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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RL*-A007A/E	Rev.	1.00
Title	Notification of Extended specification for the AD converter electrical characteristics of RL78/G1A		Information Category	Technical Notification		
Applicable Product	RL78/G1A R5F10Exx	Lot No. All lots	Reference Document	RL78/G1A User's Manual: Hardware Rev.1.10 R01UH0305EJ0110 (Mar. 2013)		

In RL78/G1A group, there is the expansion of the product as the following specifications. Please refer to the page of interest for more information.

Enhancements

Enhancements of the product specification	Applicable Page
Add the electrical characteristics with improved conversion accuracy of the A / D converter.	Page 2

Document Improvement

The above corrections will be made for the next revision of the User's Manual: Hardware.

RL78/G1A User's Manual: Hardware(R01UH0305EJ0110) (Page 929)

A/D converter characteristics

＜Addition＞

When $AV_{REF(+)}$ = AV_{REFP}/ANI0（ADREFP1 = 0, ADREFP0 = 1）, $AV_{REF(-)}$ = AV_{REFM}/ANI1（ADREFM = 1）, target pin：ANI2-ANI12

(T_A = - 40 to +85℃, 2.7 ≤ AV_{REFP} ≤ AV_{DD} ≤ V_{DD} ≤ 3.6V, V_{SS} = 0V, AV_{SS} = 0V, Reference voltage(＋) = AV_{REFP}, Reference voltage (－) = AV_{REFM} = 0V, HALT mode)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Resolution	R_{ES}				12	bit
Overall error Note1,2,3	AINL	12bit resolution		±1.7	±3.3	LSB
Conversion time	T_{CONV}	ADTYP=0, 12bit resolution	3.375			μs
Zero-scale error Note1,2,3	E_{ZS}	12bit resolution		±1.3	±3.2	LSB
Full-scale error Note1,2,3	E_{FS}	12bit resolution		±0.7	±2.9	LSB
Integral linearity error Note1,2,3	ILE	12bit resolution		±1.0	±1.4	LSB
Differential linearity error Note1,2,3	DLE	12bit resolution		±0.9	±1.2	LSB
Analog input voltage	V_{AIN}		0		AV_{REFP}	V

Notes 1: TYP. Value is the average value AV_{DD} = AV_{REFP} = 3V, T_A = 25 ℃.
MAX. Values are mean ± 3σ in normal distribution.
2: This value based on the characterization results, is not subject to production testing.
3: Excludes quantization error (±1/2 LSB).

Caution 1. Attention must be paid to noise input to each power supply and ground lines.
The reference voltage line of AV_{REFP} is separated from the other power supply lines for noise countermeasures.
Caution 2. Please make sure that pulses whose voltage suddenly change, such as digital pulses, are not input or output to a pin adjacent to the pin whose value is being A/D converted and P20 to P27, P150 to P154.

Revision History

Notification of Extended specification

Extended specification for the AD converter electrical characteristics of RL78/G1A

Document Number	Date	Description
TN-RL*-AxxxA/E	Jun. 12, 2013	First edition issued Notification of Extended specification for the AD converter electrical characteristics of RL78/G1A (This notice)