To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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April 1st, 2010
Renesas Electronics Corporation

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GRADE A

MESC TECHNICAL NEWS

No.**M7700-40-9809**

M37733/35/36 EH/MH
Revision and Specification Modification Information

The following is a description of corrective revisions and partial specification modification made on the 7733/35/36 EH/MH (124-Kbyte ROM version).

1. Related Devices

M37733EHBFP,	M37733MHBXXXFP,	M37733EHLHP,	M37733MHLXXXHP,
M37735EHBFP,	M37735MHBXXXFP,	M37735EHLHP,	M37735MHLXXXHP,
M37736EHBGP,	M37736MHBXXXGP,	M37736EHLHP,	M37736MHLXXXHP

2. Corrected Defects

We have made revisions to correct the following defects, which were described in the following MSC TECHNICAL NEWS issues.

① No.7700-29-9612:
USAGE NOTES for 7733/35/36 GROUP UART2 INTERRUPT REQUEST AT RECEPTION

② No.7700-30-9612:
USAGE NOTES for 7733/35/36 GROUP TIMER A TWO-PHASE PULSE SIGNAL PROCESS

3. Specification Modification

We have made a partial specification modification concerning the memory allocation selection bits. For a detailed explanation, refer to section “5. Specification Modification of Memory Allocation Selection Bits.”

4. Identification Method for Revised Devices

The currently mass-produced devices and the newly revised devices can be identified by the marking lot number. The revised devices will have an “E” in the 4th position of the lot number, as shown below:

- M37733EH, M37735EH, M37736EH
  - Currently Mass-produced Devices : XXXAXXX
  - Revised Devices : XXXEXXX
- M37733MH, M37735MH, M37736MH
  - Currently Mass-produced Devices : XXXBXXX, XXXCXXX, XXXDXXX
  - Revised Devices : XXXEXXX

Note: Production and shipment will be gradually shifted to the revised versions from now on.
For customers requesting shipment of the revised version, please contact Mitsubishi Electric Corporation or a sales division of an authorized Mitsubishi Semiconductor product distributor.

5. Specification Modification of Memory Allocation Selection Bits

We have modified the specification concerning the function of the memory allocation selection bits of the memory allocation control register (address 63_{16}). Below are the modification details and other usage notes. For convenience sake here, the device type will be represented by the 7th and the 8th characters of the device name.

Example: "MH" represents a device of the 7733/7735/7736 Group with a built-in 124-Kbyte ROM, such as the M37733MHBXXXFP (regardless of the voltage version: 5 V or low voltage version).

For the documents for the currently mass-produced version, refer to the following:

- The English document CD-ROM "MITSUBISHI Semiconductors" (Mar.1998 and before):
  7733/7735/7736 Group Datasheets and User's Manual (First Edition of PDF Document) Included
- "7733/7735/7736 Group User's Manual" (Document Number: H-EF490-A, Book-bound Version)

The documents for the revised version will be obtained by the following methods:

- Refer to the English document CD-ROM "MITSUBISHI MICROCOMPUTERS" (Sep. 1998 and after):
  7733/7735/7736 Group Datasheets and User's Manual (Rev. No. 2.00 of PDF Document) Included
- Please visit our Web site to get the latest information (PDF Documents, etc.):
  http://www.mitsubishichips.com/ (for Worldwide site) (Coming Soon)
  http://www.melco.co.jp/service/semicon/ (for Japanese site, including English PDF Documents)

5.1 Contents of Specification Modification

(1) MH, EH: Specification Modification

Table 1 lists the values selected by the memory allocation selection bits (ML_2, ML_1, ML_0), and the corresponding internal memory size. As listed in Table 2, we have added the memory allocation for the new devices (M4 and M8) and eliminated the selection of 32-Kbyte ROM/3968-byte RAM.

Table 1. MH/EH: Values Selectable by Memory Allocation Selection Bits and Corresponding Internal Memory Size

Memory Allocation Selection Bits			Internal Memory Size (Bytes)				Memory Allocation (Addresses)	
			Currently Mass-produced Devices		Revised Devices			
ML_2	ML_1	ML_0	ROM	RAM	ROM	RAM	ROM	RAM
0	0	0	124 K	3968	124 K	3968	1000_{16}–$1FFFF_{16}$	80_{16}–FFF_{16}
0	0	1	120 K	3968	120 K	3968	2000_{16}–$1FFFF_{16}$	80_{16}–FFF_{16}
0	1	0	–	–	60 K	2048	1000_{16}–$FFFF_{16}$	80_{16}–$87F_{16}$
0	1	1	–	–	–	–		
1	0	0	–	–	32 K	2048	8000_{16}–$FFFF_{16}$	80_{16}–$87F_{16}$
1	0	1	–	–	16 K	2048	$C000_{16}$–$FFFF_{16}$	80_{16}–$87F_{16}$
1	1	0	96 K	3968	96 K	3968	8000_{16}–$1FFFF_{16}$	80_{16}–FFF_{16}
1	1	1	32 K	3968	–	–	8000_{16}–$FFFF_{16}$	80_{16}–FFF_{16}

– : Do not select

(2) M4, M8: New Devices' Specifications

M4 and M8 have been added as two new devices. Table 2 lists a comparison of MH, M4 and M8. For evaluation of M4 and M8, be sure to use the revised EH. Table 3 lists the values of the memory allocation selection bits at evaluation for M4 and M8.

Table 2. Comparison of M4, M8, and MH

Items		M4 (Bytes)	M8 (Bytes)	MH (Bytes)
Internal Memory Size	ROM	32 K	60 K	124 K
	RAM	2048	2048	3968
Memory Allocation Selection Bits		1 Bit (See Table 3.)	Not Implemented	3 Bits (See Table 1.)

Table 3. Values of Memory Allocation Selection Bits at Evaluation for M4 and M8

Device	Memory Allocation Selection Bit (ML_0)	Internal Memory Size		Memory Allocation Selection Bits at Evaluation with EH
		ROM (Bytes)	RAM (Bytes)	
M4	0	32 K	2048	1,0,0
	1	16 K	2048	1,0,1
M8		60 K	2048	0,1,0

5.2 Usage Notes Related to Specification Modification

(1) When using a revised MH or EH with an internal ROM of 96 Kbytes or more, it can be used in the same manner as that for its currently mass-produced version. In other words, there is no difference in the usage manner between the revised and the currently mass-produced versions at the above ROM size.

(2) When using MH or EH with an internal ROM of 32 Kbytes, note that its revised version differs from the currently mass-produced version in the value set to the memory allocation selection bits and the RAM size. (See Table 1.)

(3) When using EH to evaluate M8, be sure to use the revised EH and set the memory allocation selection bits to "0, 1, 0."
Furthermore, keep these bits = "0, 1, 0" when masking.

(4) When using EH to evaluate M4, be sure to use the revised EH. Furthermore, set the memory allocation selection bits to "1, 0, 0" for use with a 32-Kbyte ROM, and "1, 0, 1" for use with a 16-Kbyte ROM. M4 has bit 0 (ML_0) only as the memory allocation selection bit. Therefore, when masking is done with these bits = "1, 0, 0" (ML_0 = "0") or with these bits = "1, 0, 1" (ML_0 = "1"), the memory size is correctly selected.

(5) If it is necessary to evaluate M4 with the currently mass-produced EH, note the following:
① 16 Kbytes cannot be selected for the internal ROM size of a currently mass-produced EH.
② When the internal ROM size is 32 Kbytes, the value of the memory allocation selection bits of the currently mass-produced EH is "1, 1, 1." At this time, the internal RAM size is 3968 bytes.
③ When masking a program which has been evaluated under condition ②, be sure to reprogram so that bit 0 of the memory allocation selection bits (ML_0) is set to "0." It is because ML_0 is "1" under condition②, and when masking for M4, the internal ROM size will be 16 Kbytes and addresses 8000_{16} to $BFFF_{16}$ will be the external area.

5.3 Revised Points in "7733/7735/7736 Group User's Manual" Based Specification Modification

The 7733/7735/7736 Group User's Manual mainly describes the M37733MHBXXXFP (the currently mass-produced version). Pages 5/7 through 7/7 of this Technical News describe changes which must be made to "7733/7735/7736 Group User's Manual." (First Edition of PDF Document, Book-bound Version H-EF490-A). However, M4 and M8 are not described in the above manual. Therefore, for details of them, do as follows :

- Refer to sections 1 and 2.
- Refer to the PDF document for the revised version in the English document CD-ROM "MITSUBISHI MICROCOMPUTERS" (Sep. 1998 and after)
- Please visit our Web site to get the PDF document for the revised version.:

http://www.mitsubishichips.com/ (for Worldwide site) (Coming Soon)

http://www.melco.co.jp/service/semicon/ (for Japanese site, including English PDF documents)

7733/7735/7736 Group User's Manual Revised Points No.1

<table>
<tr><th>Page</th><th>Currently Mass-produced Version</th><th>Revised Version</th></tr>
<tr><td>PART 1
P2-19
Fig. 2.4.1

PART 1
P21-30</td><td>
<table>
<tr><th colspan="2">Functions</th></tr>
<tr><td>b2 b1 b0</td><td>ROM size (addresses)</td></tr>
<tr><td>0 0 0 :</td><td>124 K (001000₁₆ to 01FFFF₁₆)</td></tr>
<tr><td>0 0 1 :</td><td>120 K (002000₁₆ to 01FFFF₁₆)</td></tr>
<tr><td>0 1 0 :</td><td>Do not select.</td></tr>
<tr><td>0 1 1 :</td><td>Do not select.</td></tr>
<tr><td>1 0 0 :</td><td>Do not select.</td></tr>
<tr><td>1 0 1 :</td><td>Do not select.</td></tr>
<tr><td>1 1 0 :</td><td>96 K (008000₁₆ to 01FFFF₁₆)</td></tr>
<tr><td>1 1 1 :</td><td>32 K (008000₁₆ to 00FFFF₁₆)</td></tr>
</table>
</td><td>
<table>
<tr><th colspan="3">Functions</th></tr>
<tr><td>b2 b1 b0</td><td>ROM size</td><td>RAM size</td></tr>
<tr><td>0 0 0 :</td><td>124 Kbytes,</td><td>3968 bytes</td></tr>
<tr><td>0 0 1 :</td><td>120 Kbytes,</td><td>3968 bytes</td></tr>
<tr><td>0 1 0 :</td><td>60 Kbytes,</td><td>2048 bytes</td></tr>
<tr><td>0 1 1 :</td><td>Do not select.</td><td></td></tr>
<tr><td>1 0 0 :</td><td>32 Kbytes,</td><td>2048 bytes</td></tr>
<tr><td>1 0 1 :</td><td>16 Kbytes,</td><td>2048 bytes</td></tr>
<tr><td>1 1 0 :</td><td>96 Kbytes,</td><td>3968 bytes</td></tr>
<tr><td>1 1 1 :</td><td>Do not select.</td><td></td></tr>
</table>
</td></tr>
<tr><td></td><td>Notes 1: •••••
2: When changing these bits, this change must be performed in an area which is internal ROM area before and after this change, for example addresses 008000₁₆ to 00FFFF₁₆. Also, when changing these bits, be sure to follow the procedure listed below.
3: In the M37733S4BFP, M37733S4LHP, M37735S4BFP, or M37735S4LHP, writing to address 63₁₆ is disabled.</td><td>Notes 1: •••••
2: When changing these bits, this change must be performed in an area which is internal ROM area before and after this change, for example addresses 00C000₁₆ to 00FFFF₁₆. Also, when changing these bits, be sure to follow the procedure listed below.
3: This figure is applied only to the H37733MHBXXXFP. For the other microcomputers, please refer to the latest datasheets on the English document CD-ROM or our Web site.</td></tr>
<tr><td>PART 1
P2-21
Fig. 2.4.3

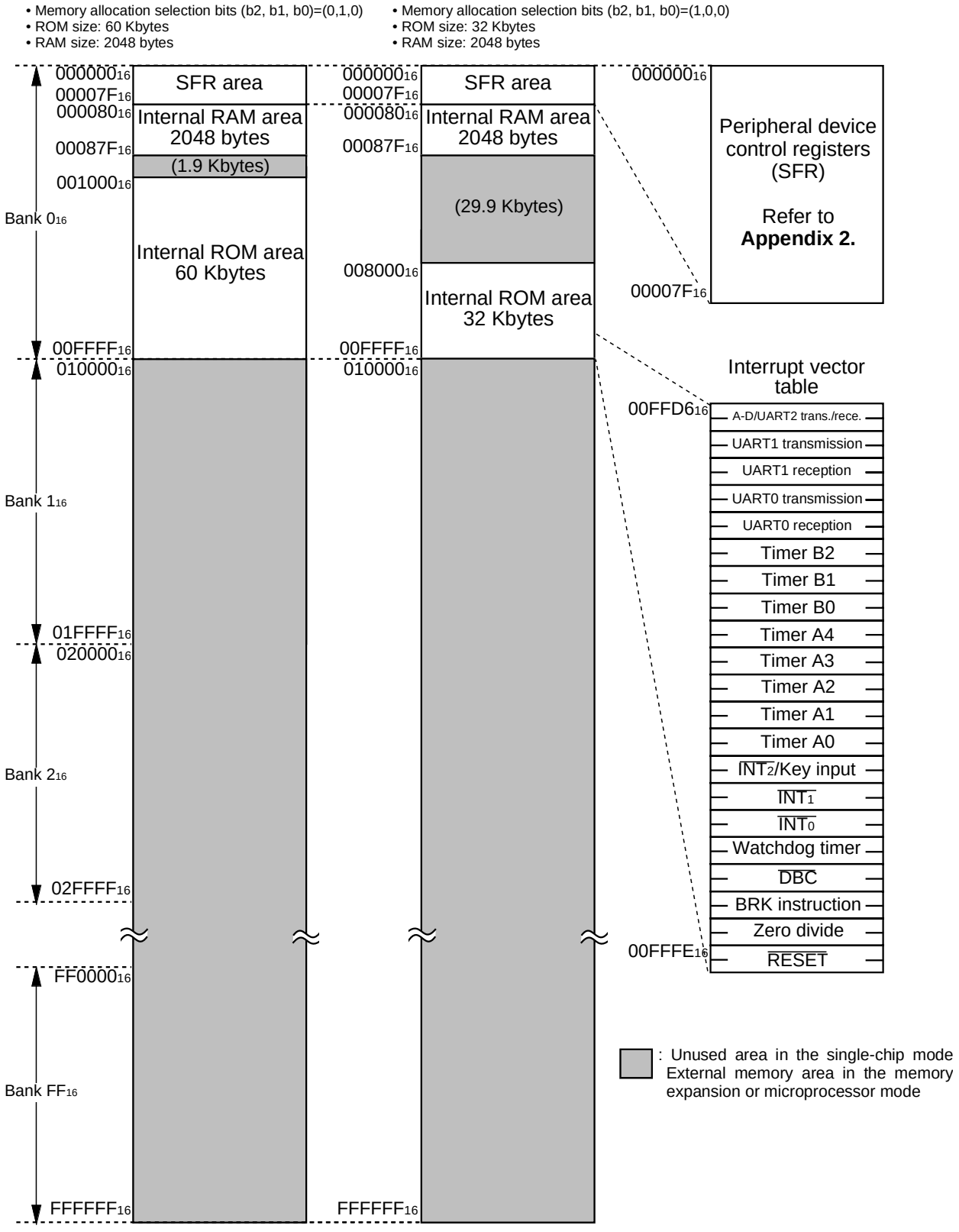
PART 1
P21-3
Fig. 2

PART 2
P21-4
Fig. 2

PART 3
P20-4
Fig. 2</td><td>Omitted.</td><td>Refer to pages (6/7) and (7/7).</td></tr>
<tr><td>PART 1
P19-4
Table 19.1.3</td><td>
<table>
<tr><th colspan="3">Memory allocation selection bits</th><th rowspan="2">Programmable area</th></tr>
<tr><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>01000₁₆–1FFFF₁₆</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>02000₁₆–1FFFF₁₆</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>08000₁₆–1FFFF₁₆</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>08000₁₆–0FFFF₁₆</td></tr>
</table>
</td><td>
<table>
<tr><th colspan="3">Memory allocation selection bits</th><th rowspan="2">Programmable area</th></tr>
<tr><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>01000₁₆–1FFFF₁₆</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>02000₁₆–1FFFF₁₆</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>01000₁₆–0FFFF₁₆</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>08000₁₆–0FFFF₁₆</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>0C000₁₆–0FFFF₁₆</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>08000₁₆–1FFFF₁₆</td></tr>
</table>
</td></tr>
<tr><td>PART 1
P21-82
Line 18</td><td>••••• addresses 008000₁₆ to 00FFFF₁₆.</td><td>••••• addresses 00C000₁₆ to 00FFFF₁₆.</td></tr>
</table>

7733/7735/7736 Group User's Manual Revised Points No.2

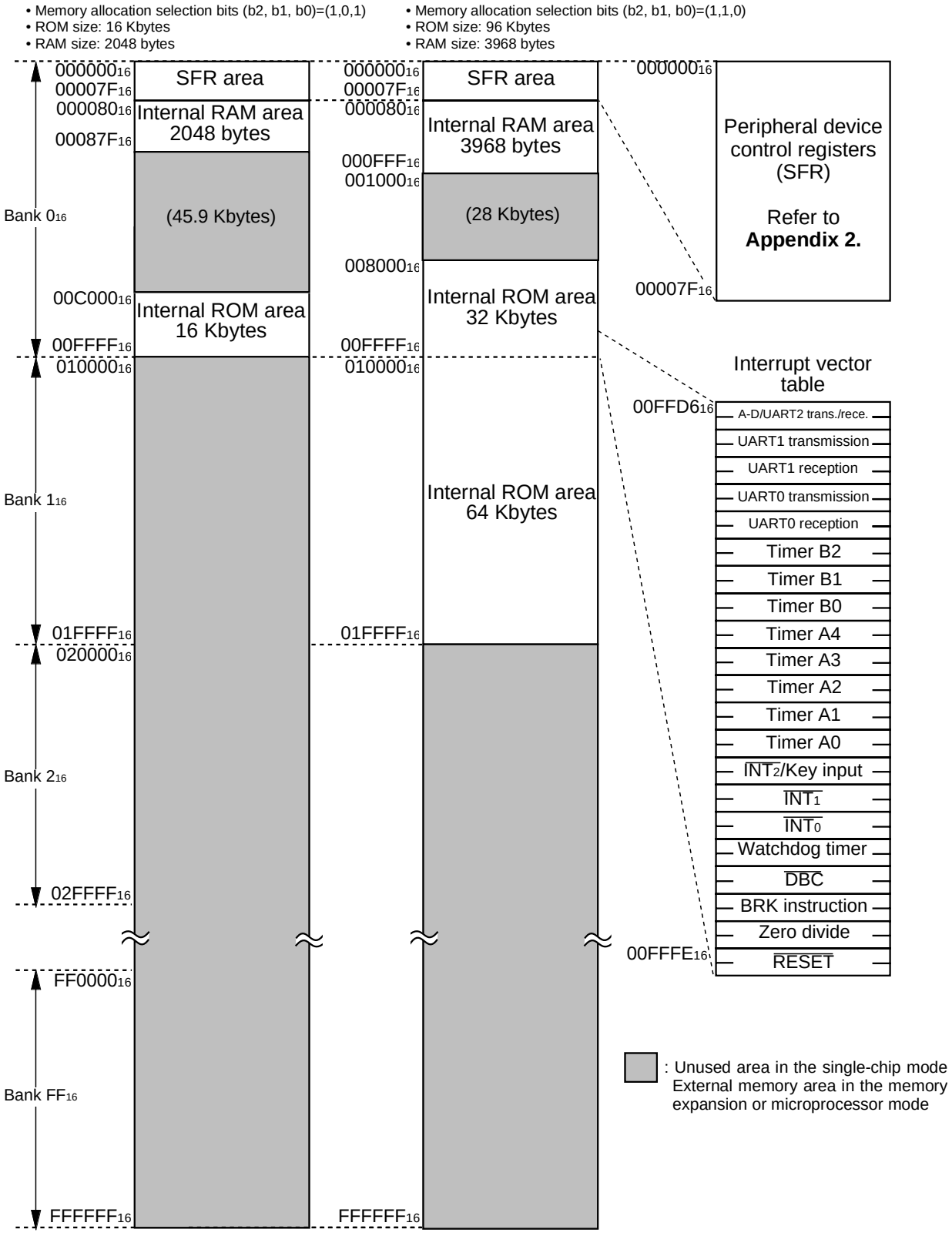
Revised Version



Notes 1: Access to internal ROM area is disabled in the microprocessor mode.
(Refer to section **"2.5 Processor modes."**)
2: Banks 10_{16} to FF_{16} cannot be accessed in the 7735 Group and in external bus mode B of the 7736 Group.

7733/7735/7736 Group User's Manual Revised Points No.3

Revised Version



Notes 1: Access to internal ROM area is disabled in the microprocessor mode.
(Refer to section **"2.5 Processor modes."**)
2: Banks 10_{16} to FF_{16} cannot be accessed in the 7735 Group and in external bus mode B of the 7736 Group.