

Noise Power Ratio (NPR) Test on RFSpace Cloud-IQ SDR Receiver

for Keith Witney VE7KW, by Adam Farson VA7OJ/AB4OJ.

Table 1: NPR Test Results, RFSpace Cloud-IQ, 14.01.2016. VA7OJ.

DUT	Mode	Det. BW kHz	BSF kHz	BLF kHz	BWR dB	Software	P _{TOT} dBm ³	NPR dB	Theor. NPR dB ⁵
SDR-IQ	LSB	2.4	1940	60...2044	29.2	SDRC ¹	-26	70	76.9
						RSC ²	-30	70	
	LSB		3886	60...4100	32.3	SDRC	-23	73	73.8
						RSC	-27	70	
	USB		5340	60...5600	33.6	SDRC	-24	70	72.4
						RSC	-27	68	
	LSB		7600	316...8160	35.1	SDRC	-25	70	70.9
						RSC	-29	66	
	USB		11700	0...13000	37.3	SDRC	-27	65	68.7
						RSC	-30	63	

Notes:

1. SDRC = SDR Console V2.3. Build 2274 (Thick Client). NPR read off scope (notch depth).
2. RSC = Remote SDR Client 1.19 (Thin Client). NPR read off S-meter (level in passband – level in stopband).
3. P_{TOT} adjusted to -1 dBFS (1 dB below clip level).
4. ATT = 0 dB.
5. Theoretical maximum NPR calculated per Ref. 2.

Radio information:

RFSpace CloudIQ, S/N CL000122, Firmware 0.13, Boot 0.03, Hardware 0.02.

Test equipment:

Wandel & Goltermann RS-50 & RS-25 noise generators, with bandstop (BSF) and band-limiting (BLF) filters as listed. 75/50Ω matching transformer at generator output.

HP 437B power meter with 8483A power sensor (to check generator output levels).

- BWR = Bandwidth Ratio = 10 log (BLF bandwidth/detection bandwidth).

Reference:

1. “Noise Power Ratio (NPR) Testing of HF Receivers”
http://www.ab4oj.com/test/docs/npr_test.pdf
2. “Theoretical maximum NPR of a 16-bit ADC”
http://www.ab4oj.com/test/docs/16bit_npr.pdf

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