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32176 Group

SFR definition file

1. Overview

This documentation presents SFR definition file for 32176 Group.

2. Introduction

The sample task described in this document uses the following microcomputers, under the respective conditions.

- Microcomputer: 32176 Group (M32176F8VFP, M32176F8UFP, and M32176F8TFP)
- Operating Frequency: 20 to 40MHz

3. Explanation of SFR definition file

3 parts written below compose SFR definition file.

(1) #pragma ADDRESS definition part

It is declared that designated variable is arranged to designated address with using #pragma external function of M3T-CC32R (Compiler).

Defined variable name in register name of SFR definition in Hardware manual.

Description example)

```
#pragma ADDRESS P10DATA 0x0080070A
```

Explanation)

Arrange variable P10DATA to absolute address 0x0080070A.

(2) Variable size definition part

Size of variable is defined here.

Description example)

```
#define VUB volatile unsigned char
static VUB P10DATA
```

Explanation)

Arrange variable P10DATA as byte size.

Note. VUB model is re-defined bite size of volatile unsigned char model by typedef.

There are others Half word size of VUH (volatile unsigned short) and word size of VUW (volatile unsigned long).

(3) Bit symbol definition part

Defined applicable bit in register as "1", others as "0".

Defined bit name as bit name in register table in Hardware manual.

Description example)

```
#define b7_8B (0x01u)
#define P107DT (b7_8B)
```

Explanation)

Define P107DT as 0x01.

Note. b7_8B is 8 bit size data defined by #define in the same definition file, the data set only position of bit7 as "1" (0x01). There are others bn_8B (n=0 to 7 or 8 to 15) bn_16B (n=0 to 15), bn_32B (n=0 to 31). Each size are 8 bit, 16bit, 32 bit.

Note. The latest SFR definition file can be downloaded from Renesas Technology Corp. website.

4. How to use SFR definition file

SFR definition file uses M3T-CC32R (compiler) of #include pre-processing, and is used with inserting file to C source program.

Example when use Bit symbol defined in SFR definition file in C source program.

Description example)

```
#include    "..\inc\sfr32176_pragma.h"
:
(Omitted)
:
P10DATA |= P107DT;          /* Set P107DT bit as "1"*/
```

Note. Bit symbol definition is defined by maximum size in register table in Hardware manual. So bit symbol definition cannot be used in accessible register in different size except maximum size.

Example)	#define b0_32B	(0x80000000u)
	#define IRB0	(b0_32B)
<input type="radio"/>	CAN0SLIMKW = IRB0;	/* Set IRB0 bit as "1" */
<input checked="" type="radio"/>	CAN0SLIMK = IRB0;	/* Because of size difference, use prohibited */

5. Reference Documents

- 32176 Group User's Manual Rev.1.01
- M3T-CC32R V.4.30 User's Manual (C compiler)
- M3T-AS32R V.4.30 User's Manual (Assembler)
- M32R Family Software manual Rev.1.20

(Please get the latest one from Renesas Technology Corp. website.)

6. Homepage and Support Center

- Renesas Technology Corp. Website:
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- Inquires for all Renesas products and technical inquiries for the M32R Family products:
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Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Jan.12.06	—	First edition issued.

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