Product Specifications Approval Sheet

Product Name: SAW DPX 782 / 751MHz 10/10MHz BW Band13 SMD1.8X1.4 mm

TST Parts No.: TF0169B(This part is compliant with AEC-Q200)

Customer Part No.:______________________________

Customer signature required

Company:_______________________________________

Division:_______________________________________

Approved by :__________________________________

Date:__________________________________________

Checked by:_____________ Anne Chen

Approved by:_____________ Andy Yu

Date:_________________________ 2018.11.30

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 782/751MHz 10/10MHz BW Band13 SMD 1.8X1.4 mm

MODEL NO.: TF0169B

REV. No.: 1.0

A. MAXIMUM RATING:
1. Input power : 29dBm (Ta=+50deg C,50000h,CW )
2. Maximum DC Voltage: +/-5 V
3. Operating temperature range: -40 °C to +85 °C
4. Storage temperature range: -55 °C to +125 °C
5. Moisture Sensitivity Level: Level 3 (MSL 3)
6. ESD 100V(MM)  200V(HBM)

B. ELECTRICAL CHARACTERISTICS:
Terminating impedance(Tx Port): 50 Ω (Single-ended)
Terminating impedance(Rx Port): 50 Ω (Single-ended)
Terminating impedance(Ant Port): 50//12nH (Ω=∞) (Single-ended)

<table>
<thead>
<tr>
<th>Parameters Description</th>
<th>Unit</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insertion Loss</td>
<td>777 ~ 787 MHz</td>
<td>Db(1)</td>
<td>-</td>
<td>1.9</td>
<td>2.5</td>
</tr>
<tr>
<td>Ripple</td>
<td>777 ~ 787 MHz</td>
<td>dB</td>
<td>-</td>
<td>0.8</td>
<td>1.6</td>
</tr>
<tr>
<td>VSWR</td>
<td>777 ~ 787 MHz</td>
<td>-</td>
<td>-</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Attenuation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>746 ~ 756 MHz</td>
<td>dB</td>
<td>44</td>
<td>51</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>758 ~ 768 MHz</td>
<td>dB</td>
<td>10</td>
<td>32</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>768 ~ 775 MHz</td>
<td>dB</td>
<td>1</td>
<td>2.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1554 ~ 1565 MHz</td>
<td>dB</td>
<td>41</td>
<td>46</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1565 ~ 1607 MHz</td>
<td>dB</td>
<td>41</td>
<td>46</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2331 ~ 2361 MHz</td>
<td>dB</td>
<td>35</td>
<td>53</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2400 ~ 2484 MHz</td>
<td>dB</td>
<td>40</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3108 ~ 3148 MHz</td>
<td>dB</td>
<td>23</td>
<td>28</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4900 ~ 5950 MHz</td>
<td>dB</td>
<td>8</td>
<td>12</td>
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## ANT to Rx

<table>
<thead>
<tr>
<th>Parameters Description</th>
<th>Unit</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Note</th>
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<tr>
<td>Insertion Loss</td>
<td>dB(*1)</td>
<td>-</td>
<td>1.7</td>
<td>2.3</td>
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<tr>
<td>Ripple</td>
<td>dB</td>
<td>-</td>
<td>0.4</td>
<td>1.0</td>
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<tr>
<td>VSWR ANT</td>
<td></td>
<td>-</td>
<td>1.4</td>
<td>2.0</td>
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</tr>
<tr>
<td>VSWR Rx</td>
<td></td>
<td>-</td>
<td>1.5</td>
<td>2.0</td>
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</table>

### Attenuation:

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Unit</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>777 ~ 787 MHz</td>
<td>dB</td>
<td>50</td>
<td>62</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2400 ~ 2500 MHz</td>
<td>dB</td>
<td>40</td>
<td>45</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>787 ~ 6000 MHz</td>
<td>dB</td>
<td>23</td>
<td>28</td>
<td>-</td>
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</tr>
</tbody>
</table>

### Tx to Rx

<table>
<thead>
<tr>
<th>Parameters Description</th>
<th>Unit</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
<th>Note</th>
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<tbody>
<tr>
<td>Isolation</td>
<td>dB</td>
<td>52</td>
<td>58</td>
<td>-</td>
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<tr>
<td>777 ~ 787 MHz</td>
<td>dB</td>
<td>56</td>
<td>61</td>
<td>-</td>
<td></td>
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</tbody>
</table>

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

**Tx to Ant**

![Graph showing Tx to Ant frequency characteristics.]

**Ant to Rx**

![Graph showing Ant to Rx frequency characteristics.]

- Mk1: 777.0MHz, S21=-1.678dB
- Mk2: 787.0MHz, S21=-1.076dB
- Mk3: 746.0MHz, S21=-57.346dB
- Mk4: 756.0MHz, S21=-49.132dB

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TST DCC

Release document
Tx to Ant, Ant to Rx

![Graph showing Tx to Ant, Ant to Rx isolation](image)

- **Mk1**: 777.0 MHz
  - S21 = -1.678 dB
  - S31 = -60.115 dB
- **Mk2**: 787.0 MHz
  - S21 = -1.076 dB
  - S31 = -64.102 dB
- **Mk3**: 746.0 MHz
  - S21 = -57.340 dB
  - S31 = -1.436 dB
- **Mk4**: 756.0 MHz
  - S21 = -49.132 dB
  - S31 = -1.386 dB

Tx to Rx Isolation

![Graph showing Tx to Rx isolation](image)

- **Mk1**: 777.0 MHz
  - S22 = -72.918 dB
- **Mk2**: 787.0 MHz
  - S22 = -68.193 dB
- **Mk3**: 746.0 MHz
  - S22 = -69.444 dB
- **Mk4**: 756.0 MHz
  - S22 = -67.897 dB
Tx Port

[Graph showing VSWR and Frequency data for different markers with their corresponding frequencies and VSWR values.]

Mk1: 777.0 MHz
VSWR= 1.442
Mk2: 787.0 MHz
VSWR= 1.547
Mk3: 746.0 MHz
VSWR= 0.674
Mk4: 756.0 MHz
VSWR= 5.291

[Another graph showing S22 data with different markers and their corresponding values.]

Mk1: 777.0
S22= 0.268 -j 0.287
Mk2: 787.0
S22= 0.734 -j 0.267
Mk3: 746.0
S22= 0.115 -j 0.025
Mk4: 756.0
S22= 0.159 -j 0.012
Rx Port

![Graph of VSWR vs Frequency]

- Mk1: 777.0 MHz
  - VSWR3=69.125
- Mk2: 787.0 MHz
  - VSWR3=46.564
- Mk3: 746.0 MHz
  - VSWR3=1.293
- Mk4: 756.0 MHz
  - VSWR3=1.178

![Smith Chart]

- Mk1: 777.0
  - S33=0.830
- Mk2: 787.0
  - S33=0.341
- Mk3: 746.0
  - S33=0.913
- Mk4: 756.0
  - S33=0.972
Ant Port

![Graph showing VSWR vs Frequency]

- **Mk1**: 777.0 MHz
  - VSWR: 1.473
- **Mk2**: 787.0 MHz
  - VSWR: 1.381
- **Mk3**: 746.0 MHz
  - VSWR: 1.255
- **Mk4**: 756.0 MHz
  - VSWR: 1.215

![Smith chart showing S11 values for different frequencies]

- **Mk1**: S1 = 1.016 - j0.393
- **Mk2**: S1 = 1.303 + j0.213
- **Mk3**: S1 = 0.969 - j0.222
- **Mk4**: S1 = 0.685 - j0.103
Tx to Ant (Wide span)

Ant to Rx (Wide span)
D. MEASUREMENT CIRCUIT:

E. FOOTPRINT:
F. OUTLINE DRAWING: (Mass Production)

Marking name: J6
△: Date code (2016 May → s, ………., 2019 Dec → m.)
◇◇: Lot Code.
Product Date Code. Follow below table.

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<td>p</td>
<td>q</td>
<td>r</td>
<td>s</td>
<td>t</td>
<td>u</td>
<td>v</td>
<td>w</td>
<td>x</td>
<td>y</td>
<td>z</td>
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<tr>
<td>2017</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
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<td>H</td>
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<td>K</td>
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<td>M</td>
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<td>2018</td>
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<td>P</td>
<td>Q</td>
<td>R</td>
<td>S</td>
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<td>V</td>
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<td>X</td>
<td>Y</td>
<td>Z</td>
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<tr>
<td>2019</td>
<td>a</td>
<td>b</td>
<td>c</td>
<td>d</td>
<td>e</td>
<td>f</td>
<td>g</td>
<td>h</td>
<td>j</td>
<td>k</td>
<td>l</td>
<td>m</td>
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<tr>
<td>2020</td>
<td>n</td>
<td>p</td>
<td>q</td>
<td>r</td>
<td>s</td>
<td>t</td>
<td>u</td>
<td>v</td>
<td>w</td>
<td>x</td>
<td>y</td>
<td>z</td>
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<tr>
<td>2021</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
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<td>H</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
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</table>

**Pin Configuration**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Pin name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Rx</td>
<td>Receiver Pin</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>3</td>
<td>Tx</td>
<td>Transmitter Pin</td>
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<tr>
<td>4</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>6</td>
<td>ANT</td>
<td>Antenna Pin</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
<td>Ground Pin</td>
</tr>
</tbody>
</table>

Figure 1. Dimensions and Pin assignment
G. PACKING:

1. REEL DIMENSION
(Please refer to FR-75D10 for packing quantity)

2. TAPE DIMENSION
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 260°C +0/-5°C peak (20~40sec).
4. Time: 2 times.