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Old Company Name in Catalogs and Other Documents

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RENESAS TECHNICAL UPDATE

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Product Category	MPU&MCU		Document No.	TN-H8*-A419A/E	Rev.	1.00
Title	H8SX/1645 Group Usage Notes when Performing A/D Conversion of Three Units Simultaneously in System Clock Mode		Information Category	Technical Notification		
Applicable Product	H8SX/1645 Group	Lot No.	Reference Document	H8SX/1645 Group Hardware Manual (REJ09B0497-0100)		
		All lots				

Thank you for your consistent patronage of Renesas semiconductor products.

We would like to inform you of the usage notes when performing A/D conversion of three units simultaneously in system clock mode of H8SX/1645 Group.

The A/D conversion accuracy may not be assured when performing A/D conversion on three units simultaneously in system clock mode using an A/D converter of H8SX/1645 Group.

Please perform detailed evaluation when using A/D converter on three units simultaneously.

1. Usage Notes

1.1 Clock Mode Setting Conditions

System clock mode

- $P\phi = I\phi/2$
- ADCSR_EXCKS = 1 (Enable the sampling state value of ADSSTR)
- ADMOSEL_ICKSEL = 1 (Select system clock mode)
- ADSSTR = H'19 (Set sampling state count to 25)

1.2 A/D Conversion Starting Conditions

(1) Usage notes when A/D conversion accuracy of the unit whose A/D conversion starts third is not assured

- The accuracy of A/D conversion of unit Z may not be assured if the A/D conversion of the third unit Z starts at a timing of $T_{XYZ} = 2$ to 7 states (relative to $P\phi$) after the A/D conversion of units X and Y starts simultaneously as shown in figure 1.
- The accuracy of A/D conversion of unit Z may not be assured if the A/D conversion of unit Y starts at a timing of $T_{XY} = 1$ state (relative to $P\phi$) after the A/D conversion of the first unit X starts, and the A/D conversion of the third unit Z starts at a timing of $T_{XZ} = 2$ to 8 states (relative to $P\phi$) after the A/D conversion of unit Y starts as shown in figure 2.

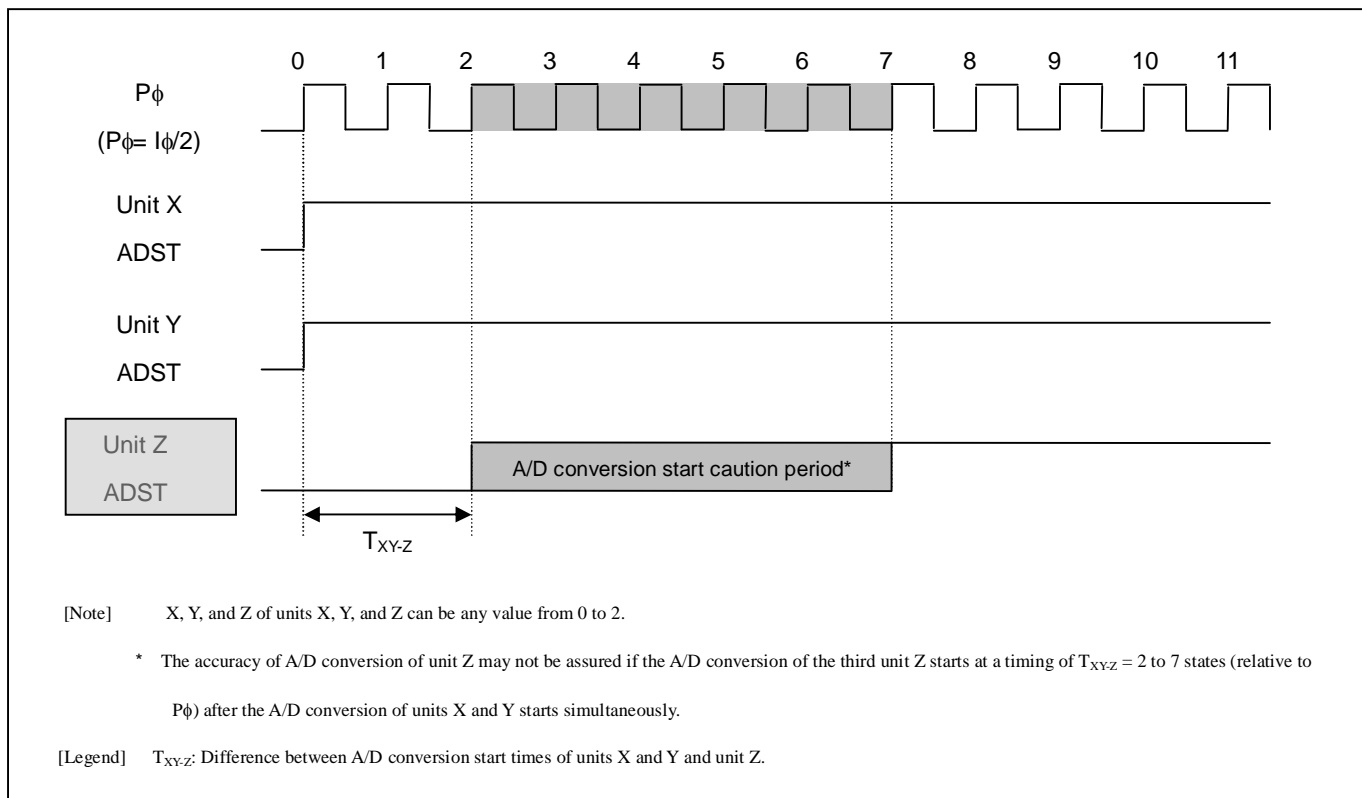


Figure 1 When A/D Conversion Accuracy of Unit Z whose A/D Conversion Starts Third is not Assured: Case 1

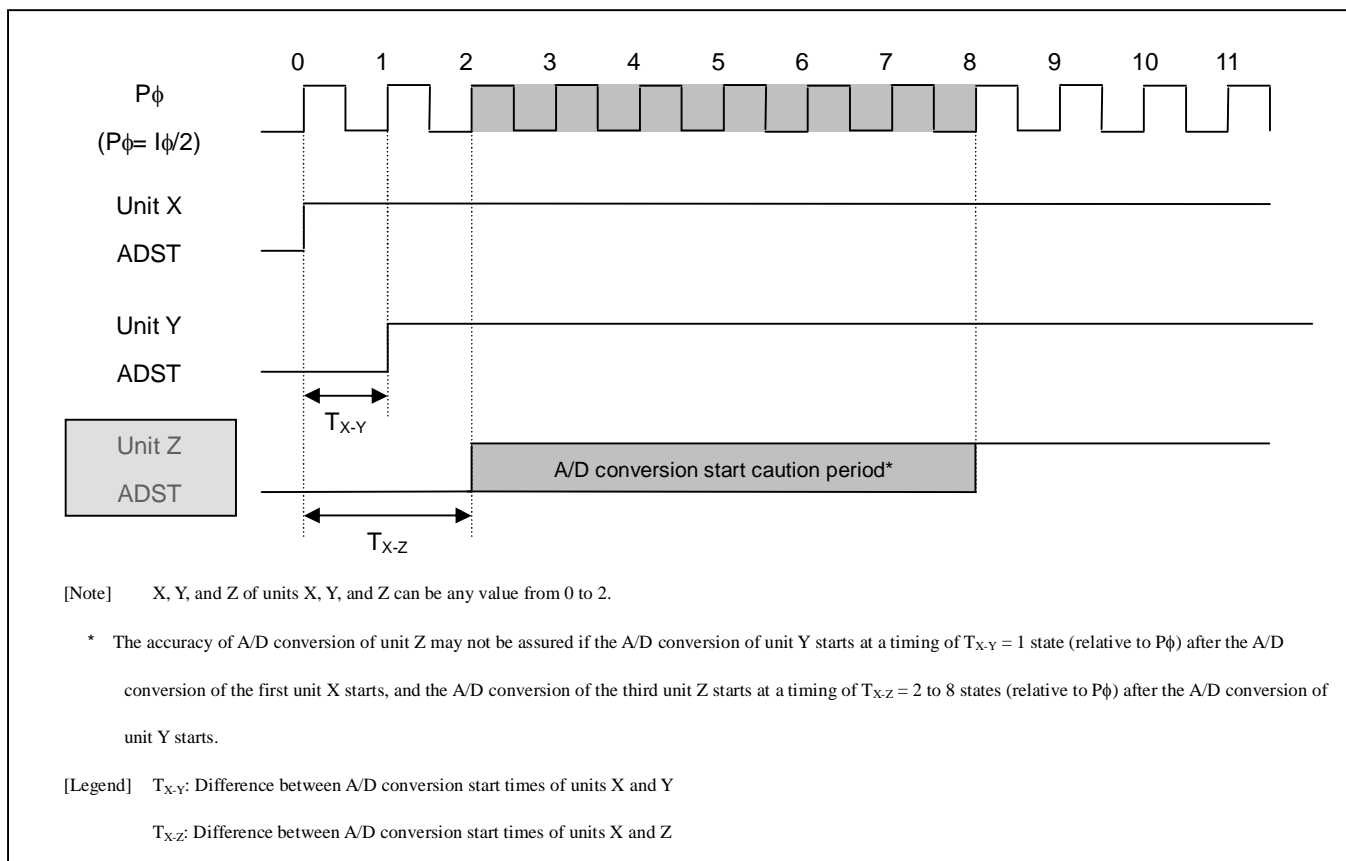


Figure 2 When A/D Conversion Accuracy of Unit Z whose A/D Conversion Starts Third is not Assured: Case 2

(2) Usage notes when A/D conversion accuracy of the unit whose A/D conversion is started first is not assured

- The accuracy of A/D conversion of unit X may not be assured if the A/D conversion of units Y and Z starts simultaneously at a timing of $T_{YZ-X} = -23$ to -19 states (relative to $P\phi$) after the A/D conversion of the first unit X starts as shown in figure 3.
- The accuracy of A/D conversion of unit X may not be assured if the A/D conversion of unit Y starts at a timing of $T_{Y-X} = -24$ to -19 states (relative to $P\phi$), and the A/D conversion of unit Z starts at a timing of $T_{Y-Z} = 1$ state (relative to $P\phi$) after the A/D conversion of the first unit X starts as shown in figure 4.

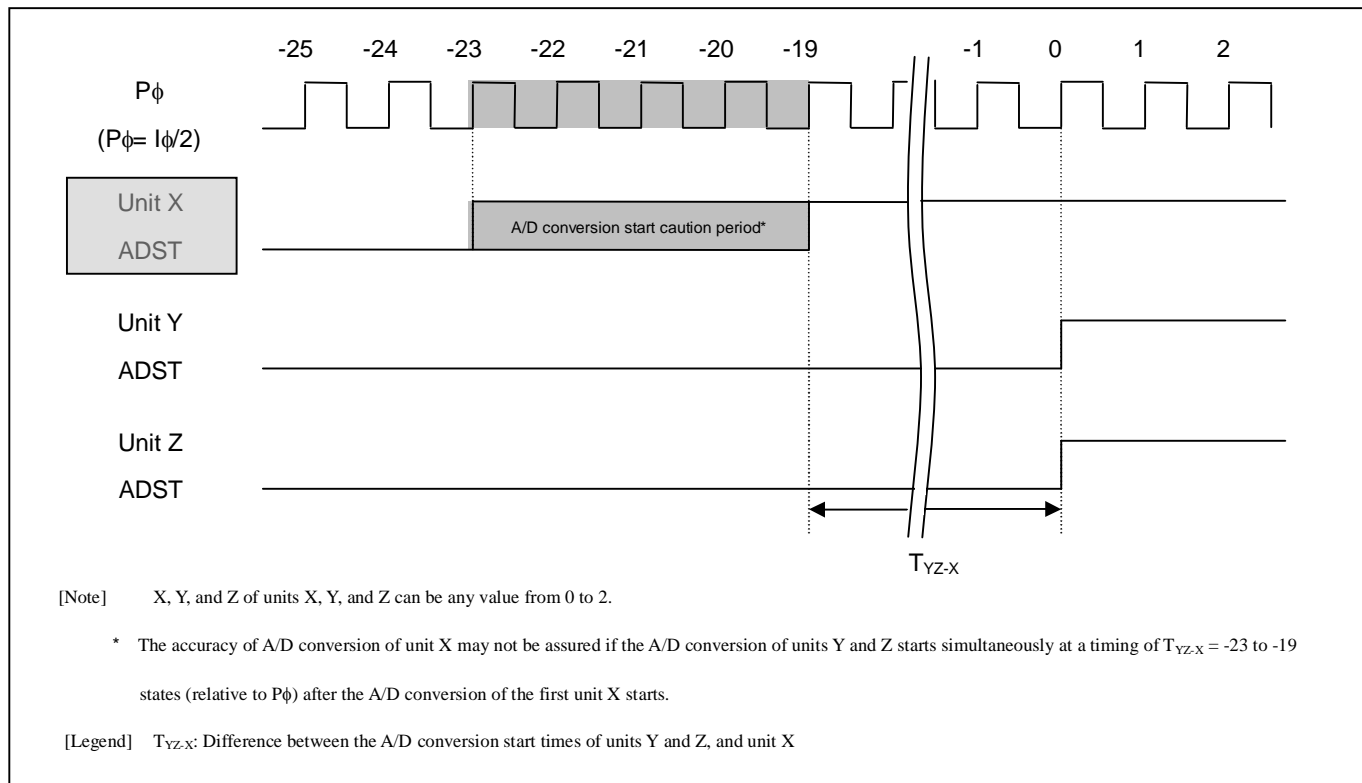


Figure 3 When A/D Conversion Accuracy of Unit X whose A/D Conversion Starts First is not Assured: Case 1

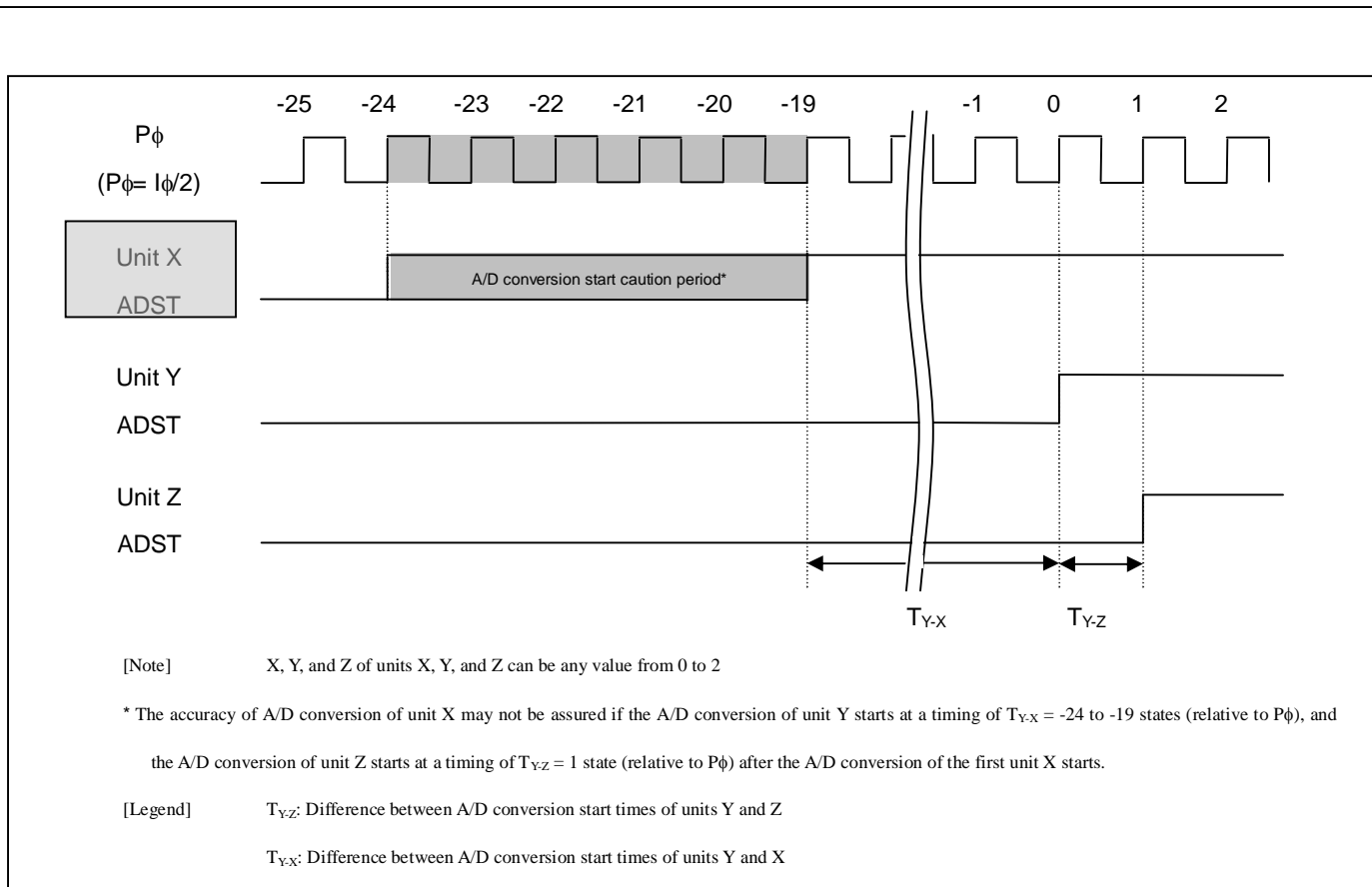


Figure 4 When A/D Conversion Accuracy of Unit X whose A/D Conversion Starts First is not Assured: Case 2

(3) Usage notes when A/D conversion accuracy of the unit whose A/D conversion is started second is not assured

- The accuracy of A/D conversion of unit Y may not be assured if the A/D conversion of unit Y starts second at a timing of $T_{X-Y} = 2$ to 7 states (relative to $P\phi$) and the A/D conversion of unit Z starts at a timing of $T_{X-Z} = 24$ states (relative to $P\phi$) after the A/D conversion of unit X starts as shown in figure 5.
- The accuracy of A/D conversion of unit Y may not be assured if the A/D conversion of unit Y starts second at a timing of $T_{X-Y} = 2$ to 6 states (relative to $P\phi$) and the A/D conversion of unit Z starts at a timing of $T_{X-Z} = 25$ states (relative to $P\phi$) after the A/D conversion of unit X starts as shown in figure 6.
- The accuracy of A/D conversion of unit Y may not be assured if the A/D conversion of unit Y starts second at a timing of $T_{X-Y} = 2$ to 7 states (relative to $P\phi$) and the A/D conversion of unit Z starts at a timing of $T_{X-Z} = 26$ states (relative to $P\phi$) after the A/D conversion of unit X starts as shown in figure 7.

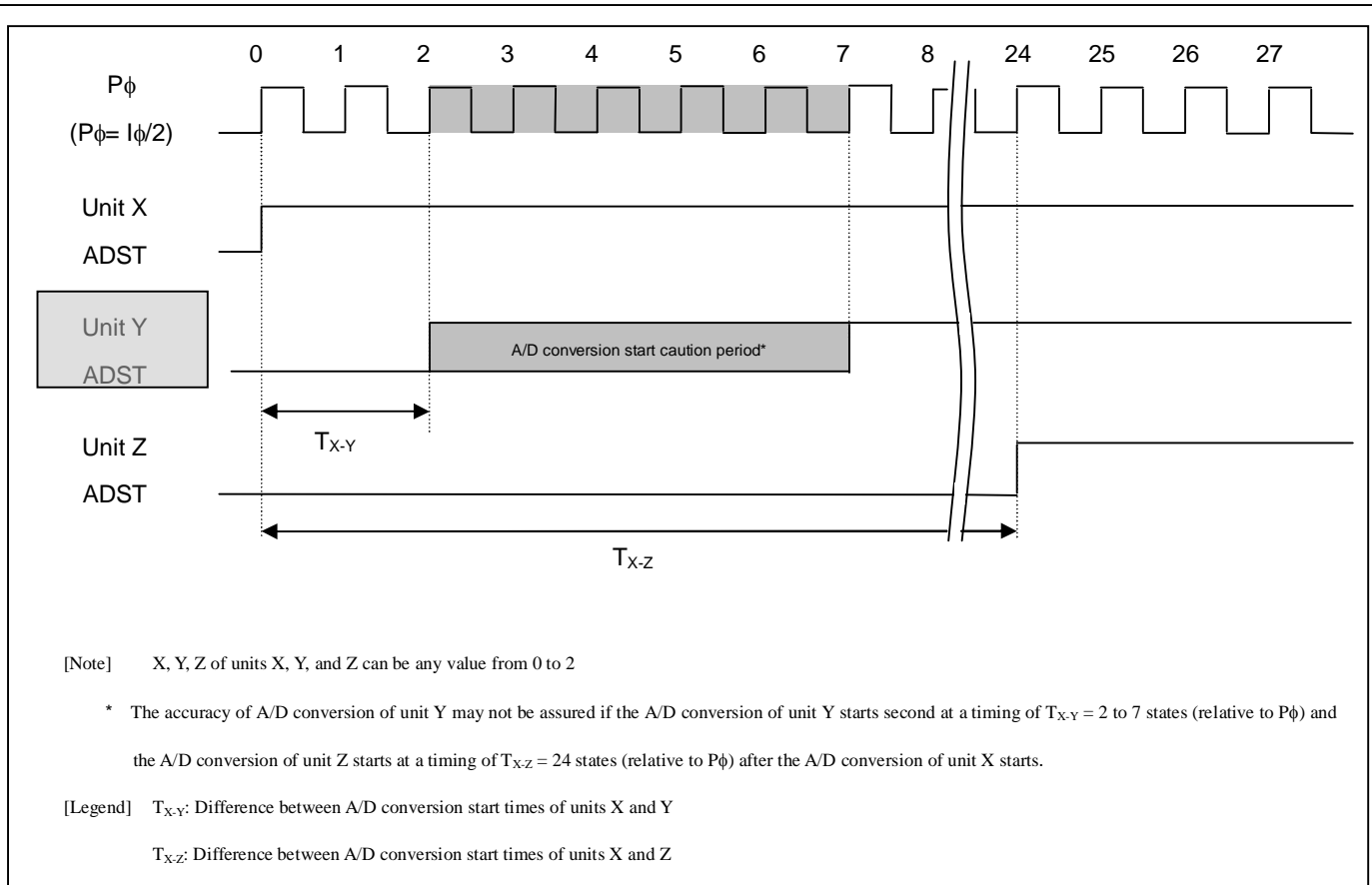


Figure 5 When A/D Conversion Accuracy of Unit Y whose A/D Conversion Starts Second is not Assured: Case 1

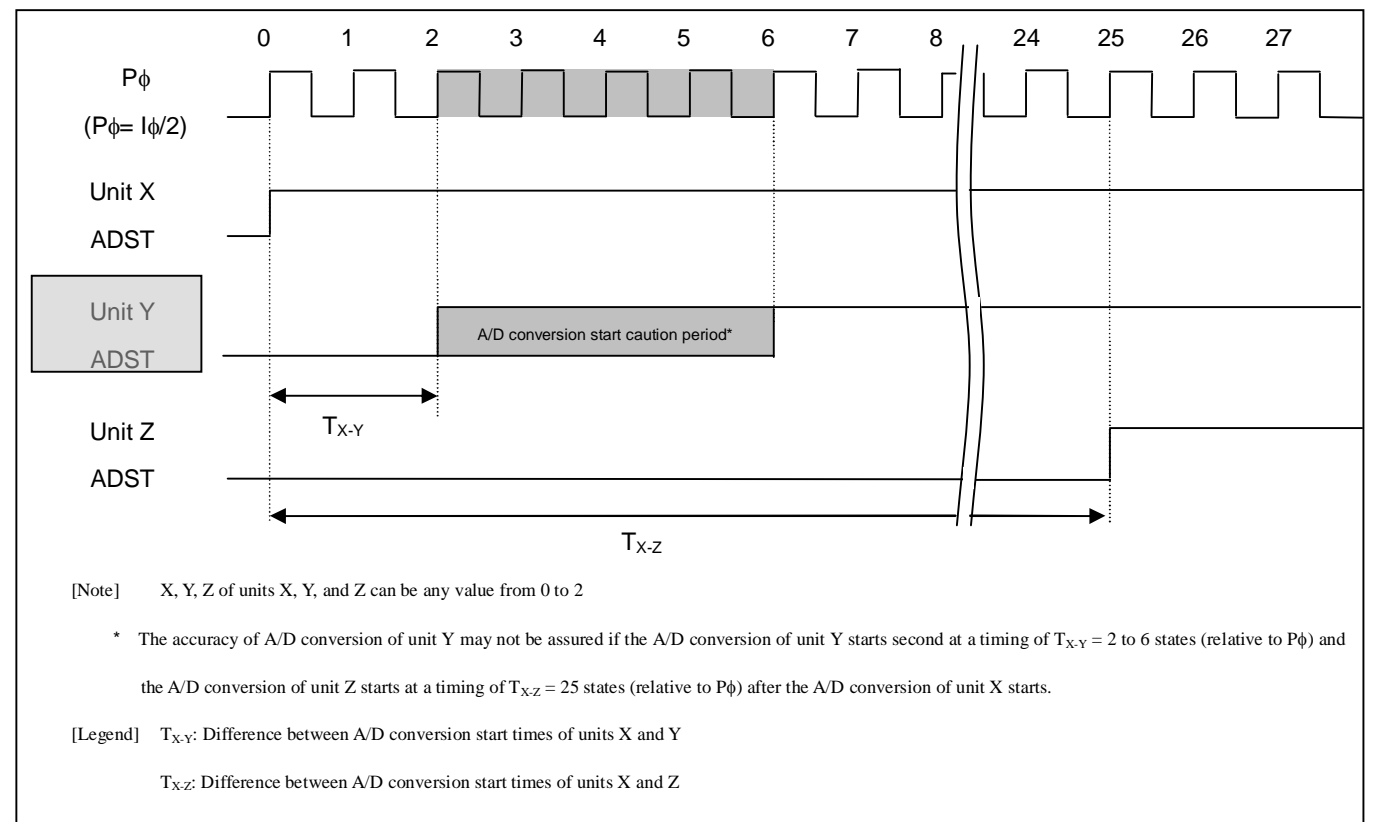


Figure 6 When A/D Conversion Accuracy of Unit Y whose A/D Conversion Starts Second is not Assured: Case 2

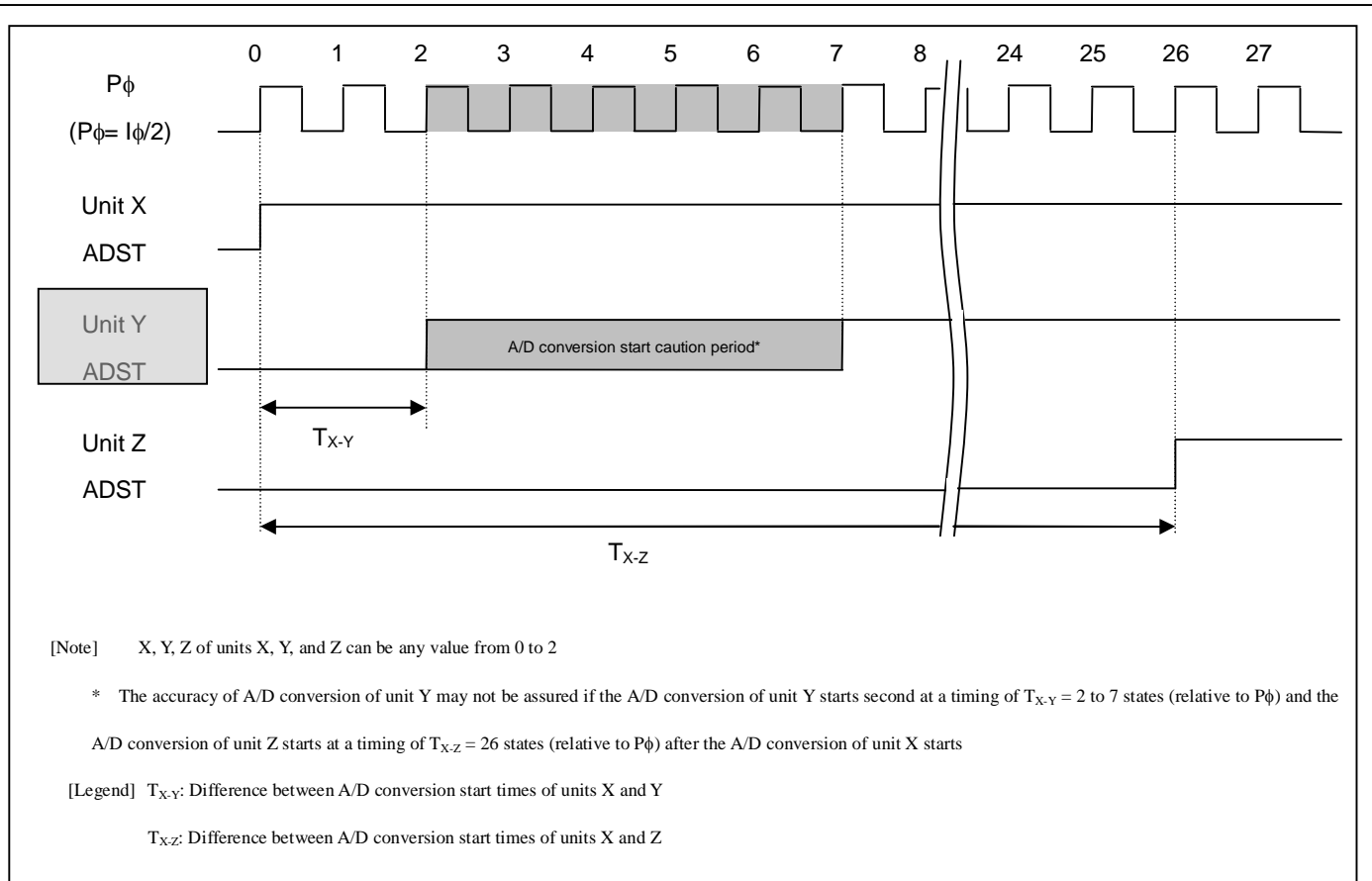


Figure 7 When A/D Conversion Accuracy of Unit Y whose A/D Conversion Starts Second is not Assured: Case 3