

RPI BCM2835 GPIOs

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[Back to RPi_Low-level_peripherals](#)

BCM2835 GPIO functions

This is a wiki-fied copy of Table 6-31 from the BCM2835 datasheet (<http://www.raspberrypi.org/wp-content/uploads/2012/02/BCM2835-ARM-Peripherals.pdf>) including any relevant errata, with a few extra columns, all nicely hyperlinked together and cross-referenced so that clicking on a function name will automatically take you to the description of that function. Any GPIOs that aren't connected on the RaspberryPi Model B revision 2.0 circuit board are ~~crossed out~~, and the GPIOs available on the GPIO Connector (P1) or P5 are in **bold**, with their default function (according to the schematics (http://www.raspberrypi.org/wp-content/uploads/2012/10/Raspberry-Pi-R2.0-Schematics-Issue2.2_027.pdf)) in **bold italics**. (If you want to see how GPIO-pins map back to *actual* pins, see this page). A selection of common circuits for interfacing with the GPIOs is given at [RPI_GPIO_Interface_Circuits](#).

GPIO Pins Alternative Function Assignment

	Bank	Pull	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	RPI Rev2.0 signal name / Rev1.0 if different	RPI Rev2.0 connection / Rev1.0 if different	RPI B+ connection (http://www.raspberrypi.org/content/uploads/2014/04/gpio.png)
GPIO0	0	High	SDA0	SA5	<reserved>				SDA0	S5-14 / P1-03	J8-27 (ID_SD)
GPIO1	0	High	SCL0	SA4	<reserved>				SCL0	S5-13 / P1-05	J8-28 (ID_SC)
GPIO2	0	High	<i>SDA1</i>	SA3	<reserved>				SDA1	P1-03 / S5-14	J8-03
GPIO3	0	High	<i>SCL1</i>	SA2	<reserved>				SCL1	P1-05 / S5-13	J8-05
GPIO4	0	High	<i>GPCLK0</i>	SA1	<reserved>			ARM_TDI	GPIO_GCLK	P1-07	J8-07
GPIO5	0	High	GPCLK1	SA0	<reserved>			ARM_TDO	CAM_CLK	S5-12	J8-29
GPIO6	0	High	GPCLK2	SOE_N / SE	<reserved>			ARM_RTCK	LAN_RUN	IC3-12	J8-31
GPIO7	0	High	<i>SPI0_CE1_N</i>	SWE_N / SRW_N	<reserved>				SPI_CE1_N	P1-26	J8-26
GPIO8	0	High	<i>SPI0_CE0_N</i>	SD0	<reserved>				SPI_CE0_N	P1-24	J8-24
GPIO9	0	Low	<i>SPI0_MISO</i>	SD1	<reserved>				SPI_MISO	P1-21	J8-21
GPIO10	0	Low	<i>SPI0_MOSI</i>	SD2	<reserved>				SPI_MOSI	P1-19	J8-19
GPIO11	0	Low	<i>SPI0_SCLK</i>	SD3	<reserved>				SPI_SCLK	P1-23	J8-23
GPIO12	0	Low	PWM0	SD4	<reserved>			ARM_TMS	nc		J8-32
GPIO13	0	Low	PWM1	SD5	<reserved>			ARM_TCK	nc		J8-33
GPIO14	0	Low	<i>TXD0</i>	SD6	<reserved>			TXD1	TXD0	P1-08	J8-08
GPIO15	0	Low	<i>RXD0</i>	SD7	<reserved>			RXD1	RXD0	P1-10	J8-10
GPIO16	0	Low	<reserved>	SD8	<reserved>	CTS0	SPI1_CE2_N	CTS1	STATUS_LED_N	D5 (ACT LED) / D5 (OK LED)	J8-36
GPIO17	0	Low	<reserved>	SD9	<reserved>	RTS0	SPI1_CE1_N	RTS1	GPIO_GEN0	P1-11	J8-11
GPIO18	0	Low	PCM_CLK	SD10	<reserved>	BSCSL SDA / MOSI	SPI1_CE0_N	PWM0	GPIO_GEN1	P1-12	J8-12
GPIO19	0	Low	PCM_FS	SD11	<reserved>	BSCSL SCL / SCLK	SPI1_MISO	PWM1	nc		J8-35
GPIO20	0	Low	PCM_DIN	SD12	<reserved>	BSCSL / MISO	SPI1_MOSI	GPCLK0	nc		J8-38
GPIO21	0	Low	PCM_DOUT	SD13	<reserved>	BSCSL / CE_N	SPI1_SCLK	GPCLK1	CAM_GPIO / GPIO_GEN2	S5-11 / P1-13	J8-40
GPIO22	0	Low	<reserved>	SD14	<reserved>	SD1_CLK	ARM_TRST		GPIO_GEN3	P1-15	J8-15
GPIO23	0	Low	<reserved>	SD15	<reserved>	SD1_CMD	ARM_RTCK		GPIO_GEN4	P1-16	J8-16
GPIO24	0	Low	<reserved>	SD16	<reserved>	SD1_DAT0	ARM_TDO		GPIO_GEN5	P1-18	J8-18
GPIO25	0	Low	<reserved>	SD17	<reserved>	SD1_DAT1	ARM_TCK		GPIO_GEN6	P1-22	J8-22
GPIO26	0	Low	<reserved>	<reserved>	<reserved>	SD1_DAT2	ARM_TDI		nc		J8-37
GPIO27	0	Low	<reserved>	<reserved>	<reserved>	SD1_DAT3	ARM_TMS		GPIO_GEN2 / CAM_GPIO	P1-13 / S5-11	J8-13
GPIO28	1	-	SDA0	SA5	PCM_CLK	<reserved>			GPIO_GEN7 / CONFIG0	P5-03 / R10 or R8	
GPIO29	1	-	SCL0	SA4	PCM_FS	<reserved>			GPIO_GEN8 / CONFIG1	P5-04 / R9 or R7	
									GPIO_GEN9 /	P5-05 / R6	

GPIO30	1	Low	<reserved>	SA3	PCM_DIN	CTS0		CTS1	CONFIG2	or R4	
GPIO31	1	Low	<reserved>	SA2	PCM_DOUT	RTS0		RTS1	GPIO_GEN10 / CONFIG3	P5-06 / R5 or R3	
GPIO32	1	Low	GPCLK0	SA1	<reserved>	TXD0		TXD1	nc		
GPIO33	1	Low	<reserved>	SA0	<reserved>	RXD0		RXD1	nc		
GPIO34	1	High	GPCLK0	SOE_N / SE	<reserved>	<reserved>			nc		
GPIO35	1	High	SPI0_CE1_N	SWE_N / SRW_N		<reserved>			nc		
GPIO36	1	High	SPI0_CE0_N	SD0	TXD0	<reserved>			nc		
GPIO37	1	Low	SPI0_MISO	SD1	RXD0	<reserved>			nc		
GPIO38	1	Low	SPI0_MOSI	SD2	RTS0	<reserved>			nc		
GPIO39	1	Low	SPI0_SCLK	SD3	CTS0	<reserved>			nc		
GPIO40	1	Low	PWM0	SD4		<reserved>	SPI2_MISO	TXD1	PWM0_OUT	R21	
GPIO41	1	Low	PWM1	SD5	<reserved>	<reserved>	SPI2_MOSI	RXD1	nc		
GPIO42	1	Low	GPCLK1	SD6	<reserved>	<reserved>	SPI2_SCLK	RTS1	nc		
GPIO43	1	Low	GPCLK2	SD7	<reserved>	<reserved>	SPI2_CE0_N	CTS1	nc		
GPIO44	1	-	GPCLK1	SDA0	SDA1	<reserved>	SPI2_CE1_N		nc		
GPIO45	1	-	PWM1	SCL0	SCL1	<reserved>	SPI2_CE2_N		PWM1_OUT	R27	
GPIO46	2	High				<internal>			HDMI_HPD_P	IC1-6	
GPIO47	2	High				<internal>			SD_CARD_DET	S8-10	
GPIO48	2	High				<internal>			SD_CLK_R	R48	
GPIO49	2	High				<internal>			SD_CMD_R	R47	
GPIO50	2	High				<internal>			SD_DATA0_R	R49	
GPIO51	2	High				<internal>			SD_DATA1_R	R50	
GPIO52	2	High				<internal>			SD_DATA2_R	R45	
GPIO53	2	High				<internal>			SD_DATA3_R	R46	
	Bank	Pull	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	RPi Rev2.0 signal name / Rev1.0 if different	RPi Rev2.0 connection / Rev1.0 if different	RPi B+ connection (http://www.raspberrypi.org/content/uploads/2014/04/gpio.png)

As in the table above, the GPIOs available on the GPIO Connector (P1) or P5 are in **bold**, with their default function (according to the schematics (http://www.raspberrypi.org/wp-content/uploads/2012/10/Raspberry-Pi-R2.0-Schematics-Issue2.2_027.pdf)) in **bold italics**.

Special function legend:

Name	Function	Datasheet section	GPIOs	DeviceTree (http://www.raspberrypi.org/documentation/configuration/pin-configuration.md) 'function'
SDA0	BSC master 0 data line	BSC	GPIO0 GPIO28 GPIO44	i2c0
SCL0	BSC master 0 clock line	BSC	GPIO1 GPIO29 GPIO45	i2c0
SDA1	BSC master 1 data line	BSC	GPIO2 GPIO44	i2c1
SCL1	BSC master 1 clock line	BSC	GPIO3 GPIO45	i2c1
GPCLK0	General purpose Clock 0	<TBD>	GPIO4 GPIO20 GPIO32 GPIO34	gp_clk
GPCLK1	General purpose Clock 1	<TBD>	GPIO5 GPIO21 GPIO42 GPIO44	gp_clk
GPCLK2	General purpose Clock 2	<TBD>	GPIO6 GPIO43	gp_clk
SPI0_CE1_N	SPI0 Chip select 1	SPI	GPIO7 GPIO35	spi
SPI0_CE0_N	SPI0 Chip select 0	SPI	GPIO8 GPIO36	spi
SPI0_MISO	SPI0 MISO	SPI	GPIO9 GPIO37	spi
SPI0_MOSI	SPI0 MOSI	SPI	GPIO10 GPIO38	spi
SPI0_SCLK	SPI0 Serial clock	SPI	GPIO11 GPIO39	spi
PWMx	Pulse Width Modulator 0..1	Pulse Width Modulator	PWM0: GPIO12 GPIO18 GPIO40 PWM1: GPIO13 GPIO19 GPIO41 GPIO45	pwm
TXD0	UART 0 Transmit Data	UART	GPIO14 GPIO32 GPIO36	uart0
RXD0	UART 0 Receive Data	UART	GPIO15 GPIO33 GPIO37	uart0
CTS0	UART 0 Clear To Send	UART	GPIO16 GPIO30 GPIO39	uart0
RTS0	UART 0 Request To Send	UART	GPIO17 GPIO31 GPIO38	uart0

PCM_CLK	PCM clock	PCM Audio	GPIO18 GPIO28	pcm
PCM_FS	PCM Frame Sync	PCM Audio	GPIO19 GPIO29	pcm
PCM_DIN	PCM Data in	PCM Audio	GPIO20 GPIO30	pcm
PCM_DOUT	PCM data out	PCM Audio	GPIO21 GPIO31	pcm
SAX	Secondary mem Address bus	Secondary Memory Interface	many	smi
SOE_N / SE	Secondary mem. Controls	Secondary Memory Interface	GPIO6 GPIO34	smi
SWE_N / SRW_N	Secondary mem. Controls	Secondary Memory Interface	GPIO7 GPIO35	smi
SDx	Secondary mem. data bus	Secondary Memory Interface	many	smi
BSCSL SDA / MOSI	BSC slave Data, SPI slave MOSI	BSC/SPI slave	GPIO18	spi_slave
BSCSL SCL / SCLK	BSC slave Clock, SPI slave clock	BSC/SPI slave	GPIO19	spi_slave
BSCSL - / MISO	BSC <not used>, SPI MISO	BSC/SPI slave	GPIO20	spi_slave
BSCSL - / CE_N	BSC <not used>, SPI CSn	BSC/SPI slave	GPIO21	spi_slave
SPI1_CEx_N	SPI1 Chip select 0-2	Auxiliary I/O	SPI1_CE0_N: GPIO18 SPI1_CE1_N: GPIO17 SPI1_CE2_N: GPIO16	spi1
SPI1_MISO	SPI1 MISO	Auxiliary I/O	GPIO19	spi1
SPI1_MOSI	SPI1 MOSI	Auxiliary I/O	GPIO20	spi1
SPI1_SCLK	SPI1 Serial clock	Auxiliary I/O	GPIO21	spi1
TXD1	UART 1 Transmit Data	Auxiliary I/O	GPIO14 GPIO32 GPIO40	uart1
RXD1	UART 1 Receive Data	Auxiliary I/O	GPIO15 GPIO33 GPIO41	uart1
CTS1	UART 1 Clear To Send	Auxiliary I/O	GPIO16 GPIO30 GPIO43	uart1
RTS1	UART 1 Request To Send	Auxiliary I/O	GPIO17 GPIO31 GPIO42	uart1
SPI2_CEx_N	SPI2 Chip select 0-2	Auxiliary I/O	SPI2_CE0_N: GPIO43 SPI2_CE1_N: GPIO44 SPI2_CE2_N: GPIO45	spi2
SPI2_MISO	SPI2 MISO	Auxiliary I/O	GPIO40	spi2
SPI2_MOSI	SPI2 MOSI	Auxiliary I/O	GPIO41	spi2
SPI2_SCLK	SPI2 Serial clock	Auxiliary I/O	GPIO42	spi2
ARM_TRST	ARM JTAG reset	<TBD>	GPIO22	arm_jtag
ARM_RTCK	ARM JTAG return clock	<TBD>	GPIO6 GPIO23	arm_jtag
ARM_TDO	ARM JTAG Data out	<TBD>	GPIO4 GPIO24	arm_jtag
ARM_TCK	ARM JTAG Clock	<TBD>	GPIO13 GPIO25	arm_jtag
ARM_TDI	ARM JTAG Data in	<TBD>	GPIO4 GPIO26	arm_jtag
ARM_TMS	ARM JTAG Mode select	<TBD>	GPIO12 GPIO27	arm_jtag
Name	Function	Datasheet section	GPIOs	DeviceTree (http://www.raspberrypi.org/documentation/configuration/pin-configuration.md) 'function'

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