SG901-1047 Flexible Interface Wi-Fi Radio

Overview

The SG901-1047 Kraken is an 802.11b/g WLAN assembly which includes an 802.11 radio designed for easy integration of 802.11 into existing and new products with very little development time. Kraken supports a variety of interfaces for simple integration with most any user product.

The SG901-1047 is a fully functional wireless radio including a single-chip 802.11b/g transceiver, an ARM9 processor, flash and SDRAM memories, and a 10/100 Ethernet combo. The system is shipped running Linux with Wi-Fi ready for customer use. Application software and OS changes are supported through the Linux system source code provided by Sagrad.

The on board 802.1 radio conforms to the IEEE 802.11b and 802.11g protocols operating in the 2.45GHz ISM frequency band supporting OFDM data rates of 54, 48, 36, 24, 18, 12, 9, and 6Mbps. It also supports CCK data rates of 11 and 5.5Mbps and legacy data rates of 2 and 1Mbps.

Kraken connects to the user system through a readily available 50-pin connector for power, ground, and all peripheral signaling.

In addition to standard serial communications interfaces, RS233, Ethernet, USB, SPI, I2C, Kraken supports standard audio and camera connections as well.

Features

• Linux OS sources available to support
• Fully integrated FCC Certified 802.11 Solution
• Ready for customer application integration
• Control interface customization available
• Customer can develop their own interfaces to their products.
• Variety of Standard Communications Interfaces
  - 10/100Base-T (external magnetics)
  - 3 UART ports (TTL Level)
  - 2 USB ports – 1+1 Device/Host or 2 Host
  - 1 SPI port
• GPIO and Peripherals
  - I2S Digital Audio interface
  - 8-bit camera interface
  - Timer I/O
  - Most serial and peripheral signals can be used for GPIO if not otherwise employed
• 128Mbytes on board Flash
• 16Mbytes on board RAM
• Small, low-profile footprint
• Low Current consumption
• Fully compliant with IEEE 802.11b and g WLAN standards
• Intelligent Power Control, Including 802.11 Power Save Mode
• RoHs Compliant

Installed Software:
• U-Boot boot-loader
• Linux 2.6 kernel
• Wireless kernel driver

Applications
• Instant Wired ethernet to Wireless
• Industrial Applications
• High Speed Printers
• Medical Markets
• Remote Cameras
• Embedded Systems
• VOIP Systems
• Wireless Internet Radio
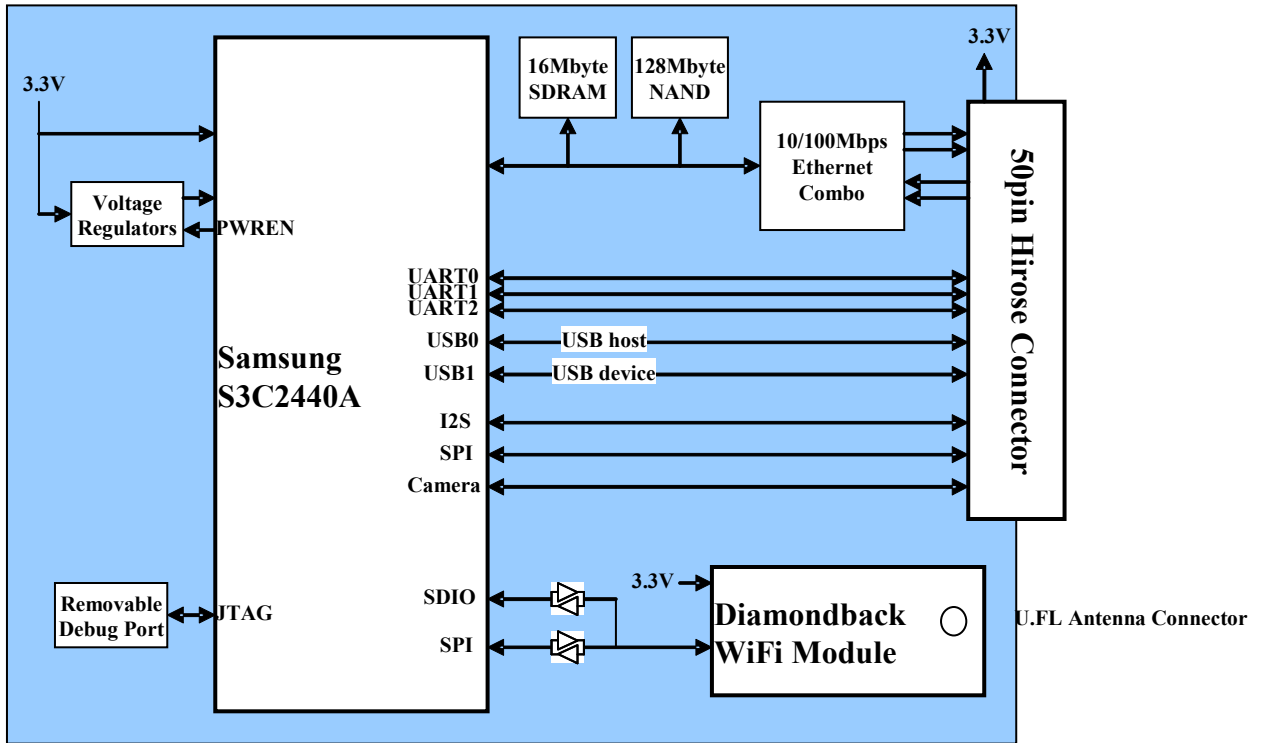

Ordering Information

Packaging	Order Number	Temp Range
Bulk Only	SG901-1047C-BLK	0° to 70°C
Bulk Only	SG901-1047I-BLK	-30° to 85°C
Eval Kit	SG923-0004	
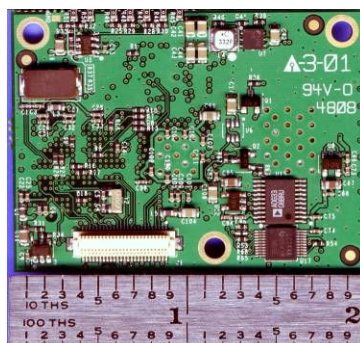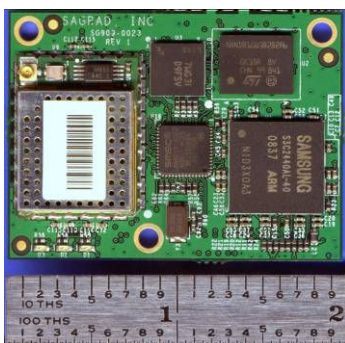
SG901-1047 Kraken Block Diagram

General Electrical Specifications

Parameter		Test Condition / Comment	Min.	Typ.	Max.	Units
Absolute Maximum Ratings						
3.3V Supply			-0.3		4.0	V
Operating Conditions and Input Power Specifications						
Operating Temperature Range		SG901-1047C	0		70	°C
		SG901-1047I	-30		85	°C
3.3V Supply	Input Supply Voltage	Power Management Unit 3.3V Supply input	3.1	3.3	3.6	V
	Standby Mode Current	3.3V, 25°C, SDRAM data retained		5		mA
	Power Save Mode Current	100mS beacon period, 75 byte beacons @ 1Mbps, short Preamble, DTIM = 3		10		mA
	Sleep Current	3.3V 25°C, no data retention, wakeup on events		380		uA
	Idle	Wireless disabled, running full-speed		250		mA
	Average TX Current	Full-speed, transmitting packets, 3.3V, 25°C		450		mA
	Average RX Current	Full-speed, Receiving packets, 3.3V, 25°C		450		mA

Digital Interface Specifications

Parameter		Test Condition / Comment	Min.	Typ.	Max.	Units
Digital Interface Specifications						
CMOS Inputs	VIH		2.0		3.6	V
	VIL		-.3		0.8	V
	Input Current		-10		+10	uA
CMOS Outputs	VOH	IOH = 4mA	2.4			V
	VOL	IOL = 4mA			.4	V

RF Characteristics

Parameter		Test Condition / Comment	Min.	Typ.	Max.	Units
RF Frequency Range			2400		2500	MHz
RF Output Power	802.11 G 54Meg	Meeting FCC and 802.11 EVM		12		dBm
	802.11 G 6Meg	Meeting FCC and 802.11 EVM			15	dBm
	802.11 B 11Meg	Meeting FCC and 802.11 EVM			15	dBm
Receiver Sensitivity	802.11 G 54Meg	10% PER		-68		dBm
	802.11 G 6Meg			-88		dBm
FCC Compliance		Passed FCC part 15C				

Note 1: Output Power is measured at the RF Antenna

Connector Pinout and Description – Hirose DF12B(3.0)-50DS-0.5V

SIGNAL NAME	PIN NUMBER	DESCRIPTION	NOTES
Ethernet Interface			
LAN_TPO-	3	Ethernet transmit negative	external magnetics required
LAN_TPO+	4	Ethernet transmit positive	external magnetics required
LAN_TPI-	6	Ethernet receive negative	external magnetics required
LAN_TPI+	7	Ethernet receive positive	external magnetics required
AC97 or I2S and Timer Signals			
TCLK0	11	Timer 0 clock input or GPIO	
TOUT2	12	Timer 2 output or GPIO	
TOUT3	13	Timer 3 output or GPIO	
I2S_LRCK	14	I2S frame output, AC97 SYNC, or GPIO	
I2S_SDO	15	I2S/AC97 serial data output or GPIO	
I2S_SDI	16	I2S/AC97 serial data input or GPIO	
I2S_SCLK	17	I2S/AC97 serial clock input/output or GPIO	
I2S_CDCLK	18	I2S master clock output, AC97 RST, GPIO	
UARTs			
RXD2	20	UART2 Receive Data (input)	3.3V CMOS level
TXD2	21	UART2 Transmit Data (output)	3.3V CMOS level
RXD1	22	UART1Receive Data (input)	3.3V CMOS level
TXD1	23	UART1Transmit Data (output)	3.3V CMOS level
RXD0	24	UART0 Receive Data (input)	3.3V CMOS level
TXD0	25	UART0 Transmit Data (output)	3.3V CMOS level
SPI			
SPI_CLK	27	SPI 1 Serial Clock	
SPI_MOSI	28	SPI 1 master out slave in or GPIO	
SPI_MISO	29	SPI 1 master in slave out or GPIO	
SS	30	SPI 1 slave select or GPIO	
USB			
USB_N1	32	USB host or device negative	
USB_P1	33	USB host or device positive	
USB_N0	34	USB host negative	
USB_P0	35	USB host positive	
Camera			
CAMD7 - 0	37, 38, 39, 40, 41, 42, 43, 44	Camera data bit 7 - 0 or GPIO	
CAMRESET	45	Camera reset output or GPIO	
CAMCLKOUT	46	Camera master clock output or GPIO	
CAMHREF	47	Camera horizontal sync input or GPIO	
CAMVSYNC	48	Camera vertical sync input or GPIO	
CAMPCLK	49	Camera pixel clock input or GPIO	
Power			
3.3V	1, 2	Input Supply	
GND	5, 8, 19, 26, 31, 36, 50	Ground Connections	
No Connect	9, 10	No internal connection	

Mechanical

ANT CONN

1.874
[47.6]

.126
[3.2]

MOUNTING HOLE (X3)
.118 DIA
[3]

1.374
[34.9] (X2)

1.131+/-.020
[28.73+/-.5]

.134
[3.41]

.855
[21.71]

.134+/-.020
[3.4+/-.5]

(TOP SIDE)

2.000
[50.8]

1.500
[38.1]

.163
[4.13]

1.368
[34.75]

(BOTTOM SIDE)