

AO-1507 ZigBee USB Dongle

Features



- Provide communication solutions based on ZigBee Pro 2007 Protocol.
- Has built-in AO-1503 ZigBee to UART program and can operate as a coordinator or router.
- Easy to use with built-in 3.3V voltage regulator.
- Equipped with JTAG programming pins for CC debugger.
- AO-1507 has optimized built-in on board antenna with 50 M (LOS) transmitting distance.

Description

AO-1507 is a USB enables USB dongles or USB upgradable network nodes to be built with low total bill-of-material costs for IEEE 802.15.4, ZigBee/ZigBee Pro and RF4CE applications. It allows the user through the tradition RS232/RS485/Modbus RTU protocol to connect other ZigBee devices. AO-1507 has the automatic baud rate detection; user can set the ZigBee parameters such as PAN ID, Node ID and RF channel by the defined AT-command.

Ordering Information

PART NUMBER	INPUT/OUTPUT	SIGNAL DETECT	VOLTAGE	TEMPERATURE
AO-1507	DC/DC	-	3.3V	0°C to 40 °C

Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	T_S	-40	85	°C	
Supply Voltage	V_{CC}	4.4	5.5	V	
Input Voltage	V_{IN}	2	3.6	V	
Operating Current	I_{OP}	---	40	mA	
Input RF level	RF_L	---	10	dBm	



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Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Operating ambient temperature range	T_A	-40	85	°C	
Supply Voltage	V_{CC}	4.4	5.5	V	
Operating Input Voltage	V_{IN}	2	3.6	V	
Operating Current	$I_{TX} + I_{RX}$	---	69.2	mA	

Electrical Characteristics

Measured on AO-1507 design with $T_A = 25^\circ\text{C}$ and $V_{DD} = 3\text{ V}$, unless otherwise noted. **Boldface** limits apply over the entire operating range, $T_A = -40^\circ\text{C}$ to 85°C , $V_{IN} = 2\text{ V}$ to 3.6 V , and $f_c = 2394\text{ MHz}$ to 2507 MHz .

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS	NOTE
I_{core} Core current consumption	PM0 DC Current		5.0	8.9	mA	
	PM1 DC Current		0.2	0.3	mA	
	PM2 DC Current		0.3	1	uA	
	32-MHz XOSC running, radio in RX mode at -100-dBm input power, no peripherals active, CPU idle		24.1	29.6	mA	
	32-MHz XOSC running, radio in TX mode, 4.5-dBm output power, no peripherals active, CPU idle		35.4	39.6	mA	

Peripheral Current Consumption

ADC	When converting		1.2		mA	
Flash	Erase		1		mA	
	Burst write peak current		6		mA	

Wake-up and Timing

Power mode 1 → active	Digital regulator on, 16-MHz RCOSC and 32-MHz crystal oscillator off. Start-up of 16-MHz RCOSC		4		μs	
Power mode 2 or 3 → active	Digital regulator off, 16-MHz RCOSC and 32-MHz crystal oscillator off. Start-up of regulator and 16-MHz RCOSC		0.1		ms	
Active → TX or RX	Initially running on 16-MHz RCOSC, with 32-MHz XOSC off		0.5		ms	
	With 32-MHz XOSC initially on			192	μs	



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RX/TX and TX/RX turnaround		192	μ s
USB PLL start-up time	With 32-MHz XOSC initially on 32 ms	32	μ s
Radio Part			
RF frequency range	Programmable in 1-MHz steps, 5 MHz between channels	2394	2507 MHz
Radio baud rate		250	kbps
Radio chip rate		2	MChip/s
Wireless Distance		30	50 m
Communication Part			
UART Baud Rate		9600	bps

RF Transmitter Electrical Characteristics

Measured on AO-1507 with $T_A = 25^\circ\text{C}$, $V_{IN} = 3\text{ V}$ and $f_c = 2440\text{ MHz}$, unless otherwise noted.

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS	NOTE
Nominal output power	Delivered to a single-ended 50- Ω load through a balun using maximum-recommended output-power setting requires minimum -3 dBm	0	4.5	8	dBm	
Programmable output power 32 dB range	When converting	---	32	---	dB	
Optimum load impedance			69 + j29		Ω	

RF Receiver Electrical Characteristics

Measured on AO-1507 with $T_A = 25^\circ\text{C}$, $V_{IN} = 3\text{ V}$ and $f_c = 2440\text{ MHz}$, unless otherwise noted.

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS	NOTE
Receiver sensitivity	PER = 1%	---	-97	-92	dBm	
Saturation (maximum input level)	PER = 1%	---	---	10	dBm	
Frequency error tolerance	requires minimum 80 ppm		± 150		ppm	
Symbol rate error tolerance	requires minimum 80 ppm		± 1000		ppm	



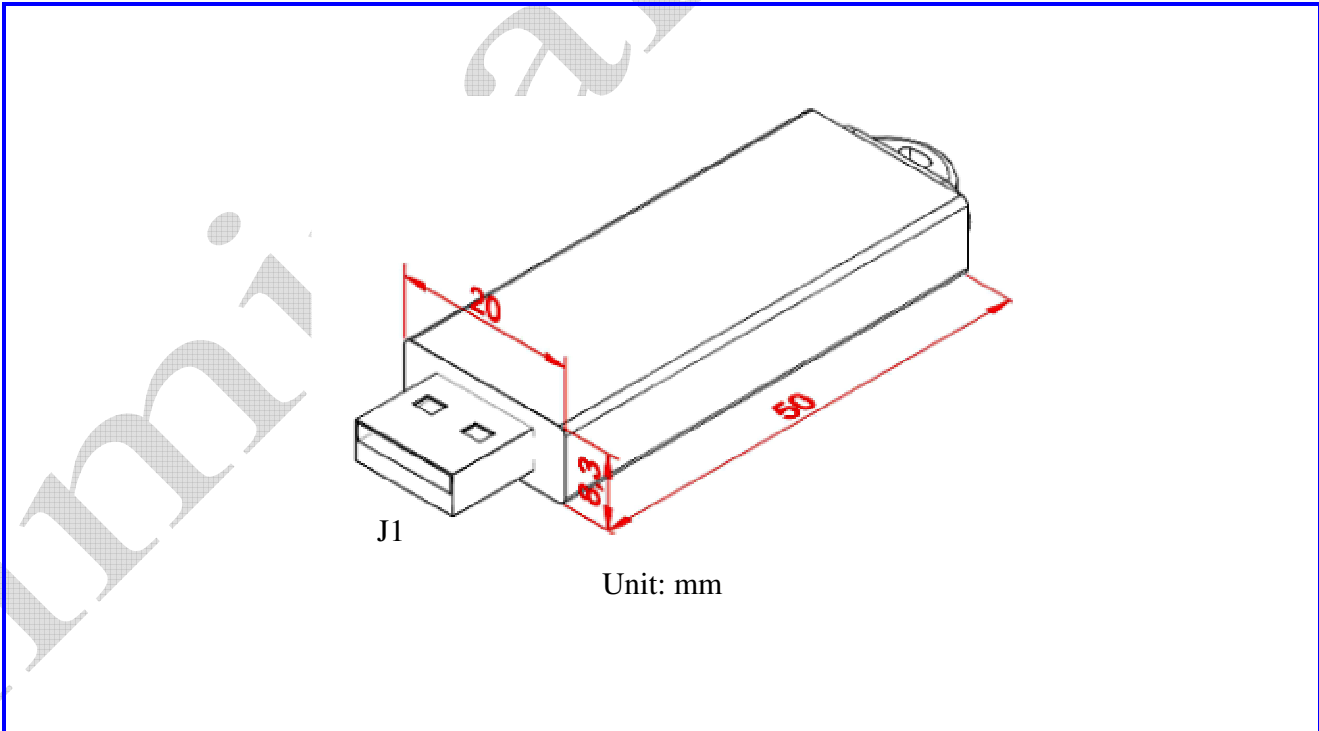
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USB Interface DC Characteristics

$T_A = 25^\circ\text{C}$, $V_{IN} = 3\text{ V to } 3.6\text{ V}$, unless otherwise noted.

PARAMETER	TEST CONDITIONS	MIN	TYP.	MAX	UNITS	NOTE
USB pad voltage output, high	$V_{DD} 3.6\text{ V}$, 4-mA load		3.4		V	
USB pad voltage output, low	$V_{DD} 3.6\text{ V}$, 4-mA load		0.2		V	

Dimensions



Pin Assignment

Pin	Signal Name	Description	Pin	Signal Name	Description
J1	USB 2.0	A-type USB connector			