

Data Acquisition Products

CCD Signal Processor/Imaging Converters

A/D Converters

Sampling A/D Converters

Digital-to-Analog Converters

Sample/Hold Amplifiers

Single-Package Data Acquisition

Multiplexers

Amplifiers

About Murata Power Solutions

Murata Power Solutions was established by Murata Manufacturing Corporation in September 2007 with its acquisition of the Power Electronics Division of C&D Technologies, Inc. The acquisition brought with it a comprehensive offering of products and capabilities from market leading companies previously acquired by C&D, including:

DATEL, Inc.

- Data acquisition technology
- Medium to high power DC/DCs
- Digital panel meters

Newport Components Ltd.

- Miniature low power DC/DCs
- Magnetic products

Power Systems Division of Celestica, Inc.

- AC/DC front end power supplies
- Processor power (VRMs)
- PoL DC/DCs

Celab Ltd.

- Power conversion products for hi-rel applications

DATEL® Data Acquisition Solutions

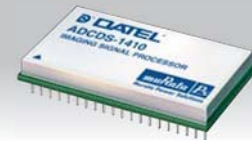
Since being established in 1970, the DATEL Data Acquisition product offering has grown to become one of the industry's broadest, designed to meet the ever-changing requirements of military, HI-REL, medical, scientific and industrial applications. Today, our leadership status in high-performance data acquisition components is unchallenged, driven in large part by our engineering expertise to develop solutions with outstanding electrical performance, small packaging, low power consumption and ease of use.

These products employ five basic technologies: monolithic CMOS, monolithic bipolar, thin-film hybrid, thick-film hybrid and discrete component circuit. Many products utilize a combination of these technologies to achieve higher levels of performance.

Whether you require a standard, off-the-shelf solution or a custom product of data acquisition, analog, linear and/or integrated power, we welcome the opportunity to work with you on your designs.

Contents

CCD Signal Processor/Imaging Converters



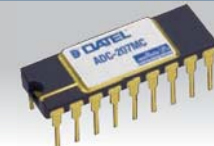
03

Sampling A/D Converters



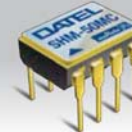
04

A/D Converters (stand-alone)



07

Sample-Hold Amplifiers



08

Multiplexers



08

Digital-to-Analog Converters (D/As)



09

Data Acquisition Systems



10

High Reliability Models



10

Warranty

11

CCD Signal Processor/Imaging Converters



The ADCDS family are application-specific video signal processors designed for electronic-imaging applications that employ CCDs (Charge Coupled Devices) as their photodetector.

They incorporate a “user configurable” input amplifier, a CDS (correlated double sampler) and a sampling A/D converter in a single package. Functionally complete, these imaging converters provide the user with a high-performance, low-cost, low-power integrated solution.

The key to the ADCDS family’s performance is a unique, high-speed, high-accuracy CDS circuit, which eliminates the effects of charge injection and “kT/C” noise on the CCD’s output floating capacitor, producing a “pixel data” output signal. The ADCDS family digitizes this resultant “pixel data” signal using a high-speed, low-noise sampling A/D converter.

If you cannot find the CCD/imaging converter solution you need in the tables below, contact us, and we’ll modify or develop one for you.

Sampling A/Ds with Integrated Correlated Double Samplers (CDS)

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	DC RMS Noise	Input Ranges	Power Supplies	Power	Temperature	Package	Process	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	LSB	Volts	Volts	Watts	°C				
12	40	0.5	1.5	1	0.68	+3.3, ±5, +12	TBD	0 to +70	44-pin TDIP/SMT	SMT	ADCDS-1240	9
14	3	0.5	2.5	1	0.35 - 2.8	±5, +12	0.500	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1403	3
	3	0.6	2.5	1.25	0.35 - 2.8	±5, +12	0.500	-55 to +125	40-pin TDIP/SMT	SMT	ADCDS-1403EX	3
	5	0.5	2.5	1	0.35 - 2.8	±5, +12	0.700	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1405	3
	5	0.6	2.5	1.25	0.35 - 2.8	±5, +12	0.700	-55 to +100	40-pin TDIP/SMT	SMT	ADCDS-1405EX	3
	10	0.5	2.5	1	0.35 - 2.8	±5, +12	0.700	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1410	3
	10	0.6	2.5	1.25	0.35 - 2.8	±5, +12	0.700	-55 to +100	40-pin TDIP/SMT	SMT	ADCDS-1410EX	3
16	2.3	0.5	1	2	0.342 - 2.048	±5	0.635	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1603	1
	2.3	0.6	2	2	0.342 - 2.048	±5	0.635	-40 to +125	40-pin TDIP/SMT	SMT	ADCDS-1603EX	1
	10	0.5	1.5	2	0.342 - 2.8	±5	TBD	0 to +70	40-pin TDIP/SMT	SMT	ADCDS-1610	7

Stand-alone Correlated Double Samplers (CDS)

Accuracy	Pixel Rate	Acquisition Time	Aperture Delay	Input Range	Hold Mode Droop	Power Supplies	Power	Temperature	Package	Model Number
%	MSPS	µsec	nsec	±Volts	µV/µsec	Volts	Watts	°C		
0.01	5	0.1	10	±2.5	5000	±5	0.35	0 to +70	24-Pin DDIP/SMT	CDS-1402MC
	5	0.1	10	±2.5	5000	±5	0.35	-55 to +125	24-Pin DDIP/SMT	CDS-1402MM
0.003	1.25	0.4	10	10	4	+5, ±15	0.7	0 to +70	24-Pin DDIP/SMT	CDS-1401MC
	1.25	0.4	10	10	4	+5, ±15	0.7	-55 to +125	24-Pin DDIP/SMT	CDS-1401MM
0.001	5	TBD	TBD	±2.5	TBD	±5	TBD	0 to +70	24-Pin DDIP/SMT	CDS-1605
	5	TBD	TBD	±2.5	TBD	±5	TBD	-55 to +125	24-Pin DDIP/SMT	CDS-1605MM

Sampling A/Ds optimized for imaging applications

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	DC RMS Noise	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	LSB	-dB	Volts	Volts	Watts	°C			
12	1	0.25	0.5	0.25	73	0 to +10	+5, ±15/12	1.7	0 to +70	24-pin DDIP/SMT	ADS-CCD1201MC	0
	1	0.25	0.5	0.25	73	0 to +10	+5, ±15/12	1.7	-55 to +125	24-pin DDIP/SMT	ADS-CCD1201MM	0
	2	0.25	0.5	0.30	72	0 to +10	+5, ±15/12	1.75	0 to +70	24-pin DDIP/SMT	ADS-CCD1202MC	0
	2	0.25	0.5	0.30	72	0 to +10	+5, ±15/12	1.75	-55 to +125	24-pin DDIP/SMT	ADS-CCD1202MM	0
14	10	0.30	1.0	0.5	78	0 to +5	+5, ±15/12	1.25	0 to 70	40-pin DDIP/SMT	ADS-CCD1410MC	7
	10	0.30	1.0	0.5	78	0 to +5	+5, ±15/12	1.25	-55 to +125	40-pin DDIP/SMT	ADS-CCD1410MM	7

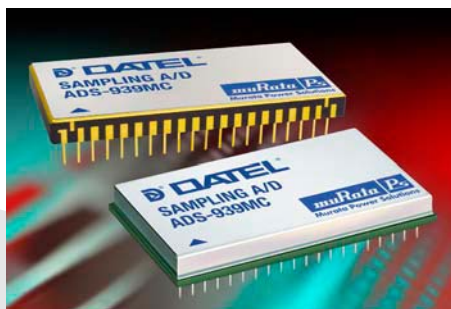
Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

www.murata-ps.com

muRata **Ps**
Murata Power Solutions

Sampling A/D Converters



The ADS family of Sampling A/Ds combine a sample-and-hold and analog-to-digital converter with support circuitry, in a single-packaged device.

As such, these sampling A/Ds provide a functionally complete (no additional external components are required) and fully static and dynamic tested device – with guaranteed performance. Active laser trimming ensures the final performance has been optimized

based upon the internal component interactions and layout management – aspects not readily achieved in discrete designs. These products do not require a minimum sampling rate. The sampling speed can be varied from a minimum clock of zero Hertz all the way to the maximum sampling rate. Extended temperature range and high-reliability devices (DESC and/or MIL-STD-883 screened and qualified units) are available for many of these devices.

12-bit Resolution Sampling A/Ds

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
12	0.06	0.75	0.75	74	70	+5, +10, ±2.5, ±5, ±10	+5, ±15	0.9	0 to +70	32-pin TDIP/SMT	ADC-HS12BMC	0
	0.06	0.75	0.75	74	70	+5, +10, ±2.5, ±5, ±10	+5, ±15	1.7	-55 to +125	32-pin TDIP/SMT	ADC-HS12BMM	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.3	0 to +70	24-pin DDIP/SMT	ADS-112MC	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.3	-55 to +125	24-pin DDIP/SMT	ADS-112MM	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.6	0 to +70	24-pin DDIP/SMT	ADS-117MC	0
	2	0.5	0.5	78	72	0 to +10, ±5	+5, ±15	1.6	-55 to +125	24-pin DDIP/SMT	ADS-117MM	0
	5	0.5	0.75	72	69	±1	±5	1.8	0 to +70	24-pin DDIP/SMT	ADS-118MC	0
	5	0.5	0.75	72	69	±1	±5	1.8	-55 to +125	24-pin DDIP/SMT	ADS-118MM	0
	10	0.5	0.75	72	69	±1.5	±5	1.8	0 to +70	24-pin DDIP/SMT	ADS-119MC	1
	10	0.5	0.75	72	69	±1.5	±5	1.8	-55 to +125	24-pin DDIP/SMT	ADS-119MM	1

14-bit Resolution Sampling A/Ds, Part 1

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
14	0.5	0.5	0.5	90	81	0 to +10	+5, ±15	1.6	0 to +70	24-pin DDIP/SMT	ADS-916MC	0
	0.5	0.5	0.5	90	81	0 to +10	+5, ±15	1.6	-55 to +125	24-pin DDIP/SMT	ADS-916MM	0
	0.5	0.5	0.5	90	81	±5	+5, ±15	1.3	0 to +70	24-pin DDIP/SMT	ADS-926MC	0
	0.5	0.5	0.5	90	81	±5	+5, ±15	1.3	-55 to +125	24-pin DDIP/SMT	ADS-926MM	0
	1	0.5	0.5	90	81	0 to +10	+5, ±15/12	1.7	0 to +70	24-pin DDIP/SMT	ADS-917MC	0
	1	0.5	0.5	90	81	0 to +10	+5, ±15/12	1.7	-55 to +125	24-pin DDIP/SMT	ADS-917MM	0
	1	0.5	0.5	90	81	±5	+5, ±15/12	1.6	0 to +70	24-pin DDIP/SMT	ADS-927MC	0
	1	0.5	0.5	90	81	±5	+5, ±15/12	1.6	-55 to +125	24-pin DDIP/SMT	ADS-927MM	0
	2	0.5	0.75	79	78	±5	+5, ±15/12	1.4	0 to +70	24-pin DDIP/SMT	ADS-929MC	0
	2	0.5	0.75	79	78	±5	+5, ±15/12	1.4	-55 to +125	24-pin DDIP/SMT	ADS-929MM	0

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

Sampling A/D Converters



The 14-bit high-resolution ADS family of Sampling A/Ds are designed utilizing SMT-based or hybrid manufacturing technology.

Both manufacturing technologies offer commercial 0 to +70°C and extended -55 to +125°C temperature range versions.

The SMT-based products serve the industrial/COTs markets with the lowest possible price/performance ratios. The hybrid-based products also deliver outstanding technical performance, and have the ability to be screened and qualified for applications demanding high reliability (MIL-STD-883 versions).

14-bit Resolution Sampling A/Ds, Part 2

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
14	3	0.5	0.75	83	79	±2	±5	1.8	0 to +70	24-pin DDIP/SMT	ADS-943MC	0
	3	0.5	0.75	83	79	±2	±5	1.8	-55 to +125	24-pin DDIP/SMT	ADS-943MM	0
	5	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	2.95	0 to +70	32-pin TDIP/SMT	ADS-944MC	0
	5	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	2.95	-55 to +125	32-pin TDIP/SMT	ADS-944MM	0
	10	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	4.2	0 to +70	Custom DIP	ADS-945MC	1
	10	0.5	0.75	80	78	±1.25	+5, -5.2, ±15	4.2	-55 to +125	Custom DIP	ADS-945-EX	1
	8	0.5	0.75	80	78	±2	±5	1.9	0 to +70	24-pin DDIP/SMT	ADS-946MC	0
	8	0.5	0.75	80	78	±2	±5	1.9	-55 to +125	24-pin DDIP/SMT	ADS-946MM	0
	10	0.5	0.75	76	76	±2	+5, -5.2	2	0 to +70	24-pin DDIP/SMT	ADS-947MC	1
	10	0.5	0.75	76	76	±2	+5, -5.2	2	-55 to +100	24-pin DDIP/SMT	ADS-947MM	1
	12.8	0.5	0.75	81	78	0 to +5, ±2.5	±5, +15	2	0 to +70	32-pin TDIP/SMT	ADS-949MC	3
	12.8	0.5	0.75	81	78	0 to +5, ±2.5	±5, +15	2	-55 to +125	32-pin TDIP/SMT	ADS-949MM	3

14-bit Resolution, Dual Sampling A/Ds, Part 3

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Process	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C				
14	2	0.5	1	79	79	±5	±5	0.6	0 to +70	40-pin TDIP/SMT	SMT	ADSD-1402S	0
	2	0.5	1	79	79	±5	±5	0.6	-55 to +125	40-pin TDIP/SMT	SMT	ADSD-1402S-EX	0
	2	0.5	1	79	79	±5	±5	0.6	0 to +70	40-pin TDIP/SMT	HYBRID	ADSD-1402MC	0
	2	0.5	1	79	79	±5	±5	0.6	-55 to +125	40-pin TDIP/SMT	HYBRID	ADSD-1402MM	0
	5	0.5	1	80	78	±2	±5, +15	1.6	0 to +70	28-pin DDIP/SMT	HYBRID	ADSD-1405MC	3
	5	0.5	1	80	78	±2	±5, +15	1.6	-55 to +125	28-pin DDIP/SMT	HYBRID	ADSD-1405MM	3
	10	0.5	1	84	75	±2.5	±5	1.7	0 to +70	28-pin DDIP/SMT	HYBRID	ADSD-1410S	3
	10	0.5	1	84	75	±2.5	±5	1.7	-55 to +125	28-pin DDIP/SMT	HYBRID	ADSD-1410S-EX	3
	10	0.5	1	83	76	±2.5	±5	1.7	0 to +70	40-pin TDIP/SMT	SMT	ADSD-1410MC	5
	10	0.75	2	83	76	±2.5	±5	1.7	-55 to +125	40-pin TDIP/SMT	SMT	ADSD-1410MM	5
	20	0.5	1	80	75	±2.5	±5	1.7	0 to +70	40-pin TDIP/SMT	SMT	ADSD-1420S	5
	20	0.75	2	80	75	±2.5	±5	1.7	-55 to +125	40-pin TDIP/SMT	SMT	ADSD-1420S-EX	5

14-bit Resolution, Quad Sampling A/Ds, Part 4

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Process	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C				
14	10	0.5	1	82	79	±2.5	±5	3.1	0 to +70	66-pin TDIP/SMT	SMT	ADSQ-1410S	3
	10	0.5	1	82	79	±2.5	±5	3.1	0 to +70	66-pin TDIP/SMT	SMT	ADSQ-1410S-EX	3

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

Sampling A/D Converters

The 16 and 18-bit high-resolution ADS family of Sampling A/Ds achieve superior noise performance by managing sensitive analog grounding, local decoupling and innovative architectures.

Some new models have been added after further optimization for signal-to-noise ratio – or perhaps peak harmonic performance, based upon customer requests/

feedback. These devices have been fully characterized and tested as a single unit, and allow the end user to focus on their system application, and not how twenty to thirty components may interact with each other over time, temperature and various production lots.



16 and 18-bit Resolution Sampling A/Ds

Resolution	Sampling Rate	Diff. Linearity Error	Integral Linearity Error	THD	SNR	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS	±LSB	±LSB	-dB	-dB	Volts	Volts	Watts	°C			
16	0.5	0.5	1	89	83	0 to -10, ±5	±5, ±15	3.5	0 to +70	40-pin TDIP/SMT	ADS-930MC	0
	0.5	0.5	1	89	83	0 to -10, ±5	±5, ±15	3.5	-55 to +125	40-pin TDIP/SMT	ADS-930MM	0
	1	0.5	0.75	89	87	0 to -5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP/SMT	ADS-931MC	3
	1	0.5	0.75	89	87	0 to -5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP/SMT	ADS-931MM	3
	1	0.5	0.75	87	88	0 to -10, ±5	+5, ±15	1.25	0 to +70	40-pin TDIP/SMT	ADS-937MC	1
	1	0.5	0.75	87	88	0 to -10, ±5	+5, ±15	1.25	-55 to +125	40-pin TDIP/SMT	ADS-937MM	1
	2	0.5	0.75	88	86	0 to -5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP/SMT	ADS-932MC	3
	2	0.5	0.75	88	86	0 to -5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP/SMT	ADS-932MM	3
	3	0.5	1.5	86	85	0 to -5.5, ±2.75	±5	1.85	0 to +70	40-pin TDIP/SMT	ADS-933MC	3
	3	0.5	1.5	86	85	0 to -5.5, ±2.75	±5	1.85	-55 to +125	40-pin TDIP/SMT	ADS-933MM	3
	5	0.5	1.5	84	84	0 to -5.5, ±2.75	±5, ±12/±15	2.85	0 to +70	40-pin TDIP/SMT	ADS-935MC	3
	5	0.5	1.5	84	84	0 to -5.5, ±2.75	±5, ±12/±15	2.85	-55 to +125	40-pin TDIP/SMT	ADS-935MM	3
	10	0.5	1.5	81	85	0 to -5.5, ±2.75	±5, ±12/±15	1.5	0 to +70	40-pin TDIP/SMT	ADS-939MC	7
	10	0.5	2	77	82	0 to -5.5, ±2.75	±5, ±12/±15	1.5	-55 to +125	40-pin TDIP/SMT	ADS-939MM	7
18	1	0.5	10	89	89	±5	+5, ±15	1.45	0 to +70	32-pin TDIP/SMT	ADS-951MC	1
	1	0.5	10	89	89	±5	+5, ±15	1.45	-40 to +110	32-pin TDIP/SMT	ADS-951MM	1
	1	0.5	10	85	93	±5	+5, ±15	1.45	0 to +70	32-pin TDIP/SMT	ADS-953MC	1
	1	0.5	10	85	93	±5	+5, ±15	1.45	-40 to +110	32-pin TDIP/SMT	ADS-953ME	1

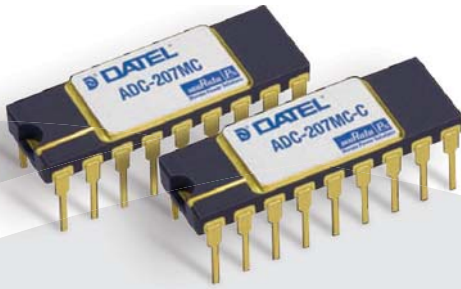
Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

Military 883 Screening

Our manufacturing line is audited and certified by DSCC as conforming to MIL-PRF-38534 and MIL-STD-883 military standards. Many different screening levels can be provided (from commercial to full MIL-883 screened), and all of the assembly and screening processes are performed on the same lines and in a state-of-the-art clean room facility.

A/D Converters (stand-alone)



The stand-alone A/D Converters include 7 & 8-bit resolution Flash A/Ds – and then some industry standard pin-out legacy A/D converters.

Both A/D converter families offer commercial 0 to +70°C and extended -55 to +125°C temperature range versions. The Flash family of A/D converters have wide-bandwidth inputs that often

digitize the input pulse and/or steady-state signal directly. The legacy A/Ds without internal sample-holds often use external sample-hold devices or are part of a larger multi-channel data acquisition system, handling multiple channels with various low-bandwidth input signal types/demands that may not require sample-holds.

7 and 8-bit Flash and Stand-alone 12-bit A/D Converters

Resolution	Conversion Rate/Time	Diff. Linearity Error	Integral Linearity Error	Input Ranges	Power Supplies	Power	Temperature	Package	Model Number	Number of Latency Delays
Bits	MSPS/μsec	±LSB	±LSB	Volts	Volts	Watts	°C			
7	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin LCC	ADC-207LC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin LCC	ADC-207LM	0
	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	18-Pin DIP	ADC-207MC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	18-Pin DIP	ADC-207MM	0
8	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin LCC	ADC-208ALC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin LCC	ADC-208ALM	0
	20 MSPS	0.5	0.5	+5	+5	0.25	0 to +70	24-Pin DIP	ADC-208AMC	0
	20 MSPS	0.5	0.5	+5	+5	0.25	-55 to +125	24-Pin DIP	ADC-208AMM	0
	20 MSPS	0.5	0.5	+5	+5, ±15	0.7	0 to +70	24-Pin DDIP/SMT	ADC-228AMC	0
	20 MSPS	0.5	0.5	+5	+5, ±15	0.7	-55 to +125	24-Pin DDIP/SMT	ADC-228AMM	0
12	2 μsec	0.75	0.75	0 to +10/20, ±5/±10	+5, ±15	2.5	0 to +70	32-pin TDIP/SMT	ADC-810MC	0
	2 μsec	0.75	0.75	0 to +10/20, ±5/±10	+5, ±15	2.5	-55 to +125	32-pin TDIP/SMT	ADC-810MM	0
	20 μsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HX12BGC	0
	20 μsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HX12BMC	0
	20 μsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	-55 to +125	32-pin TDIP/SMT	ADC-HX12BMM	0
	8 μsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HZ12BGC	0
	8 μsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	0 to +70	32-pin TDIP/SMT	ADC-HZ12BMC	0
	8 μsec	0.5	0.75	0 to +5/10, ±2.5/5/10	+5, ±15	1.2	-55 to +125	32-pin TDIP/SMT	ADC-HZ12BMM	0

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

Dedicated Solutions

With our broad process capability and design knowledge, we can create a product that meets your needs, allowing you to focus on other aspects of your design and shorten your time to market.

Typical modifications include:

- Modified input range
- Tighter DC specifications
- Modified dynamic specifications
- Custom tests or temperature ranges

We can also work with you to modify a product further to suit your specific application. For example:

- Incorporating some of your on-board circuitry into one of our existing modules, allowing you to source a single, fully screened building block tailored to meet your needs
- Increasing the speed of an existing product
- Modifying a package or pinout to accommodate your specific needs
- Converting a standard/custom product into a SMT solution (where a high reliability package is not required)

www.murata-ps.com

USA +1 800 233 2765 | Canada +1 905 944 2850 | UK +44 (0)1908 615232 | Germany +49 (0) 89 544334 0 | France +33 (0)1 34 60 01 01
China +86 21 5027 3678 (Shanghai), +86 208 221 8066 (Guangzhou) | Japan +81 3 3779 1031 (Tokyo), +81 6 6354 2025 (Osaka) | Singapore +65 6348 9096

muRata **PS**
Murata Power Solutions

Sample-Hold Amplifiers



Sample-Hold Amplifiers shorten the aperture time for A/D converters by rapidly sampling the input signal and then holding its value until the conversion is completed.

Many A/D converters now include the sample-hold with the A/D converter in a single package (appropriately named

sampling A/Ds). There are still many pulse, wide-bandwidth and multi-channel applications that can benefit from stand-alone Sample-Holds. Products from 0.1% to 0.001% accuracy (10 to 16-bit equivalent resolutions) with acquisition speeds from microseconds to the low tens of nanoseconds are offered.

Accuracy	Acquisition Time	Aperture Delay	Input Range	Small Signal Bandwidth	Hold Mode Droop	Power Supplies	Temperature	Power	Package	Model Number
(%)	μsec	nsec	±Volts	MHz	μV/μsec	Volts	°C	Watts		
0.1	40	3	2.5	25	20	±15	0 to +70	1.8	24-Pin DDIP/SMT	SHM-40MC
	40	3	2.5	25	20	±15	-55 to +125	1.8	24-Pin DDIP/SMT	SHM-40MM
0.01	6	100	11.5	1	0.2	±5 to ±18	0 to +70	0.18	TO-99	SHM-LM-2
	0.16	10	11.5	16	0.5	+5, ±15	0 to +70	0.365	8-Pin DIP/SMT	SHM-49MC
	0.16	10	11.5	16	0.5	+5, ±15	-55 to +125	0.365	8-Pin DIP/SMT	SHM-49MM
	0.16	6	10	16	0.5	+5, ±15	0 to +70	0.73	24-Pin DDIP/SMT	SHM-45MC
	0.16	6	10	16	0.5	+5, ±15	-55 to +125	0.73	24-Pin DDIP/SMT	SHM-45MM
	0.16	6	11.5	16	0.5	+5, ±15	0 to +70	0.73	24-Pin DDIP/SMT	SHM-4860MC
	0.16	6	11.5	16	0.5	+5, ±15	-55 to +125	0.73	24-Pin DDIP/SMT	SHM-4860MM
	0.025	5	2	150	1	±5, ±15	0 to +70	0.545	14-Pin DIP/SMT	SHM-43MC
	0.025	5	2	150	1	±5, ±15	-55 to +125	0.545	14-Pin DIP/SMT	SHM-43MM
0.005	0.05	5	2.5	70	3	±5	0 to +70	0.225	8-Pin DIP/SMT	SHM-50MC
	0.01	2	2.5	250	1	±5	0 to +70	0.5	16-pin CLCC	SHM-14S
	0.01	2	2.5	250	1	±5	-55 to +125	0.5	16-pin CLCC	SHM-14SM
0.001	0.8	10	10	16	15	+5, ±15	0 to +70	0.36	8-Pin DIP/SMT	SHM-950MC
	0.8	10	10	16	15	+5, ±15	-55 to +85	0.36	8-Pin DIP/SMT	SHM-950MM
0.0008	0.4	5	10.5	16	0.5	+5, ±15	0 to +70	0.305	24-Pin DDIP/SMT	SHM-945MC
	0.4	5	10.5	16	0.5	+5, ±15	-55 to +125	0.305	24-Pin DDIP/SMT	SHM-945MM

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

Multiplexers

Analog Multiplexers are used for time sharing of A/D converters between a number of analog information channels.

Our four and eight-channel multiplexers are characterized from 0.1% to 0.001% accuracy (10 to 16-bit equivalent resolutions), with fast settling time speeds in the low tens of nanoseconds.



Channels	Settling Time to 0.01% (μsec)	Access Time (nsec)	On Resistance (Ohms)	Input Ranges (±Volts)	Power Supplies (Volts)	Power (mW)	Temperature	Package	Model
4 S.E.	.05	20	18 to 70	±10	+5, ±15	207	0 to +70	14-Pin DIP	MX-850MC
	.05	20	18 to 70	±10	+5, ±15	207	-55 to +125	14-Pin DIP	MX-850MM
8 S.E.	0.225	60	5	±10	+5, ±15	395	0 to +70	24-Pin DDIP	MX-826MC
	0.225	60	5	±10	+5, ±15	395	0 to +70	24-Pin DDIP	MX-826MM

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

Digital-to-Analog Converters (D/As)



Digital to Analog converters convert digital binary codes into analog currents or voltages. Our D/A family of products provide a functionally complete tested device that incorporates internally a high precision voltage reference. Among the many and varied application usages of these devices are wireless communication,

instrumentation, data acquisition systems, automated test and process control equipment.

Products from 8-bit to 16-bit resolutions are offered, in either current and/or voltage output products. Settling times range from microseconds to tens of nanoseconds, and some units provide input latching capability too.

Accuracy	Settling Time	Differential Linearity Error	Integral Linearity Error	Output	Power Supplies	Power	Temperature	Package	Model Number
(%)	µsec	±LSB	±LSB	mA-or-Volts	Volts	Watts	°C		
8	0.025	0.5	0.75	+5, ±2.5 mA	±15	0.7	0 to +70	24-Pin DDIP	DAC-HF8BMC
	0.025	0.5	0.75	+5, ±2.5 mA	±15	0.7	-55 to +125	24-Pin DDIP	DAC-HF8BMM
	1	0.75	0.5	+1, ±1 mA	+5 to +15	0.03	0 to +70	20-Pin DIP	DAC-608C
10	0.004	0.5	1	-1	-5.2	0.45	0 to +70	28-Pin DDIP	DAC-330
	0.012	0.5	2	+2	5	0.15	0 to +70	32-Pin QFP	DAC-341
	0.025	0.5	0.5	+5, ±2.5 mA	±15	0.8	0 to +70	24-Pin DDIP	DAC-HF10BMC
	0.025	0.5	0.5	+5, ±2.5 mA	±15	0.8	-55 to +125	24-Pin DDIP	DAC-HF10BMM
12	0.02	0.5	0.75	-20.48mA	+5, -5.2	0.65	0 to +70	28-Pin CLCC	DAC-SC
	0.02	0.5	0.75	-20.48mA	+5, -5.2	0.65	-55 to +125	28-Pin CLCC	DAC-S
	0.05	0.5	0.5	+5, ±2.5 mA	±15	0.85	0 to +70	24-Pin DDIP	DAC-HF12BMC
	0.05	0.5	0.5	+5, ±2.5 mA	±15	0.85	0 to +70	24-Pin DDIP	DAC-HF12BMM
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BGC
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BMC
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	-55 to +125	24-Pin DDIP	DAC-HK12BMM
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BGC-2
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	0 to +70	24-Pin DDIP	DAC-HK12BMC-2
	3	0.75	0.5	+10, ±2.5/5/10	+5, ±15	0.7	-55 to +125	24-Pin DDIP	DAC-HK12BMM-2
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12BGC
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12BMC
	3	0.75	0.5	+5/10, ±2.5/5/10	±15	0.39	-55 to +125	24-Pin DDIP	DAC-HZ12BMM
3-Digit	3	0.25	0.25	+2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12DGC
	3	0.25	0.25	+2.5/5/10	±15	0.39	0 to +70	24-Pin DDIP	DAC-HZ12DMC
	3	0.25	0.25	+2.5/5/10	±15	0.39	-55 to +125	24-Pin DDIP	DAC-HZ12DMM
16	15	1	2	±5/10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BGC
	15	1	2	±5/10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BMC
	15	1	2	±5/10	±15	0.65	-55 to +125	24-Pin DDIP	DAC-HP16BMM
	15	1	2	±10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BGC-1
	15	1	2	±10	±15	0.65	0 to +70	24-Pin DDIP	DAC-HP16BMC-1
	15	1	2	±10	±15	0.65	-55 to +125	24-Pin DDIP	DAC-HP16BMM-1

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

www.murata-ps.com

USA +1 800 233 2765 | Canada +1 905 944 2850 | UK +44 (0)1908 615232 | Germany +49 (0) 89 544334 0 | France +33 (0)1 34 60 01 01
China +86 21 5027 3678 (Shanghai), +86 208 221 8066 (Guangzhou) | Japan +81 3 3779 1031 (Tokyo), +81 6 6354 2025 (Osaka) | Singapore +65 6348 9096

muRata **PS**
Murata Power Solutions

Data Acquisition Systems

Functionally complete Data Acquisition Systems can combine an input multiplexer, instrumentation amplifier, sample-hold, A/D converter and various interface logic in a single package device.

In addition to the size reduction realized, users receive functionally complete tested and guaranteed devices. Should high-reliability screening or qualification be required, economy is realized by only performing these quality assurance steps on a single device.

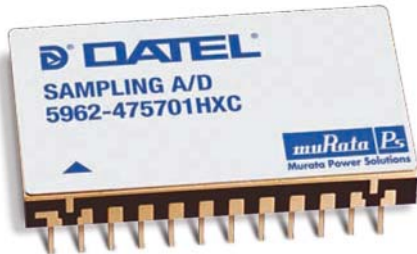


Resolution	Input Channels	Differential Linearity Error	Integral Linearity Error	Throughput Rate	Full-Scale Input Ranges	Power Supplies	Power	Temperature	Package	Model
Bits		± LSB	± LSB	kHz	Volts	Volts	Watts	°C		
12	16 S.E.	1	1	50	50mV to 10	+5, ±15	1.25	0 to +70	62-Pin QDIP	HDAS-16MC
	16 S.E.	1	1	50	50mV to 10	+5, ±15	1.25	-55 to +125	62-Pin QDIP	HDAS-16MM
	8D	1	1	50	50mV to 10	+5, ±15	1.25	0 to +70	62-Pin QDIP	HDAS-8MC
	8D	1	1	50	50mV to 10	+5, ±15	1.25	-55 to +125	62-Pin QDIP	HDAS-8MM
	8 S.E.	0.75	0.75	75	100mV to 10	±15, +5	0.7	0 to +70	40-Pin DDIP	HDAS-75MC
	8 S.E.	1	1.5	75	100mV to 10	±15, +5	0.7	-55 to +125	40-Pin DDIP	HDAS-75MM
	4D	0.75	0.75	75	100mV to 10	±15, +5	0.7	0 to +70	40-Pin DDIP	HDAS-76MC
	4D	1	1.5	75	100mV to 10	±15, +5	0.7	-55 to +125	40-Pin DDIP	HDAS-76MM
	8 S.E.	0.75	0.75	400	100mV to 10	+5, ±15	2.6	0 to +70	40-Pin DDIP	HDAS-528MC
	8 S.E.	0.75	0.75	400	100mV to 10	+5, ±15	2.6	-55 to +125	40-Pin DDIP	HDAS-528MM
	4D	0.75	0.75	400	100mV to 10	+5, ±15	2.6	0 to +70	40-Pin DDIP	HDAS-524MC
	4D	0.75	0.75	400	100mV to 10	+5, ±15	2.6	-55 to +125	40-Pin DDIP	HDAS-524MM

Contact Murata Power Solutions about high-reliability and/or surface mount version(s) of these products.

All Data Acquisition products are offered as either non-RoHS-EC compliant or RoHS-EC compliant. Non-RoHS compliant products will continue to be available as standard products. Please contact Murata Power Solutions for additional information.

High-Reliability Models (DESC/MIL-STD-883 Versions)



The Defense Electronics Supply Center (DESC) has created industry standard Source Control Drawings for popular data acquisition products.

Much as an individual MIL-PRF-38534 manufacturer may

certify their own products to MIL-STD-883 processed parts, a DESC product provides a common set of specifications, agreed to by manufacturers who supply parts that meet these requirements.

Generic Model	Package	DESC Model (Gold Pins)	DESC Model (Solder-Dipped Pins)
ADC-HX	32-Pin TDIP	5962-8850801XC	5962-8850801XA
ADC-HZ	32-Pin TDIP	5962-8850802XC	5962-8850802XA
HDAS-8	62-Pin Hybrid	5962-8851403XC	5962-8851403XA
HDAS-16	62-Pin Hybrid	5962-8851404XC	5962-8851404XA
DAC-HK	24-Pin DDIP	5962-8952801XC	5962-8952801XA
DAC-HK-2	24-Pin DDIP	5962-8952802XC	5962-8952802XA
DAC-HP	24-Pin DDIP	5962-8953101HXC	5962-8953101HXA
DAC-HP1	24-Pin DDIP	5962-8953102HXC	5962-8953102HXA
ADS-944	32-Pin TDIP	5962-9319801HXC	5962-9319801HXA
MX-826	24-Pin DDIP	5962-9450601HXC	5962-9450601HXA
ADS-927	24-Pin DDIP	5962-9475701HXC	5962-9475701HXA


Application Notes



Application Note	Description
DACAN-01	High-speed A/D converter designs: Layout and interfacing pitfalls
DACAN-02	Picking the right sample-and-hold amp for various data-acquisition needs
DACAN-03	Data converters: Getting to know dynamic specs
DACAN-04	Understanding data converter frequency domain specifications
DACAN-05	Subranging ADCs operate at high-speed with high resolution
DACAN-06	Seeing is believing! A/D converters make a difference in imaging applications
DACAN-07	Modifying start convert pulses using commercially available devices
DACAN-08	Heat sinks for data converters
DACAN-09	Performance considerations for high-end PC A/D boards

Other products from Murata Power Solutions

DC/DC Converters




- **Isolated DC/DC Converters**
Single, dual, triple and quad output from 0.25 to 340 Watts.
- **Point-of-Load Converters**
From 0.75 to 5V outputs (including user-selectable versions) at current levels from 0.5 to 50A.
- **Processor & Memory Support**
Support for 64 & 32-bit processors and DDR1 & DDR2 memory.

Magnetics




- **Inductors & Transformers**
Over 800 highly advanced and optimized inductor and transformer solutions with the emphasis on miniaturization, reliability, and ease of handling. These power oriented designs comprise the following through-hole & surface-mount products:
 - Inductors
 - Common-mode chokes
 - Pulse transformers (general purpose/digital audio/silicon support)
 - Current sense transformers
 - Agency approved transformers
 - Databus isolators
- **DC/DC Converter Filters**
To reduce differential and common mode noise

AC/DC Power Supplies



- **Front End Modules for DPAs**
AC to 12VDC or 48VDC ultra compact front end supplies for distributed power architectures with active power factor correction
- **Open Frame**
High-efficiency 200-400W single, dual, and triple output solutions in 1U chassis
- **CompactPCI**
High-efficiency 3U and 6U solutions from 150W to 500W including space-saving 4HP models
- **CATV / Telco**
Ultra-reliable, ruggedized power supplies for harsh CATV and Telecommunications
- **Hi-Rel**
Our Celab division has over 30 years' experience designing and producing custom power supplies.

Digital Panel Meters



- **General Purpose Voltmeters**
12-pin, dual-in-line package offering component-like "plug-in" convenience for pc-board mounting and a built-in bezel for easy panel mounting.
- **2-Wire Meters**
Power your measuring instrument with the signal you're measuring! Measure the voltage at a standard USA-style wall outlet simply by "plugging in" an AC line monitor.
- **Process Monitors**
4/20mA and 0-10V process control monitors
- **AC Ammeters**
Directly measure AC currents from 0-2A to 0-100A
- **DC Ammeters**
Include built-in shunts, reverse-polarity protection, and connections for all supply and load wiring

Murata Power Solutions Inc. reserves the right to alter or improve the specifications, data, descriptions, internal design, or manufacturing process at any time, without notice. Please check with your supplier or visit our web site to ensure that you have the current and complete specification for your product before use.

While such information is believed to be accurate as indicated herein, Murata Power Solutions, Inc. makes no warranty and hereby disclaims all warranties, express or implied, with regard to the accuracy or completeness of such information. Further, because the product(s) featured herein may be used under conditions beyond its control, Murata Power Solutions, Inc. hereby disclaims all warranties, either express or implied, concerning the fitness or suitability of such product(s) for any particular use or in any specific application or arising from any course of dealing or usage of trade. The user is solely responsible for determining the suitability of the product(s) featured herein

for user's intended purpose and in user's specific application. The products are not suitable for use as Safety Critical Components,¹ in Life Support Devices² or on aircraft.

Murata Power Solutions, Inc.'s liability for any breach of warranty is limited as set forth in Murata Power Solutions, Inc.'s standard warranty applicable to the product ("The Warranty"). The warranty is exclusive and offered in lieu of all other express, implied, or statutory warranties including, without limitation, implied warranties of merchantability and fitness for a particular purpose.

In no event shall Murata Power Solutions, Inc.'s liability for any damages arising out of any sale of products to buyer, and regardless of the legal theory on which such damages may be based, exceed the amount that supplier has received as payment for such products and under no circumstances shall supplier be subject to any consequential, incidental, indirect, special, or contingent damages whatsoever, including but not limited to damages

for lost profits or goodwill, even if supplier was advised of the possibility of such damage.

No part of this publication may be copied, transmitted, or stored in a retrieval system or reproduced in any way including, but not limited to, photography, photocopy, magnetic or other recording means, without prior written permission from Murata Power Solutions, Inc.

1 Safety Critical Component means any component whose failure to perform could cause the failure of, or affect the operation of a Life Support Device.

2 Life Support Device means any device, system or ancillary equipment intended for implant into the body or used in relation to supporting or sustaining life.

© Murata Power Solutions, Inc. 2008—All rights reserved

Sales Offices

Americas

Headquarters

11 Cabot Boulevard, Mansfield, MA 02048-1151 USA

Tel: +1 800 233 2765 **Fax:** +1 508 339 6356 **email:** mansfield@murata-ps.com

South America

Rua Leoncio de Carvalho, 234 10° andar Paraiso, CEP 04003-010

Sao Paulo-SP, Brazil 04003-010

Tel: +55-11-3371-6827 **Fax:** +55-11-3371-6821 **e-mail:** brazil@murata-ps.com

Asia

China (Shanghai)

16-17, Lane 912, Bibo Road, Zhangjiang High-Technology Park,
Shanghai, People's Republic of China

Tel: +86 21 5027 3678 **Fax:** +86 21 5027 3321 **email:** shanghai@murata-ps.com

China (Guangzhou)

5th Floor, Building A1, Bei Wei No.1 District, Guangzhou Economic & Technical
Development Zone, Guangzhou, Guangdong 510730, People's Republic of China

Tel: +86 208 221 8066 **Fax:** +86 208 221 5902 **email:** guangzhou@murata-ps.com

Japan (Tokyo)

Meiji Seimei Gotanda Building, 2-27-4 Nishigotanda, Shinagawa-Ku,
Tokyo 141-0031 Japan

Tel: +81 3 3779 1031 **Fax:** +81 3 3779 1030 **e-mail:** japan@murata-ps.com

Japan (Kyoto)

Nagaokakyo-shi, Kyoto 617-8555, Japan

Tel: +81-75-955-7269 **Fax:** +81-75-955-6221 **e-mail:** japan@murata-ps.com

Singapore

No. 1 Marine Parade Central, #11-09, Parkway Centre, Singapore, 449408

Tel: 65 63489096 **Fax:** 65 63489097 **email:** singapore@murata-ps.com

Europe

United Kingdom

Tanners Drive, Blakelands North, Milton Keynes, MK14 5BU, United Kingdom

Tel: +44 (0)1908 615232 **Fax:** +44 (0)1908 617545 **email:** mk@murata-ps.com

France

Zone d'Activites du Pas du Lac Nord

9, Rue Michael Farady, 78180 Montigny Le Bretonneux, France

Tel: +33 (0) 1 34 60 01 01 **Fax:** +33 (0) 1 30 58 21 30 **email:** france@murata-ps.com

Germany

Bussardstr. 5, 82166 Gräfelfing, Germany

Tel: +49 (0) 89 544334 0 **Fax:** +49 (0) 89 536337 **email:** munich@murata-ps.com

www.murata-ps.com

muRata **PS**
Murata Power Solutions