

RENESAS TECHNICAL UPDATE

TOYOSU FORESIA, 3-2-24, Toyosu, Koto-ku, Tokyo 135-0061, Japan
 Renesas Electronics Corporation

Product Category	MPU/MCU	Document No.	TN-V85-A007A/E	Rev.	1.00
Title	Precaution of A/D conversion accuracy		Information Category	Technical Notification	
Applicable Product	V850E2/Fx4-H series	Lot No.	Reference Document	User Manual of each product	
	V850E2/Fx4 series V850E2/FF4-M V850E2/Px4 series				

The above target product series add the below limitation items.

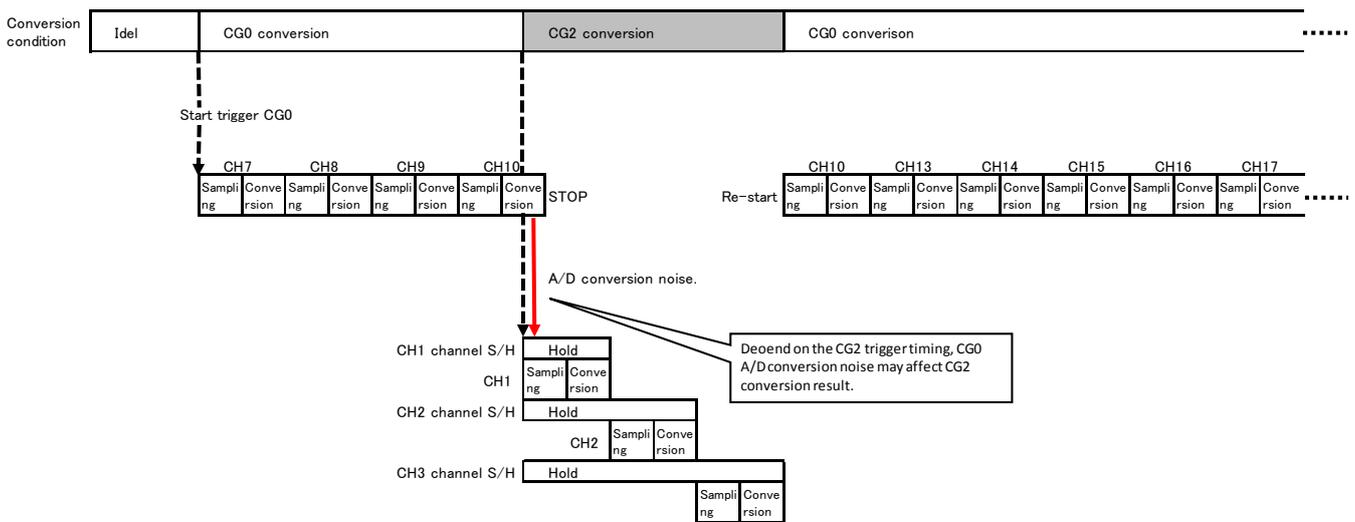
1. Restriction

There is a possibility that A/D conversion accuracy of high priority CG become worse when following both condition is used.

- 1) During the A/D conversion of low priority CG (e.g. CG0), conversion trigger of the high priority CG (e.g. CG2) occur.
- 2) The channel S/H function of high priority CG (e.g. CG2) is enabled.

Note: The above case is one of an example of CG combination. The CG priority is CG2 > CG1 > CG0.

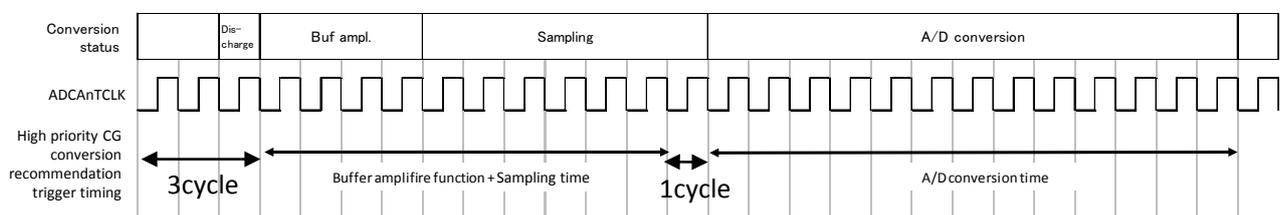
CG0(Low priority) = CH7, CH8, CH9, CH10, CH13, CH14, CH15, CH16 (Continuous conversion mode.)
 CG2(High priority) = CH1, CH2, CH3 (Channel S/H function is enabled.)



Note: The fluctuation of conversion error depends on the external circuit and devices mounted on the customer board.

2. Countermeasure

- 1) Low priority CG (e.g. CG0) A/D conversion have to be finished 3 ADCAnTCLK before the conversion trigger of high priority CG (e.g. CG2), if the CG2 contains the channels which channel S/H is available.
- 2) If there is a case that high priority CG (e.g. CG2) conversion trigger occur during the conversion of low priority CG (e.g. CG0), disable the high priority CG channel S/H function.
- 3) If the both condition mentioned in previous page need to be used, adjust high priority CG (e.g. CG2) conversion trigger timing not to occur 3 cycle period before “buffer amplifier function + sampling time” and 1cycle period before “A/D conversion time”



Example condition: Discharge function: ON, Buffer amplifier function: ON, ADCAnCTL1.ADCAnCTYP=0

Note: Even if trigger timing is adjusted above recommendation time, conversion error specified in Data Sheet can't be removed.

When taking above 3 countermeasures is difficult, taking following process is recommended.

- Doing A/D conversion several times and using average of several A/D conversion results.
- Doing continuous A/D conversion several times, remove abnormal conversion result and use only the other results.
- When abnormal A/D conversion result is detected, not to proceed abnormal operation immediately, doing one more A/D conversion before proceeding abnormal operation.

Note: The effect of above countermeasure and recommendation process is depend on the external circuit and devices mounted on the customer board. Sufficient evaluation of the system is recommended.