

```

// H8/3069F Include File
// Ver. 1.0

```

```

2006/09/29 by Atsushi Ruike

```

```

/*****
/* 16bits timer
*****/
struct st_hex_itu{
    union{
        unsigned char BYTE;
        struct{
            unsigned char :5;
            unsigned char STR2 :1;
            unsigned char STR1 :1;
            unsigned char STR0 :1;
        }BIT;
    }TSTR;
    union{
        unsigned char BYTE;
        struct{
            unsigned char :5;
            unsigned char SYNC2 :1;
            unsigned char SYNC1 :1;
            unsigned char SYNC0 :1;
        }BIT;
    }TSNC;
    union{
        unsigned char BYTE;
        struct{
            unsigned char :1;
            unsigned char MDF :1;
            unsigned char FDIR :1;
            unsigned char PWM2 :2;
            unsigned char PWM1 :1;
            unsigned char PWM0 :1;
        }BIT;
    }TMDR;
    union{
        unsigned char BYTE;
        struct{
            unsigned char :2;
            unsigned char TOB2 :1;
            unsigned char TOB1 :1;
            unsigned char TOB0 :1;
            unsigned char TOA2 :1;
            unsigned char TOA1 :1;
            unsigned char TOA0 :1;
        }BIT;
    }TOLR;
    union{
        unsigned char BYTE;
        struct{
            unsigned char :1;
            unsigned char IMIEA2 :1;
            unsigned char IMIEA1 :1;
            unsigned char IMIEA0 :1;
            unsigned char :1;
            unsigned char IMFA2 :1;
            unsigned char IMFA1 :1;
            unsigned char IMFA0 :1;
        }BIT;
    }TISRA;
    union{
        unsigned char BYTE;
        struct{
            unsigned char :1;
            unsigned char IMIEB2 :1;
            unsigned char IMIEB1 :1;
            unsigned char IMIEB0 :1;
            unsigned char _ :1;
        }BIT;
    }TISRB;

```

```

75         unsigned char IMFB2 :1; /* .IMFB2 */
76         unsigned char IMFB1 :1; /* .IMFB1 */
77         unsigned char IMFB0 :1; /* .IMFB0 */
78     }BIT; /* ----- */
79 }TISRB; /* .TISRC + */
80 union{ /* .BYTE + */
81     unsigned char BYTE; /* .BIT + */
82     struct{
83         unsigned char :1; /*
84         unsigned char OVIEB2:1; /* .OVIEB2 */
85         unsigned char OVIEB1:1; /* .OVIEB1 */
86         unsigned char OVIEB0:1; /* .OVIEB0 */
87         unsigned char :1; /*
88         unsigned char OV̄F2 :1; /* .OV̄F2 */
89         unsigned char OV̄F1 :1; /* .OV̄F1 */
90         unsigned char OV̄F0 :1; /* .OV̄F0 */
91     }BIT; /*
92 }TISRC; /*
93 }; /*
94
95
96 /*-----*/
97 /* 16bits timer channel 0-2 */
98 /*-----*/
99 struct st_hex_itu0{ /*
100     union{ /* .TCR +
101         unsigned char BYTE; /* .BYTE +
102         struct{ /* .BIT +
103             unsigned char :1; /*
104             unsigned char CCLR :2; /* .CCLR
105             unsigned char CKEG :2; /* .CKEG
106             unsigned char TPSC :3; /* .TPSC
107         }BIT; /*
108     }TCR; /* -----
109     union{ /* .TIOR +
110         unsigned char BYTE; /* .BYTE +
111         struct{ /* .BIT +
112             unsigned char :1; /*
113             unsigned char IOB :3; /* .IOB
114             unsigned char :1; /*
115             unsigned char IŌA :3; /* .IŌA
116         }BIT; /*
117     }TIOR; /* -----
118     unsigned short TCNT; /* .TCNT
119     unsigned short GRA; /* .GRA
120     unsigned short GRB; /* .GRB
121 }; /*
122
123
124 /*-----*/
125 /* 8bits timer channel 0 */
126 /*-----*/
127 struct st_oct_itu0{ /*
128     union{ /* .TCR +
129         unsigned char BYTE; /* .BYTE +
130         struct{ /* .BIT +
131             unsigned char CMIEB :1; /* .CMIEB
132             unsigned char CMIEA :1; /* .CMIEA
133             unsigned char OVIE :1; /* .OVIE
134             unsigned char CCLR :2; /* .CCLR
135             unsigned char CKS :3; /* .CKS
136         }BIT; /*
137     }TCR; /* -----
138     unsigned char _; /*
139     union{ /* .TCSR +
140         unsigned char BYTE; /* .BYTE +
141         struct{ /* .BIT +
142             unsigned char CMFB :1; /* .CMFB
143             unsigned char CMFA :1; /* .CMFA
144             unsigned char OV̄F :1; /* .OV̄F
145             unsigned char ADTE :1; /* .ADTE
146             unsigned char OIS32 :2; /* .OIS32
147             unsigned char OS10 :2; /* .OS10
148         }BIT; /*

```

```

149     }TCSR; /* ----- */
150     unsigned char    ; /*
151     unsigned char    TCORA; /* .TCORA
152     unsigned char    ; /*
153     unsigned char    TCORB; /* .TCORB
154     unsigned char    ; /*
155     unsigned char    TCNT; /* .TCNT
156     }; /*
157     /*-----*/
158     /* 8bits timer channel 2 */
159     /*-----*/
160     struct st_oct_itu2{ /*
161         union{ /* .TCR +
162             unsigned char    BYTE; /* .BYTE
163             struct{ /* .BIT +
164                 unsigned char    CMIEB :1; /* .CMIEB
165                 unsigned char    CMIEA :1; /* .CMIEA
166                 unsigned char    OVIE :1; /* .OVIE
167                 unsigned char    CCLR :2; /* .CCLR
168                 unsigned char    CKS :3; /* .CKS
169             }; /*
170         }TCSR; /* -----
171         unsigned char    _; /*
172         union{ /* .TCSR +
173             unsigned char    BYTE; /* .BYTE
174             struct{ /* .BIT +
175                 unsigned char    CMFB :1; /* .CMFB
176                 unsigned char    CMFA :1; /* .CMFA
177                 unsigned char    OVF :1; /*
178                 unsigned char    :1; /*
179                 unsigned char    OIS32 :2; /* .OIS32
180                 unsigned char    OS10 :2; /* .OS10
181             }; /*
182         }TCSR; /* -----
183         unsigned char    ; /*
184         unsigned char    TCORA; /* .TCORA
185         unsigned char    ; /*
186         unsigned char    TCORB; /* .TCORB
187         unsigned char    ; /*
188         unsigned char    TCNT; /* .TCNT
189     }; /*
190     /*-----*/
191     /* 8bits timer channel 1&3 */
192     /*-----*/
193     struct st_oct_itu13{ /*
194         union{ /* .TCR +
195             unsigned char    BYTE; /* .BYTE
196             struct{ /* .BIT +
197                 unsigned char    CMIEB :1; /* .CMIEB
198                 unsigned char    CMIEA :1; /* .CMIEA
199                 unsigned char    OVIE :1; /* .OVIE
200                 unsigned char    CCLR :2; /* .CCLR
201                 unsigned char    CKS :3; /* .CKS
202             }; /*
203         }TCSR; /* -----
204         unsigned char    _; /*
205         union{ /* .TCSR +
206             unsigned char    BYTE; /* .BYTE
207             struct{ /* .BIT +
208                 unsigned char    CMFB :1; /* .CMFB
209                 unsigned char    CMFA :1; /* .CMFA
210                 unsigned char    OVF :1; /* .OVF
211                 unsigned char    :1; /*
212                 unsigned char    OIS32 :2; /* .OIS32
213                 unsigned char    OS10 :2; /* .OS10
214             }; /*
215         }TCSR; /* -----
216         unsigned char    ; /*
217         unsigned char    TCORA; /* .TCORA
218         unsigned char    ; /*
219         unsigned char    TCORB; /* .TCORB
220         unsigned char    ; /*
221         unsigned char    TCNT; /* .TCNT
222     }; /*

```

```

223  /******
224  /* WDT
225  /******
226  struct st_wdt{
227      union{
228          union{
229              unsigned short TCSR;
230              unsigned short TCNT;
231          }WRITE;
232          struct{
233              unsigned char TCSR;
234              unsigned char TCNT;
235          }READ;
236      }RW;
237      union{
238          unsigned short WRITE;
239          struct{
240              unsigned char _;
241              unsigned char BYTE;
242          }READ;
243      }RSTCSR;
244  };
245  /******
246  /* Port 1.3.A.B
247  /******
248  struct st_p13ab{
249      unsigned char DDR;
250      unsigned char _[0x11fcf];
251      union{
252          unsigned char BYTE;
253          struct{
254              unsigned char B7 :1;
255              unsigned char B6 :1;
256              unsigned char B5 :1;
257              unsigned char B4 :1;
258              unsigned char B3 :1;
259              unsigned char B2 :1;
260              unsigned char B1 :1;
261              unsigned char B0 :1;
262          }BIT;
263      }DR;
264  };
265  /******
266  /* Port 2.4
267  /******
268  struct st_p24{
269      unsigned char DDR;
270      unsigned char _[0x3a];
271      union{
272          unsigned char BYTE;
273          struct{
274              unsigned char B7 :1;
275              unsigned char B6 :1;
276              unsigned char B5 :1;
277              unsigned char B4 :1;
278              unsigned char B3 :1;
279              unsigned char B2 :1;
280              unsigned char B1 :1;
281              unsigned char B0 :1;
282          }BIT;
283      }PCR;
284      unsigned char _[0x11f94];
285      union{
286          unsigned char BYTE;
287          struct{
288              unsigned char B7 :1;
289              unsigned char B6 :1;
290              unsigned char B5 :1;
291              unsigned char B4 :1;
292              unsigned char B3 :1;
293              unsigned char B2 :1;
294              unsigned char B1 :1;
295              unsigned char B0 :1;
296          }BIT;

```

```

297     }DR;                                /* */
298 };                                       /* */
299
300 /*****
301  * Port 5
302  *****/
303 struct st_p5{                            /* */
304     unsigned char    DDR;                /* .DDR */
305     unsigned char    _[0x3a];           /* .PCR + */
306     union{
307         unsigned char    BYTE;          /* .BYTE + */
308         struct{
309             unsigned char    :4;         /* .BIT + */
310             unsigned char    B3    :1;   /* .B3 */
311             unsigned char    B2    :1;   /* .B2 */
312             unsigned char    B1    :1;   /* .B1 */
313             unsigned char    B0    :1;   /* .B0 */
314         }BIT;
315     }PCR;
316     unsigned char    __[0x11f94];       /* ----- */
317     union{
318         unsigned char    BYTE;          /* .DR + */
319         struct{
320             unsigned char    :4;         /* .BIT + */
321             unsigned char    B3    :1;   /* .B3 */
322             unsigned char    B2    :1;   /* .B2 */
323             unsigned char    B1    :1;   /* .B1 */
324             unsigned char    B0    :1;   /* .B0 */
325         }BIT;
326     }DR;
327 };
328
329 /*****
330  * Port 6
331  *****/
332 struct st_p6{                            /* */
333     unsigned char    DDR;                /* .DDR */
334     unsigned char    _[0x11fcf];        /* .DR + */
335     union{
336         unsigned char    BYTE;          /* .BYTE + */
337         struct{
338             unsigned char    :1;         /* .BIT + */
339             unsigned char    B6    :1;   /* .B6 */
340             unsigned char    B5    :1;   /* .B5 */
341             unsigned char    B4    :1;   /* .B4 */
342             unsigned char    B3    :1;   /* .B3 */
343             unsigned char    B2    :1;   /* .B2 */
344             unsigned char    B1    :1;   /* .B1 */
345             unsigned char    B0    :1;   /* .B0 */
346         }BIT;
347     }DR;
348 };
349
350 /*****
351  * Port 7
352  *****/
353 struct st_p7{                            /* */
354     union{
355         unsigned char    BYTE;          /* .DR + */
356         struct{
357             unsigned char    B7    :1;   /* .BIT + */
358             unsigned char    B6    :1;   /* .B7 */
359             unsigned char    B5    :1;   /* .B6 */
360             unsigned char    B4    :1;   /* .B5 */
361             unsigned char    B3    :1;   /* .B4 */
362             unsigned char    B2    :1;   /* .B3 */
363             unsigned char    B1    :1;   /* .B2 */
364             unsigned char    B0    :1;   /* .B1 */
365         }BIT;
366     }DR;
367 };
368
369 /*****
370  */

```

```

371 /* Port 8 */
372 /*******/
373 struct st_p8{
374     unsigned char    DDR;
375     unsigned char    _[0x11fcf];
376     union{
377         unsigned char    BYTE;
378         struct{
379             unsigned char    :3;
380             unsigned char    B4 :1;
381             unsigned char    B3 :1;
382             unsigned char    B2 :1;
383             unsigned char    B1 :1;
384             unsigned char    B0 :1;
385         }BIT;
386     }DR;
387 };
388 /*******/
389 /* Port 9 */
390 /*******/
391 struct st_p9{
392     unsigned char    DDR;
393     unsigned char    _[0x11fcf];
394     union{
395         unsigned char    BYTE;
396         struct{
397             unsigned char    :2;
398             unsigned char    B5 :1;
399             unsigned char    B4 :1;
400             unsigned char    B3 :1;
401             unsigned char    B2 :1;
402             unsigned char    B1 :1;
403             unsigned char    B0 :1;
404         }BIT;
405     }DR;
406 };
407 /*******/
408 /* IRQ controller */
409 /*******/
410 struct st_irq{
411     union{
412         unsigned char    BYTE;
413         struct{
414             unsigned char    :2;
415             unsigned char    IRQ5SC:1;
416             unsigned char    IRQ4SC:1;
417             unsigned char    IRQ3SC:1;
418             unsigned char    IRQ2SC:1;
419             unsigned char    IRQ1SC:1;
420             unsigned char    IRQ0SC:1;
421         }BIT;
422     }ISCR;
423     union{
424         unsigned char    BYTE;
425         struct{
426             unsigned char    :2;
427             unsigned char    IRQ5E :1;
428             unsigned char    IRQ4E :1;
429             unsigned char    IRQ3E :1;
430             unsigned char    IRQ2E :1;
431             unsigned char    IRQ1E :1;
432             unsigned char    IRQ0E :1;
433         }BIT;
434     }IER;
435     union{
436         unsigned char    BYTE;
437         struct{
438             unsigned char    :2;
439             unsigned char    IRQ5F :1;
440             unsigned char    IRQ4F :1;
441             unsigned char    IRQ3F :1;
442             unsigned char    IRQ2F :1;
443             unsigned char    IRQ1F :1;
444             unsigned char    IRQ0F :1;

```



```

445         }BIT;
446     }ISR;
447     unsigned char
448     union{
449         unsigned char
450         struct{
451             unsigned char _IRQ0 :1;
452             unsigned char _IRQ1 :1;
453             unsigned char _IRQ23:1;
454             unsigned char _IRQ45:1;
455             unsigned char _WDT :1;
456             unsigned char _HEX_ITU0:1;
457             unsigned char _HEX_ITU1:1;
458             unsigned char _HEX_ITU2:1;
459         }BIT;
460     }IPRA;
461     union{
462         unsigned char
463         struct{
464             unsigned char _OCT_ITU01:1;
465             unsigned char _OCT_ITU23:1;
466             unsigned char _DMAC :1;
467             unsigned char :1;
468             unsigned char _SCI0 :1;
469             unsigned char _SCI1 :1;
470             unsigned char _SCI2 :1;
471             unsigned char :1;
472         }BIT;
473     }IPRB;
474 };

/*
/* -----
/* .IPRA +
/* |.BYTE
/* |.BIT +
/* |.IPRA4
/* |.IPRA4
/* |.IPRA4
/* |.IPRA4
/* |.IPRA3
/* |.IPRA0
/* |.IPRA0
/* |.IPRA0
/*
/* -----
/* .IPRB +
/* |.BYTE
/* |.BIT +
/* |.IPRB6
/* |.IPRB6
/* |.IPRB5
/* |.IPRB2
/* |.IPRB2
/* |.IPRB2
/*
/* -----
/*
/* -----

477
478 /******
479 /* A/D converter
480 /******
481 struct st_ad{
482     unsigned short
483     unsigned short
484     unsigned short
485     unsigned short
486     union{
487         unsigned char
488         struct{
489             unsigned char ADF :1;
490             unsigned char ADIE :1;
491             unsigned char ADST :1;
492             unsigned char SCAN :1;
493             unsigned char CKS :1;
494             unsigned char CH :3;
495         }BIT;
496     }ADCSR;
497     union{
498         unsigned char
499         struct{
500             unsigned char TRGE :1;
501             unsigned char :7;
502         }BIT;
503     }ADCR;
504 };

/*
/* .ADDRB
/* .ADDRB
/* .ADDRB
/* .ADDRB
/* .ADCSR +
/* |.BYTE
/* |.BIT +
/* |.ADF
/* |.ADIE
/* |.ADST
/* |.SCAN
/* |.CKS
/* |.CH
/*
/* -----
/* .ADCR +
/* |.BYTE
/* |.BIT +
/* |.TRGE
/*
/* -----

505
506
507
508 /******
509 /* D/A converter
510 /******
511 struct st_da{
512     union{
513         unsigned char
514         struct{
515             unsigned char :7;
516             unsigned char DASTE :1;
517         }BIT;
518     }DASTCR;

```

```

519     unsigned char    _[0x11f81]; /* */
520     unsigned char    DADR0;      /* .DADR0 */
521     unsigned char    DADR1;      /* .DADR1 */
522     union{            /* .DACR + */
523         unsigned char BYTE;      /* .BYTE + */
524         struct{        /* .BIT + */
525             unsigned char DAOE1 :1; /* .DAOE1 */
526             unsigned char DAOE0 :1; /* .DAOE0 */
527             unsigned char DAE :1;  /* .DAE */
528             unsigned char :5;
529         }BIT;
530     }DACR;
531 };
532 /*****
533 union un_syscr {                // union SYSCR
534     unsigned char BYTE;        // Byte Access
535     struct {                   // Bit Access
536         unsigned char SSBY :1; // SSBY
537         unsigned char STS :3;  // STS
538         unsigned char UE :1;  // UE
539         unsigned char NMIEG:1; // NMIEG
540         unsigned char SSOE :1; // SSOE
541         unsigned char RAME :1; // RAME
542     } BIT;
543 };
544
545
546 #define HEX_ITU      (*(volatile struct st_hex_itu *) 0xFFFF60)
547 #define HEX_ITU0     (*(volatile struct st_hex_itu0 *) 0xFFFF68)
548 #define HEX_ITU1     (*(volatile struct st_hex_itu0 *) 0xFFFF70)
549 #define HEX_ITU2     (*(volatile struct st_hex_itu0 *) 0xFFFF78)
550 #define OCT_ITU0     (*(volatile struct st_oct_itu0 *) 0xFFFF80)
551 #define OCT_ITU1     (*(volatile struct st_oct_itu13 *) 0xFFFF81)
552 #define OCT_ITU2     (*(volatile struct st_oct_itu2 *) 0xFFFF90)
553 #define OCT_ITU3     (*(volatile struct st_oct_itu13 *) 0xFFFF91)
554 #define WDT          (*(volatile struct st_wdt *) 0xFFFF8C)
555 #define P1            (*(volatile struct st_p13ab *) 0xFEE000)
556 #define P2            (*(volatile struct st_p24 *) 0xFEE001)
557 #define P3            (*(volatile struct st_p13ab *) 0xFEE002)
558 #define P4            (*(volatile struct st_p24 *) 0xFEE003)
559 #define P5            (*(volatile struct st_p5 *) 0xFEE004)
560 #define P6            (*(volatile struct st_p6 *) 0xFEE005)
561 #define P7            (*(volatile struct st_p7 *) 0xFFFFD6)
562 #define P8            (*(volatile struct st_p8 *) 0xFEE007)
563 #define P9            (*(volatile struct st_p9 *) 0xFEE008)
564 #define PA            (*(volatile struct st_p13ab *) 0xFEE009)
565 #define PB            (*(volatile struct st_p13ab *) 0xFEE00A)
566 #define IRQ           (*(volatile struct st_irq *) 0xFEE014)
567 #define AD            (*(volatile struct st_ad *) 0xFFFFFE0)
568 #define DA            (*(volatile struct st_da *) 0xFEE01A)
569
570 #define SYSCR    (*(volatile union un_syscr *)0xFEE012) // SYSCR Address
571
572 #define load_segment(num) {int base;base = (*(volatile unsigned int *) (0xffffd10 + num *
573 4));asm("mov.l %0, er5" :: "r" (base));}
574 #define set_stack(stack) asm("mov.l %0, sp" :: "r" (stack))

```