



RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

SAW Components

SAW Duplexer for Smallcell

Band 13 (3G/LTE)

| | |
|----------------|-------------------|
| Series/type: | B8005 |
| Ordering code: | B39781B8005P810 |
| Date: | February 25, 2015 |
| Version: | 2.1 |

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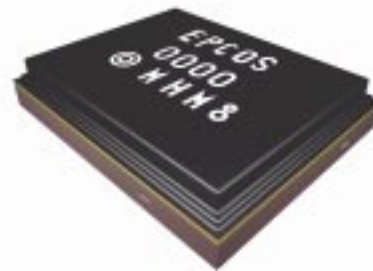
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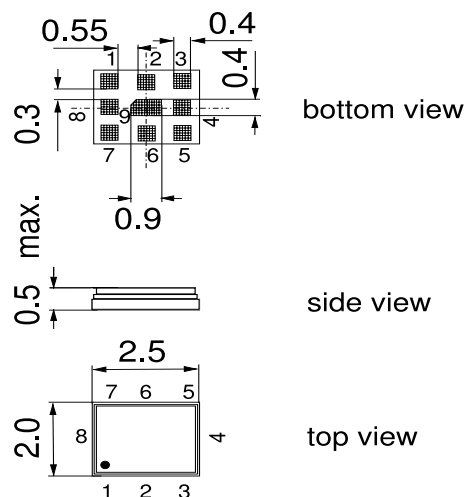
DataSheet

Application

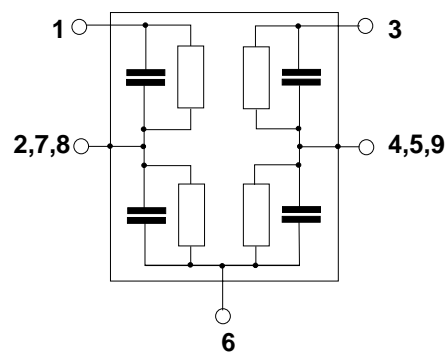
- Low-loss SAW duplexer for LTE smallcell systems (Band 13)
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 10 MHz
- High power durability
- Industrial qualification
- Rx = Uplink = 777-787 MHz
- Tx = Downlink = 746-756 MHz


Features

- Package size 2.5 * 2.0 * 0.5 mm³
- max. Package height 0.5 mm
- RoHS compatible
- Package for **Surface Mount Technology (SMT)**
- Ni, Au-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- Moisture Sensity Level 3


Pin configuration

- 3 RX output
- 1 TX input
- 6 Antenna
- 2, 4, 5, 7, 8, 9 To be grounded



DataSheet

Characteristics

| | |
|--------------------------------------|----------------------------------|
| Temperature range for specification: | T = -10 °C to +85 °C |
| Antenna terminating impedance: | Z _{ANT} = 50 Ω 17 nH |
| RX terminating impedance: | Z _{RX} = 50 Ω |
| TX terminating impedance: | Z _{TX} = 50 Ω |

| Characteristics ANT - RX | | min. | typ. @ 25 °C | max. | |
|--|-------------------|------|-----------------|------|-----|
| Center frequency | f _C | | 782.0 | | MHz |
| Maximum insertion attenuation 777.0 ... 787.0 MHz | α _{max} | - | 1.9 | 2.5 | dB |
| Amplitude ripple (p-p) 777.0 ... 787.0 MHz | Δα | - | 0.6 | 1.5 | dB |
| Error Vector Magnitude @f _{carrier} 779.5 ... 784.5 MHz | EVM ¹⁾ | - | 2.2 | 3.0 | % |
| Input VSWR (ANT port) 777.0 ... 787.0 MHz | | - | 1.5 | 1.8 | |
| Output VSWR (RX port) 777.0 ... 787.0 MHz | | - | 1.6 | 1.8 | |
| Attenuation | α | | | | |
| 10.0 ... 150.0 MHz | | 40 | 55 | - | dB |
| 150.0 ... 350.0 MHz | | 35 | 45 | - | dB |
| 350.0 ... 650.0 MHz | | 30 | 37 | - | dB |
| 728.0 ... 746.0 MHz | | 35 | 50 | - | dB |
| 746.0 ... 756.0 MHz | | 50 | 57 | - | dB |
| 758.0 ... 768.0 MHz | | 28 | 30 | - | dB |
| 808.0 ... 818.0 MHz | | 35 | 47 | - | dB |
| 859.0 ... 894.0 MHz | | 35 | 45 | - | dB |
| 1452.0 ... 1492.0 MHz | | 40 | 52 | - | dB |
| 1554.0 ... 1574.0 MHz | | 40 | 52 | - | dB |
| 1574.0 ... 1606.0 MHz | | 45 | 52 | - | dB |
| 1670.0 ... 1675.0 MHz | | 40 | 50 | - | dB |
| 1930.0 ... 1995.0 MHz | | 40 | 48 | - | dB |
| 2110.0 ... 2170.0 MHz | | 40 | 49 | - | dB |
| 2300.0 ... 2361.0 MHz | | 28 | 33 | - | dB |
| 2361.0 ... 2690.0 MHz | | 30 | 42 | - | dB |
| 3300.0 ... 3800.0 MHz | | 15 | 22 | - | dB |
| 5150.0 ... 5850.0 MHz | | 5 | 12 | - | dB |

¹⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141

DataSheet

Characteristics

| | |
|--------------------------------------|----------------------------------|
| Temperature range for specification: | T = -10 °C to +85 °C |
| Antenna terminating impedance: | Z _{ANT} = 50 Ω 17 nH |
| RX terminating impedance: | Z _{RX} = 50 Ω |
| TX terminating impedance: | Z _{TX} = 50 Ω |

| Characterisitcs TX - ANT | | min. | typ. @ 25 °C | max. | |
|--|-------------------|------|-----------------|------|-----|
| Center frequency | f _C | | 751.0 | | MHz |
| Maximum insertion attenuation 746.0 ... 756.0 MHz | α _{max} | - | 1.6 | 2.0 | dB |
| Amplitude ripple (p-p) 746.0 ... 756.0 MHz | Δα | - | 0.4 | 1.0 | dB |
| Error Vector Magnitude @f _{carrier} 748.5 ... 753.5 MHz | EVM ¹⁾ | - | 1.6 | 2.5 | % |
| Input VSWR (TX port) 746.0 ... 756.0 MHz | | - | 1.5 | 1.8 | |
| Output VSWR (ANT port) 746.0 ... 756.0 MHz | | - | 1.4 | 1.8 | |
| Attenuation | α | | | | |
| 10.0 ... 150.0 MHz | | 40 | 55 | - | dB |
| 150.0 ... 350.0 MHz | | 35 | 45 | - | dB |
| 350.0 ... 650.0 MHz | | 30 | 38 | - | dB |
| 698.0 ... 716.0 MHz | | 35 | 38 | - | dB |
| 716.0 ... 722.0 MHz | | 38 | 43 | - | dB |
| 777.0 ... 787.0 MHz | | 54 | 58 | - | dB |
| 788.0 ... 798.0 MHz | | 45 | 52 | - | dB |
| 798.0 ... 849.0 MHz | | 35 | 43 | - | dB |
| 1492.0 ... 1543.0 MHz | | 35 | 39 | - | dB |
| 1554.0 ... 1574.0 MHz | | 35 | 39 | - | dB |
| 1574.0 ... 1606.0 MHz | | 35 | 40 | - | dB |
| 1710.0 ... 1770.0 MHz | | 35 | 40 | - | dB |
| 1850.0 ... 1915.0 MHz | | 35 | 40 | - | dB |
| 1920.0 ... 1980.0 MHz | | 35 | 40 | - | dB |
| 2200.0 ... 2690.0 MHz | | 33 | 38 | - | dB |
| 2690.0 ... 3800.0 MHz | | 25 | 43 | - | dB |
| 5150.0 ... 5850.0 MHz | | 5 | 25 | - | dB |

¹⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141

DataSheet

Characteristics

| | |
|--------------------------------------|----------------------------------|
| Temperature range for specification: | T = -10 °C to +85 °C |
| Antenna terminating impedance: | Z _{ANT} = 50 Ω 17 nH |
| RX terminating impedance: | Z _{RX} = 50 Ω |
| TX terminating impedance: | Z _{TX} = 50 Ω |

| Characteristics TX-RX | | | | min. | typ. @ 25 °C | max. | |
|-----------------------|-----------------|-----|---|------|-----------------|------|----|
| Attenuation | | | α | | | | |
| | 746.0 ... 756.0 | MHz | | 50 | 60 | - | dB |
| | 777.0 ... 787.0 | MHz | | 52 | 58 | - | dB |

Maximum Ratings

| | | | | |
|---|------------------|------------------|-----|---|
| Storage temperature range | T _{stg} | -40/+85 | °C | |
| DC voltage | V _{DC} | 0 | V | |
| ESD voltage | V _{ESD} | 50 ¹⁾ | V | machine model, 1 pulse |
| Input power at pin 1 | | | | source and load impedance 50 Ω |
| 746.0 ...756.0 MHz | P _{in} | 28 ²⁾ | dBm | } Pin 28 dBm average - 39 dBm peak LTE 5 MHz downlink T = 55 °C, 100.000 h |
| elsewhere | P _{in} | 10 | dBm | |
| Operating lifetime with Output power at antenna | | | | source and load impedance 50 Ω |
| 746.0 ...756.0 MHz | P _{out} | 24 ³⁾ | dBm | Continuous wave T=55 °C, 100khrs |

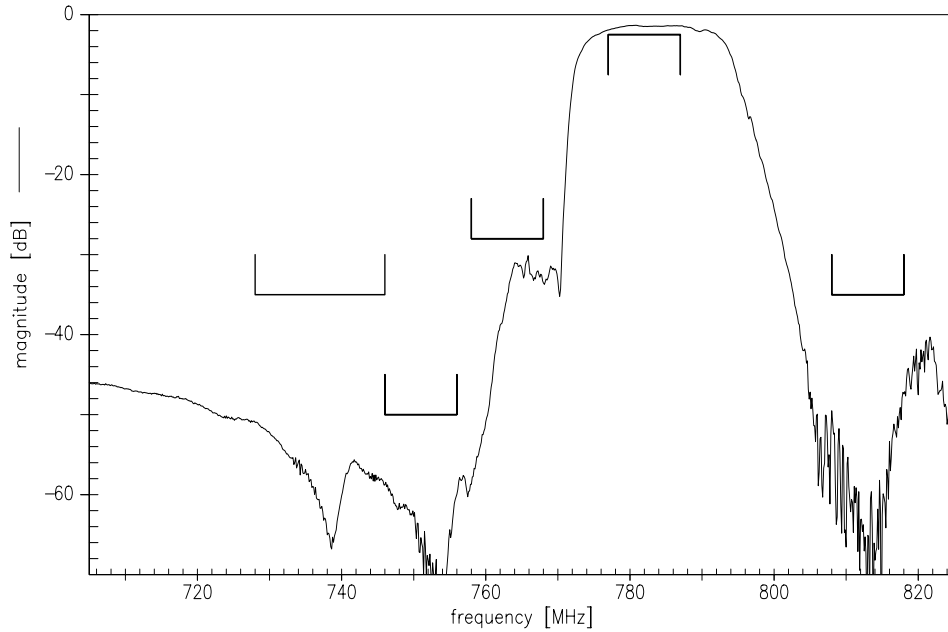
1) According to JESD22-A115A (machine model), 1 negative and 1 positive pulses.

2) Time to failure (TTDF) according to accelerated power durability tests, and wear out models.

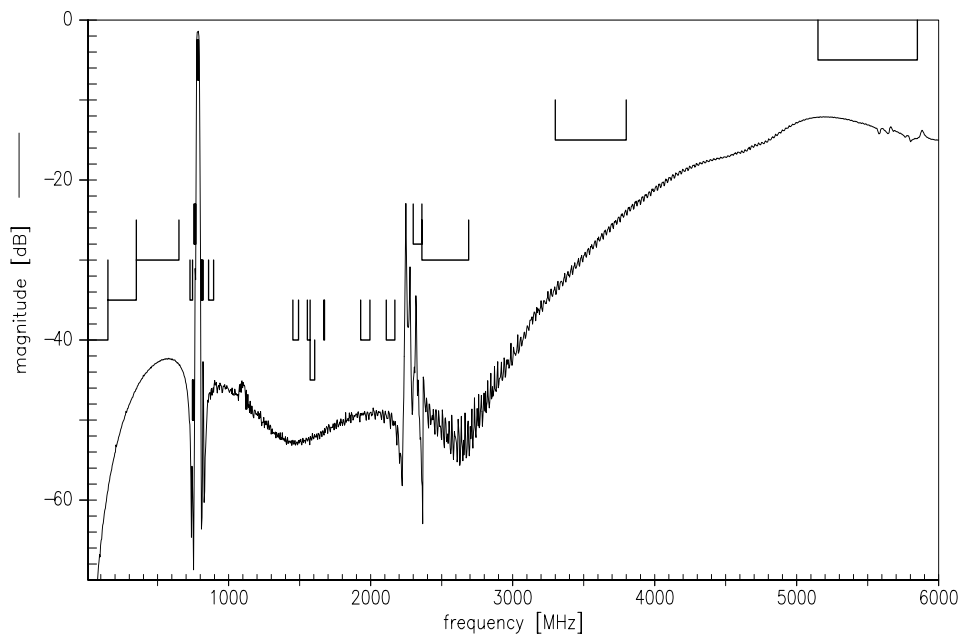
3) according to accelerated High Temperature Operating Life (HTOL) test.



Frequency Response ANT-RX

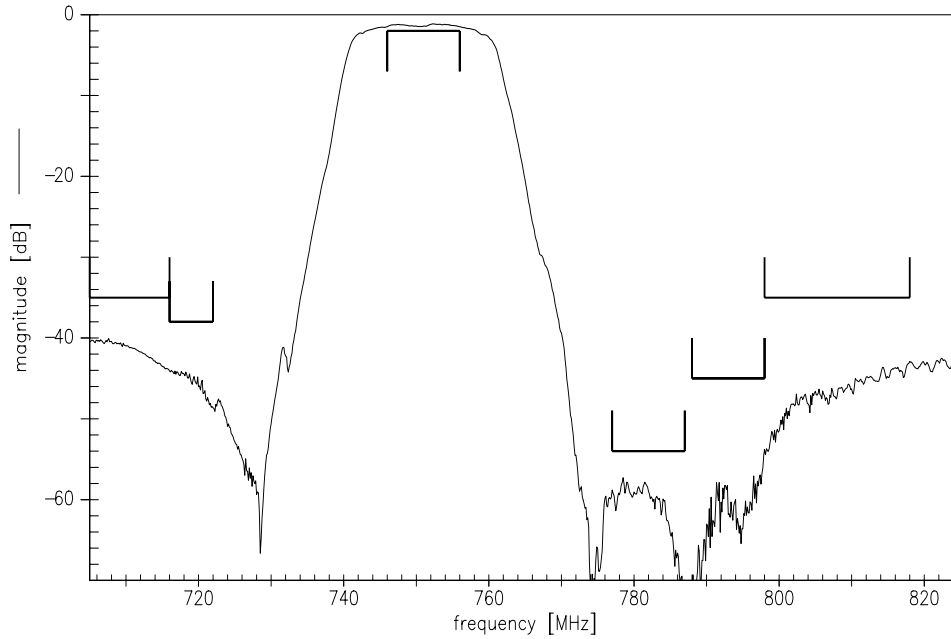


Frequency Response ANT-RX

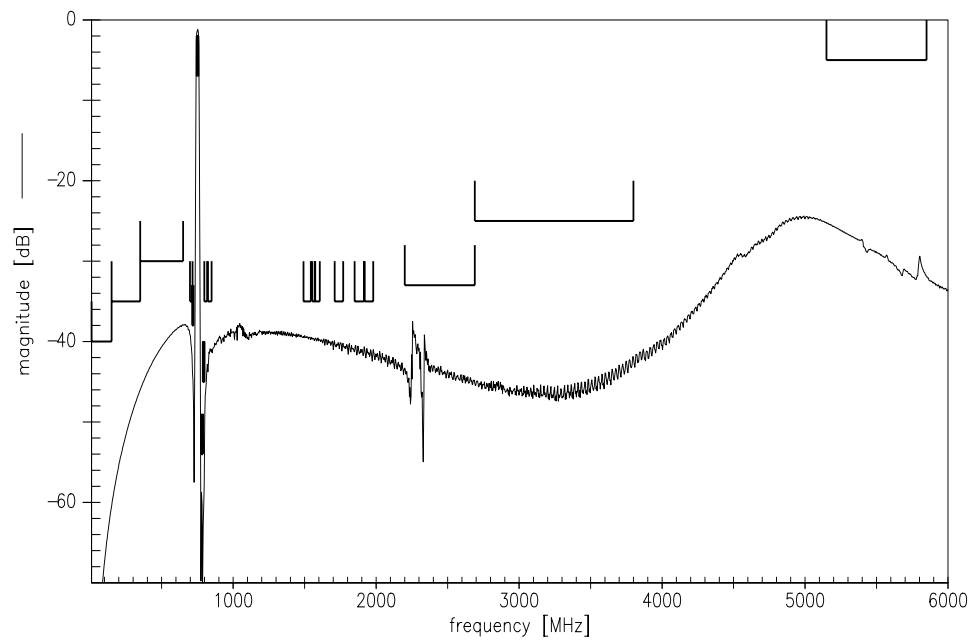




Frequency Response TX-ANT



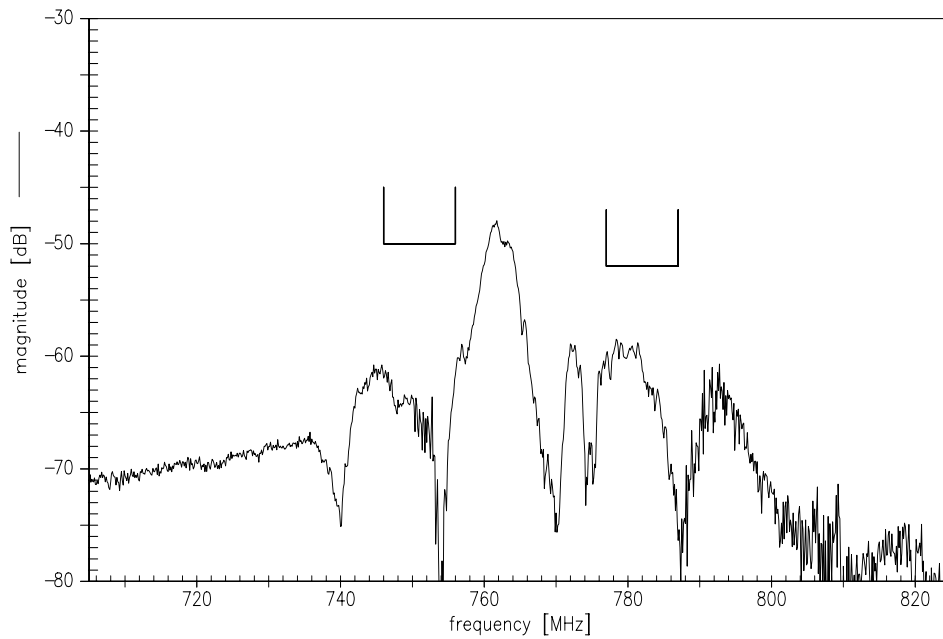
Frequency Response TX-ANT



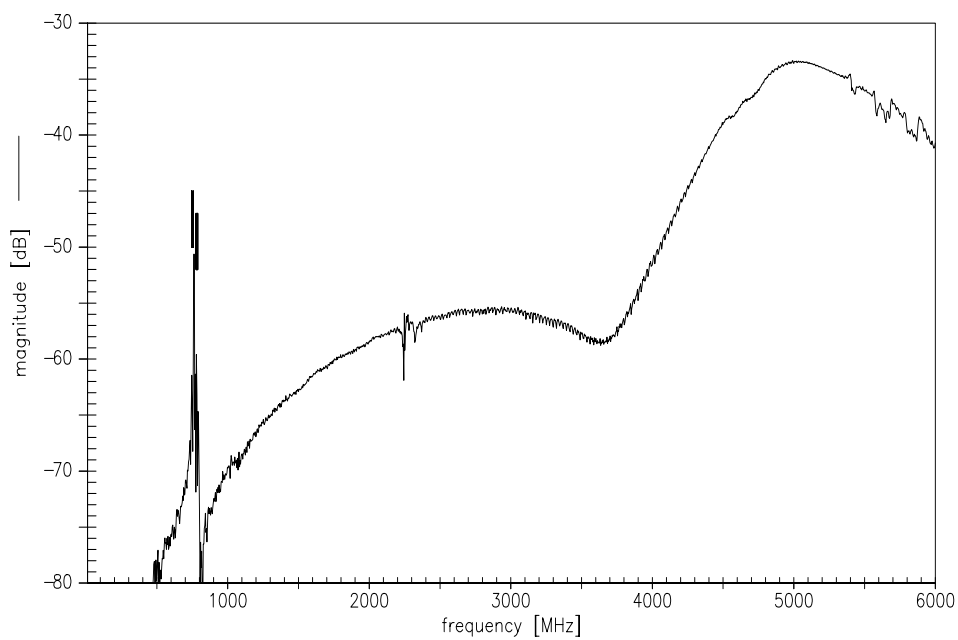
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Frequency Response TX-RX



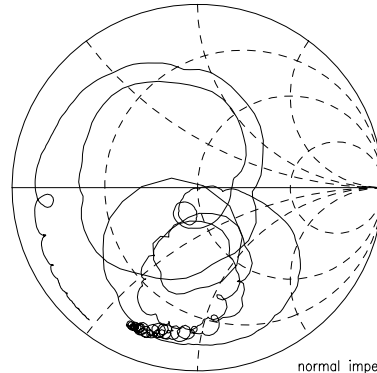
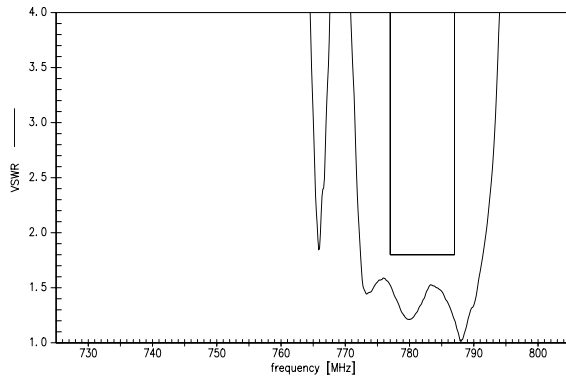
Frequency Response TX-RX



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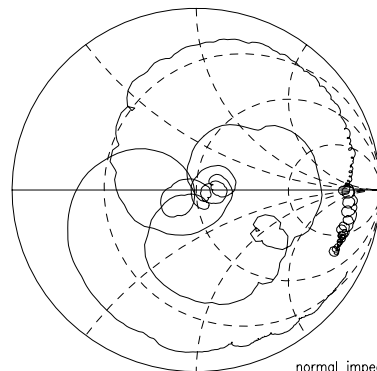
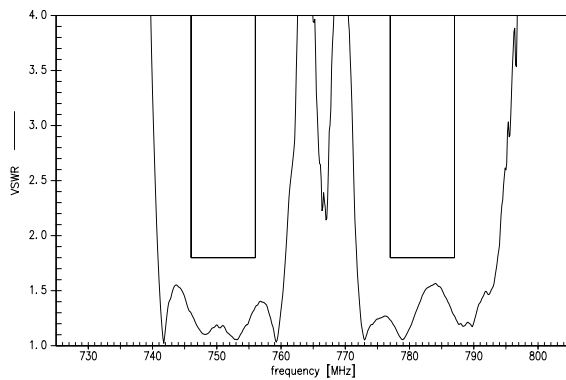


S11 VSWR (RX)



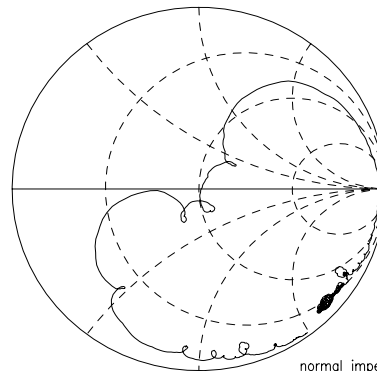
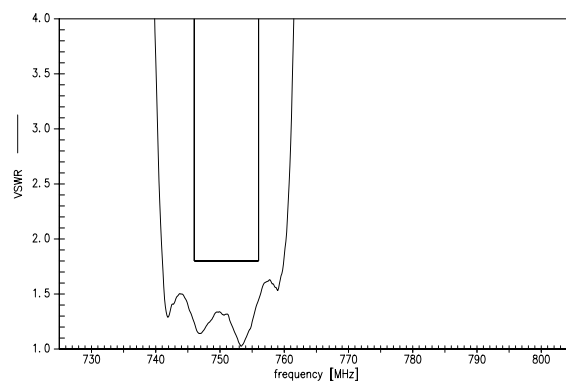
normal impedance: 50.00 Ω

S22 VSWR (ANT)



normal impedance: 50.00 Ω

S33 VSWR (TX)

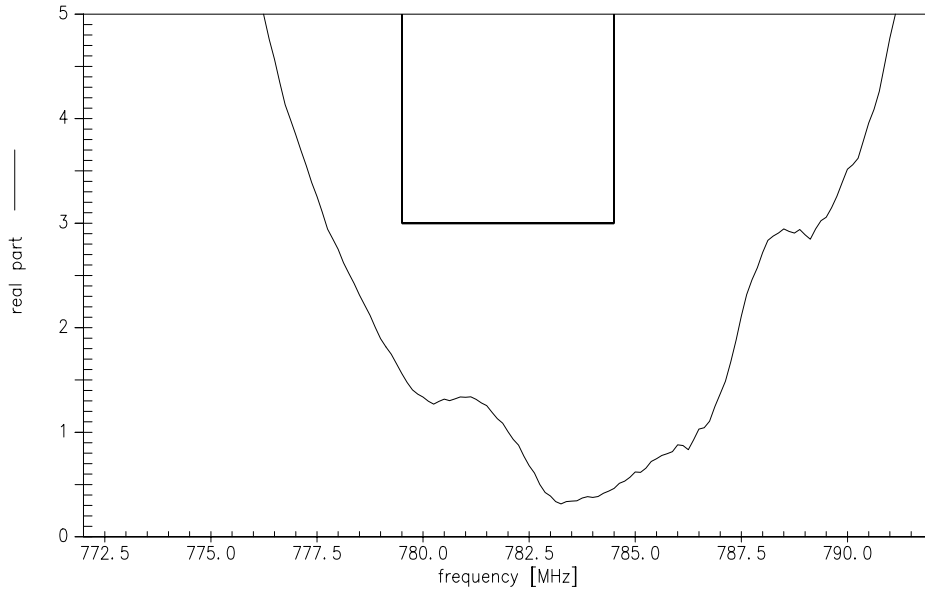


normal impedance: 50.00 Ω

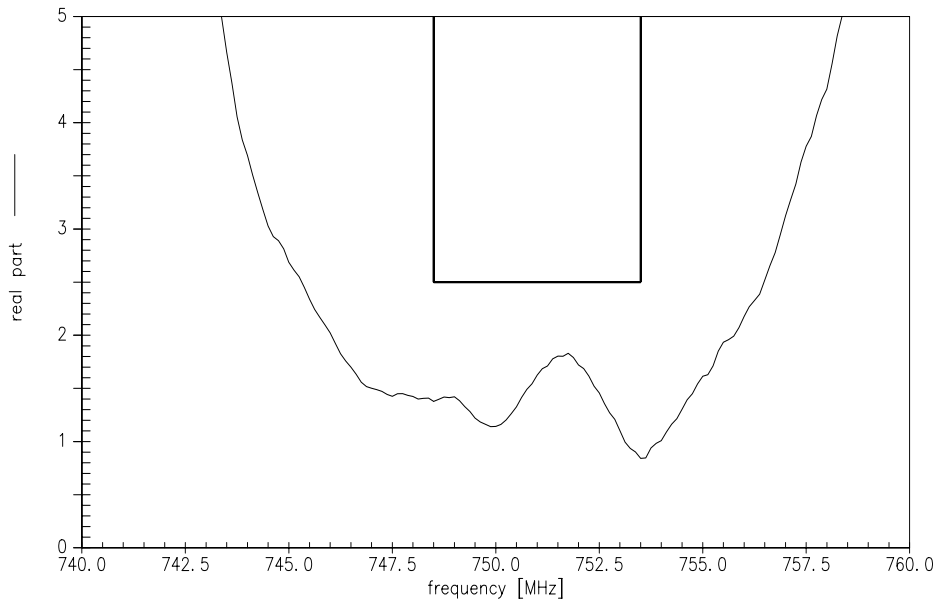
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EVM RX



EVM TX



| | |
|-----------------------|--------------------------|
| SAW Components | B8005 |
| SAW Duplexer | 782.0 / 751.0 MHz |

DataSheet



References

| | |
|----------------------------|---|
| Type | B8005 |
| Ordering code | B39781B8005P810 |
| Marking and package | C61157-A3-A27 |
| Packaging | F61074-V8232-Z000 |
| Date codes | L_1126 |
| S-parameters | B8005_NB.s3p, B8005_WB.s3p See file header for port/pin assignment table |
| Soldering profile | S_6001 |
| RoHS compatible | RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8 th , 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases. |
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| Matching coils | See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm |

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