

RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RA*-A0053A/E	Rev.	1.00
Title	RA6T2 Group Electric Specification		Information Category	Technical Notification		
Applicable Product	RA6T2 Group	Lot No.	Reference Document	RA6T2 Group User's Manual : Hardware Rev.1.10		
		All				

The description of ADC Characteristics is modified.

Colored characters indicate an updated part.

- Red character: remove

- Blue character: add

Table46.35 A/D conversion characteristics

Parameter				Min	Typ	Max	Unit	Test conditions
Resolution				-	-	12	bit	
Channel-dedicated sample-and-hold circuits in use (AN000 to AN005) (AN006 to AN011)	Conversion time ¹ (operation at ADCLK = 50 MHz)	Permissible signal source impedance Max. = 50Ω	normal conversion	0.70	-	-	μs	<ul style="list-style-type: none"> • Sampling time of channel-dedicated sample-and-hold circuits: 20 ADCLK • Hold mode switching time of channel-dedicated sample-and-hold circuits: 2 ADCLK • Sampling time : 8 ADCLK • Successive approximation time : 5 ADCLK
			When using averaging mode(4-time conversion)	2.80	-	-	μs	
Offset error				-	±0.5	±1.0	LSB	
Full-scale error				-	±1.0 ±1.5	±1.5	LSB	
Absolute accuracy	normal conversion			-	±5.0	±7.0	LSB	
	When using averaging mode (4-time conversion)			-	±4.0	±5.0	LSB	
Total unadjusted error (TUE)					±3.0	±3.4	LSB	Excludes quantization error (±0.5LSB).
DNL pseudo-differential nonlinearity error				-	-1 to +1.5	-1 to +2.5	LSB	
INL integral nonlinearity error				-	±2.0	±3.0	LSB	
High-speed channels (AN000 to AN005) (AN006 to AN011) ((AN018 to AN019) ²)	Conversion time ¹ (operation at ADCLK = 50 MHz)	Permissible signal source impedance Max. = 50Ω	normal conversion	0.16	-	-	μs	<ul style="list-style-type: none"> • Sampling time : 3 ADCLK • Successive approximation time : 5 ADCLK
			When using averaging mode(4-time conversion)	0.64	-	-	μs	
Offset error				-	±1.0	±3.0	LSB	
Full-scale error				-	±1.5	±2.5	LSB	
Absolute accuracy	normal conversion			-	±5.5	±7.0	LSB	
	When using averaging mode (4-time conversion)			-	±4.5	±5.5	LSB	
Total unadjusted error (TUE)					±3.5	±4.0	LSB	Excludes quantization error (±0.5LSB).
DNL pseudo-differential nonlinearity error				-	-1 to +1.5	-1 to +2.5	LSB	

Parameter		Min	Typ	Max	Unit	Test conditions		
	INL integral nonlinearity error	-	±2.0	±3.0	LSB			
High-precision channels (AN012 to AN017)	Conversion time ^{*1} (operation at ADCLK = 50 MHz)	Permissible signal source impedance Max. = 50Ω	normal conversion	0.28	-	-	μs	<ul style="list-style-type: none"> • Sampling time : 9 ADCLK • Successive approximation time : 5 ADCLK
			When using averaging mode(4-time conversion)	1.12	-	-	μs	
	Offset error		-	±1.0	±1.5	LSB		
	Full-scale error		-	±1.0	±2.5	LSB		
	Absolute accuracy		normal conversion	-	±4.0	±7.0	LSB	
			When using averaging mode (4-time conversion)	-	±3.0	±5.5	LSB	
	Total unadjusted error (TUE)			±3.4	±4.4	LSB	Excludes quantization error (±0.5LSB).	
	DNL pseudo-differential nonlinearity error		-	-1 to +1.5	-1 to +2.5	LSB		
	INL integral nonlinearity error	-	±2.0	±3.0	LSB			
Normal-precision channels (AN020 to AN028)	Conversion time ^{*1} (operation at ADCLK = 50 MHz)	Permissible signal source impedance Max. = 50Ω	normal conversion	0.50	-	-	μs	<ul style="list-style-type: none"> • Sampling time : 20 ADCLK • Successive approximation time : 5 ADCLK
			When using averaging mode(4-time conversion)	2.00	-	-	μs	
	Offset error		-	±1.0	±2.5	LSB		
	Full-scale error		-	±1.5	±2.5	LSB		
	Absolute accuracy		normal conversion	-	±5.5	±8.0	LSB	
			When using averaging mode (4-time conversion)	-	±5.5	±7.0	LSB	
	Total unadjusted error (TUE)			±4.2	±5.3	LSB	Excludes quantization error (±0.5LSB).	
	DNL pseudo-differential nonlinearity error		-	-1 to +1.5	-1 to +2.5	LSB		
	INL integral nonlinearity error	-	±2.0	±4.0	LSB			

Note 1. Channel-dedicated sample-and-hold circuits in use; The conversion time is the sum of the sampling time of channel-dedicated sample-and-hold circuits, the hold mode switching time, the sampling time and the successive approximation time. Each of the above state is indicated for the test conditions.

Channel-dedicated sample-and-hold circuits not in use; The conversion time is the sum of the sampling time and the successive approximation time. Each of the above state is indicated for the test conditions.

Note 2. These channels cannot be used with Channel-dedicated sample-and-hold circuits .