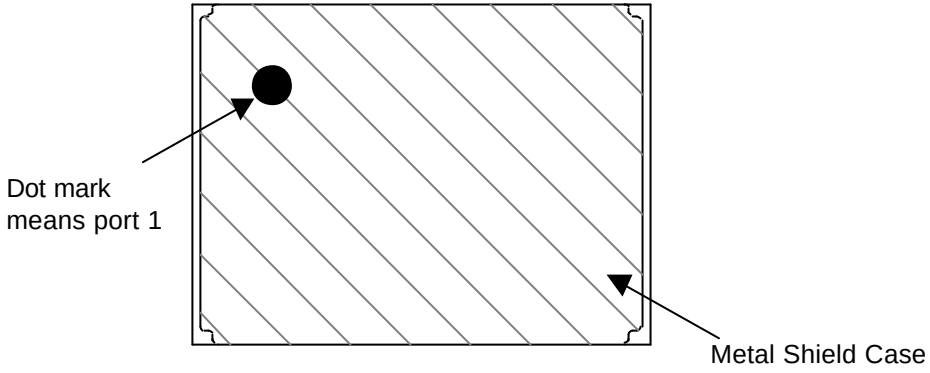
P/N	ESHS-M085TQ	DATE	26-Nov-2004
DWN.	*Shinichirou Takeuchi*	DATA-No.	2MT43556

GSM850 / GSM900 / DCS / PCS Quad Band Antenna Switch Module

Sample plot data with network analyzer

- Model No : ESHS-M085TQ (version I)

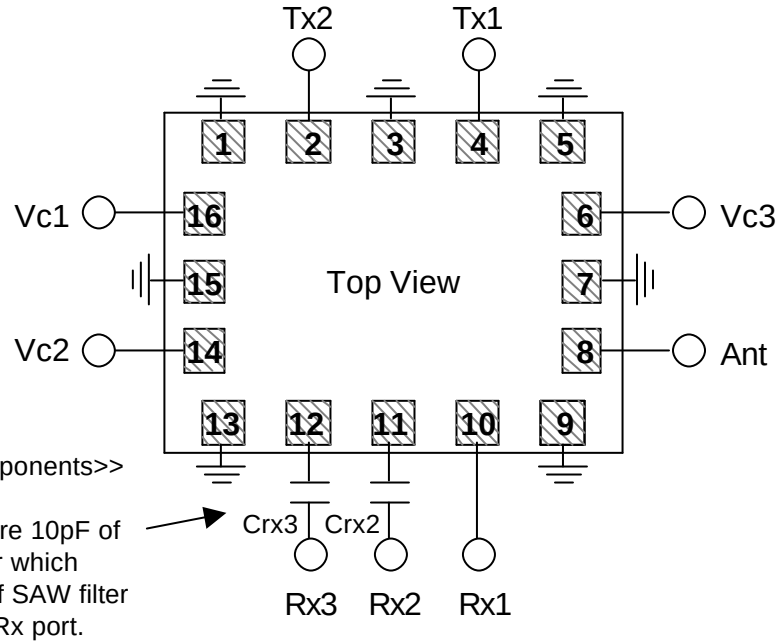
- Measurement Equipment : Network Analyzer
  8753E upto 6GHz
  8720ES upto 13GHz
- Input power : +10dBm
- Unused ports are loaded with 50 ohm terminator
- ESD protection circuit is placed at Rx1 port.



Logic & Current

	VC1	VC2	VC3	Current
TX1 mode	0V	0V	2.6V	8.0mA
TX2 mode [Type1]	2.6V	2.6V	0V	8.8mA
[Type2]	2.6V	0V	0V	8.0mA
RX1mode	0V	0V	0V	<0.1mA
RX2mode	0V	0V	0V	<0.1mA
RX3mode	0V	2.6V	0V	0.8mA

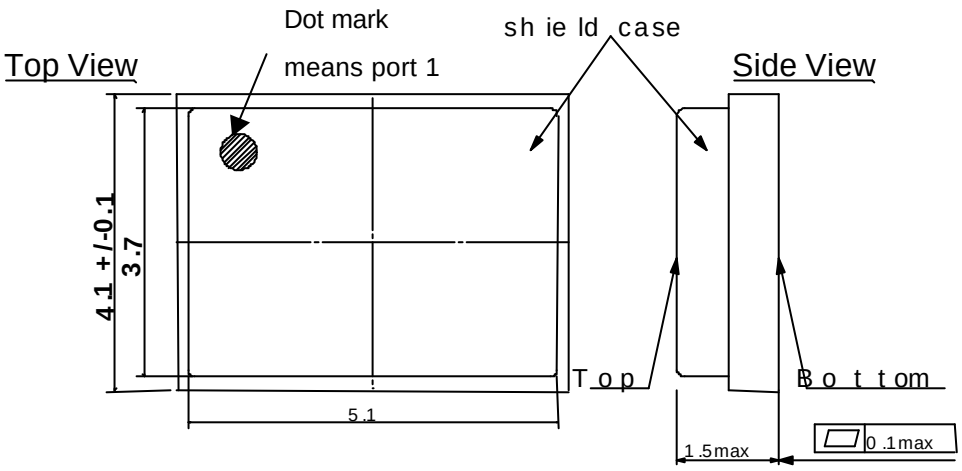
Type1 or Type2 Logic is available at TX2 mode

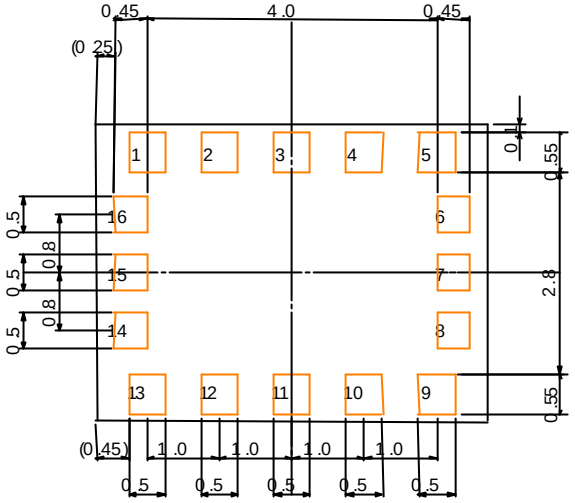


TX1 : GSM850 / GSM900_TX
TX2 : DCS / PCS_TX
RX1 : GSM850 / GSM900_RX
RX2 : DCS_RX
RX3 : PCS_RX

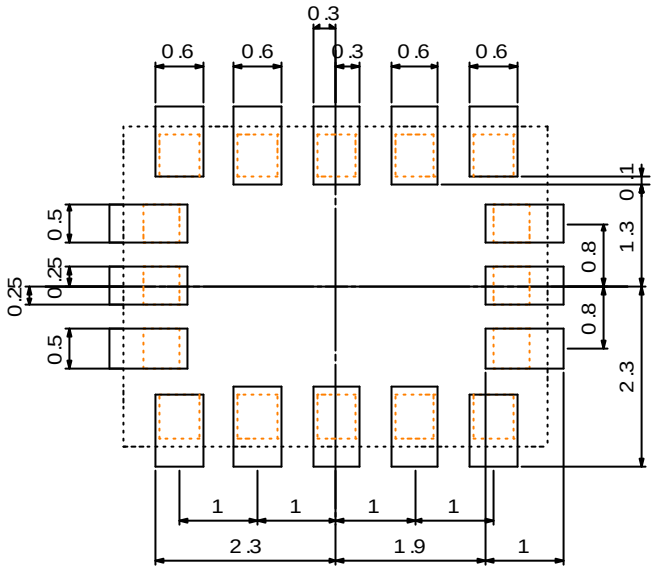
<<External Components>>
Nothing.
Crx2 and Crx3 are 10pF of DC cut capacitor which are not needed if SAW filter is connected to Rx port.

Shape & Size





Foot Pattern on PCB
(Same as conventional foot pattern)



Pin Layout

Port1	GND	Port9	GND
Port2	TX2 [DCS/PCS TX]	Port10	RX1 [GSM850/900 RX]
Port3	GND	Port11	RX2 [DCS RX]
Port4	TX1 [GSM850/900 TX]	Port12	RX3 [PCS RX]
Port5	GND	Port13	GND
Port6	VC3	Port14	VC2
Port7	GND	Port15	GND
Port8	ANT	Port16	VC1

Specification in TX-side

TX MODE	Parameter	Freq.(MHz)		unit	Temporary Specification based on Version I		Test Condition
		min	max		min	max	
GSM850/900_TX (TX1 mode)	Insertion Loss @+25 deg.C.	824	915	dB		1.4	Measured with network analyzer at +10 dBm level,measurement port and other ports should be terminated 50 ohm.
	-20 to +75 deg.C.	824	915	dB		1.6	
	Attenuation	1648	1830	dB	30		
		2472	2745	dB	25		
		3296	3660	dB	25		
	VSWR @EGSM_TX port	824	915			1.50	
	@ANT port	824	915			1.50	
	Isolation TX1 -> RX1	824	915	dB	20		
	TX1 -> RX2	824	915	dB	25		
	TX1 -> RX3	824	915	dB	30		
	Harmonics Generation	1648	1830	dBc		-70	Pin = +35 dBm
		2472	2745	dBc		-70	
	Permissible input power	-	-	dBm		35	Peak
	Current consumption	-	-	mA		10	-
DCS/PCS_TX (TX2 mode) Type1	Insertion Loss @+25 deg.C.	1710	1910	dB		1.7	Measured with network analyzer at +10 dBm level,measurement port and other ports should be terminated 50 ohm.
	-20 to +75 deg.C.	1710	1910	dB		1.9	
	Attenuation	3420	3820	dB	25		
		5130	5730	dB	30		
	VSWR @DCS/PCS_TX port	1710	1910			1.80	
	@ANT port	1710	1910			1.80	
	Isolation TX2 -> RX1	1710	1910	dB	15		
	TX2 -> RX2	1710	1910	dB	25		
	TX2 -> RX3	1710	1910	dB	15		
	Harmonics Generation	3420	3820	dBc		-67	Pin = +32 dBm
		5130	5730	dBc		-67	
	Permissible input power	-	-	dBm		32	Peak
	Current consumption	-	-	mA		11	

Specification in RX-side

RX MODE	Parameter	Freq.(MHz)		unit	Temporary Specification based on Version I		Test Condition
		min	max		min	max	
GSM850/900_RX (RX1 mode)	Insertion Loss @+25 deg.C.	869	960	dB		1.6	Measured with network analyzer at +10 dBm level, measurement port and other ports should be terminated 50 ohm.
	-20 to +75 deg.C.	869	960	dB		1.8	
	VSWR @ANT port	869	960			2.0	
	@GSM850/EGSM_RX port	869	960			2.0	
	Current consumption	-	-	uA		10	-
	Permissible input power	-	-	dBm		+10	
DCS_RX (RX2 mode)	Insertion Loss @+25 deg.C.	1805	1880	dB		1.5	Measured with network analyzer at +10 dBm level,measurement port and other ports should be terminated 50 ohm.
	-20 to +75 deg.C.	1805	1880	dB		1.7	
	VSWR @ANT port	1805	1880			1.8	
	@DCS_RX port	1805	1880			1.8	
	Current consumption	-	-	uA		10	-
	Permissible input power	-	-	dBm		+10	
PCS_RX (RX3 mode)	Insertion Loss @+25 deg.C.	1930	1990	dB		1.6	Measured with network analyzer at +10 dBm level,measurement port and other ports should be terminated 50 ohm.
	-20 to +75 deg.C.	1930	1990	dB		1.8	
	VSWR @ANT port	1930	1990			1.8	
	@PCS_RX port	1930	1990			1.8	
	Current consumption	-	-	mA		1.0	-
	Permissible input power	-	-	dBm		+10	

Tx1 Attenuation , Insertion Loss

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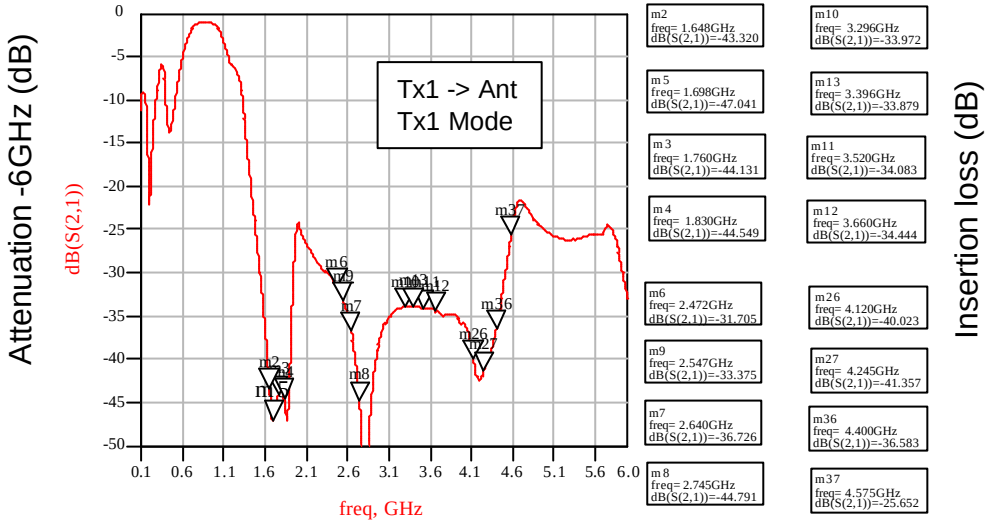
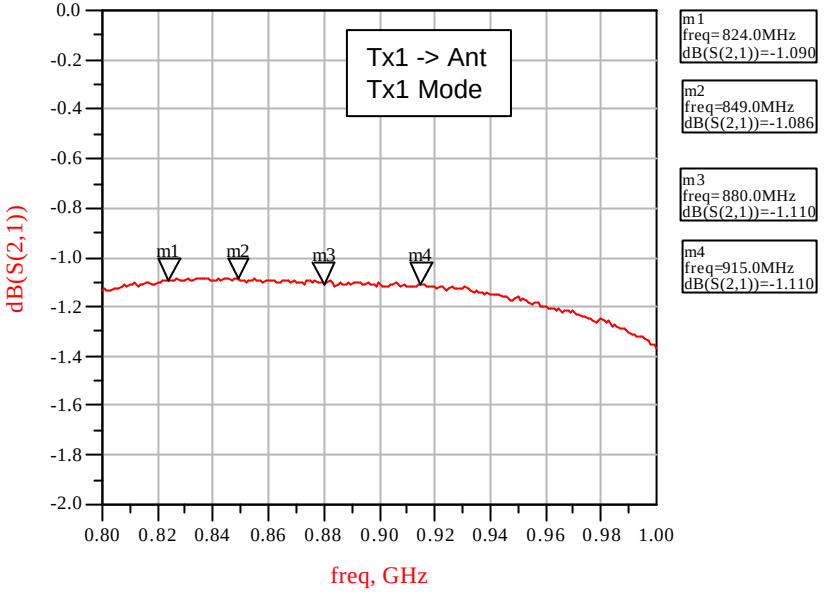
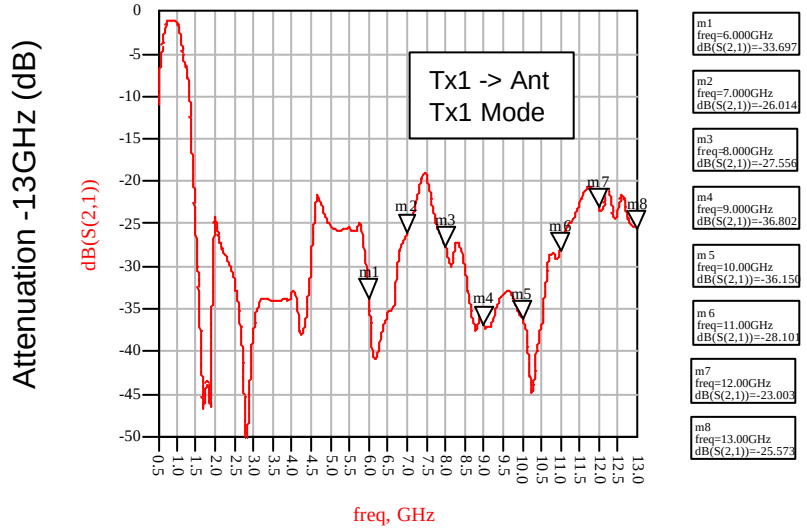


Insertion loss (dB)





Tx1 VSWR

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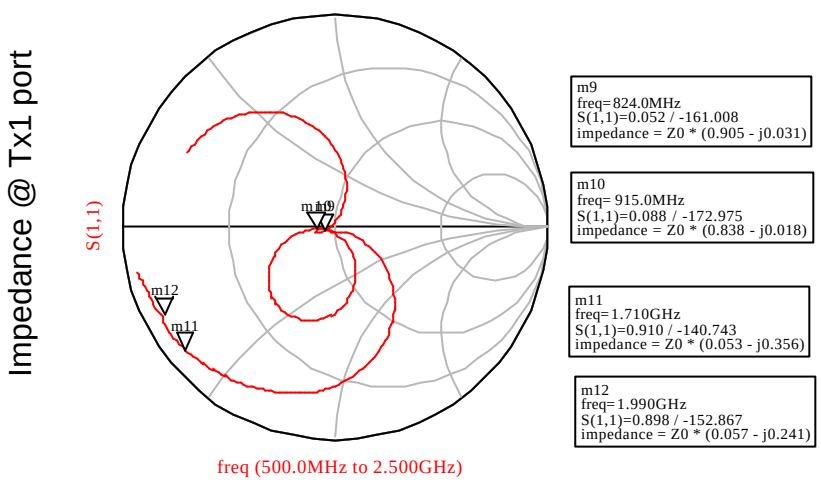
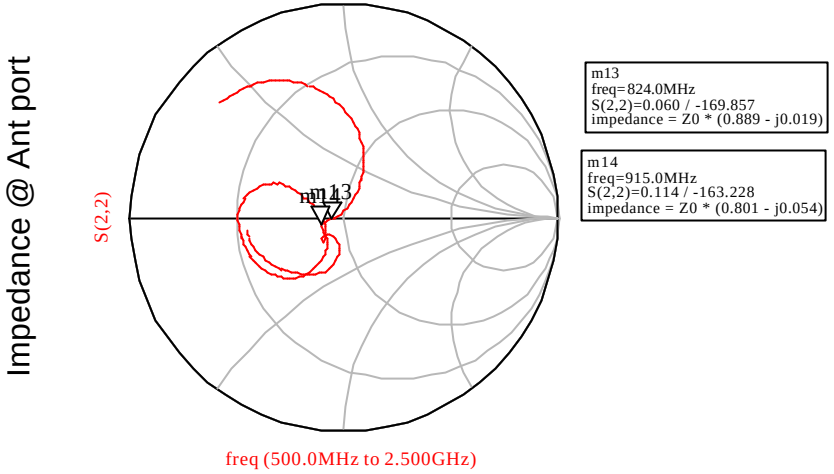
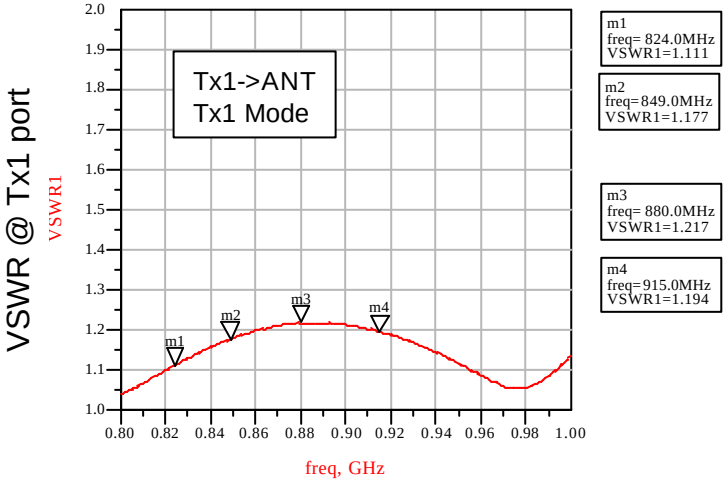
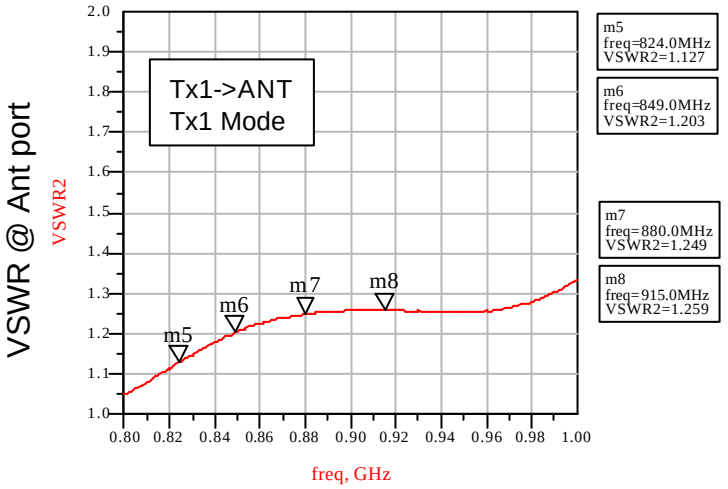
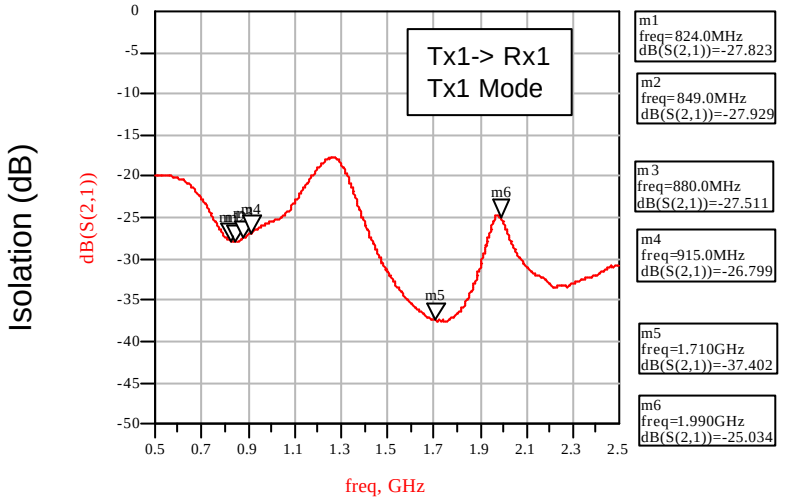


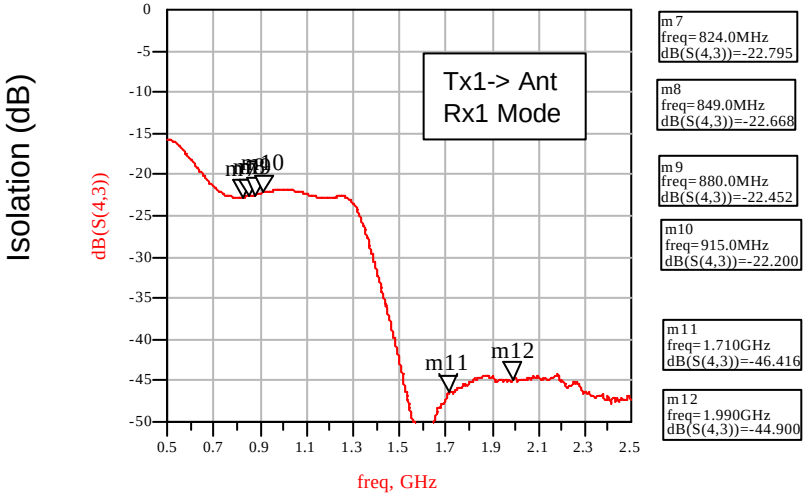




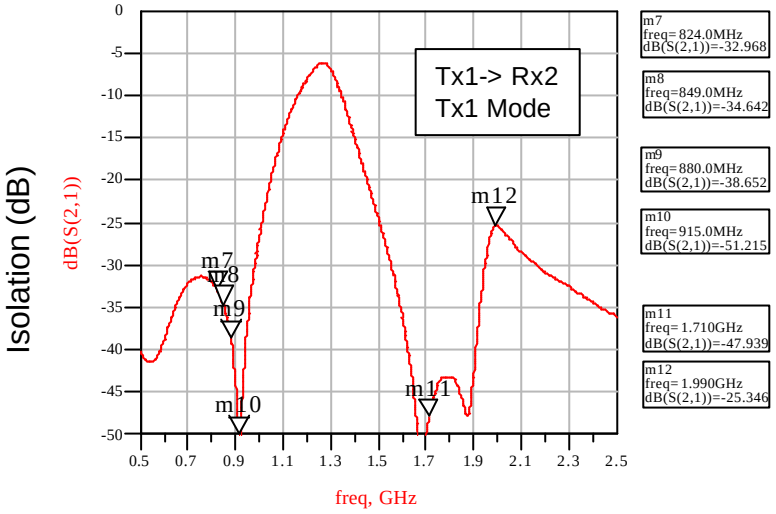


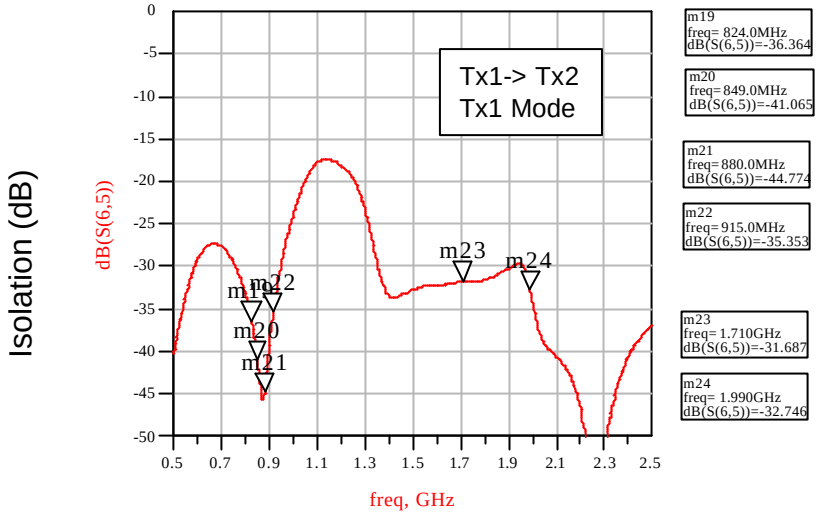
Tx1 in-band isolation

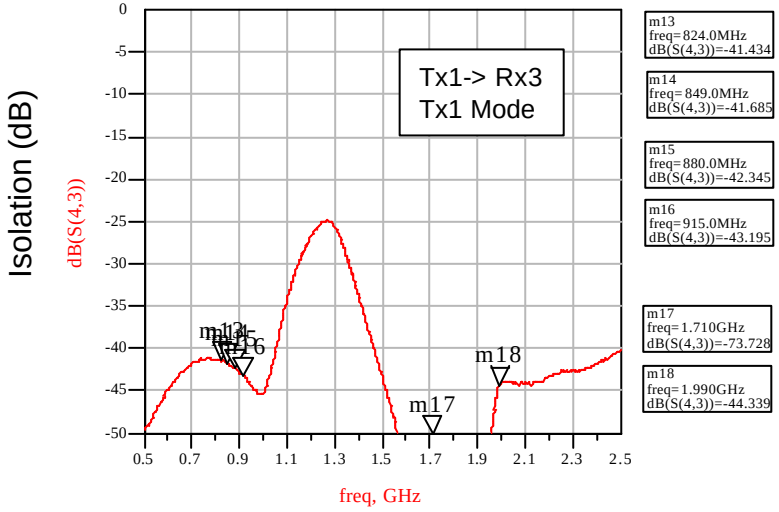




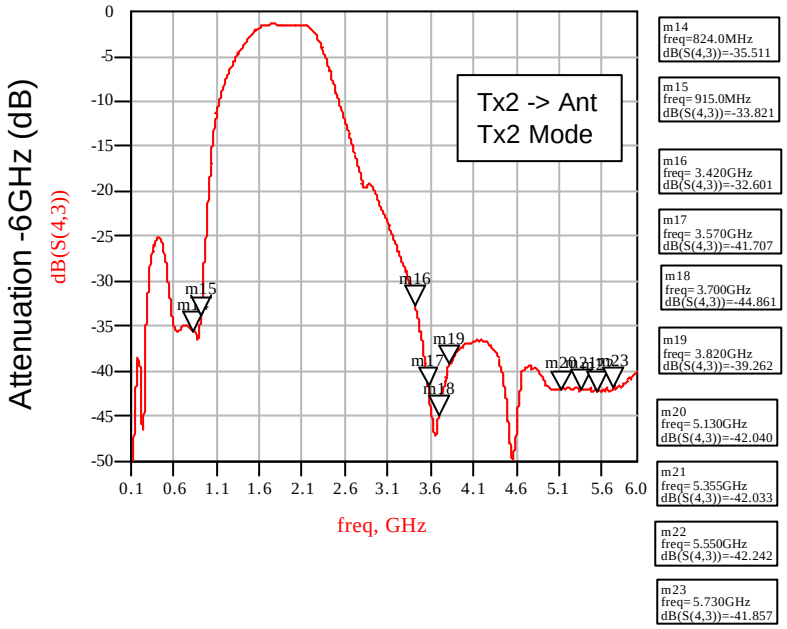
Tx1 x-band isolation

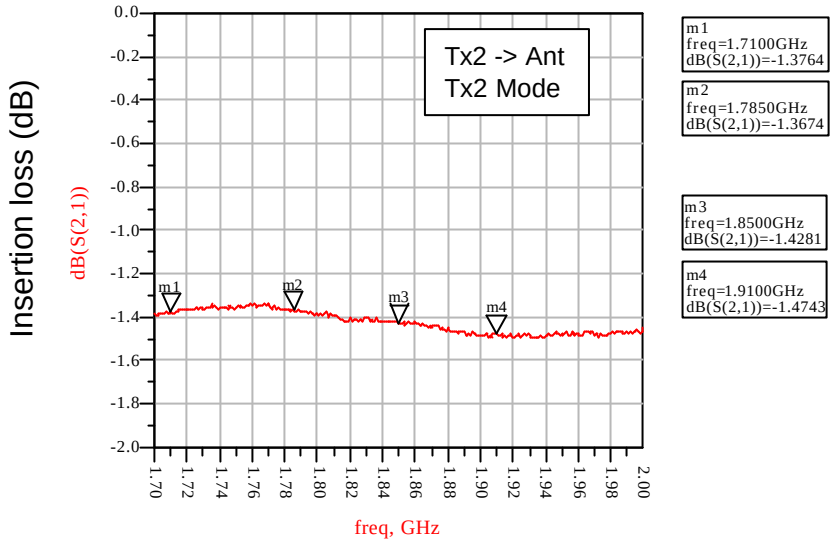


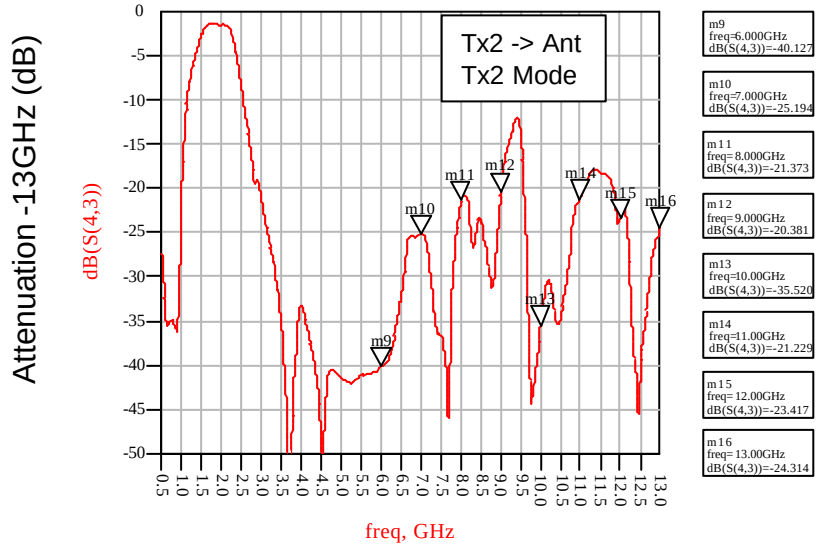




Tx2 Attenuation , Insertion Loss







Tx2 VSWR

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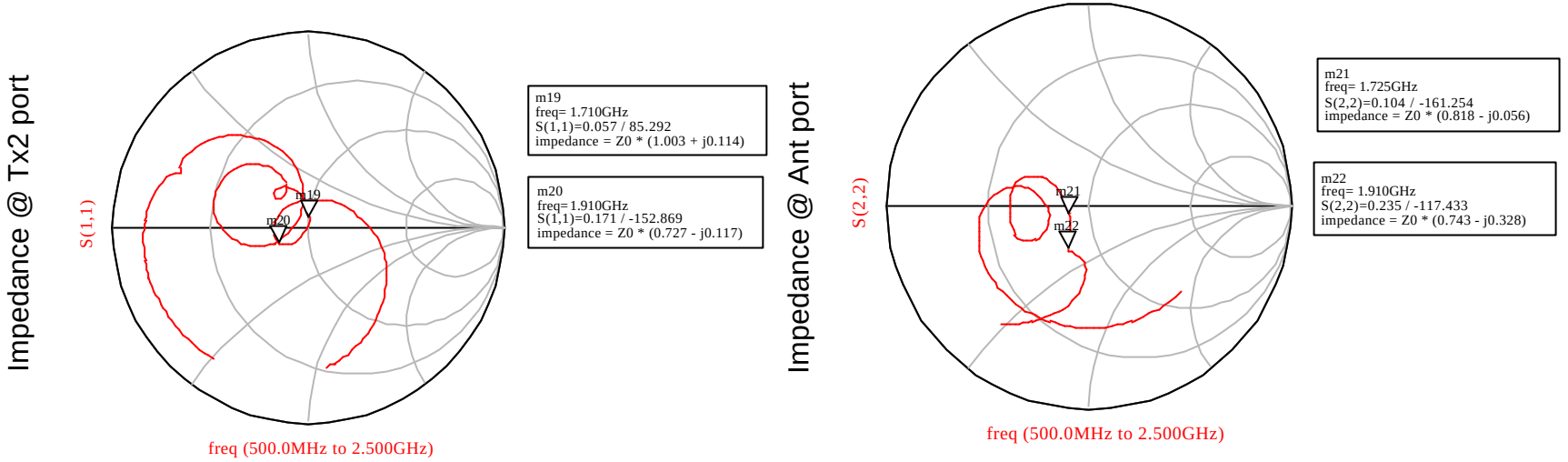

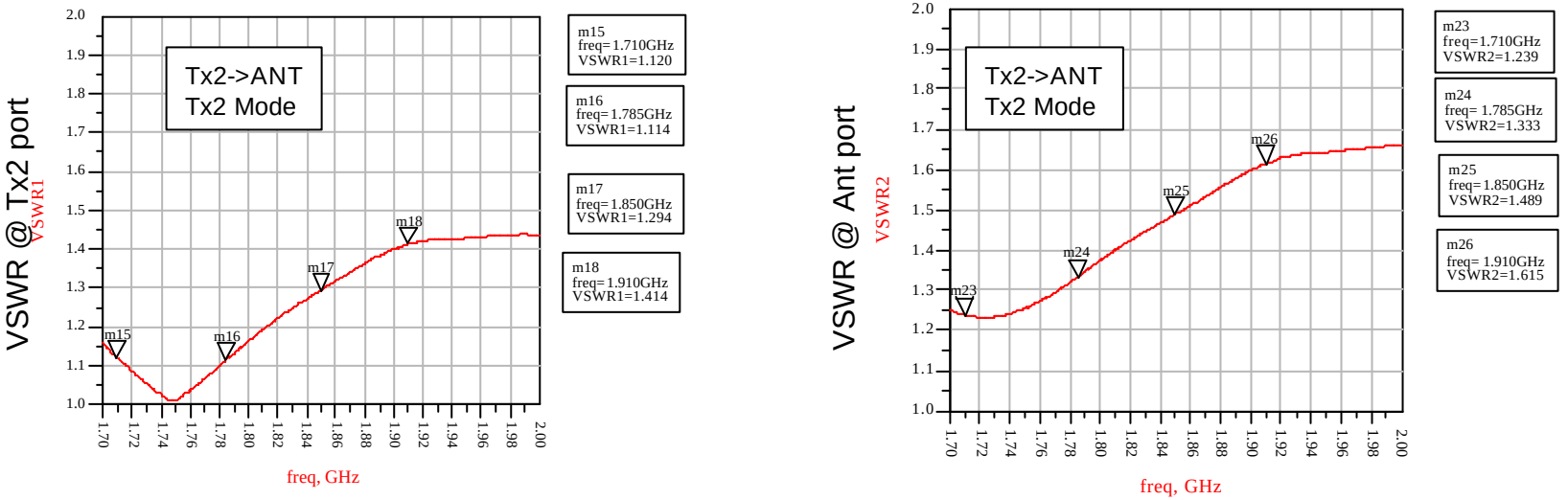

Tx2 in-band isolation

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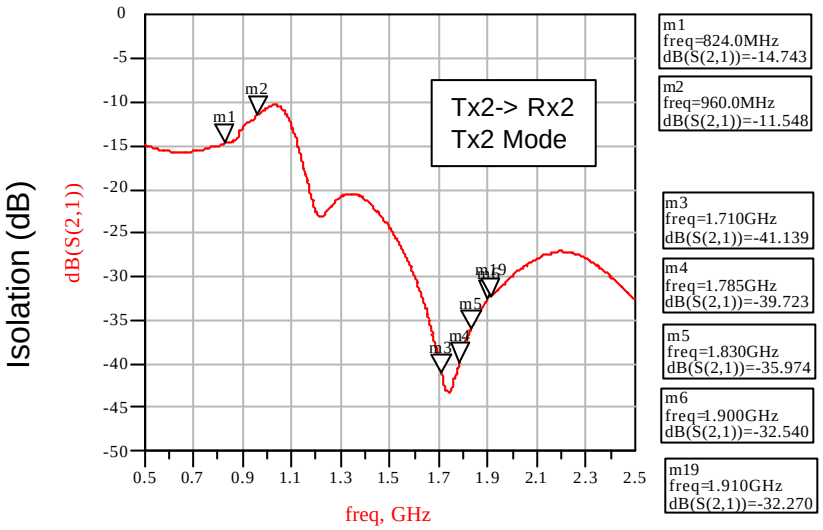
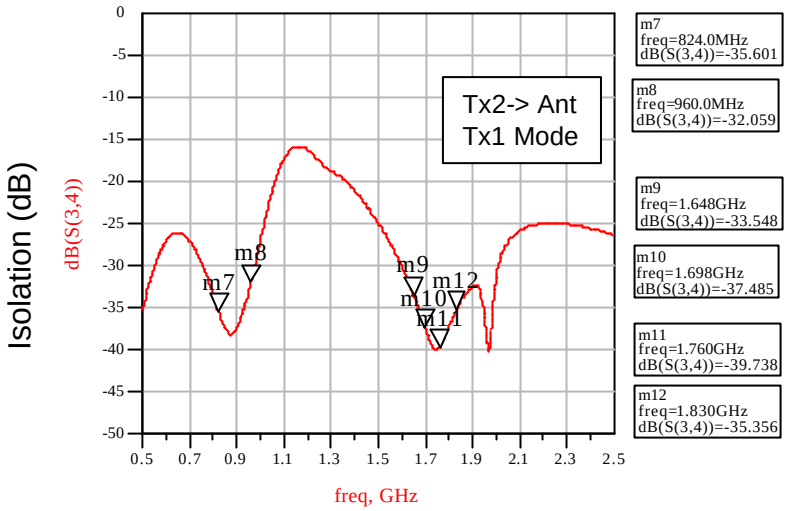
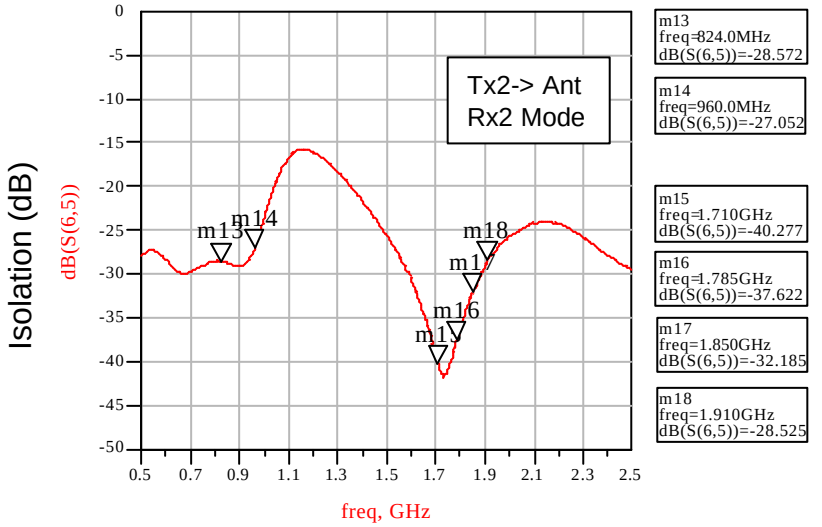
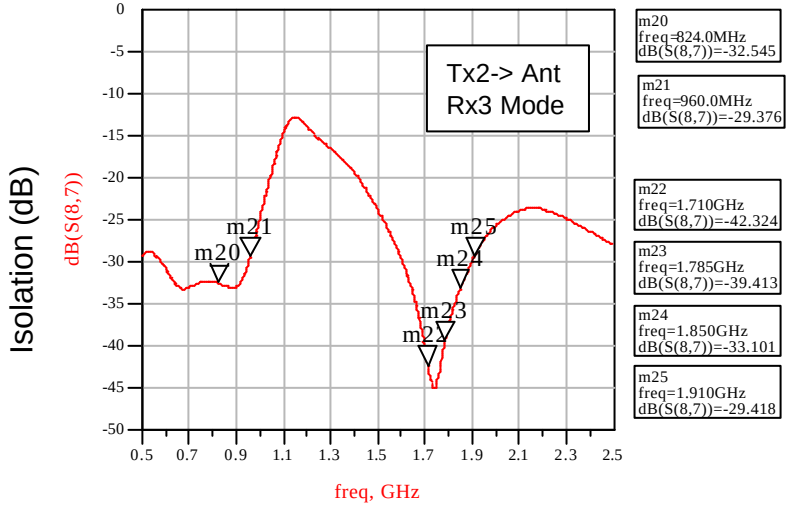
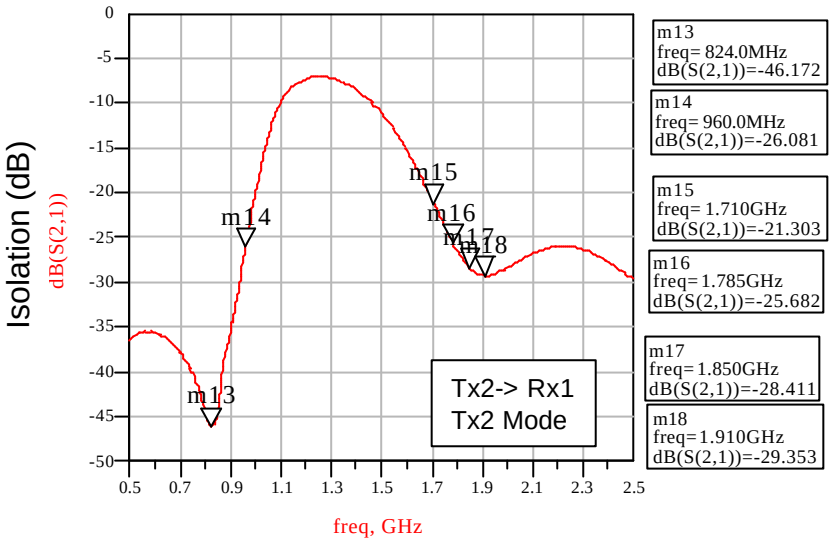


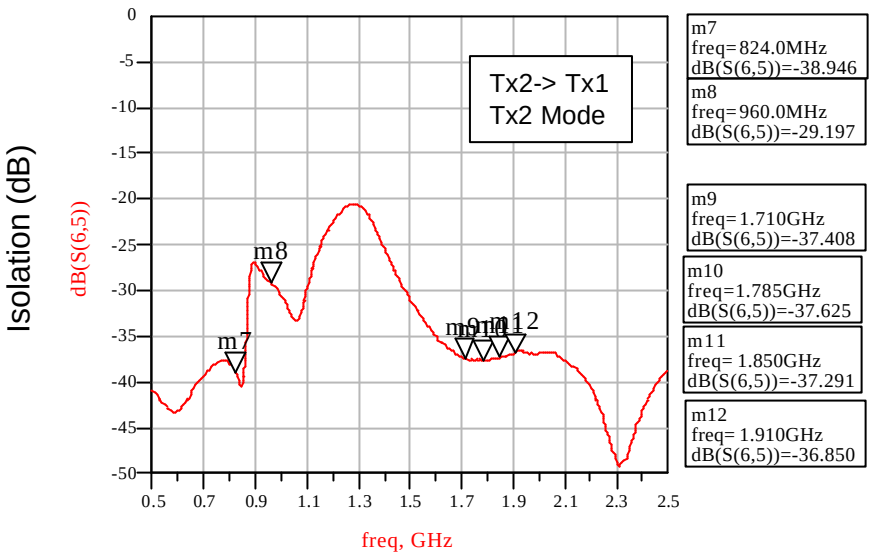


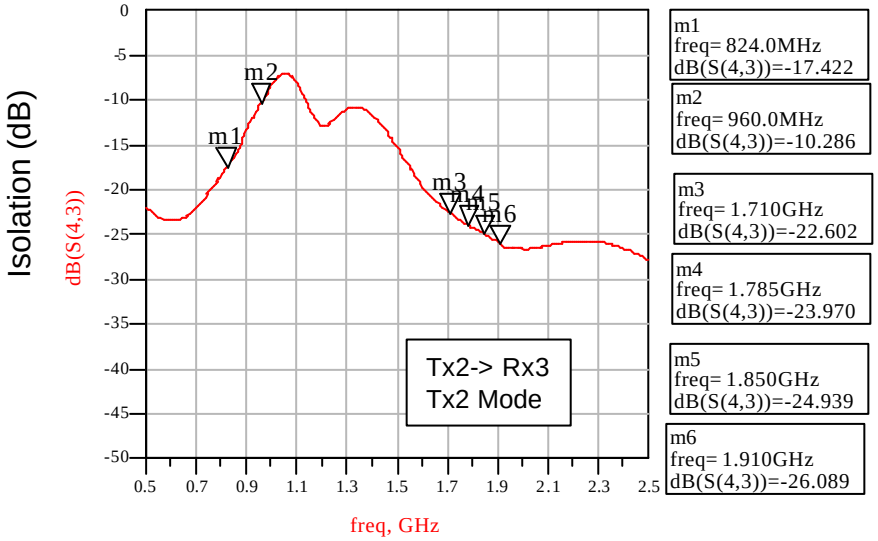




Tx2 x-band isolation







Rx1 Attenuation , Insertion Loss

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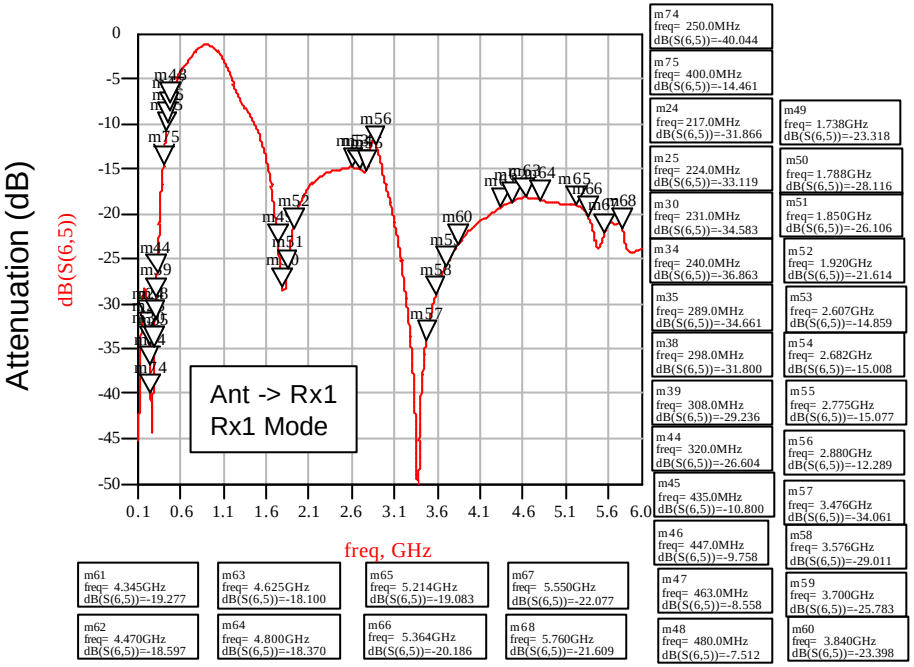

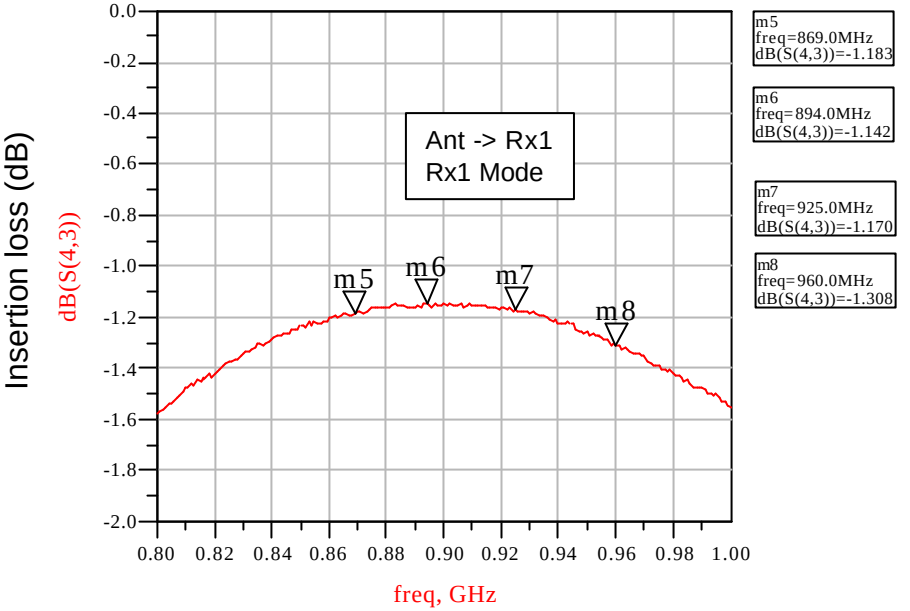

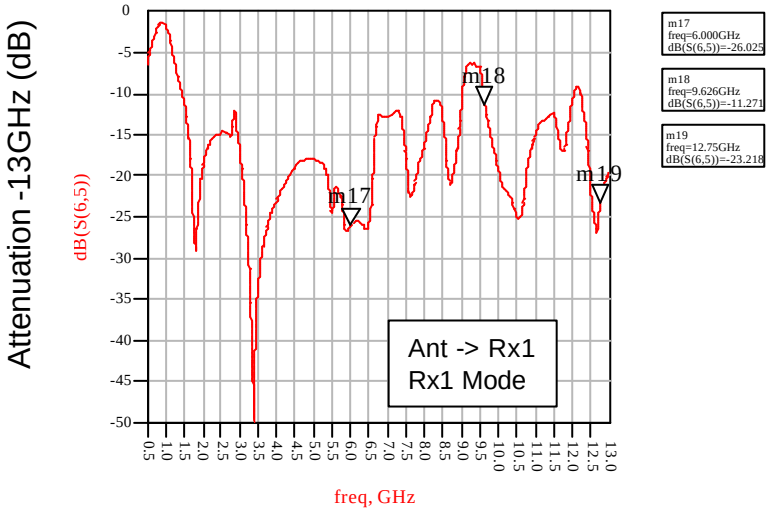

Rx1 VSWR

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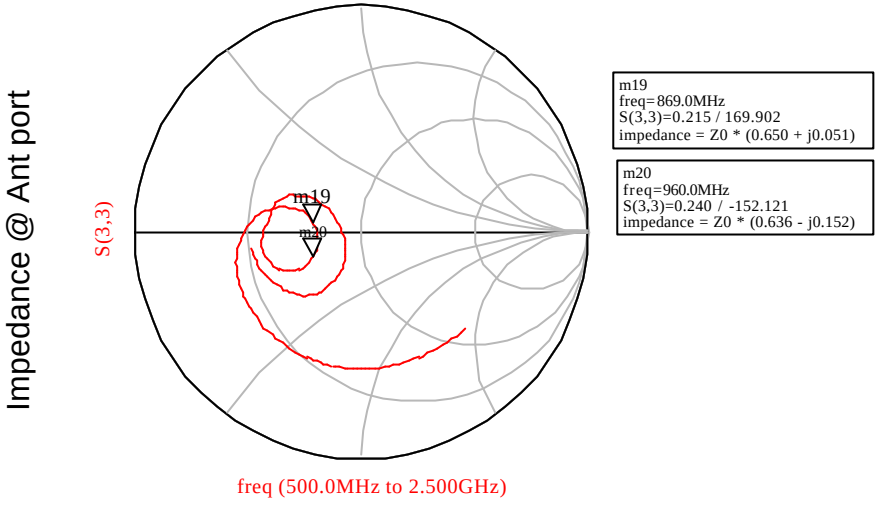

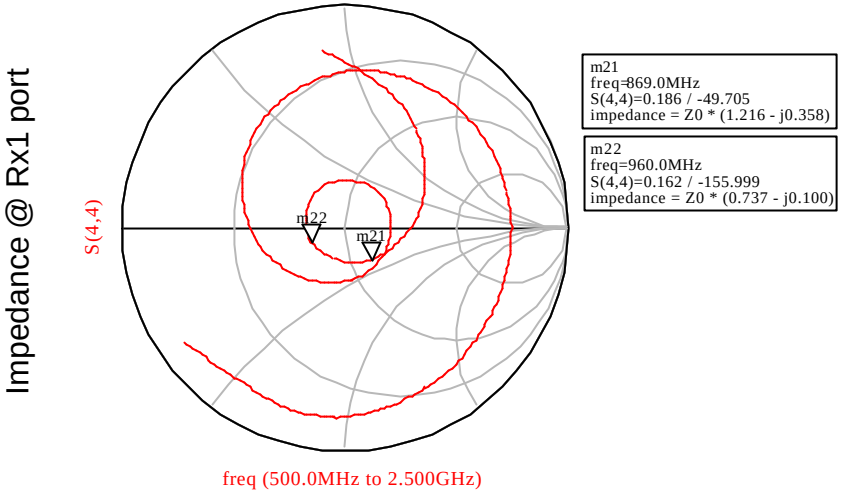

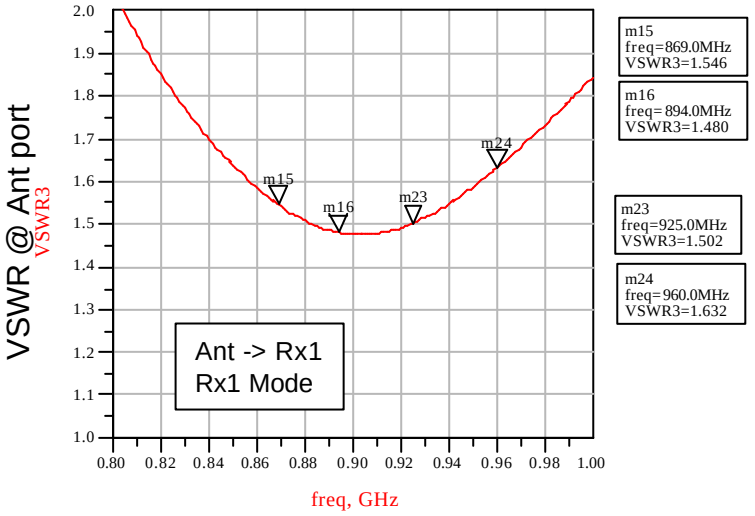

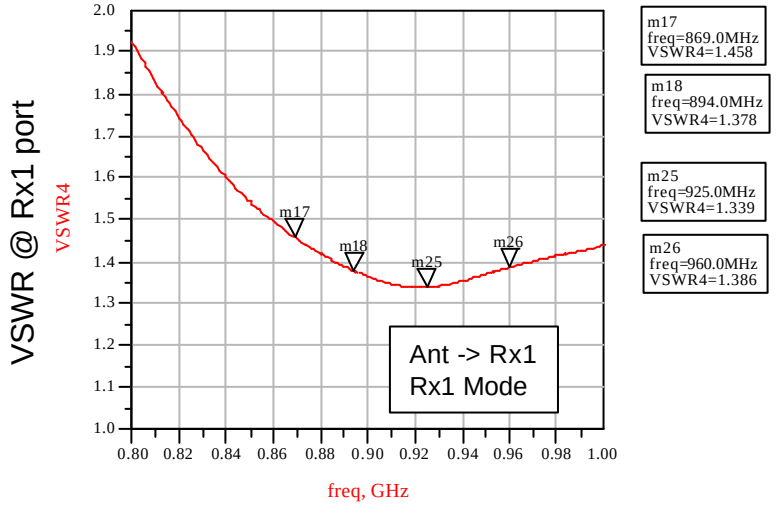

Rx2 Attenuation , Insertion Loss

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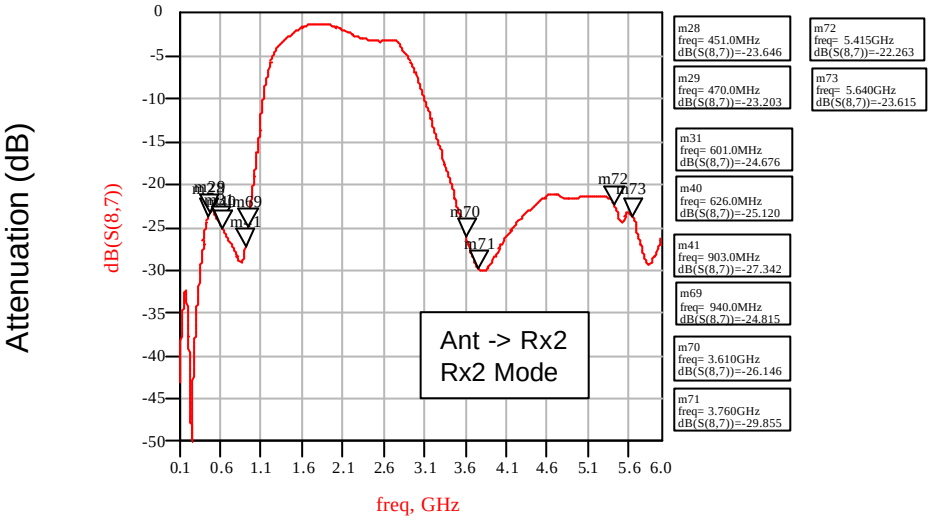

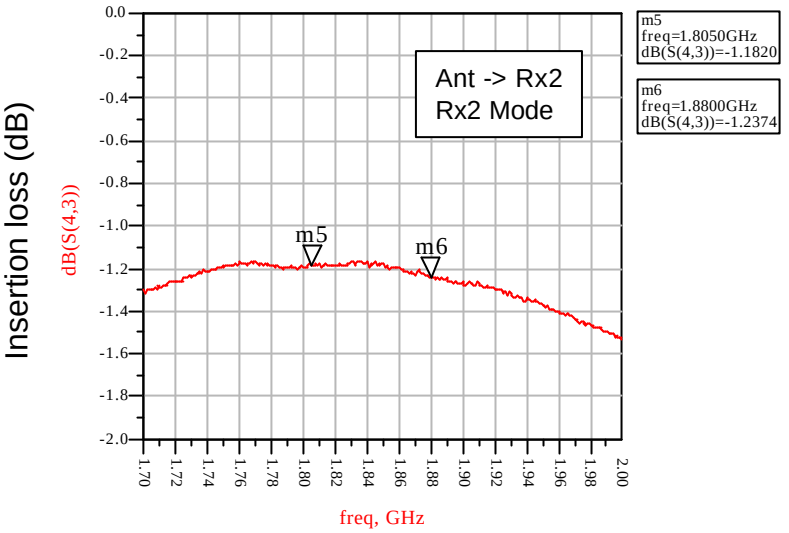

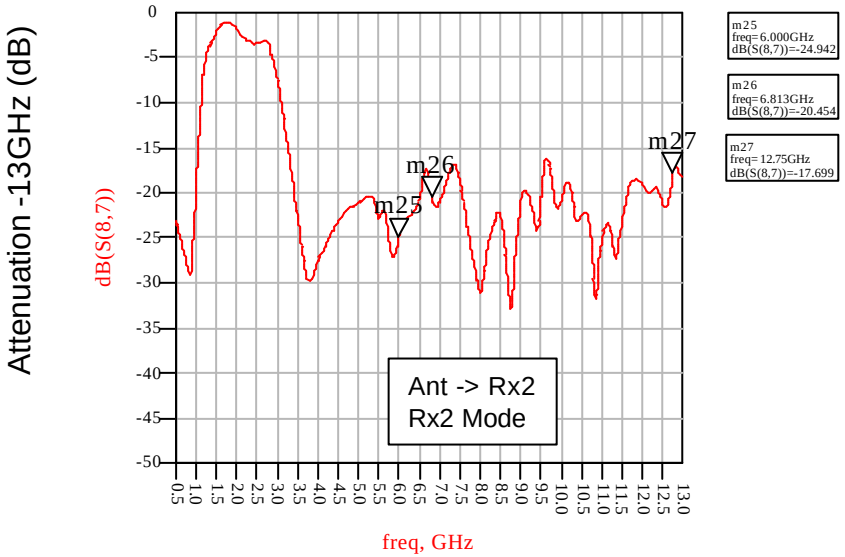

Rx2 VSWR

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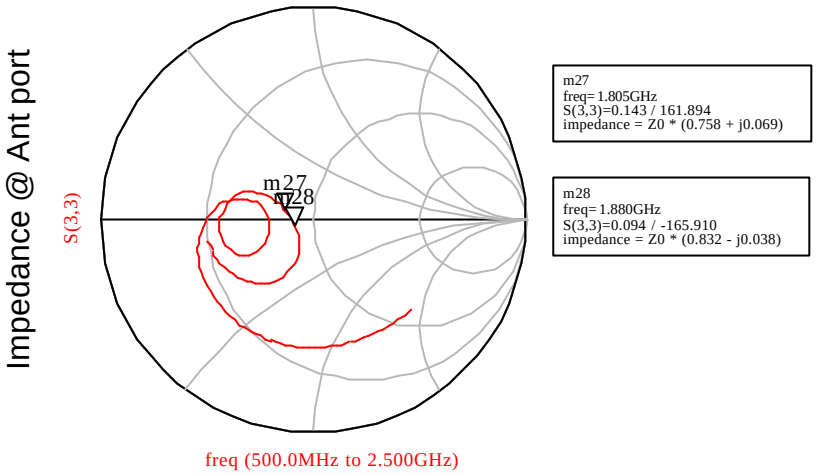

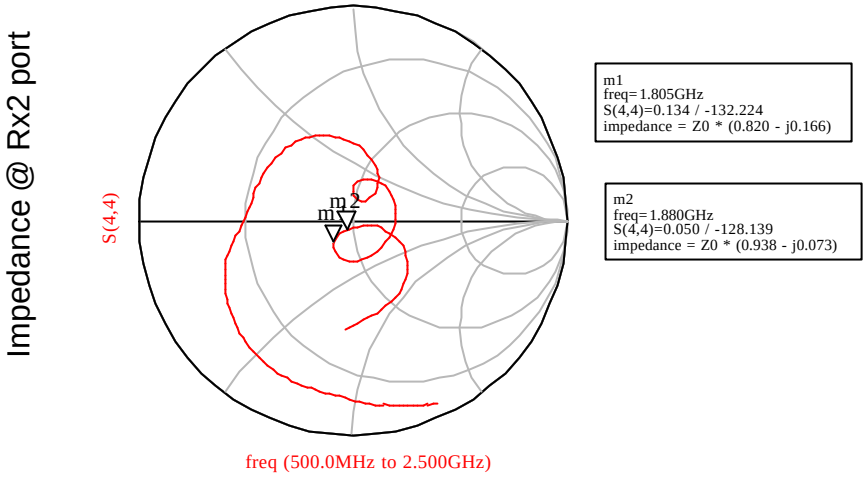

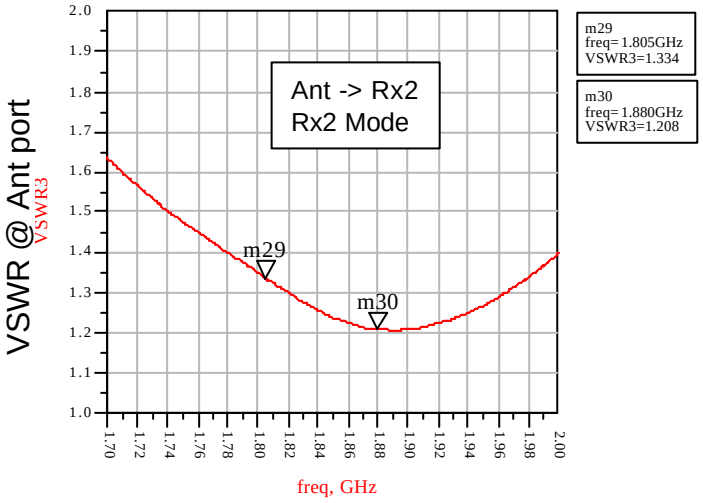

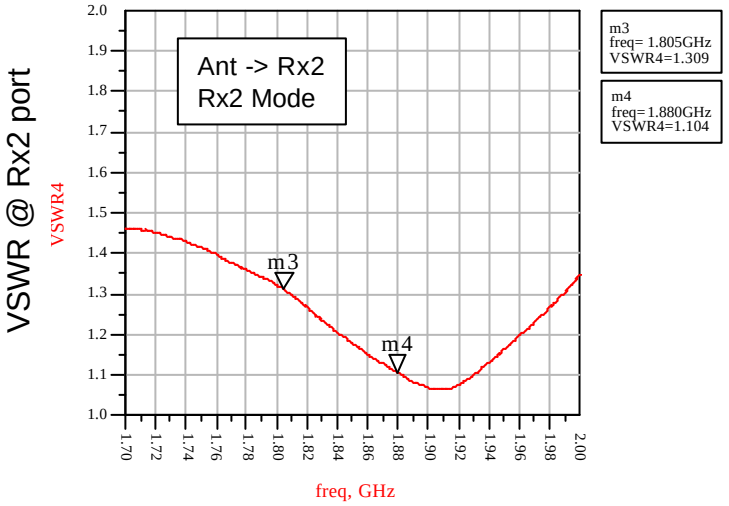

Rx3 Attenuation , Insertion Loss , isolation

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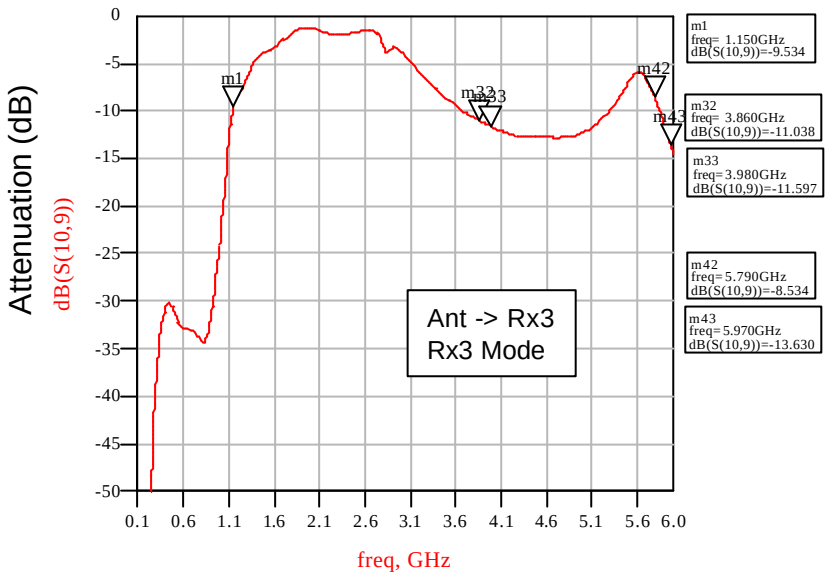

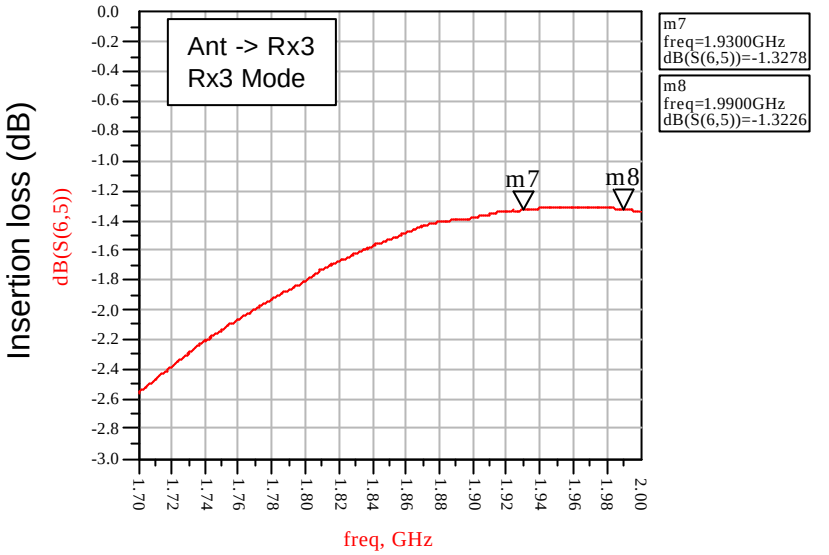

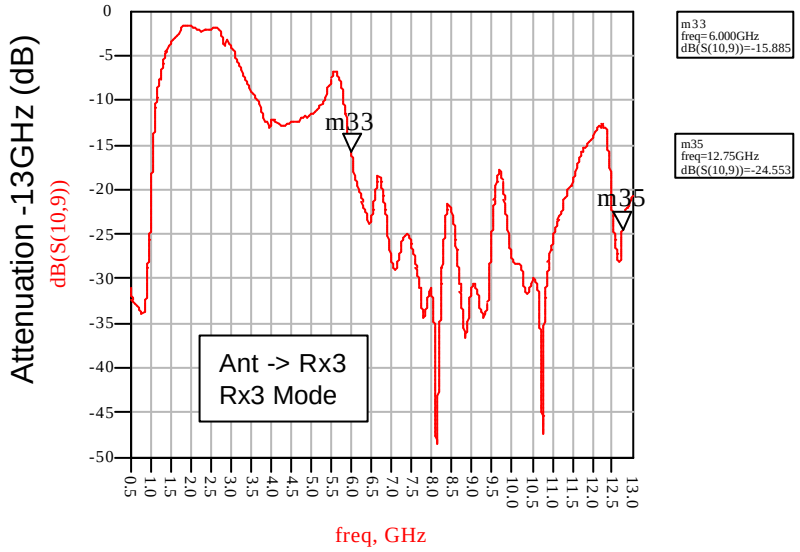

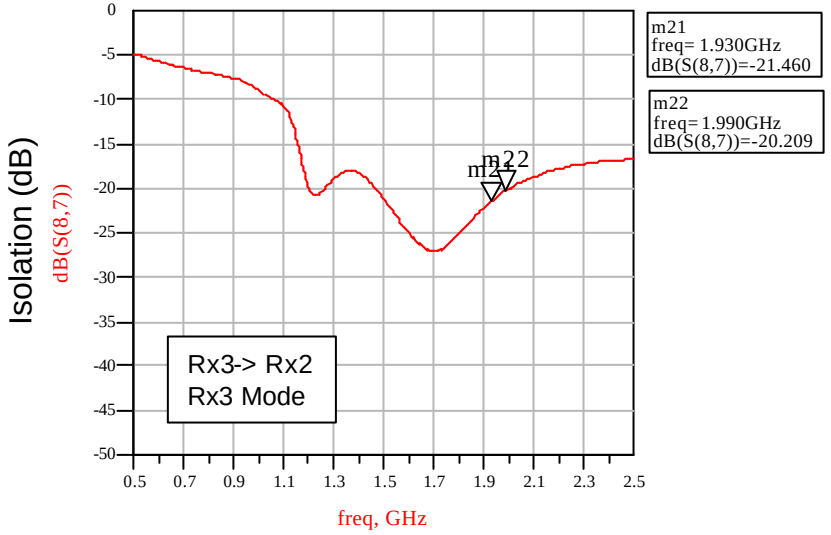

Rx3 VSWR

26-Nov-2004

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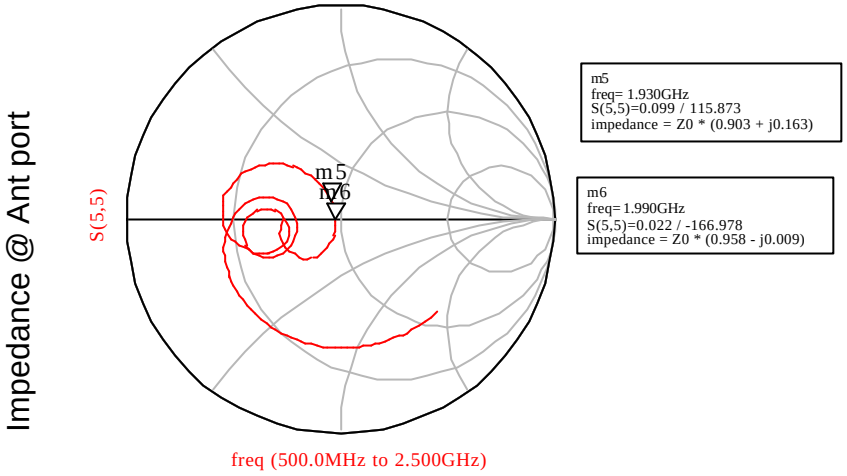
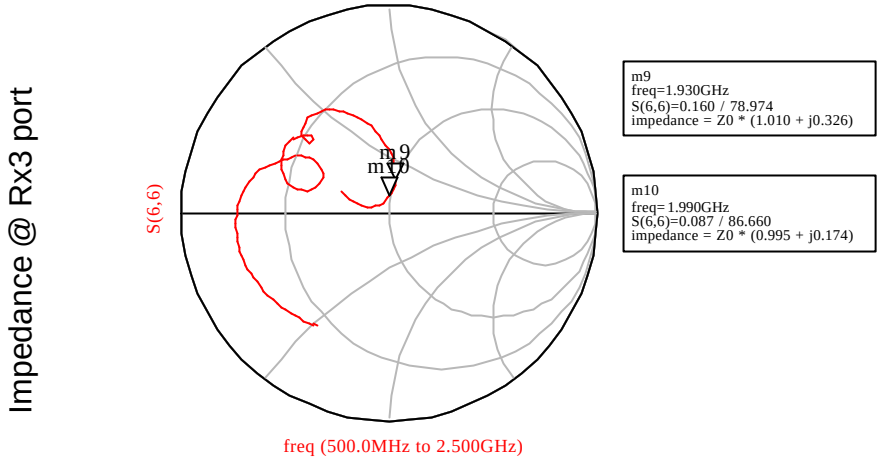
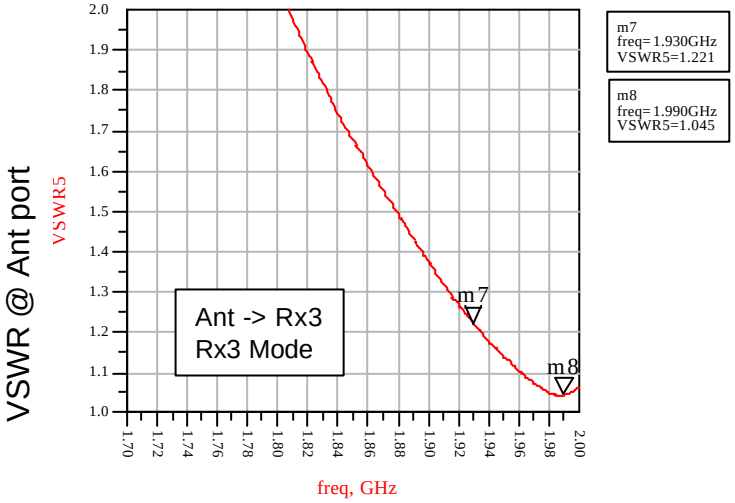
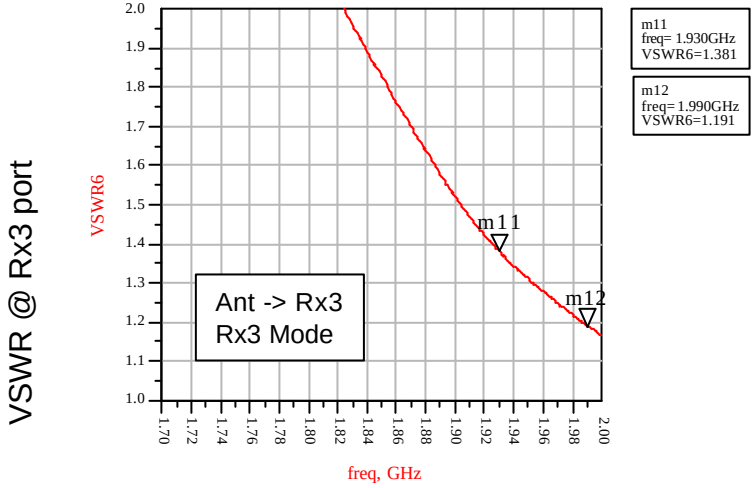
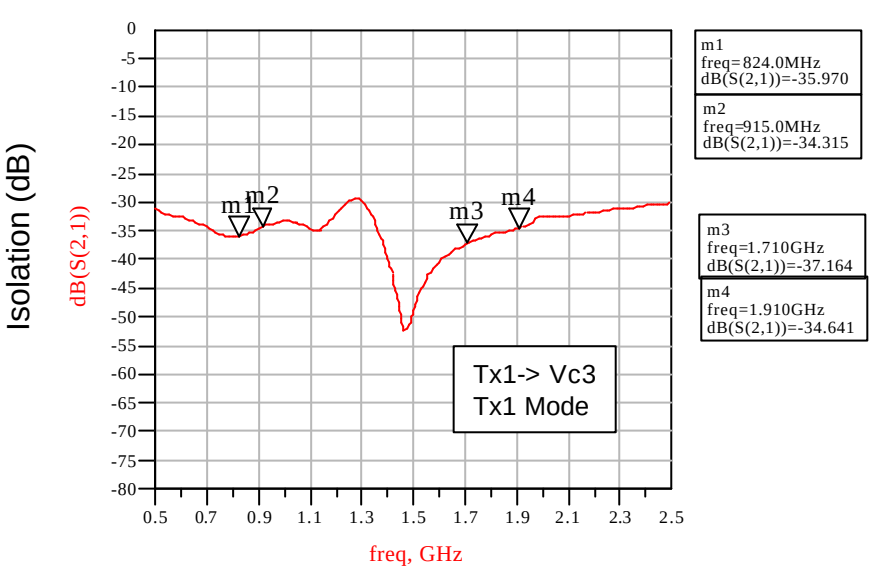


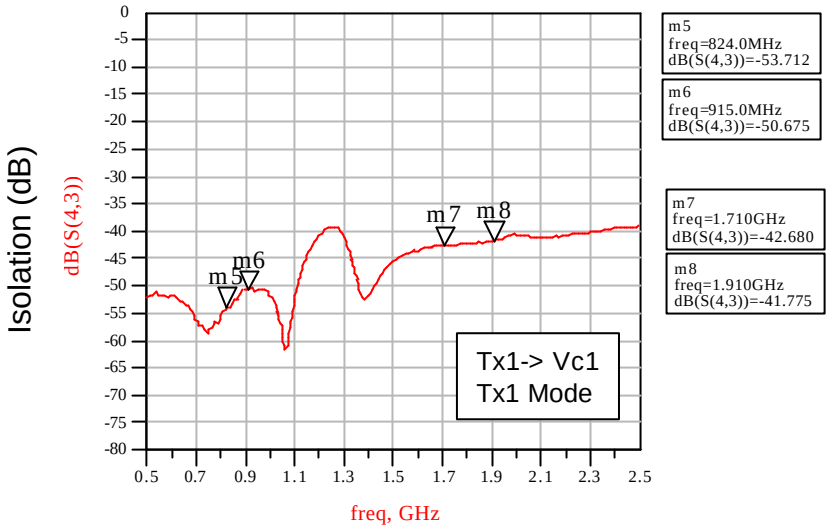


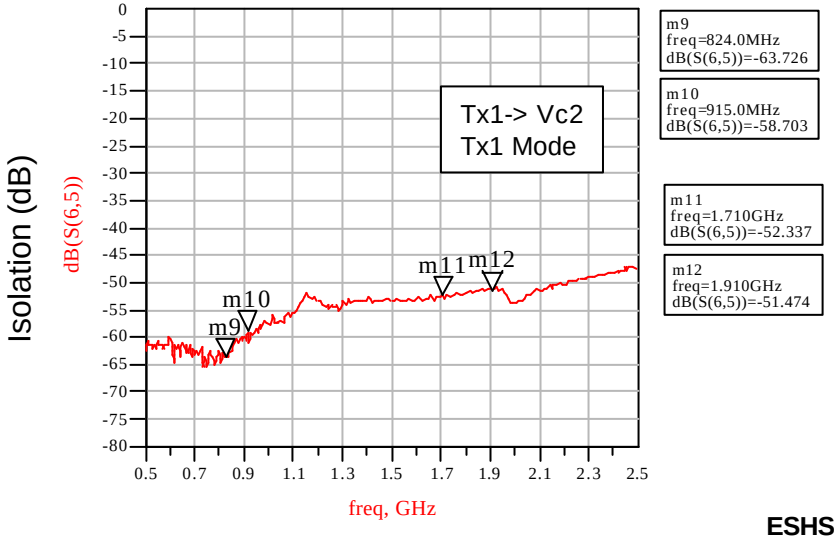




Isolation from Tx port to Vc port(Tx1 mode)







Isolation from Tx port to Vc port(Tx2 mode)