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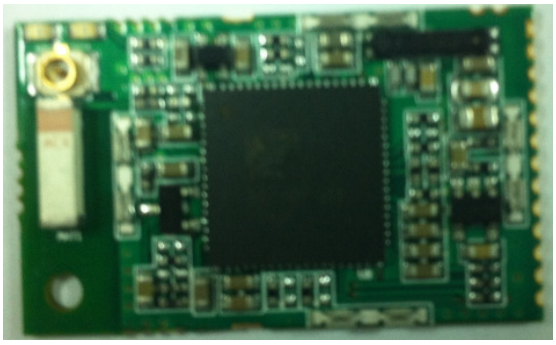
SWICED1000
UART WiFi Modules

Embedded Wireless LAN Controller Module with antenna

IEEE802.11 b/g/n



Specification
Version 1.1
24-Jan-2014

Product No.: SWICED1000

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Product Description:
IEEE802.11 b/g/n UART WiFi Module
Issue Date: 2013/06/15
Release Version: 0.1

Features:

ARM 32-bit CortexTM-M3 Frequency up to 120 MHz
1 Mbyte of Flash, 128 + 4 Kbytes of SRAM, 512 bytes of OTP memory
Diverse serial interface SPI and UART
Debug interface support JTAG
Frequency Band 2.4 GHz

Network Standard 802.11b, 802.11g, 802.11n (single stream)

Modulation Modes CCK and OFDM with BPSK, QPSK, 16 QAM, 64QAM

Hardware Encryption WEP, WPA/WPA2

Supported Data Rates IEEE 802.11b 1 – 11 Mbps
IEEE 802.11g 6 – 54 Mbps
IEEE 802.11n (2.4 GHz) 7.2 – 72.2 Mbps
Advanced 1x1 802.11n features Full/Half Guard Interval
Frame Aggregation
Space Time Block Coding (STBC)
Low Density Parity Check (LDPC) Encoding
One chip antenna and I-pex RF connector for external antenna

Operating Temperature -40℃ to 85℃
Dimension: 35X20 mm.
24 PIN patch connector easy and reliable PCB mounting.

Description

This is a complete WiFi MCU module which is designed for embedded wireless solution and a cost-effective, low power capabilities high performance MCU in M2M applications. It includes standards-based wired and wireless technologies to enable IP infrastructures for smart grid, smart home, security, building automation, toys, robots, remote health and wellness monitoring and other M2M applications.
The module integrates ARM CortexTM-M3 MCU, clock, WIFi and front end into a smallest form factor. It is based on Broadcom IEEE802.11 b/g/n antenna diversity single-stream Broadcom align technology. Thus, it can be used to enable wireless connectivity to the simplest existing sensor products with minimal engineering effort.
The solution is provided as a module to reduce development time, lower manufacturing costs, save board space, ease certification, and minimize RF expertise required. Additionally it is provided as a complete platform solution including software drivers, sample applications, API guide, user documentation and a world-class support community.

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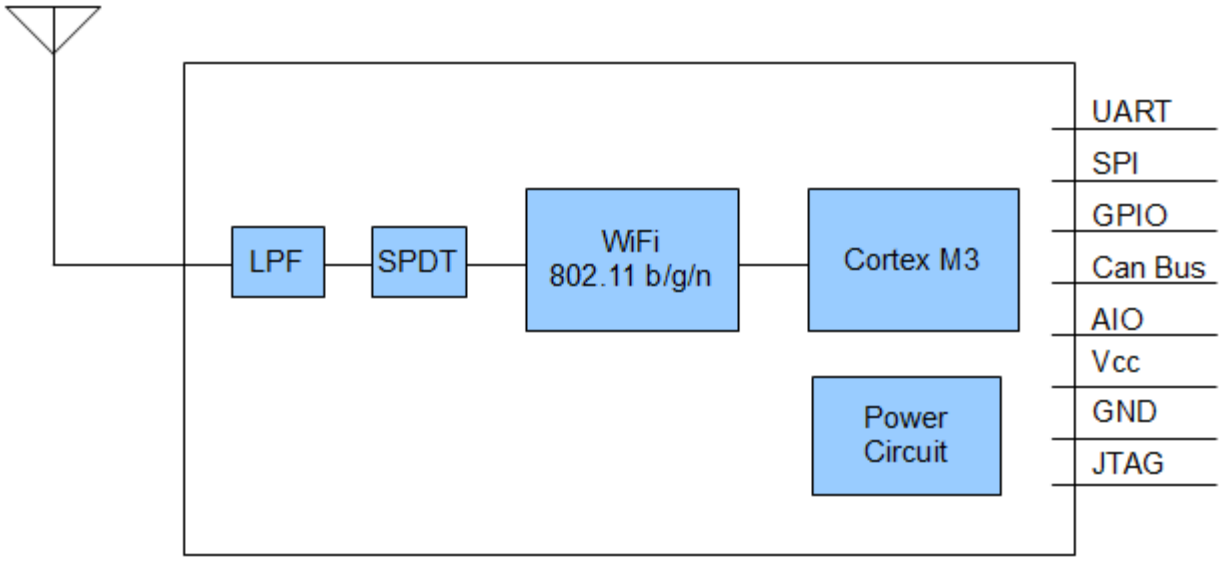
Block Diagram

SWICED1000 Module Block Diagram

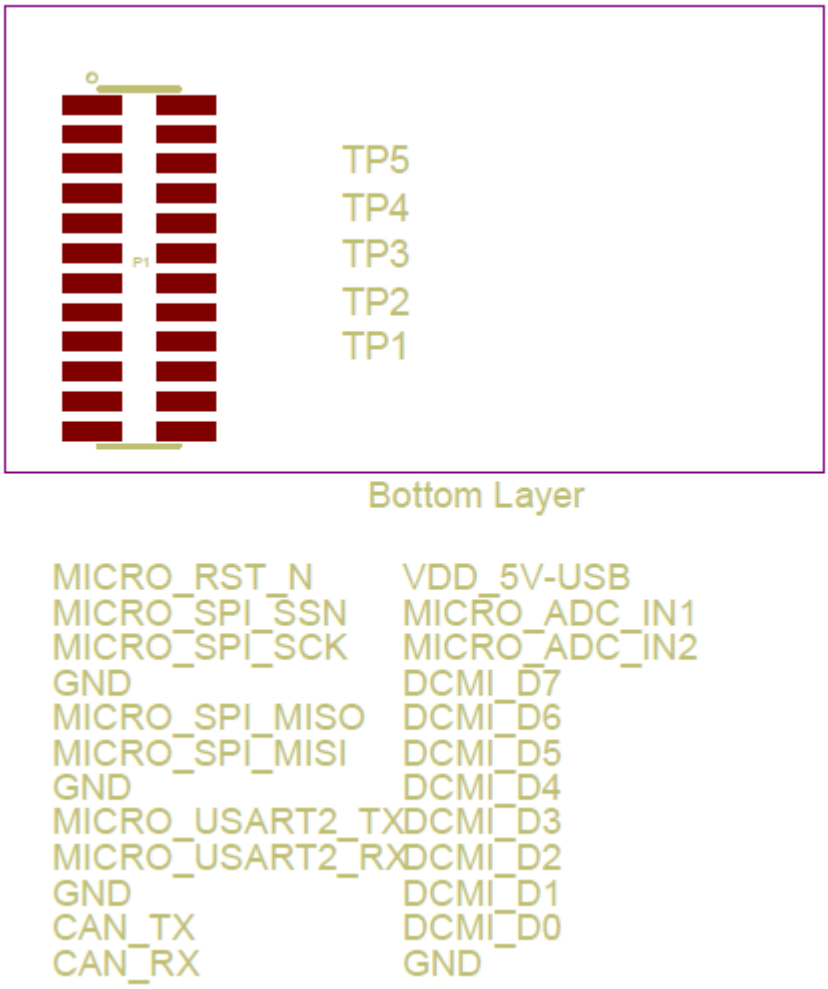


Hardware & Technical Information

Pin Definition

PIN	Name	Type	Description
1	MIRO_RST_N	PWR	SPI Reset
2	VDD	PWR	Input 5V +/-3%
3	MIRO_SIP_SSN	I/O	SPI SSN
4	MIRO_ADC_IN1	I/O	General purpuse analog I/O
5	MIRO_SIP_SCK	I/O	SPI Clock
6	MIRO_ADC_IN2	I/O	General purpuse analog I/O
7	GND	PWR	Ground
8	DCMI_D7	I/O	General purpuse Digital I/O
9	MIRO_SIP_MISO	I/O	SPI MISO
10	DCMI_D6	I/O	General purpuse Digital I/O
11	MIRO_SIP_MOSI	I/O	SPI MOSI
12	DCMI_D5	I/O	General purpuse Digital I/O
13	GND	PWR	Ground
14	DCMI_D4	I/O	General purpuse Digital I/O
15	MICRO_UART2_TX	I/O	UART TX
16	DCMI_D3	I/O	General purpuse Digital I/O
17	MICRO_UART2_Rx	I/O	UART TX
18	DCMI_D2	I/O	General purpuse Digital I/O
19	GND	PWR	Ground

20	DCMI_D1	I/O	General purpuse Digital I/O
21	CAN_TX	I/O	MCU cab bus TX
22	DCMI_D0	I/O	General purpuse Digital I/O
23	CAN_RX	I/O	MCU cab bus RX
24	GND	PWR	Ground



VCC

Supply voltage at this pin with 5V +/- 3%.

GND

Connect GND pins to the ground plane of the PCB.

MICRO_UART

This is used to implement UART data transfer from another device to SWICED1000. The UART interface requires an external RS232 transceiver chip. TTL level.

DCMI_DIO

Each of the GPIO pins can be configured by software as output (push-pull or open-drain), as input (with or without pull-up or pull-down) or as peripheral alternate function. Most of the GPIO pins are shared with digital or analog alternate functions. All GPIOs are high currentcapable. The I/Os alternate function configuration

can be locked if needed following a specific sequence in order to avoid spurious writing to the I/Os registers. I/Os on APB2 with up to 18 MHz toggling speed.

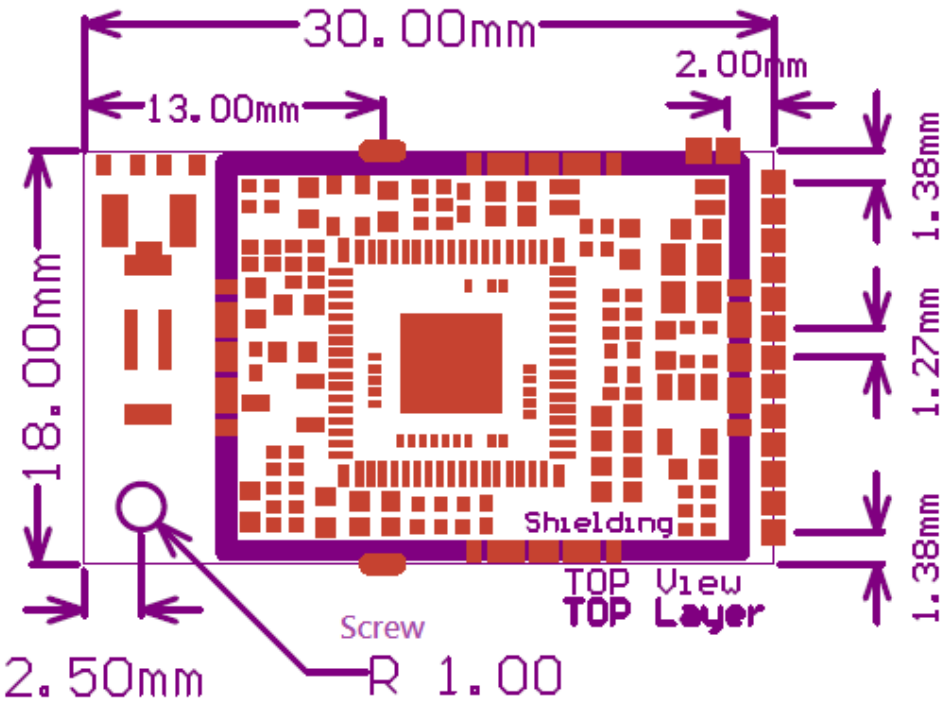
MICRO_ADC_IN

Two 12-bit analog-to-digital converters are embedded into SWICED1000 performance line devices and each ADC shares up to 16 external channels, performing conversions in single shot or scan modes. In scan mode, automatic conversion is performed on a selected groupof analog inputs.

CAN

The CAN is compliant with specifications 2.0A and B (active) with a bit rate up to 1 Mbit/s. It can receive and transmit standard frames with 11-bit identifiers as well as extended frames with 29-bit identifiers. It has three transmit mailboxes, two receive FIFOs with 3 stages and 14 scalable filter banks.

Mechanical Specification



SWICED1000 Mechanical Specification

Electrical Characteristics

■ Voltage Input

	MIN	Typ.	MAX	Unit
Supply Voltage	**4.85**	**5**	**5.15**	**V**

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■ Power Consumption

Mode	Max.
Tx mode IEEE802.11/b	410mA
Tx mode IEEE802.11/g	310mA
Tx mode IEEE802.11/n	270mA
Rx mode IEEE802.11 b/g/n	150mA

■ Operating Conditions

Voltage Range	4.85-5.15V
Operating Temperature Range	-40℃ ~ 85℃
Storage Temperature Range	-40℃ ~ 100℃
Relative Humidity (Operating)	<=90%
Relative Humidity (Storage)	<=90%

Features	Description
Frequency Band	2.4000 – 2.497 GHz (2.4 GHz ISM Band)
Number of selectable Sub channels	14 channels
Modulation	OFDM, DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK , 16QAM, 64QAM
Supported rates	1,2, 5.5,11,6,9,12,24,36,48,54 Mbps & HT20 MCS 0~7
Maximum receive input level	- 10dBm (with PER < 8%@11 Mbps) - 20dBm (with PER < 10%@54 Mbps) - 20dBm (with PER < 10%@MCS7)
Output Power	**17dBm @ 802.11b** **13dBm @ 802.11g** **11dBm @ 802.11n**
Carrier Frequency Accuracy	+/- 20ppm (crystal: 26MHz +/-10ppm in 25^0C)

Radio Characteristics

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802.11b Transmit					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Transmit output power level	1M/2M/5.5M/11M	15.5	17	18.5	dBm
Transmit center frequency tolerance		-20	0	20	ppm
Transmit spectrum mask	Fc-22MHz<F<Fc-11MHz & Fc+11MHz<F<Fc+22MHz(1/2/5.5/11Mbps; channel 1~13)			-30*	dBr
	F<Fc-22MHz & F>Fc+22MHz(1/2/5.5/11Mbps; channel 1~13)			-50*	dBr
Transmit power -on	10% ~ 90 %		0.3	2*	us
Transmit power -down	90% ~ 10 %		1.5	2*	us
Transmit modulation accuracy	1/2/5.5/11 Mbps		-17	-10	dB

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802.11g Transmit					
Item	Condition	Min.	Typ.	Max.	Unit
Transmit output power level	6M/9M/12M/18M/24M/36M/48M/54M	11.5	13	14.5	dBm
					dBm
					dBm
Transmit center frequency tolerance		-20	0	20	ppm
Transmit modulation accuracy	6Mbps		-30	-5*	dB
	9Mbps		-30	-8*	dB
	12Mbps		-30	-10*	dB
	18Mbps		-30	-13*	dB
	24Mbps		-30	-16*	dB
	36Mbps		-30	-19*	dB
	48Mbps		-30	-22*	dB
	54Mbps		-30	-25*	dB
Transmit spectrum mask	@ 11MHz			-20*	dBr
	@ 20MHz			-28*	dBr
	@ 30MHz			-40*	dBr

802.11n Transmit					
Item	Condition	Min.	Typ.	Max.	Unit
Transmit output power level	HT20 MCS 0~7	9.5	11	12.5	dBm
					dBm
					dBm
Transmit center frequency tolerance		-20	0	20	ppm
Transmit modulation accuracy	HT20, MCS0~7		-30	-28*	dB
					dB
Transmit Spectrum mask	@ 11MHz			-20*	dBr
	@ 20MHz			-28*	dBr
	@ 30MHz			-40*	dBr

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802.11 b Receiver					
Item	Condition	Min.	Typ.	Max.	Unit
Receiver minimum input level sensitivity (PER< 8 %)	1Mbps		-90	-80*	dBm
	2Mbps		-90	-80*	dBm
	5.5Mbps		-90	-76*	dBm
	11Mbps		-87	-76*	dBm
Receiver maximum input level sensitivity (PER< 8 %)	1/2/5.5/11 Mbps			-10*	dBm

802.11g Receiver					
Item	Condition	Min.	Typ.	Max.	Unit
Receiver minimum input level sensitivity (PER<10 %)	6Mbps		-85	-82*	dBm
	9Mbps		-85	-81*	dBm
	12Mbps		-85	-79*	dBm
	18Mbps		-84.5	-77*	dBm
	24Mbps		-82	-74*	dBm
	36Mbps		-78.5	-70*	dBm
	48Mbps		-74	-66*	dBm
	54Mbps		-70	-65*	dBm
Receiver maximum input level (PER<10%)	6/9/12/18/24/36/48/54			-20*	dBm

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802.11n Receiver					
Item	Condition	Min.	Typ.	Max.	Unit
Receiver minimum input level sensitivity (PER<10 %)	HT20, MCS0		-84	-82*	dBm
	HT20, MCS1		-84	-79*	dBm
	HT20, MCS2		-82.5	-77*	dBm
	HT20, MCS3		-80.5	-74*	dBm
	HT20, MCS4		-77	-70*	dBm
	HT20, MCS5		-73	-66*	dBm
	HT20, MCS6		-71	-65*	dBm
	HT20, MCS7		-70	-64*	dBm
Receiver maximum input level (PER<10%)	MSC0~MSC7			-20*	dBm

"*" indicates IEEE802.11 specification

Documentation History

Revision	Description	Date	Remark
V0.1	SWICED1000	Jun 2013	
V1.1	SWICED1000	Jan. 2014	

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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
. Reorient or relocate the receiving antenna.
. Increase the separation between the equipment and receiver.
. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the following: “Contains FCC ID: 2ACD2SWICED1000”
”

End Product Manual Information

The user manual for end users must include the following information in a prominent location “IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter.” This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) This device may not cause harmful interference and (2) This device must accept any interference received, including interference that may cause undesired operation.