	Deutsches Elektronen-Synchrotron
Title	Measurement report for:
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1 Naming convention

The document uses the following abbreviations: All channels are numbered from

RF0	RF channel 0. P2 SMA connector when jumper JP9 is opened.
RF1-RF8	RF channels 1-8. P3 8x FBM connector.
$\mathbf{RF9}$	RF channel 10. P5 SMA connector when jumper JP4 is shorted.
IF0-IF9	IF channels. The enumeration is done according to the RF one.
CLK	Clock signal. P1 SMA connector.
LF	Low frequency input signal. P2 SMA connector when JP9 is shorted.

0 to 9 from the top to the bottom of the plugged board.

2 Current consumption

Current consumption is measured with and without the high-frequency signals applied.

Current consumption without any signals applied: 789.7 A. Current consumption with $P_{LO} = 12.00$ dBm, and $P_{RF} = 0.00$ dBm are shown in 1.

Channel	CH0	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9
I [mA]	790.9	791.2	791.3	791.6	791.8	792.0	792.2	792.4	792.7	774.8

Table 1: Current consumption as the function of the active channel

3 Input matching

Input reflection coefficient was measured using VNA. The results are presented in Tab. 2.

Input	LO	CH0	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9
$ \Gamma $	-8.56	-10.19	-10.11	-10.07	-10.12	-10.10	-10.13	-10.11	-10.07	-10.05	-10.31

Table 2: Inputs reflectivity

4 Channel gain

The channel gain was measured at 2 attenuators state. The channel gain is defined as the difference between the IF power and the corresponding RF power at the channel input. In the first one the attenuation was set to 30 dB, in the second to 0 dB. The results are shown in Tab. 3.

Att $[dB]$	CH0	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9
30	6.42	6.34	6.31	6.29	6.28	6.26	6.24	6.23	6.22	6.21
0	7.29	7.23	7.21	7.18	7.16	7.15	7.13	7.12	7.11	7.09

Table 3: Channel gain as a function of attenuation

5 Nonlinearity

The first 3 harmonics were measured as a function of the input power up to 1dB-compression point. The output power for 1dB-compression point for each channel is shown in Tab. 4.

Channel	CH0	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9
P1dB [dBm]	16.75	16.73	16.71	16.69	16.68	16.66	16.65	16.64	16.63	16.63

Table 4: 1dB compression point for each channel

6 Crosstalks

Channel-to-channel

Channel IF - IF cross-talk from channel k to channel n is defined as: $I_{n,k}$ [dB] = P_{IF_k} [dBm] - P_{IF_n} [dBm], RF signal connected to channel k. P was measured using spectrum analyzer with 30.00 kHz BW. $P_{LO} = 10$ dBm, $P_{RF} = 0$ dBm. The corresponding input of the channel n has been terminated. The output of the channel k is also terminated.

n k	0	1	2	3	4	5	6	7	8	9
0	0.00	1.74	1.74	1.75	1.75	1.75	1.75	1.75	1.75	1.75
1	1.74	0.00	1.74	1.74	1.74	1.75	1.75	1.75	1.75	1.75
2	1.73	1.73	0.00	1.74	1.74	1.74	1.74	1.74	1.75	1.75
3	1.73	1.73	1.73	0.00	1.74	1.74	1.74	1.74	1.74	1.74
4	1.72	1.73	1.73	1.73	0.00	1.73	1.74	1.74	1.74	1.74
5	1.72	1.72	1.73	1.73	1.73	0.00	1.73	1.73	1.73	1.74
6	1.72	1.72	1.72	1.73	1.73	1.73	0.00	1.73	1.73	1.73
7	1.72	1.72	1.72	1.72	1.73	1.73	1.73	0.00	1.73	1.73
8	1.71	1.71	1.72	1.72	1.72	1.72	1.73	1.73	0.00	1.73
9	1.71	1.71	1.72	1.72	1.72	1.72	1.73	1.73	1.73	0.00

Table 5: Channel-to-channel crosstalks

7 Notes