SAW Components

SAW Duplexer for Smallcell

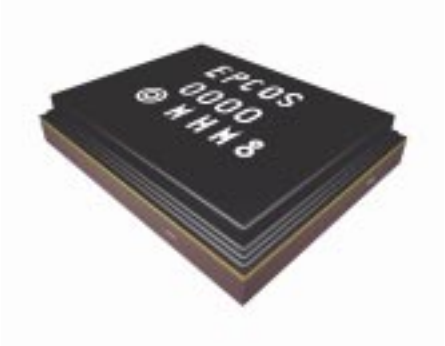
Band 13 (3G/LTE)

Series/type:	**B8006**
Ordering code:	**B39781B8006P810**
Date:	February 25, 2015
Version:	2.1

DataSheet SMD

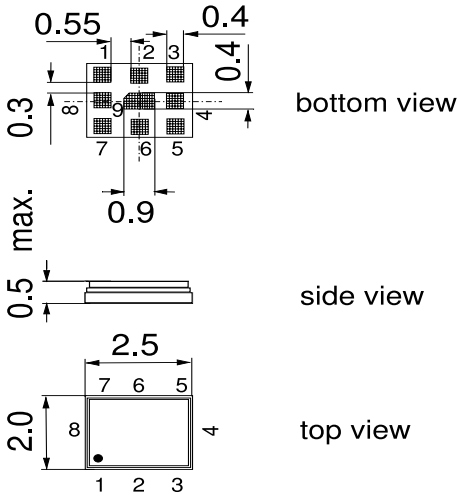
Application

- 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



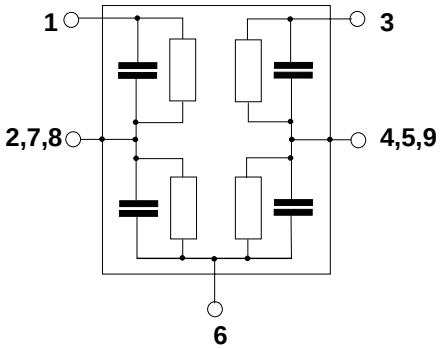
Features

- Package size 2.5 * 2.0 * 0.5 mm^3
- max. Package height 0.5 mm
- RoHS compatible
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, Au-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- Moisture Sentivity Level 3



Pin configuration

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



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 ANT - RX				min.	typ. @ 25 ˚C	max.	
Center frequency		f_C			782.0		MHz
Maximum insertion attenuation		α_{max}					
777.0 ... 787.0	MHz			-	1.9	2.5	dB
Amplitude ripple (p-p)		$\Delta\alpha$					
777.0 ... 787.0	MHz			-	0.6	1.5	dB
Error Vector Magnitude		EVM[1)]					
@$f_{carrier}$ 779.5 ... 784.5	MHz			-	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 SMD

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		α_{max}					
746.0 ... 756.0	MHz			-	1.6	2.0	dB
Amplitude ripple (p-p)		$\Delta\alpha$					
746.0 ... 756.0	MHz			-	0.4	1.0	dB
Error Vector Magnitude		EVM[1)]					
@$f_{carrier}$ 748.5 ... 753.5	MHz			-	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

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

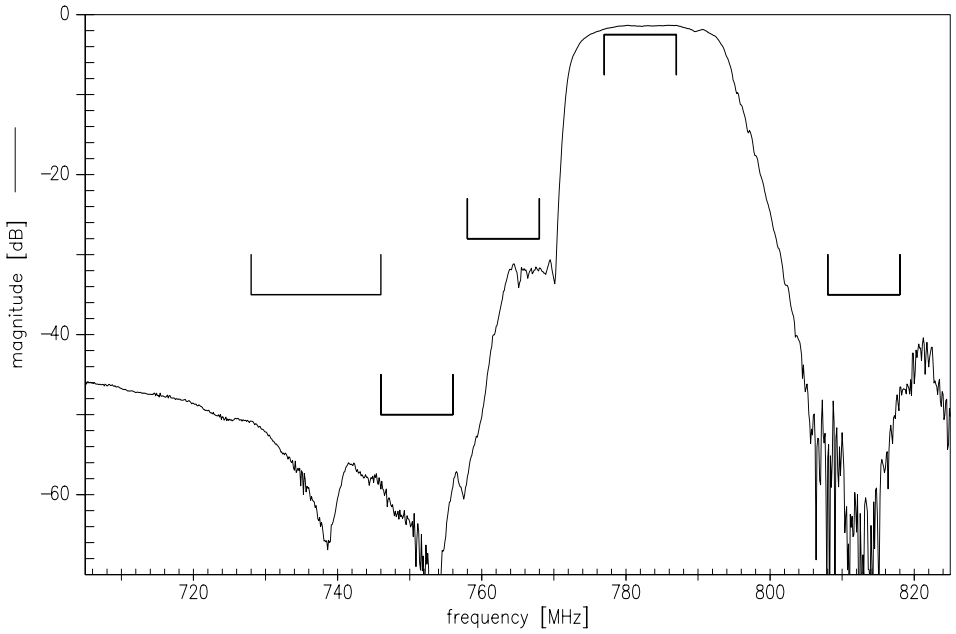
Characteristics TX-RX				min.	typ. @ 25 ˚C	max.	
Attenuation			α				
746.0 ...	756.0	MHz		50	60	-	dB
777.0 ...	787.0	MHz		52	58	-	dB

Maximum Ratings

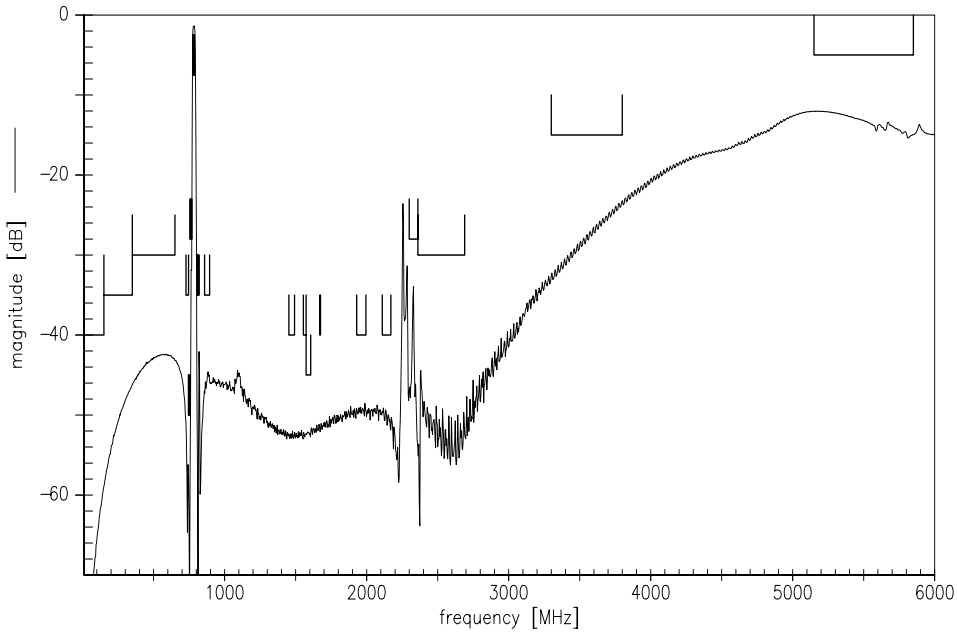
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	0	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 1 pulse
Input power at pin 1				source and load impedance 50 Ω
746.0 ...756.0 MHz	P_{in}	28[2)]	dBm	Pin 28 dBm average - 39 dBm peak LTE 5 MHz downlink T = 55˚C, 100.000 h
elsewhere	P_{in}	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.

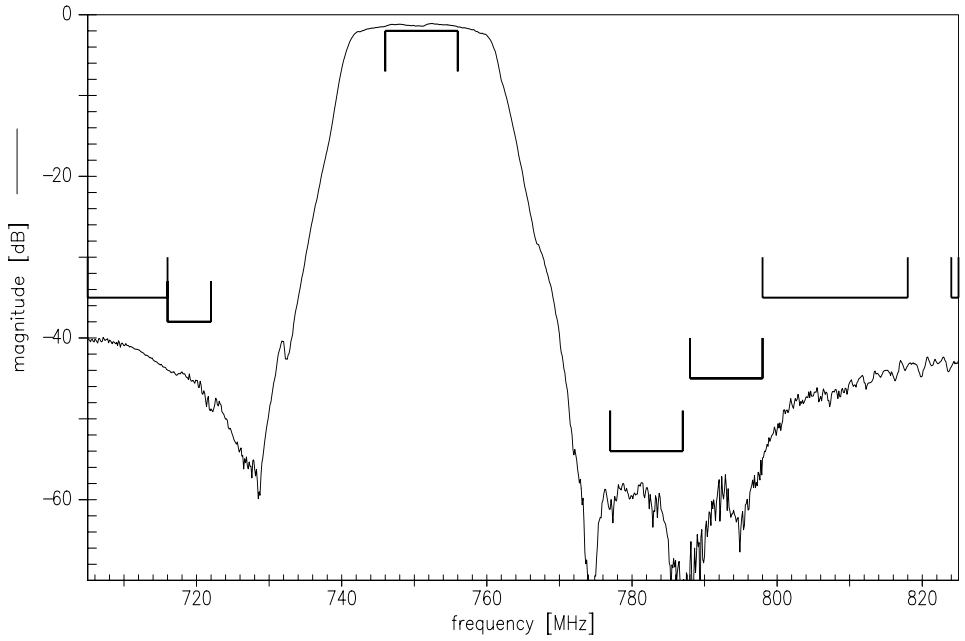
Frequency Response ANT-RX



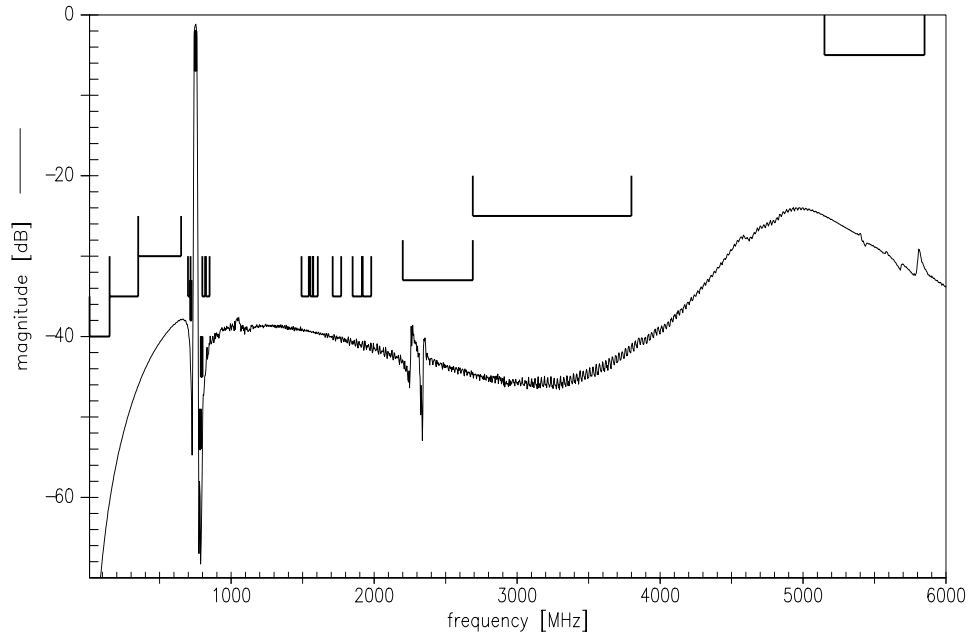
Frequency Response ANT-RX



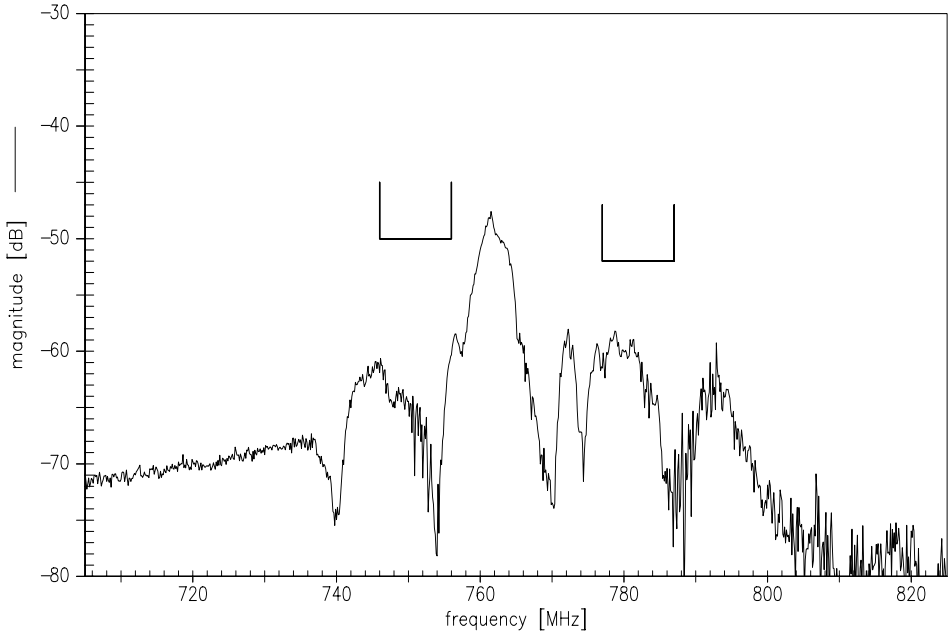
Frequency Response TX-ANT



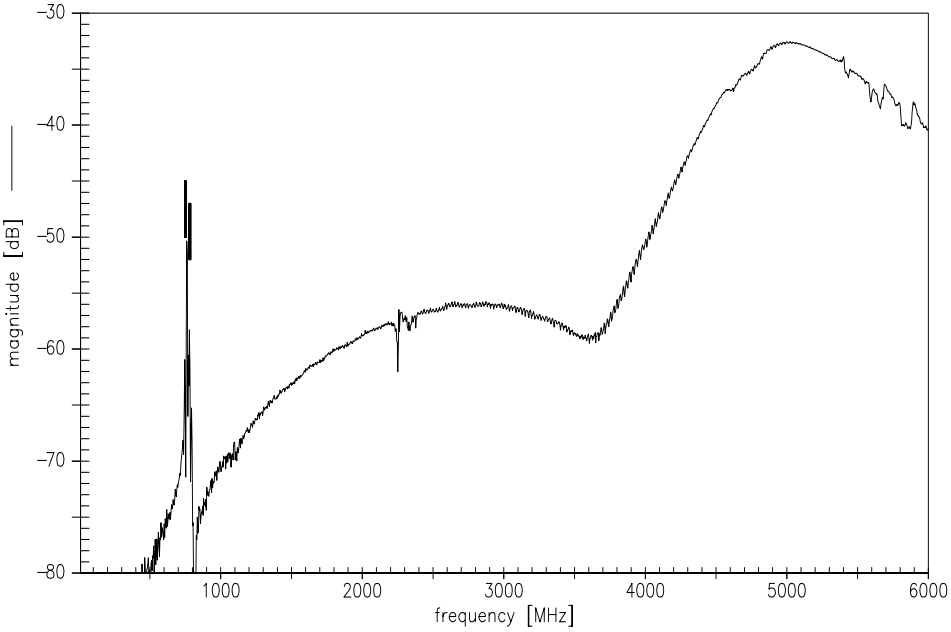
Frequency Response TX-ANT



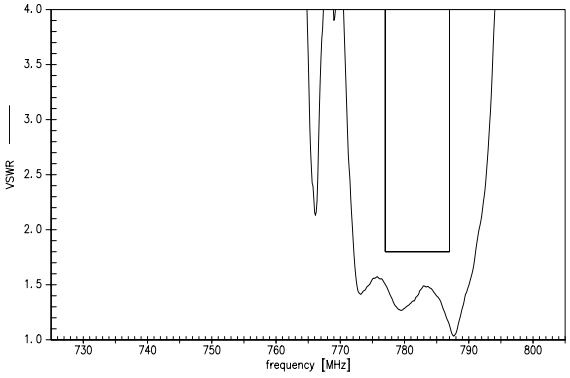
Frequency Response TX-RX

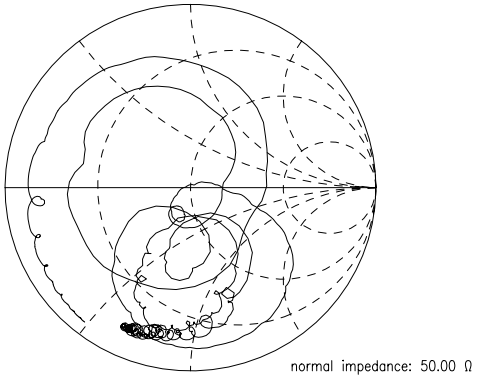


Frequency Response TX-RX

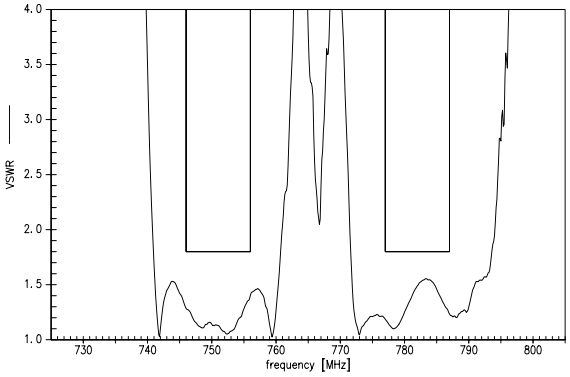


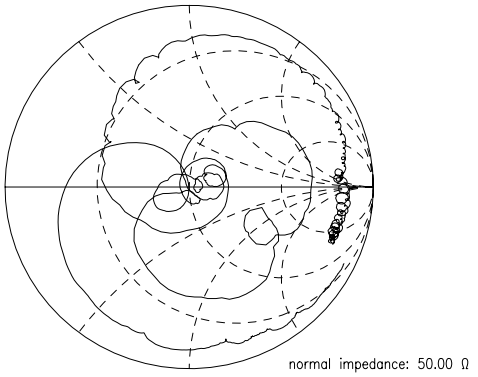
S11 VSWR (RX)



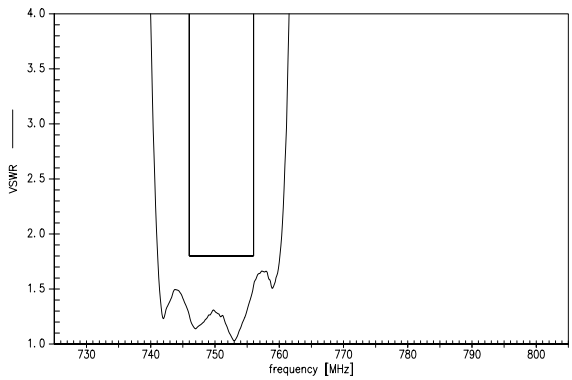


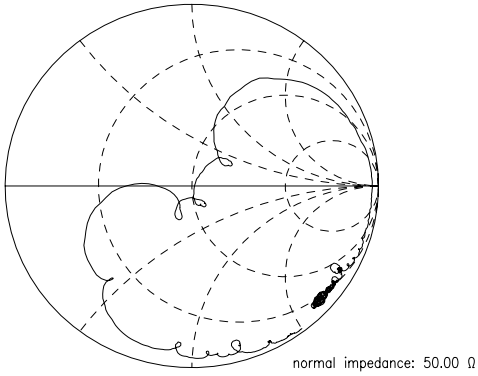
S22 VSWR (ANT)



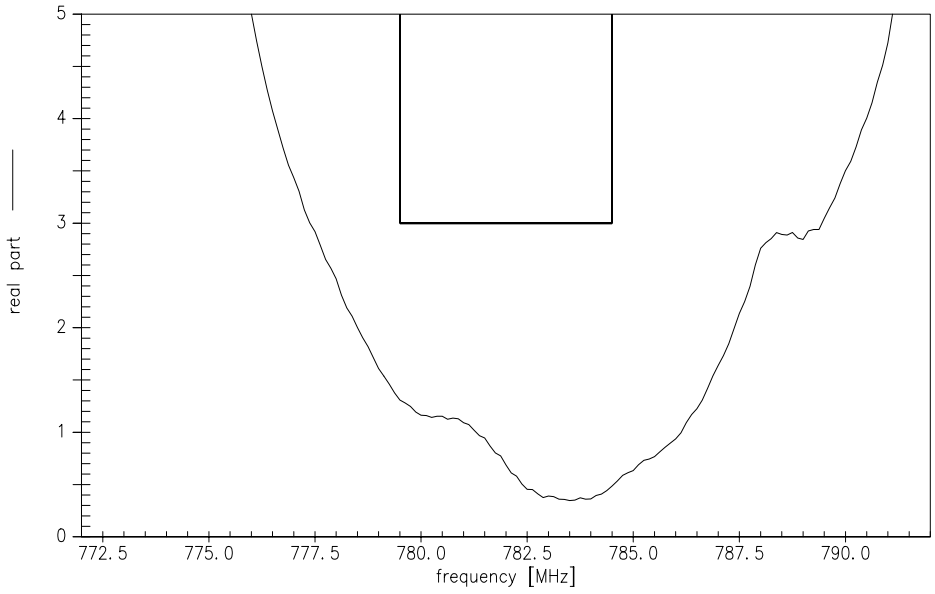


S33 VSWR (TX)

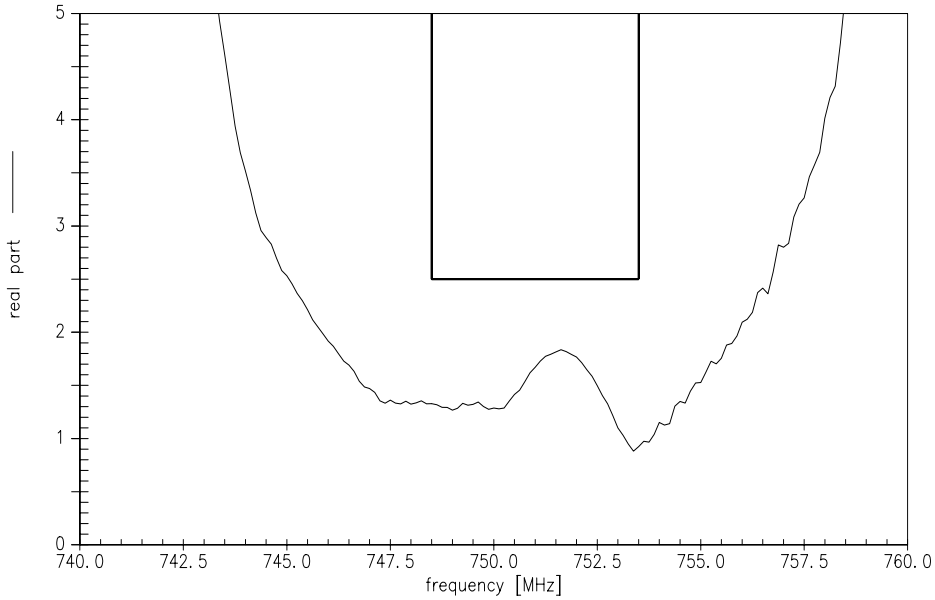




EVM RX


real part
frequency [MHz]
0
1
2
3
4
5
772.5
775.0
777.5
780.0
782.5
785.0
787.5
790.0

EVM TX


real part
frequency [MHz]
0
1
2
3
4
5
740.0
742.5
745.0
747.5
750.0
752.5
755.0
757.5
760.0

References

Type	B8006
Ordering code	B39781B8006P810
Marking and package	C61157-A3-A27
Packaging	F61074-V8232-Z000
Date codes	L_1126
S-parameters	B8006_NB.s3p, B8006_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 8th, 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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