IEEE 802.11g SDIO Embedded WLAN Module

Zcomax Technologies, Inc. has released its new line of Air Runner™ wireless LAN embedded adapters. The XG-180MU is an IEEE 802.11g 54Mbps module that has been designed with the integration market in mind. With its low profile external antenna connector and small form factor, the XG-180MU will fit into most any embedded design supporting the SDIO interface. The XG-180MU is a high performance module that exceeds both IEEE 802.11g and FCC regulatory requirements.

The XG-180MU's design was selected to help reduce the overall costs associated with wireless embedded modules by supporting the industries most popular interfaces today, thus eliminating the need for custom designs to fit existing product lines. The XG-180MU module is a robust plug and play ready device that supports windows CE, PPC2003 and Linux.

With an excellent price / performance ratio and the field-proven reliability associated with the Marvell chipset, the XG-180MU is a superb choice for any wireless application requiring both quality and reliability.

XG-180MU at a glance

- **IEEE 802.11g compliant**
- **16 dBm Tx output Power**
- **-82 dBm @ 6Mbps Rx Sensitivity**
- **Hirose U.FL Antenna Connectors**
- **SDIO host interface via 50 pin Nais AXK850145Y connector**
- **FCC and ROHS compliant**
- **MAC / Baseband – Marvell 88W8385**
- **Radio - Marvell 88W8010**
- **Driver support – Linux, CE and customized drivers are available.**

MARVELL

RoHS Compliant

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Physical Specification:

Host Interface	50-Pin Nais AXK850145Y Connector
Dimensions (L x W x H)	20mm(L) * 23mm(W) * 3.2mm (H)
Weight	≤ than 10 g

RF Specification:

Frequency Range (GHz)	North America: 2.412 ~ 2.462
	Japan TELEC: 2.412 ~ 2.484 802.11b
	Japan TELEC: 2.412 ~ 2.472 802.11g
	Europe ETSI: 2.412 ~ 2.472
	Spain: 2.457 ~ 2.462
Frequency Drift	<25KHz
Transmitter Output Power IEEE 802.11b IEEE 802.11g	 17 dBm (50mW) 14 dBm (32mW)
Antenna Impedance	50 ohms
Media Access Protocol	CSMA/CA w/ACK
802.11b Data rates 802.11g Data rates	11, 5.5, 2, 1 Mbps 54, 48, 36, 24,12,9,6 Mbps
Modulation	48/54 Mbps (QAM-64) 24/36 Mbps (QAM-16) 12/18 Mbps (QPSK) 6/9 Mbps (BPSK)
Receiver Sensitivity	54 / 48 Mbps: -65dBm / -66dBm
	36 / 24 Mbps: -70dBm / -74dBm
@ PER < 10% for 802.11g	18 / 12 Mbps: -77dBm / -79dBm
	9 / 6 Mbps: -81dBm / -82dBm
@ PER < 8% for 802.11b	11 / -80dBm / -80dBm

Electrical Specification:

Supply Voltage	3.3 Vdc, +/- 5%
Supply Voltage Ripple	120mV (pp) max.
Power-on startup time	<600 ms
Power consumption 802.11b	TX: <450 mA /802.11b, RX: <250 mA
802.11g	TX: <450mA /802.11g, RX: <250 mA
Power Save mode current	<10 mA
Sleep mode current	<1 mA

Antenna Connector Specification (supports Diversity)

Connector Type	Two Hirose U.FL 50Ω
Manufacturer	Hirose Electronic Co. Ltd.
Part Number	U.FL-R-SMT-1

Environmental

Working Temperature	0 ~ 65ºC, 95% relative humidity (non-condensing)
Storage Temperature	-20 ~ 80ºC, 95% relative humidity (non-condensing)

Absolute Maximum Rating

Stress above those listed in Absolute Maximum Rating may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in standard specifications is not implied.

Supply Voltage	3.7V
I/O Voltage	-0.5V ~ VCC+0.3V
Storage Temperature	-20 ~ +80ºC, 95% relative

	humidity (non-condensing)
Barometric Pressure	740 hPa ~ 1050 hPa

Flash

The XG-180MU has an 8Kbit Flash EEPROM

Security

The XG-180MU supports the following security features according to driver
Linux Driver 5.0.1.0 – WPA-PSK TKIP, WPA, WPA2, IEEE 802.1x
Windows CE 4.2 Driver 3.4.0p6.25 – WPA-PSK, IEEE 802.1X

Reliability(MTBF)

Mean Time to Failure is rated at 150,000 hours.

Interoperability

The XG-180MU interoperates with any IEEE 802.11g or 802.11b compliant devices.

International Frequencies

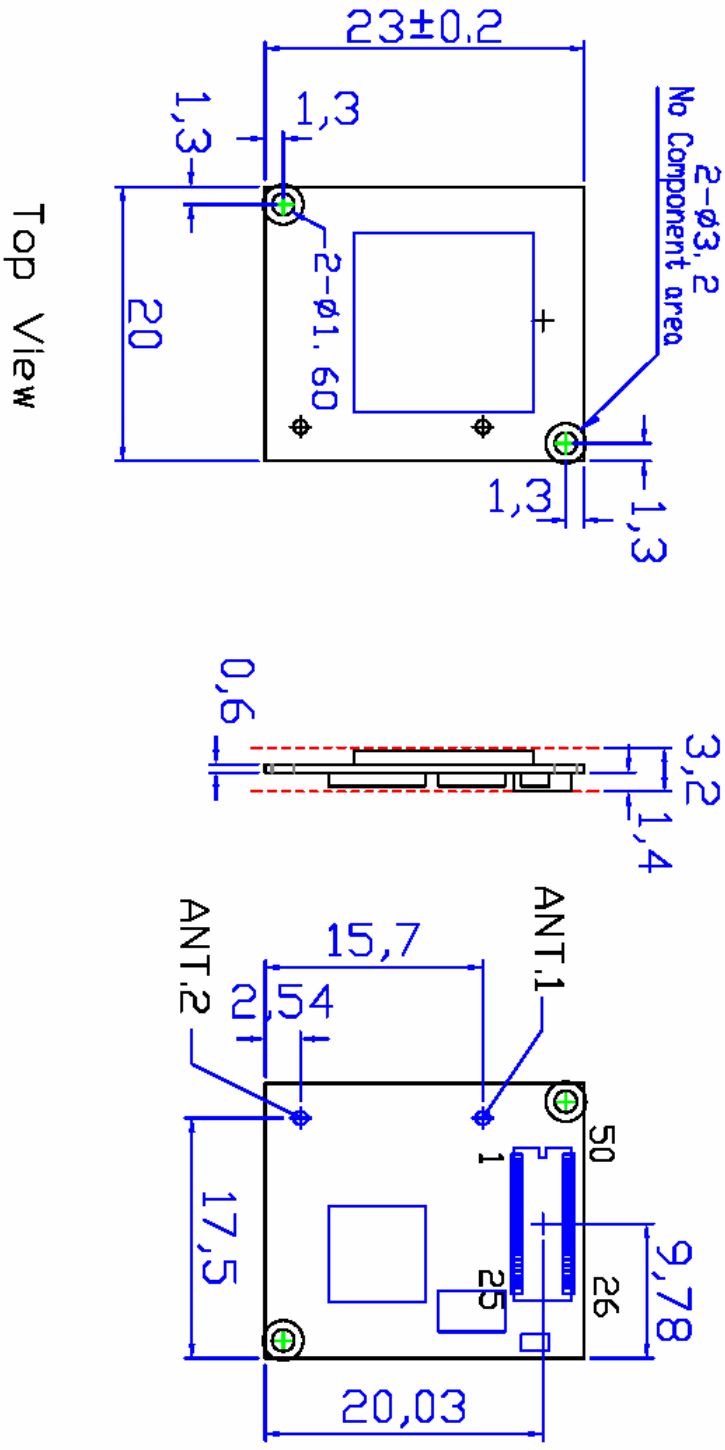
Regulatory requirements at different countries mandate different operating frequencies (channels). The XG-621 may be factory configured to support different frequency requirements. Allowable channels for each typical Domains are listed below.

Domain	**Allowable channels**
FCC	Channels 1 ~ 11
ETSI	Channels 1 ~ 13
Telec 802.11b	Channels 1 ~ 14
Telec 802.11g	Channels 1 ~ 13

Warranty

The XG-180MU is warranted to up to 12 months against manufacturing defects.

Mechanical Drawing



Host interface pin identification

Pin Assignment

No.	Name	I/O	SDIO Interface
1	GND	G	GND
2	D03	I/O	NC
3	D04	I/O	NC
4	D05	I/O	NC
5	D06	I/O	NC
6	D07	I/O	NC
7	/CE1	I/O	NC
8	A10	I/O	NC
9	/OE, SD_CMD	I/O	SD Command
10	A09	I/O	SDIO DAT2
11	A08	I/O	NC
12	A07	I/O	NC
13	VCC	Power	VCC
14	A06	I/O	NC
15	A05	I/O	NC
16	A04	I/O	NC

17	A03	I/O	NC
18	A02	I/O	NC
19	A01	I/O	NC
20	A0	I/O	NC
21	D0	I/O	NC
22	D1	I/O	NC
23	D2	I/O	NC
24	/IOIS16	I/O	
25	/CD2	I/O	DAT 0
26	GND	GND	GND
27	D11	I/O	NC
28	D12	I/O	NC
29	D13	I/O	NC
30	D14	I/O	NC
31	D15	I/O	NC
32	/CE2, SD_CLK	I/O	SD_CLK
33	GND	GND	GND
34	/IORD, SD_D1	I/O	SD Data 1
35	/IOWD, SD_D3	I/O	SD Data 3

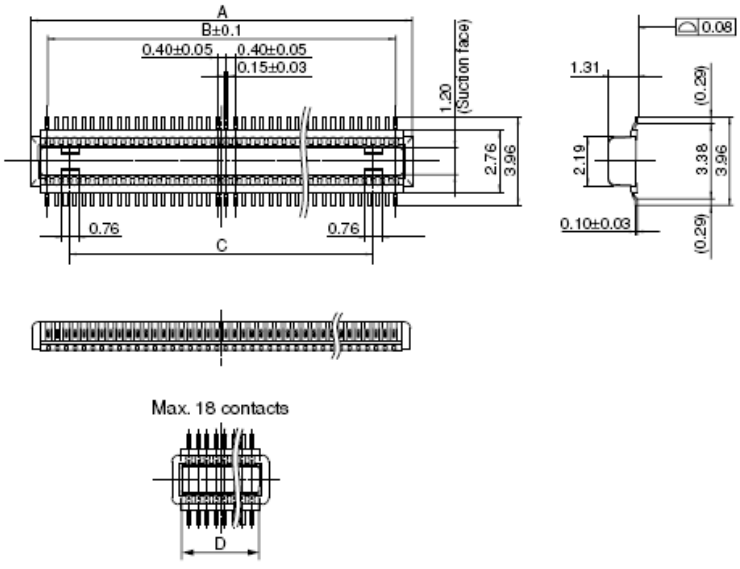
36	/WE	/WE	NC
37	/IREQ	/WE	NC
38	VCC	Power	VCC
39	GPIO0	I/O	GPIO 0
40	SPI_RST	I	NC
41	RESET	O	NC
42	/WAIT	I	NC
43	INPACK#	I/O	NC
44	/REG	I/O	NC
45	Link_LED	GPIO	Link_LED
46	/STSCH	I/O	NC
47	D08	I/O	NC
48	D09	I/O	NC
49	D10	I/O	NC
50	GND	GND	GND

Board-to-board Header

We use NAIS header (AXK850145YG) for the mated connection to NAIS socket (AXK750145YG) of the platform. The mated height is 1.5mm.

Table5.11 Board-to-board header specification

Item	Description	Note
Type	AXK850145YG	50pin V-notch type
Rated current	0.3A/contact	Max. 5A for total contacts
Rated voltage	60V AC/DC	
Contact Resistance	70m ohm max.	Measurement method of JIS-C-5402
Life Time	50 times	
Quantity	1	
Vendor	NAIS	



General tolerance: ±0.2

Dimension table (mm)

Number of contacts/ dimension	A	B	C	D
14	3.9	2.4	—	3.04
16	4.3	2.8	—	3.44
20	5.1	3.6	1.6	—
22	5.5	4.0	2.0	—
24	5.9	4.4	2.4	—
26	6.3	4.8	2.8	—
28	6.7	5.2	3.2	—
30	7.1	5.6	3.6	—
34	7.9	6.4	4.4	—
36	8.3	6.8	4.8	—
40	9.1	7.6	5.6	—
44	9.9	8.4	6.4	—
50	11.1	9.6	7.6	—
54	11.9	10.4	8.4	—
60	13.1	11.6	9.6	—
64	13.9	12.4	10.4	—
70	15.1	13.6	11.6	—
80	17.1	15.6	13.6	—
90	19.1	17.6	15.6	—
100	21.1	19.6	17.6	—

Note: "Products with V notch" and "products with V notch and post edge horseshoe bend" are mating compatible.

Fig5.13 Mechanical Drawing of ZXK850145YG