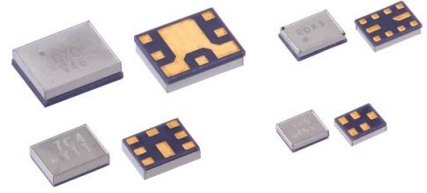


Datasheet



SAW Duplexer

Application : Band 28 Block B

P/N : FSDCSR8N788MK3ND
D5FC788M0K3ND

Version : 2.5

Date : February 9th, 2022

Features

- Size : 1.8 mm x 1.4 mm
- 5G NR Supported



* Pb Free Part



MSL1

TAIYO YUDEN CO., LTD.

The data is reference only. Electrical characteristics vary depending on environment or measurement condition.
TAIYO YUDEN reserves the right to make change to the data at any time without notice.
Before making final selection, please check product specification.

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

History

| Version No. | Date | Description |
|-------------|---------------|-------------------------------------|
| 2.4 | Oct. 19, 2020 | Datasheet Format Revised |
| | | 1. Absolute Maximum Ratings Updated |
| 2.5 | Feb. 09, 2022 | Changed to New P/N |
| | | 1. Absolute Maximum Ratings Updated |

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

1. Absolute Maximum Ratings

Table-1

| Item | Symbol | Ratings | Unit | Remarks |
|--|--------|-------------|------|--|
| Operating Temperature Range | Ta | -30 to +85 | °C | |
| Device Storage Temperature | Tstg1 | -40 to +100 | °C | |
| Carrier Tape Storage Temperature Range | Tstg2 | -5 to +40 | °C | Shelter from the Direct Sunlight |
| Maximum Input Power | Pin | +29.0 | dBm | 718 - 748 MHz Continuous Wave Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 5000 h |
| | | +29.0 | dBm | 718 - 748 MHz LTE SC-FDMA, 3MHz, 1RB 5G DFT-s-OFDM, 5MHz, 1RB Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 5000 h |
| | | +29.0 | dBm | 718 - 748 MHz 5G CP-OFDM, 5MHz, 1RB Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 5000 h |
| | | +29.5 | dBm | 718 - 748 MHz Continuous Wave Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 2000 h |
| | | +29.5 | dBm | 718 - 748 MHz LTE SC-FDMA, 3MHz, 1RB 5G DFT-s-OFDM, 5MHz, 1RB Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 2000 h |
| | | +30.0 | dBm | 718 - 748 MHz Continuous Wave Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 1000 h |
| | | +30.0 | dBm | 718 - 748 MHz LTE SC-FDMA, 3MHz, 1RB 5G DFT-s-OFDM, 5MHz, 1RB Ta = +50 °C Ant, Rx Port : Loaded at 50 Ω Input Time : 1000 h |
| Maximum DC Voltage | - | +/-5 | V | Device Only |

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

2. Evaluation Circuit

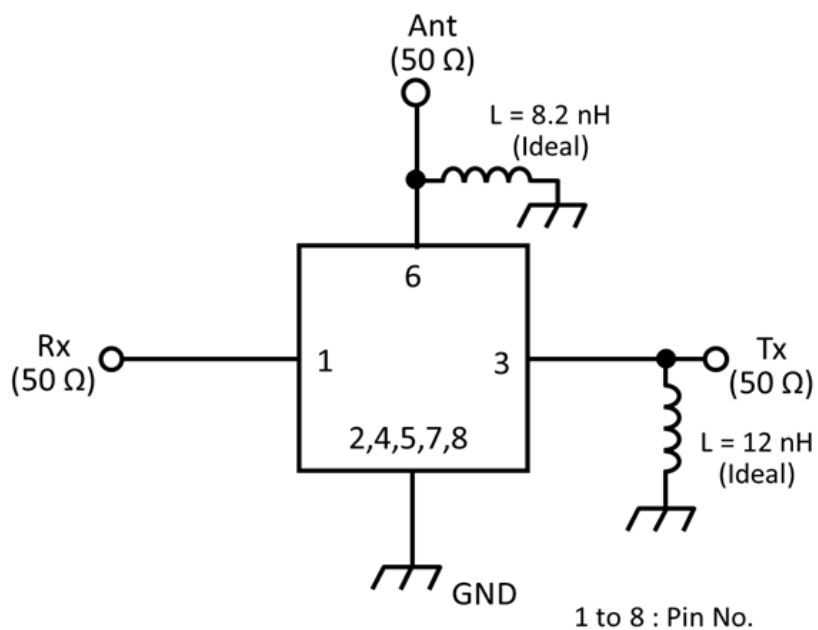


Figure-1

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

3. Electrical Specification

Table-2

| Item | | | Condition (MHz) | Specification | | | Unit | Remarks |
|------------------------|----------------------|-----|--------------------|---------------|------|------|------|-------------|
| | | | | Min. | Typ. | Max. | | |
| Tx to Ant | Insertion loss | | 718 - 748 | - | 1.8 | 2.8 | dB | |
| | | | 718.25 - 747.75 | - | 1.7 | 2.6 | dB | |
| | Ripple | | 718 - 748 | - | 1.1 | 2.5 | dB | |
| | VSWR | Tx | 718 - 748 | - | 1.9 | 2.2 | - | |
| | | Ant | 718 - 748 | - | 1.8 | 2.1 | - | |
| | Absolute attenuation | | 10 - 698 | 32 | 36 | - | dB | |
| | | | 698 - 710 | 16 | 26 | - | dB | |
| | | | 758 - 773 | 15 | 39 | - | dB | |
| | | | 773 - 803 | 50 | 55 | - | dB | Rx |
| | | | 1436 - 1496 | 25 | 29 | - | dB | 2f0 |
| | | | 1565 - 1606 | 22 | 25 | - | dB | GPS |
| | | | 2154 - 2244 | 28 | 32 | - | dB | 3f0 |
| | | | 2400 - 2500 | 30 | 38 | - | dB | ISM |
| Ant to Rx | Insertion loss | | 773 - 803 | - | 1.9 | 2.5 | dB | |
| | | | 773.25 - 802.75 | - | 1.8 | 2.3 | dB | |
| | Ripple | | 773 - 803 | - | 0.8 | 2.0 | dB | |
| | VSWR | Ant | 773 - 803 | - | 1.8 | 2.0 | - | |
| | | Rx | 773 - 803 | - | 1.7 | 2.0 | - | |
| | Absolute attenuation | | 718 - 748 | 50 | 63 | - | dB | Tx |
| | | | 2400 - 2500 | 30 | 73 | - | dB | ISM |
| Tx to Rx | Isolation | | 718 - 748 | 60 | 63 | - | dB | Tx |
| | | | 773 - 803 | 55 | 60 | - | dB | Rx |
| Terminating Impedance | | | Tx port | 50//12 nH | | | Ω | |
| | | | Rx port | 50 | | | Ω | |
| | | | Ant port | 50//8.2 nH | | | Ω | |
| DC impedance to ground | | | | 100 | | | MΩ | Device only |

*Typical Value at +25 +/- 2 °C

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

4. Dimensions & Marking Information

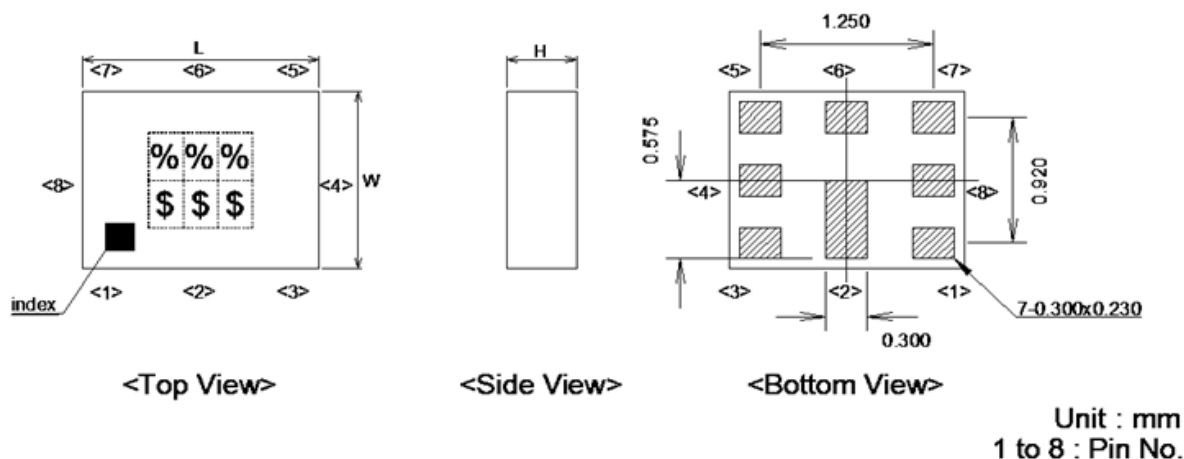


Figure-2

%%% : BND (Part Symbol)
 \$\$\$: Product Trace Code

L = 1.8 +/- 0.1 mm
 W = 1.4 +/- 0.1 mm
 H = 0.44 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 |

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

6. Recommended Foot Print Pattern

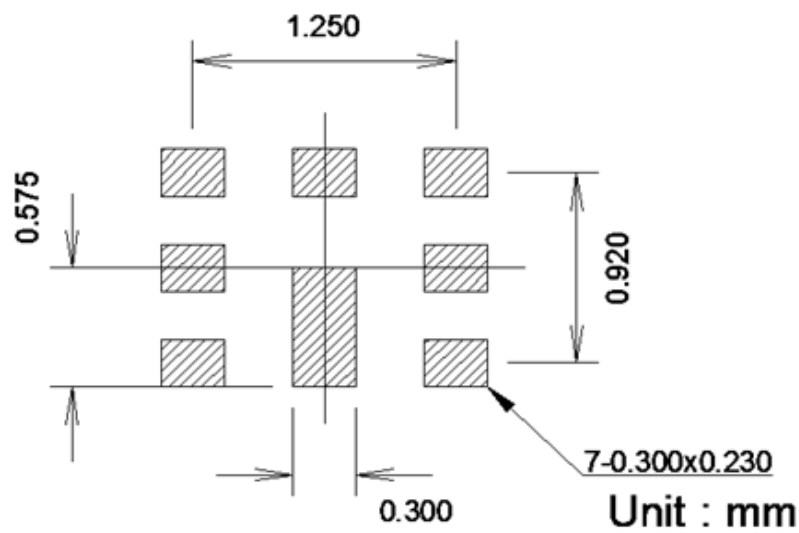


Figure-3

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

7. Electrical Characteristics

Tx to Ant

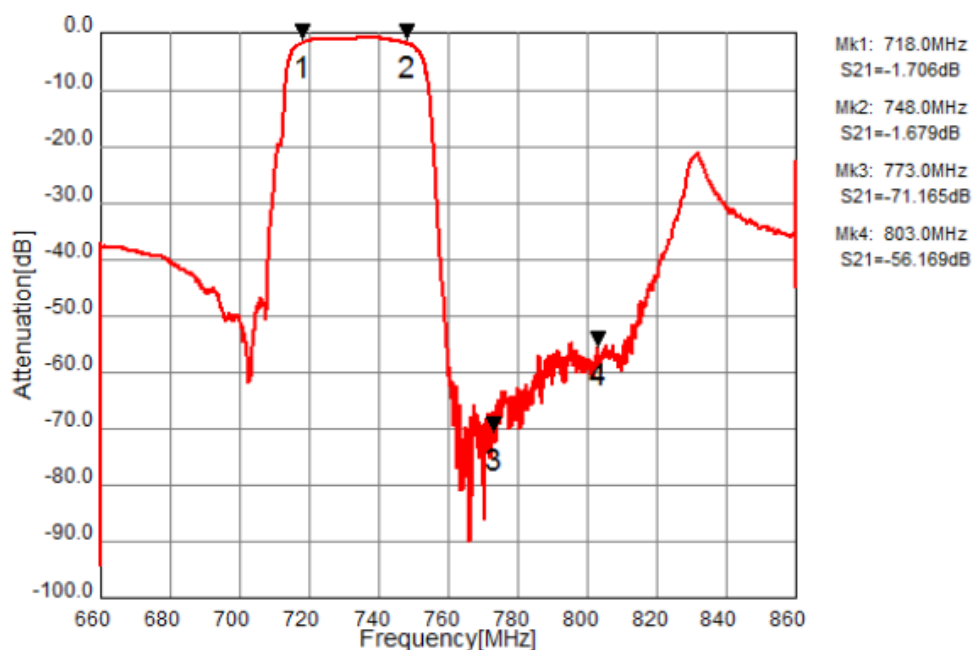


Figure-4-1

Ant to Rx

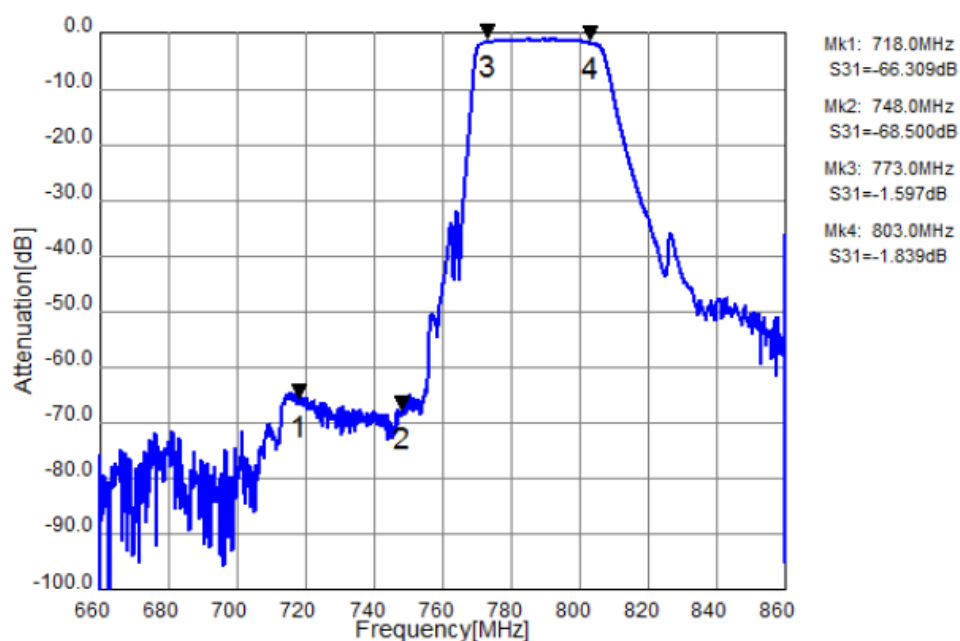


Figure-4-2

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

Tx to Ant, Ant to Rx

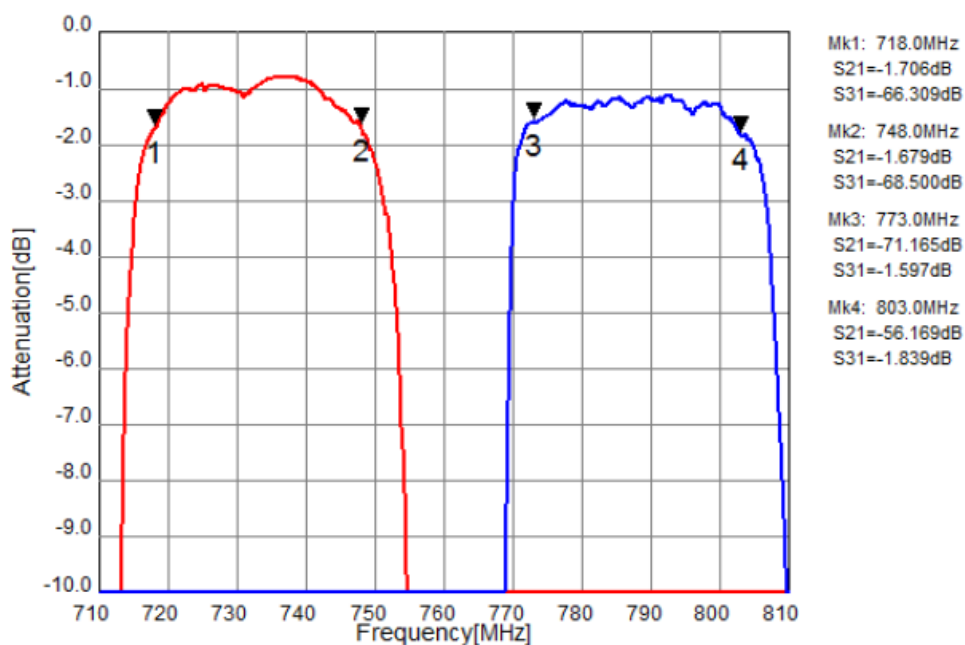


Figure-4-3

Tx to Rx Isolation

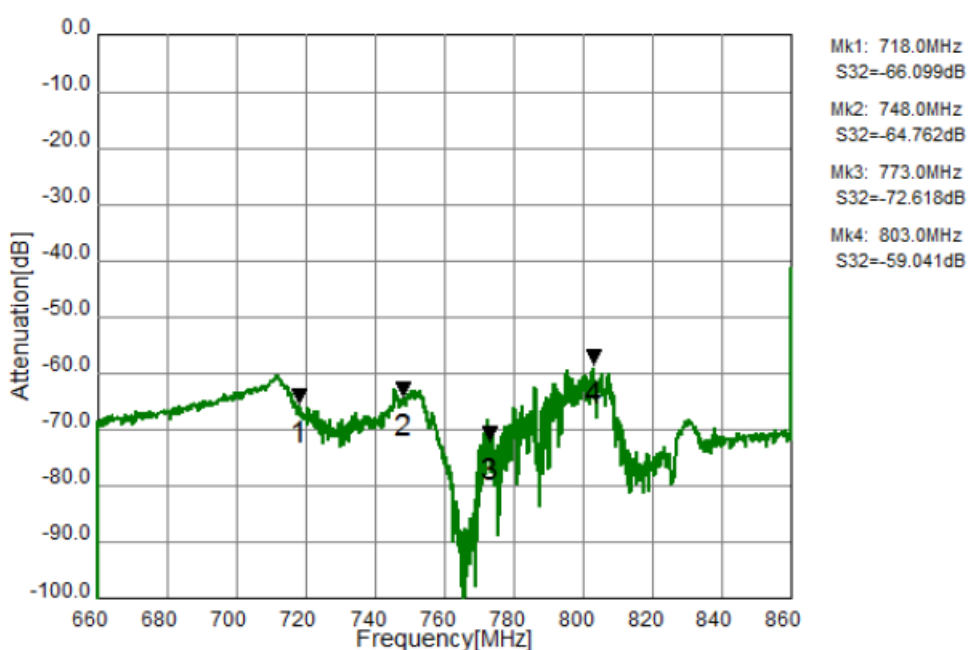


Figure-4-4

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

Tx Port

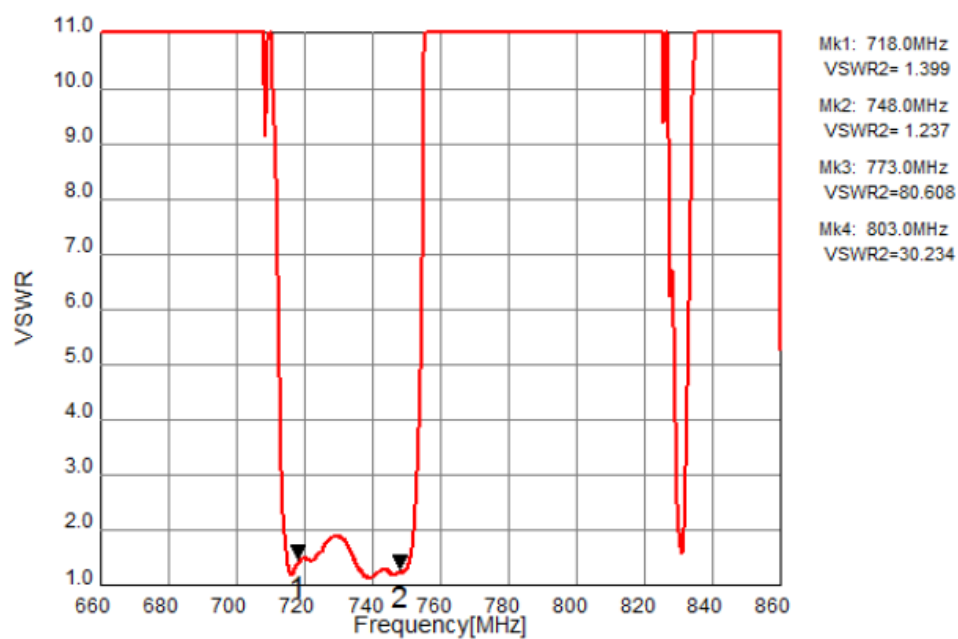


Figure-4-5

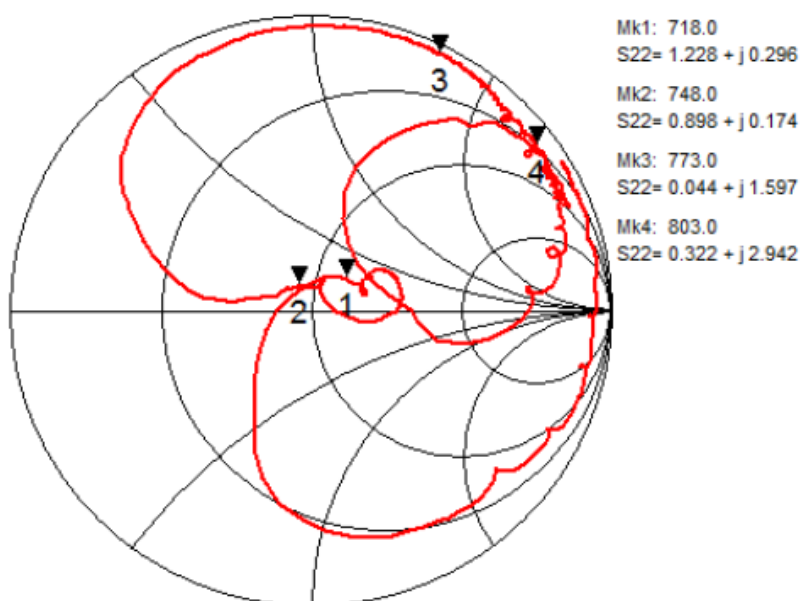


Figure-4-6

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

Rx Port

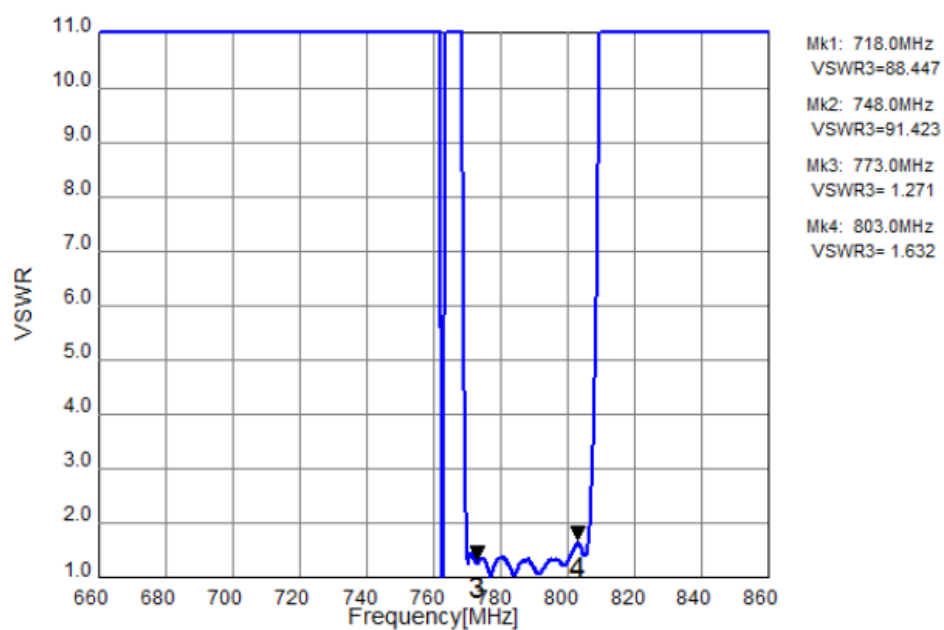


Figure-4-7

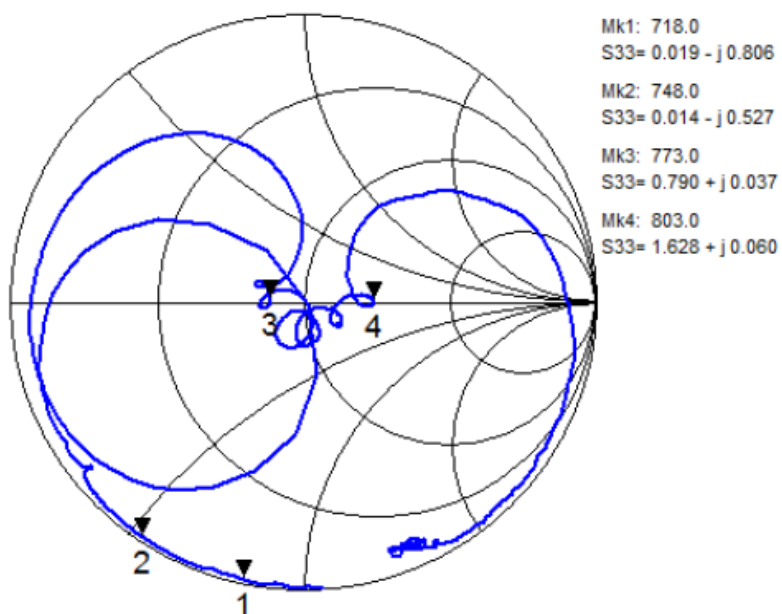


Figure-4-8

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

Ant Port

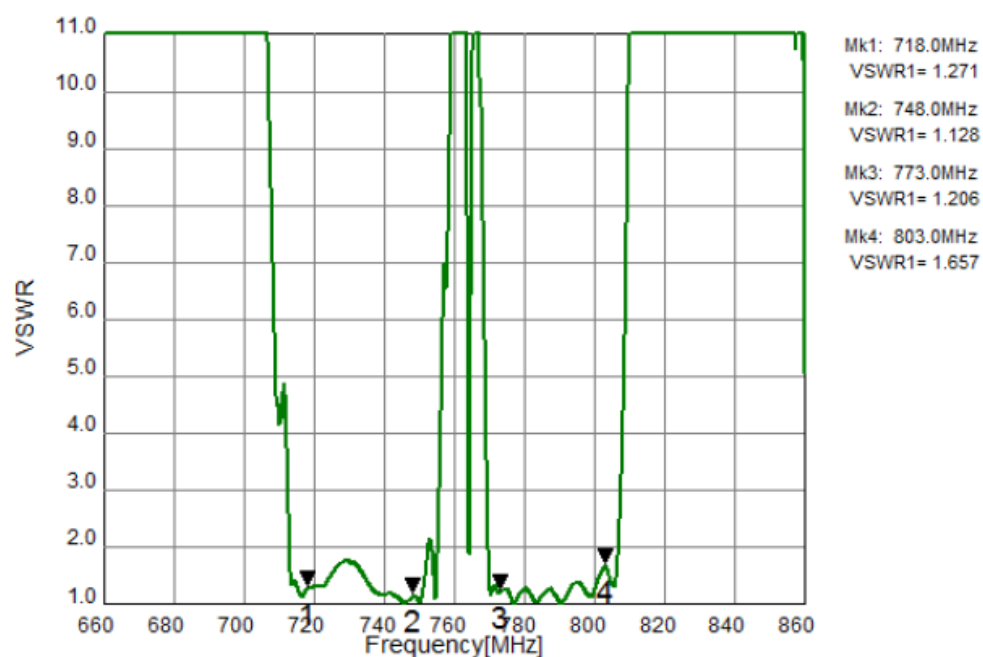


Figure-4-9

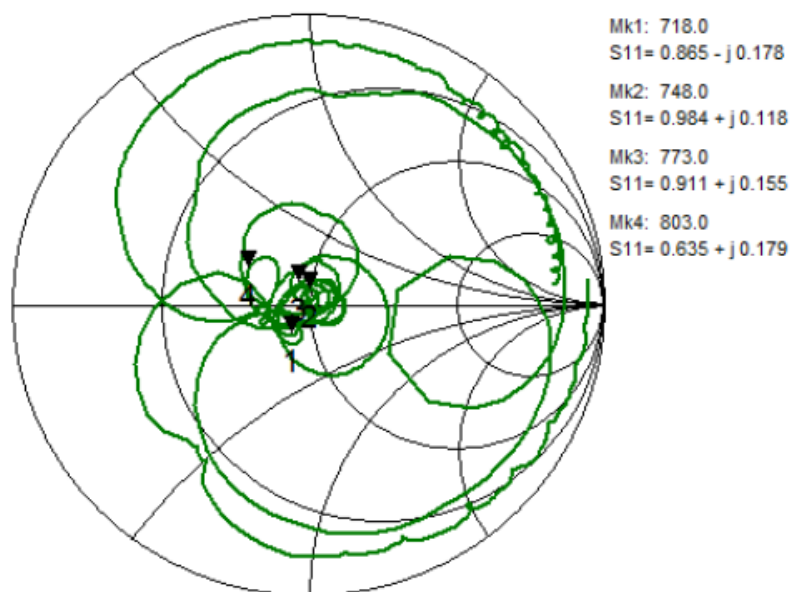


Figure-4-10

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

Tx to Ant(Wide span)

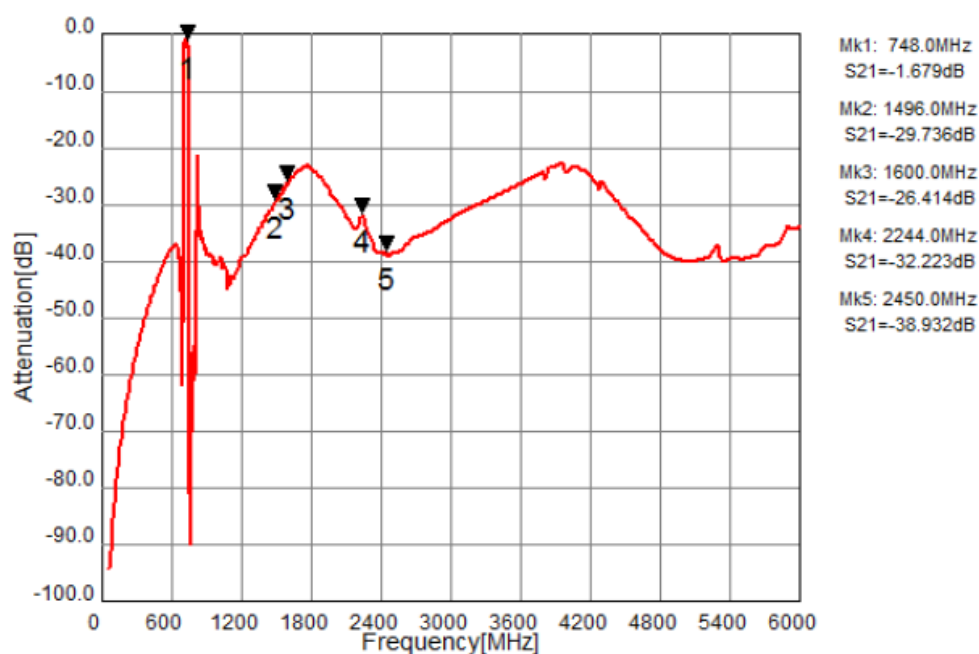


Figure-4-11

Ant to Rx(Wide span)

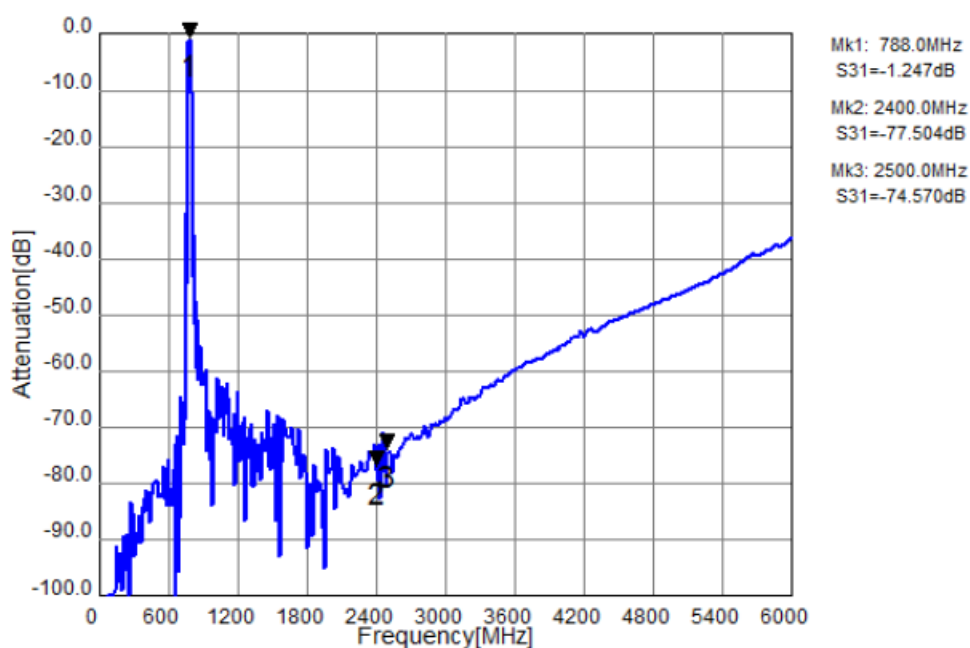


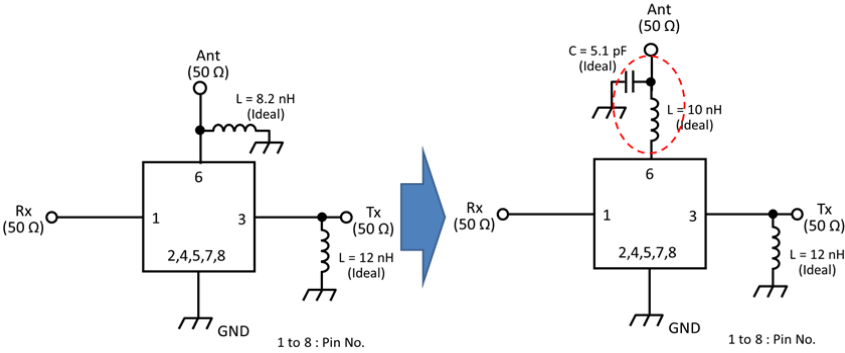
Figure-4-12

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

OPTION

External circuit addition (Second and Third Harmonics trap circuit)
 Adding an inductor (L=10.0nH) and a capacitor (C=5.1pF) at ANT port

Simulation result
 There are some trade-offs of the characteristic
 Improvement point : Tx-Second Harmonic Attenuation(12dB Improved)
 Tx-Third Harmonic Attenuation(19dB Improved)
 Deterioration point : Tx / Rx Insertion loss(0.1dB / 0.2dB deteriorated)



Optional Circuit

Figure-4-13

Tx to Ant, Ant to Rx

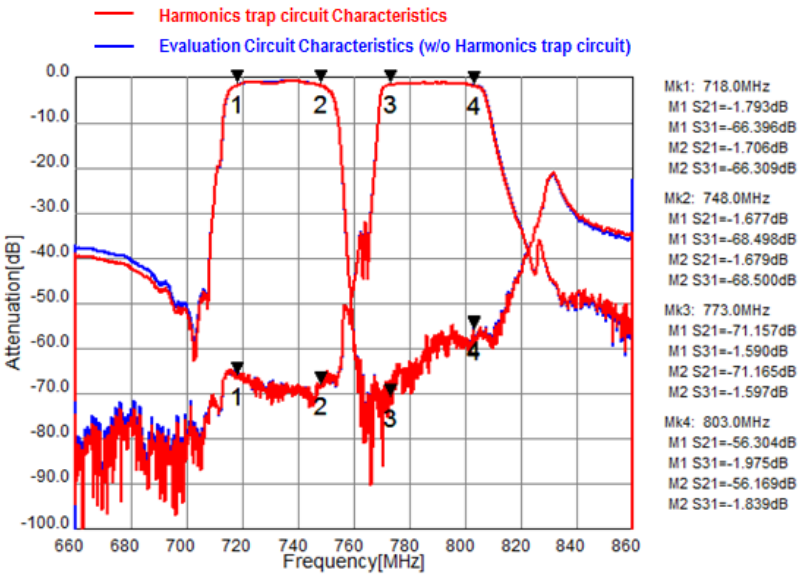


Figure-4-14

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

Tx to Ant, Ant to Rx(Narrow span)

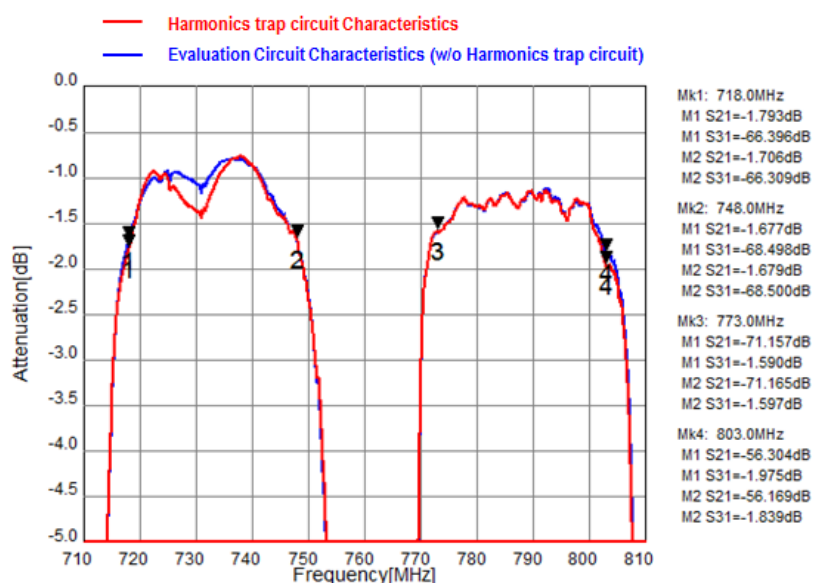


Figure-4-15

Tx to Ant(Wide span)

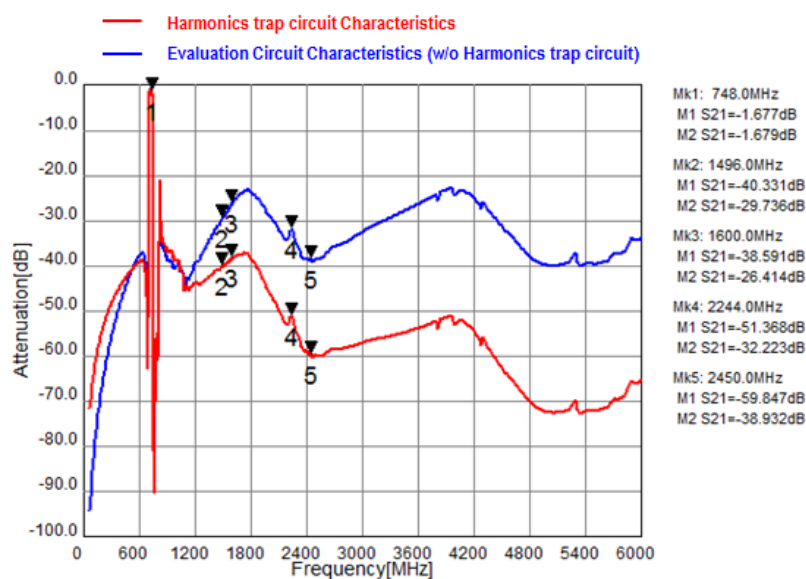


Figure-4-16

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

8. Ordering Code

Table-4

| Standard Ordering Code | Packing | Reel Size | Status |
|------------------------|-------------|-------------|--------|
| FSDCSR8N788MK3ND-AY | Tape & Reel | 15,000 pcs. | MP |
| D5FC788M0K3ND-Y | Tape & Reel | 15,000 pcs. | MP |

| Option Ordering Code | Packing | Reel Size | Status |
|----------------------|-------------|-----------------------|--------|
| FSDCSR8N788MK3ND-AYA | Tape & Reel | less than 15,000 pcs. | MP |
| FSDCSR8N788MK3ND-AZ | Tape & Reel | 3,000 pcs. | MP |
| FSDCSR8N788MK3ND-AZA | Tape & Reel | less than 3,000 pcs. | MP |
| FSDCSR8N788MK3ND-AQ | Bulk | few pcs. | MP |
| D5FC788M0K3ND-YA | Tape & Reel | less than 15,000 pcs. | MP |
| D5FC788M0K3ND-Z | Tape & Reel | 3,000 pcs. | MP |
| D5FC788M0K3ND-ZA | Tape & Reel | less than 3,000 pcs. | MP |
| D5FC788M0K3ND-Q | Bulk | few pcs. | MP |

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

*MP : Mass Production

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

9. Tape and Reel Information

Dimensions of Tape (Standard)

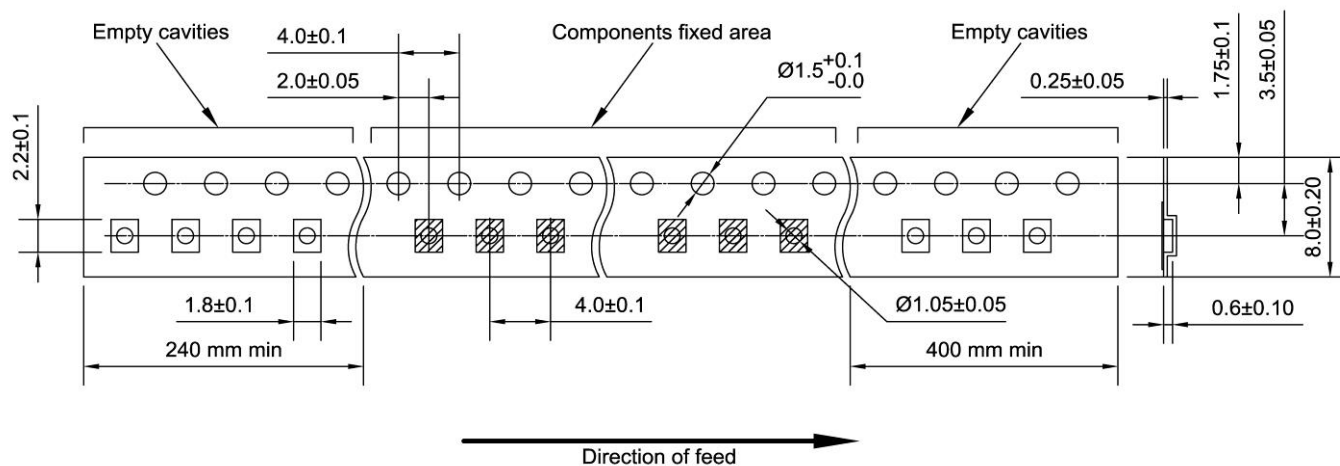


Figure-5

Dimensions of Reel

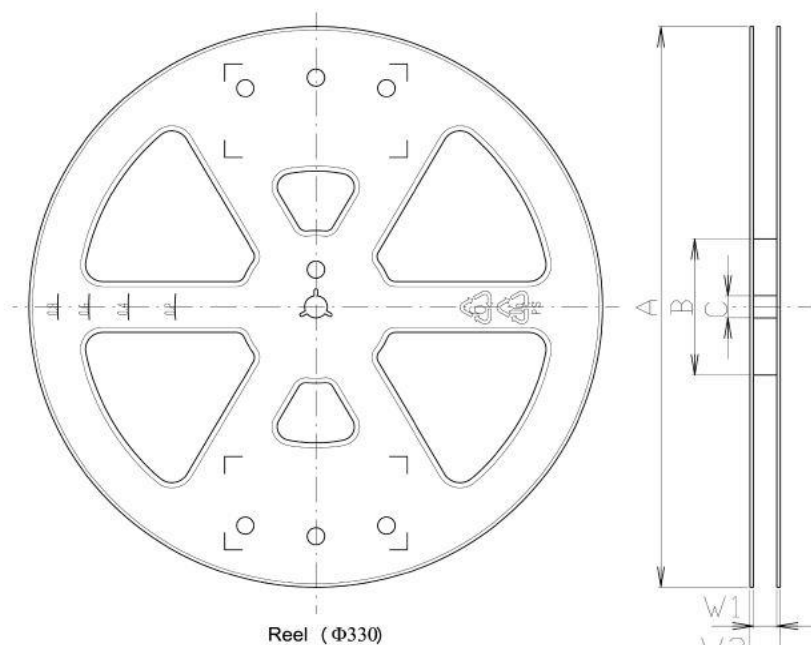


Figure-6

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

| | | | |
|---------------|----------------------------------|---|---------------|
| Customer Name | Standard | TAIYO YUDEN Mobile Technology Co., Ltd. | |
| System | Band 28 Block B | Date | Feb. 09, 2022 |
| Part Number | FSDCSR8N788MK3ND / D5FC788M0K3ND | Version 2.5 | Final |

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.