



## Reset 功能使用方法

### 1 適用產品：

1.1 SM59R16A5/SM59R09A5/SM59R05A5/SM59R16A3/SM59R09A3/SM59R05A3

1.2 SM59R04A2/ SM59R04A1/ SM59R03A1/ SM59R02A1

### 2 Reset 使用概述：

2.1 本系列 MCU 除了標準 Reset Pin 重置功能，另外提供軟件重置功能、內建重置電路（可選擇重置時間長短）及低電壓重置功能提供客戶使用。

2.2 當低電壓重置功能產生時，其中斷向量為 0x63H。

### 3 Reset 功能相關的特殊暫存器 [Reset Special Function Register] (SFR)

Mnemonic	Description	Direct	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	RESET
Reset											
TAKEY	Time Access Key register	F7h	TAKEY [7:0]								00h
SWRES	Software Reset register	E7h	SWRES [7:0]								00h
IEN0	Interrupt Enable 0 register	A8h	EA	-	ET2	ES0	ET1	EX1	ET0	EX0	00h
IEN1	Interrupt Enable 1 register	B8h	EXEN2	-	IEIIC	IELVI	IEKBI	IEADC	IESPI	IEPWM	00h
IRCON	Interrupt request register	C0h	EXF2	TF2	IICIF	LVIIF	KBIIF	ADCIF	SPIIF	PWMIF	00h
LVC		E6h	LVI_EN	-	LVRXE	-	-	-	-		20h

### 4 軟件重置功能選擇方式：

Mnemonic: TAKEY	Address: F7H																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%; text-align: center;">7</td> <td style="width: 12.5%; text-align: center;">6</td> <td style="width: 12.5%; text-align: center;">5</td> <td style="width: 12.5%; text-align: center;">4</td> <td style="width: 12.5%; text-align: center;">3</td> <td style="width: 12.5%; text-align: center;">2</td> <td style="width: 12.5%; text-align: center;">1</td> <td style="width: 12.5%; text-align: center;">0</td> <td style="width: 12.5%; text-align: center;">Reset</td> </tr> <tr> <td colspan="8" style="text-align: center;">TAKEY [7:0]</td> <td style="text-align: center;">00H</td> </tr> </table>	7	6	5	4	3	2	1	0	Reset	TAKEY [7:0]								00H	
7	6	5	4	3	2	1	0	Reset											
TAKEY [7:0]								00H											



Software reset register (SWRES) is read-only by default; software must write three specific values 55h, AAh and 5Ah sequentially to the TAKEY register to enable the SWRES register write attribute. That is:

```
MOV TAKEY, #055h
MOV TAKEY, #0AAh
MOV TAKEY, #05Ah
```

Mnemonic: SWRES								Address: E7H
7	6	5	4	3	2	1	0	Reset
SWRES [7:0]								00H

SWRES [7:0]: Software reset register bit. These 8-bit is self-reset at the end of the reset procedure.

- SWRES [7:0] = FFh, software reset.
- SWRES [7:0] = 00h ~ FEh, MCU no action.

Software reset example:

```
MOV TAKEY, #055h
MOV TAKEY, #0AAh
MOV TAKEY, #05Ah
MOV SWRES, #0FFh
```

**5 內建重置電路功能，重置時間可由燒錄時設定：**

(Provides Internal reset circuit inside，the Internal reset time can set by writer or ISP)

<b>Internal Reset time</b>
<b>25ms (default)</b>
200ms
100ms
50ms
16ms
8ms
4ms



6 低電壓重置功能：

The interrupt vector 63h.

Mnemonic: LVC								Address: E6h
7	6	5	4	3	2	1	0	Reset
LVI_EN	-	LVRXE	-	-	-	-		20H

- LVI\_EN: Low voltage interrupt function enable bit.  
 LVI\_EN = 0 : disable low voltage detect function.  
 LVI\_EN = 1 : enable low voltage detect function. LVIIF will be set when low voltage detect.
- LVRXE: External low voltage reset function enable bit.  
 LVRXE = 0 : disable external low voltage reset function.  
 LVRXE = 1 : enable external low voltage reset function.

以下適用元件：**SM59R16A5/SM59R09A5/SM59R05A5**

Low Voltage Detect Level		
	LVI	LVRX
C = 4.5V ~ 5.5V	3.5V	3.1V
L = 2.7V ~ 3.6V	2.3V	2.1V

以下適用元件：**SM59R04A2**

Low Voltage Detect Level		
	LVI	LVRX
C = 4.5V ~ 5.5V	3.5V	3.1V
L = 2.7V ~ 3.6V	2.3V	2.1V

**Mnemonic: IEN1** **Address: B8h**

7	6	5	4	3	2	1	0	Reset
EXEN2	-	IEIIC	IELVI	IEKBI	IEADC	IESPI	IEPWM	00h

- IELVI: LVI interrupt enable.  
 IELVI = 0 – Disable LVI interrupt.  
 IELVI = 1 – Enable LVI interrupt.

**Mnemonic: IRCON** **Address: C0h**

7	6	5	4	3	2	1	0	Reset
EXF2	TF2	IICIF	LVIIF	KBIIF	ADCIF	SPIIF	PWMIF	00H

- LVIIF: LVI interrupt flag.  
 LVIIF will be set when LVI\_EN=1 & occur low voltage detect. Must be cleared by software.



7 中斷功能：

Interrupt Request Flags	Interrupt Vector Address	Interrupt Number *(use Keil C Tool)
IE0 – External interrupt 0	0003h	0
TF0 – Timer 0 interrupt	000Bh	1
IE1 – External interrupt 1	0013h	2
TF1 – Timer 1 interrupt	001Bh	3
RI0/TI0 – Serial channel 0 interrupt	0023h	4
TF2/EXF2 – Timer 2 interrupt	002Bh	5
PWMIF – PWM interrupt	0043h	8
SPIIF – SPI interrupt	004Bh	9
ADCIF – A/D converter interrupt	0053h	10
KBIF – keyboard Interface interrupt	005Bh	11
<b>LVIF – Low Voltage Interrupt</b>	<b>0063h</b>	<b>12</b>
IICIF – IIC interrupt	006Bh	13
RI1/TI1 – Serial channel 1 interrupt	0083h	16
RTC/ALARM interrupt	008Bh	17
Comparator interrupt	0093h	18

\*See Keil C about C51 User’s Guide about Interrupt Function description

8 重置功能範例程序(1) 軟件重置：

Description	Software reset sample code
Main program	<pre> //===== // //           S Y N C M O S   T E C H N O L O G Y // //===== #include "..\h\SM59R04A2.h"  void Function_Enable(void) {     TAKEY  = 0x55;     TAKEY  = 0xAA;     TAKEY  = 0x5A; }  void Software_Reset(void) {     Function_Enable();           // must write specific value sequentially     SWRES = 0xFF;                // before execute S/W Reset } </pre>



	<pre> void main(void) {     P0 = 0x55;           // user code     while(1)     {         P0 = 0xAA;           // user code         Software_Reset();   // execute S/W Reset     } } </pre>
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**9 重置功能範例程序(2) 低電壓偵測置功能：**

Description	LVI & LVR sample code
<b>Main program</b>	<pre> //===== // //             S Y N C M O S   T E C H N O L O G Y // //===== #include "..\h\SM59R04A2.h"  bit LVI_test =0; void LVI_interrupt(void) interrupt d_LVI_Vector // vector=63h {     P0 =0x04;           // test code     LVI_test = 1;     LVIIIF =0;         // clear LVI flag }  void LVI_init(void) {     EA    = 1;         // Enable all interrupt     IEN1  = 0x10;     // Enable LVI interrupt     LVC    = 0xA0;    // Enable LVR &amp; LVD }  void main(void) {     P0 =0x01;           // test code     LVI_init();     while(1)     {         if(LVI_test)             P0 =0x08;   // test code         else             P0 = 0x02;   // test code     } } </pre>