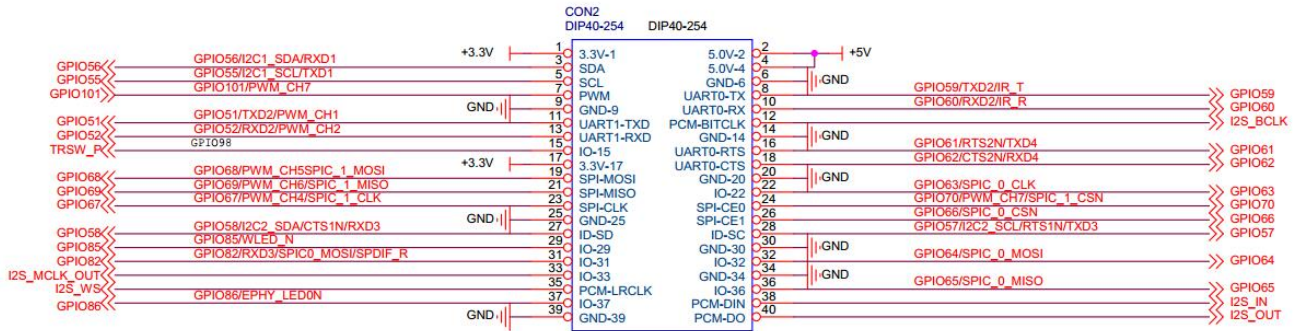








































GPIO

BPI-R2-GPIO

pin-define



2nd function	main function	pin#	xxxxxxxxxxxxxxxxxxxxxxx	pin#	main function	2nd function
	+3V3	1	1  	2	2	+5V
GPIO 56 #	I2C1_SDA	3	3  	4	4	+5V
GPIO 55 #	I2C1_SCL	5	5  	6	6	GND
GPIO101	PWM 7	7	7  	8	8	UART0-TX
	GND	9	9  	10	10	UART0-RX
GPIO 51 #	PWM1 / UART1-TX	11	11  	12	12	
GPIO 52 #	PWM2 / UART1-RX	13	13  	14	14	GND
GPIO 98 #		15	15  	16	16	GPIO 61 #
	+3V3	17	17  	18	18	GPIO 62 #
GPIO 68 #	PWM5 / SPI1 MOSI	19	19  	20	20	GND
			21  	22		
GPIO 69	PWM6 / SPI1 MISO	21	23  	24	22	SPI0 CLK
GPIO 67	PWM4 / SPI1 CLK	23	25  	26	24	SPI1 CS
	GND	25	27  	28	26	SPI0 CS
GPIO 58	I2C2 SDA	27	29  	30	28	I2C2 SCL
GPIO 85		29	31  	32	30	GND
GPIO 82	SPI0 MOSI	31	33  	34	32	SPI0 MOSI
		33	35  	36	34	GND
		35	37  	38	36	SPI0 MISO
GPIO 86		37	39  	40	38	I2S IN
	GND	39			40	I2S OUT

(# verified gpio working, 101 is blocked by pwm)

- uart0 (dts) ⇒ Debug-Uart
- uart1 (dts) ⇒ undefined ⇒ mt7622_uart2_2_tx_rx_pins (59/60)
- uart2 (dts) ⇒ uart1 (gpio) ⇒ mt7622_uart2_1_tx_rx_pins (51/52)

Kernel 4.19

```

root@bpi-iot-ros-ai:~# cat /sys/kernel/debug/pinctrl/10211000.pinctrl-
pinctrl_mt7622/gpio-ranges
GPIO ranges handled:
0: pinctrl_mt7622 GPIOs [409 - 511] PINS [0 - 102]
root@bpi-iot-ros-ai:~# GPIO_NO=$((409+56))
root@bpi-iot-ros-ai:~# echo $GPIO_NO
465
    
```

```

root@bpi-iot-ros-ai:~# echo $GPIO_NO > /sys/class/gpio/export
-bash: echo: write error: Invalid argument => blocked by i2c1

#if i2c1 is disabled in dts:
root@bpi-r64:~# echo $GPIO_NO > /sys/class/gpio/export
root@bpi-r64:~# echo out > /sys/class/gpio/gpio${GPIO_NO}/direction
root@bpi-r64:~# echo 1 > /sys/class/gpio/gpio${GPIO_NO}/value #led goes on
root@bpi-r64:~# echo 0 > /sys/class/gpio/gpio${GPIO_NO}/value #led goes off

```

The sysfs interface (/sys/class/gpio/...) needs kernel-option CONFIG_GPIO_SYSFS

uart

debug-Uart is uart0 in DTS, uart2 seems to be uart1 of gpio header...uart1 is currently not defined in dts.

on-board LEDs

needs LEDS_GPIO [=y]

there is only red and green, red seems not working

```
echo 1 > /sys/class/leds/bpi-r64\:pio\:green/brightness
```

pwm

in linux numbering begins at 0 where on bpi documentation/gpio-header pwms starting at 1...

- pwm1 pin 11 (GPIO 51)
- pwm2 pin 13 (GPIO 52)
- pwm3 fan,inverted - seems not working correctly
- pwm4 pin 23 (GPIO 67)
- pwm5 pin 19 (GPIO 68)
- pwm6 pin 21 (GPIO 69)
- pwm7 pin7 (GPIO101) - seems not working

pwm working except 3 (2) and 7 (6) in my [5.7-pwm branch](#)

```

root@bpi-r64:~# cd /sys/class/pwm/pwmchip0
root@bpi-r64:/sys/class/pwm/pwmchip0# echo 0 > export
root@bpi-r64:/sys/class/pwm/pwmchip0# cd pwm0
root@bpi-r64:/sys/class/pwm/pwmchip0/pwm0# echo 10000 > period
root@bpi-r64:/sys/class/pwm/pwmchip0/pwm0# echo 5000 > duty_cycle
root@bpi-r64:/sys/class/pwm/pwmchip0/pwm0# echo 1 > enable

```

pwm in uboot

pwm-patches from sam are merged in 2020-07, but to use them there is cmd_pwm needed

<http://forum.banana-pi.org/t/bpi-r64-current-u-boot-support/10077/74>

both Available in [2020-04-bpi-pwm branch](#)

here pwm1 (0) is defined in dts

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