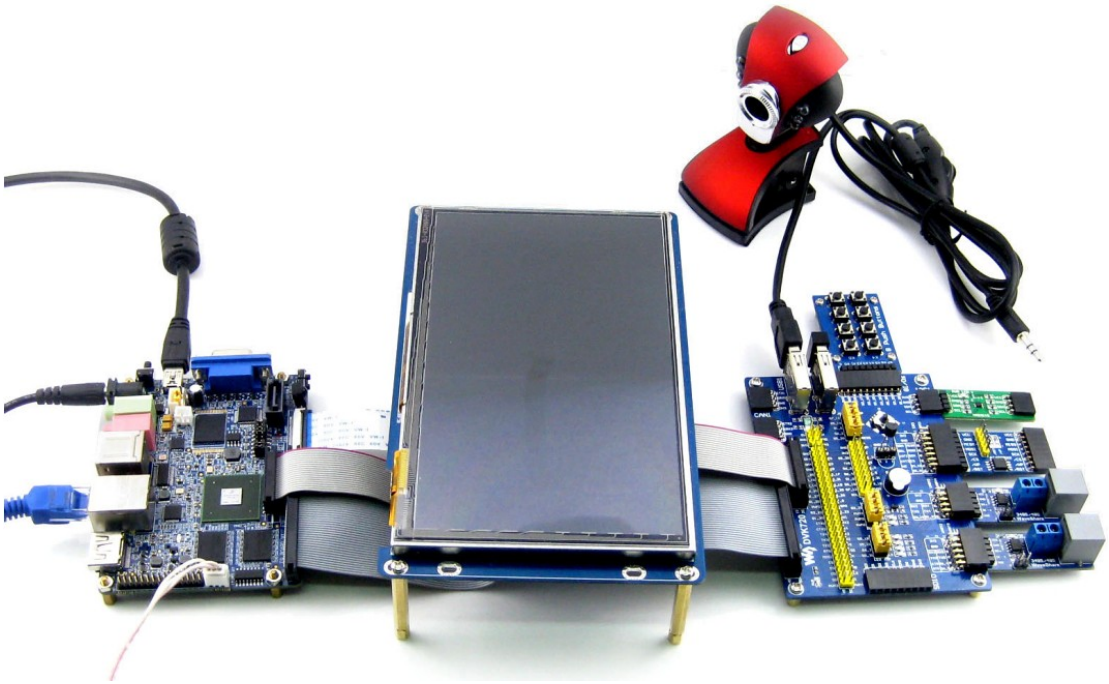
DVK720 Expansion Board

Driver Porting Manual

2014.04.03 V1.0



Copyright Statement

Revision history

Version	Date	Description
V1.0	2014.04.03	Initial Release

Content

Document formatting convention

1. Commands on PC ubuntu terminal: preceding with '#', root user privileges is requested;
2. Commands on the board terminal: preceding with '$'.

1. Porting keypad driver

1.1 Configure the pin

1) Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file arch/arm/mach-mx6/board-mx6q_sabresd.h

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

MX6Q_PAD_EIM_D17__GPIO_3_17,

MX6Q_PAD_EIM_D30__GPIO_3_30,

MX6Q_PAD_ENET_TX_EN__GPIO_1_28,

MX6Q_PAD_EIM_D20__GPIO_3_20,

MX6Q_PAD_CSI0_DAT10__GPIO_5_28,

MX6Q_PAD_EIM_D18__GPIO_3_18,

MX6Q_PAD_ENET_TXD0__GPIO_1_30,

MX6Q_PAD_EIM_D23__GPIO_3_23,

1) Add macro definition to configuration file

arch/arm/mach-mx6/board-mx6q_sabresd.c:

#vi arch/arm/mach-mx6/board-mx6q_sabresd.c

```
#define SABRESD_BUTTON1 IMX_GPIO_NR(3,17)
#define SABRESD_BUTTON2 IMX_GPIO_NR(3,30)
#define SABRESD_BUTTON3 IMX_GPIO_NR(1,28)
#define SABRESD_BUTTON4 IMX_GPIO_NR(3,20)
#define SABRESD_BUTTON5 IMX_GPIO_NR(5,28)
#define SABRESD_BUTTON6 IMX_GPIO_NR(3,18)
#define SABRESD_BUTTON7 IMX_GPIO_NR(1,30)
#define SABRESD_BUTTON8 IMX_GPIO_NR(3,23)
```

1.2 Add platform resources

1) Add below to board-mx6q_sabresd.c:

#vi arch/arm/mach-mx6/board-mx6q_sabresd.c

```
static struct gpio_keys_button sabresd_buttons[] = {
GPIO_BUTTON(SABRESD_BUTTON1, KEY_1,    1, "button1",     0, 1),
GPIO_BUTTON(SABRESD_BUTTON2, KEY_2,    1, "button2",     0, 1),
GPIO_BUTTON(SABRESD_BUTTON3, KEY_3,    1, "button3",     0, 1),
GPIO_BUTTON(SABRESD_BUTTON4, KEY_4,    1, "button4",     0, 1),
GPIO_BUTTON(SABRESD_BUTTON5, KEY_5,    1, "button5",     0, 1),
GPIO_BUTTON(SABRESD_BUTTON6, KEY_6,    1, "button6",     0, 1),
GPIO_BUTTON(SABRESD_BUTTON7, KEY_7,    1, "button7",     0, 1),
```

```
GPIO_BUTTON(SABRESD_BUTTON8, KEY_8,    1, "button8",      0, 1),
}
```

2. Porting PWM driver

2.1 Configure the pins

Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file arch/arm/mach-mx6/board-mx6q_sabresd.h

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

```
MX6Q_PAD_SD1_CMD__PWM4_PWMO,
```

2.2 Add platform resources

Add platform resources to board-mx6q_sabresd.c.

#vi arch/arm/mach-mx6/board-mx6q_sabresd.c

```
static struct platform_pwm_backlight_data
mx6_marsboard_pwm3_backlight_data ={
        .pwm_id = 3,
        .max_brightness = 255,
        .dft_brightness = 128,
        .pwm_period_ns = 50000,
};
```

```
static void __init mx6_sabresd_board_init(void){
        imx6q_add_mxc_pwm_backlight(3,&mx6_marsboard_pw
        m3_backlight_data);
}
```

3. Porting LED driver

3.1 Configure the pins

Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file board-mx6q_sabresd.h

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

```
MX6Q_PAD_CSI0_PIXCLK__GPIO_5_18,
MX6Q_PAD_CSI0_VSYNC__GPIO_5_21,
MX6Q_PAD_CSI0_DAT17__GPIO_6_3,
MX6Q_PAD_CSI0_DAT13__GPIO_5_31,
```

3.2 Configure the kernel

Copy the whole source code file /ws_driver to kernel directory drivers/char（led.c driver file included in directory ws_driver），modify Kconfig and Makefile under directory driver/char, add the driver file in file ws_driver to the kernel.

Add below to Kconfig

#vi driver/char/Kconfig

source "drivers/char/ws_driver/Kconfig"

#vi driver/char/Makefile

Add

obj-y += ws_driver/

#make menuconfig

Device Drivers --->

Character devices --->

ws_add_drivers --->

[*] LED support

4. Porting SPI driver

4.1 Configure the pins

Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file board-mx6q_sabresd.h.

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

MX6Q_PAD_EIM_CS0__ECSPI2_SCLK,

MX6Q_PAD_EIM_CS1__ECSPI2_MOSI,

MX6Q_PAD_EIM_OE__ECSPI2_MISO,

MX6Q_PAD_CSI0_DAT11__ECSPI2_SS0 ,

4.2 Add platform resources

1) Add SPI platform resources

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

```
static int mx6q_sabrelite_spi2_cs[] = {
 MX6Q_SABRELITE_ECSPI2_CS1,
};
static const struct spi_imx_master mx6q_sabresd_spi2_data
__initconst = {
            .chipselect = mx6q_marsboard_spi2_cs,
            .num_chipselect = ARRAY_SIZE(mx6q_marsboard_spi2_cs),
};

imx6q_add_ecspi(0, &mx6q_sabrelite_spi2_data);


static struct mtd_partition imx6_sabrelite_spi_nor_partitions[] = {
    {
        .name = "bootloader",
        .offset = 0,
        .size = 0x00100000,
    },
    {
        .name = "kernel",
```

```
        .offset = MTDPART_OFS_APPEND,
        .size = MTDPART_SIZ_FULL,
    },
};
static struct flash_platform_data imx6_sabrelite__spi_flash_data = {
    .name = "spidev",
    .parts = imx6_sabrelite_spi_nor_partitions,
    .nr_parts = ARRAY_SIZE(imx6_sabrelite_spi_nor_partitions),
    .type = "sst25vf016b",
};
static struct spi_board_info imx6_sabrelite_spi_nor_device[]
__initdata = {
    {
        .modalias = "spidev",
        .max_speed_hz = 12000000, /* max spi clock (SCK) speed
in HZ */
        .bus_num = 1,
        .chip_select = 0,
    .platform_data = &imx6_sabrelite__spi_flash_data,
    },
};
```

```
static void spi_device_init(void)
{
    spi_register_board_info(imx6_sabrelite_spi_nor_device,
    ARRAY_SIZE(imx6_sabrelite_spi_nor_device));
}
```

2) Configure the kernel

#make menuconfig

Device Drivers ---->

[*] SPI support ---->

<*> User mode SPI device driver support

3) Add SPI chip select signal driver

ws_driver copied in “Chapter 3.2 Configure the kernel" includes driver source code spi_io.c for SPI chip select sinal.

Execute below in top-level directory of the kernel source code:

#make menuconfig

Device Drivers ---->

Character devices ---->

ws_add_drivers ---->

[*] spi2_cs

5. Porting UART driver

5.1 Add pins configuration

1) Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file board-mx6q_sabresd.h.

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

```
MX6Q_PAD_CSI0_DAT14__UART5_TXD,
MX6Q_PAD_CSI0_DAT15__UART5_RXD,
```

2）Comment out below code in structure static iomux_v3_cfg_t mx6q_sabresd_csi0_sensor_pads[]:

```
    MX6Q_PAD_CSI0_DAT12__IPU1_CSI0_D_12,
    MX6Q_PAD_CSI0_DAT13__IPU1_CSI0_D_13,
    MX6Q_PAD_CSI0_DAT14__IPU1_CSI0_D_14,
    MX6Q_PAD_CSI0_DAT15__IPU1_CSI0_D_15,
    MX6Q_PAD_CSI0_DAT16__IPU1_CSI0_D_16,
    MX6Q_PAD_CSI0_DAT17__IPU1_CSI0_D_17,
```

6. Porting DS18B20

6.1 Add pins configuration

1）ws_driver copied in “Chapter 3.2 Configure the kernel" includes driver source code ds18b20.c.

Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file board-mx6q_sabresd.h.

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

MX6Q_PAD_EIM_D21__GPIO_3_21,

6.2 Configure the kernel

#make menuconfig

Device Drivers --->

Character devices --->

ws_add_drivers --->

[*] DS18B20 support

7. Porting RS485

7.1 Add pins configuration

1）ws_driver copied in “Chapter 3.2 Configure the kernel" includes driver source code RS485.c.

Add the pins initialization configure to structure mx6q_sabresd_cstm_tq_pads in file board-mx6q_sabresd.h.

#vi arch/arm/mach-mx6/board-mx6q_sabresd.h

MX6Q_PAD_CSI0_DAT18__GPIO_6_4,

MX6Q_PAD_CSI0_DAT19__GPIO_6_5,

7.2 Configure the kernel

#make menuconfig

```
Device Drivers    --->
    Character devices    --->
        ws_add_drivers    --->
            [*]    RS485 support
```

8. Porting USB NIC driver

8.1 Add driver source code

1) Copy source code /rtl8192cu to kernel file drivers/net/wireless, modify related file Makefile and Kconfig:

#vi drivers/net/wireless/Makefile

Add

```
obj -$(CONFIG_RTL8192CU)    += rtl8192cu/
```

#vi drivers/net/wireless/Kconfig

Add

```
source "drivers/net/wireless/rtl8192cu/Kconfig"
```

8.2 Configure the kernel

#make menuconfig

```
Device Drivers    --->
```

[*] Network device support --->

[*] Wireless LAN --->

<* > Rtaltex 8192c usb wifi