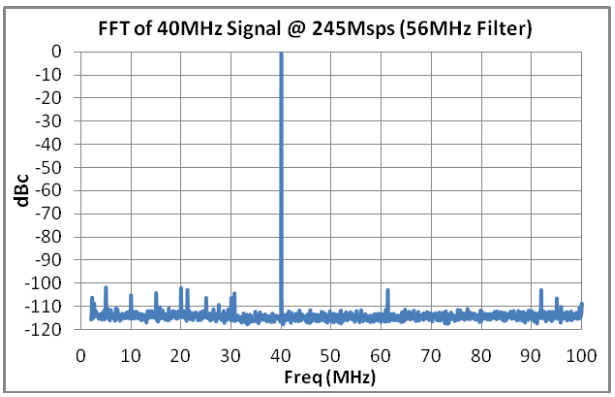
18 bit / 300Msps Arbitrary Waveform Generator

AWG18

- 300Msps without interpolation
- 600Msps and 1.2Gsps interpolation modes
- 18 bit resolution
- Differential or Single Ended outputs
- 8 output ranges / 7 output filters
- -105dBc THD typical at 10MHz
- -78dBc THD typical at 100MHz
- 73dBc SNR typical
- Programmable common mode voltage
- For ATX series hardware platform

The AWG18 is an 18 bit Arbitrary Waveform Generator for high-speed / high resolution waveform generation. This module features two dedicated signal paths. A DC to 100MHz path which is optimized for accurate time domain and frequency domain measurements up to 30MHz. And a dedicated AC path optimized for signals between 10MHz to 100MHz. In combination with the built-in filters it features a typical harmonics level of better than -80dBc for the whole range.

The module features differential outputs with a programmable common-mode voltage. For single ended applications the positive output as well as the negative output can be used. The clock can come from the backplane or from the front panel.



The module has 8 output ranges in steps of -3dB, which covers a wide range of Unit Under Test input voltages.

The unit is an excellent choice when exceptional signal integrity in combination with a high level accuracy is required. The 8M-word (16M-byte) waveform memory allows very complex signal shapes to be generated. For higher output frequencies the waveform can be improved by using the x2 or x4 interpolation modes, resulting in maximum sample frequencies of 600Msps or 1.2Gsps respectively.

The LF path combines high DC accuracy and fast level settling with an excellent dynamic signal performance up to 30MHz. This allows precision time domain measurements as well as high quality dynamic measurements. The 10MHz to 100MHz signal path excels in dynamic signal generation. It features a filter-bank with 7 Low Pass filters, if desired the user can change any filter module with a custom version allowing an even better dynamic performance at user specific frequencies.

The jitter added to the applied front- or backplane clock is typically less than 0.2ps.

APPLICOS
MEASUREMENT & CONTROL

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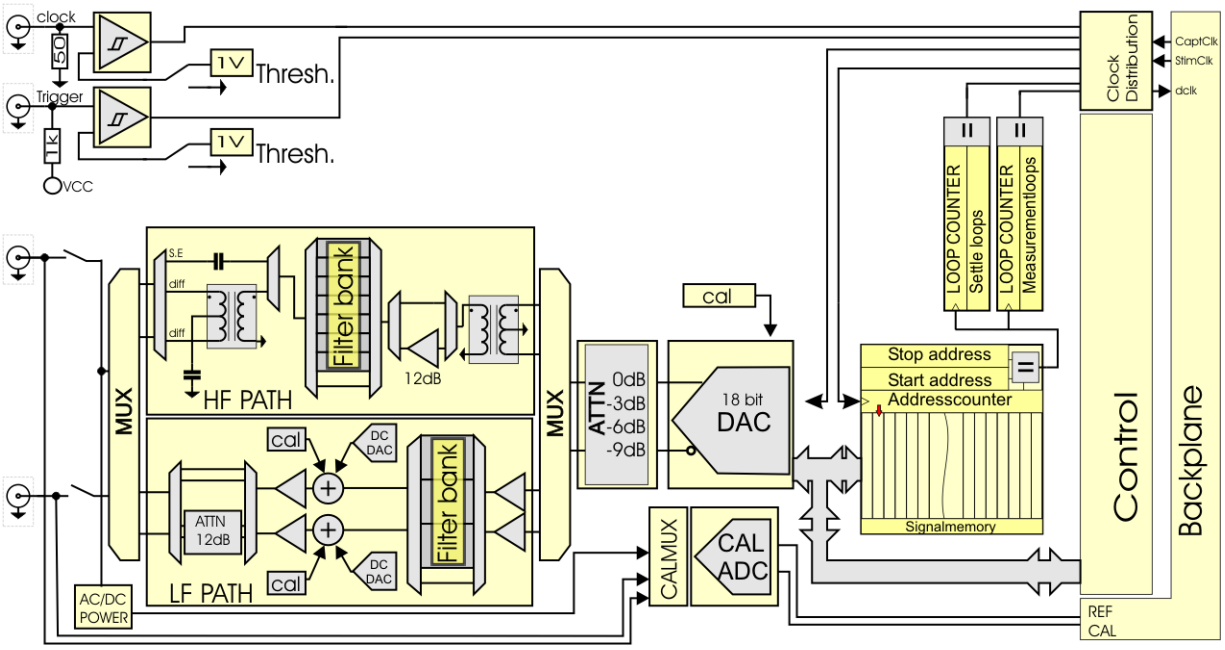
Block diagram



Specifications (conditions: after 1 hour warm-up, T_A=25ºC, filter bypass unless otherwise mentioned)

General

Resolution	18 bit
Update rate	1MHz -300MHz
Pattern memory depth	8M words

Output characteristics LF Path

Output impedance	50Ω
Ranges Single Ended (Vpp into open circuit)	0.58V, 0.82V, 1.16V, 1.64V, 2.32V, 3.28V, 4.64V, 6.56V
Output filters (3 pole Butterw.)	Bypass, 15MHz, 30MHz
Bandwidth, -3dB (typical)	100MHz (excl. sinX/X effect)
0.1dB flatness (typical)	30MHz (excl. sinX/X effect)
Output configuration	Differential, Single Ended
Output operating range	+/- 5.84V

Dynamic characteristics LF Path

(2Vpp @ 50Ohm single output, 250Msps, BW DC-100MHz)

SNR (f-out=1MHz)	73dBc
SNR (f-out=10MHz)	70dBc
THD (f-out=1MHz)	-90dBc
THD (f-out=10MHz)	-75dBc
SFDR (f-out=1MHz)	92dBc

Accuracy

Absolute accuracy	±(300µV + 0.02% of range)
Non Linearity	±0.004% of range

Common mode voltage source

Resolution	16 Bit
Voltage range	-2.56V to +2.56V
DC-offset accuracy	±(100µV + 0.005% of value)
Non Linearity	±0.004% of range

Output characteristics HF Path

Output impedance	50Ω/ 100Ω
Ranges Single Ended (Vpp into 50 Ohm)	0.41V, 0.58V, 0.82V, 1.16V, 1.64V, 2.32V, 3.28V, 4.63V
Ranges differential (Vpp_{diff} into 100 Ohm)	0.58V, 0.82V, 1.16V, 1.64V, 2.32V, 3.28V, 4.64V, 6.56V
Output filters (7 pole elliptic.)	Bypass, 17MHz, 25MHz, 38MHz, 56MHz, 80MHz, 117MHz
Bandwidth, -3dB (typical)	6MHz -100MHz (excl. sinX/X effect)
Output configuration	AC Differential, AC Single Ended

Dynamic characteristics HF Path

(4.63Vpp, 245Msps, BW 100MHz, nearest applicable filter used)

SNR (f-out=10MHz)	73dBc
SNR (f-out=100MHz)	71dBc
THD (f-out=10MHz)	-99dBc
THD (f-out=100MHz)	-75dBc
SFDR (f-out=10MHz)	94dBc

Clock input

Input impedance	50Ω
Threshold level	0V or 1V (programmable)
Input level around threshold	±100mV to ±2V (±4V max.)
Jitter from clock-in to f-out	130fs (typical, f-out=100MHz, jitter BW= 1kHz-10MHz)

Trigger input

Input impedance	1kΩ
Threshold level	0V or 1V (programmable)
Input level around threshold	±100mV to ±2V (±4V max.)

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