Telechips Android How to detect the SD Card in deep sleep state User's Guide

TC-Android-ALL-How to detect the SD Card in deep sleep state

Feb 13, 2014

Telechips

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Revision History

Date	Version	Description
2011-09-01	1.00	Initial Release
2012-05-17	1.01	Add the TCC892x
2014-02-13	1.02	Add the TCC893x

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Contents

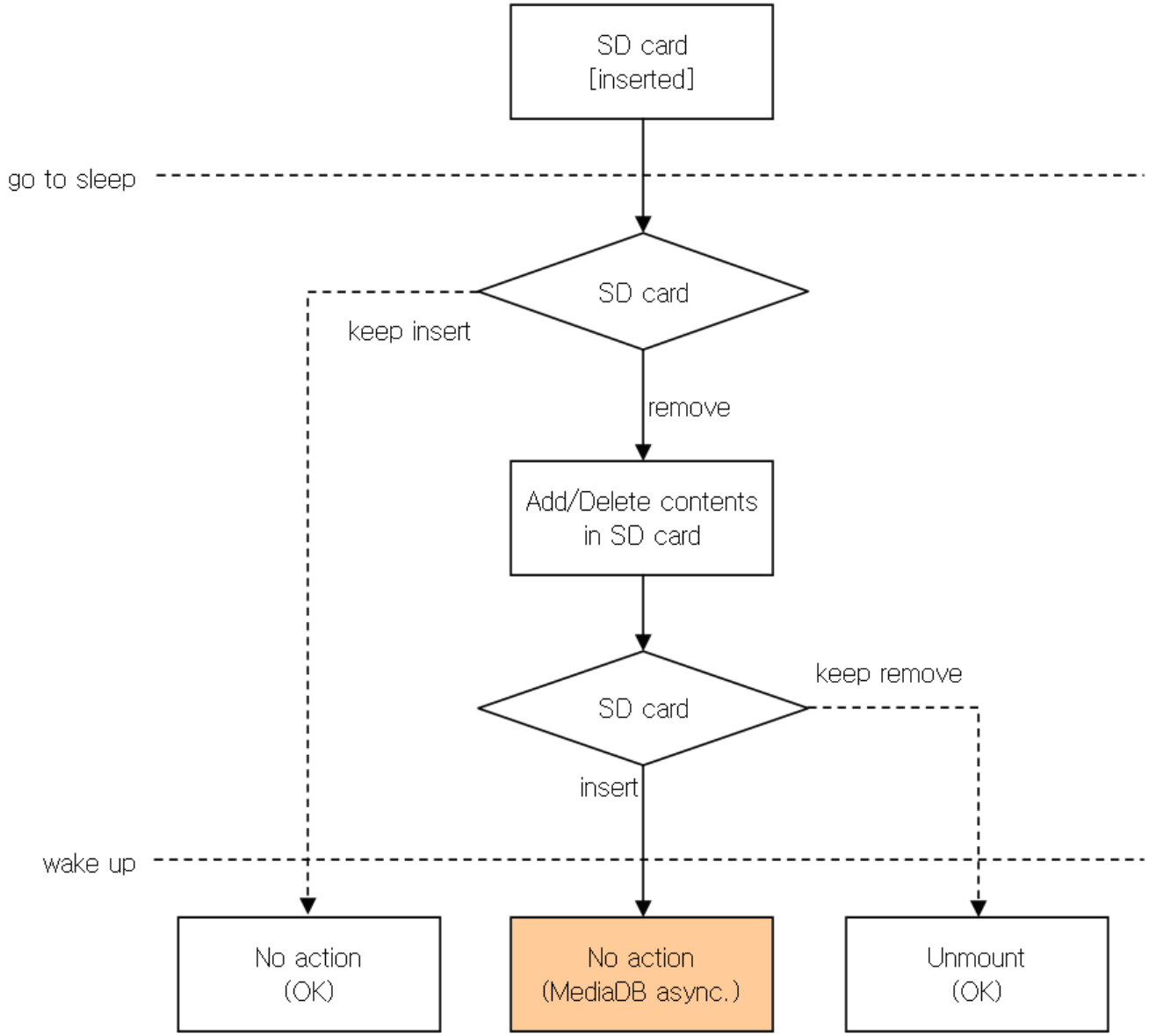
1 In sleep state, there is problem that can not detect the SD card.

Follow the steps below to reproduce the problem.

Insert the SD card → Go to Sleep → Remove the SD card → Add/Delete contents in SD card → Insert the SD card → Wake Up → Entering the Gallery,
Content added/deleted during sleep is not updated in MediaDB.
So, Deleted content is displayed, and the added content will not be displayed.

1.1 Current status of the TCC Android SDK

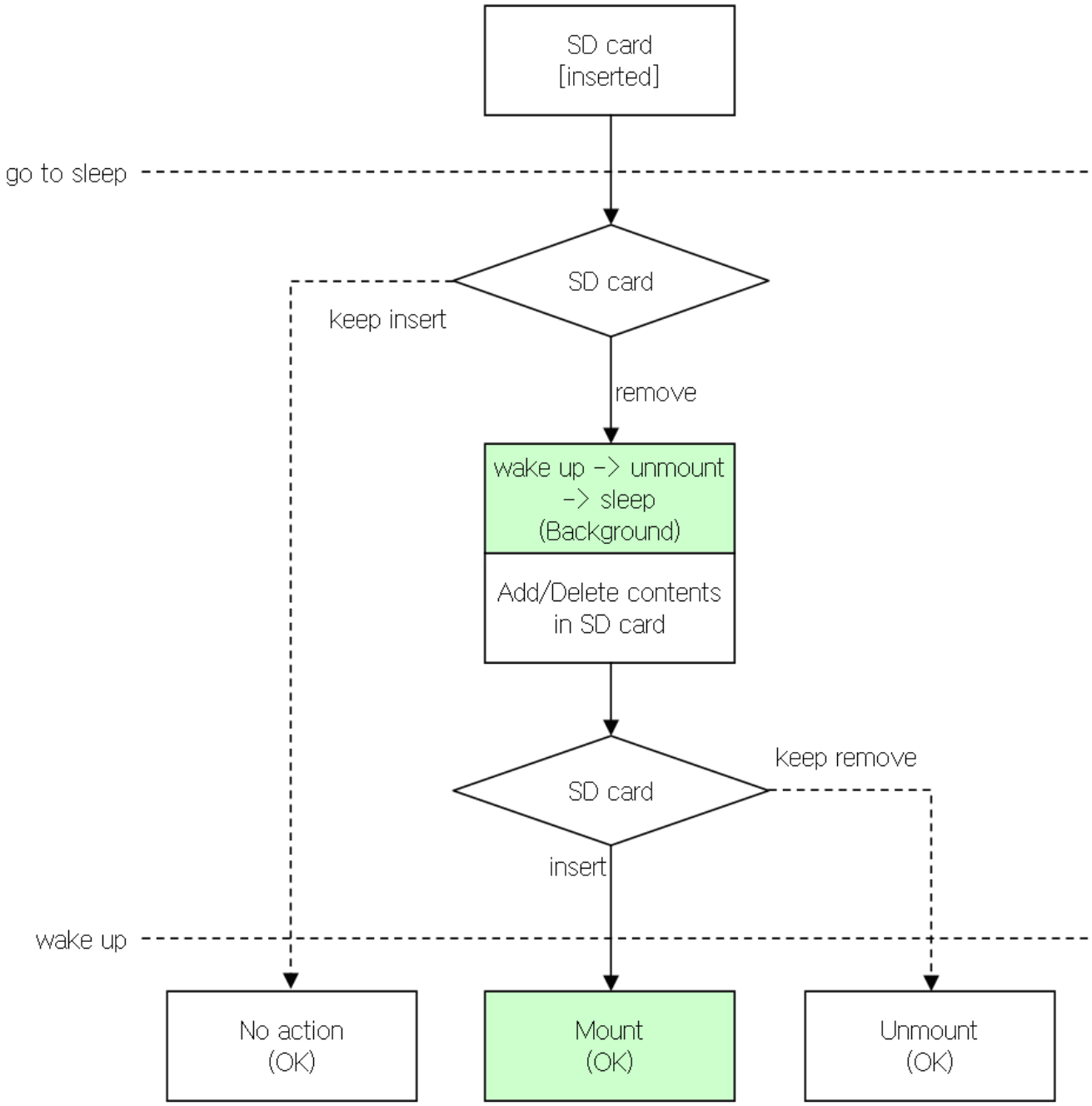
If plugged in the same SD card before / after the sleep status, Using existing MediaDB for prevents unnecessary the Media Scanning behavior.
But, As follows: MediaDB async problems like this can occur.



1.2 Recommended Solution

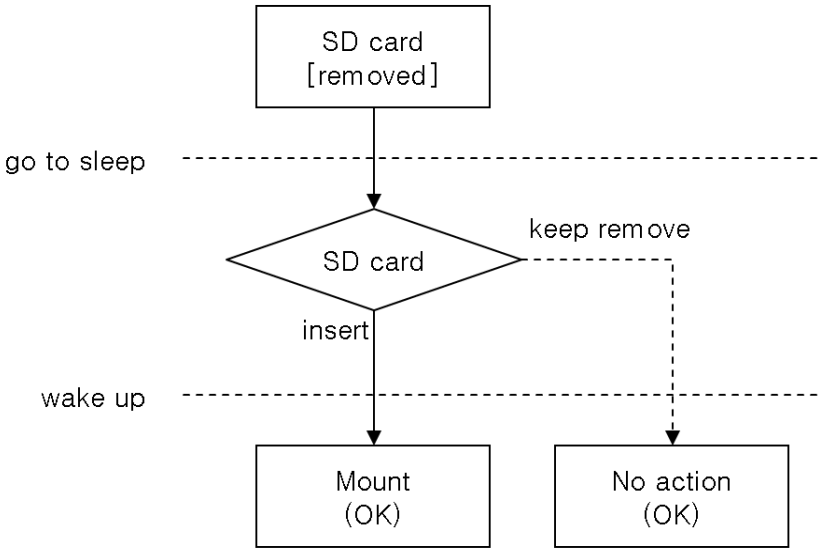
If remove the SD card in sleep state, background WakeUp and Unmount and go to the sleep state.
(background WakeUp , it means keep LCD turn off.)

If there was inserted SD card before the sleep state,
background wakeup is performed only if SD card is the first removed in the sleep state.



1.3 If there is removed SD card before the sleep state

In any case, does not matter.

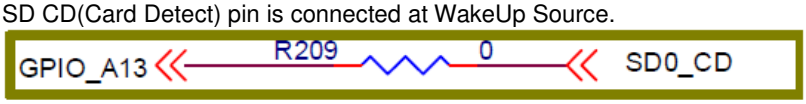


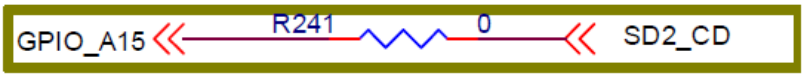
2 How to detect the SD Card in deep sleep state?

If SD CD(Card Detect) pin is connected at WakeUp Source (following table), In deep sleep state can detect the SD card.

2.1 Hardware – TCC880x

SD CD(Card Detect) pin is connected at WakeUp Source.





Following table is SD CD (Card Detection) allocation table of TCC88xx board.

TCC88XX_B'd_SD_Card_Detection_I/F_Information

Board Name			PCB Silk Date	SD_CARD			Remark
				SD0_CD	SD1_CD	SD2_CD	
DEMO B'd	TCC8801F	D2_08X4_SV6.0	2010.05.03	GPIO_F10	GPIO_E25	GPIO_F13	
		D2_08X4_SV6.1	2010.12.06	GPIO_F10	GPIO_E25	GPIO_F13	
		D2_08X4_SV6.2	2010.03.23	GPIO_F10	GPIO_E25	GPIO_F13	Date Correction (2010 =>2011)
		D2_08X4_SV6.3	2010.04.14	GPIO_A13	GPIO_E25	GPIO_A15	Date Correction (2010 =>2011)
		D2_16X2_SV6.0	2010.01.17	GPIO_F10	GPIO_E25	GPIO_F13	
		D3_08X4_SV6.0	2010.05.03	GPIO_A13	GPIO_E25	GPIO_A15	Date Correction (2010 =>2011)
		D3_16X2_SV6.0	2011.02.08	GPIO_F10	GPIO_E25	GPIO_F13	
		D3_16X2_SV6.1	2011.04.11	GPIO_A13	GPIO_E25	GPIO_A15	
	TCC8803	D2_16X4_2CS_SV6.0	2011.02.21	GPIO_A13	GPIO_E25	GPIO_A15	
		D3_16X2_SV6.0	2010.10.27	GPIO_F10	GPIO_E25	GPIO_F13	
		D3_16X2_SV6.1	2011.05.06	GPIO_A13	GPIO_E25	GPIO_A15	
		LPD2_32X1_SV6.1	2011.06.13	GPIO_A13	GPIO_E25	GPIO_A15	
Real B'd	M805	D3_16X2_V0.1	2010.11.08	GPIO_F17	-	-	
		D3_16X2_V0.2	2010.12.31	GPIO_F17	-	-	
		D3_16X2_V0.3	2011.03.24	GPIO_F17	-	-	
		D3_16X2_V0.4	-	GPIO_F17	-	-	Only Data Exist
		D3_16X2_V0.4A	2011.07.21	GPIO_E25	-	-	
	M803	MAIN_V0.1	2011.03.23	GPIO_F17	-	-	
		MAIN_V0.2	-	GPIO_F17	-	-	Only Data Exist
		MAIN_V0.2A	2011.07.22	GPIO_E25	-	-	

TEXT External Interrupt available GPIO

TEXT External Wake-up and Interrupt available GPIO

Following board can be supported to function that in deep sleep state can detect the SD card.

*** TCC8801F EVM - D2_08X4_6.3**
- D3_08X4_6.0
- D3_16X2_6.1

*** TCC8803 EVM - D2_16X4_2CS_6.0**
- D3_16X2_6.1
- LPD2_32X1_SV6.1

*** M805 - D3_16X2_V0.4A**

*** M803 - MAIN_V0.2A**

2.2 Software – TCC880x

Following table is WakeUp source of TCC880x.

WKUPEN0 Register **0xF0404004**

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
SRCS[31:0]															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SRCS[31:0]															

Field	Name	RW	Reset	Description
31-0	SRCS[31:0]	R/W	0x0	Wakeup Enable Register for Each Wakeup Sources SRCS[0] : SRCS[1] : GPIOC[28] SRCS[2] : GPIOC[29] SRCS[3] : GPIOC[30] SRCS[4] : GPIOC[31] SRCS[5] : GPIOF[27] SRCS[6] : GPIOF[26] SRCS[7] : GPIOF[25] SRCS[8] : GPIOF[24] SRCS[9] : GPIOF[23] SRCS[10] : TSC_WKU[3] SRCS[11] : GPIOD[18] SRCS[12] : TSC_STOP_WKU[4] SRCS[13] : TSC_UPDOWN[5] SRCS[14] : GPIOA[2] SRCS[15] : GPIOA[3] SRCS[16] : GPIOA[4] SRCS[17] : GPIOA[5] SRCS[18] : GPIOA[6] SRCS[19] : GPIOA[7] SRCS[20] : GPIOA[10] SRCS[21] : GPIOA[11] SRCS[22] : GPIOA[12] SRCS[23] : GPIOA[13] SRCS[24] : GPIOA[14] SRCS[25] : GPIOA[15] SRCS[26] : GPIOB[30] SRCS[27] : GPIOB[31] SRCS[28] : GPIOE[04] SRCS[29] : GPIOE[05] SRCS[30] : GPIOE[24] SRCS[31] : GPIOE[25]

To WakeUp when to remove the SD card, the WKUPEN register should be configured at suspend processing.

Kernel/arch/arm/mach-tcc88xx/Pm.c

```
static int tcc_pm_enter(suspend_state_t state)
{

    if(gpio_get_value(TCC_GPA(15)) == 0)            // if(A15=0) : Low(insert) -> High(remove) : Active High
            *((volatile unsigned long *)0xF0404004) |= HwPMU_WKUP_GPIOA15;

    #if defined(CONFIG_MMC_TCC_PORT3)
    if(gpio_get_value(TCC_GPA(13)) == 0)            // if(A13=0) : Low(insert) -> High(remove) : Active High
            *((volatile unsigned long *)0xF0404004) |= HwPMU_WKUP_GPIOA13;
    #endif

}
```

2.3 Software – TCC892x

Following table is WakeUp source of TCC892x.

PMU Wakeup Enable Register for Group 0 (PMU_WKUPEN0) **0x74400020**

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
SRCS[31:0]															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SRCS[31:0]															

Field	Name	RW	Reset	Description
31-0	SRCS[31:0]	R/W	0x0	Wakeup Enable Register for Each Wakeup Sources SRCS[0] : TSADC UPDOWN[1] SRCS[1] : TSADC STOP_WKU[2] SRCS[2] : TSADC WAKEUP SRCS[3] : RTC WAKEUP SRCS[4] : REMOTE CTRL WAKEUP SRCS[5] : GPIO_D[08] SRCS[6] : GPIO_D[09] SRCS[7] : GPIO_D[12] SRCS[8] : GPIO_D[13] SRCS[9] : GPIO_D[14] SRCS[10] : GPIO_B[11] SRCS[11] : GPIO_B[12] SRCS[12] : GPIO_B[13] SRCS[13] : GPIO_B[14] SRCS[14] : GPIO_B[15] SRCS[15] : GPIO_C[00] SRCS[16] : GPIO_G[05] SRCS[17] : GPIO_G[08] SRCS[18] : GPIO_G[09] SRCS[19] : GPIO_G[10] SRCS[20] : GPIO_G[11] SRCS[21] : GPIO_G[12] SRCS[22] : GPIO_G[13] SRCS[23] : GPIO_G[14] SRCS[24] : GPIO_G[16] SRCS[25] : GPIO_G[17] SRCS[26] : GPIO_G[18] SRCS[27] : GPIO_G[19] SRCS[28] : GPIO_HDMI[00] SRCS[29] : GPIO_HDMI[01] SRCS[30] : GPIO_ADC[04] SRCS[31] : - ***TSADC STOP WKU, TSADC WAKEUP, and REMOTE CTRL WAKEUP cannot be used in SHUTDOWN mode, but it can be used in SLEEP mode.***

PMU Wakeup Enable Register for Group 1 (PMU_WKUPEN1) 0x74400024

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
SRCS[63:32]															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SRCS[63:32]															

Field	Name	RW	Reset	Description
31-0	SRCS[63:32]	R/W	0x0	Wakeup Enable Register for Each Wakeup Sources SRCS[32] : GPIO_E[00] SRCS[33] : GPIO_E[01] SRCS[34] : GPIO_E[02] SRCS[35] : GPIO_E[03] SRCS[36] : GPIO_E[04] SRCS[37] : GPIO_E[05] SRCS[38] : GPIO_E[06] SRCS[39] : GPIO_E[07] SRCS[40] : GPIO_E[08] SRCS[41] : GPIO_E[09] SRCS[42] : GPIO_E[10] SRCS[43] : GPIO_E[11] SRCS[44] : GPIO_E[12] SRCS[45] : GPIO_E[13] SRCS[46] : GPIO_E[14] SRCS[47] : GPIO_E[15] SRCS[48] : GPIO_E[16] SRCS[49] : - SRCS[50] : - SRCS[51] : - SRCS[52] : GPIO_E[20] SRCS[53] : GPIO_E[21] SRCS[54] : GPIO_E[22] SRCS[55] : GPIO_E[23] SRCS[56] : GPIO_E[24] SRCS[57] : GPIO_E[25] SRCS[58] : GPIO_E[26] SRCS[59] : GPIO_E[27] SRCS[60] : GPIO_E[28] SRCS[61] : GPIO_E[29] SRCS[62] : GPIO_E[30] SRCS[63] : GPIO_E[31]

To WakeUp when to remove the SD card, the WKUPEN register should be configured at suspend processing.

Kernel/arch/arm/mach-tcc892x/Pm.c

```
static int tcc_pm_enter(suspend_state_t state)
{

    *(volatile unsigned long *)(SRAM_STACK_ADDR+4) = tcc892x_sd_card_detect();

}


static void shutdown(void)
{

    if(*(volatile unsigned long *)(SRAM_STACK_ADDR+4) == 1)
        ((PPMU)HwPMU_BASE)->PMU_WKUP0.bREG.GPIO_D13 = 1;          // If SD Card Detect Pin is D13.

}
```

2.4 Software – TCC893x

Following table is WakeUp source of TCC893x.

PMU Wakeup Enable Register for Group 0 (PMU_WKUPEN0) **0x74400020**

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
SRCS[31:0]															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SRCS[31:0]															

Field	Name	RW	Reset	Description
31-0	SRCS[31:0]	R/W	0x0	Wakeup Enable Register for Each Wakeup Sources SRCS[0] : TSADC UPDOWN[1] SRCS[1] : TSADC STOP_WKU[2] SRCS[2] : TSADC WAKEUP SRCS[3] : RTC WAKEUP SRCS[4] : REMOTE CTRL WAKEUP SRCS[5] : GPIO_D[08] SRCS[6] : GPIO_D[09] SRCS[7] : GPIO_D[12] SRCS[8] : GPIO_D[13] SRCS[9] : GPIO_D[14] SRCS[10] : GPIO_B[11] SRCS[11] : GPIO_B[12] SRCS[12] : GPIO_B[13] SRCS[13] : GPIO_B[14] SRCS[14] : GPIO_B[15] SRCS[15] : GPIO_C[00] SRCS[16] : GPIO_G[05] SRCS[17] : GPIO_G[08] SRCS[18] : GPIO_G[09] SRCS[19] : GPIO_G[10] SRCS[20] : GPIO_G[11] SRCS[21] : GPIO_G[12] SRCS[22] : GPIO_G[13] SRCS[23] : GPIO_G[14] SRCS[24] : GPIO_G[16] SRCS[25] : GPIO_G[17] SRCS[26] : GPIO_G[18] SRCS[27] : GPIO_G[19] SRCS[28] : GPIO_HDMI[00] SRCS[29] : GPIO_HDMI[01] SRCS[30] : GPIO_ADC[04] SRCS[31] : - ***TSADC STOP WKU, TSADC WAKEUP, and REMOTE CTRL WAKEUP cannot be used in SHUTDOWN mode, but it can be used in SLEEP mode.***

PMU Wakeup Enable Register for Group 1 (PMU_WKUPEN1) **0x74400024**

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
SRCS[63:32]															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SRCS[63:32]															

Field	Name	RW	Reset	Description
31-0	SRCS[63:32]	R/W	0x0	Wakeup Enable Register for Each Wakeup Sources SRCS[32] : GPIO_E[00] SRCS[33] : GPIO_E[01] SRCS[34] : GPIO_E[02] SRCS[35] : GPIO_E[03] SRCS[36] : GPIO_E[04] SRCS[37] : GPIO_E[05] SRCS[38] : GPIO_E[06] SRCS[39] : GPIO_E[07] SRCS[40] : GPIO_E[08] SRCS[41] : GPIO_E[09] SRCS[42] : GPIO_E[10] SRCS[43] : GPIO_E[11] SRCS[44] : GPIO_E[12] SRCS[45] : GPIO_E[13] SRCS[46] : GPIO_E[14] SRCS[47] : GPIO_E[15] SRCS[48] : GPIO_E[16] SRCS[49] : - SRCS[50] : - SRCS[51] : - SRCS[52] : GPIO_E[20] SRCS[53] : GPIO_E[21] SRCS[54] : GPIO_E[22] SRCS[55] : GPIO_E[23] SRCS[56] : GPIO_E[24] SRCS[57] : GPIO_E[25] SRCS[58] : GPIO_E[26] SRCS[59] : GPIO_E[27] SRCS[60] : GPIO_E[28] SRCS[61] : GPIO_E[29] SRCS[62] : GPIO_E[30] SRCS[63] : GPIO_E[31]

To wake-up device when SD card was removed in suspend status, the WKUPEN register should be configured at suspend processing. Following code is wake-up reference code based on tcc8930.

kernel/arch/arm/mach-tcc893x/pm.c

```
static int tcc_pm_enter(suspend_state_t state)
{

    *(volatile unsigned long *)(SRAM_STACK_ADDR+4) = tcc893x_sd_card_detect();

}


static void tcc_pm_shutdown(void)
{

    if(*(volatile unsigned long *)(SRAM_STACK_ADDR+4) == 1)
        ((PPMU)HwPMU_BASE)->PMU_WKUP0.bREG.GPIO_B12 = 1; // If SD Card Detect Pin is B12(tcc8930).

}
```