High Frequency Arbitrary AC Source Module Design

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Modules
FEATURES

Differential Arbitrary Signal Generation
14 Bit Resolution
Selectable Filters
3Vpp Differential Output
Up to 90 dB SFDR
On-board DC Power de-coupling
52 Pin Plug-in Module
No DIB Application Components Needed
DIBSRC_HF Functional Block Diagram

Amplitude Control via Segment
Selectable Clocks: HSD or Precision Clock

- HSD Clock: CMOS TTL Levels
- Precision Clock: PECL Level - Low Jitter

Level Shaper: Converts PECL Level to CMOS TTL level
**DAC and Gain Control Block**

- Resolution: 14 Bit
- Max Data Rate: 165MSPS
- Differential Current Outputs: 1mA to Max. 30mA
- Amplitude Control: 100mV – 3Vpp

Max. 165MHz Clock

Gain control via resistor divider

I_OUT Differential 1 mA to 20 mA
Signal Data Generation

- Signal Data Memory: Digital Signal I/O Memory
- Signal Data Format: 14 Bit Binary or 2’s Complement
- Segment Amplitude Control: 100mVpp (13bit data) to 49uVpp (2 bit data)
I/V (Current to Voltage) Converter

- Feedback design ensures zero common mode offset
- Current input: 0 ~ 30mA
Filter Block

I/V CONV

Filter Block

Offset Driver

SRC_P
FLT_SEL_P
SRC_N
FLT_SEL_N

Differential Filter #1
Differential Filter #2
Filter Dimensions
Offset Control and Driver

- Offset Control: -2V to +2V including signal
- Driver: 50 Ohm Output Impedance
- Both Differential and Single Ended Drive Capability
Pin Connections

NO external application components needed!
Module Dimensions

Artwork layout pattern
4MHz NO Filter

Wave Display dir: /u/basocon/PROJECTS/MODULES/DIBSRC_HF_REVB

Waveform trace #1: 4M.wav

Sample freq: 70.66MHz  size: 262144  Zero dB: 1.000

DATA: 4.454e-18 to 0.4217  DISPLAY: -130.0dB to 0.000dB

Some data are offscale (above or below Y-axis limits)
4MHz with Diff. 6MHz LPF
5Mhz NO Filter
5MHz with Diff. 6MHz LPF

Some data are offscale (above or below Y-axis limits)
6MHz Tone
No Filter

SFDR 78dBc
6MHz Tone

6MHz Differential LPF

~98dBc

SFDR 90dBc
11MHz Tone
No Filter

SFDR 70dBc
11MHz Tone
17MHz Differential LPF

Wave Display: dir: /u/basocon/PROJECTS/MODULES/Loopback/TUG2003

Waveform trace #1: 11MHz.wav
File View Sample freq: 70.856 MHz size: 262144 Zero dB: 1.000
Y-axis Zoom Exp DATA: 1.439e-18 to 0.3191 DISPLAY: -130.0 dB to 0.000 dB

SFDR 85dBc

85dBc

95dBc

Some data are offscale (above or below Y-axis limits)
256 Multi-Tone

> 90dBc

Missing Tone
1624 Multi-Tone

Wave Display dir: /u/basocon/PROJECTS/MODULES/Loopback/TUC2003

Waveform trace #1: 1624MT.wav
Sample freq: 70.856M  size: 262144  Zero dB: 1.000
DATA: 8.591e-19 to 3.675e-05  DISPLAY: -130.0dB to -40.00dB

Some data are offscale (above or below Y-axis limits)
DIBSRC_HF Design

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