

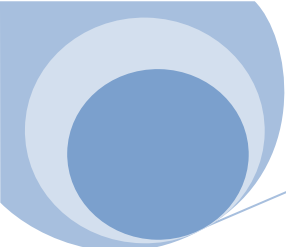


ABOV

CodeGen32

(Code)

Release V1.00000



ABOV CodeGen32 (Code)

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Release information

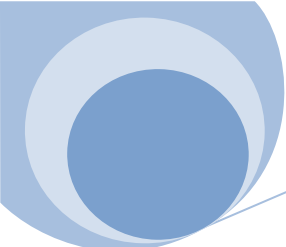
Version	Date	Change
V1.00000	July 2016	

ABOV

ABOV

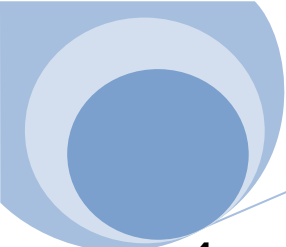
()

ABOV web address
<http://www.abov.co.kr>



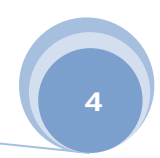
ABOV CodeGen32 (Code)

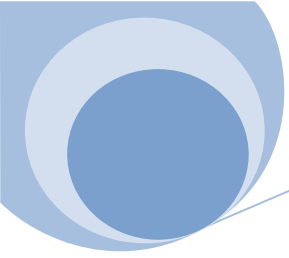
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1

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1.1

1.1.1

OS

- MS-Windows NT
- MS-Windows 2000
- MS-Windows XP
- MS-Windows Vista
- MS-Windows7
- MS-Windows8
- MS-Windows10

100MB

1.1.2

PC

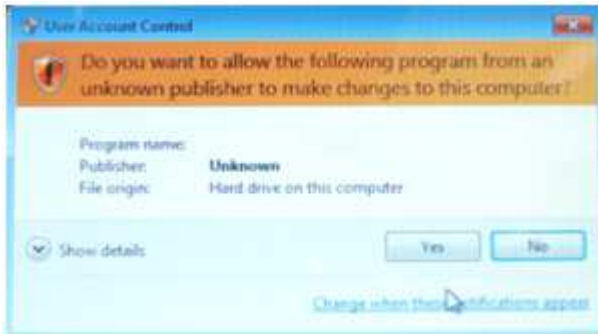
- PC

1.2

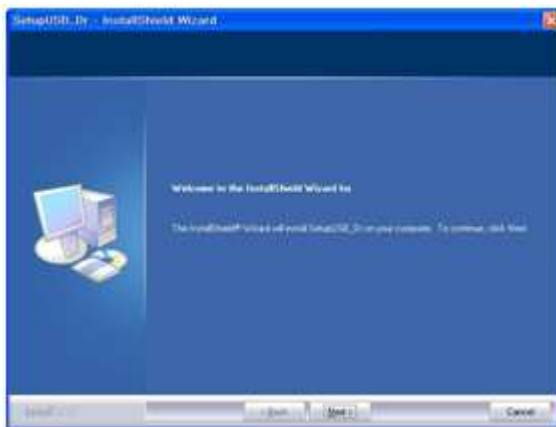
<http://www.abov.co.kr>.

1.2.1

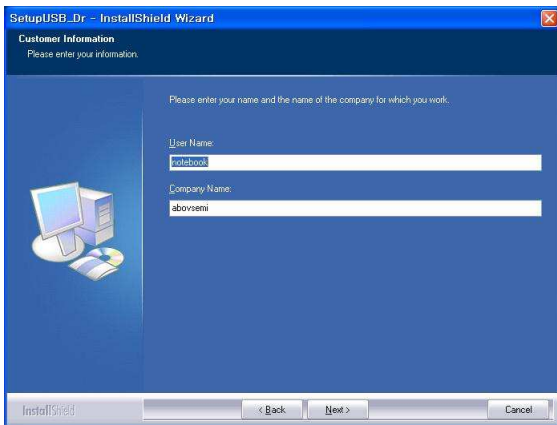
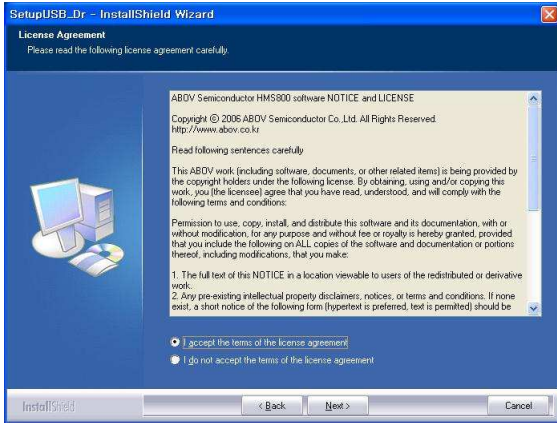
“ ”



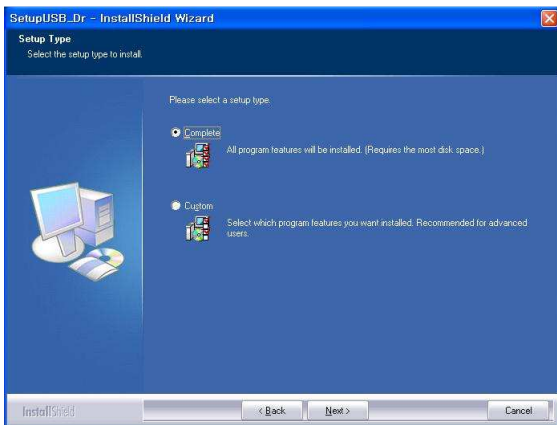
“ ”

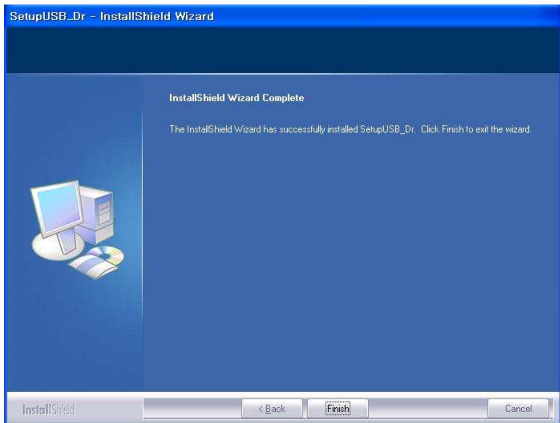
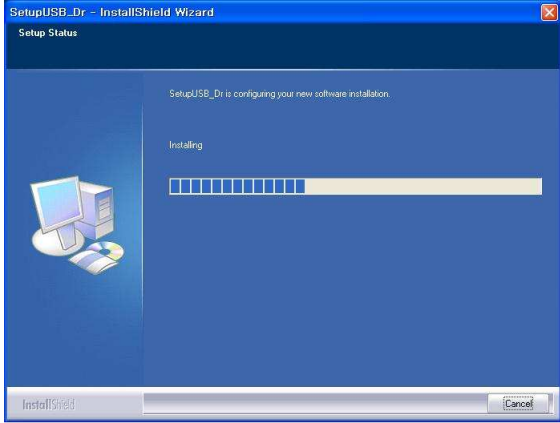
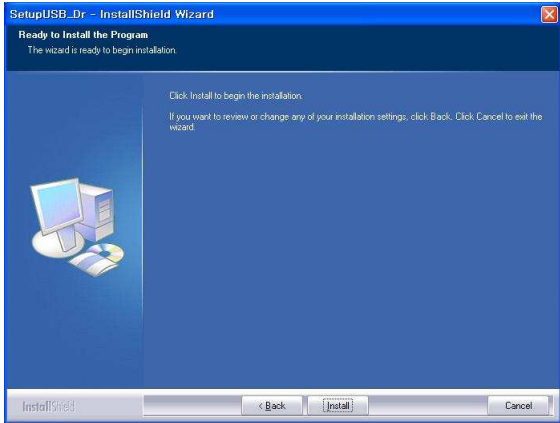


"accept"



"Complete".





2

CodeGen32

- CodeGen32
- CodeGen32

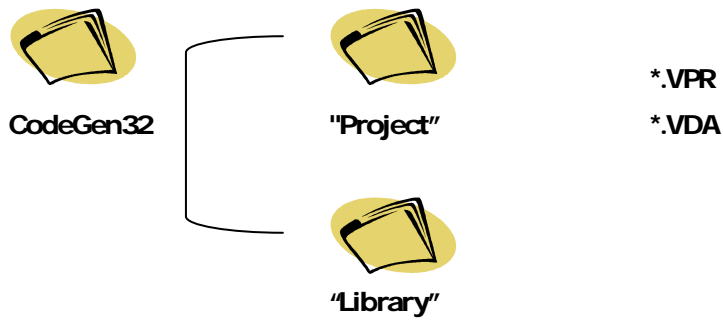


2.1 CodeGen32

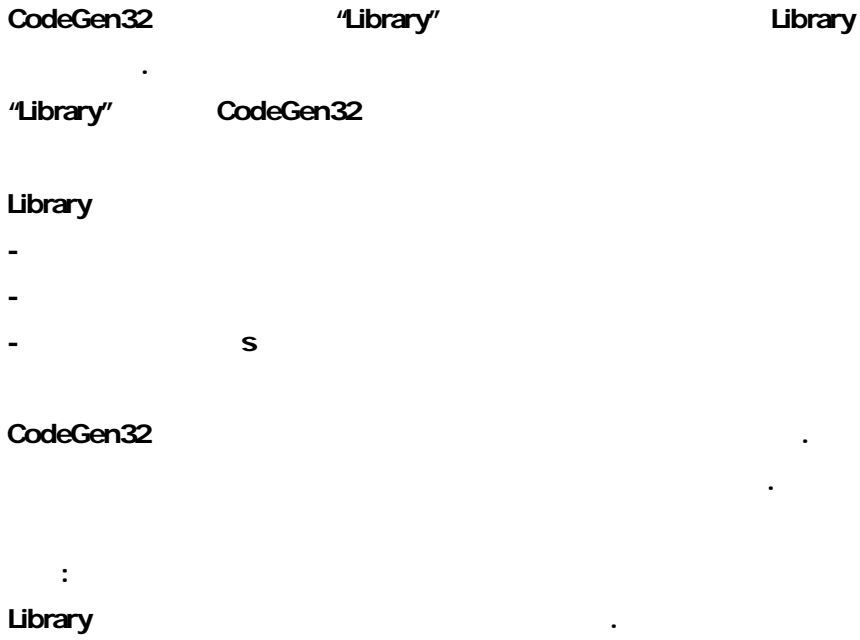
```

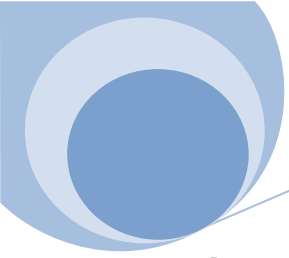
CodeGen32          "Project"          CodeGen32
.
"Project"         CodeGen32          .
CodeGen32          *.VPR *.VDA          .
*.VPR             ( , , )          .
)
ABOV-CodeGen32-A3x V1.00000 20160422
AC33V8128 MQFP 80
*.VDA
)
*Clock 1
*GPIO-A 1
*GPIO-B 1:
:
u02 000000...00000000
u03 000000...00000000
w00 040000...CA000000
:
*.VPR *.VDA

```



2.2 CodeGen32





3

CodeGen32

- CodeGen32
-
-
-

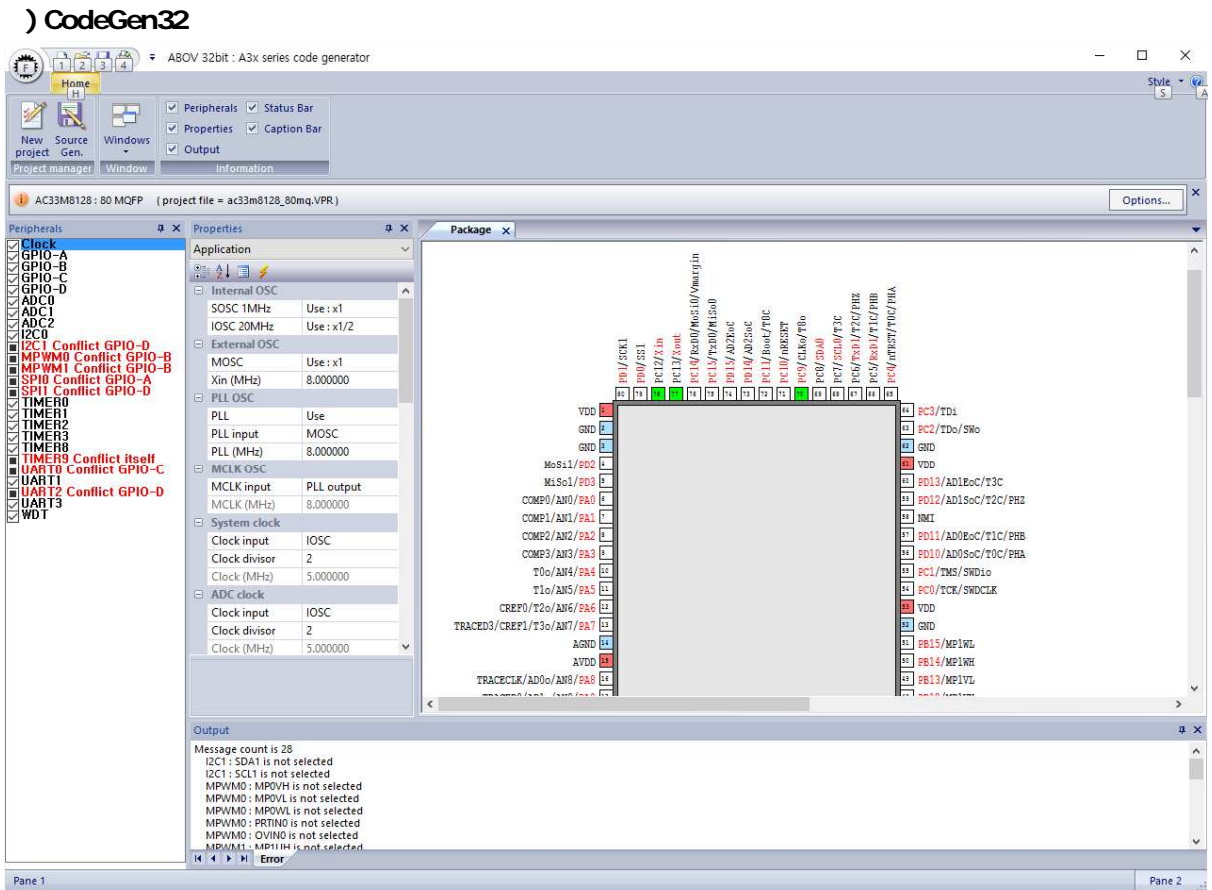
3.1 CodeGen32

CodeGen32

compiler

32bit

A3x





3.1.1

CodeGen32

-
- KEIL compiler . (2016. 7)
 - KEIL *.uvproj
 -
 - KEIL
 - C
"main.c", "init.c", "peri.c"
- - : IAR, CooCox, etc
- CodeGen32
 -
 -
 -
 - ()
-
-
- CodeGen32

3.1.2

CodeGen32



“Series name”, “Device name”, “Package type”, “Cancel”



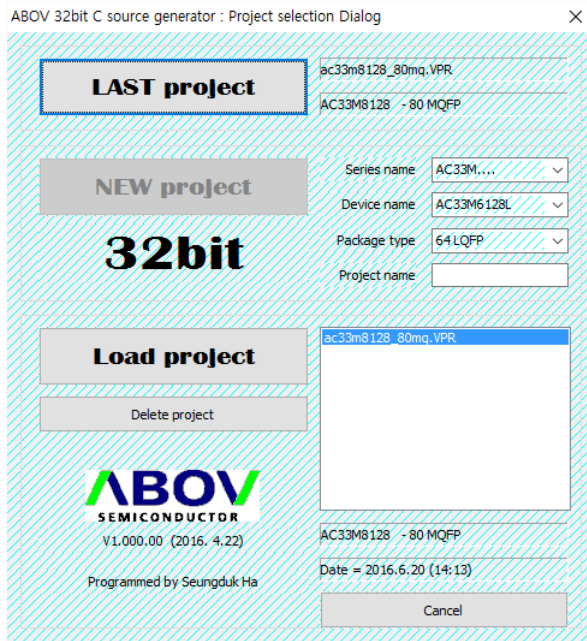


"New project"



"New project"

CodeGen32



- "LAST project"
-
-

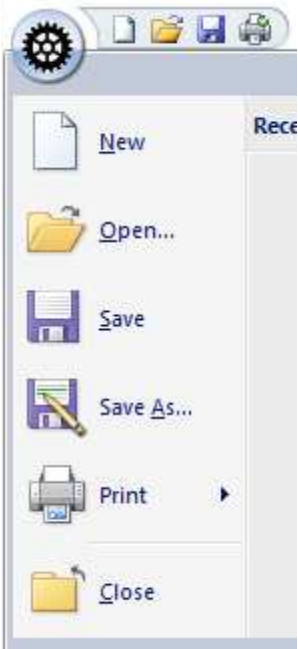
- "Delete project"

CodeGen32

The screenshot displays the ABOV CodeGen32 software interface for an AC33M8128: 80 MQFP. The interface is divided into several panes:

- Peripherals:** Lists various peripherals with checkboxes. Conflicts are highlighted in red:
 - i2c1 Conflict GPIO-D
 - MPWM0 Conflict GPIO-B
 - MPWM1 Conflict GPIO-B
 - SPI0 Conflict GPIO-A
 - SPI1 Conflict GPIO-D
 - TIMER9 Conflict itself
 - UART2 Conflict GPIO-C
 - UART3 Conflict GPIO-D
- Properties:** Shows configuration for the selected peripheral (Application).
 - Internal OSC: SOSC 1MHz (Use: x1), IOSC 20MHz (Use: x1/2)
 - External OSC: MOSC (Use: x1), Xin (MHz): 8.000000
 - PLL OSC: PLL (Use), PLL input: MOSC, PLL (MHz): 8.000000
 - MCLK OSC: MCLK input: PLL output, MCLK (MHz): 8.000000
 - System clock: Clock input: IOSC, Clock divider: 2, OSC: 5.000000
- Package:** Shows a pinout table for the AC33M8128 package.

Pin	Signal	Pin	Signal
1	VDD	44	PC3/TDI
2	GND	45	PC2/TDo/SWo
3	GND	46	GND
4	VDD	47	PC1/AD1EoC/T3C
5	PC13/AD1EoC/T3C	48	VDD
6	PC12/AD1SoC/T2C/BH2	49	PC13/AD1EoC/T3C
7	VDD	50	PC12/AD1SoC/T2C/BH2
8	PC11/AD0EoC/T1C/BH1	51	NMI
9	PC10/AD0SoC/T0C/PHA	52	PC11/AD0EoC/T1C/BH1
10	PC1/TMS/SWDIo	53	PC10/AD0SoC/T0C/PHA
11	PC0/TCR/SWDCLK	54	PC1/TMS/SWDIo
12	VDD	55	PC0/TCR/SWDCLK
13	GND	56	VDD
14	PC15/MP1WL	57	GND
15	PC14/MP1WH	58	PC15/MP1WL
16	PC13/MP1VL	59	PC14/MP1WH
17	PC12/MP1VH	60	PC13/MP1VL
18	PC11/MP1VH	61	PC12/MP1VH
19	PC10/MP1VH	62	PC11/MP1VH
20	PC9/MP1VH	63	PC10/MP1VH
21	PC8/MP1VH	64	PC9/MP1VH
22	PC7/MP1VH	65	PC8/MP1VH
23	PC6/MP1VH	66	PC7/MP1VH
24	PC5/MP1VH	67	PC6/MP1VH
25	PC4/MP1VH	68	PC5/MP1VH
26	PC3/MP1VH	69	PC4/MP1VH
27	PC2/MP1VH	70	PC3/MP1VH
28	PC1/MP1VH	71	PC2/MP1VH
29	PC0/MP1VH	72	PC1/MP1VH
30	PC15/MP1VH	73	PC0/MP1VH
31	PC14/MP1VH	74	PC15/MP1VH
32	PC13/MP1VH	75	PC14/MP1VH
33	PC12/MP1VH	76	PC13/MP1VH
34	PC11/MP1VH	77	PC12/MP1VH
35	PC10/MP1VH	78	PC11/MP1VH
36	PC9/MP1VH	79	PC10/MP1VH
37	PC8/MP1VH	80	PC9/MP1VH
38	PC7/MP1VH	81	PC8/MP1VH
39	PC6/MP1VH	82	PC7/MP1VH
40	PC5/MP1VH	83	PC6/MP1VH
41	PC4/MP1VH	84	PC5/MP1VH
42	PC3/MP1VH	85	PC4/MP1VH
43	PC2/MP1VH	86	PC3/MP1VH
44	PC1/MP1VH	87	PC2/MP1VH
45	PC0/MP1VH	88	PC1/MP1VH
46	PC15/MP1VH	89	PC0/MP1VH
47	PC14/MP1VH	90	PC15/MP1VH
48	PC13/MP1VH	91	PC14/MP1VH
49	PC12/MP1VH	92	PC13/MP1VH
50	PC11/MP1VH	93	PC12/MP1VH
51	PC10/MP1VH	94	PC11/MP1VH
52	PC9/MP1VH	95	PC10/MP1VH
53	PC8/MP1VH	96	PC9/MP1VH
54	PC7/MP1VH	97	PC8/MP1VH
55	PC6/MP1VH	98	PC7/MP1VH
56	PC5/MP1VH	99	PC6/MP1VH
57	PC4/MP1VH	100	PC5/MP1VH
58	PC3/MP1VH	101	PC4/MP1VH
59	PC2/MP1VH	102	PC3/MP1VH
60	PC1/MP1VH	103	PC2/MP1VH
61	PC0/MP1VH	104	PC1/MP1VH
62	PC15/MP1VH	105	PC0/MP1VH
63	PC14/MP1VH	106	PC15/MP1VH
64	PC13/MP1VH	107	PC14/MP1VH
65	PC12/MP1VH	108	PC13/MP1VH
66	PC11/MP1VH	109	PC12/MP1VH
67	PC10/MP1VH	110	PC11/MP1VH
68	PC9/MP1VH	111	PC10/MP1VH
69	PC8/MP1VH	112	PC9/MP1VH
70	PC7/MP1VH	113	PC8/MP1VH
71	PC6/MP1VH	114	PC7/MP1VH
72	PC5/MP1VH	115	PC6/MP1VH
73	PC4/MP1VH	116	PC5/MP1VH
74	PC3/MP1VH	117	PC4/MP1VH
75	PC2/MP1VH	118	PC3/MP1VH
76	PC1/MP1VH	119	PC2/MP1VH
77	PC0/MP1VH	120	PC1/MP1VH
78	PC15/MP1VH	121	PC0/MP1VH
79	PC14/MP1VH	122	PC15/MP1VH
80	PC13/MP1VH	123	PC14/MP1VH
81	PC12/MP1VH	124	PC13/MP1VH
82	PC11/MP1VH	125	PC12/MP1VH
83	PC10/MP1VH	126	PC11/MP1VH
84	PC9/MP1VH	127	PC10/MP1VH
85	PC8/MP1VH	128	PC9/MP1VH
86	PC7/MP1VH	129	PC8/MP1VH
87	PC6/MP1VH	130	PC7/MP1VH
88	PC5/MP1VH	131	PC6/MP1VH
89	PC4/MP1VH	132	PC5/MP1VH
90	PC3/MP1VH	133	PC4/MP1VH
91	PC2/MP1VH	134	PC3/MP1VH
92	PC1/MP1VH	135	PC2/MP1VH
93	PC0/MP1VH	136	PC1/MP1VH
94	PC15/MP1VH	137	PC0/MP1VH
95	PC14/MP1VH	138	PC15/MP1VH
96	PC13/MP1VH	139	PC14/MP1VH
97	PC12/MP1VH	140	PC13/MP1VH
98	PC11/MP1VH	141	PC12/MP1VH
99	PC10/MP1VH	142	PC11/MP1VH
100	PC9/MP1VH	143	PC10/MP1VH
101	PC8/MP1VH	144	PC9/MP1VH
102	PC7/MP1VH	145	PC8/MP1VH
103	PC6/MP1VH	146	PC7/MP1VH
104	PC5/MP1VH	147	PC6/MP1VH
105	PC4/MP1VH	148	PC5/MP1VH
106	PC3/MP1VH	149	PC4/MP1VH
107	PC2/MP1VH	150	PC3/MP1VH
108	PC1/MP1VH	151	PC2/MP1VH
109	PC0/MP1VH	152	PC1/MP1VH
110	PC15/MP1VH	153	PC0/MP1VH
111	PC14/MP1VH	154	PC15/MP1VH
112	PC13/MP1VH	155	PC14/MP1VH
113	PC12/MP1VH	156	PC13/MP1VH
114	PC11/MP1VH	157	PC12/MP1VH
115	PC10/MP1VH	158	PC11/MP1VH
116	PC9/MP1VH	159	PC10/MP1VH
117	PC8/MP1VH	160	PC9/MP1VH
118	PC7/MP1VH	161	PC8/MP1VH
119	PC6/MP1VH	162	PC7/MP1VH
120	PC5/MP1VH	163	PC6/MP1VH
121	PC4/MP1VH	164	PC5/MP1VH
122	PC3/MP1VH	165	PC4/MP1VH
123	PC2/MP1VH	166	PC3/MP1VH
124	PC1/MP1VH	167	PC2/MP1VH
125	PC0/MP1VH	168	PC1/MP1VH
126	PC15/MP1VH	169	PC0/MP1VH
127	PC14/MP1VH	170	PC15/MP1VH
128	PC13/MP1VH	171	PC14/MP1VH
129	PC12/MP1VH	172	PC13/MP1VH
130	PC11/MP1VH	173	PC12/MP1VH
131	PC10/MP1VH	174	PC11/MP1VH
132	PC9/MP1VH	175	PC10/MP1VH
133	PC8/MP1VH	176	PC9/MP1VH
134	PC7/MP1VH	177	PC8/MP1VH
135	PC6/MP1VH	178	PC7/MP1VH
136	PC5/MP1VH	179	PC6/MP1VH
137	PC4/MP1VH	180	PC5/MP1VH
138	PC3/MP1VH	181	PC4/MP1VH
139	PC2/MP1VH	182	PC3/MP1VH
140	PC1/MP1VH	183	PC2/MP1VH
141	PC0/MP1VH	184	PC1/MP1VH
142	PC15/MP1VH	185	PC0/MP1VH
143	PC14/MP1VH	186	PC15/MP1VH
144	PC13/MP1VH	187	PC14/MP1VH
145	PC12/MP1VH	188	PC13/MP1VH
146	PC11/MP1VH	189	PC12/MP1VH
147	PC10/MP1VH	190	PC11/MP1VH
148	PC9/MP1VH	191	PC10/MP1VH
149	PC8/MP1VH	192	PC9/MP1VH
150	PC7/MP1VH	193	PC8/MP1VH
151	PC6/MP1VH	194	PC7/MP1VH
152	PC5/MP1VH	195	PC6/MP1VH
153	PC4/MP1VH	196	PC5/MP1VH
154	PC3/MP1VH	197	PC4/MP1VH
155	PC2/MP1VH	198	PC3/MP1VH
156	PC1/MP1VH	199	PC2/MP1VH
157	PC0/MP1VH	200	PC1/MP1VH
- Output:** Shows a list of messages, many starting with "Message count is 28" and indicating that certain peripherals are not selected:
 - i2c1: SDA1 is not selected
 - i2c1: SCL1 is not selected
 - MPWM0: MPOVH is not selected
 - MPWM0: MPOVL is not selected
 - MPWM0: MPOVH is not selected
 - MPWM0: MPOVL is not selected
 - MPWM0: PRTINO is not selected
 - MPWM0: OVINO is not selected
 - MPWM1: MP11H is not selected



CodeGen32

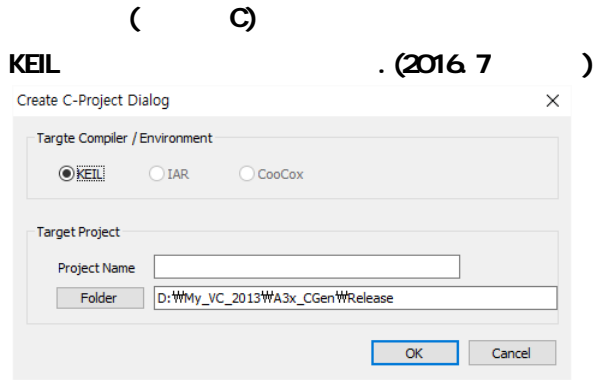
2



3.3.1 New project



3.3.2 Source Gen.



Source generation

CodeGen32

```

-
  init.h      :          define
  peri.h     :
-
  init.c     :
  main.c    : main(void)
  peri.c    :
- KEIL
  KEIL_proj.uvproj :
  
```

Library copy

CodeGen32

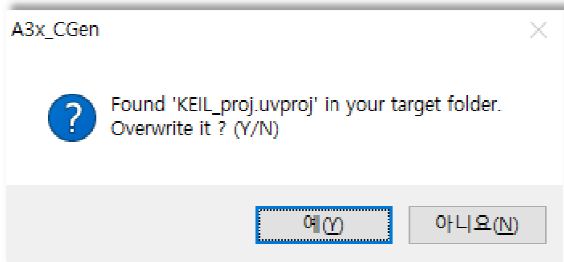
```

-
-
-
  
```

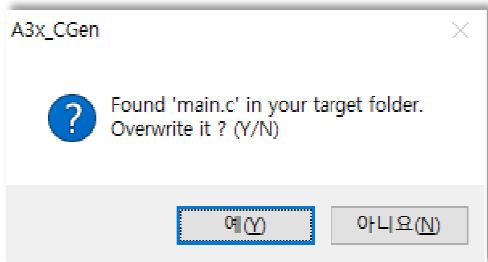
Notification

- "init.c", "peri.h", "peri.c"

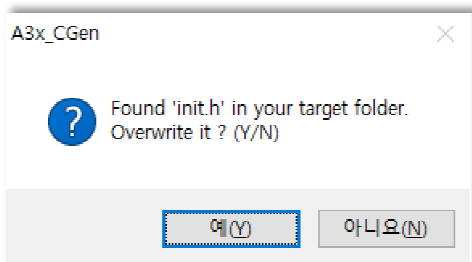
)



) main.c



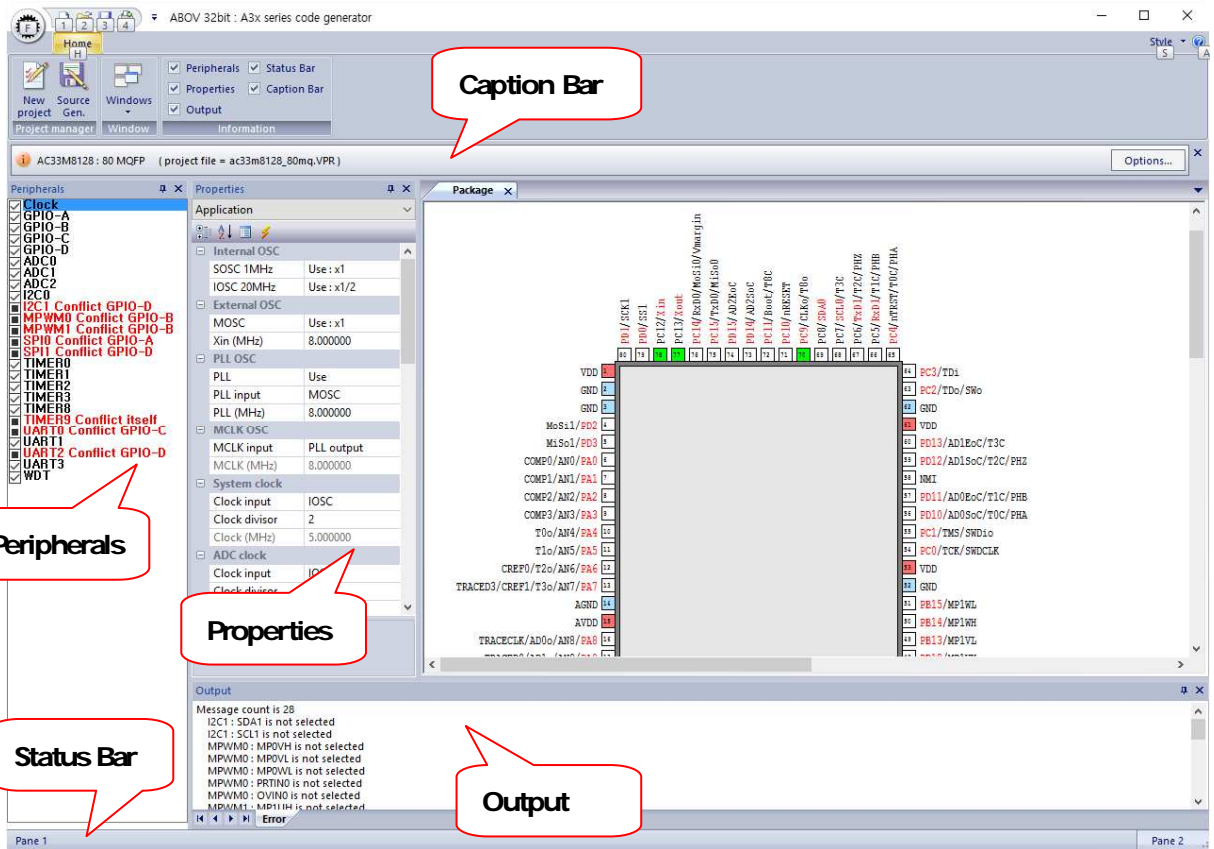
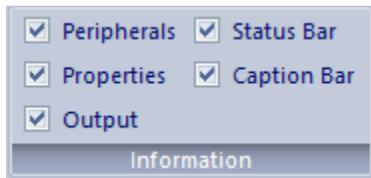
) inith



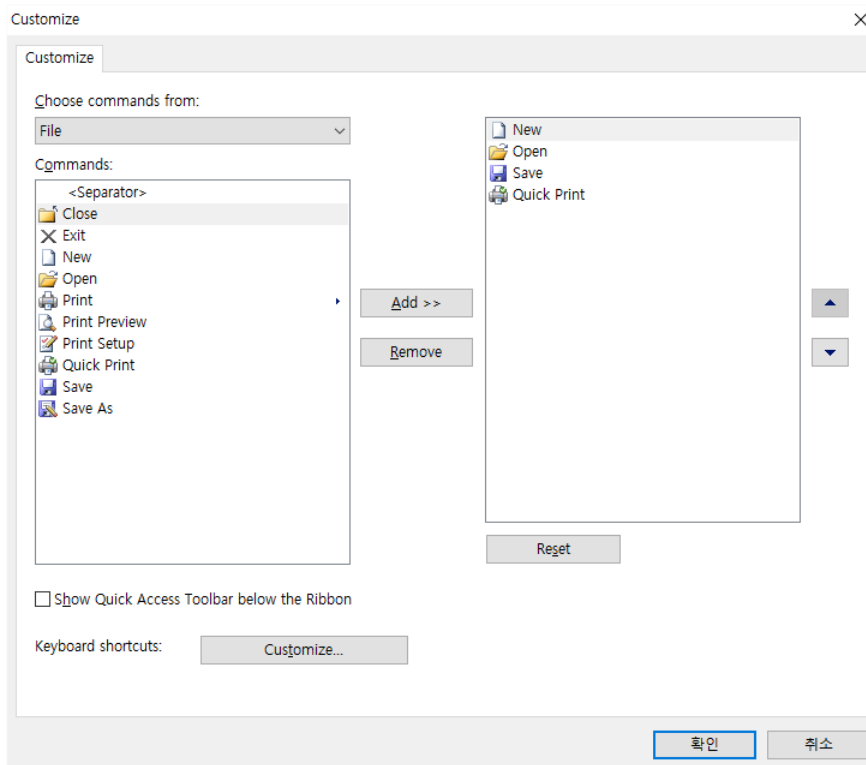
3.3.3 Windows



3.3.4 Information



Caption bar / Option



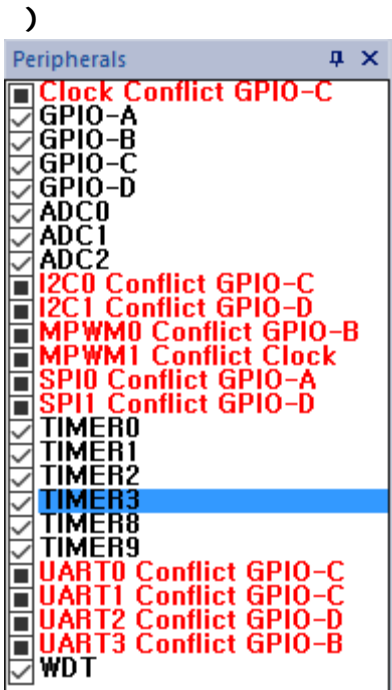
3.4

CodeGen32

3

3.4.1

wo



3.4.2

Gusvo

CodeGen32

-
-
-
-

)

Control #1 reg.	
ADC trigger so...	Disable
Initial output va...	Low
Clock source	PCLK/2
Clear capture at	Rising edge
Timer mode	Periodic
Prescaler reg.	
divisor(1~64)	1
General A reg.	
Period (ms)	0.004000
PWM duty (ms)	0.004000
OneShot delay ...	0.004000

>

66MHz UART 9600bps

66MHz 9600bps

CodeGen32 bps

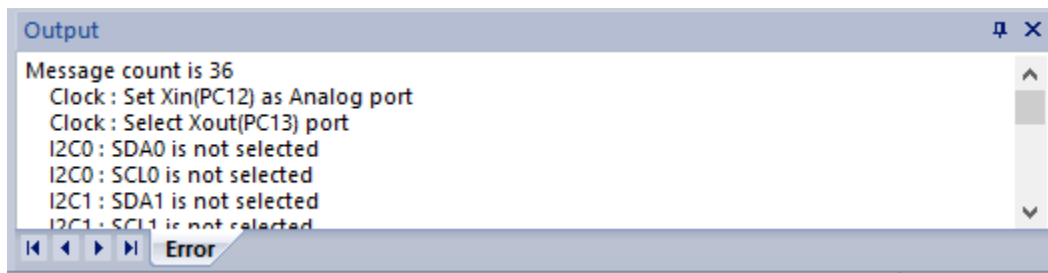
Baudrate, Time	
Baudrate	9600
Wait value	0

: 9600bps

Baudrate, Time	
Baudrate	9600.129233
Wait value	0

CodeGen32 : 9600.129bps @ 66MHz

343



The screenshot displays the ABOV CodeGen32 software interface for the AC33M8128L: 80 LQFP package. The interface is divided into several panes:

- Peripherals:** A list of peripherals with checkboxes. Conflicts are highlighted in red, such as "I2C0 Conflict GPIO-C", "I2C1 Conflict GPIO-D", "MPWM0 Conflict GPIO-B", "MPWM1 Conflict Clock", "SPI0 Conflict GPIO-A", "SPI1 Conflict GPIO-D", "UART0 Conflict GPIO-C", "UART1 Conflict GPIO-C", "UART2 Conflict GPIO-D", and "UART3 Conflict GPIO-B".
- Properties:** Configuration settings for the application, including:
 - Internal OSC: SOSC 1MHz (Use:x1), IOSOC 20MHz (Use:x1)
 - External OSC: MOSC (Use:x1), Xin (MHz) 8.000000
 - PLL OSC: PLL (Use)
 - PLL input: MOSC, PLL (MHz) 64.000000
 - MCLK OSC: MCLK input (PLL output), MCLK (MHz) 64.000000
 - system clock source (MCCR1): Clock input (MOSC), Clock divisor 4, Clock (MHz) 2.000000
 - Trace clock (MCCR1): Clock input (IOSC), Clock divisor 1, Clock (MHz) 20.000000
 - MPWM0 clock (MCCR2): Clock input (SOSC)
- Package:** A pinout diagram for the C33M8128L, Package: 80LQFP, showing various pins like M0S11/P0S1, M1S61/P0S1, COM0P1/AN0/P0A1, etc.
- peric.c:** Generated C code for peripheral initialization. Key snippets include:


```
// Used ABOV Semiconductor code generator
// Initialize each peripherals
//-----
#include "init.h"
#include "peri.h"

void Init_GPIO(void)
{
    PORT_ACCESS_EN();

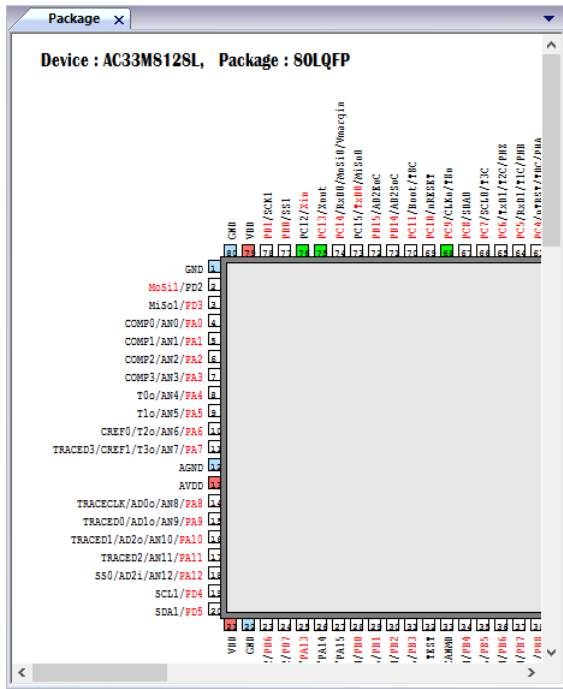
    // GPIO-A -----
    SCU->PER1 |= 0x00000100;
    SCU->PCER1 |= 0x00000100;

    PCA->MR = 0x50000000;
    PCA->CR = 0x00000000;
    PCA->PCR = 0x00000001;
    PCA->DBER = 0x00000000;
    PCA->IER = 0x00000004;
    PCA->ICR = 0x00000004;

    NVIC_SetPriority(GPIOAQ_IRQn, ((0x01<<1)|0x01));
    NVIC_EnableIRQ(GPIOAQ_IRQn);
    __enable_irq();

    // GPIO-B -----
    SCU->PER1 |= 0x00000200;
    SCU->PCER1 |= 0x00000200;

    PCB->MR = 0x00000000;
    PCB->CR = 0x00000000;
}
```
- Output:** A message window showing the number of messages (35) and a list of errors:
 - Clock : Set Xin(PC12) as Analog port
 - Clock : Select Xout(PC13) port
 - I2C0 : SDA0 is not selected
 - I2C0 : SCL0 is not selected
 - I2C1 : SDA1 is not selected
 - I2C1 : SCL1 is not selected

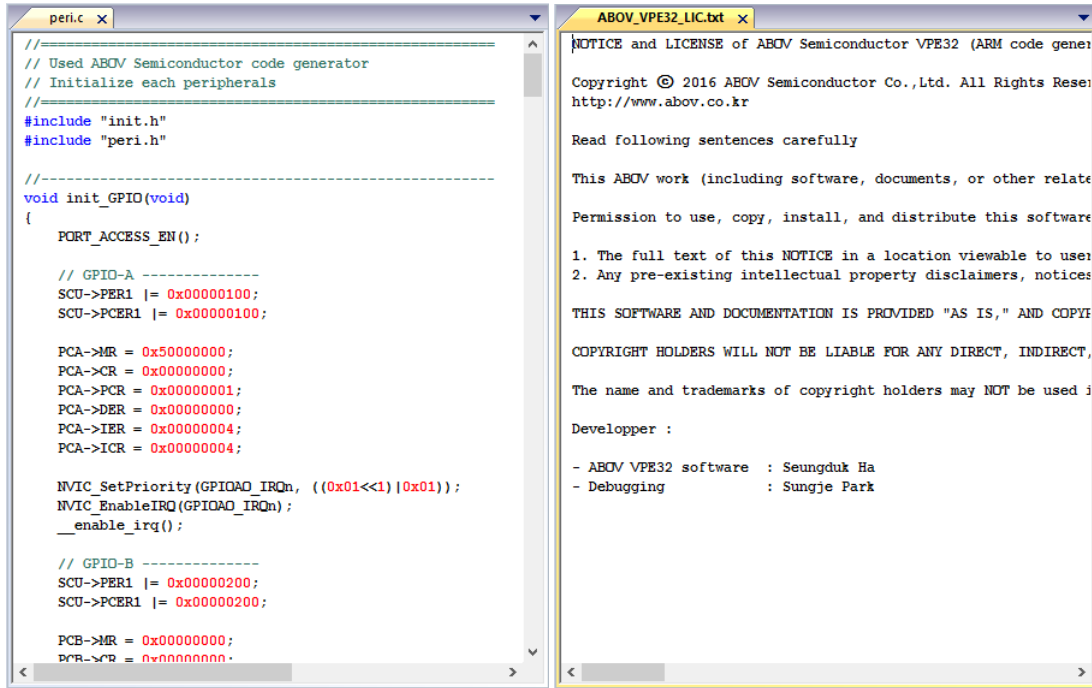


	/

Pin5 : PA1/AN1/COMP1

PA1

'c' 'h'



4

- CodeGen32
- CodeGen32

4.1

CodeGen32

4.1.1 init.h

KEIL

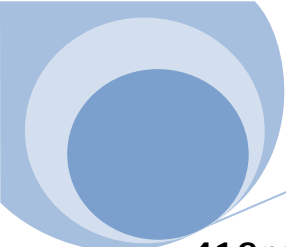
```

)      AC33M8128  init.h
//=====
// Used ABOV Semiconductor code generator
// Device name : AC33M8128
//=====
#include "AC33Mx128.h"
#include "system_AC33Mx128.h"
#include "aa_types.h"
#include "ac33mx128_adc.h"
#include "ac33mx128_afe.h"
#include "ac33mx128_dmac.h"
#include "ac33mx128_gpio.h"
#include "ac33mx128_i2c.h"
#include "ac33mx128_libcfg.h"
#include "ac33mx128_mpwm.h"
#include "ac33mx128_pcu.h"
#include "ac33mx128_pwr.h"
#include "ac33mx128_scu.h"
#include "ac33mx128_spi.h"
#include "ac33mx128_timer.h"
#include "ac33mx128_uart.h"
#include "ac33mx128_wdt.h"
#include "debug_frmwrk.h"
#include "slib.h"

#define _ADC
#define _AFE
#define _DMAC
#define _GPIO
#define _I2C
#define _MPWM
#define _SPI
#define _TIMER
#define _UART
#define _WDT

void init(void);

```



4.1.2 peri.h

V32

KEIL

```
) AC33V8128 peri.h
//=====
// Used ABOV Semiconductor code generator
// Define initialize function of each peripherals
//=====

void init_GPIO(void);
void GPIOA_IRQHandler(void);
void GPIOCE_IRQHandler(void);
void init_clock(void);
void init_ADC_0(void);
void init_ADC_1(void);
void init_ADC_2(void);
void init_I2C_0(void);
void init_I2C_1(void);
void init_MPWM_0(void);
void init_MPWM_1(void);
void init_SPI_0(void);
void init_SPI_1(void);
void init_TIMER_0(void);
void init_TIMER_1(void);
void init_TIMER_2(void);
void init_TIMER_3(void);
void init_TIMER_8(void);
void init_TIMER_9(void);
void init_UART_0(void);
void init_UART_1(void);
void init_UART_2(void);
void init_UART_3(void);
void init_WDT(void);
```

4.2

CodeGen32

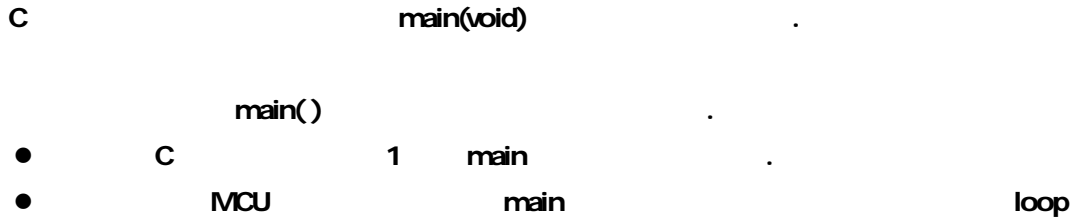
4.21 init.c

KEIL

```
)      AC33VB128  initc
//=====
// Used ABOV Semiconductor code generator
// Basic initialize function
//=====
#include "init.h"
#include "peri.h"

void init(void)
{
    init_GPIO();
    init_clock();
    init_ADC_0();
    init_ADC_1();
    init_ADC_2();
    init_I2C_0();
    init_I2C_1();
    init_MFWM_0();
    init_MFWM_1();
    init_SPI_0();
    init_SPI_1();
    init_TIMER_0();
    init_TIMER_1();
    init_TIMER_2();
    init_TIMER_3();
    init_TIMER_8();
    init_TIMER_9();
    init_UART_0();
    init_UART_1();
    init_UART_2();
    init_UART_3();
    init_WDT();
}
```

4.2.2 main.c



CodeGen32

CodeGen32

```

)      AC33M8128  main.c
//=====
// Used ABOV Semiconductor's code generator
// Device name : AC33M8128
//=====
#include "init.h"

int main()
{
    WDT->CON = 0; // disable watch-dog timer
    init();     // initialize selected peripherals here

    while(1) {
        // TOTO : Fill your code
    };
    return 0;
}
    
```

4.23 peri.c

KEIL

```
)      AC33M8128  peri.c
//=====
// Used ABOV Semiconductor code generator
// Initialize each peripherals
//=====
#include "init.h"
#include "peri.h"

//-----
void init_GPIO(void)
{
    PORT_ACCESS_EN();

    // GPIO-A -----
    SCU->PER1 |= 0x00000100;
    SCU->PCER1 |= 0x00000100;

    PCA->MR = 0x50000000;
    PCA->CR = 0x00000000;
    PCA->PCR = 0x00000001;
    PCA->DER = 0x00000000;
    PCA->IER = 0x00000004;
    PCA->ICR = 0x00000004;

    NVIC_SetPriority(GPIOA0_IRQn, ((0x01<<1)|0x01));
    NVIC_EnableIRQ(GPIOA0_IRQn);
    __enable_irq();

    // GPIO-B -----
    SCU->PER1 |= 0x00000200;
    SCU->PCER1 |= 0x00000200;
```

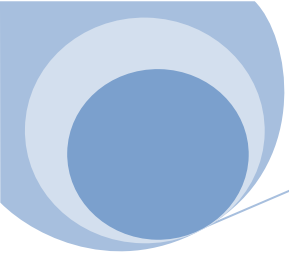
4.3

CodeGen32

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. (2016. 7)

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End of document.