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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RA*-A0133B/E	Rev.	2.00
Title	Restrictions when using AGT/AGTW Event counter mode		Information Category	Technical Notification		
Applicable Product	RA2L1, RA2E1, RA2E2, RA2E3, RA2A1, RA2A2, RA4M1, RA4M2, RA4M3, RA4E1, RA4E2, RA4T1, RA4W1, RA6M1, RA6M2, RA6M3, RA6M4, RA6M5, RA6E1, RA6E2, RA6T1, RA6T2, RA6T3, RA8D1, RA8M1, RA8E1, RA8E2, RA8T1 Group	Lot No. All	Reference Document	Refer table at the end of this document		

Restrictions when using AGT/AGTW Event counter mode are added as follows.

1) RA2L1, RA2E1, RA2E3
2) RA2E2
3) RA2A1
4) RA2A2
5) RA4M1, RA4W1
6) RA4M2, RA4M3
7) RA4E1
8) RA4E2, RA4T1, RA6E2, RA6T3
9) RA6M1, RA6T1
10) RA6M2, RA6M3
11) RA6M4, RA6M5
12) RA6E1
13) RA6T2
14) RA8M1, RA8D1, RA8E1, RA8E2, RA8T1

1) RA2L1, RA2E1, RA2E3

Table 21.9 Usable settings in Software Standby mode (AGT0)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*2	—	AGTIOn (n = 0)*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 21.10 Usable settings in Software Standby mode (AGT1)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode*3	—	AGTIOn (n = 1)*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby mode is only AGT1.
Note 1. Only when AGT0 operates in Table 21.9
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

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2) RA2E2

Table 21.9 Usable settings in Software Standby mode (AGTW0)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b	AGTLCLK	—
Pulse output mode	100b	AGTLCLK	—
Event counter mode*2	—	AGTIOn (n = 0)*1	—
Pulse width measurement mode	100b	AGTLCLK	—
Pulse period measurement mode	100b	AGTLCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 21.10 Usable settings in Software Standby mode (AGTW1)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Compare match A/B
Event counter mode*3	—	AGTIOn (n = 1)*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby mode is only AGT1.
Note 1. Only when AGTW0 operates in Table 21.9
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

3) RA2A1

Table 22.9 Usable settings in Software Standby mode (AGT0)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	–
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	–
Event counter mode *1	– (invalid)	AGTIO0	–
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	–
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	–

Note 1. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby mode (AGT1)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode*2	— (invalid)	AGTIO1	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: Release of Software Standby mode is only AGT1.
Note 1. Only when AGT0 operates in Table 22.9.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

4) RA2A2

Table 21.9 Usable settings in Software Standby mode (AGTx (x = 0, 2, 4, 6))

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	Underflow
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	Underflow
Event counter mode*2	—	AGTIOn (n = 0)*1	Underflow
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	● Underflow ● Active edge

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 21.10 Usable settings in Software Standby mode (AGTy (y = 1, 3, 5, 7))

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTx (x = 0, 2, 4, 6) underflow	Underflow
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTx (x = 0, 2, 4, 6) underflow	Underflow
Event counter mode*3	—	AGTIOn (n = 1)*2	Underflow
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTx (x = 0, 2, 4, 6) underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTx (x = 0, 2, 4, 6) underflow	● Underflow ● Active edge

Note: —: invalid
Note: AGT0 to AGT7 release Software Standby mode.
Note 1. Only when AGTx (x = 0, 2, 4, 6) operates in Table 21.9. AGTy (y = 1, 3, 5, 7) uses the AGTx (x = 0, 2, 4, 6) underflow.
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 22.9 Usable settings in Software Standby mode (AGTW0)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	Underflow
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	Underflow
Event counter mode*2	—	AGTWIOn*1	Underflow
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	● Underflow ● Active edge

Note: —: Invalid.
Note 1. When using the AGTWIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby mode (AGTW1)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b, 110b or 101b*1	AGTLCLK, AGTSCLK or AGTW0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b, 110b or 101b*1	AGTLCLK, AGTSCLK or AGTW0 underflow	● Underflow ● Compare match A/B
Event counter mode*3	—	AGTWIOn*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b, 110b or 101b*1	AGTLCLK, AGTSCLK or AGTW0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b, 110b or 101b*1	AGTLCLK, AGTSCLK or AGTW0 underflow	● Underflow ● Active edge

Note: —: Invalid.
Note: Release of Software Standby mode is only for AGTW1.
Note 1. Only when AGTW0 operates in Table 22.9.
Note 2. When using the AGTWIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

5) RA4M1, RA4W1

Table 23.9 Usable setting in Software Standby mode (AGT0) *for RA4M1*
Table 24.8 Usable setting in Software Standby mode (AGT0) *fot RA4W1*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	–
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	–
Event counter mode *1	– (invalid)	AGTIO0	–
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	–
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	–

Note 1. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary..

Table 23.10 Usable setting in Software Standby mode (AGT1) *for RA4M1*
Table 24.9 Usable setting in Software Standby mode (AGT1) *for RA4W1*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode *2	– (invalid)	AGTIO1	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: Release of Software Standby mode is only for AGT1.
Note 1. Only when AGT0 operates in Table 23.9. *for RA4M1*
Note 1. Only when AGT0 operates in Table 24.8. *for RA4W1*
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

6) RA4M2, RA4M3

Table 22.9 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 0, 2, 4)*2)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*3,*4	—	AGTIOn (n = 0, 2, 4)*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. AGT4 cannot operate in Deep Software Standby mode.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary..
Note 4. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 1, 3, 5)*3)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Compare match A/B
Event counter mode*4,+5	—	AGTIOn (n = 1, 3, 5)*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby or Deep Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGTn (n = 0, 2, 4) operates in Table 22.9
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. AGT5 cannot operate in Deep Software Standby mode.
Note 4. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 5. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

7) RA4E1

Table 22.9 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 0, 2))

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*2, *3	—	AGTIOn*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 3. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 1, 3, 5)*3)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2) underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2) underflow	● Underflow ● Compare match A/B
Event counter mode*4, *5	—	AGTIOn*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2) underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2) underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby or Deep Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGTn (n = 0, 2) operates in Table 22.9
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. AGT5 cannot operate in Deep Software Standby mode.
Note 4. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 5. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

8) RA4E2, RA4T1, RA6E2, RA6T3

Table 21.9 Usable settings in Software Standby and Deep Software Standby mode (AGT0) *for* *RA4E2, RA6E2*
Table 21.10 Usable settings in Software Standby and Deep Software Standby mode (AGT0) *for* *RA4T1, RA6T3*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*2, *3	—	AGTIOn*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby and Deep Software Standby mode, set AGTIOSEL.TIES = 1
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.d.
Note 3. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 21.10 Usable settings in Software Standby and Deep Software Standby mode (AGT1) *for RA4E2, RA6E2*
Table 21.11 Usable settings in Software Standby and Deep Software Standby mode (AGT1) *for RA4T1, RA6T3*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode*3, *4	—	AGTIOn*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby or Deep Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGT0 operates in Table 21.9 *for RA4E2, RA6E2*
Note 1. Only when AGT0 operates in Table 21.10 *for RA4T1, RA6T3*
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.d.
Note 4. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

9) RA6M1, RA6T1

Table 25.9 Usable settings in Software Standby and Deep Software Standby modes (AGT0) *for RA6M1*
Table 24.9 Usable settings in Software Standby and Deep Software Standby modes (AGT0) *for RA6T1*

Operating mode	TCK[2:0] bits of AGTMR1 register	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode *1, *2	- (Invalid)	AGTIOn	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note 1. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 2. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 25.10 Usable settings in Software Standby and Deep Software Standby modes (AGT1) *for RA6M1*
Table 24.10 Usable settings in Software Standby and Deep Software Standby modes (AGT1) *for RA6T1*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode *2, *3	— (invalid)	AGTIOn	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: Release of Software Standby mode or Deep Software Standby mode is only AGT1.
Note 1. Only when AGT0 operates in Table 25.9. *for RA6M1*
Note 1. Only when AGT0 operates in Table 24.9. *for RA6T1*
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 3. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

10) RA6M2, RA6M3

Table 25.9 Usable settings for AGT0 in Software Standby and Deep Software Standby modes

Operating mode	TCK[2:0] bits of AGTMR1 register	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode *1, *2	- (Invalid)	AGTIOn	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note 1. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 2. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 25.10 Usable settings AGT1 in Software Standby and Deep Software Standby modes

Operating mode	TCK[2:0] bits of AGTMR1 register	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode *2, *3	— (invalid)	AGTIOn	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b *1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: Release of Software Standby mode or Deep Software Standby mode is only AGT1.
Note 1. Only when AGT0 operates in Table 25.9.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary..
Note 3. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

11) RA6M4, RA6M5

Table 22.9 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 0, 2, 4)*2)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*3, *4	—	AGTIOn (n = 0, 2, 4)*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. AGT4 cannot operate in Deep Software Standby mode.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 4. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 1, 3, 5)*3)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Compare match A/B
Event counter mode*4, *5	—	AGTIOn (n = 1, 3, 5)*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby or Deep Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGTn (n = 0, 2, 4) operates in Table 22.9
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. AGT5 cannot operate in Deep Software Standby mode.
Note 4. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 5. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

12) RA6E1

Table 22.9 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 0, 2, 4)*2)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*3, *4	—	AGTIOn (n = 0, 2, 4)*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. AGT4 cannot operate in Deep Software Standby mode.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary..
Note 4. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby and Deep Software Standby mode (AGTn (n = 1, 3, 5)*3)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Compare match A/B
Event counter mode*4, *5	—	AGTIOn (n = 1, 3, 5)*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGTn (n = 0, 2, 4) underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby or Deep Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGTn (n = 0, 2, 4) operates in Table 22.9
Note 2. When using the AGTIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. AGT5 cannot operate in Deep Software Standby mode.
Note 4. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.
Note 5. When AGTIOSEL.SEL = 00 is set and AGTIO cannot be used as AGTIO input pin in Deep Software Standby mode, stop the count operation before entering Deep Software Standby mode. After returning from Deep Software Standby mode, restart the count operation if necessary.

13) RA6T2

Table 23.9 Usable settings in Software Standby mode (AGTW0)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b	AGTLCLK	—
Pulse output mode	100b	AGTLCLK	—
Event counter mode*2	—	AGTWIOn (n = 0)*1	—
Pulse width measurement mode	100b	AGTLCLK	—
Pulse period measurement mode	100b	AGTLCLK	—

Note: —: invalid
Note 1. When using the AGTWIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 23.10 Usable settings in Software Standby mode (AGTW1)

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Compare match A/B
Event counter mode*3	—	AGTWIOn (n = 1)*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 101b*1	AGTLCLK or AGTW0 underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGTW0 operates in Table 23.9
Note 2. When using the AGTWIOn pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

14) RA8M1, RA8D1, RA8E1, RA8E2, RA8T1

Table 22.9 Usable settings in Software Standby mode (AGT0) *for RA8M1, RA8D1, RA8E1, RA8E2*
Table 21.9 Usable settings in Software Standby mode (AGT0) *for RA8T1*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse output mode	100b or 110b	AGTLCLK or AGTSCLK	—
Event counter mode*2,*3	—	AGTIO0*1	—
Pulse width measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—
Pulse period measurement mode	100b or 110b	AGTLCLK or AGTSCLK	—

Note: —: invalid
Note 1. When using the AGTIO0 pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 2. AGTEE pin is not available during Software Standby mode. External events are always enabled.
Note 3. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Table 22.10 Usable settings in Software Standby mode (AGT1) *for RA8M1, RA8D1, RA8E1, RA8E2*
Table 21.10 Usable settings in Software Standby mode (AGT1) *for RA8T1*

Operating mode	AGTMR1.TCK[2:0]	Operating clock	Resurgence factor of CPU
Timer mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Pulse output mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Compare match A/B
Event counter mode*3, *4	—	AGTIO1*2	● Underflow ● Compare match A/B
Pulse width measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge
Pulse period measurement mode	100b or 110b or 101b*1	AGTLCLK or AGTSCLK or AGT0 underflow	● Underflow ● Active edge

Note: —: invalid
Note: Release of Software Standby mode is only AGT1.
Note: Compare match A/B is resurgence factor of CPU from Software Standby mode.
Note 1. Only when AGT0 operates in Table 22.9 for RA8M1, RA8D1, RA8E1, RA8E2
Note 1. Only when AGT0 operates in Table 21.9 for RA8T1
Note 2. When using the AGTIO1 pin for external event input in Software Standby mode, set AGTIOSEL.TIES = 1.
Note 3. AGTEE pin is not available during Software Standby mode. External events are always enabled
Note 4. When AGTIOSEL.TIES = 0 and the external event input signal is disabled during Software Standby mode, stop the count operation before entering Software Standby mode. After returning from Software Standby mode, restart the count operation if necessary.

Reason for Restrictions

When either of the following two conditions, the counter input is fixed to the value shown in the Fixed Value Information Table below, regardless of the external input.

- Software Standby mode, AGTIOSEL.TIES = 0
- Deep Software Standby mode, AGTIOSEL.SEL = 00

When the external input is set to a value different from the fixed value, a change in the counter input will cause the counter to decrement. This restriction prevents this decrement.

The fixed value information Table

fixed value	Product
0	RA2L1, RA2E1, RA2E2, RA2E3, RA2A1, RA2A2, RA4M1, RA4W1 Group
1	RA4M2, RA4M3, RA4E1, RA4E2, RA4T1, RA6M1, RA6M2, RA6M3, RA6M4, RA6M5, RA6E1, RA6E2, RA6T1, RA6T2, RA6T3, RA8D1, RA8M1, RA8E1, RA8E2, RA8T1 Group

Reference Document

Product	Document name
RA2L1 Group	Renesas RA2L1 Group User's Manual: Hardware Rev. 1.50
RA2E1 Group	Renesas RA2E1 Group User's Manual: Hardware Rev. 1.50
RA2E2 Group	Renesas RA2E2 Group User's Manual: Hardware Rev. 1.40
RA2E3 Group	Renesas RA2E3 Group User's Manual: Hardware Rev. 1.20
RA2A1 Group	Renesas RA2A1 Group User's Manual: Hardware Rev. 1.10
RA2A2 Group	Renesas RA2A2 Group User's Manual: Hardware Rev. 1.20
RA4M1 Group	Renesas RA4M1 Group User's Manual: Hardware Rev. 1.10
RA4M2 Group	Renesas RA4M2 Group User's Manual: Hardware Rev. 1.30
RA4M3 Group	Renesas RA4M3 Group User's Manual: Hardware Rev. 1.40
RA4E1 Group	Renesas RA4E1 Group User's Manual: Hardware Rev. 1.20
RA4E2 Group	Renesas RA4E2 Group User's Manual: Hardware Rev. 1.30
RA4T1 Group	Renesas RA4T1 Group User's Manual: Hardware Rev. 1.20
RA4W1 Group	Renesas RA4W1 Group User's Manual: Hardware Rev. 1.00
RA6M1 Group	Renesas RA6M1 Group User's Manual: Hardware Rev. 1.20
RA6M2 Group	Renesas RA6M2 Group User's Manual: Hardware Rev.1.20
RA6M3 Group	Renesas RA6M3 Group User's Manual: Hardware Rev.1.20
RA6M4 Group	Renesas RA6M4 Group User's Manual: Hardware Rev.1.40
RA6M5 Group	Renesas RA6M5 Group User's Manual: Hardware Rev.1.30
RA6E1 Group	Renesas RA6E1 Group User's Manual: Hardware Rev.1.20
RA6E2 Group	Renesas RA6E2 Group User's Manual: Hardware Rev. 1.30
RA6T1 Group	Renesas RA6T1 Group User's Manual: Hardware Rev. 1.20
RA6T2 Group	Renesas RA6T2 Group User's Manual: Hardware Rev. 1.40
RA6T3 Group	Renesas RA6T3 Group User's Manual: Hardware Rev. 1.20
RA8D1 Group	Renesas RA8D1 Group User's Manual: Hardware Rev. 1.20
RA8M1 Group	Renesas RA8M1 Group User's Manual: Hardware Rev. 1.20
RA8E1 Group	Renesas RA8E1 Group User's Manual: Hardware Rev. 1.00
RA8E2 Group	Renesas RA8E2 Group User's Manual: Hardware Rev. 1.00
RA8T1 Group	Renesas RA8T1 Group User's Manual: Hardware Rev. 1.20