

Hittite Microwave

**Using HMCAD1050-80
FS 100MSPS - 125MSPS
Fin 145 – 175MHz**

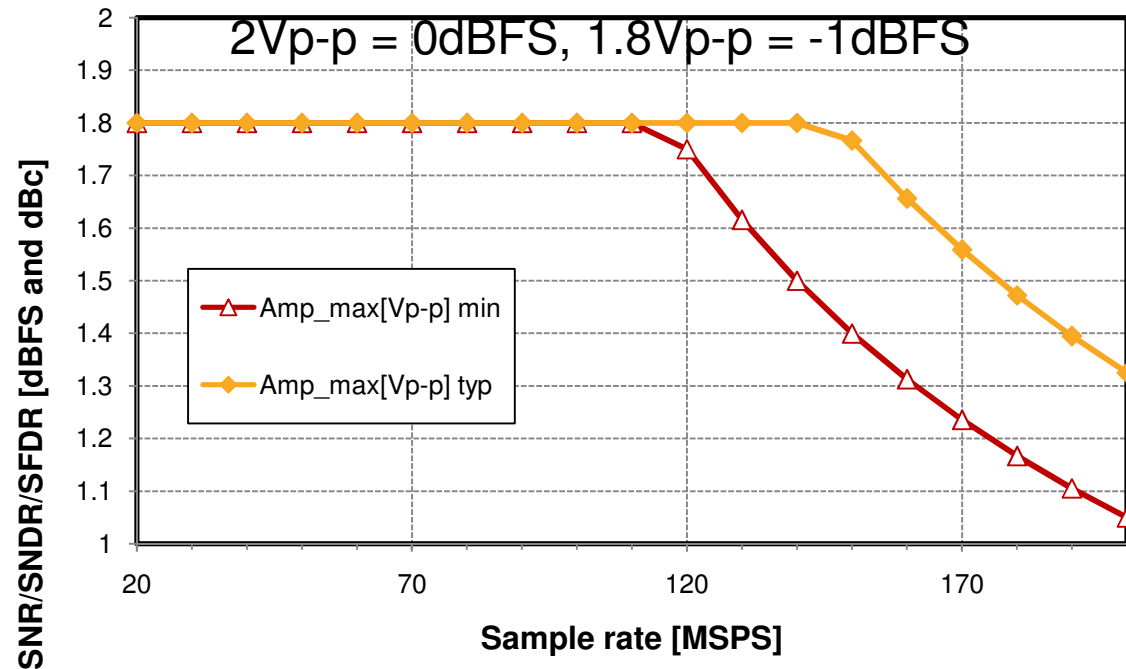
HMCAD1050-80 setup for 100 MSPS – 125MSPS

- ✓ To achieve high performance with HMCAD1050-80 up to 125MSPS, the ADC must be driven with a differential amplifier
- ✓ At 100MSPS or higher a 1.9V+/-0.1V supply is recommended

HMCAD1050-80 setup for Fin >100MHz

- ✓ To ensure a robust performance at high input frequency, an LC-oscillator tank at the ADC input is recommended
 - ✓ The LC frequency is set to eliminate the ADC input capacitance at the IF frequency
- ✓ To avoid missing codes, the maximum input amplitude should be limited at high input frequencies
 - ✓ A 210MHzVp-p frequency-Amplitude product is recommended
 - ✓ The plot below shows the max recommended amplitude versus input frequency

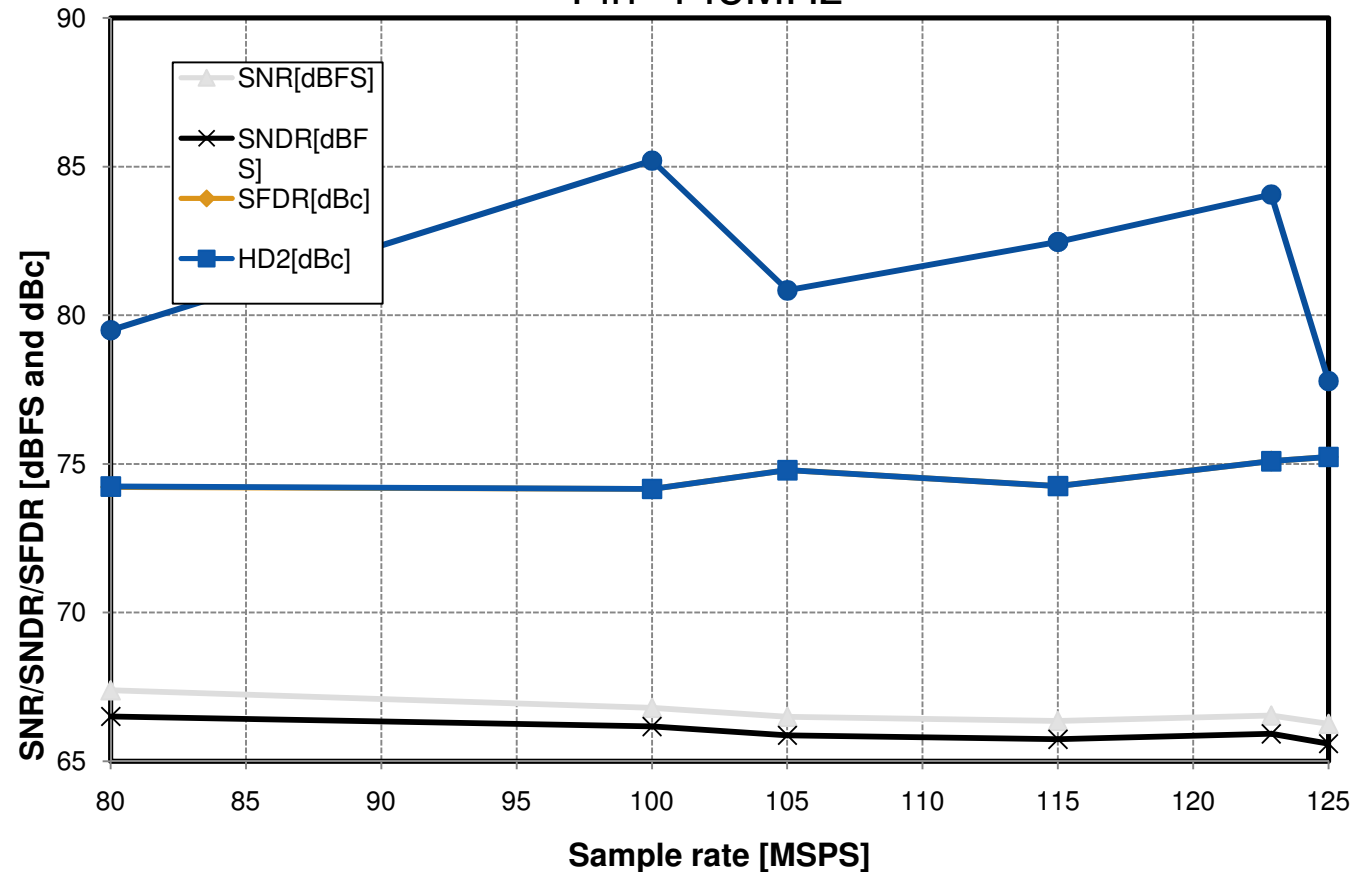
Max recommended input Amplitude vs Fin



HMCAD1050-80 FS=80 to 125MSPS, $f_{in}=145\text{MHz}$

- ✓ $V_{sup}=1.9\text{V}$
- ✓ $A_{in}: -1\text{dBFS}$
- ✓ ADC clock: HMC830
- ✓ LC tank:
 - ✓ $L_{shunt}=47\text{nH}$
 - ✓ $C_{shunt}=33\text{pF}$
- ✓ SFDR:
 - ✓ Limited by HD2

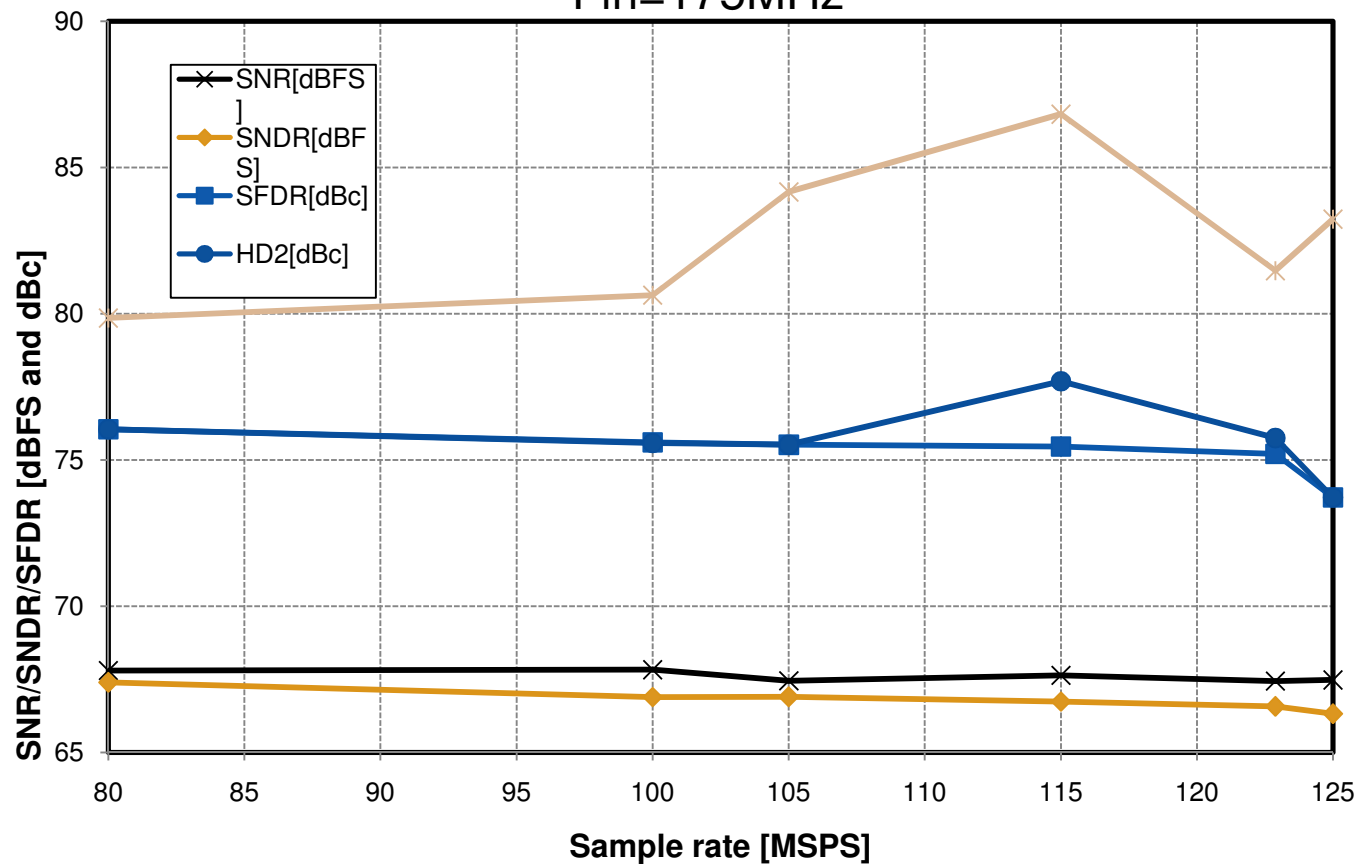
Performance vs Sample rate
 $f_{in}=145\text{MHz}$



HMCAD1050-80 FS=80 to 125MSPS, $f_{in}=175\text{MHz}$

- ✓ $V_{sup}=1.9\text{V}$
- ✓ $A_{in}: -3\text{dBFS}$
- ✓ ADC clock: HMC830
- ✓ LC tank:
 - ✓ $L_{shunt}=47\text{nH}$
 - ✓ $C_{shunt}=15\text{pF}$

Performance vs Sample rate
 $f_{in}=175\text{MHz}$



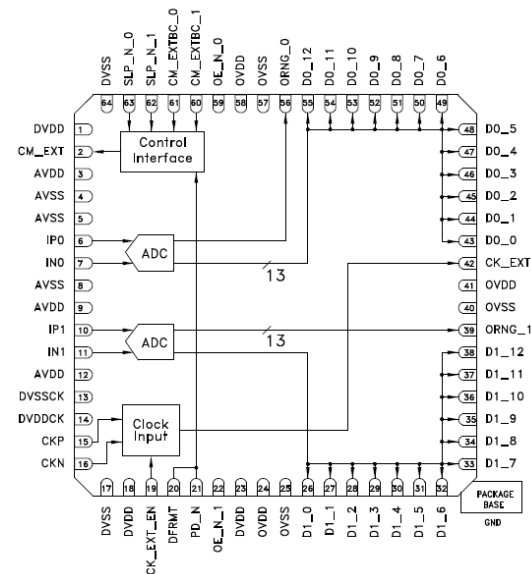
Driving HMCAD1050-80 at 100 to 125 MSPS and Fin 145-175MHz

- ✓ *By applying the following conditions HMCAD1050-80 can be recommended up to 125MSPS and fin up to 175MHz*
 - ✓ *Supply voltage: 1.9V+/-0.1V*
 - ✓ *ADC driver: Differential amplifier*
 - ✓ *ADC input signal termination: LC-tank*
- ✓ *Measurement results show*
 - ✓ *SNR/SNDR : 65dB or better, including clock driver jitter*
 - ✓ *Linearity: 74 dB or better, mostly limited by HD2*

Part Number	Function / Mode	Resolution (bits)	Sample Rate (MSPS)	Power Dissipation ^[2] ^[3]	SNR (dBFS)	SFDR (dBc)	Package
HMCAD1050-80	Dual Channel	13 / 12	80	102 mW	72	77	LP9E
	Dual Channel	13 / 12	65	85 mW	72.6	81	
HMCAD1050-40	Dual Channel	13 / 12	40	55 mW	72.7	81	LP9E
	Dual Channel	13 / 12	20	30 mW	72.2	85	
HMCAD1040-80	Dual Channel	10	80	78 mW	61.6	75	LP9E
	Dual Channel	10	65	65 mW	61.6	77	
HMCAD1040-40	Dual Channel	10	40	43 mW	61.6	81	LP9E
	Dual Channel	10	20	24 mW	61.6	81	

Features

- ✓ Selectable 20/40/65/80 MSPS
- ✓ Ultra Low Power Dissipation
 - ✓ Dynamic power vs sample rate scaling
- ✓ 72 dB SNR at 80 MSPS & 8MHz F_{in}
- ✓ Internal Reference Circuitry
- ✓ Parallel CMOS Output
- ✓ 64 Pin QFN Package
- ✓ Pin Compatible



^[2] Supply Voltage (Vdd) +1.8 Vdc Analog Supply (Avdd) and +1.8Vdc Digital Supply (Dvdd)

^[3] Output Supply Voltage (OVdd) +1.7 to +3.6 Vdc