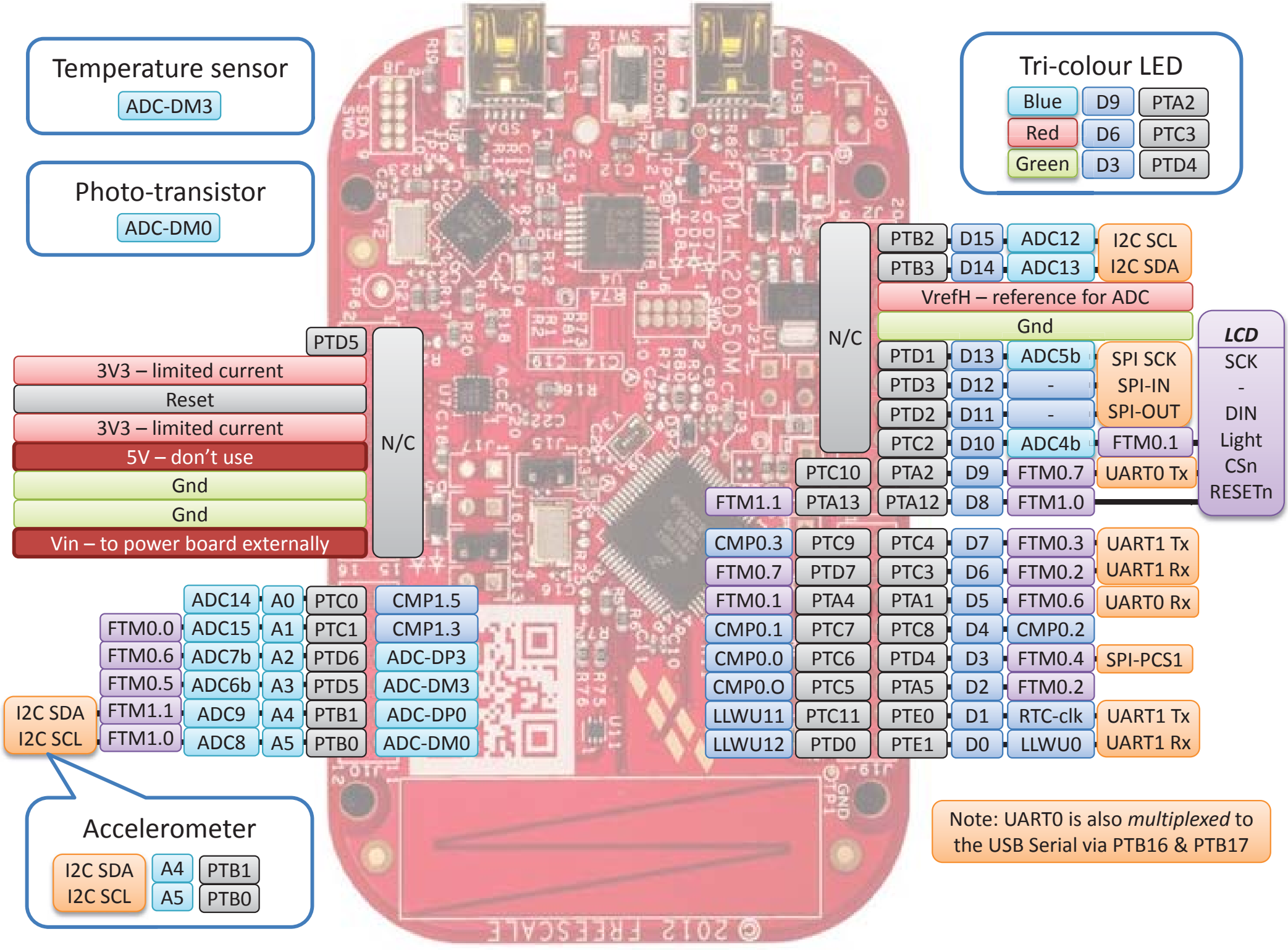
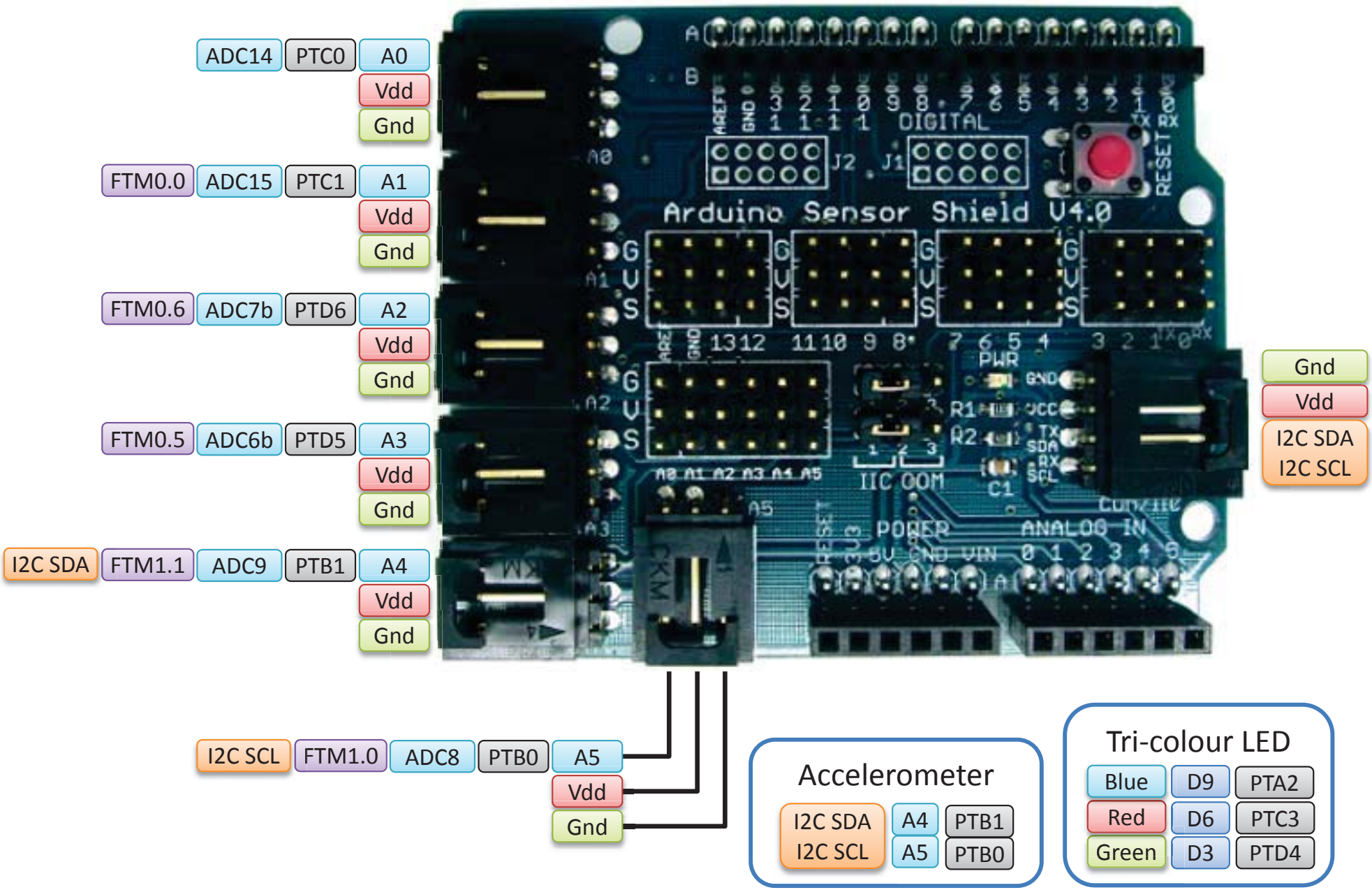
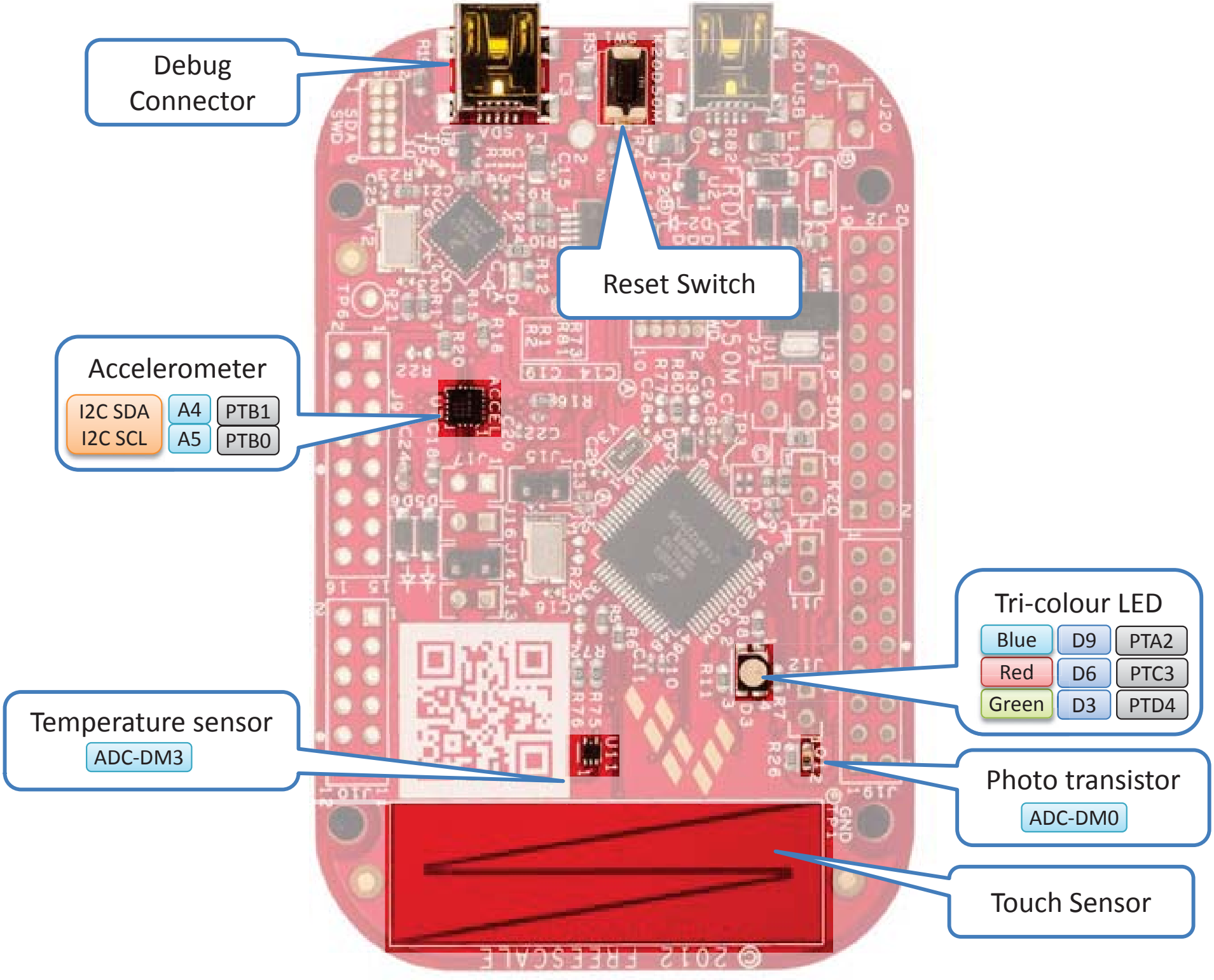

Temperature sensor
ADC-DM3
Photo-transistor
ADC-DM0
Tri-colour LED
Blue D9 PTA2
Red D6 PTC3
Green D3 PTD4
PTB2 D15 ADC12 I2C SCL
PTB3 D14 ADC13 I2C SDA
VrefH – reference for ADC
Gnd
PTD1 D13 ADC5b SPI SCK
PTD3 D12 - SPI-IN
PTD2 D11 - SPI-OUT
PTC2 D10 ADC4b FTM0.1
PTC10 PTA2 D9 FTM0.7 UART0 Tx
FTM1.1 PTA13 PTA12 D8 FTM1.0
LCD
SCK
-
DIN
Light
CSn
RESETn
N/C
PTD5
3V3 – limited current
Reset
3V3 – limited current
5V – don't use
Gnd
Gnd
Vin – to power board externally
N/C
CMP0.3 PTC9 PTC4 D7 FTM0.3 UART1 Tx
FTM0.7 PTD7 PTC3 D6 FTM0.2 UART1 Rx
FTM0.1 PTA4 PTA1 D5 FTM0.6 UART0 Rx
CMP0.1 PTC7 PTC8 D4 CMP0.2
CMP0.0 PTC6 PTD4 D3 FTM0.4 SPI-PCS1
CMP0.O PTC5 PTA5 D2 FTM0.2
LLWU11 PTC11 PTE0 D1 RTC-clk UART1 Tx
LLWU12 PTD0 PTE1 D0 LLWU0 UART1 Rx
ADC14 A0 PTC0 CMP1.5
FTM0.0 ADC15 A1 PTC1 CMP1.3
FTM0.6 ADC7b A2 PTD6 ADC-DP3
FTM0.5 ADC6b A3 PTD5 ADC-DM3
I2C SDA FTM1.1 ADC9 A4 PTB1 ADC-DP0
I2C SCL FTM1.0 ADC8 A5 PTB0 ADC-DM0
Accelerometer
I2C SDA A4 PTB1
I2C SCL A5 PTB0
Note: UART0 is also multiplexed to the USB Serial via PTB16 & PTB17


ADC14 PTC0 A0
Vdd
Gnd
FTM0.0 ADC15 PTC1 A1
Vdd
Gnd
FTM0.6 ADC7b PTD6 A2
Vdd
Gnd
FTM0.5 ADC6b PTD5 A3
Vdd
Gnd
I2C SDA FTM1.1 ADC9 PTB1 A4
Vdd
Gnd
I2C SCL FTM1.0 ADC8 PTB0 A5
Vdd
Gnd
Arduino Sensor Shield V4.0
DIGITAL
POWER
ANALOG IN
IIC OOM
PWR
Gnd
Vdd
I2C SDA
I2C SCL
Accelerometer
I2C SDA A4 PTB1
I2C SCL A5 PTB0
Tri-colour LED
Blue D9 PTA2
Red D6 PTC3
Green D3 PTD4


Debug Connector
Reset Switch
Accelerometer
I2C SDA
I2C SCL
A4
A5
PTB1
PTB0
Tri-colour LED
Blue
D9
PTA2
Red
D6
PTC3
Green
D3
PTD4
Temperature sensor
ADC-DM3
Photo transistor
ADC-DM0
Touch Sensor

FRDM-MK20 Pin Muxing (abbreviated)

Label	Pin Name	Default Fn	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	On-board Use	Display
A0	PTC0	ADC0_SE14/TSI0_CH13	ADC0_SE14/TSI0_CH13	PTC0	SPI0_PCS4	PDB0_EXTRG						East-Switch
A1	PTC1	ADC0_SE15/TSI0_CH14	ADC0_SE15/TSI0_CH14	PTC1/LLWU_P6	SPI0_PCS3	UART1_RTS_b	FTM0_CH0		I2S0_TXD0			South-Switch
A2	PTD6	ADC0_SE7b	ADC0_SE7b	PTD6/LLWU_P15	SPI0_PCS3	UART0_RX	FTM0_CH6		FTM0_FLT0			West-Switch
A3	PTD5	ADC0_SE6b	ADC0_SE6b	PTD5	SPI0_PCS2	UART0_CTS_b UART0_COL_b	FTM0_CH5		EWM_OUT_b			Centre-Switch
A4	PTB1	ADC0_SE9/TSI0_CH6	ADC0_SE9/TSI0_CH6	PTB1	I2C0_SDA	FTM1_CH1			FTM1_QD_PHB		Accelerometer (I2C)	North-Switch
A5	PTB0	ADC0_SE8/TSI0_CH0	ADC0_SE8/TSI0_CH0	PTB0/LLWU_P5	I2C0_SCL	FTM1_CH0			TM1_QD_PHA		Accelerometer (I2C)	

Label	Pin Name	Default Fn	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	On-board Use	
	PTB2		ADC0_SE12/TSI0_CH7	PTB2	I2C0_SCL	UART0_RTSb			FTM0_FLT3			
	PTB3		ADC0_SE13/TSI0_CH8	PTB3	I2C0_SDA	UART0_CTSb			FTM0_FLT0			
D13	PTD1	ADC0_SE5b	ADC0_SE5b	PTD1	SPI0_SCK	UART2_CTS_b						SPI-SCK
D12	PTD3			PTD3	SPI0_SIN	UART2_TX						
D11	PTD2			PTD2/LLWU_P13	SPI0_SOUT	UART2_RX						SPI-DIN
D10	PTC2	ADC0_SE4b/CMP1_IN0 TSI0_CH15	ADC0_SE4b CMP1_IN0/TSI0_CH15	PTC2	SPI0_PCS2	UART1_CTS_b	FTM0_CH1		I2S0_TX_FS			Backlight
D9	PTA2	JTAG_TDO/TRACE_SWO	TSI0_CH3	PTA2	UART0_TX	FTM0_CH7					Blue LED	CSn
D8	PTA12			PTA12		FTM1_CH0			I2S0_TXD0	FTM1_QD_PHA		RESETn

Label	Pin Name	Default Fn	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	On-board Use	
D7	PTC4			PTC4/LLWU_P8	SPI0_PCS0	UART1_TX	FTM0_CH3		CMP1_OUT			
D6	PTC3	CMP1_IN1	CMP1_IN1	PTC3/LLWU_P7	SPI0_PCS1	UART1_RX	FTM0_CH2	CLKOUT	I2S0_TX_BCLK		Red LED	
D5	PTA1	JTAG_TDI/EZP_DI	TSI0_CH2	PTA1	UART0_RX	FTM0_CH6						
D4	PTC8	CMP0_IN2	CMP0_IN2	PTC8			I2S0_MCLK					
D3	PTD4			PTD4/LLWU_P14	SPI0_PCS1	UART0_RTS_b	FTM0_CH4		EWM_IN		Green LED	
D2	PTA5			PTA5	USB_CLKIN	FTM0_CH2			I2S0_TX_BCLK			
D1	PTE0			PTE0		UART1_TX				RTC_CLKOUT		
D0	PTE1			PTE1/LLWU_P0		UART1_RX						

Label	Pin Name	Default Fn	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	On-board Use	
	ADC0_DM0	ADC0_DM0	ADC0_DM0								Light Sensor	
	ADC0_DM3	ADC0_DM3	ADC0_DM3								Temp. Sensor	

Label	Pin Name	Default Fn	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	On-board Use	
	PTC9	CMP0_IN3	CMP0_IN3	PTC9			I2S0_RX_BCLK					
	PTD7			PTD7	CMT_IRO	UART0_TX	FTM0_CH7		FTM0_FLT1			
	PTA4	NMI_b	TSI0_CH5	PTA4/LLWU_P3		FTM0_CH1				NMI_b		
	PTC7	CMP0_IN1	CMP0_IN1	PTC7	SPI0_SIN	USB_SOF_OUT	I2S0_RX_FS			I2S0_MCLK		
	PTC6	CMP0_IN0	CMP0_IN0	PTC6/LLWU_P10	SPI0_SOUT	PDB0_EXTRG	I2S0_RX_BCLK			I2S0_MCLK	Accelerometer Int 2	
	PTC5			PTC5/LLWU_P9	SPI0_SCK	LPTMR0_ALT2	I2S0_RXD0		CMP0_OUT	NMI_b		
	PTC11			PTC11/LLWU_P11							Accelerometer Int 1	
	PTD0			PTD0/LLWU_P12	SPI0_PCS0	UART2_RTSb						

Label	Pin Name	Default Fn	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	On-board Use	
	PTA13			PTA13/LLWU_P4		FTM1_CH1			I2S0_TX_FS	FTM1_QD_PHB		
	PTC10			PTC10			I2S0_RX_FS					

FRDM-KL20 Shield Pin Layout (abbreviated)

Layout matches board when orientated so that the **sparkfun.com** logo on daughter board reads correcty

	Label	Description
	RST	Target Reset (also to reset switch)
	3.3V	3.3 volts (limited current)
	5V	5 volts - DO NOT USE
	GND	Ground
	GND	Ground
	Vin	Vin to power the board externally

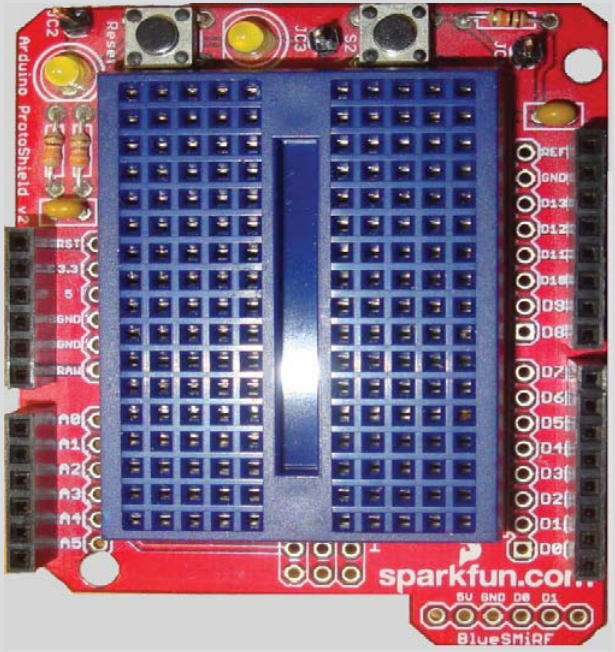
Display	Label	MCU Pin	Interesting functions available on the pin
East-Switch	A0	PTC0	ADC0_SE14/TSI0_CH13
South-Switch	A1	PTC1	ADC0_SE15/TSI0_CH14, I2S0_TxD,FTM0_CH0
West-Switch	A2	PTD6	ADC0_SE7b, UART0_RX, FTM0_CH6, LLWU
Centre-Switch	A3	PTD5	ADC0_SE6b, FTM0_CH5, EWM_OUT_b
North-Switch	A4	PTB1	ADC0_SE9/TSI0_CH6, I2C0_SDA, FTM1_CH1
	A5	PTB0	ADC0_SE8/TSI0_CH0, I2C0_SCL, FTM1_CH0

	Extra pins on board
JC1	SWITCH
JC2	LED
JC3	LED

	Function
ADC	Analogue-to-digital converter
CMP	Comparator
EWM	External Watchdog Monitor
FTM	FlexTimer Module
I2S	Integrated interchip sound
I2C	Inter-integrated circuit
LLWU	Low-Leakage Wake-up Unit
RTC	Real Time Clock
SPI	Serial Peripheral Interface
TSI	Touch Sense Input
UART	Universal Asynch. Receiver/Transmitter

Interesting functions available on the pin	MCU Pin	Label	Display
Voltage reference for the ADC (~3.3V)	VrefH	Ref	
Ground		Gnd	
ADC0_SE5b, SPI0_SCK	PTD1	D13	SPI_SCK
SPI0_SIN, UART2_TX	PTD3	D12	
LLWU_P13, SPI0_SOUT, UART2_RX	PTD2	D11	SPI_DIN
ADC0_SE4b/CMP1_IN0, FTM0_CH1	PTC2	D10	Backlight
TSI0_CH3, UART0_TX, FTM0_CH7	PTA2	D9	CSn
FTM1_CH0, I2S0_TXD0, FTM1_QD_PHA	PTA12	D8	RESETn

Interesting functions available on the pin	MCU Pin	Label	
LLWU_P8, UART1_TX, FTM0_CH3, CMP1_OUT	PTC4	D7	
CMP1_IN1, LLWU_P7, UART1_RX, FTM0_CH2	PTC3	D6	
TSI0_CH2, UART0_RX, FTM0_CH6	PTA1	D5	
CMP0_IN2, I2S0_MCLK	PTC8	D4	
LLWU_P14, FTM0_CH4, EWM_IN	PTD4	D3	
FTM0_CH2, I2S0_TX_BCLK	PTA5	D2	
UART1_TX, RTC_CLKOUT	PTE0	D1	
LLWU_P0, UART1_RX	PTE1	D0	

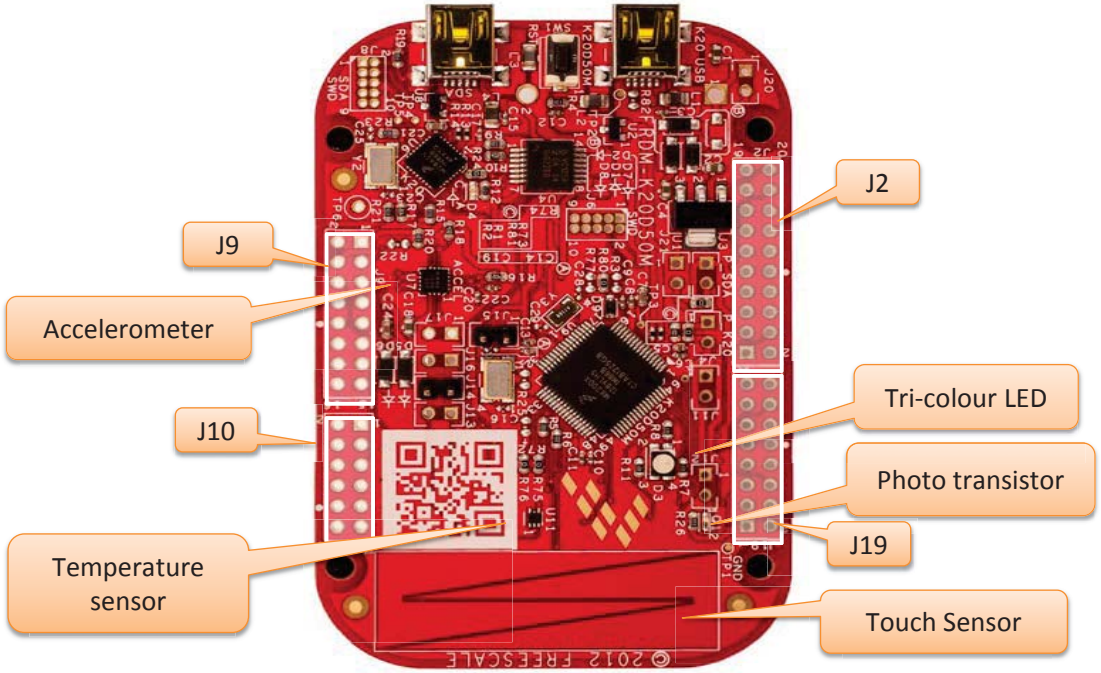


J9 outside functions	MCU Pin	
PTD5	PTD5	n.c
3.3 volts (limited current)		n.c
Target Reset (also to reset switch)	Reset	n.c
3.3 volts (limited current)	Vcc	n.c
5 volts - DO NOT USE		n.c
Ground	Gnd	n.c
Ground	Gnd	n.c
Vin to power the board externally		n.c

J10 outside functions	MCU Pin	MCU Pin	J10 inside functions
ADC0_SE14/TSI0_CH13, SPI0_PCS4	PTC0	CMP0_IN5	VREF_OUT/CMP1_IN5/CMP0_IN5
ADC0_SE15/TSI0_CH14,FTM0_CH0,I2S0_TxD	PTC1	CMP1_IN3	CMP1_IN3/ADC0_SE23
ADC0_SE7b, UART0_RX, FTM0_CH6, LLWU	PTD6	ADC0_DP3	ADC0_DP3
ADC0_SE6b, FTM0_CH5, EWM_OUT_b	PTD5	ADC0_DM3	ADC0_DM3
ADC0_SE9/TSI0_CH6, I2C0_SDA, FTM1_CH1	PTB1	ADC0_DP0	ADC0_DP0
ADC0_SE8/TSI0_CH0, I2C0_SCL, FTM1_CH0	PTB0	ADC0_DM0	ADC0_DM0

J2 inside functions	MCU Pin	MCU Pin	J2 outside functions
	n.c	PTB2	ADC0_SE12/TSI0_CH7,I2C0_SCL,UART0_RTSb,FTM0_FLT3
	n.c	PTB3	ADC0_SE13/TSI0_CH8,I2C0_SDA,UART0_CTSb,FTM0_FLT0
	n.c	VrefH	Voltage reference for the ADC (~3.3V)
	n.c	Gnd	Ground
	n.c	PTD1	ADC0_SE5b, SPI0_SCK
	n.c	PTD3	SPI0_SIN, UART2_TX
	n.c	PTD2	LLWU_P13, SPI0_SOUT, UART2_RX
	n.c	PTC2	ADC0_SE4b/CMP1_IN0, FTM0_CH1
I2S0_RX_FS	PTC10	PTA2	TSI0_CH3, UART0_TX, FTM0_CH7
LLWU,FTM1_CH1,I2S0_TX_FS,FTM1_QD_PHB	PTA13	PTA12	FTM1_CH0, I2S0_TXD0, FTM1_QD_PHA

J19 inside functions	MCU Pin	MCU Pin	J19 outside functions
CMP0_IN3,I2S0_RX_BCLK	PTC9	PTC4	LLWU_P8, UART1_TX, FTM0_CH3, CMP1_OUT
CMT_IRO,UART0_TX,FTM0_CH7,FTM0_FLT1	PTD7	PTC3	CMP1_IN1, LLWU_P7, UART1_RX, FTM0_CH2
TSI0_CH5,LLWU_P3,FTM0_CH1,NMI_b	PTA4	PTA1	TSI0_CH2, UART0_RX, FTM0_CH6
SPI0_SIN,USB_SOF_OUT,I2S0_RX_FS	PTC7	PTC8	CMP0_IN2, I2S0_MCLK
CMP0_IN0,LLWU_P10,SPI0_SOUT, I2S0_RX_BCLK,I2S0_MCLK	PTC6	PTD4	LLWU_P14, FTM0_CH4, EWM_IN
LLWU_P9,SPI0_SCK,LPTMR0_ALT2, I2S0_RXD0,CMP0_OUT	PTC5	PTA5	FTM0_CH2, I2S0_TX_BCLK
LLWU_P11	PTC11	PTE0	UART1_TX, RTC_CLKOUT
LLWU_P12,SPI0_PCS0,UART2_RTSb	PTD0	PTE1	LLWU_P0, UART1_RX



	Function
ADC	Analogue-to-digital converter
CMP	Comparator
EWM	External Watchdog Monitor
FTM	FlexTimer Module
I2S	Integrated interchip sound
I2C	Inter-integrated circuit
LLWU	Low-Leakage Wake-up Unit
RTC	Real Time Clock
SPI	Serial Peripheral Interface
TSI	Touch Sense Input
UART	Universal Asynch. Receiver/Transmitter
n.c.	No connect

FRDM-MK20 ADC Mapping

ADC Channel #	Channel Name		Input Signal			
			AC1x.DIFF=0		AC1x.DIFF=1	
	CFG2.MUX=0	CFG2.MUX=1	CFG2.MUX=0	CFG2.MUX=1	CFG2.MUX=0	CFG2.MUX=1
0	DAD0		ADC0_DP0		ADC0_DP0 + ADC0_DM0	
1	DAD1					
2	DAD2					
3	DAD3		ADC0_DP3		ADC0_DP3 + ADC0_DM3	
4	AD4a	AD4b		ADC0_SE4b		
5	AD5a	AD5b		ADC0_SE5b		
6	AD6a	AD6b		ADC0_SE6b		
7	AD7a	AD7b		ADC0_SE7b		
8	AD8		ADC0_SE8			
9	AD9		ADC0_SE9			
10	AD10					
11	AD11					
12	AD12		ADC0_SE12			
13	AD13		ADC0_SE13			
14	AD14		ADC0_SE14			
15	AD15		ADC0_SE15			
16	AD16					
17	AD17					
18	AD18					
19	AD19		ADC0_DM0			
20	AD20					
21	AD21		ADC0_DM3			
22	AD22		VREF Output			
23	AD23		/ADC0_SE23			
24	AD24					
25	AD25					
26	AD26		Temperature Sensor SE		Temperature Sensor DIFF	
27	AD27		Bandgap SE		Bandgap DIFF	
28	AD28					
29	AD29		VREFH		-VREFH DIFF	
30	AD30		VREFL			
31	Disabled		Disabled			