

RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RZ*-A017A/E	Rev.	1.00
Title	RZ/T1 Group Low-Power Consumption Function Adding a description concerning about releasing from the module-stop state		Information Category	Technical Notification		
Applicable Product	RZ/T1 GROUP	Lot No.	Reference Document	RZ/T1 Group User's Manual: Hardware Rev.1.2 R01UH0483EJ0120		
		All lots				

There is added description concerning about exiting the module-stop state of Module Stop Function in the user's manual of RZ/T1 Group.

■ Release from the module-stop state procedure:

When in need to release from the module-stop state of Module Stop Function for any peripheral module listed in Table 1, follow the procedures described below to release from the module-stop state. For the peripheral module not listed in In **Table 1**, follow the procedures specified in Initializing section for that peripheral module described in user's manual.

“Procedures”

- Immediately after set “0” to the corresponding bit of Module Stop Control Register MSTPCRm (m = A~E) to release from the module-stop state, dummy read that MSTPCRm register once.
- Dummy read any one of registers of the peripheral module which exited the module-stop state of.

After then, access to all of registers of that peripheral module will be possible.

Remarks : It is preconditioned that the access control attribute for peripheral register memory region is set to ‘Strongly-ordered’ or ‘Device’ by MPU.

<Example code>.

```
volatile unsigned long dummy;           // Declared volatile to prevent it from omitted by Optimization

SYSTEM.MSTPCRA.BIT.MSTPCRA0 = 0;      // Exit module-stop of CMTW unit 1
dummy = SYSTEM.MSTPCRA.BIT.MSTPCRA0;  // Procedure 1. Dummy-read MSTPCRm register

dummy = CMTW1.CMWIOR.WORD;            // Procedure 2. Dummy-read any register of CMTW unit 1
CMTW1.CMWIOR.WORD = 0x81;             // The first setting to CMTW unit 1 (value picked as e.g.)
```

■ Plan for development tools

Planning to include this procedures for releasing from Module-stop state into development tools as listed below.

Until below tools are updated, insert the procedures by manually to the source code generated by the development tools.

Product name	Version	Schedule
AP4 for RZ	V1.05.00	January/2017 (Target)
e ² studio	V5.3.0	January/2017 (Target)

Table 1 Corresponding peripheral module and Module Stop Control Register

Peripheral Modules	Corresponding Module Stop Control Register
CMTW unit 1	MSTPCRA register MSTPCRA0 bit
CMTW unit 0	MSTPCRA register MSTPCRA1 bit
CMT unit 2	MSTPCRA register MSTPCRA2 bit
CMT unit 1	MSTPCRA register MSTPCRA3 bit
CMT unit 0	MSTPCRA register MSTPCRA4 bit
PPG unit 1	MSTPCRA register MSTPCRA5 bit
PPG unit 0	MSTPCRA register MSTPCRA6 bit
TPUa unit 1	MSTPCRA register MSTPCRA7 bit
TPUa unit 0	MSTPCRA register MSTPCRA8 bit
GPTa	MSTPCRA register MSTPCRA9 bit
MTU3a	MSTPCRA register MSTPCRA11 bit
RSCAN	MSTPCRB register MSTPCRB1 bit
RIIa unit 1	MSTPCRB register MSTPCRB2 bit
RIIa unit 0	MSTPCRB register MSTPCRB3 bit
SCIFA unit 4	MSTPCRB register MSTPCRB5 bit
SCIFA unit 3	MSTPCRB register MSTPCRB6 bit
SCIFA unit 2	MSTPCRB register MSTPCRB7 bit
SCIFA unit 1	MSTPCRB register MSTPCRB8 bit
SCIFA unit 0	MSTPCRB register MSTPCRB9 bit
RSPIa unit 3	MSTPCRB register MSTPCRB10 bit
RSPIa unit 2	MSTPCRB register MSTPCRB11 bit
RSPIa unit 1	MSTPCRB register MSTPCRB12 bit
RSPIa unit 0	MSTPCRB register MSTPCRB13 bit
DELTA-SIGMA INTERFACE	MSTPCRC register MSTPCRC2 bit
TEMPERATURE SENSOR	MSTPCRC register MSTPCRC3 bit
ADC unit 1	MSTPCRC register MSTPCRC4 bit
ADC unit 0	MSTPCRC register MSTPCRC5 bit
ELC	MSTPCRC register MSTPCRC6 bit
BSC	MSTPCRC register MSTPCRC7 bit
SPIBSC	MSTPCRC register MSTPCRC9 bit
DOC	MSTPCRC register MSTPCRC10 bit
CRC	MSTPCRC register MSTPCRC11 bit
CLMA unit 2	MSTPCRC register MSTPCRC12 bit
CLMA unit 1	MSTPCRC register MSTPCRC13 bit
CLMA unit 0	MSTPCRC register MSTPCRC14 bit
SSI	MSTPCRD register MSTPCRD2 bit
ENCODE INTERFACE	MSTPCRE register MSTPCRE0 bit
DMAC unit 1	MSTPCRE register MSTPCRE4 bit
DMAC unit 0	MSTPCRE register MSTPCRE5 bit