Pin No		Pin Name	I/O circuit type	Pin state type
LQFP64 QFN64	LQFP48 QFN48			
46	-	P24	F	M
		AN06		
		SCK1_0 (SCL1_0)		
		INT07_1		
		IC10_0		
47	-	P25	F	M
		AN07		
		SOT1_0 (SDA1_0)		
		INT08_1		
		IC11_0		
		CROUT_0		
48	-	P26	F	M
		AN08		
		SIN1_0		
		INT09_1		
		IC12_0		
49	37	P04	E	G
		TDO		
		SWO		
50	38	P03	E	G
		TMS		
		SWDIO		
51	39	P02	E	G
		TDI		
52	40	P01	E	G
		TCK		
		SWCLK		
53	41	P00	E	G
		TRSTX		
54	42	P66	F	M
		AN09		
		INT10_1		
		CROUT_1		
	-	IC13_0		
55	-	P65	L	M
		AN10		
		SCK0_1 (SCL0_1)		
		TIOA2_1		
		INT11_1		
		RTCCO_0		
		SUBOUT_0		
56	-	P64	L	M
		AN11		
		SOT0_1 (SDA0_1)		
		TIOB2_1		
		INT12_1		

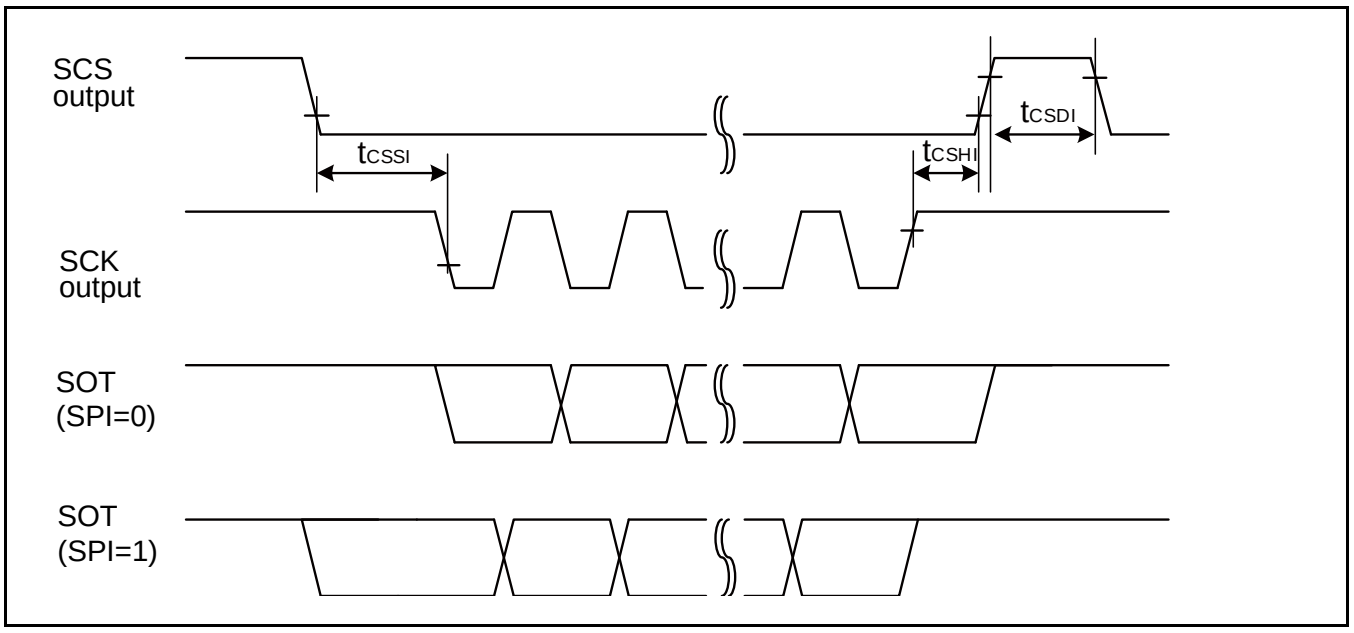
Pin No		Pin Name	I/O circuit type	Pin state type
LQFP64 QFN64	LQFP48 QFN48			
57	-	P63	F	M
		AN12		
		SIN0_1		
		TIOA3_1		
		INT13_1		
		ADTG_4		
58	-	P62	F	M
		AN13		
		SIN1_1		
		TIOB3_1		
		INT14_1		
59	43	P61	F	M
		AN14		
		ADTG_5		
		SOT1_1 (SDA1_1)		
		INT15_1		
		UHCONX0		
		IC00_2		
60	44	P60	I	F
		SCK1_1 (SCK1_1)		
		NMIX		
		WKUP0		
		IC01_2		
61	45	USBVCC	-	-
62	46	P80	H	R
		UDM0		
63	47	P81	H	R
		UDP0		
64	48	VSS	-	-

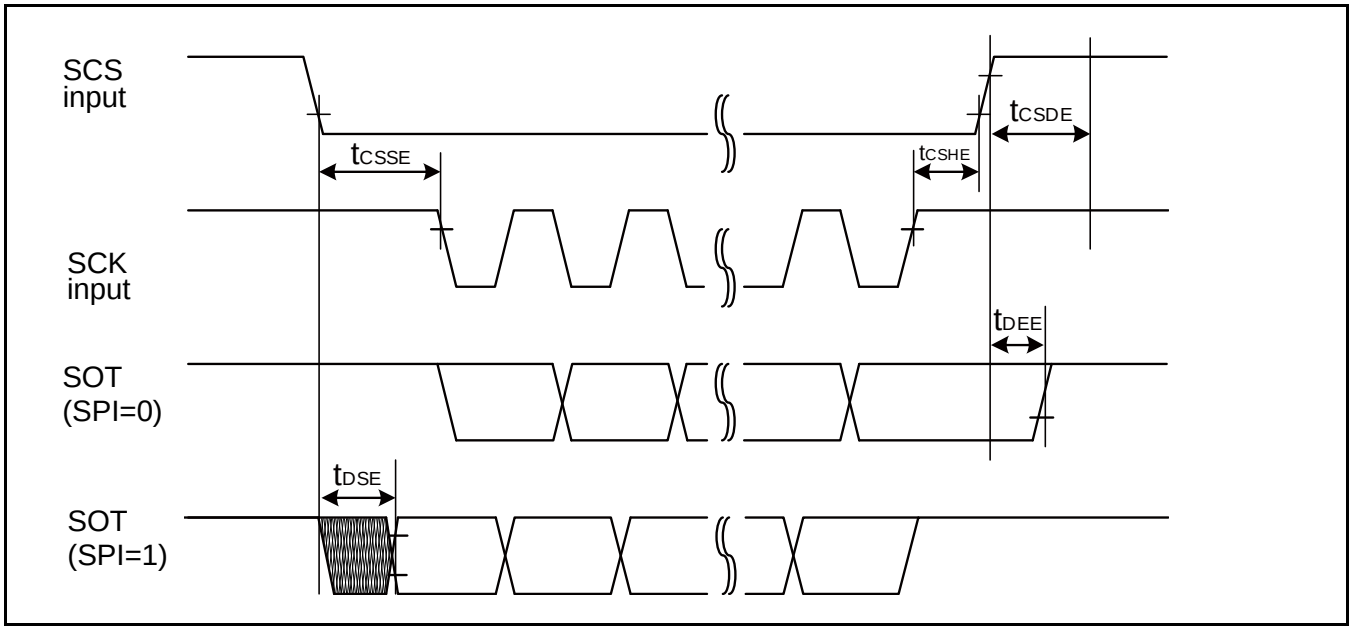
Pin function	Pin name	Function description	Pin No	
			LQFP64 QFN64	LQFP48 QFN48
Multi-function Timer 0	DTTI0X_0	Input signal controlling wave form generator outputs RTO00 to RTO05 of Multi-function timer 0.	9	5
	FRCK0_0	16-bit free-run timer ch.0 external clock input pin	8	4
	IC00_0	16-bit input capture ch.0 input pin of Multi-function timer 0. ICxx describes channel number.	4	-
	IC00_1		37	28
	IC00_2		59	43
	IC01_0		5	-
	IC01_1		36	27
	IC01_2		60	44
	IC02_0		6	2
	IC02_1		35	26
	IC03_0		7	3
	IC03_1		34	25
	RTO00_0 (PPG00_0)	Wave form generator output pin of Multi-function timer 0. This pin operates as PPG00 when it is used in PPG0 output modes.	10	6
	RTO01_0 (PPG00_0)	Wave form generator output pin of Multi-function timer 0. This pin operates as PPG00 when it is used in PPG0 output modes.	11	7
	RTO02_0 (PPG02_0)	Wave form generator output pin of Multi-function timer 0. This pin operates as PPG02 when it is used in PPG0 output modes.	12	8
	RTO03_0 (PPG02_0)	Wave form generator output pin of Multi-function timer 0. This pin operates as PPG02 when it is used in PPG0 output modes.	13	9
	RTO04_0 (PPG04_0)	Wave form generator output pin of Multi-function timer 0. This pin operates as PPG04 when it is used in PPG0 output modes.	14	10
	RTO05_0 (PPG04_0)	Wave form generator output pin of Multi-function timer 0. This pin operates as PPG04 when it is used in PPG0 output modes.	15	11

Pin function	Pin name	Function description	Pin No	
			LQFP64 QFN64	LQFP48 QFN48
Multi-function Timer 1	DTTI1X_0	Input signal controlling wave form generator outputs RTO10 to RTO15 of Multi-function timer 1.	45	-
	FRCK1_0	16-bit free-run timer ch.1 external clock input pin	44	-
	IC10_0	16-bit input capture ch.1 input pin of Multi-function timer 1. ICxx describes channel number.	46	-
	IC11_0		47	-
	IC12_0		48	-
	IC13_0		54	-
	RTO10_0 (PPG10_0)	Wave form generator output pin of Multi-function timer 1. This pin operates as PPG10 when it is used in PPG1 output modes.	34	-
	RTO11_0 (PPG10_0)	Wave form generator output pin of Multi-function timer 1. This pin operates as PPG10 when it is used in PPG1 output modes.	35	-
	RTO12_0 (PPG12_0)	Wave form generator output pin of Multi-function timer 1. This pin operates as PPG12 when it is used in PPG1 output modes.	36	-
	RTO13_0 (PPG12_0)	Wave form generator output pin of Multi-function timer 1. This pin operates as PPG12 when it is used in PPG1 output modes.	37	-
	RTO14_0 (PPG14_0)	Wave form generator output pin of Multi-function timer 1. This pin operates as PPG14 when it is used in PPG1 output modes.	38	-
	RTO15_0 (PPG14_0)	Wave form generator output pin of Multi-function timer 1. This pin operates as PPG14 when it is used in PPG1 output modes.	43	-
Quadrature Position/ Revolution Counter 0	AIN0_0	QPRC ch.0 AIN input pin	2	-
	AIN0_1		10	6
	AIN0_2		34	25
	BIN0_0	QPRC ch.0 BIN input pin	3	-
	BIN0_1		11	7
	BIN0_2		35	26
	ZIN0_0	QPRC ch.0 ZIN input pin	4	-
	ZIN0_1		12	8
	ZIN0_2		36	36

5. I/O Circuit Type

Type	Circuit	Remarks
A	Digital output Digital output Pull-up resistor control Digital input Standby mode control Clock input Standby mode control Digital input Standby mode control Digital output Digital output Pull-up resistor control	It is possible to select the main oscillation / GPIO function When the main oscillation is selected. Å Oscillation feedback resistor : Approximately 1 Mq Å With Standby mode control When the GPIO is selected. Å CMOS level output. Å CMOS level hysteresis input Å With pull-up resistor control Å With standby mode control Å Pull-up resistor : Approximately 50 kq Å I_{OH} = -4 mA, I_{OL} = 4 mA
B	Pull-up resistor Digital input	Å CMOS level hysteresis input Å Pull-up resistor : Approximately 50 kq


SCS output
tCSSI
tCSDI
tCSHI
SCK output
SOT (SPI=0)
SOT (SPI=1)


SCS input
tCSSE
tCSDE
tCSHE
SCK input
tDEE
SOT (SPI=0)
tDSE
SOT (SPI=1)

When Using High-speed Synchronous Serial Chip Select (SPI = 1, SCINV = 0, MS=0, CSLVL=0)

(V_{CC} = 2.7V to 5.5V, V_{SS} = 0V)

Parameter	Symbol	Conditions	V_{CC} < 4.5 V		V_{CC} ≥ 4.5 V		Unit
			Min	Max	Min	Max	
SCSx↓SCKx↑setup	t_{CSSI}	Internal shift clock operation	(*1)-20	(*1)+0	(*1)-20	(*1)+0	ns
SCKx↓SCSx↑hold	t_{CSHI}		(*2)+0	(*2)+0	(*2)+0	(*2)+0	ns
SCS deselect time	t_{CSDI}		(*3)-20+5t_{CYCP}	(*3)+20+5t_{CYCP}	(*3)-20+5t_{CYCP}	(*3)+20+5t_{CYCP}	ns
SCSx↓SCKx↑setup	t_{CSSE}	External shift clock operation	3t_{CYCP}+15	-	3t_{CYCP}+15	-	ns
SCKx↓SCSx↑hold	t_{CSHE}		0	-	0	-	ns
SCS deselect time	t_{CSDE}		3t_{CYCP}+15	-	3t_{CYCP}+15	-	ns
SCSx↓SOT delay	t_{DSE}		-	25	-	25	ns
SCSx↑SOT delay	t_{DEE}		0	-	0	-	ns

(*1): CSSU bit value×serial chip select timing operating clock cycle [ns]

(*2): CSHD bit value×serial chip select timing operating clock cycle [ns]

(*3): CSDS bit value×serial chip select timing operating clock cycle [ns]

Notes:

- t_{CYCP} indicates the APB bus clock cycle time.
  About the APB bus number which UART is connected to, see 8. Block Diagram in this data sheet.
- About CSSU, CSHD, CSDS, serial chip select timing operating clock, see FM4 Family Peripheral Manual Main part (002-04856).
- When the external load capacitance C_L = 30 pF.

Document History

Document Title: MB9B360L Series 32 -Bit ARM® Cortex® - M4F, FM4 Microcontroller
Document Number: 002-04930

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	-	AKIH	12/25/2013	Migrated to Cypress and assigned document number 002-04930. No change to document contents or format.
*A	5273878	AKIH	05/12/2016	Updated to Cypress format.

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