

# Broadband Data Converters Product Guide

## Evaluation Board Test Kits

Family	Ordering Code
ADC 12-bit 500Msps	AT84AS001TP-EB
MCM 10 bit 1.5Gsps ADC & DMUX	AT84AS003TP-EB
MCM 10 bit 2Gsps ADC & DMUX	AT84AS004TP-EB
ADC 10-bit 2Gsps	TSEV83102GoBGL
ADC 10-bit 2.2Gsps	AT84AS008GL-EB
ADC 10-bit 2.5Gsps	EV10AS150ATP-EB
ADC 10-bit 3Gsps	EV10AS152ATP-EB
ADC 8-bit 1Gsps	TSEV8388BGL TSXEV8388BF
QUAD ADC 8-bit 1.25Gsps	EV8AQ160TPY-EB
QUAD ADC 10-bit 1.25Gsps	EV10AQ190TPY-EB
DUAL ADC 8-bit 1Gsps	AT84AD001TD-EB
DUAL ADC 8-bit 500Msps	AT84AD004TD-EB
DMUX 8/10-bit 1.5Gsps	TSEV81102GoFS
DMUX 10-bit 2.2Gsps	AT84CS001TP-EB
MUXDAC 10-bit 1.2Gsps	TSEV86101G2BGL
MUXDAC 12-bit 3Gsps	EV12DS130ZPY-EB

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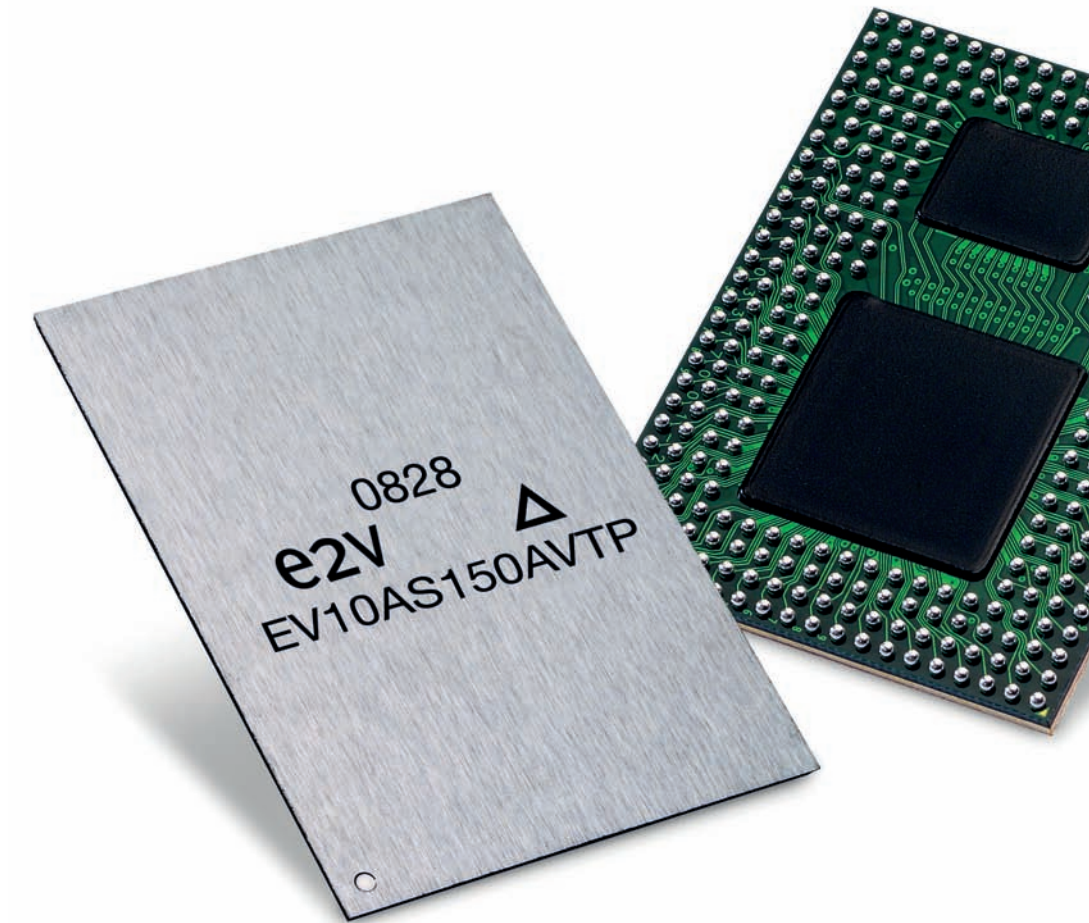
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# Broadband Data Converters | Quick Reference Selection Table

## 12 bit ADC Family

		Typical parameters																										
12 bit 500MSPS single core ADC	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Input Voltage	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	SPI Adjustments: 256 steps within...			Available	Package	Status
AT84AS001					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		10MHz	250MHz	498MHz	10MHz	250MHz	498MHz	10MHz	250MHz	498MHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
-	1	200MHz	1GHz	2.4W	5.4 pJ/Conv.	1.1 V <sub>pp</sub>	Diff.	5V / 3.3V / 2.5V	5ns	10.1	9.8	9.3	63dB	61dB	58.5dB	75dBc	75dBc	71dBc	-	10 <sup>-14</sup>	LVDS	1:1	-1.5dB to +1.2dB	±45LSB	-	Comm. - Indust	EBGA192	Qualified

## 10 bit ADC Family

		Typical parameters																										
Quad 10 bit 1.25GSPS / 5GSPS ADC	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Input Voltage	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	SPI Adjustments: 1024 steps within...			Available	Package	Status
EV10AQ190TPY					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		100MHz	620MHz	1.2GHz	100MHz	620MHz	1.2GHz	100MHz	620MHz	1.2GHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
4 Ch. Mode - Fs = 1.25G - Max BW	4	1GHz	3GHz	1.4W/Ch	3.0 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 1.8V	7ns	8.8	8.5	7.8	56dB	54dB	50dB	65dBc	63dBc	57dBc	> 60dB	10 <sup>-16</sup>	LVDS	1:1	±10%	±40mV	±15ps	Commercial	EBGA380	Sampling
2 Ch. Mode - Fs = 2.5G - Max BW	2	1GHz	3GHz	2.8W/Ch	5.4 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 1.8V	7ns	8.7	8.4	7.7	56dB	54dB	50dB	63dBc	61dBc	55dBc	> 60dB	10 <sup>-16</sup>	LVDS	1:1	±10%	±40mV	±15ps			
1 Ch. Mode - Fs = 5G	1	1GHz	3GHz	5.6W	6.2 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 1.8V	7ns	8.7	8.4	7.7	56dB	54dB	50dB	63dBc	61dBc	55dBc	> 60dB	10 <sup>-16</sup>	LVDS	1:1	±10%	±40mV	±15ps			

## 10 bit single core 2.5GSPS ADC

		Typical parameters																										
EV10AS15x series	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Input Voltage	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	SPI Adjustments: 256 steps within...			Available	Package	Status
EV10AS150A - Fs = 2.5G					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		500MHz	1245MHz	2495MHz	500MHz	1245MHz	2495MHz	500MHz	1245MHz	2495MHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
-	1	2.5GHz	4.5GHz	6.2W	7.9 pJ/Conv.	500mV <sub>pp</sub>	SE/Diff.	5.2V / 3.3V / 2.5V	1.8ns to 3ns	8.4	8.2	8.1	53dBFS	52dBFS	51dBFS	63dBFS	62dBFS	61dBFS	-	10 <sup>-14</sup>	LVDS	1:2 / 1:4	±6%	±40 LSB	±60ps	Comm. - Indust	EBGA317	Sampling

## 10 bit single core extended BW ADC

		Typical parameters																										
AT84AS00x series	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Common Mode / Input	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	Analog adjustments			Available	Package	Status
AT84AS003 - 10bit 1.5GSPS w. DMUX					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		750MHz	1GHz	2GHz	750MHz	1GHz	2GHz	750MHz	1GHz	2GHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
AT84AS003 - 10bit 1.5GSPS w. DMUX	1	1.5GHz	3GHz	6.5W	17 pJ/Conv.	500mV <sub>pp</sub>	SE/Diff.	3.3V / -5V / 2.5V / -2.2V	3ns to 5ns	8.0	-	-	52dB	-	-	58dBc	-	-	-	10 <sup>-11</sup>	LVDS	1:2 / 1:4	±0.1%	NA	±120ps	Comm. - Indust	EBGA317	Mature
AT84AS004 - 10bit 2GSPS w. DMUX	1	1.5GHz	3GHz	6.5W	15 pJ/Conv.	500mV <sub>pp</sub>	SE/Diff.	3.3V / -5V / 2.5V / -2.2V	2.25ns to 3.5ns	-	7.8	7.5	-	51dB	50dB	-	55dBc	54dBc	-	10 <sup>-11</sup>	LVDS	1:2 / 1:4	±0.1%	NA	±120ps	Comm. - Indust	EBGA317	Mature
AT84AS008 - 10bit 2.2GSPS	1	1.5GHz	3.3GHz	4.2W	15 pJ/Conv.	500mV <sub>pp</sub>	SE/Diff.	±5V / 1.45V	1.82ns	-	7.6	7.4	-	50dB	48dB	-	54dBc	54dBc	-	10 <sup>-11</sup>	ECL/LVDS	N/A	±0.1%	NA	±120ps	Comm. - Indust	CBGA152 / CI-CCGA152	Mature
TS83102GoB - 10bit 2GSPS	1		3.3GHz	4.6W		500mV <sub>pp</sub>	SE/Diff.	±5V / 1.45V	2ns	7.6	7.5	6.5	48dB	47dB	41dB	59dBc	58dBc	54dBc	-	10 <sup>-12</sup>	ECL/LVDS	N/A	±0.1%	NA	±120ps	Mil - Space	CBGA152 / CI-CCGA152	Mature

## 8 bit ADC Family

		Typical parameters																										
Quad 8 bit 1.25GSPS / 5GSPS ADC	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Input Voltage	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	SPI Adjustments: 256 steps within...			Available	Package	Status
EV8AQ160					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		10MHz	100MHz	620MHz	10MHz	100MHz	620MHz	10MHz	100MHz	620MHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
4 Ch. Mode - Fs = 1.25GSPS - Max BW	4	650MHz	2GHz	1.05W/Ch	5.3 pJ/Conv.	500 / 625mV <sub>pp</sub>	Diff.	3.3V / 1.8V	7ns	7.5	7.5	7.3	46.5dB	46.5dB	45dB	59dBc	58dBc	56dBc	> 60dB	10 <sup>-16</sup>	LVDS	1:1 / 1:2	±18%	±50mV	±14ps	Commercial	EBGA380	Qualified
2 Ch. Mode - Fs = 2.5GSPS - Max BW	2	650MHz	2GHz	2.1W/Ch	6.56 pJ/Conv.	500 / 625mV <sub>pp</sub>	Diff.	3.3V / 1.8V	7.5ns	7.5	7.5	7.2	46dB	46dB	44.5dB	59dBc	58dBc	56dBc	> 60dB	10 <sup>-16</sup>	LVDS	1:1 / 1:2	±18%	±50mV	±14ps	Commercial		
1 Ch. Mode - Fs = 5GSPS	1	650MHz	2GHz	4.2W	8pJ/Conv.	500 / 625mV <sub>pp</sub>	Diff.	3.3V / 1.8V	7.5ns	7.4	7.4	7.1	46dB	46dB	44dB	59dBc	58dBc	56dBc	> 60dB	10 <sup>-16</sup>	LVDS	1:1 / 1:2	±18%	±50mV	±14ps	Commercial		

## Dual 8 Bit 1GSPS ADC

		Typical parameters																										
AT84AD001B	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Input Voltage	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	SPI Adjustments: 256 steps within...			Available	Package	Status
2 Ch. Independent at 1GSPS each					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		20MHz	500MHz	1GHz	20MHz	500MHz	1GHz	20MHz	500MHz	1GHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
2 Ch. Independent at 1GSPS each	2	500MHz	1.5GHz	0.7W/Ch	6.3 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 2.5V	3ns to 4ns	7.2	6.8	6.4	45dB	42dB	41dB	56dBc	54dBc	50dBc	> 55dB	10 <sup>-13</sup>	LVDS	1:1 / 1:2	±0.3dB		±120ps	Comm. - Indust.	LQFP144	Qualified
2 Ch. Interleaved to 2GSPS	2	500MHz	1.5GHz	1.4W	8.9 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 2.5V	3ns to 4ns	7.1	6.8	-	42dB	40dB	-	54dBc	52dBc	-	> 55dB	10 <sup>-13</sup>	LVDS	1:1 / 1:2	±32LSB			Comm. - Indust.		

## Dual 8 Bit 500MSPS ADC

		Typical parameters																										
AT84AD004B	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Input Voltage	Input Type	Supply Voltages	Latency	ENOB @ Fin...			SNR @ Fin...			SFDR @ Fin...			Xtalk	BER	Output Type	DMUX	SPI Adjustments: 256 steps within...			Available	Package	Status
2 Ch. Independent at 500MSPS each					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		20MHz	250MHz	500MHz	20MHz	250MHz	500MHz	20MHz	250MHz	500MHz	Isolation			Ratio	Gain range	Offset range	Clk Skew	Grades		
2 Ch. Independent at 500MSPS each	2	400MHz	1GHz	0.7W/Ch	9.5 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 2.5V	6 ns to 8 ns	7.4	7.2	7.0	46dB	45dB	44dB	57dBc	56dBc	56dBc	> 55dB	10 <sup>-13</sup>	LVDS	1:1 / 1:2	±0.3dB		±120ps	Comm. - Indust.	LQFP144	Qualified
2 Ch. Interleaved to 1GSPS	2	400MHz	1GHz	1.4W	13 pJ/Conv.	500mV <sub>pp</sub>	Diff.	3.3V / 2.5V	6 ns to 8 ns	7.3	7.1	-	45dB	44dB	-	56dBc	55dBc	-	> 55dB	10 <sup>-13</sup>	LVDS	1:1 / 1:2	±32LSB					

## 12 bit DAC Family

		Typical parameters																							
12 bit 3GSPS DAC	No. Input Chan.	0.5dB BW	3dB BW	Power	Energy *	Output Voltage	Input Type	Supply Voltages	Latency	NPR @ Fs 3GSPS (-12dB Fs loading factor)	SNR @ Fs 3GSPS	SFDR @ Fin...(-3dBFS out.)			Xtalk	BER	Input Type	MUX	Digital control			Available	Package	Status	
EV12DS130					at Nyquist	Range		V <sub>cca</sub> /V <sub>ccd</sub> /V <sub>cco</sub>		20 to 900MHz pattern, 25MHz notch at 450MHz	F <sub>out</sub> 750MHz	750MHz (NTZ)	1.5GHz (RTZ)	3GHz (RTZ)	Isolation			Ratio	Functionality	Offset range	Clk Skew	Grades			
-	2/4	-	-	1W	NA	1V <sub>pp</sub>	LVDS 4:1 / 2:1	3.3V / 5V	NA		52dB	62dB	67dBc	54dBc	56dBc	-	-	LVDS	4:1 / 2:1	RTZ/NRZ			Comm. - Indust.	fpBGA196	Sampling

\* Data converter Energy consumption (pJ / Conv) = (Power consumption) / (2<sup>N</sup>ENOB x Fs x Nb of Channels)  
 \*\* Channel Capacity in wireless communications (Gbps) = B x log2 (1 + 10<sup>(SNR(dB) / 10)</sup>) where B is channel bandwidth in Hz.

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