

SPECIFICATIONS**Number of Output Channels: 2**

- D.C. Output Characteristics**
- Output Voltage Range:** ± 5 V into 50 Ω ; ± 10 V into >10 k Ω load.
 - Maximum output current:** ± 100 mA
 - Output impedance:** 50 $\pm .5$ Ω
 - Minimum amplitude range:** <100 μ V full-scale into 50 Ω
 - D.C. Output Accuracy: (at calibrate time):** 0.5% FSR into 50.00 Ω for FS ≥ 500 mV
1.0% FSR ± 500 μ V into 50.0 Ω for FS < 500 mV. (Accuracy gradually drops from .5% to 1% at 50 mV FS)
0.3% FSR into user supplied load of from 49 Ω to 1 M Ω for FSR $\geq 10\%$ of Max Output Voltage Range.
 - Output Temperature Coefficient:** $<0.01\%$ of FSR/ $^{\circ}$ C typical
 - Waveform DAC Resolution:** 12 bits
 - Gain Adjust Resolution:** 0.05% Amplitude
 - Offset Adjust Resolution:** 0.05% FSR
 - Waveform DAC Int. Non-Linearity:** $\pm 0.03\%$ typ.; $\pm 0.05\%$ max
 - Waveform DAC Diff. Non-Linearity:** ± 0.75 lsb typ; ± 1 lsb max, monotonic
 - Offset Adjust Range:** \pm Full Scale Amplitude (wrt midscale of waveform); must be within Output Voltage range.
- Dynamic Characteristics:**
- Risetime/Falltime:** ≤ 8 nsec (5.5 nsec typ)
 - Overshoot and Ringing:** $\leq 5\%$, typically 2%
 - Total Harmonic Distortion:** ≤ -65 dBc, $f < 200$ kHz
(1 V rms into 50 Ω) ≤ -55 dBc, $f < 1$ MHz
 ≤ -45 dBc, $f < 5$ MHz
 - Spurious and non-harmonic distortion:**
 < -65 dBc, $f \leq 1$ MHz
 < -60 dBc, $f > 1$ MHz
excluding the band within
1 kHz of carrier
 - Settling Time:** < 20 nsec to 1% typical,
50 nsec max.
 - Interchannel Crosstalk:** $\leq 0.05\%$, tested with both channels at 10 V amplitude.
 - Channel-to-Channel Analog Delay Difference:** ≤ 3 nsec

2 Product Description

Low Pass Output Filter:	Corner Frequency (-3 dB): 36 MHz Source Impedance: 50 Ω Filter Input Impedance: 50 Ω Filter Load Impedance: 50 Ω Passband Flatness: DC to 10 MHz: 0.1 dB 10 MHz to 25 MHz: 0.4 dB Attenuation at 50 MHz: > 40 dB Maximum Applied DC Voltage: 7 V Maximum AC Signal Amplitude: 12 V p-p Input and Output Connectors: BNC female
Noise	Signal to Noise Ratio (non-coherent): >70 dB rms P-P Noise: $\leq 0.1\%$ FS + ≤ 2 mV excluding glitch Max Glitch Energy: (5 X 10 ⁻¹¹ V-sec) times FS
Timebase	Max. Waveform Point Rate: 50 Mpoints/sec each channel Range: 20 nsec/point to 100 sec/point Resolution: .035% Accuracy: ≤ 5 ppm at achievable setpoints, 23 ^o C, 115 VAC/60 Hz, after 30 minute warmup Stability: <0.5 ppm per $^{\circ}$ C
Waveform Memory	Fast Memory Length: 64 Kpoints single channel Waveform Length Resolution: single channel: 4 pt blocks dual channel: 2 pt blocks
Analog Output Protection	Protected against application of up to ± 40 V DC
Digital Output Specification	Output Channels: 2 channels with Channel 1 data corresponding to the channel 1 analog output. Channel 2 digital data corresponds to the channel 2 analog output. Digital data is normalized so that a data value of 4095 (FFF ₁₆) on the 12 msbs of the digital word (D15-D4) corresponds to maximum analog amplitude and a data value of 0(000 ₁₆) on the 12 msbs of the digital word corresponds to the minimum analog output. Maximum Digital Pattern Length: Same as for Analog Output Digital Outputs per Channel: 16 data lines, clock, 17 grounds Maximum Data Output Rates: (Identical to 9112 analog sample rate) Single or Dual channel operation: 50 Msamples/sec (20 nsec per word)

Timing: (All outputs unloaded)

Digital Clock to Analog Output: Clock precedes the Analog output by 1 clock period +16 nsec \pm 3 nsec

Digital Clock to Digital Data: 4 nsec typical

Clock Duty Cycle: 40% min, 60% max

Setup Time Provided: 15 nsec min at 50 Megawords/second
typically setup time = (sample period)-(hold time)

Data to Data Skew Time: \pm 0.8 nsec max within each channel's data word

Hold time Provided: 2 nsec min, 4 nsec typ

Channel to Channel Skew:

Clock: \pm 0.8 nsec max

Data to Data Skew Time: \pm 1.6 nsec for any data line to data line

Risetime: 5 nsec max (20% - 80%)

Falltime: 3.5 nsec max (20% - 80%)

Both risetime and falltime measured 20%-80% after 3 ft of Twist 'N Flat cable. Load at termination is two LS TTL data inputs plus a probe loading of 5 k Ω in parallel with 2 pF

Logic Levels:

V(high) min: +2.7 V at +1 mA

V(low) max: +0.75 V at -3.2 mA

Absolute max applied voltages: +5.5 v, -0.5 V