UC2550

Overview

The efficiency of our UC2550 makes it ideal for low power applications. It is also our lowest cost UCM and offers a large complement of peripherals. Unlike the UC5550 however, it does not support USB host, a parallel LCD display, Ethernet PHY, or DCMI (Digital Camera Interface).

We currently stock the UC2550 both with and without Wi-Fi depending on the model. We also offer customized, non-stock versions of our SoMs. See Options below for more information.

Getting Started

The UCM development options can greatly simplify the process of building a product or prototype using the UC2550. Options include a development board and displays which can get you programming in minutes. Please refer to the Development Optionspage for more information.

Using TinyCLR OS

TinyCLR provides a way to program the UC2550 in C# or Visual Basic from the Microsoft Visual Studio integrated development environment. To get started you must first install the bootloader and firmware on the UC2550 (instructions below) and then go to the TinyCLR Getting Started page for instructions on setting up the host computer and writing and deploying programs.

Loading Bootloader Version 2

Download the UC2550 bootloader from here.

Go to the Uploading DFU Files section of the STM32 Bootloader page for instructions on installing the bootloader.

Loading the Firmware

TIP

First make sure you have bootloader v2 loaded. This needs to be done only once.

To activate bootloader v2, hold the LDR0 signal low (press BOOT B on the UCM Dev and Breakout boards) and reset the board. You may have to wait a couple of seconds before releasing LDR0.

Download the UC2550 firmware and follow the Loading the Firmware steps.

Setup the Host Computer and Start Coding

Now that you have installed the bootloader and firmware on the UC2550, you can setup your host computer and start programming. Go to the TinyCLR Getting Startedpage for instructions.

Using Native Code with TinyCLR

TinyCLR OS also lets you use native code that that works alongside your managed application. Native code can be used to provide improved performance or access to advanced features not exposed through TinyCLR. For more information check out Native Code on TinyCLR.

TinyCLR cannot relocate native code, so you will have specify its location in the scatterfile. For the UC2550, the interop region starts at address 0x2003E000, and its length is 0x1FF8.

Updating the Wi-Fi Module Firmware

To update the firmware on the UC2550 Wi-Fi module, follow the instructions on this page.

Schematic

The schematic for the UC2550 can be found here.

Options

Model Number	Wi-Fi	External QSPI Flash
UC2550-13NNN	no	no
UC2550-13NNW	yes	no

Customization

We also offer customized, non-stock versions of our SoMs. Many options are available, such as various sizes of external QSPI flash. Please contact us for details. We will always do our best to provide you with a module to fit your exact needs.

Specifications

Specs	Value
Processor	STM STM32F413 32-bit ARM Cortex-M4
Speed	100 MHz
Internal RAM	320 KByte (SRAM)
Internal Flash	1 MByte
External RAM	0 KByte
External Flash	Up to 4 MByte (QSPI)
Dimensions	67.7 x 31.7 x 3.2 mm

Note: Not all memory will be available for your application.

Peripherals

Peripheral	UCM Standard	Overall*
UART	4	9 (including HS)
UART HS	2	2
I2C	2	2
SPI	2	3
CAN	2	2
SDIO	1	1
ADC	8	15

Peripheral	UCM Standard	Overall*
PWM	8	27
GPIO	10	67
IRQ	4	67
USB Client	Supported	Supported
USB Host	Not supported	Not supported
LCD	Not supported	Not supported
Ethernet PHY	Not supported	Not supported
Wi-Fi	Supported	Supported
DCMI	Not supported	Not supported
VBAT	Supported	Supported
JTAG	SWD	SWD

**The "Overall" column includes peripherals that fall outside of the UCM standard definition. Using these peripherals may reduce code portability with our other UCM models. Also, as many of these non-standard peripherals share I/O pins, not all of them will be available to your application.*

Pin Assignments

SO-DIMM Pin	Universal Compute Standard	Function Name
1	AGND	AGND
2	Ethernet TX-	
3	Module Specific 1	(Wi-Fi PIN14) Wi-Fi Power LED
4	Ethernet TX+	
5	Analog VREF-	Analog VREF-

SO-DIMM Pin	Universal Compute Standard	Function Name
6	Ethernet RX-	
7	Reserved	
8	Ethernet RX+	
9	Reserved	
10	Indicator A	(Wi-Fi PIN15) Wi-Fi Link Up LED
11	Indicator B	(Wi-Fi PIN5) Wi-Fi Running (Blink) LED
12	Reserved	
13	GND	GND
14	DCMI D0	
15	DCMI D1	
16	DCMI D2	
17	DCMI D3	
18	DCMI D4	
19	DCMI D5	
20	Analog 3.3V	Analog 3.3V
21	DCMI D6	
22	DCMI D7	
23	DCMI VSYNC	
24	DCMI HSYNC	

SO-DIMM Pin	Universal Compute Standard	Function Name
25	DCMI PIXCLK	
26	DCMI XCLK	
27	GND	GND
28	PWM E	PE5, TIM9 CH1
29	PWM F	PE6, TIM9 CH2
30	PWM G	PB14, TIM12 CH1
31	PWM H	PB15, TIM12 CH2
32	Analog VREF+	Analog VREF+
33	Reserved	
34	5V	
35	Module Specific 4	(Wi-Fi PIN13)
36	Module Specific 5	(Wi-Fi PIN16)
37	Module Specific 6	(Wi-Fi PIN22)
38	Module Specific 7	
39	Module Specific 8	
40	GND	GND
41	GND	GND
42	LCD 24bpp R0	
43	LCD 24bpp R1	
44	LCD 24bpp R2	

SO-DIMM Pin	Universal Compute Standard	Function Name
45	LCD 24bpp G0	
46	3.3V	3.3V
47	LCD 24bpp G1	
48	LCD 24bpp B0	
49	LCD 24bpp B1	
50	LCD 24bpp B2	
51	GND	GND
52	Module Specific 9	
53	I2S SCK	
54	I2S WD	
55	I2S WS	
56	5V	
57	IRQ A	PC0, ADC10
58	IRQ B	PC1, ADC11
59	IRQ C	PC2, ADC12
60	3.3V	3.3V
61	IRQ D	PC3, ADC13
62	GPIO A	PC4, ADC14
63	GPIO B	PC5, ADC15
64	GPIO C	PA15, TIM2 CH1

SO-DIMM Pin	Universal Compute Standard	Function Name
65	GND	GND
66	GPIO D	PB0, ADC8, TIM3 CH3
67	GPIO E	PB7, TIM4 CH2
68	GPIO F	PD7
69	GPIO G	PD10
70	5V	
71	Reserved	
72	3.3V	3.3V
73	I2C B SDA	PB8, I2C3 SDA, TIM10 CH1
74	I2C B SCL	PA8, I2C3 SCL, MCO1
75	UART C TX	PE1, UART8 TX
76	UART C RX	PE0, UART8 RX
77	UART D TX	PD15, USART9 TX, TIM4 CH4
78	UART D RX	PD14, USART9 RX, TIM4 CH3
79	GND	GND
80	Reserved	
81	Reserved	
82	Reserved	
83	Reserved	
84	Reserved	

SO-DIMM Pin	Universal Compute Standard	Function Name
85	Reserved	
86	5V	
87	USB Device ID	
88	3.3V	3.3V
89	UART B TX	PE8, USART7 TX
90	UART B RX	PE7, USART7 RX
91	ADC A	PA0, ADC0, TIM5 CH1
92	GPIO H	PE10
93	SPI B MISO	(Wi-Fi PIN6) PE13, SPI5 MISO, TIM1 CH3
94	SPI B MOSI	(Wi-Fi PIN8) PE14, SPI5 MOSI, TIM1 CH4
95	GND	GND
96	SPI B SCK	(Wi-Fi PIN10) PE12, SPI5 SCK
97	ADC B	PA1, ADC1, TIM5 CH2
98	CAN A TD	PD1, CAN1 TX, UART4 TX
99	CAN A RD	PD0, CAN1 RX, UART4 RX
100	CAN B TD	PB13, CAN2 TX, UART5 TX
101	CAN B RD	PB12, CAN2 RX, UART5 RX
102	UART HS A TX	PD5, USART2 TX
103	UART HS A RX	PD6, USART2 RX

SO-DIMM Pin	Universal Compute Standard	Function Name
104	ADC C	PA2, ADC2, TIM5 CH3
105	PWM A	PE9, TIM1 CH1
106	3.3V	3.3V
107	BOOT A	BOOT0
108	Module Specific 2	(Wi-Fi PIN2)
109	Module Specific 3	(Wi-Fi PIN4)
110	ADC D	PA3, ADC3, TIM5 CH4
111	BOOT C	PE3, LDR1
112	PWM B	PE11, TIM1 CH2
113	GND	GND
114	ADC E	PA4, ADC4, DAC1
115	I2C A SDA	PB9, I2C2 SDA, TIM10 CH1
116	I2C A SCL	PB10, I2C2 SCL, TIM2 CH3
117	UART A RX	PA10, USART1 RX
118	UART A TX	PA9, USART1 TX
119	GPIO I	PD14, UART9 RX, TIM4 CH3
120	UART HS A RTS	PD4, USART2 RTS
121	UART HS A CTS	PD3, USART2 CTS
122	GPIO J	PD15, UART9 RX, TIM4 CH4
123	SD Card D0	PC8, SD D0, TIM8 CH3

SO-DIMM Pin	Universal Compute Standard	Function Name
124	3.3V	3.3V
125	SD Card CMD	PD2, SD CMD
126	SD Card CLK	PC12, SD CLK, SPI3 MOSI
127	SD Card D1	PC9, SD D1, TIM8 CH4
128	SD Card D2	PC10, SD D2, SPI3 SCK
129	SD Card D3	PC11, SD D3, SPI3 MISO
130	PWM C	PC6, TIM3 CH1, USART6 TX
131	GND	GND
132	GPIO K	
133	PWM D	PC7, TIM3 CH2, USART6 RX
134	BOOT B	PB2, LDR0
135	BOOT D	PE4, MODE
136	GPIO L	
137	Module Specific 10	
138	UART HS B RTS	PD12, USART3 RTS
139	UART HS B CTS	PD11, USART3 CTS
140	UART HS B TX	PD8, USART3 TX
141	UART HS B RX	PD9, USART3 RX
142	3.3V	3.3V
143	LCD VSYNC	

SO-DIMM Pin	Universal Compute Standard	Function Name
144	LCD HSYNC	
145	LCD CLK	
146	LCD DE	
147	Module Specific 11	
148	SD Card CD	PC13
149	Module Specific 12	
150	Reserved	
151	GND	GND
152	LCD B3	
153	LCD B4	
154	LCD B5	
155	LCD B6	
156	LCD B7	
157	ADC F	PA5, ADC5, DAC2
158	ADC G	PA6, ADC6
159	ADC H	PA7, ADC7
160	3.3V	3.3V
161	LCD G2	
162	LCD G3	
163	LCD G4	

SO-DIMM Pin	Universal Compute Standard	Function Name
164	LCD G5	
165	LCD G6	
166	Module Specific 13	
167	Indicator C	
168	LCD R7	
169	GND	GND
170	LCD G7	
171	LCD R3	
172	LCD R4	
173	LCD R5	
174	LCD R6	
175	SPI A SCK	PB3, SPI1 SCK, TIM2 CH2
176	SPI A MISO	PB4, SPI1 MISO
177	Module Specific 14	
178	SPI A MOSI	PB5, SPI1 MOSI
179	Module Specific 15	
180	3.3V	3.3V
181	Module Specific 16	
182	Module Specific 17	
183	VBAT	VBAT

SO-DIMM Pin	Universal Compute Standard	Function Name
184	Module Specific 18	
185	GND	GND
186	GND	GND
187	RESET	RESET
188	USB Host D+	
189	JTAG RTCK	
190	USB Host D-	
191	JTAG TDO	
192	3.3V	3.3V
193	JTAG NTRST	
194	USB Device D+	PA12, USB D+
195	JTAG TDI	
196	USB Device D-	PA11, USB D-
197	JTAG TCK (SWCLK)	PA14, JTCK, SWCLK
198	GND	GND
199	JTAG TMS (SWDIO)	PA13, JTMS, SWDIO
200	Indicator D	