

Characterisation of RF Source : Harmonics

11MHz EOM					
Notes					
a Variable Attenuator set to max = 10dB					
b Output measured with power meter = 16.56 dBm					
	Freq, fo (MHz)	Power(dBm)	Vrms (mV)	Power	Normalised to fo (dB)
	11	15.15	1277.90	36 mW	0
	22	-24.55	13.12	0.0034 mW	-40
	33	-34.91	4.12	345 nW	-50
	44	< 50			
	55	-50.33	0.68	22 nW	-65

Notes					
c Variable Attenuator set to minimum = 0dB					
d Output measured with power meter = 24.7 dBm					
	Freq, fo (MHz)	Power(dBm)	Vrms (mV)	Power	Normalised to fo (dB)
	11.14	25.3	4106.6	337 mW	0
	22.21	-7.61	94	0.177 mW	-33
	33.44	-20.43	21	0.00926 mW	-46
	44.51	-40.68	2	200 nW	-66
	55.58	-30.69	6	805 nW	-56

Note					
e Since we are now close to the 30dB input limit of the spectrum analyser An external co-ax attenuator of 12 dB was introduced to see if this affects the harmonics. The internal Ref Voltage offset was					
	Freq, fo (MHz)	Power(dBm)	Normalised to fo power (dB)		
	11.14	25.3	0		
	22.21	-8	-33.3		
	33.44	-21	-46.3		
	44.51	-40	-65.3		
	55.58	-29	-54.3		

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55 MHz EOM					
Notes:					
a Variable attenuator set to max = 10dB					
b Total power measured with the power meter = 17.92 Bm					
	Freq, fo (MHz)	Power(dBm)	Vrms (mV)	Power	Normalised to fo (dB)
	55.5	15.3	1300	36.3 mW	0
	110.8	-24.7	12.9	0.0037 mW	-40
	166.1	-37	2.8	152 nW	-52

Notes:					
c Variable attenuator set to min = 0 dB					
d Total power measured with the power meter = 28 dBm					
	Freq, fo (MHz)	Power(dBm)	Vrms(mV)	Power	Normalised to fo power (dB)
	55.3	25.91	4405.4	388 mW	0
	111.7	-9.97	72	0.103 mW	-36
	166.3	-11.96	57	0.067 mW	-38
	221.4	-17.82	27	0.014 mW	-44

Note					
e Since we are now close to the 30dB input limit of the spectrum analyser An external co-ax attenuator of 12 dB was introduced to see if this affects the harmonics. The internal Ref Voltage offset was adjusted to 12dB					
	Freq, fo (MHz)	Power(dBm)	Normalised to fo power (dB)		
	55.3	25.7	0		
	111.2	-10.24	-35.94		
	166.9	-13.12	-38.82		
	221.4	-20.71	-46.41		
	277.1	-20.61	-46.31		
	332.8	-23	-48.7		
	387.3	-26	-51.7		

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11 MHz Demod	Freq, fo (MHz)	Power(dBm)	Normalised to fo power (dB)
	11.17	6.1	0
	22.31	-41.2	-47.3
	33.65	-46.72	-52.82
	44	< -60	< -66
	55.72	-55.39	-61.49

55 MHz Demod	Freq, fo (MHz)	Power(dBm)	Normalised to fo power (dB)
	54.9	6.18	0
	110.5	-39.04	-45.22
	166.1	-49.62	-55.8

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Summary				
11 MHz	Nominal Frequency (Mhz)	11 MHz EOM Output	EOM Driver Requirement (dB)	11 MHz Demod Output
Harmonic #		@ 25 dBm		@ 6 dBm
0	11	0	0	0
1	22	-33	-60	-47
2	33	-46	-60	-53
3	44	-66	-60	< -66
4	55	-56	0	-61

Summary				
55 MHz	Nominal Frequency (Mhz)	55 MHz EOM Output	EOM Driver Requirement (dB)	55 MHz Demod Output
Harmonic #		@ 28 dBm		@ 6 dBm
0	55	0	0	0
1	110	-36	-60	-45
2	165	-38	-60	-56
3	220	-44	-60	