meta-rz-pmod0-ili9341

yocto meta layer for ili9341 + touch support
Please see the corresponding sections below for details.

Dependencies

The following meta packages are required:

> poky
> meta-renesas
> meta-openembedded

Supported boards:

- Renesas RZFive-EVK [rzfive_vlp_v3.0.2]
- Renesas RZG2L-EVK [rzg_bsp_v3.0.1]
- Renesas RZG2UL-EVK [rzg_bsp_v3.0.1]
- Renesas RZG2VL-EVK [rzv_bsp_v3.0.2]

Patches

To contribute to this layer you should email patches to renesas-rz@renesas.com.
Please send .patch files as email attachments, not embedded in the email body.

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I. Adding the meta-rz-pmod0-ili9341 layer to your build

Run 'bitbake-layers add-layer meta-rz-pmod0-ili9341'
or add the following to the build/conf/bblayers.conf

BBLAYERS += "${TOPDIR}/../meta-rz-pmod0-ili9341 "

In addition please define the basic display rotation and
the display size in the

build/conf/local.conf file

 # supported rotation: 0, 90, 180, 270
 # 0 - long connector line is at the bottom of the display pcb
 # 90 - long connector line is at the left of the display pcb
 # 180 - long connector line is at the top of the display pcb
 # 270 - long connector line is at the right of the display pcb
IS_PMOD0_ILI9341_ROT = "180"

 # supported display size 2.4 or 2.8 inch
IS_PMOD0_ILI9341_SIZE = "2.8"

For disabling the CONSOLE output during start the recommended way is to
find out the available /dev/fb? devices and to map the output to a not existing device:

$ cat /proc/fb

0 fb_ili9341

The addition of the following variable to the u-boot "bootargs" will disable
the console output(device 1 is the first unused device) in our example

fbcon=map:1

Remapping of the console with the "con2fbmap" tool will still be possible.

II. Hardware connectivity

PMOD0		ILI9341 + touch PCB	
1	CS	3	CS
2	MOSI	6, 12	SDI, T_DIN
3	MISO	9, 13	SDO, T_DO
4	SCK	7, 10	SCK, T_CLK
5, 11	GND	2	GND
6, 12	VCC	1, 8	VCC, LED*
7	INT	14	T_IRQ
8	RESET	4	RESET
9	CS2	5	D/C
10	CS3	11	T_CS

VCC - +3.3V
Signal - +3.3V

For a simplified connection of th TFT with the PMOD0 port of the EVK carrier board a
design study is available within this meta package.
PCB-POC for a PMOD to TFT with touch adapter

LED* Some TFT modules have direct LED backlight connection to the LED pin other have a
transistor. As the PMOD0 interface has no functional pin left the PWM is not
implemented.

Note:
EVK PMOD0 VCC should be set to 3.3V.
Please bridge the 5V to 3.3V regulator on the TFT-PCB.
Most boards have a solder point or a jumper for it.

Note:
PMOD0 is of type PMOD 2A(extended SPI) (near to the PCB carrier board corner)

III. Misc

DISPLAY:

ILI9341 display with a XPT2046(or compatible touch controller)
(1x14pin connector, preferred PCB with FET on LED line + regulator)
[LCD WIKI](#) modules with

Resolution: 240 x 320

Size: 2.4 or 2.8 inch

touch device : /dev/input/ts_uinput

display device: /dev/fb0

The basic settings are for the above configuration.

There are different touch panels on the market the predefined
calibration values may fail.
The following steps explains the re-calibration:

$ systemctl stop ts_uinput.service

$ ts_calibrate

$ systemctl start ts_uinput.service

update the **pointercal_<size>.<orientation>** files inside of the
meta-rz-pmod0-ili9341/recipes-common/recipes-graphics/tslib/tslib
directory based on the data in the **/etc/pointercal** directory.
Please update the calibration data for all four orientations. A rotation change
will require an rebuild with adapted IS_PMOD0_ILI9341_ROT entries.

frame buffer device mapping:

EVK	meta-rz-pmod0-ili9341	primary display	ili9341 display
RZG2L	used	/dev/fb1	/dev/fb0
RZV2L	used	/dev/fb1	/dev/fb0
RZG2UL	used	N/A	/dev/fb0
RZFIVE	used	N/A	/dev/fb0

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