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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RA*-A0020A/E	Rev.	1.00
Title	RA6M3 Group, Note on the number of ADC channels.		Information Category	Technical Notification		
Applicable Product	RA6M3 Group	Lot No. All	Reference Document	RA6M3 Group User's Manual Hardware Rev.1.10		

The descriptions about the number of ADC channels were changed.

1. Overview

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Table 1.9 Analog

Feature	Functional description
12-bit A/D Converter (ADC12)	Up to two successive approximation 12-bit A/D Converters (ADC12) are provided. In unit 0, up to 13 analog input channels are selectable. In unit 1, up to 11 analog input channels, the temperature sensor output, and an internal reference voltage are selectable for conversion. The A/D conversion accuracy is selectable from 12-bit, 10-bit, and 8-bit conversion, making it possible to optimize the tradeoff between speed and resolution in generating a digital value. See section 47, 12-Bit A/D Converter (ADC12).

After

Table 1.9 Analog

Feature	Functional description
12-bit A/D Converter (ADC12)	Two units of successive approximation 12-bit A/D Converter (ADC12) are provided. Analog input channels are selectable up to 13 in unit 0 and up to 11 in unit 1. Each 2 analog inputs of unit 0 and 1 are assigned to same port (AN005/AN105, AN006/AN106), up to 22 ports are available as analog input. The temperature sensor output and an internal reference voltage are selectable for conversion of each unit 0 and 1. The A/D conversion accuracy is selectable from 12-bit, 10-bit, and 8-bit conversion, making it possible to optimize the tradeoff between speed and resolution in generating a digital value. See section 47, 12-Bit A/D Converter (ADC12).

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Table 1.15 Functional comparison

Function		Part numbers				
		R7FA6M3AH2CBG/ R7FA6M3AF2CBG	R7FA6M3AH3CFC/ R7FA6M3AF3CFC	R7FA6M3AH2CLK/ R7FA6M3AF2CLK	R7FA6M3AH3CFB/ R7FA6M3AF3CFB	R7FA6M3AH3CFP/ R7FA6M3AF3CFP
Pin count		176	176	145	144	100
Analog	ADC12	24		22		19

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Table 1.15 Functional comparison

Function		Part numbers				
		R7FA6M3AH2CBG/ R7FA6M3AF2CBG	R7FA6M3AH3CFC/ R7FA6M3AF3CFC	R7FA6M3AH2CLK/ R7FA6M3AF2CLK	R7FA6M3AH3CFB/ R7FA6M3AF3CFB	R7FA6M3AH3CFP/ R7FA6M3AF3CFP
Pin count		176	176	145	144	100
Analog	ADC12	Unit0: 13 Unit1: 11 Shared channel pin: 2*		Unit0: 13 Unit1: 9 Shared channel pin: 2*		Unit0: 11 Unit1: 8 Shared channel pin: 2*
	3ch-S/H	Unit0: 1(3ch) Unit1: 1(3ch)				
	PGA	Unit0: 3 Unit1: 3				

Note. Some input channels of the ADC units are sharing same port pin.

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Table 1.16 Pin functions (5 of 5)

Function	Signal	I/O	Description
ADC12	AN000 to AN007, AN016 to AN020	Input	Input pins for the analog signals to be processed by the ADC12
	AN100 to AN103, AN105 to AN107, AN116 to AN119	Input	

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Table 1.16 Pin functions (5 of 5)

Function	Signal	I/O	Description
ADC12	AN000 to AN007, AN016 to AN020	Input	Input pins for the analog signals to be processed by the ADC12 AN005 & AN105 and AN006 & AN106 are assigned to same port pin
	AN100 to AN103, AN105 to AN107, AN116 to AN119	Input	

2. 12-Bit A/D Converter (ADC12)

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47. 12-Bit A/D Converter (ADC12)

47.1 Overview

The MCU provides two 12-bit successive approximation A/D converter (ADC12) units. In unit 0, up to 13 analog input channels, temperature sensor output, and internal reference voltage are selectable for conversion. In unit 1, up to 11 analog input channels, temperature sensor output, and internal reference voltage are selectable for conversion. The A/D conversion accuracy is selectable from 12-, 10-, and 8-bit conversion, making it possible to optimize the trade-off between speed and resolution in generating a digital value.

ADC12 features include:

・13 channels (unit 0), 11 channels (unit 1)

After

47. 12-Bit A/D Converter (ADC12)

47.1 Overview

The MCU provides two 12-bit successive approximation A/D converter (ADC12) units. Analog input channels are selectable up to 13 in unit 0 and up to 11 in unit 1. Each 2 analog inputs of unit 0 and 1 are assigned to same port (AN005/AN105, AN006/AN106), up to 22 ports are available as analog input. The temperature sensor output and an internal reference voltage are selectable for conversion of each unit 0 and 1.

The A/D conversion accuracy is selectable from 12-, 10-, and 8-bit conversion, making it possible to optimize the trade-off between speed and resolution in generating a digital value.

ADC12 features include:

・13 channels (unit 0), 11 channels (unit 1) , Total usable 22 channels

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Table 47.1 ADC12 specifications (2 of 3)

Parameter	Specifications
Input channels	• Unit 0: Up to 13 channels • Unit 1: Up to 11 channels

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Table 47.1 ADC12 specifications (2 of 3)

Parameter	Specifications
Input channels	• Unit 0: Up to 13 channels • Unit 1: Up to 11 channels (2 channels share same port pin)

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Table 47.2 ADC12 functions

Parameter	Unit 0 (ADC120)	Unit 1 (ADC121)
Analog input channel	AN000 to AN007, AN016 to AN020 Internal reference voltage Temperature sensor output	AN100 to AN103, AN105 to AN107, AN116 to AN119 Internal reference voltage Temperature sensor output

After

Table 47.2 ADC12 functions

Parameter	Unit 0 (ADC120)	Unit 1 (ADC121)
Analog input channel *3	AN000 to AN007, AN016 to AN020 Internal reference voltage Temperature sensor output	AN100 to AN103, AN105 to AN107, AN116 to AN119 Internal reference voltage Temperature sensor output

Note 3. AN005 & AN105 and AN006 & AN106 are assigned to same port pin.

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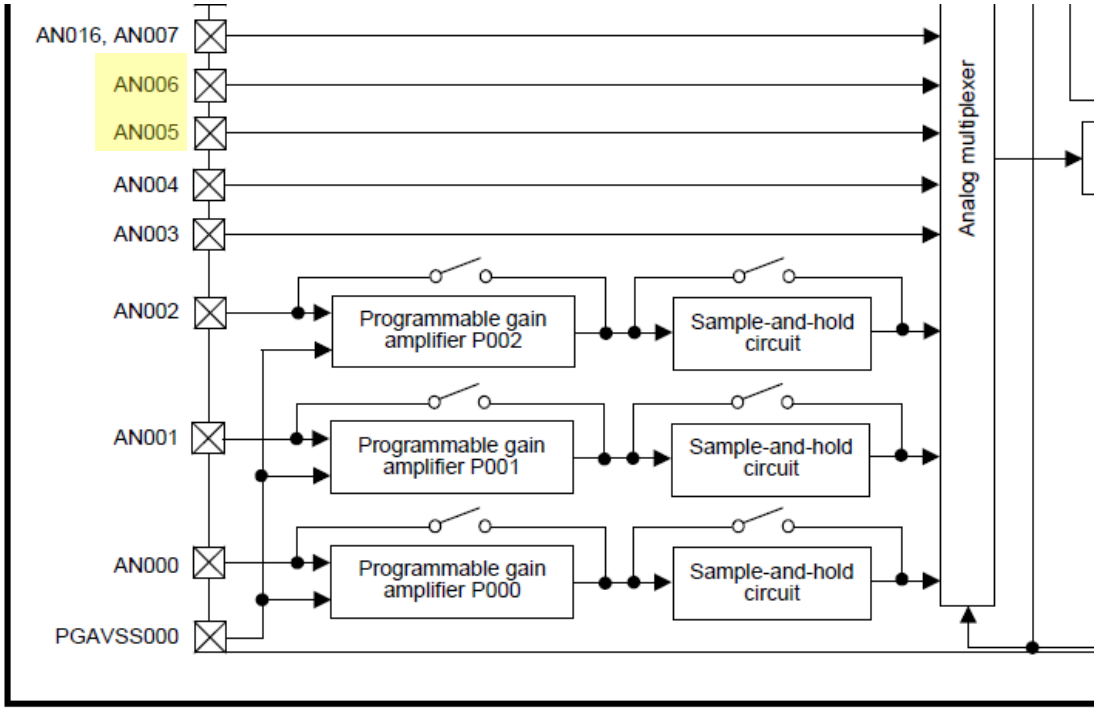

Figure 47.1 ADC12 unit 0 block diagram

After

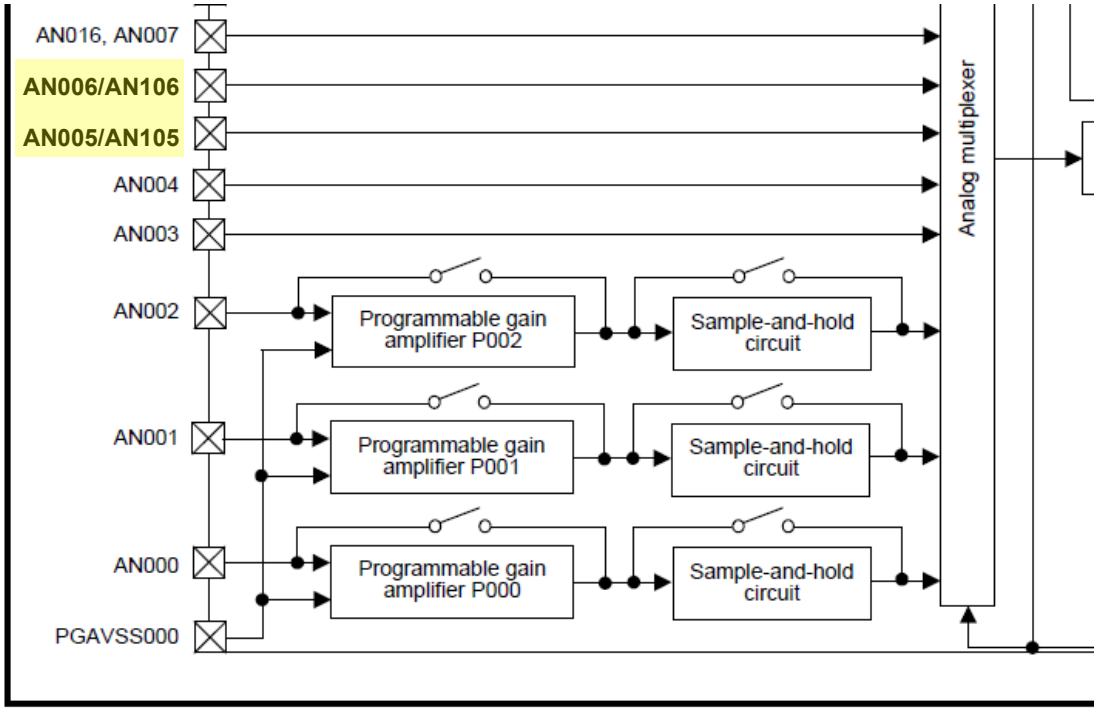

Figure 47.1 ADC12 unit 0 block diagram

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Before

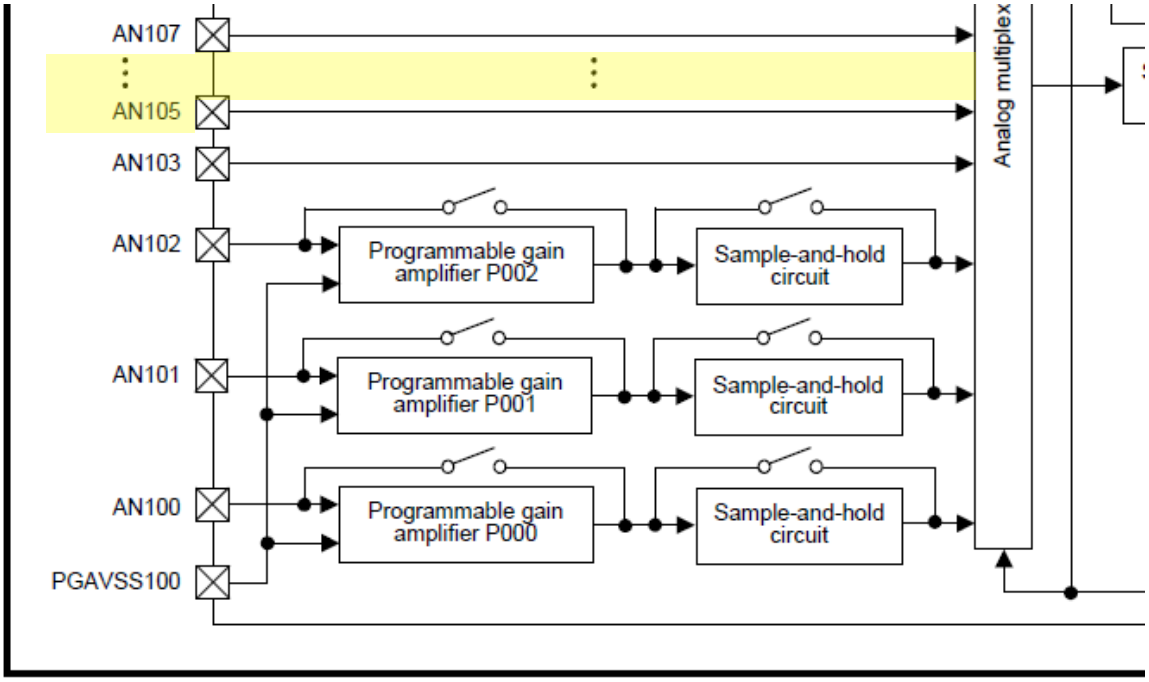

Figure 47.2 ADC12 unit 1 block diagram

After

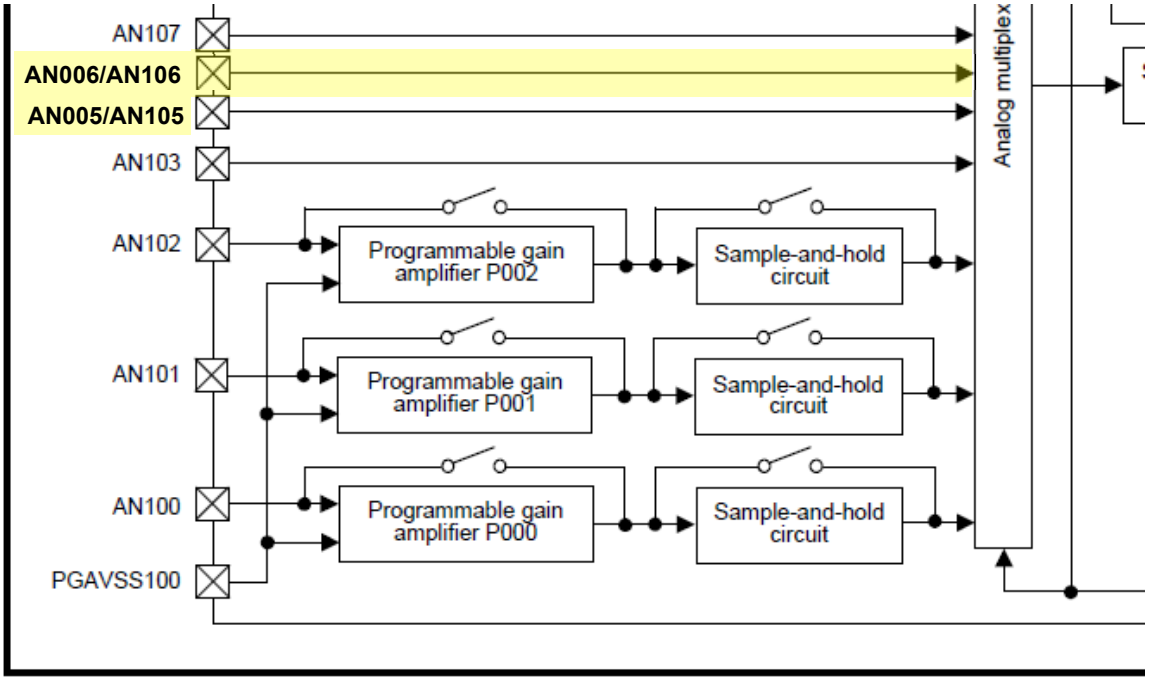

Figure 47.2 ADC12 unit 1 block diagram

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Table 47.3 ADC12 I/O pins

Unit	Pin name	I/O	Function
Unit 0	AVCC0	Input	Analog block power supply pin
	AVSS0	Input	Analog block power supply ground pin
	VREFH0	Input	Reference power supply pin
	VREFL0	Input	Reference power supply ground pin
	AN000 to AN007, AN016 to AN020	Input	Analog input pins 0 to 7 and 16 to 20
	ADTRG0	Input	External trigger input pin for starting A/D conversion, active low
	PGAVSS000	Input	Differential input pin
Unit 1	AVCC0	Input	Analog block power supply pin
	AVSS0	Input	Analog block power supply ground pin
	VREFH	Input	Reference power supply pin for ADC12 unit 1 and DAC
	VRELF	Input	Reference power supply ground pin for ADC12 unit 1 and DAC
	AN100 to AN103, AN105 to AN107, AN116 to AN119	Input	Analog input pins 0 to 3, 5 to 7, and 16 to 19
	ADTRG1	Input	External trigger input pin for starting A/D conversion, active low
	PGAVSS100	Input	Differential input pin

After

Table 47.3 ADC12 I/O pins

Unit	Pin name	I/O	Function
Unit 0	AVCC0	Input	Analog block power supply pin
	AVSS0	Input	Analog block power supply ground pin
	VREFH0	Input	Reference power supply pin
	VREFL0	Input	Reference power supply ground pin
	AN000 to AN007, *1 AN016 to AN020	Input	Analog input pins 0 to 7 and 16 to 20
	ADTRG0	Input	External trigger input pin for starting A/D conversion, active low
	PGAVSS000	Input	Differential input pin
Unit 1	AVCC0	Input	Analog block power supply pin
	AVSS0	Input	Analog block power supply ground pin
	VREFH	Input	Reference power supply pin for ADC12 unit 1 and DAC
	VRELF	Input	Reference power supply ground pin for ADC12 unit 1 and DAC
	AN100 to AN103, AN105 to AN107, *1 AN116 to AN119	Input	Analog input pins 0 to 3, 5 to 7, and 16 to 19
	ADTRG1	Input	External trigger input pin for starting A/D conversion, active low
	PGAVSS100	Input	Differential input pin

Note 1. AN005 & AN105 and AN006 & AN106 are assigned to same port pin.