HMCAD1520 Crosstalk

Product Application Note

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1   Introduction

Crosstalk is a measure of how isolated one analog input is from others. Cross-talk has the potential to increase noise in the ADCs, reducing (SNR), or create spurs thereby reducing SFDR. In the HMCAD1520, a quad input device, there are six potential channel coupling paths (1-2, 1-3, 1-4, 2-3, 2-4, 3-4).

Many ADC datasheets provide only an idle channel measurement in which no power is input into the channel of interest and a full power tone is injected into a adjacent channel. This may not be indicative of real-world performance in which variable power signals are input on each channel.

The basic crosstalk measurement for the HMCAD1520 is taken with a 70 MHz full scale input applied to one channel and measurement taken on second channel driven to full scale at 71 MHz. Under these conditions, the crosstalk specification is 70 dBc.

Measurement of crosstalk at lower input frequencies is tabulated below.

2   HMCAD1520 Crosstalk Measurement Data

The crosstalk measurements where obtained using a EVAL01-HMCAD1520 board under the following conditions:

> 12bit High-speed, dual channel mode;
> Fs=500MSPS; Fi1=8.123MHz; Fi2=9.877MHz; delta F=1.754MHz
> Unless otherwise noted: Vsup=1.8v; Temp=23°C

Definition of crosstalk: highest (worst-case) reading of the two measurements [ch1->ch2, ch1<-ch2]

Inp1		Inp2		Inp3		Inp4					(Low Frq)	(High Frq)
[MHz]	[dBFS]	[MHz]	[dBFS]	[MHz]	[dBFS]	[MHz]	[dBFS]	[dBFS]	**[dBc]**		Chan_A	Chan_B
F_inp1	Ai_inp1	F_inp2	Ai_inp2	F_inp3	Ai_inp3	F_inp4	Ai_inp4	Crosstalk	**Crosstalk**	Xtalk name	Xt[dBFS]	Xt[dBFS]
8,123	-1,01	9,877	-1,08					-79,36	-78,4	Xtalk(1-2)	-81,050	-79,360
8,123	-1,01			9,877	-1,02			-81,00	-80,0	Xtalk(1-3)	-81,000	-86,500
8,123	-1,00					9,877	-1,02	-80,23	-79,2	Xtalk(1-4)	-85,367	-80,231
		8,123	-1,08	9,877	-1,01			-77,77	-76,8	Xtalk(2-3)	-80,617	-77,769
		8,123	-1,05			9,877	-1,05	-76,55	-75,6	Xtalk(2-4)	-81,174	-76,551
				8,123	-1,06	9,877	-1,07	-75,21	-74,2	Xtalk(3-4)	-75,469	-75,211

Table 1   HMCAD1520 Crosstalk Measurements