Technical Document

AXM100 Hardware Specification

Version 0.1

Updated: MAY 2016

Abstract

This Document describe the interface specification about AXM100 Module.

㈜에이투유정보통신

http://www.a2uict.com/

A2U ICT

Giving IT all to you

Revision History

Author	Description of Changes	Date
sunny	Initial Draft	Feb. 2016
sunny	HW pin 설명 변경 및 업데이트	May. 2016

Contents

References

IEEE802.15.4-2011

IEEE802.15.4g-2012

Abbreviations

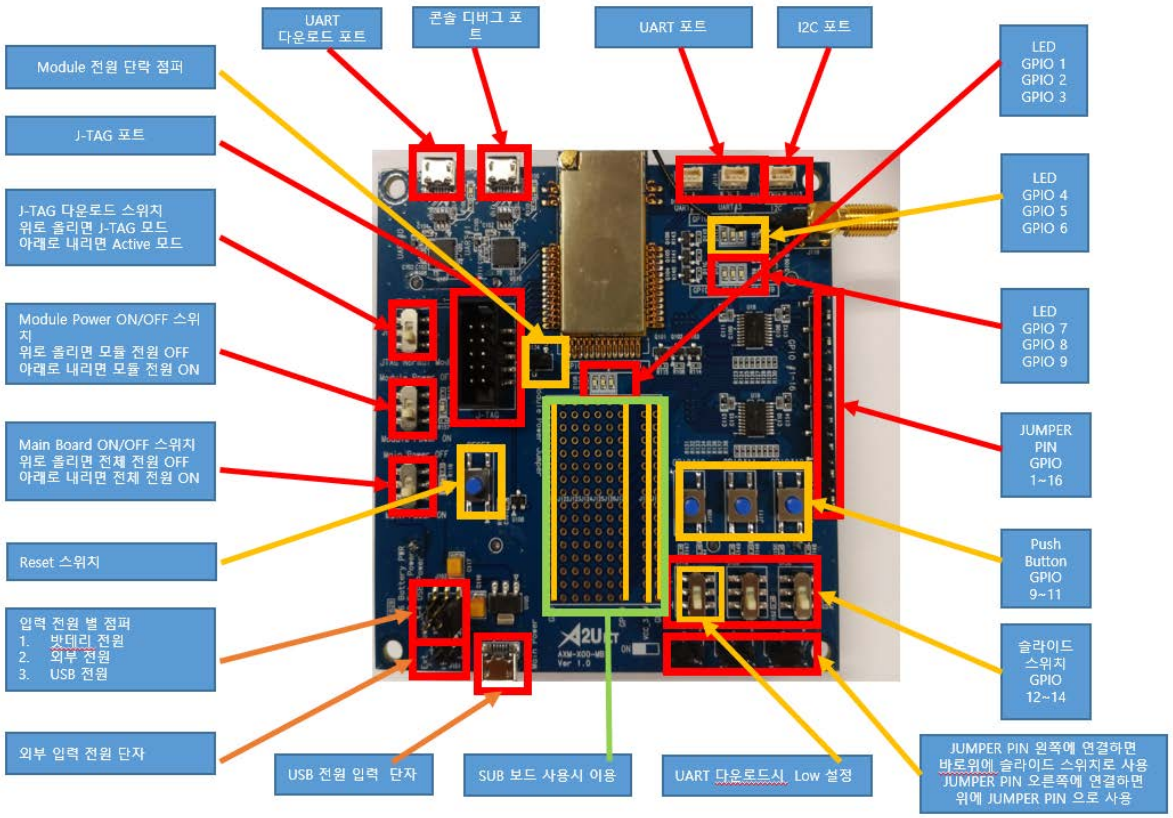
AXM100	A2UICT LPWAN Module for IEEE802.15.4g Compatible
AXR100	A2UICT RF Transceiver
AXS100	A2UICT LPWAN RF SoC
AXP100	A2UICT Processor for IOT
AXT100	A2UICT LPWAN Antenna
LPWAN	Low-Power Wide-Area Network
CAP	contention access period
CCA	clear channel assessment
CSMA-CA	carrier sense multiple access with collision avoidance
GTS	guaranteed time slot
ED	energy detection
MAC	medium access control
MCPS	MAC common part sublayer
MCPS-SAP	MAC common part sublayer service access point
MLME	MAC sublayer management entity
MLME-SAP	MAC sublayer management entity service access point
MPDU	MAC protocol data unit
MSDU	MAC service data unit
PD-SAP	PHY data service access point
PDU	protocol data unit
PHY	physical layer
PLME	physical layer management entity
PLME-SAP	physical layer management entity-service access point
PSDU	PHY service data unit
RF	radio frequency
SAP	service access point
SFD	start-of-frame delimiter

WPAN	**wireless personal area network**

1. Introduction

본 문서는AXM100 모듈의 HW 기본 사양 및 Pin 및 배치도에 대한 상세한 사항을 기술한 문서이다.

2. AXM100 Hardware 구성도



3. General Specification

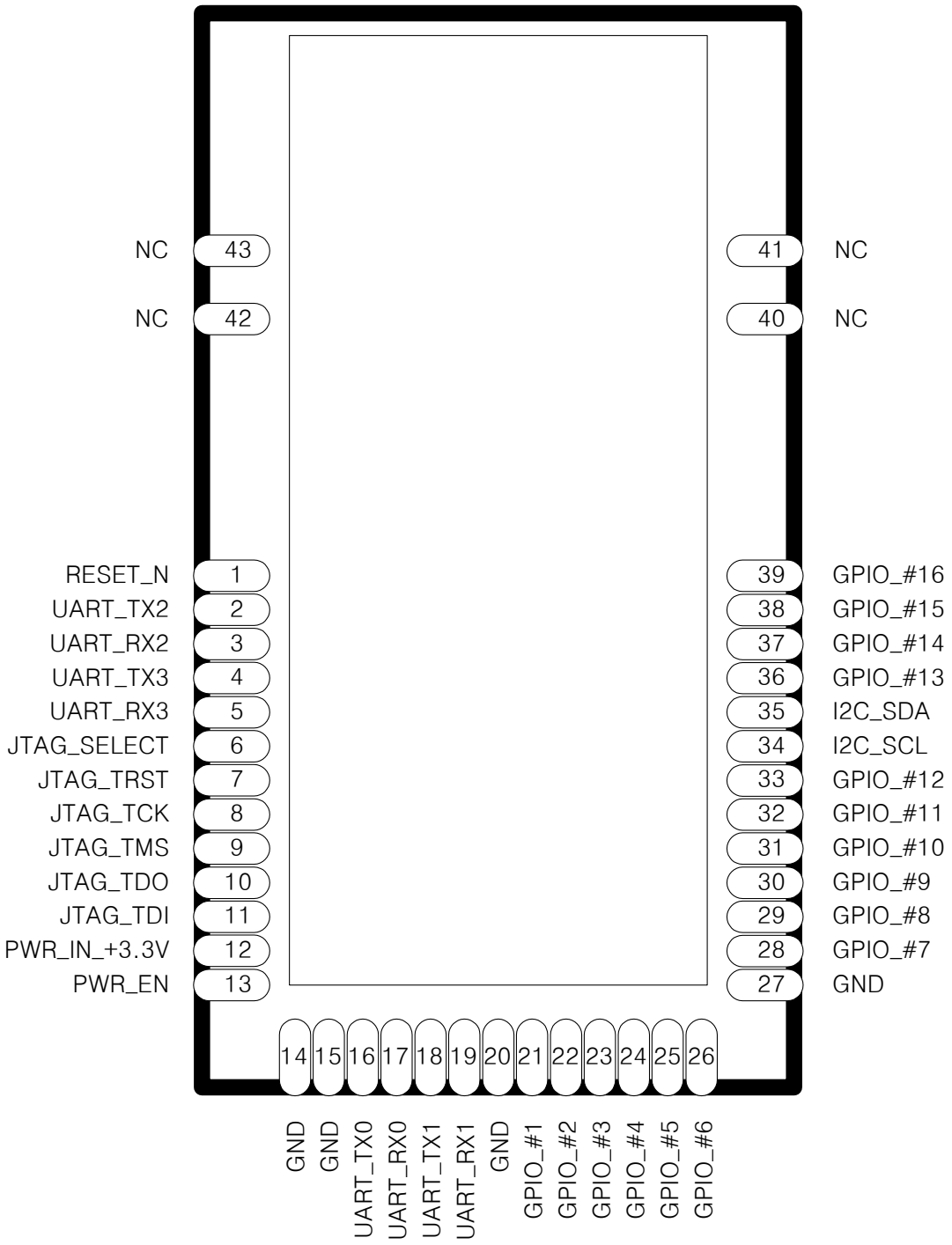
Specification	Description
Frequency Band	917.300 MHz to 923.100 MHz
Modulation Method	2FSK Technology modulation
Data Rate	12.5/25 kbps with 2FSK modulation @ LECIM Mode 50/150/200 kbps with 2FSK modulation @ SUN Mode
RF Connection	U.F-R-SMT(HRS), Surface Mount Coaxial Connector.
Interface	4 UART, SPI, I2C, MAX 16 GPIOs
Dimension	20 x 37.75 x 3.3 mm
Sensitivity at 10% PER	-98 dBm@50kbps, 256Byte Packet, FEC OFF, SUN Mode
RF TX Power	Adjustable up to max. +14 dBm on 921.1 MHz band
Temperature (operating)	-25°C to +80°C
Temperature (storage)	-40°C to +100°C
Humidity	10% ~ 90% Non-condensing

4. Electrical characteristics

Parameter	Min.	Typ.	Max.	Units
Supply Voltage	**—**	**3.3**	**3.6**	**V**
Voltage on any pin with respect to VSS (except VDD)	**-0.3**	**—**	**VDD + 0.3**	**V**
Voltage on VDD with respect to VSS	**-0.3**	**—**	**3.9**	**V**
Brown-out Reset Voltage	**—**	**3.3**	**3.6**	**V**
Logic Input Low Voltage	—	—	0.15 x VDD	V
Logic Input High Voltage	0.8 x VDD	—	—	V
RF Output Level	-21	10	14	dBm

5. HW Pin Diagram

AXM100 모든 IO가 외부 인터페이스에 연결되어 다양한 Device 와 연동이 가능하다.
AXM100 전원은 3.3VDC의 IO 전원을 사용하며 모든 IO 인터페이스는 3.3V TTL level을 따른다.
보드의 interface는 다음과 같다.

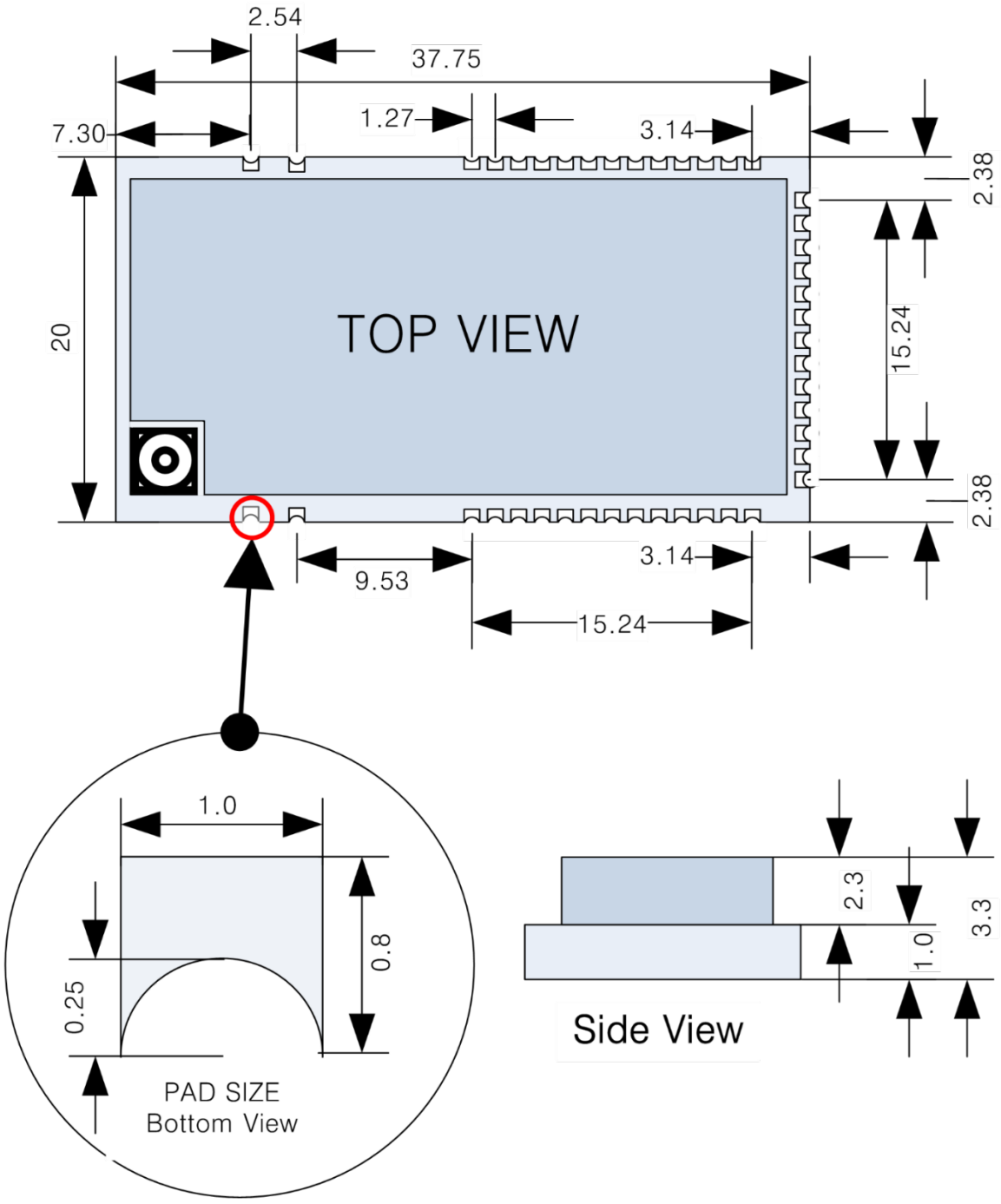


6. AXM100 Pin Description

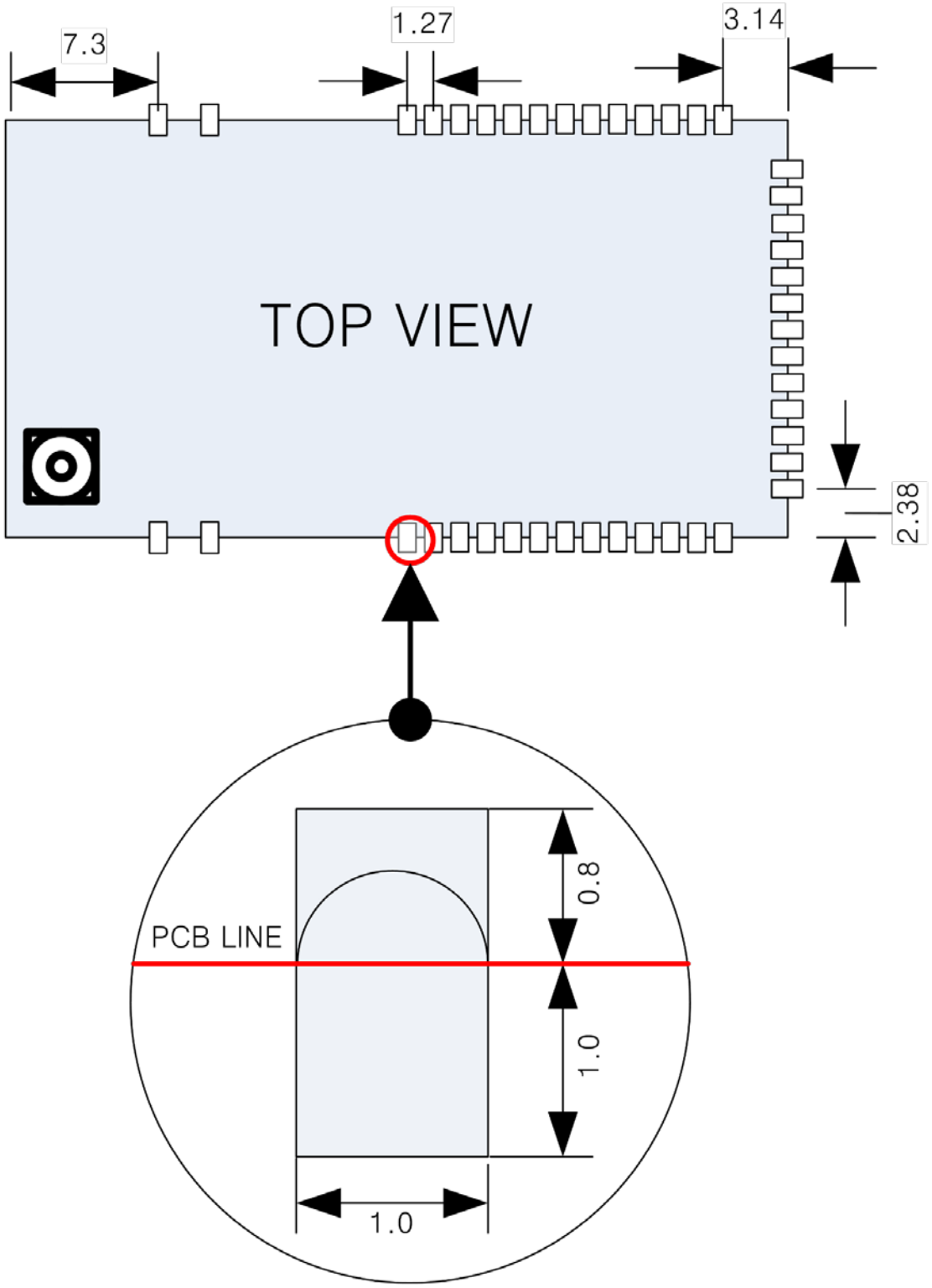
PIN #	NAME	IO	Description
1	RESET_N	I	External reset signal. Active low reset
2	UART_TX2	B	General purpose I/O port
3	UART_RX2	B	General purpose I/O port
4	UART_TX3	B	General purpose I/O port
5	UART_RX3	B	General purpose I/O port
6	JTAG_SELECT	B	JTAG debugger select
7	JTAG_TRST	B	General purpose I/O port
8	JTAG_TCK	B	General purpose I/O port
9	JTAG_TMS	B	General purpose I/O port
10	JTAG_TDO	O	JTAG TDO
11	JTAG_TDI	B	General purpose I/O port
12	+3.3VD	PWR	3.3V (Main power domain),
13	PWR_EN	I	Main Power Enable Switch, Active High
14	GND	GND	Ground
15	GND	GND	Ground
16	UART_TX0	B	UART TX0
17	UART_RX0	B	UART RX0
18	UART_TX1	B	UART TX1
19	UART_RX1	B	UART RX1
20	GND	GND	Ground
21	GPIO_#1	B	General purpose I/O port
22	GPIO_#2	B	General purpose I/O port
23	GPIO_#3	B	General purpose I/O port

24	GPIO_#4	B	General purpose I/O port
25	GPIO_#5	B	General purpose I/O port
26	GPIO_#6	B	General purpose I/O port
27	GND	GND	Ground
28	GPIO_#7	B	General purpose I/O port
29	GPIO_#8	B	General purpose I/O port
30	GPIO_#9	B	General purpose I/O port
31	GPIO_#10	B	General purpose I/O port
32	GPIO_#11	B	General purpose I/O port
33	GPIO_#12	B	General purpose I/O port
34	I2C_SCL	B	TWI SCL
35	I2C_SDA	B	TWI_SDA
36	GPIO_#13	B	General purpose I/O port
37	GPIO_#14	B	General purpose I/O port
38	GPIO_#15	B	General purpose I/O port
39	GPIO_#16	B	General purpose I/O port
40	NC		
41	NC		
42	NC		
43	NC		

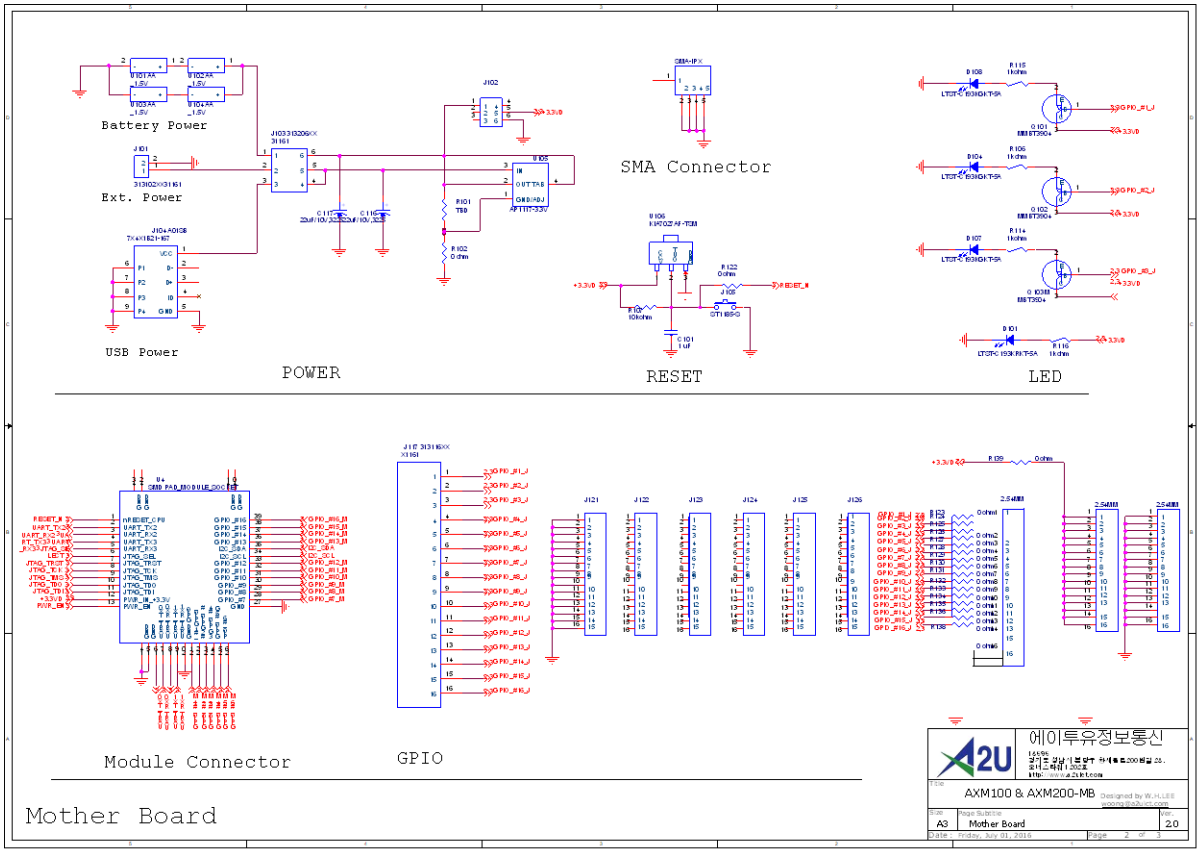
7. AXM100 Physical Dimension

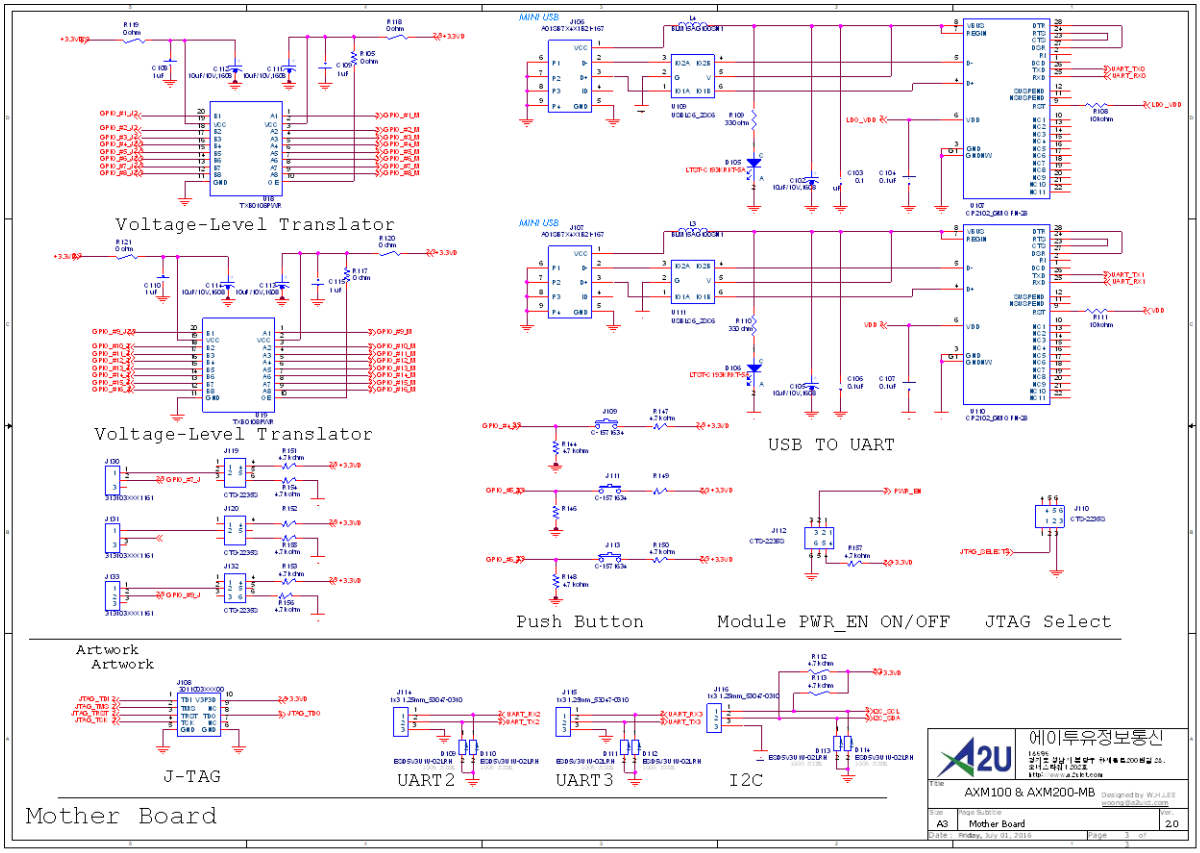


8. AXM100 Recommended PCB Layout

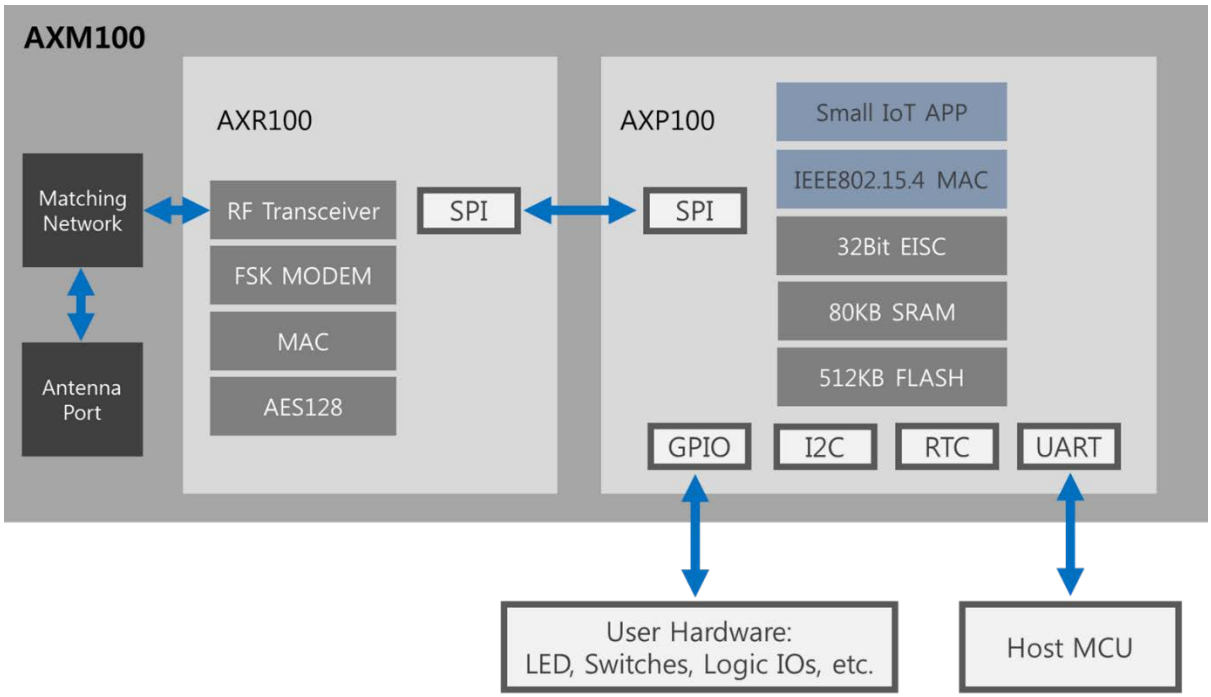


9. Board Interface Schematics Example





10. Application Interface Example



11. Frequency Band

- 한국 917~923.5(MHz)

채널	주파수(MHz)	채널	주파수(MHz)	채널	주파수(MHz)	채널	주파수(MHz)
1	917.1	9	918.7	17	920.3	25	921.9
2	917.3	10	918.9	18	920.5	26	922.1
3	917.5	11	919.1	19	920.7	27	922.3
4	917.7	12	919.3	20	920.9	28	922.5
5	917.9	13	919.5	21	921.1	29	922.7
6	918.1	14	919.7	22	921.3	30	922.9
7	918.3	15	919.9	23	921.5	31	923.1
8	918.5	16	920.1	24	921.7	32	923.3
송신 파워 3mW (4.77dBm)				송신 파워 10mW (10dBm)			

Table 1 917MHz 대역 주파수 채널표(MR-FSK 50kbps mode)