2. Device overview

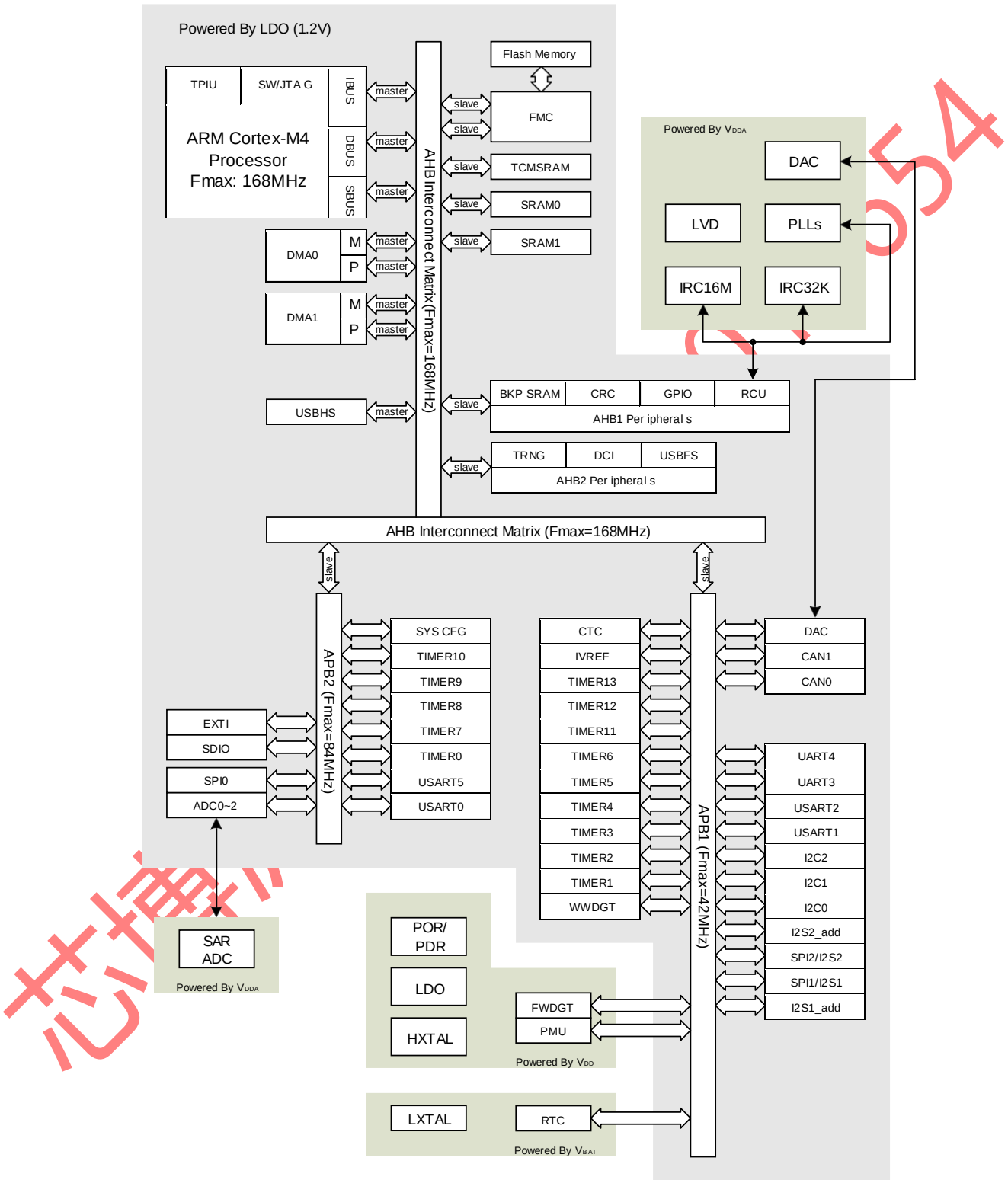
2.1. Device information

Table 2-1. GD32F405xx devices features and peripheral list

Part Number		GD32F405xx								
		RE	RG	RK	VG	VK	VG	VK	ZG	ZK
Flash	Code area (KB)	512	512	512	512	512	512	512	512	512
	Data area (KB)	0	512	2560	512	2560	512	2560	512	2560
	Total (KB)	512	1024	3072	1024	3072	1024	3072	1024	3072
SRAM (KB)		192	192	192	192	192	192	192	192	192
Timers	General timer(16-bit)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)	8 (2-3,8-13)
	General timer (32-bit)	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)	2 (1,4)
	Advanced timer(16-bit)	2 (0,7)	2 (0,7)	2 (0,7)	2 (0,7)	2 (0,7)	2 (0,7)	2 (0,7)	2 (0,7)	2 (0,7)
	Basic timer(16-bit)	2 (5,6)	2 (5,6)	2 (5,6)	2 (5,6)	2 (5,6)	2 (5,6)	2 (5,6)	2 (5,6)	2 (5,6)
	SysTick	1	1	1	1	1	1	1	1	1
	Watchdog	2	2	2	2	2	2	2	2	2
	RTC	1	1	1	1	1	1	1	1	1
Connectivity	USART	4	4	4	4	4	4	4	4	4
	UART	2	2	2	2	2	2	2	2	2
	I2C	3	3	3	3	3	3	3	3	3
	SPI/I2S	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)	3/2 (0-2)/(1-2)
	SDIO	1	1	1	1	1	1	1	1	1
	CAN	2	2	2	2	2	2	2	2	2
	USB	FS+HS	FS+HS	FS+HS	FS+HS	FS+HS	FS+HS	FS+HS	FS+HS	FS+HS
	DCI	1	1	1	1	1	1	1	1	1
GPIO		51	51	51	82	82	82	82	114	114
ADC(CHs)		3(16)	3(16)	3(16)	3(16)	3(16)	3(16)	3(16)	3(24)	3(24)
DAC		2	2	2	2	2	2	2	2	2
Package		LQFP64			LQFP100		BGA100		LQFP144	

2.2. Block diagram

Figure 2-1. GD32F405xx block diagram



2.3. Pinouts and pin assignment

Figure 2-2. GD32F405Vx BGA100 pinouts

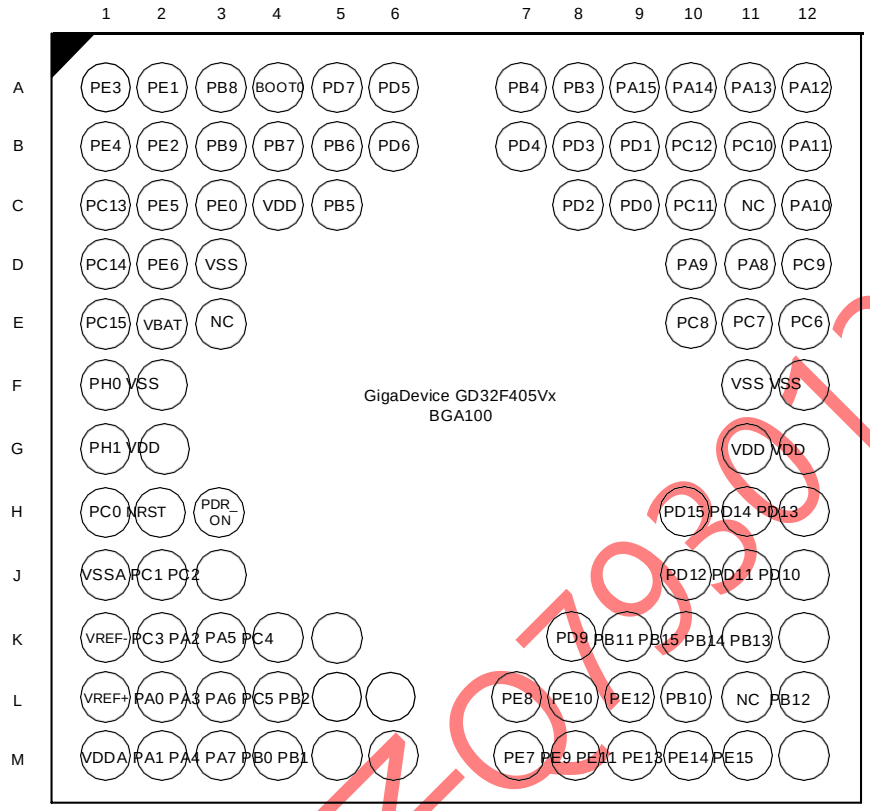


Figure 2-3. GD32F405Zx LQFP144 pinouts

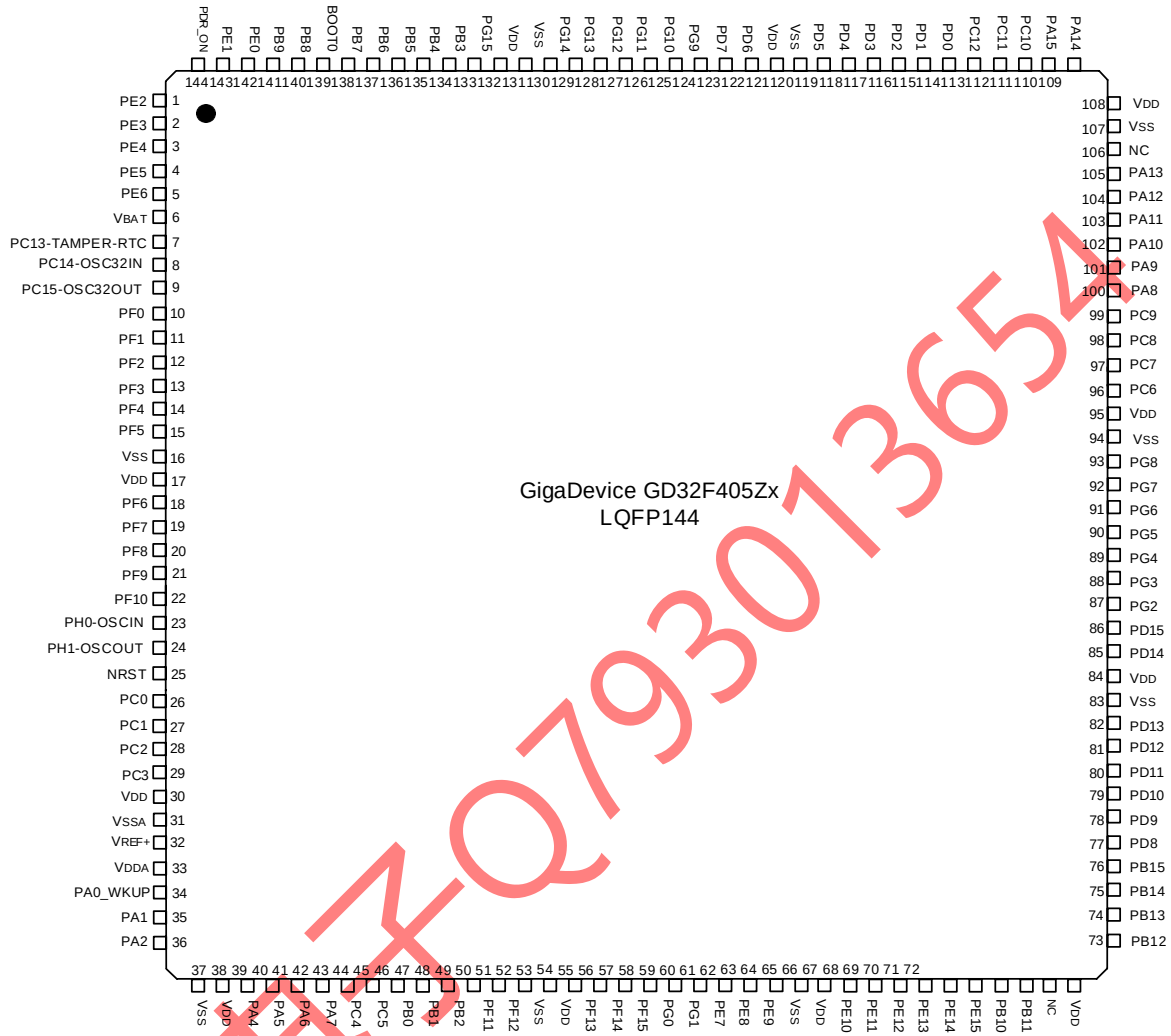


Figure 2-4. GD32F405Vx LQFP100 pinouts

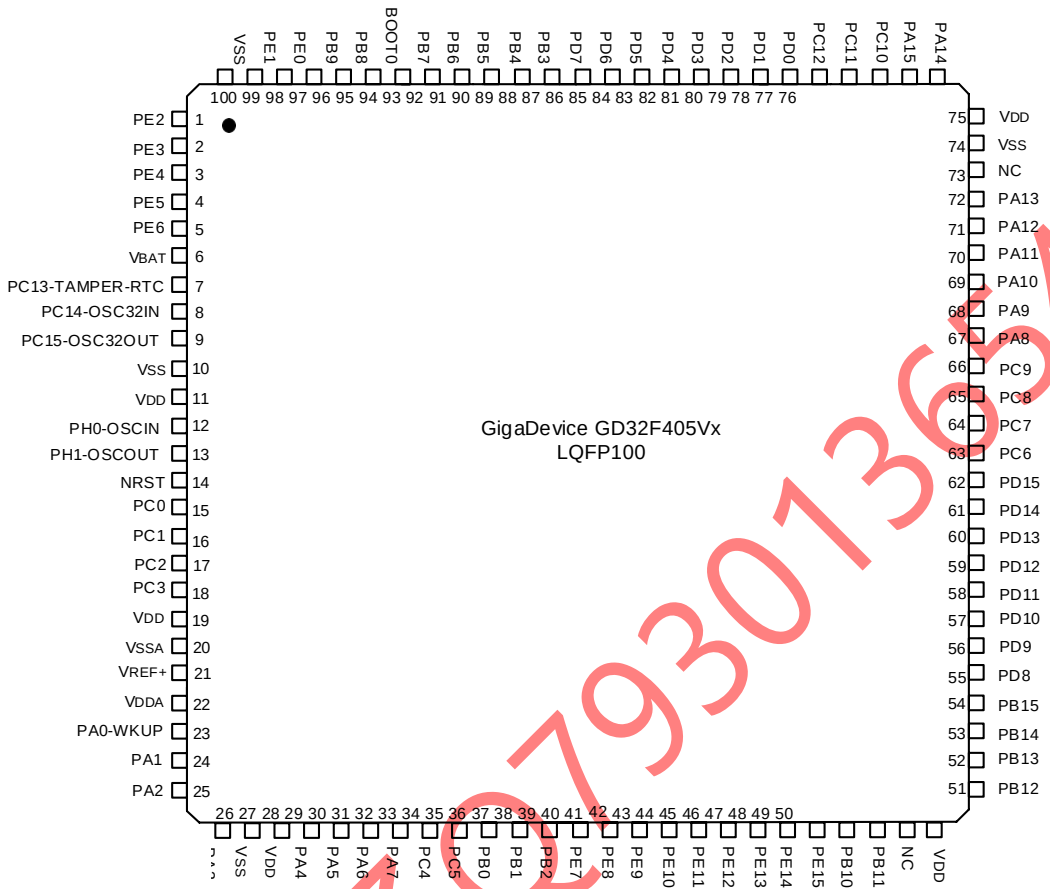
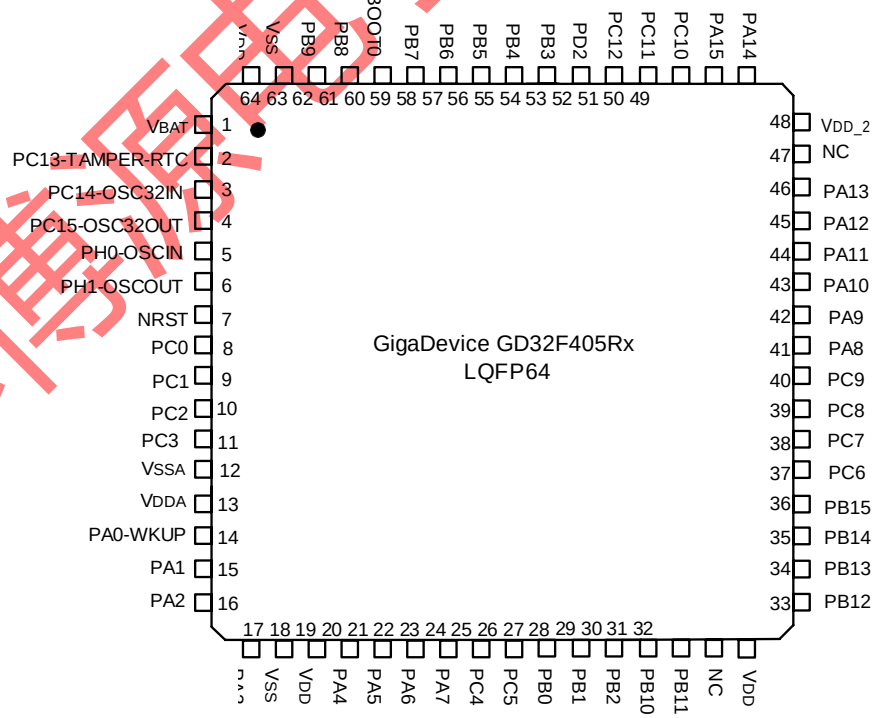


Figure 2-5. GD32F405Rx LQFP64 pinouts



2.4. Memory map

Table 2-2. GD32F405xx memory map

Pre-defined Regions	Bus	Address	Peripherals
External Device	AHB	0xC000 0000 - 0xDFFF FFFF	Reserved
		0xA000 1000 - 0xBFFF FFFF	Reserved
		0xA000 0000 - 0xA000 0FFF	Reserved
External RAM		0x9000 0000 - 0x9FFF FFFF	Reserved
		0x7000 0000 - 0x8FFF FFFF	Reserved
		0x6000 0000 - 0x6FFF FFFF	Reserved
Peripheral	AHB2	0x5006 0C00 - 0x5FFF FFFF	Reserved
		0x5006 0800 - 0x5006 0BFF	TRNG
		0x5005 0400 - 0x5006 07FF	Reserved
		0x5005 0000 - 0x5005 03FF	DCI
		0x5004 0000 - 0x5004 FFFF	Reserved
		0x5000 0000 - 0x5003 FFFF	USBFS
	AHB1	0x4008 0000 - 0x4FFF FFFF	Reserved
		0x4004 0000 - 0x4007 FFFF	USBHS
		0x4002 BC00 - 0x4003 FFFF	Reserved
		0x4002 B000 - 0x4002 BBFF	Reserved
		0x4002 A000 - 0x4002 AFFF	Reserved
		0x4002 8000 - 0x4002 9FFF	Reserved
		0x4002 6800 - 0x4002 7FFF	Reserved
		0x4002 6400 - 0x4002 67FF	DMA1
		0x4002 6000 - 0x4002 63FF	DMA0
		0x4002 5000 - 0x4002 5FFF	Reserved
		0x4002 4000 - 0x4002 4FFF	BKP SRAM
		0x4002 3C00 - 0x4002 3FFF	FMC
		0x4002 3800 - 0x4002 3BFF	RCU
		0x4002 3400 - 0x4002 37FF	Reserved
		0x4002 3000 - 0x4002 33FF	CRC
		0x4002 2400 - 0x4002 2FFF	Reserved
		0x4002 2000 - 0x4002 23FF	GPIOI
		0x4002 1C00 - 0x4002 1FFF	GPIOH
		0x4002 1800 - 0x4002 1BFF	GPIOG
		0x4002 1400 - 0x4002 17FF	GPIOF
		0x4002 1000 - 0x4002 13FF	GPIOE
		0x4002 0C00 - 0x4002 0FFF	GPIOD
		0x4002 0800 - 0x4002 0BFF	GPIOC
		0x4002 0400 - 0x4002 07FF	GPIOB
		0x4002 0000 - 0x4002 03FF	GPIOA

Pre-defined Regions	Bus	Address	Peripherals
	APB2	0x4001 6C00 - 0x4001 FFFF	Reserved
		0x4001 6800 - 0x4001 6BFF	Reserved
		0x4001 5800 - 0x4001 67FF	Reserved
		0x4001 5400 - 0x4001 57FF	Reserved
		0x4001 5000 - 0x4001 53FF	Reserved
		0x4001 4C00 - 0x4001 4FFF	Reserved
		0x4001 4800 - 0x4001 4BFF	TIMER10
		0x4001 4400 - 0x4001 47FF	TIMER9
		0x4001 4000 - 0x4001 43FF	TIMER8
		0x4001 3C00 - 0x4001 3FFF	EXTI
		0x4001 3800 - 0x4001 3BFF	SYSCFG
		0x4001 3400 - 0x4001 37FF	Reserved
		0x4001 3000 - 0x4001 33FF	SPI0
		0x4001 2C00 - 0x4001 2FFF	SDIO
		0x4001 2400 - 0x4001 2BFF	Reserved
		0x4001 2300 - 0x4001 23FF	ADC0(1)
		0x4001 2200 - 0x4001 22FF	ADC2
		0x4001 2100 - 0x4001 21FF	ADC1
		0x4001 2000 - 0x4001 20FF	ADC0
		0x4001 1800 - 0x4001 1FFF	Reserved
		0x4001 1400 - 0x4001 17FF	USART5
		0x4001 1000 - 0x4001 13FF	USART0
		0x4001 0800 - 0x4001 0FFF	Reserved
		0x4001 0400 - 0x4001 07FF	TIMER7
		0x4001 0000 - 0x4001 03FF	TIMER0
	APB1	0x4000 C800 - 0x4000 FFFF	Reserved
		0x4000 C400 - 0x4000 C7FF	IREF
		0x4000 8000 - 0x4000 C3FF	Reserved
		0x4000 7C00 - 0x4000 7FFF	Reserved
		0x4000 7800 - 0x4000 7BFF	Reserved
		0x4000 7400 - 0x4000 77FF	DAC
		0x4000 7000 - 0x4000 73FF	PMU
		0x4000 6C00 - 0x4000 6FFF	CTC
		0x4000 6800 - 0x4000 6BFF	CAN1
		0x4000 6400 - 0x4000 67FF	CAN0
		0x4000 6000 - 0x4000 63FF	Reserved
		0x4000 5C00 - 0x4000 5FFF	I2C2
		0x4000 5800 - 0x4000 5BFF	I2C1
		0x4000 5400 - 0x4000 57FF	I2C0
		0x4000 5000 - 0x4000 53FF	UART4
		0x4000 4C00 - 0x4000 4FFF	UART3

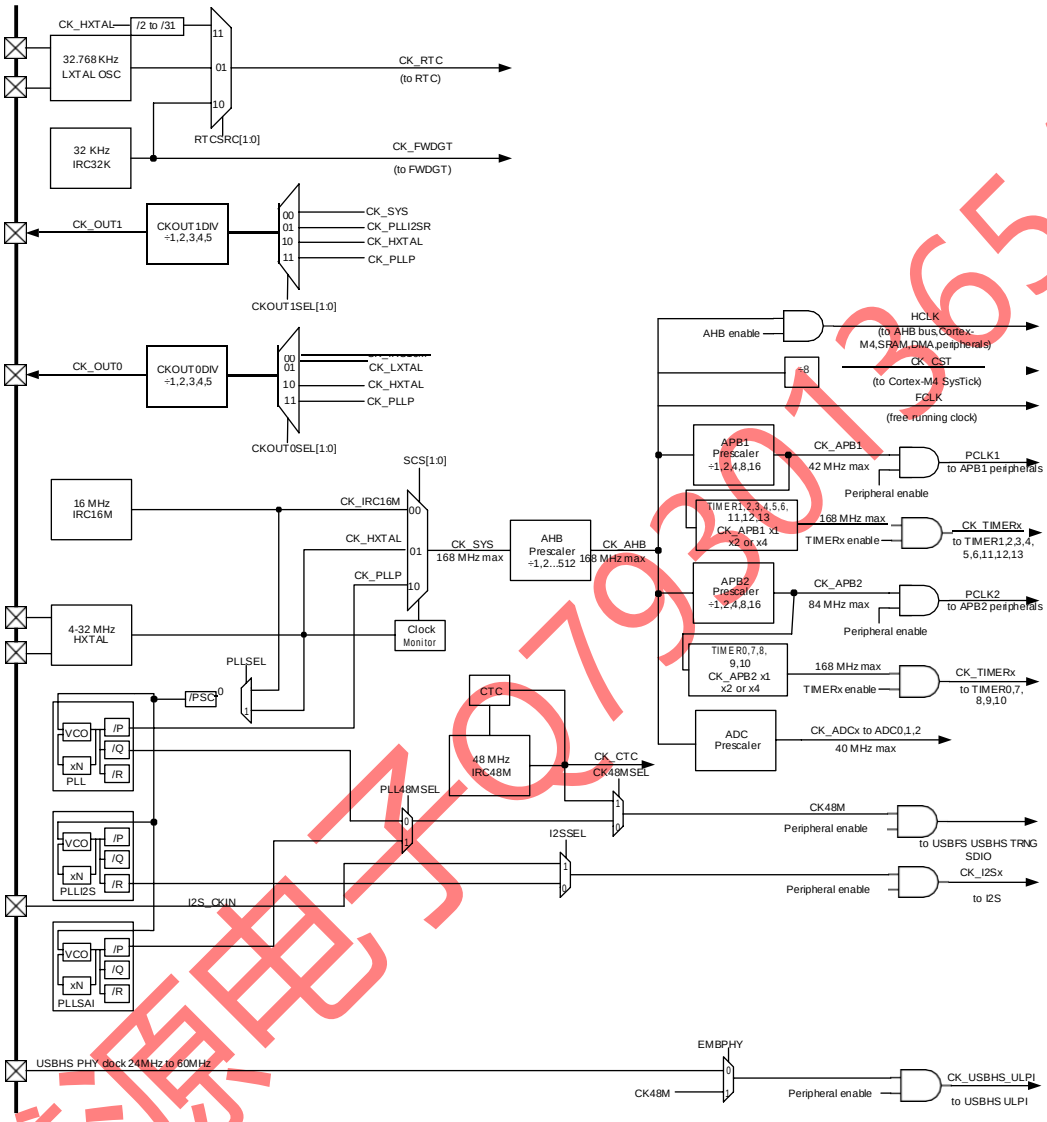
Pre-defined Regions	Bus	Address	Peripherals
		0x4000 4800 - 0x4000 4BFF	USART2
		0x4000 4400 - 0x4000 47FF	USART1
		0x4000 4000 - 0x4000 43FF	I2S2_add
		0x4000 3C00 - 0x4000 3FFF	SPI2/I2S2
		0x4000 3800 - 0x4000 3BFF	SPI1/I2S1
		0x4000 3400 - 0x4000 37FF	I2S1_add
		0x4000 3000 - 0x4000 33FF	FWDGT
		0x4000 2C00 - 0x4000 2FFF	WWDGT
		0x4000 2800 - 0x4000 2BFF	RTC
		0x4000 2400 - 0x4000 27FF	Reserved
		0x4000 2000 - 0x4000 23FF	TIMER13
		0x4000 1C00 - 0x4000 1FFF	TIMER12
		0x4000 1800 - 0x4000 1BFF	TIMER11
		0x4000 1400 - 0x4000 17FF	TIMER6
		0x4000 1000 - 0x4000 13FF	TIMER5
		0x4000 0C00 - 0x4000 0FFF	TIMER4
		0x4000 0800 - 0x4000 0BFF	TIMER3
		0x4000 0400 - 0x4000 07FF	TIMER2
		0x4000 0000 - 0x4000 03FF	TIMER1
SRAM	AHB	0x2007 0000 - 0x3FFF FFFF	Reserved
		0x2003 0000 - 0x2006 FFFF	Reserved
		0x2002 0000 - 0x2002 FFFF	Reserved
		0x2001 C000 - 0x2001 FFFF	SRAM1(16KB)
		0x2000 0000 - 0x2001 BFFF	SRAM0(112KB)
Code	AHB	0x1FFF C010 - 0x1FFF FFFF	Reserved
		0x1FFF C000 - 0x1FFF C00F	Option bytes(Bank 0)
		0x1FFF 7A10 - 0x1FFF BFFF	Reserved
		0x1FFF 7800 - 0x1FFF 7A0F	Reserved
		0x1FFF 0000 - 0x1FFF 77FF	Boot loader(30KB)
		0x1FFE C010 - 0x1FFE FFFF	Reserved
		0x1FFE C000 - 0x1FFE C00F	Option bytes(Bank 1)
		0x1001 0000 - 0x1FFE BFFF	Reserved
		0x1000 0000 - 0x1000 FFFF	TCMSRAM(64KB)
		0x0830 0000 - 0x0FFF FFFF	Reserved
		0x0800 0000 - 0x082F FFFF	Main Flash(3072KB)
		0x0000 0000 - 0x07FF FFFF	Aliased to the boot device

Note:

(1) ADC_SSTAT, ADC_SYNCCTL, ADC_SYNCDATA based on base address of ADC0.

2.5. Clock tree

Figure 2-6. GD32F405xx clock tree



Legend:

HXTAL: High speed crystal oscillator

LXTAL: Low speed crystal oscillator

IRC16M: Internal 16M RC oscillators

IRC32K: Internal 32K RC oscillator

IRC48M: Internal 48M RC oscillators

2.6. Pin definitions

2.6.1. GD32F405Zx LQFP144 pin definitions

Table 2-3. GD32F405Zx LQFP144 pin definitions

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PE2	1	I/O	5VT	Default: PE2 Alternate: TRACECK, EVENTOUT
PE3	2	I/O	5VT	Default: PE3 Alternate:TRACED0, EVENTOUT
PE4	3	I/O	5VT	Default: PE4 Alternate:TRACED1, DCI_D4, EVENTOUT
PE5	4	I/O	5VT	Default: PE5 Alternate:TRACED2,TIMER8_CH0, DCI_D6, EVENTOUT
PE6	5	I/O	5VT	Default: PE6 Alternate:TRACED3,TIMER8_CH1, DCI_D7, EVENTOUT
V_{BAT}	6	P	-	Default: V_{BAT}
PC13-TAMPER-RTC	7	I/O	5VT	Default: PC13 Alternate: EVENTOUT Additional: RTC_TAMP0, RTC_OUT, RTC_TS
PC14-OSC32IN	8	I/O	5VT	Default: PC14 Alternate: EVENTOUT Additional: OSC32IN
PC15-OSC32OUT	9	I/O	5VT	Default: PC15 Alternate: EVENTOUT Additional: OSC32OUT
PF0	10	I/O	5VT	Default: PF0 Alternate:I2C1_SDA, EVENTOUT, CTC_SYNC
PF1	11	I/O	5VT	Default: PF1 Alternate: I2C1_SCL, EVENTOUT
PF2	12	I/O	5VT	Default: PF2 Alternate: I2C1_SMBA, EVENTOUT
PF3	13	I/O	5VT	Default: PF3 Alternate: EVENTOUT, I2C1_TXFRAME Additional: ADC2_IN9
PF4	14	I/O	5VT	Default: PF4 Alternate: EVENTOUT Additional: ADC2_IN14
PF5	15	I/O	5VT	Default: PF5 Alternate: EVENTOUT Additional: ADC2_IN15
V_{SS}	16	P	-	Default: V_{SS}

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
V_{DD}	17	P	-	Default: V_{DD}
PF6	18	I/O	5VT	Default: PF6 Alternate:TIMER9_CH0, EVENTOUT Additional: ADC2_IN4
PF7	19	I/O	5VT	Default: PF7 Alternate:TIMER10_CH0, EVENTOUT Additional: ADC2_IN5
PF8	20	I/O	5VT	Default: PF8 Alternate: TIMER12_CH0, EVENTOUT Additional: ADC2_IN6
PF9	21	I/O	5VT	Default: PF9 Alternate: TIMER13_CH0, EVENTOUT Additional: ADC2_IN7
PF10	22	I/O	5VT	Default: PF10 Alternate: DCI_D11, EVENTOUT Additional: ADC2_IN8
PH0	23	I/O	5VT	Default: PH0, OSCIN Alternate: EVENTOUT Additional: OSCIN
PH1	24	I/O	5VT	Default: PH1, OSCOUT Alternate: EVENTOUT Additional: OSCOUT
NRST	25	-	-	Default: NRST
PC0	26	I/O	5VT	Default: PC0 Alternate: USBHS_ULPI_STP, EVENTOUT Additional: ADC012_IN10
PC1	27	I/O	5VT	Default: PC1 Alternate:SPI2_MOSI, I2S2_SD, SPI1_MOSI, I2S1_SD, EVENTOUT Additional: ADC012_IN11
PC2	28	I/O	5VT	Default: PC2 Alternate:SPI1_MISO,I2S1_ADD_SD,USBHS_ULPI_DIR, EVENTOUT Additional: ADC012_IN12
PC3	29	I/O	5VT	Default: PC3 Alternate:SPI1_MOSI,I2S1_SD,USBHS_ULPI_NXT, EVENTOUT Additional: ADC012_IN13
V_{DD}	30	P	-	Default: V_{DD}
V_{SSA}	31	P	-	Default: V_{SSA}
V_{REFP}	32	P	-	Default: V_{REF+}
V_{DDA}	33	P	-	Default: V_{DDA}

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PA0-WKUP	34	I/O	5VT	Default: PA0 Alternate:TIMER1_CH0,TIMER1_ETI,TIMER4_CH0, TIMER7_ETI,USART1_CTS, UART3_TX, EVENTOUT Additional: ADC012_IN0, WKUP
PA1	35	I/O	5VT	Default: PA1 Alternate:TIMER1_CH1, TIMER4_CH1, USART1_RTS, UART3_RX, EVENTOUT Additional: ADC012_IN1
PA2	36	I/O	5VT	Default: PA2 Alternate:TIMER1_CH2,TIMER4_CH2,TIMER8_CH0, I2S_CKIN, USART1_TX, EVENTOUT Additional: ADC012_IN2
PA3	37	I/O	5VT	Default: PA3 Alternate:TIMER1_CH3,TIMER4_CH3,TIMER8_CH1, I2S1_MCK,USART1_RX,USBHS_ULPI_D0, EVENTOUT Additional: ADC012_IN3
V_{SS}	38	P	-	Default: V_{SS}
V_{DD}	39	P	-	Default: V_{DD}
PA4	40	I/O		Default: PA4 Alternate:SPI0_NSS,SPI2_NSS, I2S2_WS, USART1_CK, USBHS_SOF, DCI_HSYNC, EVENTOUT Additional: ADC01_IN4, DAC_OUT0
PA5	41	I/O		Default: PA5 Alternate:TIMER1_CH0,TIMER1_ETI, TIMER7_CH0_ON, SPI0_SCK, USBHS_ULPI_CK, EVENTOUT Additional: ADC01_IN5, DAC_OUT1
PA6	42	I/O	5VT	Default: PA6 Alternate:TIMER0_BRKIN,TIMER2_CH0,TIMER7_BRKIN,SPI0 _MISO, I2S1_MCK, TIMER12_CH0, SDIO_CMD, DCI_PIXCLK, EVENTOUT Additional: ADC01_IN6
PA7	43	I/O	5VT	Default: PA7 Alternate:TIMER0_CH0_ON,TIMER2_CH1, TIMER7_CH0_ON,SPI0_MOSI,TIMER13_CH0, EVENTOUT Additional: ADC01_IN7
PC4	44	I/O	5VT	Default: PC4 Alternate: EVENTOUT Additional: ADC01_IN14
PC5	45	I/O	5VT	Default: PC5 Alternate:USART2_RX, EVENTOUT Additional: ADC01_IN15
PB0	46	I/O	5VT	Default: PB0

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate:TIMER0_CH1_ON,TIMER2_CH2,TIMER7_CH1_ON, SPI2_MOSI,I2S2_SD,USBHS_ULPI_D1, SDIO_D1, EVENTOUT Additional: ADC01_IN8, IREF
PB1	47	I/O	5VT	Default: PB1 Alternate:TIMER0_CH2_ON,TIMER2_CH3,TIMER7_CH2_ON, USBHS_ULPI_D2, SDIO_D2, EVENTOUT Additional: ADC01_IN9
PB2	48	I/O	5VT	Default: PB2, BOOT1 Alternate:TIMER1_CH3,SPI2_MOSI,I2S2_SD,USBHS_ULPI_D4, SDIO_CK, EVENTOUT
PF11	49	I/O	5VT	Default: PF11 Alternate: DCI_D12, EVENTOUT
PF12	50	I/O	5VT	Default: PF12 Alternate: EVENTOUT
V_{SS}	51	P	-	Default: V_{SS}
V_{DD}	52	P	-	Default: V_{DD}
PF13	53	I/O	5VT	Default: PF13 Alternate: EVENTOUT
PF14	54	I/O	5VT	Default: PF14 Alternate: EVENTOUT
PF15	55	I/O	5VT	Default: PF15 Alternate: EVENTOUT
PG0	56	I/O	5VT	Default: PG0 Alternate: EVENTOUT
PG1	57	I/O	5VT	Default: PG1 Alternate: EVENTOUT
PE7	58	I/O	5VT	Default: PE7 Alternate: TIMER0_ETI, EVENTOUT
PE8	59	I/O	5VT	Default: PE8 Alternate: TIMER0_CH0_ON, EVENTOUT
PE9	60	I/O	5VT	Default: PE9 Alternate: TIMER0_CH0, EVENTOUT
V_{SS}	61	P	-	Default: V_{SS}
V_{DD}	62	P	-	Default: V_{DD}
PE10	63	I/O	5VT	Default: PE10 Alternate: TIMER0_CH1_ON, EVENTOUT
PE11	64	I/O	5VT	Default: PE11 Alternate:TIMER0_CH1, EVENTOUT
PE12	65	I/O	5VT	Default: PE12 Alternate:TIMER0_CH2_ON, EVENTOUT
PE13	66	I/O	5VT	Default: PE13

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate:TIMER0_CH2, EVENTOUT
PE14	67	I/O	5VT	Default: PE14 Alternate:TIMER0_CH3, EVENTOUT
PE15	68	I/O	5VT	Default: PE15 Alternate: TIMER0_BRKIN, EVENTOUT
PB10	69	I/O	5VT	Default: PB10 Alternate: TIMER1_CH2,I2C1_SCL, SPI1_SCK, I2S1_CK, I2S2_MCK, USART2_TX, USBHS_ULPI_D3, SDIO_D7, EVENTOUT
PB11	70	I/O	5VT	Default: PB11 Alternate:TIMER1_CH3,I2C1_SDA,I2S_CKIN,USART2_RX,USBHS_ULPI_D4, EVENTOUT
NC	71	P	-	Default: V_{CORE}
V_{DD}	72	P	-	Default: V_{DD}
PB12	73	I/O	5VT	Default: PB12 Alternate:TIMER0_BRKIN,I2C1_SMBA,SPI1_NSS, I2S1_WS, USART2_CK, CAN1_RX, USBHS_ULPI_D5, USBHS_ID, EVENTOUT
PB13	74	I/O	5VT	Default: PB13 Alternate:TIMER0_CH0_ON,SPI1_SCK,I2S1_CK, USART2_CTS,CAN1_TX,USBHS_ULPI_D6, EVENTOUT, I2C1_TXFRAME Additional: USBHS_VBUS
PB14	75	I/O	5VT	Default: PB14 Alternate:TIMER0_CH1_ON,TIMER7_CH1_ON,SPI1_MISO,I2S1_ADD_SD,USART2_RTS,TIMER11_CH0,USBHS_DM, EVENTOUT
PB15	76	I/O	5VT	Default: PB15 Alternate: RTC_REFIN, TIMER0_CH2_ON, TIMER7_CH2_ON, SPI1_MOSI, I2S1_SD, TIMER11_CH1, USBHS_DP, EVENTOUT
PD8	77	I/O	5VT	Default: PD8 Alternate: USART2_TX, EVENTOUT
PD9	78	I/O	5VT	Default: PD9 Alternate: USART2_RX, EVENTOUT
PD10	79	I/O	5VT	Default: PD10 Alternate: USART2_CK, EVENTOUT
PD11	80	I/O	5VT	Default: PD11 Alternate: USART2_CTS, EVENTOUT
PD12	81	I/O	5VT	Default: PD12 Alternate: TIMER3_CH0,USART2_RTS , EVENTOUT
PD13	82	I/O	5VT	Default: PD13

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: TIMER3_CH1, EVENTOUT
V_{SS}	83	P	-	Default: V_{SS}
V_{DD}	84	P	-	Default: V_{DD}
PD14	85	I/O	5VT	Default: PD14 Alternate: TIMER3_CH2, EVENTOUT
PD15	86	I/O	5VT	Default: PD15 Alternate:TIMER3_CH3, EVENTOUT, CTC_SYNC
PG2	87	I/O	5VT	Default: PG2 Alternate: EVENTOUT
PG3	88	I/O	5VT	Default: PG3 Alternate: EVENTOUT
PG4	89	I/O	5VT	Default: PG4 Alternate: EVENTOUT
PG5	90	I/O	5VT	Default: PG5 Alternate: EVENTOUT
PG6	91	I/O	5VT	Default: PG6 Alternate: DCI_D12, EVENTOUT
PG7	92	I/O	5VT	Default: PG7 Alternate: USART5_CK, DCI_D13, EVENTOUT
PG8	93	I/O	5VT	Default: PG8 Alternate: USART5_RTS, EVENTOUT
V_{SS}	94	P	-	Default: V_{SS}
V_{DD}	95	P	-	Default: V_{DD}
PC6	96	I/O	5VT	Default: PC6 Alternate: TIMER2_CH0, TIMER7_CH0, I2S1_MCK, USART5_TX, SDIO_D6, DCI_D0, EVENTOUT
PC7	97	I/O	5VT	Default: PC7 Alternate: TIMER2_CH1, TIMER7_CH1, SPI1_SCK, I2S1_CK, I2S2_MCK, USART5_RX, SDIO_D7, DCI_D1, EVENTOUT
PC8	98	I/O	5VT	Default: PC8 Alternate: TRACED0, TIMER2_CH2, TIMER7_CH2, USART5_CK, SDIO_D0, DCI_D2, EVENTOUT
PC9	99	I/O	5VT	Default: PC9 Alternate: CK_OUT1, TIMER2_CH3, TIMER7_CH3, I2C2_SDA, I2S_CKIN, SDIO_D1, DCI_D3, EVENTOUT
PA8	100	I/O	5VT	Default: PA8 Alternate: CK_OUT0, TIMER0_CH0, I2C2_SCL, USART0_CK, USBFS_SOF, SDIO_D1, EVENTOUT, CTC_SYNC
PA9	101	I/O	5VT	Default: PA9 Alternate: TIMER0_CH1, I2C2_SMBA, SPI1_SCK, I2S1_CK, USART0_TX, SDIO_D2, DCI_D0, EVENTOUT Additional: USBFS_VBUS

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PA10	102	I/O	5VT	Default: PA10 Alternate: TIMER0_CH2, I2C2_TXFRAME, USART0_RX, USBFS_ID, DCI_D1, EVENTOUT
PA11	103	I/O	5VT	Default: PA11 Alternate: TIMER0_CH3, USART0_CTS, USART5_TX, CAN0_RX, USBFS_DM, EVENTOUT
PA12	104	I/O	5VT	Default: PA12 Alternate: TIMER0_ETI, USART0_RTS, USART5_RX, CAN0_TX, USBFS_DP, EVENTOUT
PA13	105	I/O	5VT	Default: JTMS, SWDIO, PA13 Alternate: EVENTOUT
NC	106	-	-	-
V_{SS}	107	P	-	Default: V_{SS}
V_{DD}	108	P	-	Default: V_{DD}
PA14	109	I/O	5VT	Default: JTCK, SWCLK, PA14 Alternate: EVENTOUT
PA15	110	I/O	5VT	Default: JTDI, PA15 Alternate: TIMER1_CH0, TIMER1_ETI, SPI0_NSS, SPI2_NSS, I2S2_WS, USART0_TX, EVENTOUT
PC10	111	I/O	5VT	Default: PC10 Alternate: SPI2_SCK, I2S2_CK, USART2_TX, UART3_TX, SDIO_D2, DCI_D8, EVENTOUT
PC11	112	I/O	5VT	Default: PC11 Alternate: I2S2_ADD_SD, SPI2_MISO, USART2_RX, UART3_RX, SDIO_D3, DCI_D4, EVENTOUT
PC12	113	I/O	5VT	Default: PC12 Alternate: I2C1_SDA, SPI2_MOSI, I2S2_SD, USART2_CK, UART4_TX, SDIO_CK, DCI_D9, EVENTOUT
PD0	114	I/O	5VT	Default: PD0 Alternate: SPI2_MOSI, I2S2_SD, CAN0_RX, EVENTOUT
PD1	115	I/O	5VT	Default: PD1 Alternate: SPI1_NSS, I2S1_WS, CAN0_TX, EVENTOUT
PD2	116	I/O	5VT	Default: PD2 Alternate: TIMER2_ETI, UART4_RX, SDIO_CMD, DCI_D11, EVENTOUT
PD3	117	I/O	5VT	Default: PD3 Alternate: TRACED1, SPI1_SCK, I2S1_CK, USART1_CTS, DCI_D5, EVENTOUT
PD4	118	I/O	5VT	Default: PD4 Alternate: USART1_RTS, EVENTOUT
PD5	119	I/O	5VT	Default: PD5 Alternate: USART1_TX, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
V_{SS}	120	P	-	Default: V_{SS}
V_{DD}	121	P	-	Default: V_{DD}
PD6	122	I/O	5VT	Default: PD6 Alternate: SPI2_MOSI, I2S2_SD, USART1_RX, DCI_D10, EVENTOUT
PD7	123	I/O	5VT	Default: PD7 Alternate: USART1_CK, EVENTOUT
PG9	124	I/O	5VT	Default: PG9 Alternate: USART5_RX, DCI_VSYNC, EVENTOUT
PG10	125	I/O	5VT	Default: PG10 Alternate: DCI_D2, EVENTOUT
PG11	126	I/O	5VT	Default: PG11 Alternate: DCI_D3, EVENTOUT
PG12	127	I/O	5VT	Default: PG12 Alternate: USART5_RTS, EVENTOUT
PG13	128	I/O	5VT	Default: PG13 Alternate: TRACED2, USART5_CTS, EVENTOUT
PG14	129	I/O	5VT	Default: PG14 Alternate:TRACED3, USART5_TX, EVENTOUT
V_{SS}	130	P	-	Default: V_{SS}
V_{DD}	131	P	-	Default: V_{DD}
PG15	132	I/O	5VT	Default: PG15 Alternate: USART5_CTS, DCI_D13, EVENTOUT
PB3	133	I/O	5VT	Default: JTDO, PB3 Alternate: TRACESWO, TIMER1_CH1, SPI0_SCK, SPI2_SCK, I2S2_CK, USART0_RX, I2C1_SDA, EVENTOUT
PB4	134	I/O	5VT	Default: NJTRST, PB4 Alternate: TIMER2_CH0, I2C0_TXFRAME, SPI0_MISO, SPI2_MISO, I2S2_ADD_SD, I2C2_SDA, SDIO_D0, EVENTOUT
PB5	135	I/O	5VT	Default: PB5 Alternate: TIMER2_CH1, I2C0_SMBA, SPI0_MOSI, SPI2_MOSI, I2S2_SD, CAN1_RX, USBHS_ULPI_D7, DCI_D10, EVENTOUT
PB6	136	I/O	5VT	Default: PB6 Alternate: TIMER3_CH0, I2C0_SCL, USART0_TX, CAN1_TX, DCI_D5, EVENTOUT
PB7	137	I/O	5VT	Default: PB7 Alternate: TIMER3_CH1, I2C0_SDA, USART0_RX, DCI_VSYNC, EVENTOUT
BOOT0	138	I/O	5VT	Default: BOOT0
PB8	139	I/O	5VT	Default: PB8

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: TIMER1_CH0, TIMER1_ETI, TIMER3_CH2, TIMER9_CH0, I2C0_SCL, CAN0_RX, SDIO_D4, DCI_D6, EVENTOUT
PB9	140	I/O	5VT	Default: PB9 Alternate:TIMER1_CH1, TIMER3_CH3, TIMER10_CH0, I2C0_SDA, SPI1_NSS, I2S1_WS, CAN0_TX, SDIO_D5, DCI_D7, EVENTOUT
PE0	141	I/O	5VT	Default: PE0 Alternate:TIMER3_ETI, DCI_D2, EVENTOUT
PE1	142	I/O	5VT	Default: PE1 Alternate:TIMER0_CH1_ON, DCI_D3, EVENTOUT
PDR_ON	143	P	-	Default: PDR_ON
V_{DD}	144	P	-	Default: V_{DD}

Notes:

(1) Type: I = input, O = output, P = power.

(2) I/O Level: 5VT = 5 V tolerant.

2.6.2. GD32F405Vx LQFP100 pin definitions

Table 2-4. GD32F405Vx LQFP100 pin definitions

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PE2	1	I/O	5VT	Default: PE2 Alternate: TRACECK, EVENTOUT
PE3	2	I/O	5VT	Default: PE3 Alternate: TRACED0, EVENTOUT
PE4	3	I/O	5VT	Default: PE4 Alternate: TRACED1, DCI_D4, EVENTOUT
PE5	4	I/O	5VT	Default: PE5 Alternate:TRACED2,TIMER8_CH0, DCI_D6, EVENTOUT
PE6	5	I/O	5VT	Default: PE6 Alternate: TRACED3, TIMER8_CH1, DCI_D7, EVENTOUT
V_{BAT}	6	P	-	Default: V_{BAT}
PC13-TAMPER-RTC	7	I/O	5VT	Default: PC13 Alternate: EVENTOUT Additional: RTC_TAMP0, RTC_OUT, RTC_TS
PC14-OSC32IN	8	I/O	5VT	Default: PC14 Alternate: EVENTOUT Additional: OSC32IN
PC15-OSC32O	9	I/O	5VT	Default: PC15 Alternate: EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
UT				Additional: OSC32OUT
V_{SS}	10	P	-	Default: V_{SS}
V_{DD}	11	P	-	Default: V_{DD}
PH0	12	I/O	5VT	Default: PH0, OSCIN Alternate: EVENTOUT Additional: OSCIN
PH1	13	I/O	5VT	Default: PH1, OSCOUT Alternate: EVENTOUT Additional: OSCOUT
NRST	14	-	-	Default: NRST
PC0	15	I/O	5VT	Default: PC0 Alternate: USBHS_ULPI_STP, EVENTOUT Additional: ADC012_IN10
PC1	16	I/O	5VT	Default: PC1 Alternate: SPI2_MOSI, I2S2_SD, SPI1_MOSI, I2S1_SD, EVENTOUT Additional: ADC012_IN11
PC2	17	I/O	5VT	Default: PC2 Alternate: SPI1_MISO, I2S1_ADD_SD, USBHS_ULPI_DIR, EVENTOUT Additional: ADC012_IN12
PC3	18	I/O	5VT	Default: PC3 Alternate: SPI1_MOSI, I2S1_SD, USBHS_ULPI_NXT, EVENTOUT Additional: ADC012_IN13
V_{DD}	19	P	-	Default: V_{DD}
V_{SSA}	20	P	-	Default: V_{SSA}
V_{REF+}	21	P	-	Default: V_{REF+}
V_{DDA}	22	P	-	Default: V_{DDA}
PA0-WKUP	23	I/O	5VT	Default: PA0 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER4_CH0, TIMER7_ETI, USART1_CTS, UART3_TX, EVENTOUT Additional: ADC012_IN0, WKUP
PA1	24	I/O	5VT	Default: PA1 Alternate:TIMER1_CH1, TIMER4_CH1, USART1_RTS, UART3_RX, EVENTOUT Additional: ADC012_IN1
PA2	25	I/O	5VT	Default: PA2 Alternate: TIMER1_CH2, TIMER4_CH2, TIMER8_CH0, I2S_CKIN, USART1_TX, EVENTOUT Additional: ADC012_IN2
PA3	26	I/O	5VT	Default: PA3

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: TIMER1_CH3, TIMER4_CH3, TIMER8_CH1, I2S1_MCK, USART1_RX, USBHS_ULPI_D0, EVENTOUT Additional: ADC012_IN3
V_{SS}	27	P	-	Default: V_{SS}
V_{DD}	28	P	-	Default: V_{DD}
PA4	29	I/O		Default: PA4 Alternate: SPI0_NSS, SPI2_NSS, I2S2_WS, USART1_CK, USBHS_SOF, DCI_HSYNC, EVENTOUT Additional: ADC01_IN4, DAC_OUT0
PA5	30	I/O		Default: PA5 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER7_CH0_ON, SPI0_SCK, USBHS_ULPI_CK, EVENTOUT Additional: ADC01_IN5, DAC_OUT1
PA6	31	I/O	5VT	Default: PA6 Alternate: TIMER0_BRKIN, TIMER2_CH0, TIMER7_BRKIN, SPI0_MISO, I2S1_MCK, TIMER12_CH0, SDIO_CMD, DCI_PIXCLK, EVENTOUT Additional: ADC01_IN6
PA7	32	I/O	5VT	Default: PA7 Alternate: TIMER0_CH0_ON, TIMER2_CH1, TIMER7_CH0_ON, SPI0_MOSI, TIMER13_CH0, EVENTOUT Additional: ADC01_IN7
PC4	33	I/O	5VT	Default: PC4 Alternate: EVENTOUT Additional: ADC01_IN14
PC5	34	I/O	5VT	Default: PC5 Alternate: USART2_RX, EVENTOUT Additional: ADC01_IN15
PB0	35	I/O	5VT	Default: PB0 Alternate: TIMER0_CH1_ON, TIMER2_CH2, TIMER7_CH1_ON, SPI2_MOSI, I2S2_SD, USBHS_ULPI_D1, SDIO_D1, EVENTOUT Additional: ADC01_IN8, IREF
PB1	36	I/O	5VT	Default: PB1 Alternate: TIMER0_CH2_ON, TIMER2_CH3, TIMER7_CH2_ON, USBHS_ULPI_D2, SDIO_D2, EVENTOUT Additional: ADC01_IN9
PB2	37	I/O	5VT	Default: PB2, BOOT1 Alternate: TIMER1_CH3, SPI2_MOSI, I2S2_SD, USBHS_ULPI_D4, SDIO_CK, EVENTOUT
PE7	38	I/O	5VT	Default: PE7 Alternate: TIMER0_ETI, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PE8	39	I/O	5VT	Default: PE8 Alternate: TIMER0_CH0_ON, EVENTOUT
PE9	40	I/O	5VT	Default: PE9 Alternate: TIMER0_CH0, EVENTOUT
PE10	41	I/O	5VT	Default: PE10 Alternate: TIMER0_CH1_ON, EVENTOUT
PE11	42	I/O	5VT	Default: PE11 Alternate: TIMER0_CH1, EVENTOUT
PE12	43	I/O	5VT	Default: PE12 Alternate:TIMER0_CH2_ON, EVENTOUT
PE13	44	I/O	5VT	Default: PE13 Alternate: TIMER0_CH2, EVENTOUT
PE14	45	I/O	5VT	Default: PE14 Alternate: TIMER0_CH3, EVENTOUT
PE15	46	I/O	5VT	Default: PE15 Alternate: TIMER0_BRKIN, EVENTOUT
PB10	47	I/O	5VT	Default: PB10 Alternate: TIMER1_CH2, I2C1_SCL, SPI1_SCK, I2S1_CK, I2S2_MCK, USART2_TX, USBHS_ULPI_D3, SDIO_D7, EVENTOUT
PB11	48	I/O	5VT	Default: PB11 Alternate: TIMER1_CH3, I2C1_SDA, I2S_CKIN, USART2_RX, USBHS_ULPI_D4, EVENTOUT
NC	49	P	-	Default: V_{CORE}
V_{DD}	50	P	-	Default: V_{DD}
PB12	51	I/O	5VT	Default: PB12 Alternate: TIMER0_BRKIN, I2C1_SMBA, SPI1_NSS, I2S1_WS, USART2_CK, CAN1_RX, USBHS_ULPI_D5, USBHS_ID, EVENTOUT
PB13	52	I/O	5VT	Default: PB13 Alternate: TIMER0_CH0_ON, SPI1_SCK, I2S1_CK, USART2_CTS, CAN1_TX, USBHS_ULPI_D6, EVENTOUT, I2C1_TXFRAME Additional: USBHS_VBUS
PB14	53	I/O	5VT	Default: PB14 Alternate: TIMER0_CH1_ON, TIMER7_CH1_ON, SPI1_MISO, I2S1_ADD_SD, USART2_RTS, TIMER11_CH0, USBHS_DM, EVENTOUT
PB15	54	I/O	5VT	Default: PB15 Alternate: RTC_REFIN, TIMER0_CH2_ON, TIMER7_CH2_ON, SPI1_MOSI, I2S1_SD, TIMER11_CH1, USBHS_DP, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PD8	55	I/O	5VT	Default: PD8 Alternate: USART2_TX, EVENTOUT
PD9	56	I/O	5VT	Default: PD9 Alternate: USART2_RX, EVENTOUT
PD10	57	I/O	5VT	Default: PD10 Alternate: USART2_CK, EVENTOUT
PD11	58	I/O	5VT	Default: PD11 Alternate: USART2_CTS, EVENTOUT
PD12	59	I/O	5VT	Default: PD12 Alternate: TIMER3_CH0, USART2_RTS, EVENTOUT
PD13	60	I/O	5VT	Default: PD13 Alternate: TIMER3_CH1, EVENTOUT
PD14	61	I/O	5VT	Default: PD14 Alternate: TIMER3_CH2, EVENTOUT
PD15	62	I/O	5VT	Default: PD15 Alternate:TIMER3_CH3, EVENTOUT, CTC_SYNC
PC6	63	I/O	5VT	Default: PC6 Alternate: TIMER2_CH0, TIMER7_CH0, I2S1_MCK, USART5_TX, SDIO_D6, DCI_D0, EVENTOUT
PC7	64	I/O	5VT	Default: PC7 Alternate: TIMER2_CH1, TIMER7_CH1, SPI1_SCK, I2S1_CK, I2S2_MCK, USART5_RX, SDIO_D7, DCI_D1, EVENTOUT
PC8	65	I/O	5VT	Default: PC8 Alternate: TRACED0, TIMER2_CH2, TIMER7_CH2, USART5_CK, SDIO_D0, DCI_D2, EVENTOUT
PC9	66	I/O	5VT	Default: PC9 Alternate: CK_OUT1, TIMER2_CH3, TIMER7_CH3, I2C2_SDA, I2S_CKIN, SDIO_D1, DCI_D3, EVENTOUT
PA8	67	I/O	5VT	Default: PA8 Alternate: CK_OUT0, TIMER0_CH0, I2C2_SCL, USART0_CK, USBFS_SOF, SDIO_D1, EVENTOUT, CTC_SYNC
PA9	68	I/O	5VT	Default: PA9 Alternate: TIMER0_CH1, I2C2_SMBA, SPI1_SCK, I2S1_CK, USART0_TX, SDIO_D2, DCI_D0, EVENTOUT Additional: USBFS_VBUS
PA10	69	I/O	5VT	Default: PA10 Alternate: TIMER0_CH2, USART0_RX, USBFS_ID, DCI_D1, EVENTOUT, I2C2_TXFRAME
PA11	70	I/O	5VT	Default: PA11 Alternate: TIMER0_CH3, USART0_CTS, USART5_TX, CAN0_RX, USBFS_DM, EVENTOUT
PA12	71	I/O	5VT	Default: PA12

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: TIMER0_ETI, USART0_RTS, USART5_RX, CAN0_TX, USBFS_DP, EVENTOUT
PA13	72	I/O	5VT	Default: JTMS, SWDIO, PA13 Alternate: EVENTOUT
NC	73	-	-	-
V_{SS}	74	P	-	Default: V_{SS}
V_{DD}	75	P	-	Default: V_{DD}
PA14	76	I/O	5VT	Default: JTCK, SWCLK, PA14 Alternate: EVENTOUT
PA15	77	I/O	5VT	Default: JTDI, PA15 Alternate: TIMER1_CH0, TIMER1_ETI, SPI0_NSS, SPI2_NSS, I2S2_WS, USART0_TX, EVENTOUT
PC10	78	I/O	5VT	Default: PC10 Alternate: SPI2_SCK, I2S2_CK, USART2_TX, UART3_TX, SDIO_D2, DCI_D8, EVENTOUT
PC11	79	I/O	5VT	Default: PC11 Alternate: I2S2_ADD_SD, SPI2_MISO, USART2_RX, UART3_RX, SDIO_D3, DCI_D4, EVENTOUT
PC12	80	I/O	5VT	Default: PC12 Alternate: I2C1_SDA, SPI2_MOSI, I2S2_SD, USART2_CK, UART4_TX, SDIO_CK, DCI_D9, EVENTOUT
PD0	81	I/O	5VT	Default: PD0 Alternate: SPI2_MOSI, I2S2_SD, CAN0_RX, EVENTOUT
PD1	82	I/O	5VT	Default: PD1 Alternate: SPI1_NSS, I2S1_WS, CAN0_TX, EVENTOUT
PD2	83	I/O	5VT	Default: PD2 Alternate: TIMER2_ETI, UART4_RX, SDIO_CMD, DCI_D11, EVENTOUT
PD3	84	I/O	5VT	Default: PD3 Alternate: TRACED1, SPI1_SCK, I2S1_CK, USART1_CTS, DCI_D5, EVENTOUT
PD4	85	I/O	5VT	Default: PD4 Alternate: USART1_RTS, EVENTOUT
PD5	86	I/O	5VT	Default: PD5 Alternate: USART1_TX, EVENTOUT
PD6	87	I/O	5VT	Default: PD6 Alternate: SPI2_MOSI, I2S2_SD, USART1_RX, DCI_D10, EVENTOUT
PD7	88	I/O	5VT	Default: PD7 Alternate: USART1_CK, EVENTOUT
PB3	89	I/O	5VT	Default: JTDO, PB3 Alternate: TRACESWO, TIMER1_CH1, SPI0_SCK, SPI2_SCK,

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				I2S2_CK, USART0_RX, I2C1_SDA, EVENTOUT
PB4	90	I/O	5VT	Default: NJTRST, PB4 Alternate: TIMER2_CH0, SPI0_MISO, SPI2_MISO, I2S2_ADD_SD, I2C2_SDA, SDIO_D0, EVENTOUT, I2C0_TXFRAME
PB5	91	I/O	5VT	Default: PB5 Alternate: TIMER2_CH1, I2C0_SMBA, SPI0_MOSI, SPI2_MOSI, I2S2_SD, CAN1_RX, USBHS_ULPI_D7, DCI_D10, EVENTOUT
PB6	92	I/O	5VT	Default: PB6 Alternate: TIMER3_CH0, I2C0_SCL, USART0_TX, CAN1_TX, DCI_D5, EVENTOUT
PB7	93	I/O	5VT	Default: PB7 Alternate: TIMER3_CH1, I2C0_SDA, USART0_RX, DCI_VSYNC, EVENTOUT
BOOT0	94	I/O	5VT	Default: BOOT0
PB8	95	I/O	5VT	Default: PB8 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER3_CH2, TIMER9_CH0, I2C0_SCL, CAN0_RX, SDIO_D4, DCI_D6, EVENTOUT
PB9	96	I/O	5VT	Default: PB9 Alternate: TIMER1_CH1, TIMER3_CH3, TIMER10_CH0, I2C0_SDA, SPI1_NSS, I2S1_WS, CAN0_TX, SDIO_D5, DCI_D7, EVENTOUT
PE0	97	I/O	5VT	Default: PE0 Alternate: TIMER3_ETI, DCI_D2, EVENTOUT
PE1	98	I/O	5VT	Default: PE1 Alternate: TIMER0_CH1_ON, DCI_D3, EVENTOUT
V_{SS}	99	P	-	Default: V_{SS}
V_{DD}	100	P	-	Default: V_{DD}

Notes:

(1) Type: I = input, O = output, P = power.

(2) I/O Level: 5VT = 5 V tolerant.

2.6.3. GD32F405Vx BGA100 pin definitions

Table 2-5. GD32F405Vx BGA100 pin definitions

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PE2	B2	I/O	5VT	Default: PE2 Alternate: TRACECK, EVENTOUT
PE3	A1	I/O	5VT	Default: PE3

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate:TRACED0, EVENTOUT
PE4	B1	I/O	5VT	Default: PE4 Alternate:TRACED1, DCI_D4, EVENTOUT
PE5	C2	I/O	5VT	Default: PE5 Alternate: TRACED2, TIMER8_CH0, DCI_D6, EVENTOUT
PE6	D2	I/O	5VT	Default: PE6 Alternate:TRACED3,TIMER8_CH1, DCI_D7, EVENTOUT
V_{BAT}	E2	P	-	Default: V_{BAT}
PC13-TAMPER-RTC	C1	I/O	5VT	Default: PC13 Alternate: EVENTOUT Additional: RTC_TAMP0, RTC_OUT, RTC_TS
PC14-OSC32IN	D1	I/O	5VT	Default: PC14 Alternate: EVENTOUT Additional: OSC32IN
PC15-OSC32OUT	E1	I/O	5VT	Default: PC15 Alternate: EVENTOUT Additional: OSC32OUT
V_{SS}	F2	P	-	Default: V_{SS}
V_{DD}	G2	P	-	Default: V_{DD}
PH0	F1	I/O	5VT	Default: PH0, OSCIN Alternate: EVENTOUT Additional: OSCIN
PH1	G1	I/O	5VT	Default: PH1, OSCOUT Alternate: EVENTOUT Additional: OSCOUT
NRST	H2	-	-	Default: NRST
PC0	H1	I/O	5VT	Default: PC0 Alternate: USBHS_ULPI_STP, EVENTOUT Additional: ADC012_IN10
PC1	J2	I/O	5VT	Default: PC1 Alternate:SPI2_MOSI, I2S2_SD, SPI1_MOSI, I2S1_SD, EVENTOUT Additional: ADC012_IN11
PC2	J3	I/O	5VT	Default: PC2 Alternate: SPI1_MISO, I2S1_ADD_SD, USBHS_ULPI_DIR, EVENTOUT Additional: ADC012_IN12
PC3	K2	I/O	5VT	Default: PC3 Alternate: SPI1_MOSI, I2S1_SD, USBHS_ULPI_NXT, EVENTOUT Additional: ADC012_IN13
V_{SSA}	J1	P	-	Default: V_{SSA}

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
V_{REFN}	K1	P	-	Default: V_{REF-}
V_{REFP}	L1	P	-	Default: V_{REF+}
V_{DDA}	M1	P	-	Default: V_{DDA}
PA0-WKUP	L2	I/O	5VT	Default: PA0 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER4_CH0, TIMER7_ETI, USART1_CTS, UART3_TX, EVENTOUT Additional: ADC012_IN0, WKUP
PA1	M2	I/O	5VT	Default: PA1 Alternate: TIMER1_CH1, TIMER4_CH1, USART1_RTS, UART3_RX, EVENTOUT Additional: ADC012_IN1
PA2	K3	I/O	5VT	Default: PA2 Alternate: TIMER1_CH2, TIMER4_CH2, TIMER8_CH0, I2S_CKIN, USART1_TX, EVENTOUT Additional: ADC012_IN2
PA3	L3	I/O	5VT	Default: PA3 Alternate: TIMER1_CH3, TIMER4_CH3, TIMER8_CH1, I2S1_MCK, USART1_RX, USBHS_ULPI_D0, EVENTOUT Additional: ADC012_IN3
NC	E3	-	-	-
PA4	M3	I/O		Default: PA4 Alternate: SPI0_NSS, SPI2_NSS, I2S2_WS, USART1_CK, USBHS_SOF, DCI_HSYNC, EVENTOUT Additional: ADC01_IN4, DAC_OUT0
PA5	K4	I/O		Default: PA5 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER7_CH0_ON, SPI0_SCK, USBHS_ULPI_CK, EVENTOUT Additional: ADC01_IN5, DAC_OUT1
PA6	L4	I/O	5VT	Default: PA6 Alternate: TIMER0_BRKIN, TIMER2_CH0, TIMER7_BRKIN, SPI0_MISO, I2S1_MCK, TIMER12_CH0, SDIO_CMD, DCI_PIXCLK, EVENTOUT Additional: ADC01_IN6
PA7	M4	I/O	5VT	Default: PA7 Alternate: TIMER0_CH0_ON, TIMER2_CH1, TIMER7_CH0_ON, SPI0_MOSI, TIMER13_CH0, EVENTOUT Additional: ADC01_IN7
PC4	K5	I/O	5VT	Default: PC4 Alternate: EVENTOUT Additional: ADC01_IN14
PC5	L5	I/O	5VT	Default: PC5 Alternate: USART2_RX, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Additional: ADC01_IN15
PB0	M5	I/O	5VT	Default: PB0 Alternate: TIMER0_CH1_ON, TIMER2_CH2, TIMER7_CH1_ON, SPI2_MOSI, I2S2_SD, USBHS_ULPI_D1, SDIO_D1, EVENTOUT Additional: ADC01_IN8, IREF
PB1	M6	I/O	5VT	Default: PB1 Alternate: TIMER0_CH2_ON, TIMER2_CH3, TIMER7_CH2_ON, USBHS_ULPI_D2, SDIO_D2, EVENTOUT Additional: ADC01_IN9
PB2	L6	I/O	5VT	Default: PB2, BOOT1 Alternate: TIMER1_CH3, SPI2_MOSI, I2S2_SD, USBHS_ULPI_D4, SDIO_CK, EVENTOUT
PE7	M7	I/O	5VT	Default: PE7 Alternate: TIMER0_ETI, EVENTOUT
PE8	L7	I/O	5VT	Default: PE8 Alternate: TIMER0_CH0_ON, EVENTOUT
PE9	M8	I/O	5VT	Default: PE9 Alternate: TIMER0_CH0, EVENTOUT
PE10	L8	I/O	5VT	Default: PE10 Alternate: TIMER0_CH1_ON, EVENTOUT
PE11	M9	I/O	5VT	Default: PE11 Alternate:TIMER0_CH1, EVENTOUT
PE12	L9	I/O	5VT	Default: PE12 Alternate:TIMER0_CH2_ON, EVENTOUT
PE13	M10	I/O	5VT	Default: PE13 Alternate: TIMER0_CH2, EVENTOUT
PE14	M11	I/O	5VT	Default: PE14 Alternate: TIMER0_CH3, EVENTOUT
PE15	M12	I/O	5VT	Default: PE15 Alternate: TIMER0_BRKIN, EVENTOUT
PB10	L10	I/O	5VT	Default: PB10 Alternate: TIMER1_CH2, I2C1_SCL, SPI1_SCK, I2S1_CK, I2S2_MCK, USART2_TX, USBHS_ULPI_D3, SDIO_D7, EVENTOUT
PB11	K9	I/O	5VT	Default: PB11 Alternate: TIMER1_CH3, I2C1_SDA, I2S_CKIN, USART2_RX, USBHS_ULPI_D4, EVENTOUT
NC	L11	P	-	Default: V_{CORE}
V_{SS}	F12	P	-	Default: V_{SS}
V_{DD}	G12	P	-	Default: V_{DD}
PB12	L12	I/O	5VT	Default: PB12

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: TIMER0_BRKIN, I2C1_SMBA, SPI1_NSS, I2S1_WS, USART2_CK, CAN1_RX, USBHS_ULPI_D5, USBHS_ID, EVENTOUT
PB13	K12	I/O	5VT	Default: PB13 Alternate: TIMER0_CH0_ON, SPI1_SCK, I2S1_CK, USART2_CTS, CAN1_TX, USBHS_ULPI_D6, EVENTOUT, I2C1_TXFRAME Additional: USBHS_VBUS
PB14	K11	I/O	5VT	Default: PB14 Alternate: TIMER0_CH1_ON, TIMER7_CH1_ON, SPI1_MISO, I2S1_ADD_SD, USART2_RTS, TIMER11_CH0, USBHS_DM, EVENTOUT
PB15	K10	I/O	5VT	Default: PB15 Alternate: RTC_REFIN, TIMER0_CH2_ON, TIMER7_CH2_ON, SPI1_MOSI, I2S1_SD, TIMER11_CH1, USBHS_DP, EVENTOUT
PD9	K8	I/O	5VT	Default: PD9 Alternate: USART2_RX, EVENTOUT
PD10	J12	I/O	5VT	Default: PD10 Alternate: USART2_CK, EVENTOUT
PD11	J11	I/O	5VT	Default: PD11 Alternate: USART2_CTS, EVENTOUT
PD12	J10	I/O	5VT	Default: PD12 Alternate: TIMER3_CH0, USART2_RTS, EVENTOUT
PD13	H12	I/O	5VT	Default: PD13 Alternate: TIMER3_CH1, EVENTOUT
PD14	H11	I/O	5VT	Default: PD14 Alternate: TIMER3_CH2, EVENTOUT
PD15	H10	I/O	5VT	Default: PD15 Alternate: TIMER3_CH3, EVENTOUT, CTC_SYNC
PC6	E12	I/O	5VT	Default: PC6 Alternate: TIMER2_CH0, TIMER7_CH0, I2S1_MCK, USART5_TX, SDIO_D6, DCI_D0, EVENTOUT
PC7	E11	I/O	5VT	Default: PC7 Alternate: TIMER2_CH1, TIMER7_CH1, SPI1_SCK, I2S1_CK, I2S2_MCK, USART5_RX, SDIO_D7, DCI_D1, EVENTOUT
PC8	E10	I/O	5VT	Default: PC8 Alternate: TRACED0, TIMER2_CH2, TIMER7_CH2, USART5_CK, SDIO_D0, DCI_D2, EVENTOUT
PC9	D12	I/O	5VT	Default: PC9 Alternate: CK_OUT1, TIMER2_CH3, TIMER7_CH3, I2C2_SDA, I2S_CKIN, SDIO_D1, DCI_D3, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PA8	D11	I/O	5VT	Default: PA8 Alternate: CK_OUT0, TIMER0_CH0, I2C2_SCL, USART0_CK, USBFS_SOF, SDIO_D1, EVENTOUT, CTC_SYNC
PA9	D10	I/O	5VT	Default: PA9 Alternate: TIMER0_CH1, I2C2_SMBA, SPI1_SCK, I2S1_CK, USART0_TX, SDIO_D2, DCI_D0, EVENTOUT Additional: USBFS_VBUS
PA10	C12	I/O	5VT	Default: PA10 Alternate: TIMER0_CH2, USART0_RX, USBFS_ID, DCI_D1, EVENTOUT, I2C2_TXFRAME
PA11	B12	I/O	5VT	Default: PA11 Alternate: TIMER0_CH3, USART0_CTS, USART5_TX, CAN0_RX, USBFS_DM, EVENTOUT
PA12	A12	I/O	5VT	Default: PA12 Alternate: TIMER0_ETI, USART0_RTS, USART5_RX, CAN0_TX, USBFS_DP, EVENTOUT
PA13	A11	I/O	5VT	Default: JTMS, SWDIO, PA13 Alternate: EVENTOUT
NC	C11	-	-	-
V_{SS}	F11	P	-	Default: V_{SS}
V_{DD}	G11	P	-	Default: V_{DD}
PA14	A10	I/O	5VT	Default: JTCK, SWCLK, PA14 Alternate: EVENTOUT
PA15	A9	I/O	5VT	Default: JTDI, PA15 Alternate: TIMER1_CH0, TIMER1_ETI, SPI0_NSS, SPI2_NSS, I2S2_WS, USART0_TX, EVENTOUT
PC10	B11	I/O	5VT	Default: PC10 Alternate: SPI2_SCK, I2S2_CK, USART2_TX, UART3_TX, SDIO_D2, DCI_D8, EVENTOUT
PC11	C10	I/O	5VT	Default: PC11 Alternate: I2S2_ADD_SD, SPI2_MISO, USART2_RX, UART3_RX, SDIO_D3, DCI_D4, EVENTOUT
PC12	B10	I/O	5VT	Default: PC12 Alternate: I2C1_SDA, SPI2_MOSI, I2S2_SD, USART2_CK, UART4_TX, SDIO_CK, DCI_D9, EVENTOUT
PD0	C9	I/O	5VT	Default: PD0 Alternate: SPI2_MOSI, I2S2_SD, CAN0_RX, EVENTOUT
PD1	B9	I/O	5VT	Default: PD1 Alternate: SPI1_NSS, I2S1_WS, CAN0_TX, EVENTOUT
PD2	C8	I/O	5VT	Default: PD2 Alternate: TIMER2_ETI, UART4_RX, SDIO_CMD, DCI_D11, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
PD3	B8	I/O	5VT	Default: PD3 Alternate: TRACED1, SPI1_SCK, I2S1_CK, USART1_CTS, DCI_D5, EVENTOUT
PD4	B7	I/O	5VT	Default: PD4 Alternate: USART1_RTS, EVENTOUT
PD5	A6	I/O	5VT	Default: PD5 Alternate: USART1_TX, EVENTOUT
PD6	B6	I/O	5VT	Default: PD6 Alternate: SPI2_MOSI, I2S2_SD, USART1_RX, DCI_D10, EVENTOUT
PD7	A5	I/O	5VT	Default: PD7 Alternate: USART1_CK, EVENTOUT
PB3	A8	I/O	5VT	Default: JTDO, PB3 Alternate: TRACESWO, TIMER1_CH1, SPI0_SCK, SPI2_SCK, I2S2_CK, USART0_RX, I2C1_SDA, EVENTOUT
PB4	A7	I/O	5VT	Default: NJTRST, PB4 Alternate: TIMER2_CH0, SPI0_MISO, SPI2_MISO, I2S2_ADD_SD, I2C2_SDA, SDIO_D0, EVENTOUT, I2C0_TXFRAME
PB5	C5	I/O	5VT	Default: PB5 Alternate: TIMER2_CH1, I2C0_SMBA, SPI0_MOSI, SPI2_MOSI, I2S2_SD, CAN1_RX, USBHS_ULPI_D7, DCI_D10, EVENTOUT
PB6	B5	I/O	5VT	Default: PB6 Alternate: TIMER3_CH0, I2C0_SCL, USART0_TX, CAN1_TX, DCI_D5, EVENTOUT
PB7	B4	I/O	5VT	Default: PB7 Alternate: TIMER3_CH1, I2C0_SDA, USART0_RX, DCI_VSYNC, EVENTOUT
BOOT0	A4	I/O	5VT	Default: BOOT0
PB8	A3	I/O	5VT	Default: PB8 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER3_CH2, TIMER9_CH0, I2C0_SCL, CAN0_RX, SDIO_D4, DCI_D6, EVENTOUT
PB9	B3	I/O	5VT	Default: PB9 Alternate: TIMER1_CH1, TIMER3_CH3, TIMER10_CH0, I2C0_SDA, SPI1_NSS, I2S1_WS, CAN0_TX, SDIO_D5, DCI_D7, EVENTOUT
PE0	C3	I/O	5VT	Default: PE0 Alternate: TIMER3_ETI, DCI_D2, EVENTOUT
PE1	A2	I/O	5VT	Default: PE1 Alternate: TIMER0_CH1_ON, DCI_D3, EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
V_{SS}	D3	P	-	Default: V_{SS}
PDR_ON	H3	P	-	Default: PDR_ON
V_{DD}	C4	P	-	Default: V_{DD}

Notes:

(1) Type: I = input, O = output, P = power.

(2) I/O Level: 5VT = 5 V tolerant.

2.6.4. GD32F405Rx LQFP64 pin definitions

Table 2-6. GD32F405Rx LQFP64 pin definitions

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
V_{BAT}	1	P	-	Default: V_{BAT}
PC13-TAMPER-RTC	2	I/O	5VT	Default: PC13 Alternate: EVENTOUT Additional: RTC_TAMP0, RTC_OUT, RTC_TS
PC14-OSC32IN	3	I/O	5VT	Default: PC14 Alternate: EVENTOUT Additional: OSC32IN
PC15-OSC32OUT	4	I/O	5VT	Default: PC15 Alternate: EVENTOUT Additional: OSC32OUT
PH0	5	I/O	5VT	Default: PH0, OSCIN Alternate: EVENTOUT Additional: OSCIN
PH1	6	I/O	5VT	Default: PH1, OSCOUT Alternate: EVENTOUT Additional: OSCOUT
NRST	7	-	-	Default: NRST
PC0	8	I/O	5VT	Default: PC0 Alternate: USBHS_ULPI_STP, EVENTOUT Additional: ADC012_IN10
PC1	9	I/O	5VT	Default: PC1 Alternate: SPI2_MOSI, I2S2_SD, SPI1_MOSI, I2S1_SD, EVENTOUT Additional: ADC012_IN11
PC2	10	I/O	5VT	Default: PC2 Alternate: SPI1_MISO, I2S1_ADD_SD, USBHS_ULPI_DIR, EVENTOUT Additional: ADC012_IN12
PC3	11	I/O	5VT	Default: PC3

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: SPI1_MOSI, I2S1_SD, USBHS_ULPI_NXT, EVENTOUT Additional: ADC012_IN13
V_{SSA}	12	P	-	Default: V_{SSA}
V_{DDA}	13	P	-	Default: V_{DDA}
PA0-WKUP	14	I/O	5VT	Default: PA0 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER4_CH0, TIMER7_ETI, USART1_CTS, UART3_TX, EVENTOUT Additional: ADC012_IN0, WKUP
PA1	15	I/O	5VT	Default: PA1 Alternate: TIMER1_CH1, TIMER4_CH1, USART1_RTS, UART3_RX, EVENTOUT Additional: ADC012_IN1
PA2	16	I/O	5VT	Default: PA2 Alternate: TIMER1_CH2, TIMER4_CH2, TIMER8_CH0, I2S_CKIN, USART1_TX, EVENTOUT Additional: ADC012_IN2
PA3	17	I/O	5VT	Default: PA3 Alternate: TIMER1_CH3, TIMER4_CH3, TIMER8_CH1, I2S1_MCK, USART1_RX, USBHS_ULPI_D0, EVENTOUT Additional: ADC012_IN3
V_{SS}	18	P	-	Default: V_{SS}
V_{DD}	19	P	-	Default: V_{DD}
PA4	20	I/O		Default: PA4 Alternate: SPI0_NSS, SPI2_NSS, I2S2_WS, USART1_CK, USBHS_SOF, DCI_HSYNC, EVENTOUT Additional: ADC01_IN4, DAC_OUT0
PA5	21	I/O		Default: PA5 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER7_CH0_ON, SPI0_SCK, USBHS_ULPI_CK, EVENTOUT Additional: ADC01_IN5, DAC_OUT1
PA6	22	I/O	5VT	Default: PA6 Alternate: TIMER0_BRKIN, TIMER2_CH0, TIMER7_BRKIN, SPI0_MISO, I2S1_MCK, TIMER12_CH0, SDIO_CMD, DCI_PIXCLK, EVENTOUT Additional: ADC01_IN6
PA7	23	I/O	5VT	Default: PA7 Alternate: TIMER0_CH0_ON, TIMER2_CH1, TIMER7_CH0_ON, SPI0_MOSI, TIMER13_CH0, EVENTOUT Additional: ADC01_IN7
PC4	24	I/O	5VT	Default: PC4 Alternate: EVENTOUT

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Additional: ADC01_IN14
PC5	25	I/O	5VT	Default: PC5 Alternate: USART2_RX, EVENTOUT Additional: ADC01_IN15
PB0	26	I/O	5VT	Default: PB0 Alternate: TIMER0_CH1_ON, TIMER2_CH2, TIMER7_CH1_ON, SPI2_MOSI, I2S2_SD, USBHS_ULPI_D1, SDIO_D1, EVENTOUT Additional: ADC01_IN8, IREF
PB1	27	I/O	5VT	Default: PB1 Alternate: TIMER0_CH2_ON, TIMER2_CH3, TIMER7_CH2_ON, USBHS_ULPI_D2, SDIO_D2, EVENTOUT Additional: ADC01_IN9
PB2	28	I/O	5VT	Default: PB2, BOOT1 Alternate: TIMER1_CH3, SPI2_MOSI, I2S2_SD, USBHS_ULPI_D4, SDIO_CK, EVENTOUT
PB10	29	I/O	5VT	Default: PB10 Alternate: TIMER1_CH2, I2C1_SCL, SPI1_SCK, I2S1_CK, I2S2_MCK, USART2_TX, USBHS_ULPI_D3, SDIO_D7, EVENTOUT
PB11	30	I/O	5VT	Default: PB11 Alternate: TIMER1_CH3, I2C1_SDA, I2S_CKIN, USART2_RX, USBHS_ULPI_D4, EVENTOUT
NC	31	P	-	Default: V_{CORE}
V_{DD}	32	P	-	Default: V_{DD}
PB12	33	I/O	5VT	Default: PB12 Alternate: TIMER0_BRKIN, I2C1_SMBA, SPI1_NSS, I2S1_WS, USART2_CK, CAN1_RX, USBHS_ULPI_D5, USBHS_ID, EVENTOUT
PB13	34	I/O	5VT	Default: PB13 Alternate: TIMER0_CH0_ON, SPI1_SCK, I2S1_CK, USART2_CTS, CAN1_TX, USBHS_ULPI_D6, EVENTOUT, I2C1_TXFRAME Additional: USBHS_VBUS
PB14	35	I/O	5VT	Default: PB14 Alternate: TIMER0_CH1_ON, TIMER7_CH1_ON, SPI1_MISO, I2S1_ADD_SD, USART2_RTS, TIMER11_CH0, USBHS_DM, EVENTOUT
PB15	36	I/O	5VT	Default: PB15 Alternate: RTC_REFIN, TIMER0_CH2_ON, TIMER7_CH2_ON, SPI1_MOSI, I2S1_SD, TIMER11_CH1, USBHS_DP, EVENTOUT
PC6	37	I/O	5VT	Default: PC6

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				Alternate: TIMER2_CH0, TIMER7_CH0, I2S1_MCK, USART5_TX, SDIO_D6, DCI_D0, EVENTOUT
PC7	38	I/O	5VT	Default: PC7 Alternate: TIMER2_CH1, TIMER7_CH1, SPI1_SCK, I2S1_CK, I2S2_MCK, USART5_RX, SDIO_D7, DCI_D1, EVENTOUT
PC8	39	I/O	5VT	Default: PC8 Alternate: TRACED0, TIMER2_CH2, TIMER7_CH2, USART5_CK, SDIO_D0, DCI_D2, EVENTOUT
PC9	40	I/O	5VT	Default: PC9 Alternate: CK_OUT1, TIMER2_CH3, TIMER7_CH3, I2C2_SDA, I2S_CKIN, SDIO_D1, DCI_D3, EVENTOUT
PA8	41	I/O	5VT	Default: PA8 Alternate: CK_OUT0, TIMER0_CH0, I2C2_SCL, USART0_CK, USBFS_SOF, SDIO_D1, EVENTOUT, CTC_SYNC
PA9	42	I/O	5VT	Default: PA9 Alternate: TIMER0_CH1, I2C2_SMBA, SPI1_SCK, I2S1_CK, USART0_TX, SDIO_D2, DCI_D0, EVENTOUT Additional: USBFS_VBUS
PA10	43	I/O	5VT	Default: PA10 Alternate: TIMER0_CH2, USART0_RX, USBFS_ID, DCI_D1, EVENTOUT, I2C2_TXFRAME
PA11	44	I/O	5VT	Default: PA11 Alternate: TIMER0_CH3, USART0_CTS, USART5_TX, CAN0_RX, USBFS_DM, EVENTOUT
PA12	45	I/O	5VT	Default: PA12 Alternate: TIMER0_ETI, USART0_RTS, USART5_RX, CAN0_TX, USBFS_DP, EVENTOUT
PA13	46	I/O	5VT	Default: JTMS, SWDIO, PA13 Alternate: EVENTOUT
NC	47	-	-	-
V_{SS}	-	P	-	Default: V_{SS}
V_{DD}	48	P	-	Default: V_{DD}
PA14	49	I/O	5VT	Default: JTCK, SWCLK, PA14 Alternate: EVENTOUT
PA15	50	I/O	5VT	Default: JTDI, PA15 Alternate: TIMER1_CH0, TIMER1_ETI, SPI0_NSS, SPI2_NSS, I2S2_WS, USART0_TX, EVENTOUT
PC10	51	I/O	5VT	Default: PC10 Alternate: SPI2_SCK, I2S2_CK, USART2_TX, UART3_TX, SDIO_D2, DCI_D8, EVENTOUT
PC11	52	I/O	5VT	Default: PC11 Alternate: I2S2_ADD_SD, SPI2_MISO, USART2_RX,

Pin Name	Pins	Pin Type(1)	I/O Level(2)	Functions description
				UART3_RX, SDIO_D3, DCI_D4, EVENTOUT
PC12	53	I/O	5VT	Default: PC12 Alternate: I2C1_SDA, SPI2_MOSI, I2S2_SD, USART2_CK, UART4_TX, SDIO_CK, DCI_D9, EVENTOUT
PD2	54	I/O	5VT	Default: PD2 Alternate: TIMER2_ETI, UART4_RX, SDIO_CMD, DCI_D11, EVENTOUT
PB3	55	I/O	5VT	Default: JTDO, PB3 Alternate: TRACESWO, TIMER1_CH1, SPI0_SCK, SPI2_SCK, I2S2_CK, USART0_RX, I2C1_SDA, EVENTOUT
PB4	56	I/O	5VT	Default: NJTRST, PB4 Alternate: TIMER2_CH0, SPI0_MISO, SPI2_MISO, I2S2_ADD_SD, I2C2_SDA, SDIO_D0, EVENTOUT, I2C0_TXFRAME
PB5	57	I/O	5VT	Default: PB5 Alternate: TIMER2_CH1, I2C0_SMBA, SPI0_MOSI, SPI2_MOSI, I2S2_SD, CAN1_RX, USBHS_ULPI_D7, DCI_D10, EVENTOUT
PB6	58	I/O	5VT	Default: PB6 Alternate: TIMER3_CH0, I2C0_SCL, USART0_TX, CAN1_TX, DCI_D5, EVENTOUT
PB7	59	I/O	5VT	Default: PB7 Alternate: TIMER3_CH1, I2C0_SDA, USART0_RX, DCI_VSYNC, EVENTOUT
BOOT0	60	I/O	5VT	Default: BOOT0
PB8	61	I/O	5VT	Default: PB8 Alternate: TIMER1_CH0, TIMER1_ETI, TIMER3_CH2, TIMER9_CH0, I2C0_SCL, CAN0_RX, SDIO_D4, DCI_D6, EVENTOUT
PB9	62	I/O	5VT	Default: PB9 Alternate: TIMER1_CH1, TIMER3_CH3, TIMER10_CH0, I2C0_SDA, SPI1_NSS, I2S1_WS, CAN0_TX, SDIO_D5, DCI_D7, EVENTOUT
V_{SS}	63	P	-	Default: V_{SS}
V_{DD}	64	P	-	Default: V_{DD}

Notes:

(1) Type: I = input, O = output, P = power.

(2) I/O Level: 5VT = 5 V tolerant.

2.6.5. GD32F405xx pin alternate functions

Table 2-7. Port A alternate functions summary

Pin Name	AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
PA0		TIMER1_CH0/TIMER1_ETI	TIMER4_CH0	TIMER7_ETI				USART1_CTS	UART3_TX							EVENTOUT
PA1		TIMER1_CH1	TIMER4_CH1					USART1_RTS	UART3_RX							EVENTOUT
PA2		TIMER1_CH2	TIMER4_CH2	TIMER8_CH0		I2S_CKIN		USART1_TX								EVENTOUT
PA3		TIMER1_CH3	TIMER4_CH3	TIMER8_CH1		I2S1_MCK		USART1_RX			USBHS_ULPI_D0					EVENTOUT
PA4						SPI0_NSS	SPI2_NSS/I2S2_WS	USART1_CK					USBHS_SOF	DCI_HSYNC		EVENTOUT
PA5		TIMER1_CH0/TIMER1_ETI		TIMER7_CH0_ON		SPI0_SCK					USBHS_ULPI_CK					EVENTOUT
PA6		TIMER0_BRKIN	TIMER2_CH0	TIMER7_BRKIN		SPI0_MISO	I2S1_MCK			TIMER12_CH0			SDIO_CMD	DCI_PIXCLK		EVENTOUT
PA7		TIMER0_CH0_ON	TIMER2_CH1	TIMER7_CH0_ON		SPI0_MOSI				TIMER13_CH0						EVENTOUT
PA8	CK_OUT0	TIMER0_CH0			I2C2_SCL			USART0_CK		CTC_SYNC	USBFS_SOF		SDIO_D1			EVENTOUT
PA9		TIMER0_CH1			I2C2_SMBA	SPI1_SCK/I2S1_CK		USART0_TX					SDIO_D2	DCI_D0		EVENTOUT
PA10		TIMER0_CH2			I2C2_TXFRAME			USART0_RX			USBFS_ID			DCI_D1		EVENTOUT
PA11		TIMER0_CH3						USART0_CTS	USART5_TX	CAN0_RX	USBFS_DM					EVENTOUT
PA12		TIMER0_ETI						USART0_RTS	USART5_RX	CAN0_TX	USBFS_DP					EVENTOUT
PA13	JTMS/SWDIO															EVENTOUT
PA14	JTCK/SWCLK															EVENTOUT
PA15	JTDI	TIMER1_CH0/TIMER1_ETI				SPI0_NSS	SPI2_NSS/I2S2_WS	USART0_TX								EVENTOUT

Table 2-8. Port B alternate functions summary

Pin Name	AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
PB0		TIMER0_CH1_ON	TIMER2_CH2	TIMER7_CH1_ON				SPI2_MOSI/I2S2_SD			USBHS_ULPI_D1		SDIO_D1			EVENTOUT
PB1		TIMER0_CH2_ON	TIMER2_CH3	TIMER7_CH2_ON							USBHS_ULPI_D2		SDIO_D2			EVENTOUT
PB2		TIMER1_CH3						SPI2_MOSI/I2S2_SD			USBHS_ULPI_D4		SDIO_CK			EVENTOUT
PB3	JTDO/TRACESWO	TIMER1_CH1				SPI0_SCK	SPI2_SCK/I2S2_CK	USART0_RX		I2C1_SDA						EVENTOUT
PB4	NJTRST		TIMER2_CH0		I2C0_TXFRAME	SPI0_MISO	SPI2_MISO	I2S2_ADD_SD		I2C2_SDA			SDIO_D0			EVENTOUT
PB5			TIMER2_CH1		I2C0_SMBA	SPI0_MOSI	SPI2_MOSI/I2S2_SD			CAN1_RX	USBHS_ULPI_D7			DCI_D10		EVENTOUT
PB6			TIMER3_CH0		I2C0_SCL			USART0_TX		CAN1_TX				DCI_D5		EVENTOUT
PB7			TIMER3_CH1		I2C0_SDA			USART0_RX						DCI_VSYNC		EVENTOUT
PB8		TIMER1_CH0/TIMER1_ETI	TIMER3_CH2	TIMER9_CH0	I2C0_SCL					CAN0_RX			SDIO_D4	DCI_D6		EVENTOUT
PB9		TIMER1_CH1	TIMER3_CH3	TIMER10_CH0	I2C0_SDA	SPI1_NSS/I2S1_WS				CAN0_TX			SDIO_D5	DCI_D7		EVENTOUT
PB10		TIMER1_CH2			I2C1_SCL	SPI1_SCK/I2S1_CK	I2S2_MCK	USART2_TX			USBHS_ULPI_D3		SDIO_D7			EVENTOUT
PB11		TIMER1_CH3			I2C1_SDA	I2S_CKIN		USART2_RX			USBHS_ULPI_D4					EVENTOUT
PB12		TIMER0_BRKIN			I2C1_SMBA	SPI1_NSS/I2S1_WS		USART2_CK		CAN1_RX	USBHS_ULPI_D5		USBHS_ID			EVENTOUT
PB13		TIMER0_CH0_ON			I2C1_TXFRAME	SPI1_SCK/I2S1_CK		USART2_CTS		CAN1_TX	USBHS_ULPI_D6					EVENTOUT
PB14		TIMER0_CH1_ON		TIMER7_CH1_ON		SPI1_MISO	I2S1_ADD_SD	USART2_RTS		TIMER11_CH0			USBHS_DM			EVENTOUT
PB15	RTC_REFIN	TIMER0_CH2_ON		TIMER7_CH2_ON		SPI1_MOSI/I2S1_SD				TIMER11_CH1			USBHS_DP			EVENTOUT

Table 2-9. Port C alternate functions summary

Pin Name	AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
PC0											USBHS_ULPI_STP					EVENTOUT
PC1						SPI2_MOSI/I2S2_SD		SPI1_MOSI/I2S1_SD								EVENTOUT
PC2						SPI1_MISO	I2S1_ADD_SD				USBHS_ULPI_DIR					EVENTOUT
PC3						SPI1_MOSI/I2S1_SD					USBHS_ULPI_NXT					EVENTOUT
PC4																EVENTOUT
PC5								USART2_RX								EVENTOUT
PC6			TIMER2_CH0	TIMER7_CH0		I2S1_MCK			USART5_TX				SDIO_D6	DCI_D0		EVENTOUT
PC7			TIMER2_CH1	TIMER7_CH1		SPI1_SCK/I2S1_CK	I2S2_MCK		USART5_RX				SDIO_D7	DCI_D1		EVENTOUT
PC8	TRACED0		TIMER2_CH2	TIMER7_CH2					USART5_CK				SDIO_D0	DCI_D2		EVENTOUT
PC9	CK_OUT1		TIMER2_CH3	TIMER7_CH3	I2C2_SDA	I2S_CKIN							SDIO_D1	DCI_D3		EVENTOUT
PC10							SPI2_SCK/I2S2_CK	USART2_TX	UART3_TX				SDIO_D2	DCI_D8		EVENTOUT
PC11						I2S2_ADD_SD	SPI2_MISO	USART2_RX	UART3_RX				SDIO_D3	DCI_D4		EVENTOUT
PC12					I2C1_SDA		SPI2_MOSI/I2S2_SD	USART2_CK	UART4_TX				SDIO_CK	DCI_D9		EVENTOUT
PC13																EVENTOUT
PC14																EVENTOUT
PC15																EVENTOUT

Table 2-10. Port D alternate functions summary

Pin Name	AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
PD0							SPI2_MOSI/I2S2_SD			CAN0_RX						EVENTOUT
PD1								SPI1_NSS/I2S1_WS		CAN0_TX						EVENTOUT
PD2			TIMER2_ETI						UART4_RX				SDIO_CMD	DCI_D11		EVENTOUT
PD3	TRACED1					SPI1_SCK/I2S1_CK		USART1_CTS						DCI_D5		EVENTOUT
PD4								USART1_RTS								EVENTOUT
PD5								USART1_TX								EVENTOUT
PD6						SPI2_MOSI/I2S2_SD		USART1_RX						DCI_D10		EVENTOUT
PD7								USART1_CK								EVENTOUT
PD8								USART2_TX								EVENTOUT
PD9								USART2_RX								EVENTOUT
PD10								USART2_CK								EVENTOUT
PD11								USART2_CTS								EVENTOUT
PD12			TIMER3_CH0					USART2_RTS								EVENTOUT
PD13			TIMER3_CH1													EVENTOUT
PD14			TIMER3_CH2													EVENTOUT
PD15	CTC_SYNC		TIMER3_CH3													EVENTOUT

Table 2-11. Port E alternate functions summary

Pin Name	AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
PE0			TIMER3_ETI											DCI_D2		EVENTOUT
PE1		TIMER0_CH1_ON												DCI_D3		EVENTOUT
PE2	TRACECK															EVENTOUT
PE3	TRACED0															EVENTOUT
PE4	TRACED1													DCI_D4		EVENTOUT
PE5	TRACED2			TIMER8_CH0										DCI_D6		EVENTOUT
PE6	TRACED3			TIMER8_CH1										DCI_D7		EVENTOUT
PE7		TIMER0_ETI														EVENTOUT
PE8		TIMER0_CH0_ON														EVENTOUT
PE9		TIMER0_CH0														EVENTOUT
PE10		TIMER0_CH1_ON														EVENTOUT
PE11		TIMER0_CH1														EVENTOUT
PE12		TIMER0_CH2_ON														EVENTOUT
PE13		TIMER0_CH2														EVENTOUT
PE14		TIMER0_CH3														EVENTOUT
PE15		TIMER0_BRKIN														EVENTOUT

Table 2-12. Port F alternate functions summary

Pin Name	AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7	AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
PF0	CTC_SYNC				I2C1_SDA											EVENTOUT
PF1					I2C1_SCL											EVENTOUT
PF2					I2C1_SMBA											EVENTOUT
PF3					I2C1_TXFRAME											EVENTOUT
PF4																EVENTOUT
PF5																EVENTOUT
PF6				TIMER9_CH0												EVENTOUT
PF7				TIMER10_CH0												EVENTOUT
PF8										TIMER12_CH0						EVENTOUT
PF9										TIMER13_CH0						EVENTOUT
PF10														DCI_D11		EVENTOUT
PF11														DCI_D12		EVENTOUT
PF12																EVENTOUT
PF13																EVENTOUT
PF14																EVENTOUT
PF15																EVENTOUT