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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RX*-A128A/E	Rev.	1.00
Title	Accuracy degradation of the 24-Bit ΔΣ A/D Converter (DSAD)		Information Category	Technical Notification		
Applicable Product	RX21A Group	Lot No. All	Reference Document	RX21A Group User's Manual: Hardware Rev.1.10 (R01UH0251EJ0110)		

Few of devices of RX21A Group shipped until March 2015 may have a DSAD whose SNDR is lower than typical under the certain conditions. Please apply the workaround when using the RX21A under the conditions of occurrence.

Applies to:

RX21A Group shipped until March 2015

Conditions of Occurrence:

When using the differential channel 0 to 3 of the DSAD under the following conditions.

Condition 1:

The gain is set at x32.

The input voltage is between -14.4 and -12.9 mV or between 12.9 and 14.4 mV.

OR Condition 2:

The gain is set at x64.

The input voltage is between -5.0 and -3.5 mV or between 3.5 and 5.0 mV.

Symptoms:

The output from the DSAD is at most 2% smaller than the ideal value (See Figure 1).

Accordingly, the SNDR becomes about 20 dB lower than the typical value shown in 'Table 44.36 ΔΣA/D Conversion Characteristics' on the User's Manual.

Workaround:

Keep the DSAD input voltage within the range listed below when the gain is set at x32 or x64.

When the input voltage goes over these ranges, please change the gain lower.

x32: From -12.9 to 12.9 mV

x64: From -3.5 to 3.5 mV

Solution:

Renesas already have been reinforcing the DSAD linearity test.

R5F521A6BDFP: Since the 6th week of 2015

The other RX21As: Since the 3rd week of 2015

The improved devices can be distinguished by the trace codes marked on them.

See Figure 2 to know the format of the trace code.

Blue line: Ideal output

Red line: Actual output derived from the DSAD data register

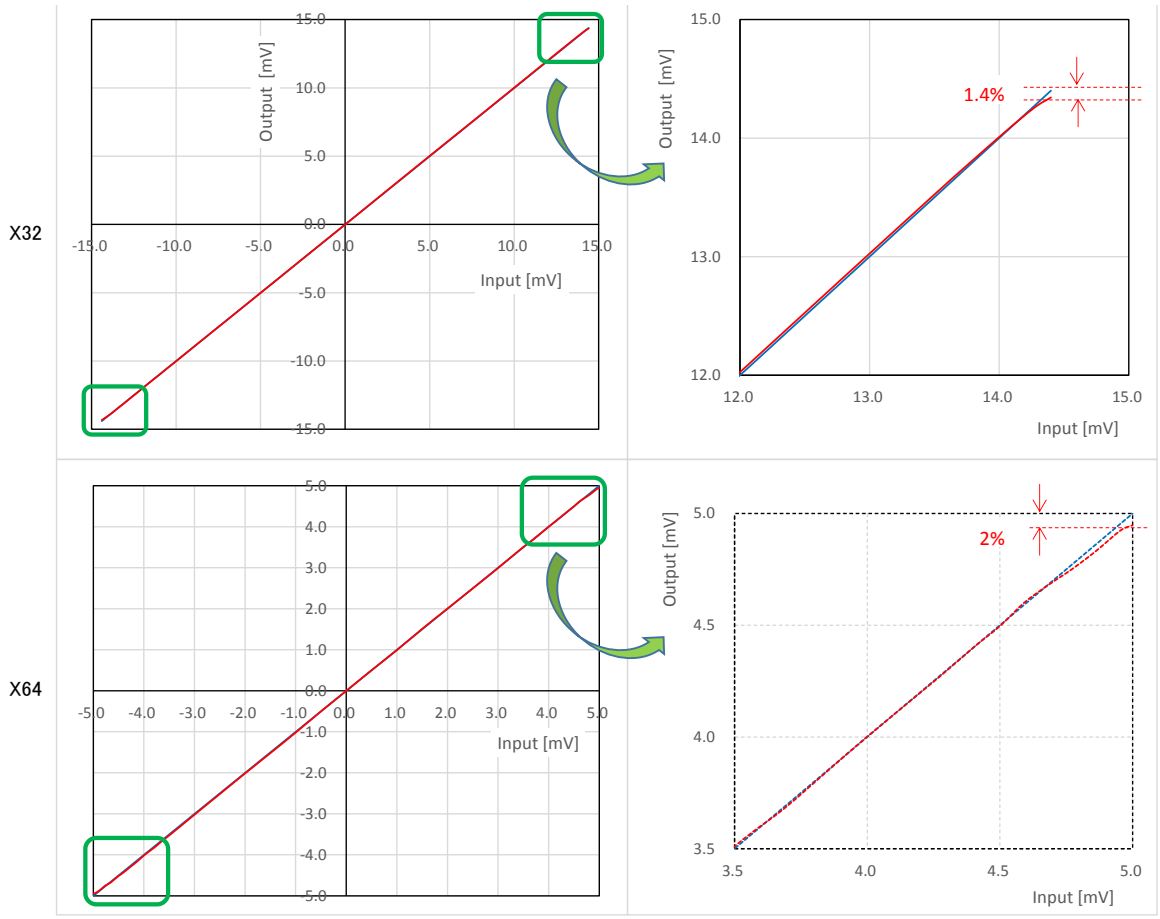

Figure 1. An example of the output from the channel whose accuracy is not good.

Red text : (The last digit of the year number) + (Week number)

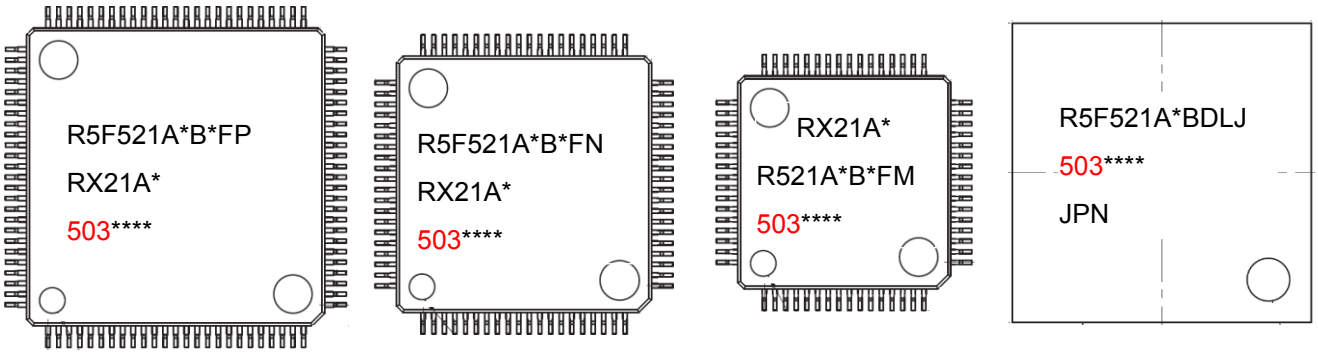

Figure 2. Examples of the trace codes (Week 03 in 2015)