[Notes]

RX Family

SCI Module Using Firmware Integration Technology

RX Driver Package

R20TS1066ES0100
Rev.1.00
Sep. 20, 2024

Outline

When using the product in the title, note the following points:

1. The bit rate is not set correctly due to a problem in the formula for calculating the value to be set in the MDDR register in sci_init_bit_rate () function (r_sci_rxXXX.c). (XXX: is the RX target device)

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1.1 Applicable Products

1) SCI module Firmware Integration Technology (SCI FIT module)

The applicable revision numbers and document numbers are as follows:

Table 1.1 SCI FIT module applicable products

Revision number of the SCI FIT module	Document number
Rev.5.20	R01AN1815EJ0520
Rev.5.10	R01AN1815EJ0510
Rev.5.00	R01AN1815EJ0500
Rev.4.90	R01AN1815EJ0490
Rev.4.80	R01AN1815EJ0480
Rev.4.70	R01AN1815EJ0470
Rev.4.60	R01AN1815EJ0460
Rev.4.50	R01AN1815EJ0450
Rev.4.40	R01AN1815EJ0440
Rev.4.30	R01AN1815EJ0430
Rev.4.20	R01AN1815EJ0420
Rev.4.10	R01AN1815EJ0410
Rev.4.00	R01AN1815EJ0400
Rev.3.91	R01AN1815EJ0391
Rev.3.90	R01AN1815EJ0390
Rev.3.80	R01AN1815EJ0380
Rev.3.70	R01AN1815EJ0370
Rev.3.60	R01AN1815EJ0360
Rev.3.50	R01AN1815EJ0350
Rev.3.40	R01AN1815EJ0340
Rev.3.30	R01AN1815EJ0330
Rev.3.21	R01AN1815EJ0321
Rev.3.20	R01AN1815EJ0320
Rev.3.10	R01AN1815EJ0310
Rev.3.00	R01AN1815EJ0300
Rev.2.20	R01AN1815EJ0220
Rev.2.11	R01AN1815EJ0211
Rev.2.10	R01AN1815EJ0210

Revision number of the SCI FIT module	Document number
Rev.2.01	R01AN1815EJ0201
Rev.2.00	R01AN1815EJ0200
Rev.1.90	R01AN1815EJ0190
Rev.1.80	R01AN1815EJ0180
Rev.1.70	R01AN1815EJ0170

2) RX Driver Package

The SCI FIT module in 1) is also included in the RX Driver Package

The product names and revision numbers of the applicable RX Driver Package and the revision numbers of the SCI FIT module are as follows:

Table 1.2 SCI FIT module applicable products

RX Driver Package product name	RX Driver Package revision number	Document number	Revision number of the included SCI FIT module
RX Family RX Driver Package Ver.1.43	Rev.1.43	R01AN7387xx0143	Rev.5.20
RX Family RX Driver Package Ver.1.42	Rev.1.42	R01AN7163xx0142	Rev.5.00
RX Family RX Driver Package Ver.1.41	Rev.1.41	R01AN6907 xx0141	Rev.4.90
RX Family RX Driver Package Ver.1.40	Rev.1.40	R01AN6906 xx0140	Rev.4.90
RX Family RX Driver Package Ver.1.39	Rev.1.39	R01AN6905 xx0139	Rev.4.80
RX Family RX Driver Package Ver.1.37	Rev.1.37	R01AN6721 xx0137	Rev.4.60
RX Family RX Driver Package Ver.1.36	Rev.1.36	R01AN6515 xx0136	Rev.4.40
RX Family RX Driver Package Ver.1.34	Rev.1.34	R01AN6323 xx0134	Rev.4.30
RX Family RX Driver Package Ver.1.33	Rev.1.33	R01AN6073 xx0133	Rev.4.10
RX Family RX Driver Package Ver.1.32	Rev.1.32	R01AN6013 xx0132	Rev.3.90
RX Family RX Driver Package Ver.1.31	Rev.1.31	R01AN5975 xx0131	Rev.3.80
RX Family RX Driver Package Ver.1.30	Rev.1.30	R01AN5882xx0130	Rev.3.70
RX Family RX Driver Package Ver.1.28	Rev.1.28	R01AN5826xx0129	Rev.3.70
RX Family RX Driver Package Ver.1.27	Rev.1.27	R01AN5600xx0127	Rev.3.70
RX Family RX Driver Package Ver.1.26	Rev.1.26	R01AN5401xx0126	Rev.3.50
RX Family RX Driver Package Ver.1.25	Rev.1.25	R01AN5371xx0125	Rev.3.40
RX Family RX Driver Package Ver.1.24	Rev.1.24	R01AN5267xx0124	Rev.3.30
RX Family RX Driver Package Ver.1.23	Rev.1.23	R01AN4976xx0123	Rev.3.21
RX Family RX Driver Package Ver.1.22	Rev.1.22	R01AN4873xx0122	Rev.3.20
RX Family RX Driver Package Ver.1.20	Rev.1.20	R01AN4794xx0120	Rev.3.00
RX Family RX Driver Package Ver.1.19	Rev.1.19	R01AN4677xx0119	Rev.2.20
RX Family RX Driver Package Ver.1.18	Rev.1.18	R01AN4659xx0118	Rev.2.11

RX Driver Package product name	RX Driver Package revision number	Document number	Revision number of the included SCI FIT module
RX Family RX Driver Package Ver.1.16	Rev.1.16	R01AN4471xx0116	Rev.2.10
RX Family RX Driver Package Ver.1.15	Rev.1.15	R01AN4372xx0115	Rev.2.01
RX Family RX Driver Package Ver.1.14	Rev.1.14	R01AN4191xx0114	Rev.2.01
RX Family RX Driver Package Ver.1.13	Rev.1.13	R01AN3859xx0113	Rev.2.00
RX Family RX Driver Package Ver.1.12	Rev.1.12	R01AN3651xx0112	Rev.1.90
RX Family RX Driver Package Ver.1.11	Rev.1.11	R01AN3467xx0111	Rev.1.80
RX Family RX Driver Package Ver.1.10	Rev.1.10	R01AN3345xx0110	Rev.1.70
RX Family RX Driver Package Ver.1.04	Rev.1.04	R01AN2606xx0104	Rev.1.70
RX Family RX Driver Package Ver.1.03	Rev.1.03	R01AN3233xx0103	Rev.1.70
RX Family RX Driver Package Ver.1.02	Rev.1.02	R01AN3159xx0102	Rev.1.70
RX Family RX Driver Package Ver.1.01	Rev.1.01	R01AN2670xx0101	Rev.1.70

1.2 Applicable Devices

RX130, RX140, RX13T Groups

RX230, RX231, RX23T, RX23W, RX23E-A, RX23E-B, RX24T, RX24U, RX26T Groups

RX64M, RX65N, RX651, RX66T, RX66N, RX660, RX671 Groups

RX71M, RX72T, RX72M, RX72N Groups

1.3 Details

The BRR register is an 8-bit register which adjusts the bit rate.

The MDDR register corrects the bit rate adjusted by the BRR register

The formula to calculate value to be set in the MDDR register is incorrect due to the order of type casting. This leads to wrong setting in MDDR register which also affects BRR register and bit rate output.

1.4 Conditions

An error occurs when the bit rate input value causes the absolute bit rate error to be greater than 1%.

This issue occurs in the asynchronous mode whereby the formula to calculate the value to be set in the MDDR register is incorrect as the code below:

```
float_M = ((float)((baud * divisor) * 256) * tmp) / pclk;
```

1.5 Workaround

Method 1: Avoid choosing input bit rate which would cause absolute bit rate error to be greater than 1%.

Method 2: If the input bit rate value cannot be changed and it causes absolute bit rate error to be greater than 1%, then the code should be modified in sci_init_bit_rate function (r_sci_rxXXX.c) as below:

```
float_M = ((((float)baud * divisor) * 256) * tmp) / pclk;
```

1.6 Schedule for Fixing the Problem

This problem will be fixed in SCI FIT module Rev.5.30.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Sep.20.24	-	First edition issued

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TS Colophon 4.3