

[Notes]

R20TS0574EJ0100

Rev.1.00

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RE Software Development Kit

RE01 1500KB Group CMSIS Driver Package Rev1.00, Rev1.01, Rev1.10
SMIP Driver Restrictions

Outline

When using the products in the title, note the following point.

1. When driving an LCD from KYOCERA using the SMIP driver

1. When Driving an LCD from KYOCERA Using the SMIP Driver

1.1 Applicable Products

- (1) RE01 1500KB Group CMSIS Driver Package

The product name, revision and document number of the applicable RE01 1500KB Group CMSIS Driver Package are as follows.

Table 1 RE01 1500KB Group CMSIS Driver Package Applicable Products

RE01 1500KB Group CMSIS Driver Package Product name	RE01 1500KB Group CMSIS Driver Package revision	Document number
RE01 1500KB Group CMSIS Driver Package Rev1.10	Rev.1.10	R01AN5355EJ0110
RE01 1500KB Group CMSIS Driver Package Rev1.01	Rev.1.01	R01AN5278EJ0101
RE01 1500KB Group CMSIS Driver Package Rev1.00	Rev.1.00	R01AN4947EJ0100

- (2) Application note

The product name, revision and document number of the applicable application note are as follows.

Table 2 Applicable Application Note

Application Note Product name	Application Note Revision	Document number
RE01 1500KB Group R_GDT Driver Sample Code (Using CMSIS Driver Package)	Rev.1.01	R01AN4755EJ0101

1.2 Applicable Devices

RE01 family: RE01 1500KB group

1.3 Details and Conditions

When the SMIP driver is used to drive an LCD from KYOCERA, the following three problems occur.

When driving an LCD from KYOCERA, specify &g_smip_tbl_lcd_info[SMIP_TYPE_KYOCERA] for the argument *p_info in the R_SMIP_Open function.

Table 3 List of problems

	Problems	Conditions	CMSIS Driver Package Rev.			Application note Rev.
			1.00	1.01	1.10	1.01
(1)	The VCOM setup time or hold time differs from the time specified in the r_smip_cfg.h file.	When any one of the following function calls overlaps with an AGT interrupt used by the SMIP driver: - Function R_SMIP_AllZero - Function R_SMIP_AllOne - Function R_SMIP_SendCommand	Applicable	Applicable	Applicable	Applicable
(2)	An AGT register write verification processing loops until a timeout occurs.	When any one of the following function calls overlaps with an AGT interrupt used by the SMIP driver: - Function R_SMIP_AllZero - Function R_SMIP_AllOne - Function R_SMIP_SendCommand	Applicable	Applicable	Applicable	Applicable
		An R_SMIP_Close function call overlaps with an AGT interrupt used by the SMIP driver:	Applicable	Applicable	-	Applicable
(3)	The AGT timer does not stop after the SMIP driver is released.	An R_SMIP_Close function call overlaps with an AGT interrupt used by the SMIP driver:	Applicable	Applicable	-	Applicable

-: Not applicable

1.4 Workaround

Perform all three of the following procedures:

- (i) Add AGT interrupt-enable processing to the `r_smip_tm_lpm_on` function.
- (ii) Add AGT interrupt-disable processing to the `r_smip_tm_lpm_off` function.
- (iii) In the `r_smip_all_write` function, move the `gs_smip_state` specification from "before the timer stops" to "after the timer stops".

Codes before and after modification are shown in red in the source file.

File location: Project file name/Driver/Src/r_smip/r_smip_api.c

Source file: "r_smip_api.c"

[Source Code modification example: (i) Add AGT interrupt-enable processing]

Location: Around line 2446 (RE01 1500KB group CMSIS Driver Package Rev1.10)

Function name: `r_smip_tm_lpm_on`

- Before modification

```
static void r_smip_tm_lpm_on(void)
{

#ifdef (1 == SMIP_CFG_VCOM_TIMER_LPM)
    /* AGTMR2 - AGT Mode Register 2
       b7 - LPM - Low Power Consumption Mode Setting - Low power consumption
       mode */
    gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].reg->AGTMR2_b.LPM = 1;
    R_SYS_SoftwareDelay(SMIP_PRV_AGT_LPM_WAIT,
        SYSTEM_DELAY_UNITS_MICROSECONDS);
#endif

}/* End of function r_smip_tm_lpm_on */
```

• After modification

```
static void r_smip_tm_lpm_on(void)
{

#if (1 == SMIP_CFG_VCOM_TIMER_LPM)
    /* AGTMR2 - AGT Mode Register 2
       b7 - LPM - Low Power Consumption Mode Setting - Low power consumption
       mode */
    gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].reg->AGTMR2_b.LPM = 1;
    R_SYS_SoftwareDelay(SMIP_PRV_AGT_LPM_WAIT,
SYSTEM_DELAY_UNITS_MICROSECONDS);
#endif

    /* AGTI interrupt enable */
    R_NVIC_EnableIRQ(gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].agti_irq);

}/* End of function r_smip_tm_lpm_on */
```

[Source code modification example: (ii) Add AGT interrupt-disable processing]

Location: Around line 2461 (RE01 1500KB group CMSIS Driver Package Rev1.10)

Function name: r_smip_tm_lpm_off

• Before modification

```
static void r_smip_tm_lpm_off(void)
{
    R_LPM_ModuleStart(gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].mstp_id);
#if (1 == SMIP_CFG_VCOM_TIMER_LPM)
    /* AGTMR2 - AGT Mode Register 2
    b7      - LPM - Low Power Consumption Mode Setting - Normal mode. */
    gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].reg->AGTMR2_b.LPM = 0;
    R_SYS_SoftwareDelay(SMIP_PRV_AGT_LPM_WAIT,
SYSTEM_DELAY_UNITS_MICROSECONDS);
#endif
}/* End of function r_smip_tm_lpm_off */
```

• After modification

```
static void r_smip_tm_lpm_off(void)
{
    /* AGTI interrupt disable */
    R_NVIC_DisableIRQ(gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].agti_irq);
    R_LPM_ModuleStart(gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].mstp_id);
#if (1 == SMIP_CFG_VCOM_TIMER_LPM)
    /* AGTMR2 - AGT Mode Register 2
    b7      - LPM - Low Power Consumption Mode Setting - Normal mode. */
    gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].reg->AGTMR2_b.LPM = 0;
    R_SYS_SoftwareDelay(SMIP_PRV_AGT_LPM_WAIT,
SYSTEM_DELAY_UNITS_MICROSECONDS);
#endif
}/* End of function r_smip_tm_lpm_off */
```

[Source Code modification example: (iii) move the gs_smip_state specification]

Location: Around line 1334 (RE01 1500KB group CMSIS Driver Package Rev1.10)

Function name: r_smip_all_write

• Before modification

```

    case SMIP_PRV_STATE_ADJUST_RDY:
    {
        r_smip_set_aw_data(wr_data, all_wr_size);
        if (SMIP_PRV_PWON_BUSY == gs_power_on_seq)
        {
            gs_smip_state = SMIP_PRV_STATE_ADJUST_AW_BUSY;
            result = r_smip_start_line_send();
        }
        else
        {
            gs_smip_state = SMIP_PRV_STATE_ADJUST_AW_TS_VCOM;
            r_smip_tm_lpm_off();
            r_smip_vcom_timer_stop();
#if (1 == SMIP_CFG_AGTO_EN)
            /* AGTIOC - AGT I/O Control Register
            b2      - TOE - AGTOn Output Enable - Disable AGTOn output */
            gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].reg->AGTIOC_b.TOE = 0;
#endif

            r_smip_vcom_timer_start(gs_ts_vcom);
            r_smip_tm_lpm_on();
        }
    }
    break;

```

• After modification

```
case SMIP_PRV_STATE_ADJUST_RDY:
{
    r_smip_set_aw_data(wr_data, all_wr_size);
    if (SMIP_PRV_PWON_BUSY == gs_power_on_seq)
    {
        gs_smip_state = SMIP_PRV_STATE_ADJUST_AW_BUSY;
        result = r_smip_start_line_send();
    }
    else
    {
//          Comment out the specification before the timer stops
//          gs_smip_state = SMIP_PRV_STATE_ADJUST_AW_TS_VCOM;
        r_smip_tm_lpm_off();
        r_smip_vcom_timer_stop();
//          Add the specification afer the timer stops
        gs_smip_state = SMIP_PRV_STATE_ADJUST_AW_TS_VCOM;
#ifdef (1 == SMIP_CFG_AGTO_EN)
        /* AGTIOC - AGT I/O Control Register
        b2      - TOE - AGTOn Output Enable - Disable AGTOn output */
        gs_vcom_timer[SMIP_CFG_VCOM_TIMER_CH].reg->AGTIOC_b.TOE = 0;
#endif

        r_smip_vcom_timer_start(gs_ts_vcom);
        r_smip_tm_lpm_on();
    }
}
break;
```

1.5 Schedule for Fixing the Problem

The table below shows the schedule for modification of each product.

Table 4 Schedule for Modification

Product name	Revision	Document number	Schedule
RE01 1500KB Group CMSIS Driver Package Rev1.10	Rev.1.10	R01AN5355EJ0110	Will be fixed in the next version Rev.1.20.
RE01 1500KB Group CMSIS Driver Package Rev1.01	Rev.1.01	R01AN5278EJ0101	
RE01 1500KB Group CMSIS Driver Package Rev1.00	Rev.1.00	R01AN4947EJ0100	
R_GDT Driver Sample Code (Using CMSIS Driver Package) for RE01 1500KB Group	Rev.1.01	R01AN4755EJ0101	Will be fixed in the next version Rev.1.03. (Scheduled to be released in May 2020.)

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	May.16.20	-	First edition issued

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