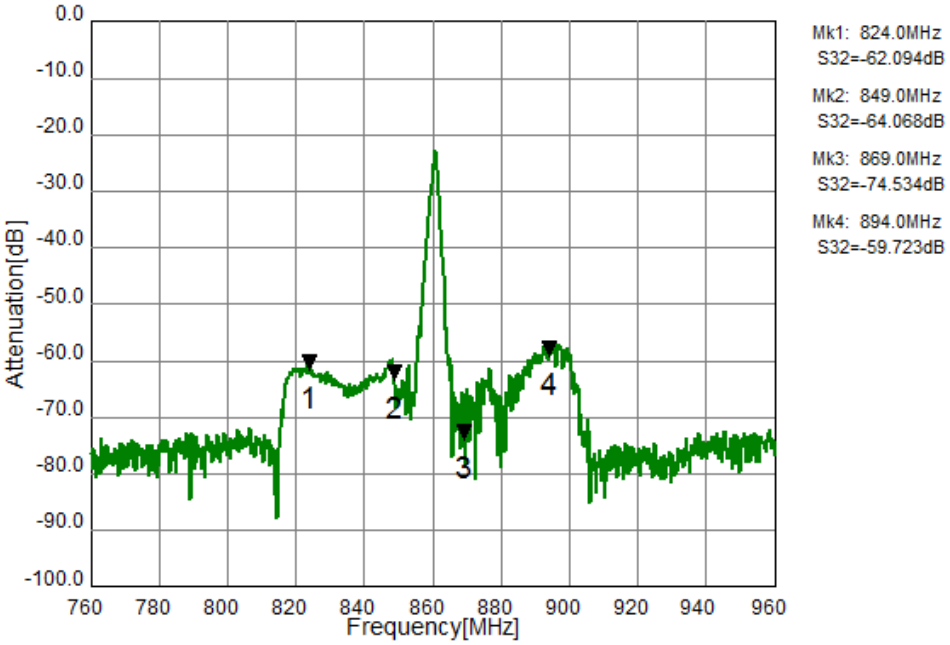
Table 1. Recommended PCB Structure.

Test Results Using Recommended PCB

Tx to Antenna and Antenna to Rx



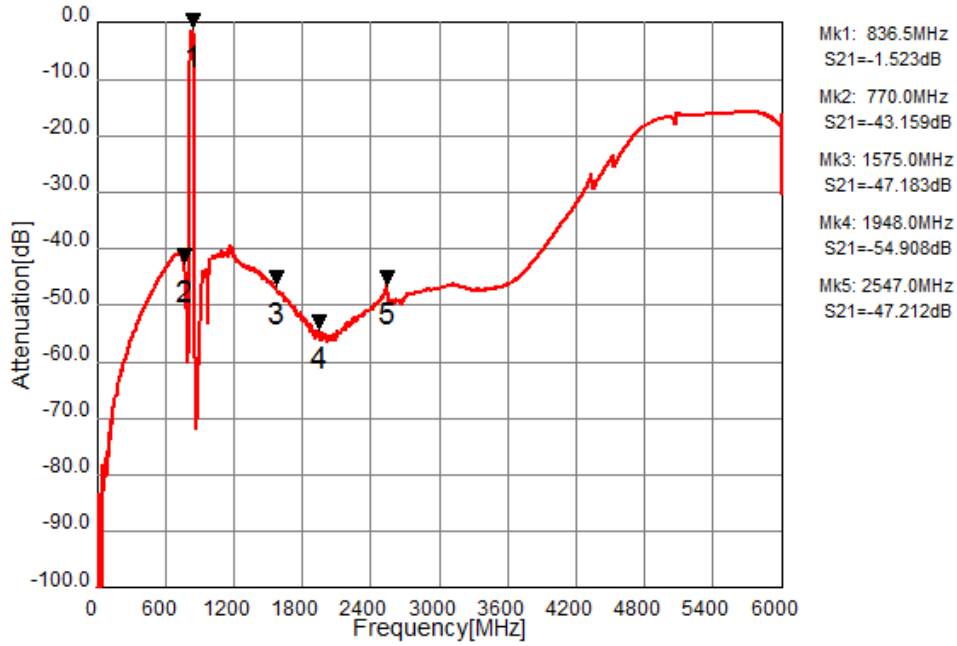
Tx to Rx



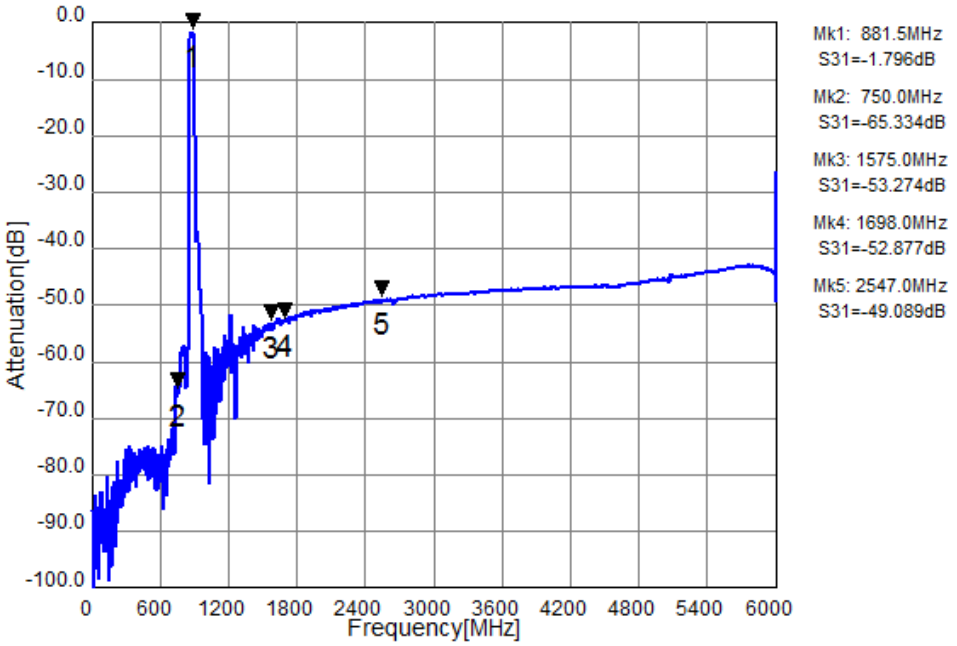
* DUT and matching inductor(6.8nH) at antenna port was soldered on recommended PCB.

Fig. 4 (a). Test Results Using Recommended PCB.

Tx to Antenna (Wide span)



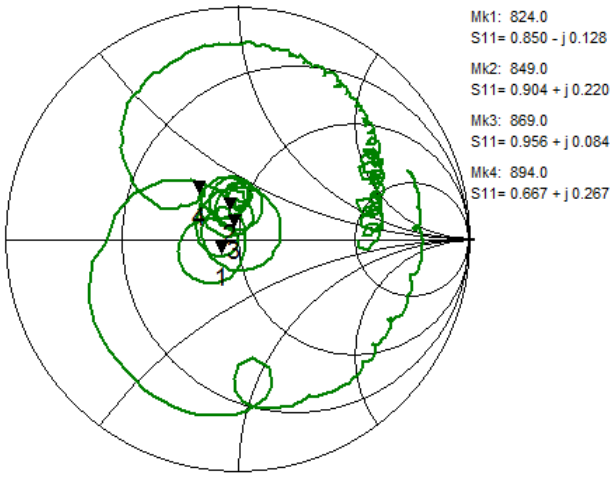
Antenna to Rx (Wide span)



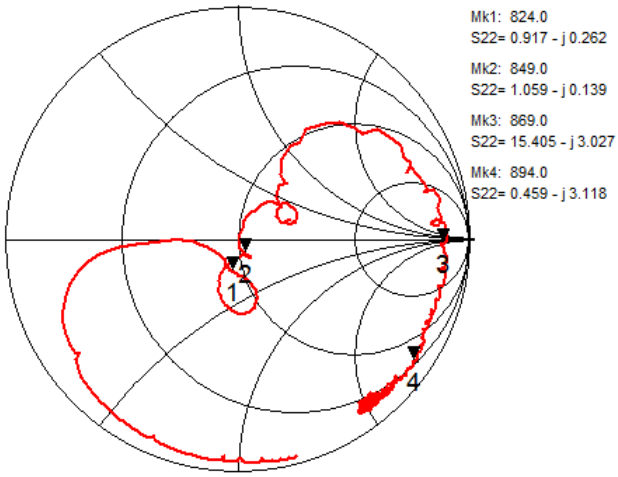
* DUT and matching inductor(6.8nH) at antenna port was soldered on recommended PCB.

Fig. 4 (b). Test Results Using Recommended PCB.

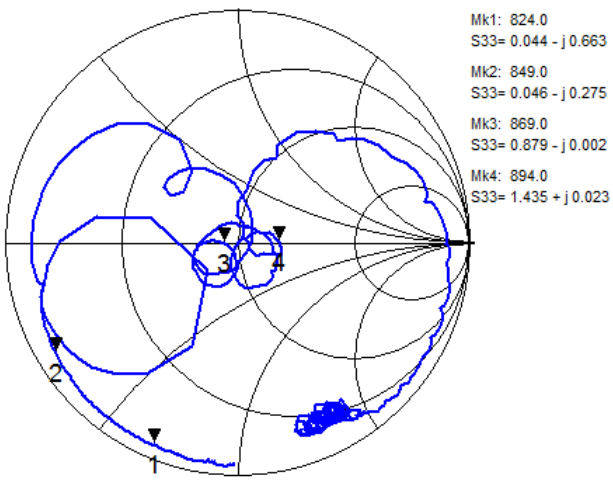
Antenna port



Tx port



Rx port



* DUT and matching inductor(6.8nH) at antenna port was soldered on recommended PCB.

Fig. 4 (c). Test Results Using Recommended PCB.

TAIYO YUDEN

Feb. 23, 2022