

BPM Amplifier Investigation

1. The input signal is a three period square wave of 600MHz. The amplifier bandwidth should cover the sub-bandwidths about $\pm 200\text{MHz}$ around the first harmonic (600MHz) and the third harmonic (1800MHz).

2. Three amplifiers. From the datasheets:

number	type	make	gain, dB	NF, dB	1dB compression, dBm	
1	RF2360	RFMD	20	1.2 to 1.5	+24	
2	MAALSS0038	MACOM	14	1.5	+21	
3	MERA-533	Mini-Circuits	20	3.5	+17	

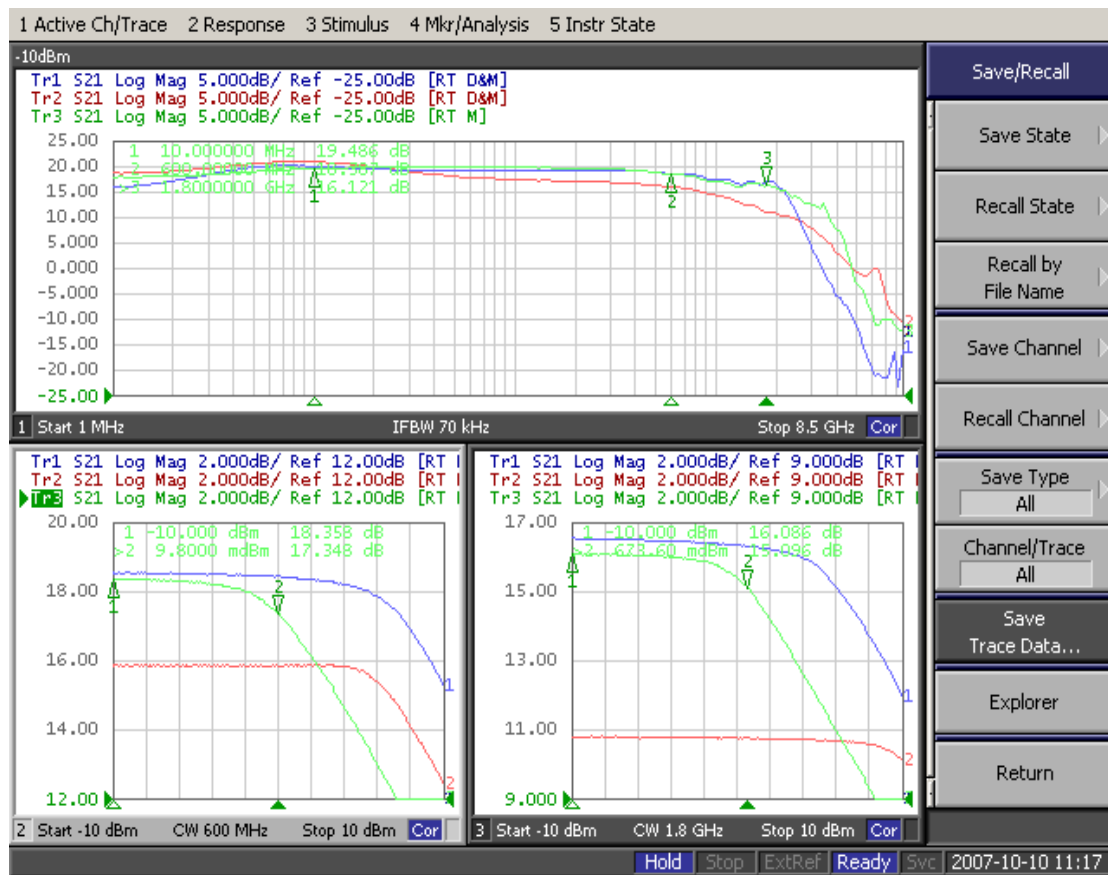
3. The Input Amplifier: the types 1 and 2 to choose from. The SD CLOCK Amplifier: the type 3.

4. The circuitry:

number	type	input series inductor, nH	output choke	resistor in series, Ohm	PS, V
1	RF2360	0	ADCH-80A	25	+10
2	MAALSS0038	0	ADCH-80A	55	+10
3	MERA-533	3.3	ADCH-80A	78	+10

5. A Network Analyser E5071B.

1. The bandwidth and the compression



		gain (dB) at 600MHz	gain (dB) at 1800MHz
1	RF2360	18.5	16.8
2	MAALSS0038	15.9	10.8
3	MERA-533	18.4	16.1

		the 600MHz input (dBm) for 1dB compression	1dB compression output, dBm +(gain-1dB)
1	RF2360	6.8	~24
2	MAALSS0038	7.0	~22
3	MERA-533	0	~17

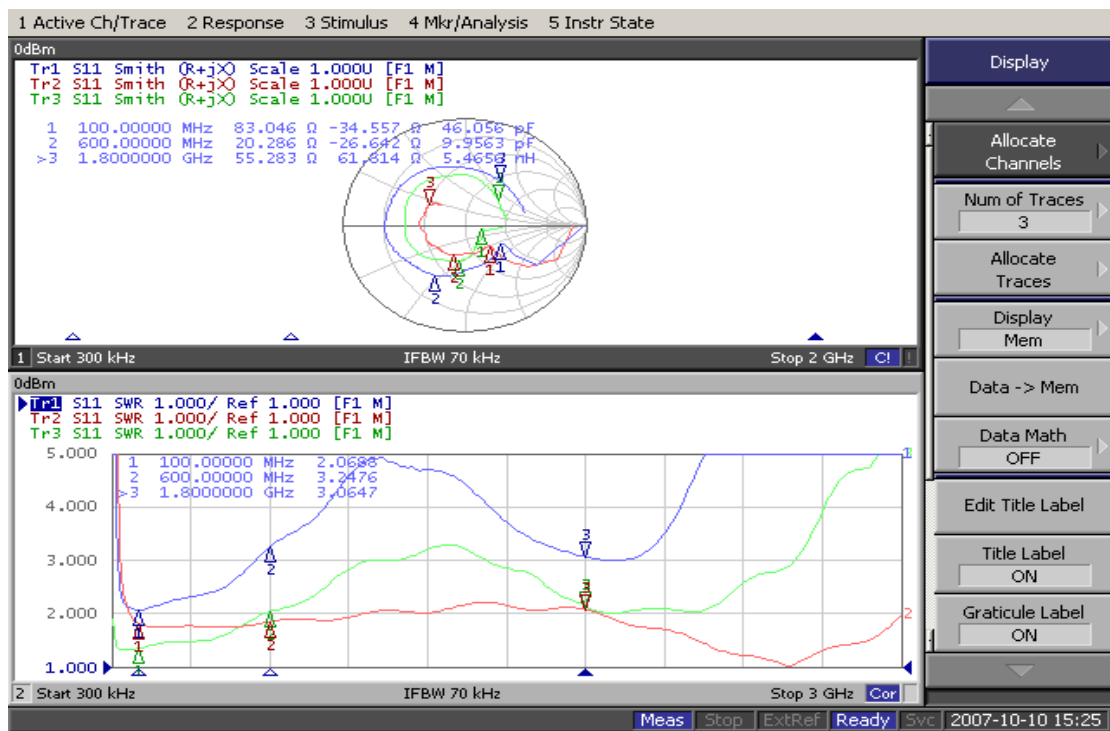
		the 1800MHz input (dBm) for 1dB compression	1dB compression output, dBm +(gain-1dB)
1	RF2360	5.3	~21
2	MAALSS0038	10	~20
3	MERA-533	1	~16

2. The step response



		0.1 to 0.9 rise time, ns
1	RF2360	0.2
2	MAALSS0038	0.44*
3	MERA-533	0.14**

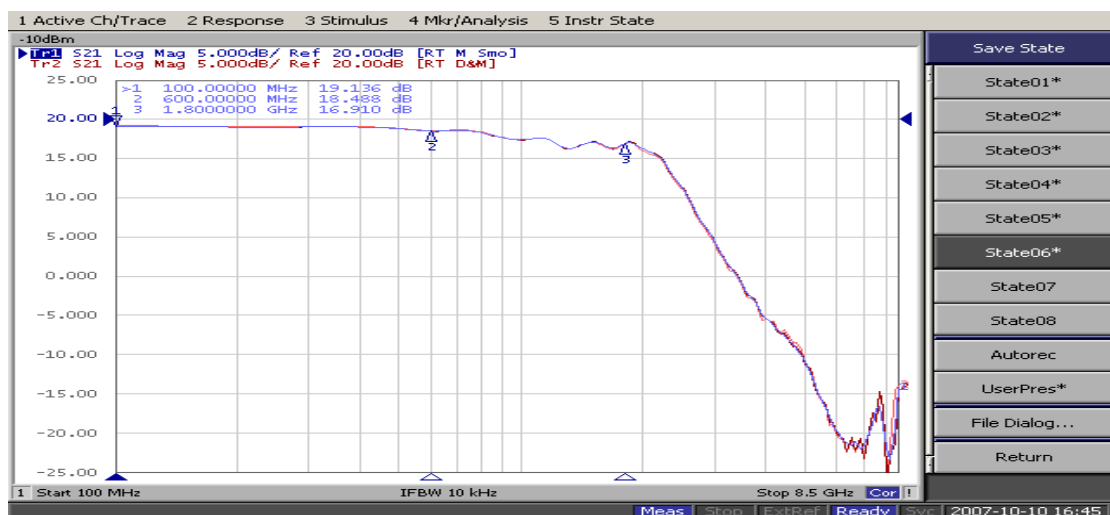
3. Input impedance



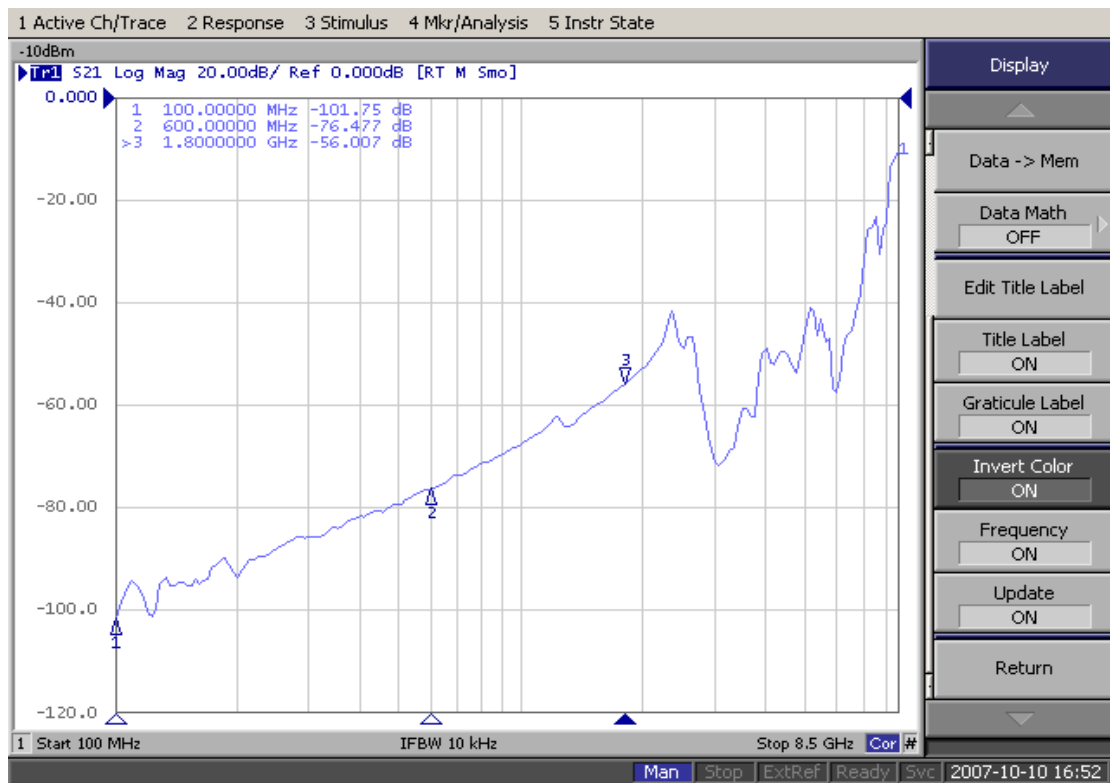
	R, Ohm	X, Ohm	r, Ohm	x, Ohm	x
100MHz	83	-35	100	-232	7pF
600MHz	20	-27	57	-42	6.3pF
1800MHz	55	+62	125	+111	10nH

		SWR at 100MHz	SWR at 600MHz	SWR at 1800MHz
1	RF2360	~2	~3	~3
2	MAALSS0038	<2	<2	~2
3	MERA-533	<1.5	~2	~2

4. Two RF2360 Amplifiers, gains



5. Isolation of two RF2360 Amplifiers (on a common PCB)



6. RF2360 Evaluation Board (input series inductor 4.7nH)

