Product Specifications Approval Sheet

Product Description: SAW DPX 831.5 / 876.5MHz Band 26 SMD 1.8X1.4 mm (BW=34.52 MHz)

TST Part No.: TF0137A

Customer Part No.: ____________________________

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Customer signature required

Company: ____________________________

Division: ____________________________

Approved by: ____________________________

Date: ____________________________

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Checked by: __________________ Anne Chen [Signature]

Approved by: __________________ Bob Chau [Signature]

Date: __________________ 03, 14, 2017

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1. Customer signed back is required before TST can proceed with sample build and receive orders.
2. Orders received without customer signed back will be regarded as agreement on the specifications.
3. Any specifications changes must be approved upon by both parties and a new revision of specifications shall be released to reflect the change.
SAW DPX 831.5 / 876.5MHz Band 26 SMD 1.8X1.4mm (BW=34.52 MHz)
MODEL NO.:TF0137A REV.1.0

A. MAXIMUM RATING:
1. Operating temperature range: -20 °C to +85 °C
2. Storage temperature range: -20 °C to +85 °C
3. Input power : 29dB (Ta=+50°C,5000h,WCDMA modulation )
4. Maximum DC Voltage: +/-3 V
5. Moisture Sensitivity Level: Level 1 (MSL 1)
6. ESD 100V(MM)  200V(HBM)

B. ELECTRICAL CHARACTERISTICS:
Terminating impedance (Tx Port): 50+5.1nH Ω(Single-ended)
Terminating impedance (Rx Port): 50 Ω (Differential)
Terminating impedance (Ant Port): 50//8.2nH Ω(Single-ended)

<table>
<thead>
<tr>
<th>Parameters Description</th>
<th>Unit</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion Loss</td>
<td>dB(*1)</td>
<td>1.3</td>
<td>2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>815 ~ 845MHz</td>
<td></td>
<td>-</td>
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<td></td>
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<tr>
<td>814.24 ~ 815MHz</td>
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<td>1.4</td>
<td>2.4</td>
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<tr>
<td>845 ~ 848.76MHz</td>
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<td>1.9</td>
<td>2.9</td>
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<tr>
<td>Amplitude ripple</td>
<td>dB</td>
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<tr>
<td>814.24 ~ 848.76MHz</td>
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<td>-</td>
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<tr>
<td>VSWR</td>
<td></td>
<td>-</td>
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<tr>
<td>Tx</td>
<td>dB</td>
<td>1.6</td>
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<tr>
<td>814.24 ~ 848.76MHz</td>
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<td>-</td>
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<tr>
<td>ANT</td>
<td>dB</td>
<td>1.5</td>
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<tr>
<td>814.24 ~ 848.76MHz</td>
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<td>-</td>
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</tr>
</tbody>
</table>

Attenuation:
10 ~ 494 MHz dB 35 41 -
494 ~ 804 MHz dB 32 37 -
859.24 ~ 893.76 MHz dB 44 56 -
1475.9 ~ 1698 MHz dB 35 40 -
1710 ~ 2494 MHz dB 30 35 -
3256 ~ 4245 MHz dB 20 27 -
4884 ~ 6000 MHz dB 35 44 -
6512 ~ 6792 MHz dB 15 28 -
7326 ~ 7641 MHz dB 12 26 -

(*1) Specification of insertion loss excludes loss that comes from the test board
ANT to Rx ($f_{to}=876.5$ MHz)

<table>
<thead>
<tr>
<th>Parameters Description</th>
<th>Unit</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Remarks</th>
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<td>Insertion Loss</td>
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<td>2.0</td>
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<td>Amplitude ripple</td>
<td>dB</td>
<td>-</td>
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<td>2.2</td>
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<tr>
<td>VSWR</td>
<td>dB</td>
<td>1.8</td>
<td>2.2</td>
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<td>VSWR</td>
<td>dB</td>
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<td>2.2</td>
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</table>

**Attenuation:**

| 1~447 MHz              | dB       | 50   | 75   | -    |         |
| 814.24~848.76 MHz      | dB       | 45   | 55   | -    |         |
| 909~979 MHz            | dB       | 10   | 22   | -    |         |
| 1427~2500 MHz          | dB       | 45   | 50   | -    |         |
| 2577~6000 MHz          | dB       | 38   | 47   | -    |         |
| 6013~6258 MHz          | dB       | 20   | 44   | -    |         |

**Tx to Rx**

| Isolation              | dB       | 55   | 60   | -    |         |
| 814.24~848.76 MHz      | dB       | 52   | 57   | -    |         |

(*1) Specification of insertion loss excludes loss that comes from the test board.

**C.Evaluation Circuit**

![Evaluation Circuit Diagram]
D. FREQUENCY CHARACTERISTICS:

**Tx to Ant**

![Graph showing frequency characteristics from Tx to Ant.]

**Ant to Rx**

![Graph showing frequency characteristics from Ant to Rx.]

Mk1: 814.2MHz
M1 S31=-1.284dB
Mk2: 848.8MHz
M1 S31=-1.819dB
Mk3: 859.2MHz
M1 S31=-63.902dB
Mk4: 893.8MHz
M1 S31=-56.144dB
Tx to Ant, Ant to Rx

![Graph showing attenuation vs frequency for Tx to Ant, Ant to Rx](image)

**Mk1: 814.2MHz**
- M1 S21=-59.660dB
- M1 S31=-1.284dB

**Mk2: 848.8MHz**
- M1 S21=-60.333dB
- M1 S31=-1.819dB

**Mk3: 859.2MHz**
- M1 S21=-1.746dB
- M1 S31=-63.902dB

**Mk4: 893.8MHz**
- M1 S21=-2.000dB
- M1 S31=-56.144dB

Tx to Rx Isolation

![Graph showing attenuation vs frequency for Tx to Rx Isolation](image)

**Mk1: 814.2MHz**
- M1 S32=-61.548dB

**Mk2: 848.8MHz**
- M1 S32=-64.118dB

**Mk3: 859.2MHz**
- M1 S32=-73.244dB

**Mk4: 893.8MHz**
- M1 S32=-56.290dB
Tx Port

![Graph showing VSWR vs Frequency with markers and values]

- **Mk1**: 814.2MHz
  - M1 VSW= 1.033
- **Mk2**: 848.8MHz
  - M1 VSW= 1.317
- **Mk3**: 859.2MHz
  - M1 VSW= 17.159
- **Mk4**: 893.8MHz
  - M1 VSW= 8.266

![Graph showing Smith chart with markers and values]

- **Mk1**: 814.2MHz
  - S33= 0.985 + j 0.023
- **Mk2**: 848.8MHz
  - S33= 1.197 + j 0.229
- **Mk3**: 859.2MHz
  - S33= 0.650 + j 3.161
- **Mk4**: 893.8MHz
  - S33= 0.354 - j 1.366
Ant Port

![Graph of VSWR vs Frequency](image1)

- **Mk1:** 814.2 MHz, VSWR = 1.136
- **Mk2:** 848.8 MHz, VSWR = 1.325
- **Mk3:** 859.2 MHz, VSWR = 1.498
- **Mk4:** 893.8 MHz, VSWR = 1.713

![Smith Chart](image2)

- **Mk1:** S11 = 0.982 - j0.100
- **Mk2:** S11 = 1.184 + j0.246
- **Mk3:** S11 = 0.000 + j0.320
- **Mk4:** S11 = 0.927 + j0.520
Tx to Ant (Wide Span)

Ant to Rx (Wide Span)
E. OUTLINE DRAWING:
(Mass Production)

\[ \text{\( \triangle \): Date code (2016 May \( \rightarrow \) s, \ldots, 2019 Dec \( \rightarrow \) m.)} \]

\[ \text{\( \blacklozenge \blacklozenge \): Lot Code.} \]

Product Date Code. Follow below table.

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<td>j</td>
<td>k</td>
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**Pin assignment**

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<tr>
<th>Pin No.</th>
<th>Pin name</th>
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<tbody>
<tr>
<td>1</td>
<td>Rx</td>
<td>Receiver</td>
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<tr>
<td>2</td>
<td>GND</td>
<td>Ground</td>
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<tr>
<td>3</td>
<td>Tx</td>
<td>Transmitter</td>
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<tr>
<td>4</td>
<td>GND</td>
<td>Ground</td>
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<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>Ant</td>
<td>Antenna</td>
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<tr>
<td>7</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
<td>Ground</td>
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*Figure 1. Dimensions and Pin assignment*
Top View (Sample Production):

F. FOOTPRINT:

Figure 2. Recommended foot print pattern
G. PACKING:
1. REEL DIMENSION
(Please refer to FR-75D10 for packing quantity)

Materials of Reel
Material: Polystyrene + Carbon
Characteristics: Conforms to EIAJ-ET-7200A
Color: Black
Surface resistance (reference value): $10^8 \Omega$/sq Max.

<table>
<thead>
<tr>
<th>Code</th>
<th>Quantity</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<th>W2</th>
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<tbody>
<tr>
<td>Z</td>
<td>3,000 pcs</td>
<td>180.0±0.1</td>
<td>86.0±0.5</td>
<td>13.0±0.2</td>
<td>9.0±1.0</td>
<td>11.4±1.0</td>
</tr>
</tbody>
</table>

2. TAPE DIMENSION

Direction of feed

Unit: mm
H. RECOMMENDED REFLOW PROFILE:

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 245~260°C peak (min. 10sec).
4. Time: 2 times.