Actiontec

Expanding Your World of Data Communications

SPECIFICATIONS

of 802.11b Access Point:

802AI

Version 1
Date: 08/27/01

Contents

1. Device Overall Description

The 802AI is designed to provide IEEE 802.11b complianted WLAN Access Point application. It is a long-range, high performance LAN product, which provides Access Point services to a 2,4 GHz RF net-work and bridges to an Ethernet backbone. The design is based on Intersil ISL3865 Access point Controller, which implements the full IEEE802.11b standard date rates up to 11Mbps.

Block Diagram

The access point product is based on ISL3865CK module, It is an Arm940 core controller with an onboard MAC to Ethernet(10/100 Base T) interface. The ISL3856 directly interfaces with the Intersil HFA386x family of Baseband Processors, offering a complete end-to-end IEEE 802.11b compliant chip set solution for wireless LAN products. Protocol and PHY support are implemented in firmware to allow custom protocol and different PHY transceivers.
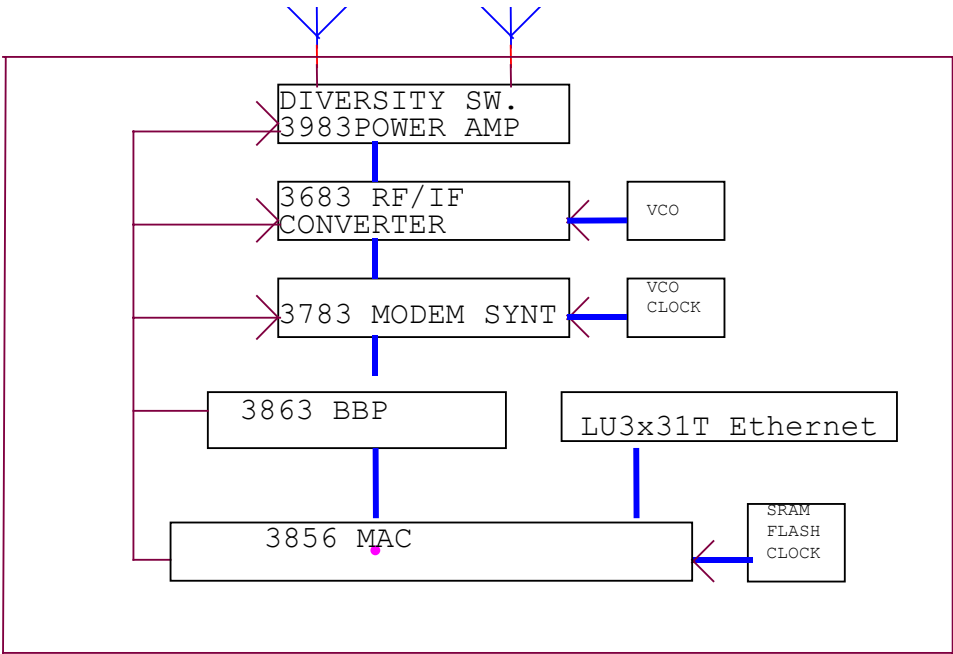The ISL3856 is a Harvard architecture cached processor. The separate instruction and data caches in this design are 4K bytes each in size with a four-word line length. A protection unit allows the memory to be segmented and protected in a simple manner. There is no virtual physical
address mapping. Write-back cache schemes and write buffers are used to optimize performance and minimize bus traffic thus reducing system power consumption. This Processor Core is implemented using a five-stage pipeline consisting of fetch, decode, execute, memory and write stages.
Firmware implements the full IEEE 802.11b Wireless LAN MAC protocol. It supports Infrastructure mode BSS operation under DCF, and operation under the optional Point Coordiantion Function (PCF). All low-level 802.11 functions are handled by firmware. Additional firmware functions specific to access point applications are also available.
The ISL3856 is the industry's first Access Point on a chip, which implements both the IEEE 802.11 MAC protocol and the MAC bridging function, which in alternative solutions
requires a separate external processor. For network management, an SNMP agent is implemented for access to the MIB.
Designing wireless protocol systems using the ISL3856 is made easier with Intersil supplied firmware, software device drivers, and complete documentation.

ISL3865CK   Intersil,ARM MAC processor.
Lu3x31T: Lucent ,10/100 Ethernet transceiver.
HFA3863IN: Intersil, Baseband Processor
HFA3783IN: Intersil, I/Q Modulator/Demodulator and Synthesizer
HFA3683:   Intersil, 2.4GHz RF/IF Converter and Synthesizer
HFA3983:   Intersil, 2.4GHz Power Amp and Detector
ICW3183:   Intersil, 748MHz Voltage Controlled Oscillator   ????

DIVERSITY SW. 3983POWER AMP	
3683 RF/IF CONVERTER	VCO
3783 MODEM SYNT	VCO CLOCK
3863 BBP	LU3x31T Ethernet
3856 MAC	SRAM FLASH CLOCK

Modulation Methods

	Modulation	spec.
1 Mbps	DBPSK	802.11
2 Mbps	DQPSK	802.11
5.5 Mbps	CCK	802.11b
11 Mbps	CCK	802.11b

Channel Assignment

Channel	Frequency	FCC	IC	ETSI	France	Japan	
1	2412MHz	X	X	X		X	
2	2417MHz	X	X	X		X	
3	2422MHz	X	X	X		X	
4	2427MHz	X	X	X		X	
5	2432MHz	X	X	X		X	
6	2437MHz	X	X	X		X	
7	2442MHz	X	X	X		X	
8	2447MHz	X	X	X		X	
9	2452MHz	X	X	X		X	
10	2457MHz	X	X	X	X	X	
11	2462MHz	X	X	X	X	X	
12	2467MHz			X	X	X	
13	2472MHz			X	X	X	
14	2484MHz					X	

Many countries and region are currently revising the channel assignment.

2. Features

ISL3865CK FEATURES:
Among the features of the ISL3865CK are the following:
- **ARM940T core.**
- **Baseband Processor Interface providing a direct transmit and receive serial interfaces to an external baseband processor.**
- **Serial Control Port (SCP), supporting serial communication for control of external devices.**
- **Memory Interfaces supporting SRAM, ROM and SDRAM memories, at 8, 16 or 32 bits.**
- **Real Time Clock.**
- **MII Interface**
- **3 General Purpose Timers.**
- **Interrupt Controller.**
- **16 General Purpose I/Os (GPIO).**
- **A UART to enable system debugging, multiplexed onto GPIO lines.**
- **On-chip PLL for clock generation.**
- **Test Interface Controller (TIC) to support manufacturing tests.**
- **JTAG interface for boundary scan and debug port.**
- **Power management capabilities.**
- **IEEE802.11 Standard Data Rates: 1, 2, 5.5 and 11Mbps**
- **Part of the Intersil PRISM Wireless LAN Chip Set**
- **Full Implementation of the MAC Protocol Specified in IEEE Standards 802.11-1999 and 802.11b**
- **Operation at 3.3V Supply**
- **Package 169 pin uBGA Package Targeted for compact gateways**

Firmware Features

The IEEE 802.11b firmware implementation for the 802AI supports:
- **Standard Firmware features, such as**
    - **Distributed Coordination Function**
        CSMA/CA
        Backoff Procedure
        NAV Management
        ACK Procedure
        Retransmission of unacknowledged frames
    - **RTS/CTS Handshake**
    - **Duplicate Detection and Recovery**
    - **Beacon Generation**
    - **Probe Response**
    - **Fragmentation and Reassembly**
    - **Authentication Algorithm (Open System, Shared Key)**
    - **Short Preamble**
    -
- **802.11 Mandatory**
- **WEP40/128**
- **ASBF**
- **SNMP Agent**
- **Power management**
- **User CAC/ACL (128/1024)**
- **Web server**
- **Roaming: Among APs on the same subnet**
- **DHCP**
- **Operation Modes supported: Access Point**
- **Network Interface: supports 10/100 Mbps network interface.**

– **Radio Interface As far as the radio interface is concerned, it supports: Antenna Diversity and Specific Antenna Tx/Rx**

Management feature

For Bridge Management, it supports:
– **Standard bridging function**
  – **Automatic Learning Process**
  – **Filtering Database**
  – **Forwarding Process**
  – **IP Filtering**
  – **Aging Function**
  – **Static Filtering Entries for individual/broadcast/multicast address**
  – **Protocol Filtering**
– **Allow QOS, Security enhancements**
– **Auto setup & configuration software utilities**
– **KickStart(+API)**
– **Firmware object code: Web Browser &HTML Config**
– **Set IP Session (arp/ping)**
– **Airlock Security Software,128-bit key length**
– **Apcenter management tool.**
– **ADKA key management.**

Throughput

Security	UP Stream	Down Stream
None	4.587	4.650
40bit	4.569	4.658
128 bit	4.691	4.691

Coverage: 350 Meters outdoor.

3.RF Characteristics

Specification	Minimum	Typical	Maximum	Units
BOM Cost		TBD		$
Form Factor		NWN		Custom
PC Interface		Ethernet 10baseT		IEEE802.3
Plug and Play Compatible		No		
Access Point Capable		Yes		
Integral Antenna Impedance		50	open	ohms
Operating Temperature Range	0		70	C
Storage Temperature Range	-20		+85	C
AC Input Voltage (50 - 60 Hz)	95	120	265	V
AC Input Current		0.35		A
DC Input Voltage (filtered)	4.75	5.00	5.70	V
DC Input Current		600	750	mA
Antenna Gain[4]		+1.9		dBi
RX Input IP3		-10		dBm

RX Image Rejection (if applicable)	60			dB
RX Adjacent Channel Rejection [2]	35			dB
RX Sensitivity, 1 Mbps [1]		-92	-89	dBm
RX Sensitivity, 2 Mbps [1]		-89	-86	dBm
RX Sensitivity, 5 Mbps [1]		-88	-85	dBm
RX Sensitivity, 11 Mbps [1]		-85	-82	dBm
Diversity Isolation	12	15		dB
TX Output Power	14	15.5		dBm
TX Output Power Range (closed Loop)	-0.3	0	0.3	dB
TX Carrier Suppression	15			dB
TX Spectral Mask, 1st side-lobe			-30	dBc
TX Spectral Mask, 2nd side-lobe			-50	dBc
Dual Antenna Diversity, Short Preamble		BBP HW		
Dual Antenna Diversity, Long Preamble		BBP HW		
Preamble Length		Short/Long		
1 Mbps Multipath Tolerance [3]		500 nsec rms		802.11
2 Mbps Multipath Tolerance [3]		500 nsec rms		802.11
5.5 Mbps Multipath Tolerance [3]	150 nsec rms	200 nsec rms		802.11
11 Mbps Multipath Tolerance [3]	75 nsec rms	120 nsec rms		802.11
SDRAM		4M X 16		
Program Flash		4M X 8		
FCC Compliance		Part 15		
ETSI Compliance		300 - 826	300 - 328	
MTP Compliance		ARIB - 39		
802.11 Compliance		Compliant		

Note 1: Sensitivity based upon 1 kbyte packet length, 8% PER, single antenna driven, diversity enabled.
Note 2: Adjacent channel rejection based upon 1 kbyte packet length, 8% PER, 25 MHz jammer offset.
Note 3: Multipath tolerance based upon 1 kbyte packet length, 8% PER, signal level > -60 dBm, single antenna driven, diversity enabled.
Note 4: Gain measured along axis of maximum output

4.Software & OS support

OS	Driver
Win95, OSR2	NDIS4
NT4	NDIS4
Win98	NDIS5
Windows Millennium	NDIS5
Win2000	NDIS5
User Configuration Utility	Available

5.Regulation
US   FCC 15.247
Canada RSS

Europe   ETSI 300 826 11:1997
         ETSI 300 328 11:1996, 2nd Edition
         ETSI 300 328 A1 07:1997, 2nd Edition
         ERC/DEC/(96) 17, ERC Decision of 1 November 1996
         CE Mark
Japan   Telec
Others   upon requested

6.Interoperability

Actiontec is an active member of Wireless Ethernet Compatibility Alliance (WECA).
All Actiontec 802.11b Wireless product will be certified by WECA Wi-fi test to assure interoperability
between vendor's of 802.11b.

7.Operating Conditions

Voltage Range	3.3V +-0.3V
Operating Temperature Range	0°C - 65°C
Storage Temperature Range	-20°C - 85°C
Relative Humidity during Operating	95%
Relative Humidity during Storage	95%

8. Power requirement and dissipation

Operating voltage:+5v =/- 5% @1A .
The typical approximated power dissipation :
RF active:
Sleep mode:

9. Mechanic and weight

The board mechanic is 99X60 MM
Weight: 1LB

End