

labZY nanoMCA-II and nanoMCA versus Amptek Digital MCA's

| COMPANY | labZY | labZY | Amptek | Amptek |
|---------------------------------------|--|--|----------------------------|---|
| PRODUCT | nanoMCA-II | nanoMCA | MCA8000D | DPP5 OEM |
| PULSE PROCESSING | | | | |
| DIGITAL PULSE PROCESSING (DPP) | YES | YES | NO | YES |
| ANALOG PULSE-HEIGHT MEASUREMENT (PHA) | YES | YES | YES | NO |
| OPEN PLATFORM | YES | YES | NO | NO |
| USER CUSTOMIZABLE | YES | YES | NO | NO |
| ADC Resolution | 16-bit | 16-bit | 16-bit | 12-bit |
| ADC Sampling Frequency | 125 MHz | 80MHz | 100MHz | 80MHZ (20MHz) |
| Pulse Shaping | Trapezoidal or Custom | Trapezoidal or Custom | NA | Trapezoidal |
| Shaped Pulse Rise Time (RT) | 16ns to 16 μ s, in 8ns increments | 25ns to 25 μ s, in 12.5ns increments | NA | 100ns to 102 μ s, 30 preset values |
| Shaped Pulse Flat Top (FT) | 0 to 8.2 μ s, RT Independent | 0 to 3.2 μ s, RT Independent | NA | RT Dependent, >50ns |
| Input Pulse Polarity | Positive or negative | Positive or negative | Positive | Positive |
| Input Pulse Rise Time PHA | >150ns | >200ns | >500ns | NA |
| Coarse Gain DPP | 32 steps, 1 to 215 | 32 steps, 1 to 215 | NA | 16 steps, 1.12 to 102 |
| Coarse Gain PHA | 1, 1.41, 2, 2.83 | 1, 1.41, 2, 2.83 | NO | NA |
| Fine Gain PHA or DPP | 1 to 1.2, 16-bit resolution | 1 to 1.2, 16-bit resolution | NA | 0.75 to 1.25, 13-bit resolution |
| Gain Stability (typ) | ± 5 ppm/ $^{\circ}$ C | ± 5 ppm/ $^{\circ}$ C | ± 10 ppm/ $^{\circ}$ C | <20 ppm/ $^{\circ}$ C |
| Base Line Drift PHA (typ) | < 1 ppm/ $^{\circ}$ C | < 1 ppm/ $^{\circ}$ C | ± 10 ppm/ $^{\circ}$ C | NA |
| Fast Channel Rise Time (FRT) | 8ns to 2 μ s, in 8ns increments | 12.5ns to 3.2 μ s, in 12.5ns increments | NA | 50ns to 800ns (200ns to 3.2 μ s) 5 preset values |
| Fast Channel Flat Top (FFT) | 8ns to 2 μ s, in 8ns increments | 12.5ns to 3.2 μ s, in 12.5ns increments | NA | FRT Dependent |
| PHA Peak Estimator | Real Time Peak Fitting | Real Time Peak Fitting | Not Specified | NA |
| Timing Signal PHA or DPP | Constant Fraction | Constant Fraction | NO | NO |
| Pole-Zero Adjustment DPP | 25 μ s to ∞ | 50 μ s (25 μ s - Zopt) to ∞ | NA | NO |

| MCA | | | | |
|--|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|
| Numbers of Channels | 16k | 16k | 8k | 8k |
| Channel Capacity | 4 bytes (4.3·10 ⁹ counts) | 4 bytes (4.3·10 ⁹ counts) | 3 bytes (16.7·10 ⁶ counts) | 3 bytes (16.7·10 ⁶ counts) |
| Input Sensitivity DPP | ±1.5V/16k chn, gain 1 | ±0.8V/16k chn, gain 1 | NA | 1V/8k chn, gain 1 |
| Input Sensitivity PHA | ±3.3V/16k chn, gain 1 | ±3.3V/16k chn, gain 1 | 1V/8k or 10V/8k | NA |
| Preset Acquisition Time | 2 ³² s | 2 ³² s | 2 ²⁴ s | 10ms to 496 days |
| Acquisition Time Resolution | 200ns | 200ns | 10ms | 10ms |
| Timer Accuracy (MAX, over all conditions) | ±10ppm | ±25ppm | Not Specified | Not Specified |
| Coincidence/Anticoincidence | YES | YES | YES | NO |
| DPP Input Referred Noise RMS [channels] | See Graph Below the Table | See Graph Below the Table | Not Specified | Not Specified |
| Special Functions | | | | |
| Automatic Thresholds PHA or DPP | YES | YES | Not Specified | Not Specified |
| Baseline Restoration PHA or DPP | 1024 Settings | 1024 Settings | NO | 16 Settings |
| Digital Pulser Noise Estimator | YES | YES | NO | NO |
| Enhanced Pile-Up Rejector DPP | YES | YES | NA | NO |
| Counting Losses Estimator DPP | Extended Pulse Width | Extended Pulse Width | NA | Not Specified |
| True Incoming Rate Estimator DPP | Yes | Yes | NA | NO |
| Digital Trace Viewer (Oscilloscope) PHA or DPP | YES | YES | NO | NO |
| Automatic Pulse Polarity PHA or DPP | YES | YES | NO | NO |
| MCS | NO | NO | YES | YES |

| | | | | |
|---------------------------------|---|---|--|-----------------------------------|
| SCA | Up to 3 Per Customer Specifications | NO | NO | 16 |
| Particle Counting Option PHA | Standard, Built-in | Standard, Built-in | Option | NA |
| Connectors and Interface | | | | |
| Digital Inputs/Gates | 3 | 2 | 2 | Multiple IO |
| Digital Outputs | 3 | 2 per customer request | 0 | Multiple IO |
| Interface | USB Ethernet WiFi Bluetooth Serial Fiber Optic | USB Ethernet WiFi Bluetooth Serial Fiber Optic | USB Ethernet Serial | USB Ethernet Serial |
| Mechanical and Power | | | | |
| Size | 3.6" x 1.5" x 1" (92 x 38 x 25 mm) | 3.6" x 1.5" x 1" (92 x 38 x 25 mm) | 5" x 2.8" x 0.8" (125 x 71 x 20 mm) | Board 3.5" x 2.5" (89 x 64 mm) |
| Weight | <135g Enclosed | <135g Enclosed | <165g Enclosed | 32g Board |
| Power Consumption | 1350mW | 900mW | 2000mW | 1000mW(900mW) Board Only |

& Includes both DPP and PHA, fully reprogrammable and customizable

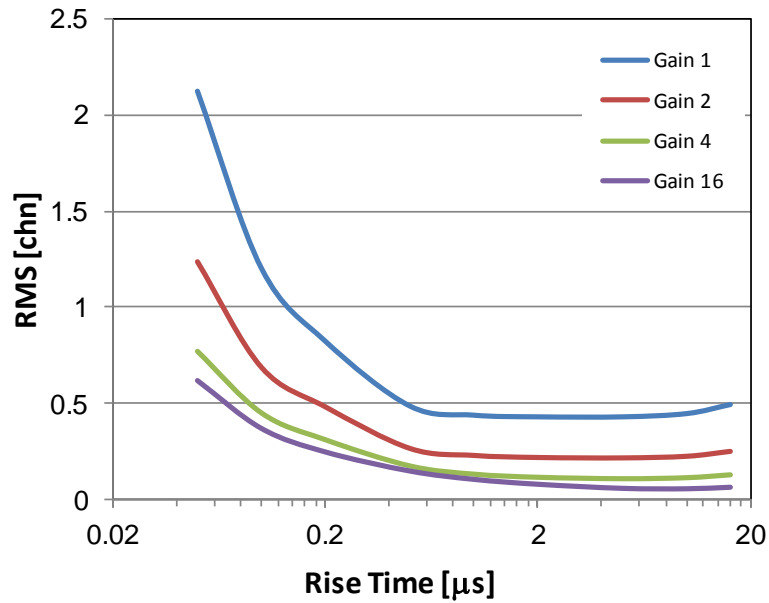
PHA only

* DPP only

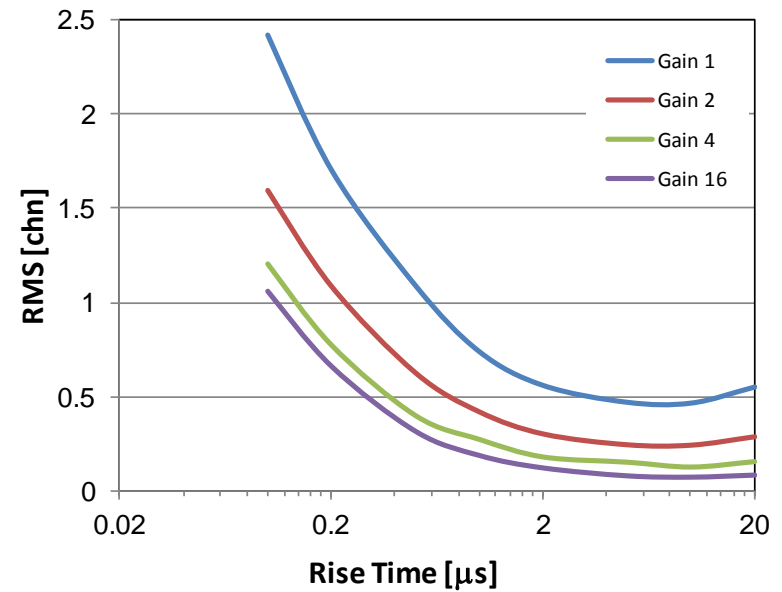
NA - Not Applicable

For specs not included in this table, please, contact sales@labzy.com

Noise performance of nanoMCA-II and nanoMCA



nanoMCA - II - input referred noise for triangular shape with rise time from 50ns to 16μs, spectrum size 16k channels (DPP mode)



nanoMCA - input referred noise for triangular shape with rise time from 100ns to 20μs, spectrum size 16k channels (DPP mode)

nanoMCA-II - PHA Mode, Pulser FWHM, 16k Spectrum

| Gain | 1 | 1.4 | 2 | 2.8 |
|------------|-----|-----|-----|-----|
| FWHM [chn] | 1.5 | 1.6 | 1.6 | 1.6 |

nanoMCA - PHA Mode, Pulser FWHM, 16k Spectrum

| Gain | 1 | 1.4 | 2 | 2.8 |
|------------|-----|-----|-----|-----|
| FWHM [chn] | 3.8 | 4.0 | 4.2 | 4.4 |