FRDM-KL25Z Pin usage and pinout chart

FRDM-KL25Z Pins				KL25Z128 Pins									
On-board Usage	I/O Header & Pin Num	Arduino™ R3 Pin Name	FRDM-KL25Z Pin Name	KL25Z Pin #	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7	Reset State/Function
–	J2 20	D14	PTE0	1		PTE0		UART1_TX	RTC_CLKOUT	CMP0_OUT	I2C1_SDA		DISABLED
–	J2 18	D15	PTE1	2		PTE1	SPI1_MOSI	UART1_RX		SPI1_MISO	I2C1_SCL		DISABLED
–	J9 09	–	PTE2	3		PTE2	SPI1_SCK						DISABLED
–	J9 11	–	PTE3	4		PTE3	SPI1_MISO			SPI1_MOSI			DISABLED
–	J9 13	–	PTE4	5		PTE4	SPI1_PCS0						DISABLED
–	J9 15	–	PTE5	6		PTE5							DISABLED
Power	–	–	VDD	7	VDD								VDD
Power	–	–	VSS	8	VSS								VSS
USB	–	–	USB0_DP	9	USB0_DP								USB0_DP
USB	–	–	USB0_DM	10	USB0_DM								USB0_DM
2.2uF cap	–	–	VOUT33	11	VOUT33								VOUT33
USB VBUS (5V)	–	–	VREGIN	12	VREGIN								VREGIN
–	J10 01	–	PTE20	13	ADC0_DP0/ADC0_SE0	PTE20		FTM1_CH0	UART0_TX				ADC0_DP0/ADC0_SE0
–	J10 03	–	PTE21	14	ADC0_DM0/ADC0_SE4a	PTE21		FTM1_CH1	UART0_RX				ADC0_DM0/ADC0_SE4a
–	J10 05	–	PTE22	15	ADC0_DP3/ADC0_SE3	PTE22		FTM2_CH0	UART2_TX				ADC0_DP3/ADC0_SE3
–	J10 07	–	PTE23	16	ADC0_DM3/ADC0_SE7a	PTE23		FTM2_CH1	UART2_RX				ADC0_DM3/ADC0_SE7a
Power	–	–	VDDA	17	VDDA								VDDA
Power	J2 16	AREF*	VREFH	18	VREFH								VREFH
Power	–	–	VREFL	19	VREFL								VREFL
Power	–	–	VSSA	20	VSSA								VSSA
–	J10 09	–	PTE29	21	CMP0_IN5/ADC0_SE4b	PTE29		FTM0_CH2	FTM_CLKIN0				CMP0_IN5/ADC0_SE4b
–	J10 11	–	PTE30	22	DAC0_OUT/ADC0_SE23/CMP0_IN4	PTE30		FTM0_CH3	FTM_CLKIN1				DAC0_OUT/ADC0_SE23/CMP0_IN4
–	J2 13	–	PTE31	23		PTE31		FTM0_CH4					DISABLED
Accelerometer I2C	–	–	PTE24	24		PTE24		FTM0_CH0		I2C0_SCL			DISABLED
Accelerometer I2C	–	–	PTE25	25		PTE25		FTM0_CH1		I2C0_SDA			DISABLED
Debug (SWD_CLK)	–	–	PTA0	26	TSI0_CH1	PTA0		FTM0_CH5			SWD_CLK		SWD_CLK
–	J1 02	D0	PTA1	27	TSI0_CH2	PTA1	UART0_RX	FTM2_CH0					DISABLED
–	J1 04	D1	PTA2	28	TSI0_CH3	PTA2	UART0_TX	FTM2_CH1					DISABLED
Debug (SWD_DIO)	–	–	PTA3	29	TSI0_CH4	PTA3	I2C1_SCL	FTM0_CH0			SWD_DIO		SWD_DIO
–	J1 10	D4	PTA4	30	TSI0_CH5	PTA4	I2C1_SDA	FTM0_CH1				NMI_b	NMI_b
–	J1 12	D5	PTA5	31		PTA5	USB_CLKIN	FTM0_CH2					DISABLED
–	J1 08	D3	PTA12	32		PTA12		FTM1_CH0					DISABLED
–	J2 02	D8	PTA13	33		PTA13		FTM1_CH1					DISABLED
Accelerometer INT1	–	–	PTA14	34		PTA14	SPI0_PCS0	UART0_TX					DISABLED
Accelerometer INT2	–	–	PTA15	35		PTA15	SPI0_SCK	UART0_RX					DISABLED
–	J2 09	–	PTA16	36		PTA16	SPI0_MOSI			SPI0_MISO			DISABLED
–	J2 11	–	PTA17	37		PTA17	SPI0_MISO			SPI0_MOSI			DISABLED
Power	–	–	VDD	38	VDD								VDD
Power	–	–	VSS	39	VSS								VSS
8MHz XTAL	–	–	PTA18	40	EXTAL0	PTA18		UART1_RX	FTM_CLKIN0				EXTAL0
8MHz XTAL	–	–	PTA19	41	XTAL0	PTA19		UART1_TX	FTM_CLKIN1	LPTMR0_ALT1			XTAL0
Reset	J9 06	–	PTA20	42		PTA20					RESET_b		RESET_b
–	J10 02	A0	PTB0	43	ADC0_SE8/TSI0_CH0	PTB0/LLWU_P5	I2C0_SCL	FTM1_CH0					ADC0_SE8/TSI0_CH0
–	J10 04	A1	PTB1	44	ADC0_SE9/TSI0_CH6	PTB1	I2C0_SDA	FTM1_CH1					ADC0_SE9/TSI0_CH6
–	J10 06	A2	PTB2	45	ADC0_SE12/TSI0_CH7	PTB2	I2C0_SCL	FTM2_CH0					ADC0_SE12/TSI0_CH7
–	J10 08	A3	PTB3	46	ADC0_SE13/TSI0_CH8	PTB3	I2C0_SDA	FTM2_CH1					ADC0_SE13/TSI0_CH8
–	J9 01	–	PTB8	47		PTB8		EXTRG_IN					DISABLED
–	J9 03	–	PTB9	48		PTB9							DISABLED
–	J9 05	–	PTB10	49		PTB10	SPI1_PCS0						DISABLED
–	J9 07	–	PTB11	50		PTB11	SPI1_SCK						DISABLED

Touch Slider	–	–	PTB16	51	TSI0_CH9	PTB16	SPI1_MOSI	UART0_RX	FTM_CLKIN0			SPI1_MISO	TSI0_CH9
Touch Slider	–	–	PTB17	52	TSI0_CH10	PTB17	SPI1_MISO	UART0_TX	FTM_CLKIN1			SPI1_MOSI	TSI0_CH10
Red LED	–	–	PTB18	53	TSI0_CH11	PTB18		FTM2_CH0					TSI0_CH11
Green LED	–	–	PTB19	54	TSI0_CH12	PTB19		FTM2_CH1					TSI0_CH12
–	J1 03	–	PTC0	55	ADC0_SE14/TSI0_CH13	PTC0			EXTRG_IN	CMP0_OUT			ADC0_SE14/TSI0_CH13
–	J10 12	A5	PTC1	56	ADC0_SE15/TSI0_CH14	PTC1/LLWU_P6/RTC_CLKIN	I2C1_SCL		FTM0_CH0				ADC0_SE15/TSI0_CH14
–	J10 10	A4	PTC2	57	ADC0_SE11/TSI0_CH15	PTC2	I2C1_SDA		FTM0_CH1				ADC0_SE11/TSI0_CH15
–	J1 05	–	PTC3	58		PTC3/LLWU_P7		UART1_RX	FTM0_CH2	CLKOUT			DISABLED
Power	–	–	VSS	59	VSS								VSS
Power	–	–	VDD	60		VDD							VDD
–	J1 07	–	PTC4	61		PTC4/LLWU_P8	SPI0_PCS0	UART1_TX	FTM0_CH3				DISABLED
–	J1 09	–	PTC5	62		PTC5/LLWU_P9	SPI0_SCK	LPTMR0_ALT2			CMP0_OUT		DISABLED
–	J1 11	–	PTC6	63	CMP0_IN0	PTC6/LLWU_P10	SPI0_MOSI	EXTRG_IN				SPI0_MISO	CMP0_IN0
–	J1 01	–	PTC7	64	CMP0_IN1	PTC7	SPI0_MISO					SPI0_MOSI	CMP0_IN1
–	J1 14	D6	PTC8	65	CMP0_IN2	PTC8	I2C0_SCL	FTM0_CH4					CMP0_IN2
–	J1 16	D7	PTC9	66	CMP0_IN3	PTC9	I2C0_SDA	FTM0_CH5					CMP0_IN3
–	J1 13	–	PTC10	67		PTC10	I2C1_SCL						DISABLED
–	J1 15	–	PTC11	68		PTC11	I2C1_SDA						DISABLED
–	J2 01	–	PTC12	69		PTC12			FTM_CLKIN0				DISABLED
–	J2 03	–	PTC13	70		PTC13			FTM_CLKIN1				DISABLED
–	J2 05	–	PTC16	71		PTC16							DISABLED
–	J2 07	–	PTC17	72		PTC17							DISABLED
–	J2 06	D10	PTD0	73		PTD0	SPI0_PCS0		FTM0_CH0				DISABLED
Blue LED	J2 12	D13	PTD1	74	ADC0_SE5b	PTD1	SPI0_SCK		FTM0_CH1				ADC0_SE5b
–	J2 08	D11	PTD2	75		PTD2	SPI0_MOSI	UART2_RX	FTM0_CH2			SPI0_MISO	DISABLED
–	J2 10	D12	PTD3	76		PTD3	SPI0_MISO	UART2_TX	FTM0_CH3			SPI0_MOSI	DISABLED
–	J1 06	D2	PTD4	77		PTD4/LLWU_P14	SPI1_PCS0	UART2_RX	FTM0_CH4				DISABLED
–	J2 04	D9	PTD5	78	ADC0_SE6b	PTD5	SPI1_SCK	UART2_TX	FTM0_CH5				ADC0_SE6b
–	J2 17	–	PTD6	79	ADC0_SE7b	PTD6/LLWU_P15	SPI1_MOSI	UART0_RX				SPI1_MISO	ADC0_SE7b
–	J2 19	–	PTD7	80		PTD7	SPI1_MISO	UART0_TX				SPI1_MOSI	DISABLED
Power	J2 14	GND	GND										
–	J2 15	–	–										
–	J9 02	RFU	SDA_PTD5										
Power	J9 04	IOREF	P3V3										
Power	J9 08	3.3V	P3V3										
Power	J9 10	5V	P5V_USB										
Power	J9 12	GND	GND										
Power	J9 14	GND	GND										
Power	J9 16	VIN	P5-9V_VIN										

* AREF is not connected to VREFH by default. VREFH is connected to P3V3_KL25Z by default. To supply an external AREF, cut the trace SH1 and install a 0ohm resistor or a wire short on R3.

= valid signal options

FRDM-KL25Z I/O Connector signal connections

J1				J2				J9				J10			
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
J1 01	PTC7	J1 02	PTA1	J2 01	PTC12	J2 02	PTA13	J9 01	PTB8	J9 02	SDA_PTD5	J10 01	PTE20	J10 02	PTB0
J1 03	PTC0	J1 04	PTA2	J2 03	PTC13	J2 04	PTD5	J9 03	PTB9	J9 04	P3V3	J10 03	PTE21	J10 04	PTB1
J1 05	PTC3	J1 06	PTD4	J2 05	PTC16	J2 06	PTD0	J9 05	PTB10	J9 06	PTA20	J10 05	PTE22	J10 06	PTB2
J1 07	PTC4	J1 08	PTA12	J2 07	PTC17	J2 08	PTD2	J9 07	PTB11	J9 08	P3V3	J10 07	PTE23	J10 08	PTB3
J1 09	PTC5	J1 10	PTA4	J2 09	PTA16	J2 10	PTD3	J9 09	PTE2	J9 10	P5V_USB	J10 09	PTE29	J10 10	PTC2
J1 11	PTC6	J1 12	PTA5	J2 11	PTA17	J2 12	PTD1	J9 11	PTE3	J9 12	GND	J10 11	PTE30	J10 12	PTC1
J1 13	PTC10	J1 14	PTC8	J2 13	PTE31	J2 14	GND	J9 13	PTE4	J9 14	GND				
J1 15	PTC11	J1 16	PTC9	J2 15	NC	J2 16	VREFH	J9 15	PTE5	J9 16	P5-9V_VIN				
				J2 17	PTD6	J2 18	PTE1								
				J2 19	PTD7	J2 20	PTE0								

FRDM-KL25Z Arduino™ R3 pin layout compatibility comparison chart

		UART	PWM	GPIO	Interrupt	I2C	SPI	A/D	Input Capture	Comparator	LED
D0	Arduino Uno R3	RX		✓	✓						
	FREEDOM-KL25Z (PTA1)	UART0_RX	FTM2_CH0	✓	✓				FTM2_CH0		
D1	Arduino Uno R3	TX		✓	✓						
	FREEDOM-KL25Z (PTA2)	UART0_TX	FTM2_CH1	✓	✓				FTM2_CH1		
D2	Arduino Uno R3			✓	✓						
	FREEDOM-KL25Z (PTD4)		FTM0_CH4	✓	✓				FTM0_CH4		
D3	Arduino Uno R3		✓	✓	✓						
	FREEDOM-KL25Z (PTA12)		FTM1_CH0	✓	✓				FTM1_CH0		
D4	Arduino Uno R3			✓	✓						
	FREEDOM-KL25Z (PTA4)		FTM0_CH1	✓	✓				FTM0_CH1		
D5	Arduino Uno R3		✓	✓	✓						
	FREEDOM-KL25Z (PTA5)		FTM0_CH2	✓	✓				FTM0_CH2		
D6	Arduino Uno R3		✓	✓	✓					✓	
	FREEDOM-KL25Z (PTC8)		FTM0_CH4	✓	X	I2C0_SCL			FTM0_CH4	COMP0_IN2	
D7	Arduino Uno R3			✓	✓					✓	
	FREEDOM-KL25Z (PTC9)		FTM0_CH5	✓	X	I2C0_SDA			FTM0_CH5	COMP0_IN3	
D8	Arduino Uno R3			✓	✓				✓		
	FREEDOM-KL25Z (PTA13)		FTM1_CH1	✓	✓				FTM1_CH1		
D9	Arduino Uno R3		✓	✓	✓						
	FREEDOM-KL25Z (PTD5)		FTM0_CH5	✓	✓				FTM0_CH5		
D10	Arduino Uno R3		✓	✓	✓		✓				
	FREEDOM-KL25Z (PTD0)		FTM0_CH0	✓	✓		SPI0_PCS0		FTM0_CH0		
D11	Arduino Uno R3			✓	✓		✓				
	FREEDOM-KL25Z (PTD2)	UART2_RX	FTM0_CH2	✓	✓		SPI0_MOSI		FTM0_CH2		
D12	Arduino Uno R3			✓	✓		✓				
	FREEDOM-KL25Z (PTD3)	UART2_TX	FTM0_CH3	✓	✓		SPI0_MISO		FTM0_CH3		
D13	Arduino Uno R3			✓	✓		✓				✓
	FREEDOM-KL25Z (PTD1)		FTM0_CH1	✓	✓		SPI0_SCK	ADC0_SE5b	FTM0_CH1		FTM0_CH1
D14	Arduino Uno R3			✓	✓	SDA		A4			
	FREEDOM-KL25Z (PTE0)			✓	X	I2C1_SDA		X			
D15	Arduino Uno R3			✓	✓	SCL		A5			
	FREEDOM-KL25Z (PTE1)			✓	X	I2C1_SCL		X			
A0	Arduino Uno R3			✓	✓			A0			
	FREEDOM-KL25Z (PTB0)			✓	X	I2C0_SCL		ADC0_SE8	FTM1_CH0		
A1	Arduino Uno R3			✓	✓			A1			
	FREEDOM-KL25Z (PTB1)			✓	X	I2C0_SDA		ADC0_SE9	FTM1_CH1		
A2	Arduino Uno R3			✓	✓			A2			
	FREEDOM-KL25Z (PTB2)			✓	X	I2C0_SCL		ADC0_SE12	FTM2_CH0		
A3	Arduino Uno R3			✓	✓			A3			
	FREEDOM-KL25Z (PTB3)			✓	X	I2C0_SDA		ADC0_SE13	FTM2_CH1		
A4	Arduino Uno R3			✓	✓	SDA		A4			
	FREEDOM-KL25Z (PTC2)			✓	X	I2C1_SDA		ADC0_SE11			
A5	Arduino Uno R3			✓	✓	SCL		A5			
	FREEDOM-KL25Z (PTC1)			✓	X	I2C1_SCL		ADC0_SE15			

OpenSDA Pinouts

K20 32QFN	Pin Name	Use Case	DEFAULT	ALT0	ALT1	ALT2	ALT3	ALT4	ALT5	ALT6	ALT7
1	VDD	3.3V	VDD	VDD							
2	VSS	GND	VSS	VSS							
3	USB0_DP	USB D+	USB0_DP	USB0_DP							
4	USB0_DM	USB D-	USB0_DM	USB0_DM							
5	VOUT33	2.2uF to GND	VOUT33	VOUT33							
6	VREGIN	USB VBUS (5V)	VREGIN	VREGIN							
7	VDDA	3.3V	VDDA	VDDA							
8	VSSA	GND	VSSA	VSSA							
9	XTAL32	No Connect - pads for XTAL available	XTAL32	XTAL32							
10	EXTAL32	No Connect - pads for XTAL available	EXTAL32	EXTAL32							
11	VBAT	No Connect	VBAT	VBAT							
12	PTA0	Debug Connector	JTAG_TCLK/SWD_CLK/EZP_CLK	TSI0_CH1	PTA0	UART0_CTS_b/UART0_COL_b	FTM0_CH5				JTAG_TCLK/SWD_CLK
13	PTA1	Debug Connector	JTAG_TDI/EZP_DI	TSI0_CH2	PTA1	UART0_RX	FTM0_CH6				JTAG_TDI
14	PTA2	Debug Connector	JTAG_TDO/TRACE_SWO/EZP_DO	TSI0_CH3	PTA2	UART0_TX	FTM0_CH7				JTAG_TDO/TRACE_SWO
15	PTA3	Debug Connector	JTAG_TMS/SWD_DIO	TSI0_CH4	PTA3	UART0_RTS_b	FTM0_CH0				JTAG_TMS/SWD_DIO
16	PTA4/LLWU_P3	SWD_EN (disconnecto SPI port from target)	NMI_b/EZP_CS_b	TSI0_CH5	PTA4/LLWU_P3		FTM0_CH1				NMI_b
17	PTA18	8MHz resonator	EXTAL0	EXTAL0	PTA18		FTM0_FLT2	FTM_CLKIN0			
18	PTA19	8MHz resonator	XTAL0	XTAL0	PTA19		FTM1_FLT0	FTM_CLKIN1		LPTMR0_ALT1	
19	RESET_b	Voltage divider to USB VBUS	RESET_b	RESET_b							
20	PTB0/LLWU_P5	SWD_OE (Output Buffer Enable)	ADC0_SE8/TSI0_CH0	ADC0_SE8/TSI0_CH0	PTB0/LLWU_P5	I2C0_SCL	FTM1_CH0			FTM1_QD_PHA	
21	PTB1	RESET Output to target MCU	ADC0_SE9/TSI0_CH6	ADC0_SE9/TSI0_CH6	PTB1	I2C0_SDA	FTM1_CH1			FTM1_QD_PHB	
22	PTC1/LLWU_P6	SPI Flash Reset	ADC0_SE15/TSI0_CH14	ADC0_SE15/TSI0_CH14	PTC1/LLWU_P6	SPI0_PCS3	UART1_RTS_b	FTM0_CH0		I2S0_TXD0	
23	PTC2	SPI Flash CS	ADC0_SE4b/CMP1_IN0/TSI0_CH15	ADC0_SE4b/CMP1_IN0/TSI0_CH15	PTC2	SPI0_PCS2	UART1_CTS_b	FTM0_CH1		I2S0_TX_FS	
24	PTC3/LLWU_P7	Connect to target MCU TX pin	CMP1_IN1	CMP1_IN1	PTC3/LLWU_P7	SPI0_PCS1	UART1_RX	FTM0_CH2	CLKOUT	I2S0_TX_BCLK	
25	PTC4/LLWU_P8	Connect to target MCU RX pin	DISABLED		PTC4/LLWU_P8	SPI0_PCS0	UART1_TX	FTM0_CH3		CMP1_OUT	
26	PTC5/LLWU_P9	SWD_CLK to target MCU, SPI to SPI Flash	DISABLED		PTC5/LLWU_P9	SPI0_SCK	LPTMR0_ALT2	I2S0_RXD0		CMP0_OUT	
27	PTC6/LLWU_P10	SWD_DIO to 74*126, SPI to SPI Flash	CMP0_IN0	CMP0_IN0	PTC6/LLWU_P10	SPI0_SOUT	PDB0_EXTRG	I2S0_RX_BCLK		I2S0_MCLK	
28	PTC7	SWD_DIO to target MCU, SPI Flash	CMP0_IN1	CMP0_IN1	PTC7	SPI0_SIN	USB_SOF_OUT	I2S0_RX_FS			
29	PTD4/LLWU_P14	Green LED (may no-pop)	DISABLED		PTD4/LLWU_P14	SPI0_PCS1	UART0_RTS_b	FTM0_CH4		EWM_IN	
30	PTD5	**Special case -- connected to IO header**	ADC0_SE6b	ADC0_SE6b	PTD5	SPI0_PCS2	UART0_CTS_b/UART0_COL_b	FTM0_CH5		EWM_OUT_b	
31	PTD6/LLWU_P15	**Special case -- connected to RTC_CLKIN**	ADC0_SE7b	ADC0_SE7b	PTD6/LLWU_P15	SPI0_PCS3	UART0_RX	FTM0_CH6		FTM0_FLT0	
32	PTD7	USB 5V Power Sense	DISABLED		PTD7	CMT_IRO	UART0_TX	FTM0_CH7		FTM0_FLT1	