



LTE Cat.4 Modem

# NTLE9607-S4

## 제품설명서

Ver. 1.3 / 10.13.20



## Revision History

Revision	Date	Authors	Description
V1.0	2020.01.06	Evan Lee	작 성
V1.1	2020.02.18	Evan Lee	Pin Map 변경
V1.2	2020.06.03	Evan Lee	12Pin External Connector Pin MAP변경
V1.3	2020.10.13	Evan Lee	30Pin B to B Connector Pin MAP변경

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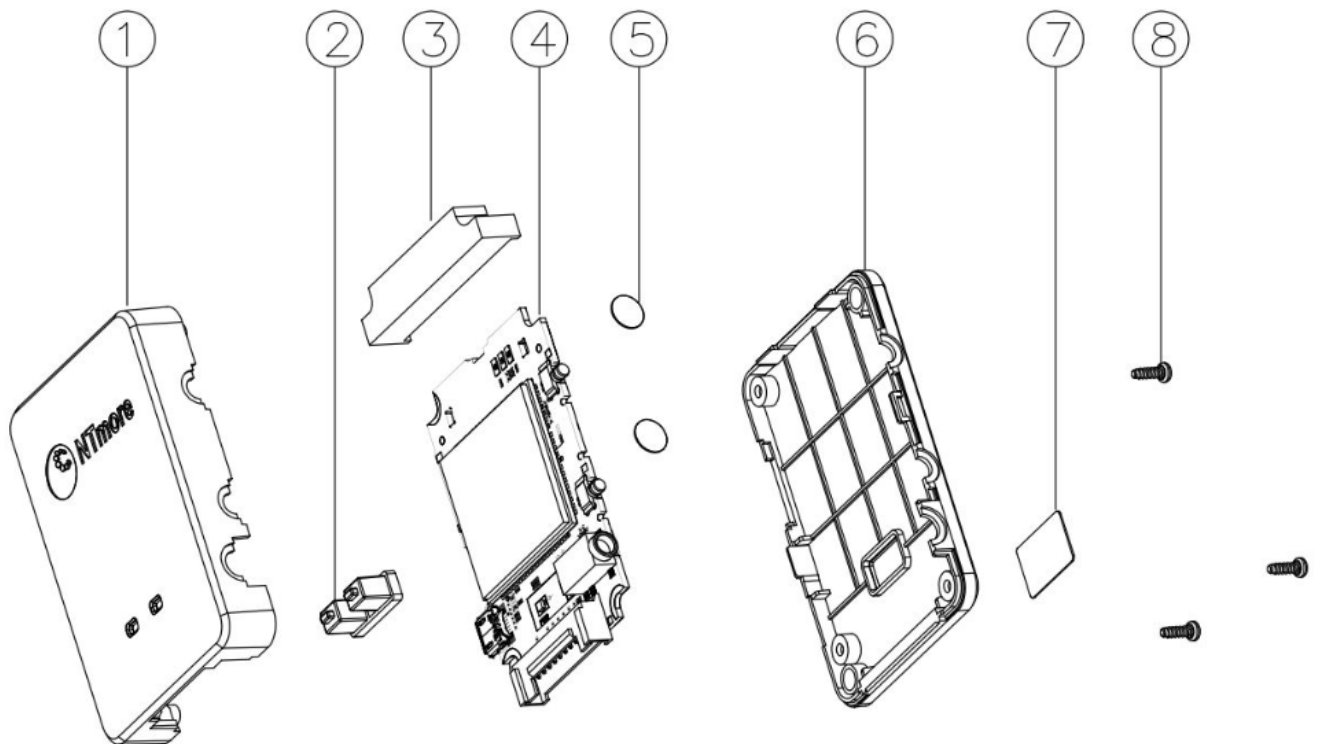
## 1. 기기의 개요 (Introduction)

### 1.1. 기기의 개요

NTLE9607-S4는 데이터 통신용 외장형 Modem이며 LTE Cat.4를 지원합니다.

Data 속도는 Downlink : 150Mbps, Uplink : 50Mbps 입니다.

### 1.2. 제품 분해 사진



NO	PART NO.	MATERIAL	Q'TY
1	CASE TOP	PC	1
2	LIGHT GUIDE	PC	1
3	ANTENNA	-	1
4	PCB ASSY	-	1

NO	PART NO.	MATERIAL	Q'TY
5	PC SHEET ANT	PC SHEET	2
6	CASE BOT	PC	1
7	PC SHEET CONNECTOR	PC SHEET	1
8	SCREW M2.0 X 6	-	3

Figure 1-1 Exploded view

### 1.3. 제품 외부 Interface

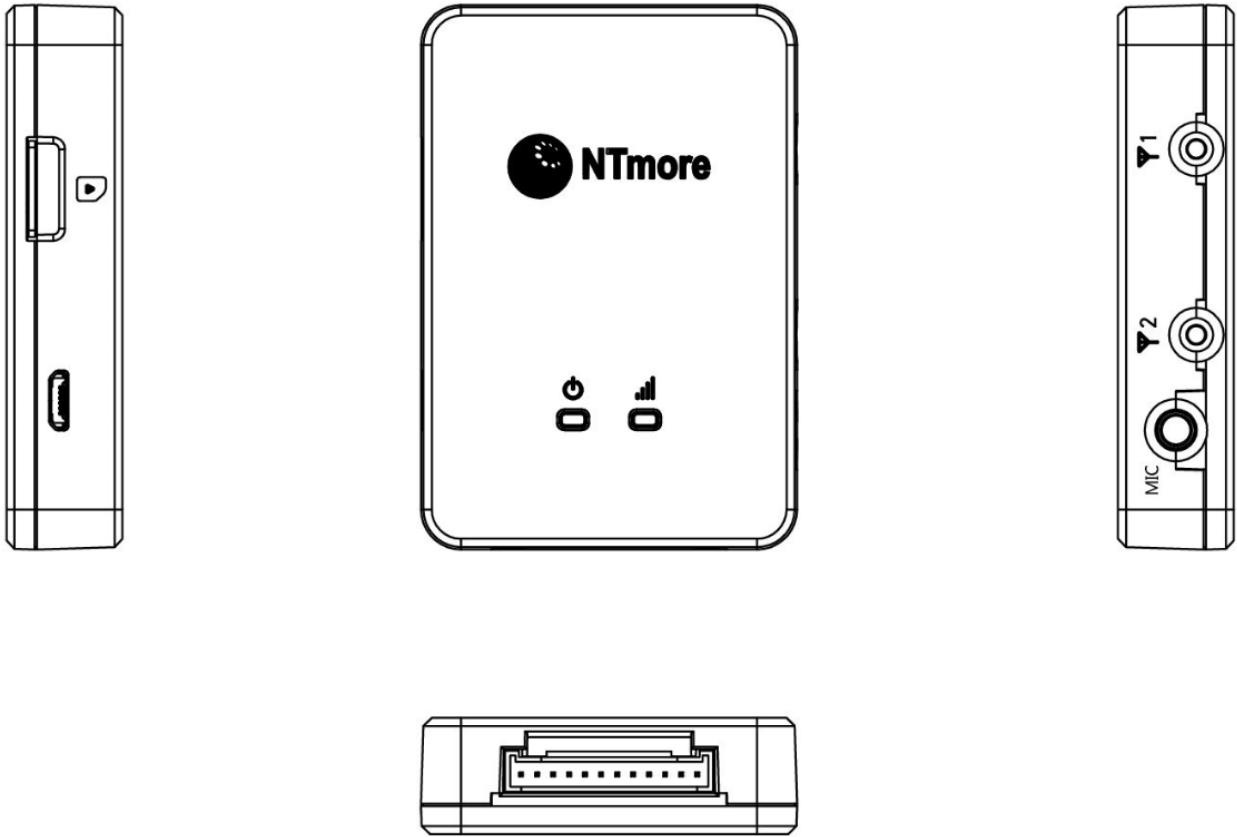


Figure 1-2 외부 Interface

## 1.4. Block Diagram Architecture

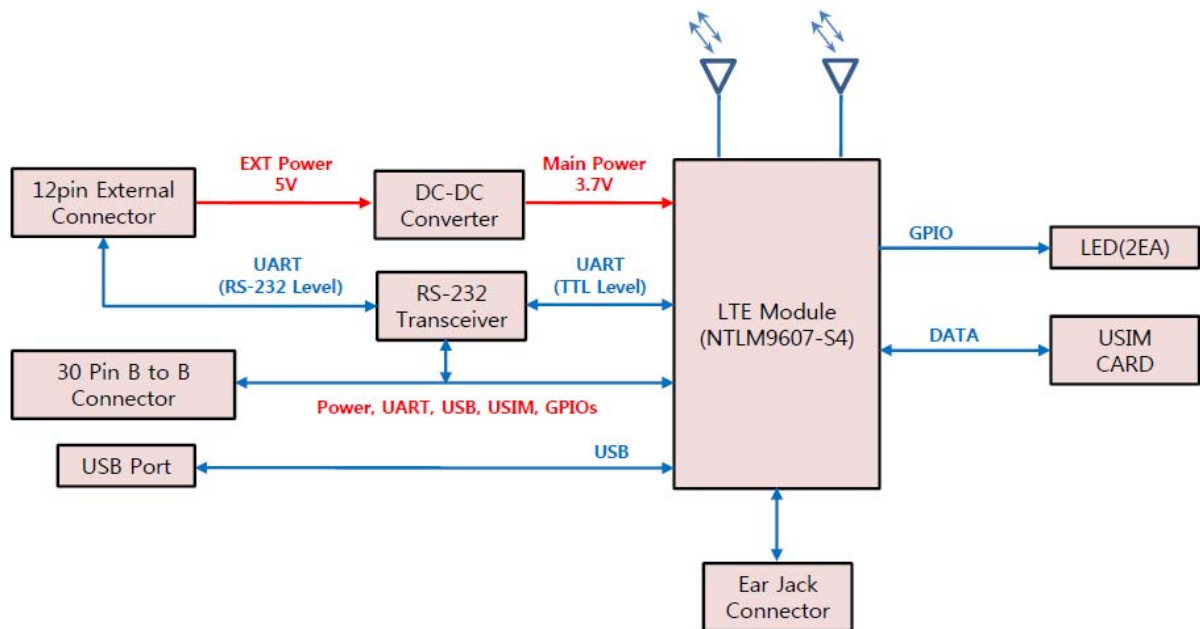


Figure 1-3 Block Diagram

## 2. 제 품 규 격 (Specification)

### 2.1. 일반

#### 2.1.1 환경시험

상대습도	10% ~ 90%
동작온도	-30°C ~ 70°C
저장온도	-40°C ~ 85°C

Table 2-1 Temperature Specification

### 2.2. 하드웨어 규격

#### 2.2.1 일반적 규격

항 목	규 격 내 용			
무선 Protocol	FDD LTE Cat.4			
전원공급 방식	DC +5V			
사용주파수대역	송신	LTE B3: 1710 ~ 1785MHz B5: 824 ~ 849MHz	수신	LTE B3: 1805 ~ 1880MHz B5: 869 ~ 894MHz
Antenna Type	Internal Antenna(Main), External Antenna(Div)			
Interface	12Pin External Connector, 30Pin B to B Connector, USB, USIM, Ear Jack			
외부장착케이블	12Pin Cable, USB Cable			
LED	Power(Red), LTE Signal Level(3 Color)			

Table 2-2 General Specification

**2.2.2 Module 규격 (NTLM9607-S4)**

ITEM		SPECIFICATION	
LTE	Standard	3GPP Release 9	
	UE Category	Cat.4	
	Frequency Range	Band 3 (UL: 1710 ~ 1785MHz, DL: 1805 ~ 1880MHz) Band 5 (UL: 824 ~ 849MHz, DL: 869 ~ 894MHz)	
	Duplex Mode	FDD	
	RF Paths	2 x Rx / 1 x Tx	
	Modulation(UL)	QPSK, 16QAM	
	Demodulation(DL)	QPSK, 16QAM, 64QAM	
	Reference Sensitivity	QPSK, BW : 10MHz	Band 3 : -94dBm Band 5 : -95dBm
	Maximum Tx Power	23dBm ±2dB	@Antenna Port
	Transmit Data Rate	D/L 150Mbps, U/L : 50Mbps	
	Host Interface	LCC	

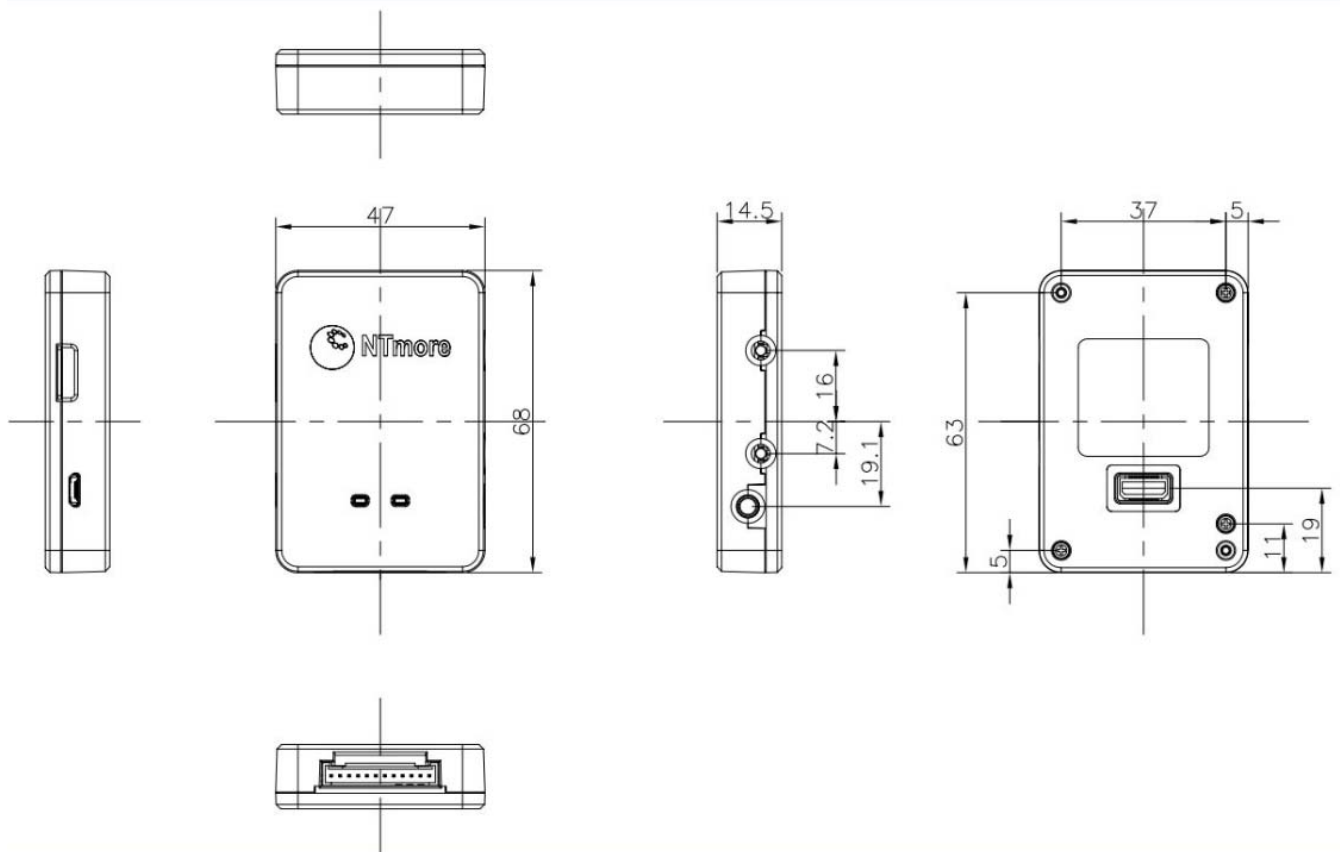
**Table 2-3 LTE General Specification**



## 2.3 기구 규격

사이즈(W*H*T)mm	47.0 x 68.0 x 14.5mm
무게(gram)	32g

Table 2-4 Mechanical Specification



### 3. Modem Interface 규격

#### 3.1. UART Interface

NTLE9607-S4는 HOST와의 통신 시 RS-232 level로 데이터를 송수신하고 있으며 사용된 RS-232 인터페이스 신호 및 규격은 하기 표와 같다.

Signal Name	내 용	방 향	SWING Voltage
HOST_CTS	Clear to send(송신 허가)	M-to-H	10Vp_p
HOST_RXD	Receive Data(수신 데이터)	M-to-H	10Vp_p
HOST_TXD	Transmit Data(송신 데이터)	H-to-M	5.4Vp_p
HOST_RTS	Request to send(송신 요구)	H-to-M	5.4Vp_p

\* M : NTLE9607-S4, H : HOST(PC)

(note) RS-232 Interface signal name is based on Modem

**Table 3-1 RS-232 interface description**

#### 3.2. USB Interface

NTLE9607-S4의 상태를 Monitoring 하기 위한 DM 통신의 Interface이며 일반 사용자에게는 지원안함

#### 3.3. LED Interface

LED를 사용하여 Power, UART, LTE 신호 세기 상태를 표시한다

Signal Name	Color	내 용
Power	Red	전원 공급 시 LED가 켜지며 전원이 정상 공급됨을 나타냄
LTE	Red, Green, Yellow	LTE 신호의 세기를 나타내며 강전계는 Green, 약전계는 Yellow, No Service는 Red로 표시 됨

**Table 3-2 LED interface description**

### 3.4. USIM Interface

USIM을 지원하기 위한 slot을 갖고 있으며

USIM은 사용자 인증정보를 제공함으로써, 단말기가 네트워크에 접속이 가능 하게 해준다

### 3.5. Power Supply

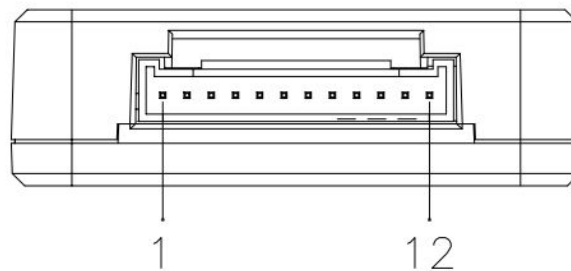
전원 공급 시 3M 이내의 DC+5V/1A(Max) Adapter 전원을 사용하여야 하며

별도 옵션으로 제공 가능합니다.

### 3.6. 12Pin External Connector

SOCKET : 연호전자 / SMAW200-12P( **NTLE9607-S4 적용**)

PLUG : 연호전자 / SMH200-12P(**Cable 적용**)



NO	External Pin Definition	IO	Functional Description	Remarks
1	UART1_TX	DO	Serial data transmission	TTL Level (1.8V)
2	UART1_RX	DI	Serial data reception	TTL Level (1.8V)
3	MAIN_PWR	PI	Power input DC(+5V)	
4	GND		Ground	
5	RS232_TXD	DO	Serial data transmission	RS232 Level
6	RS232_RXD	DI	Serial data reception	RS232 Level
7	RS232_RTS	DI	Request to send	RS232 Level
8	RX232_CTS	DO	Clear send	RS232 Level
9	GND		Ground	
10	MIC	AI	Audio Input	

11	SPK	AO	Audio Output	
12	RESERVED		Not Connected	

Table 3-3 External 12Pin Connector Descriptions

### 3.7. Board To Board Connector(30Pin)

#### • P5K



Socket



Header

SOCKET : Panasonic / AXK5S30047YG( **NTLE9607-S4 적용**)

**Mated Height : 4.0mm type**

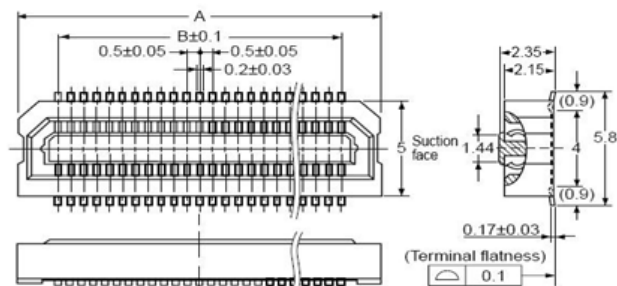
#### • Socket

##### CAD Data



Dimension table (mm)

No. of contacts	A	B
20	8.20	4.50
22	8.70	5.00
30	10.70	7.00
34	11.70	8.00
40	13.20	9.50
50	15.70	12.00
60	18.20	14.50
70	20.70	17.00
80	23.20	19.50
100	28.20	24.50
120	33.20	29.50



General tolerance: ±0.2

**HEADER : Panasonic / AXK6S30447YG**

**Mated Height : 4.0mm type**

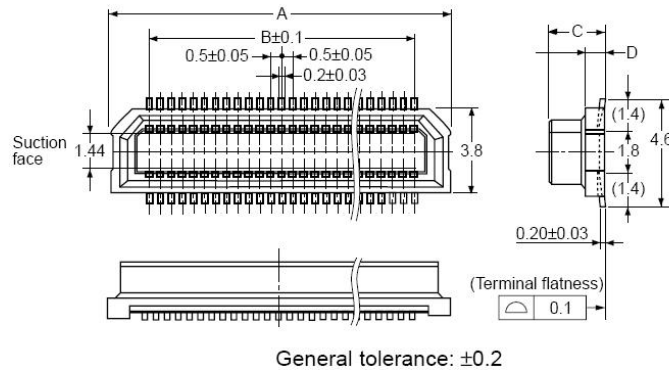
• Header

**CAD Data**



**Dimension table (mm)**

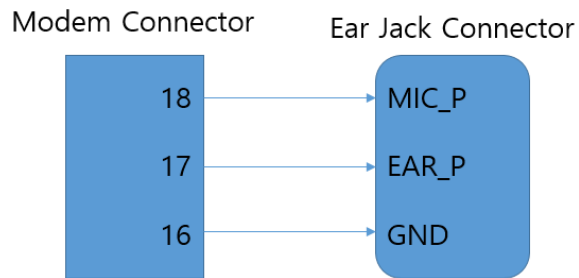
No. of contacts	A	B
20	8.20	4.50
22	8.70	5.00
30	10.70	7.00
34	11.70	8.00
40	13.20	9.50
50	15.70	12.00
60	18.20	14.50
70	20.70	17.00
80	23.20	19.50
100	28.20	24.50
120	33.20	29.50



NO	External Pin Definition	IO	Functional Description	Remarks
1	GND		Ground	
2	USB_DP	IO	USB Differential Signals+	
3	USB_DN	IO	USB Differential Signals-	
4	GND		Ground	
5	GPIO	IO	General purpose input/output	1.8V
6	GPIO	IO	General purpose input/output	1.8V
7	GPIO	IO	General purpose input/output	1.8V
8	VDD_18V_EXT	PO	Internal 1.8V Power Output	
9	RESET	DI	Reset control	Active Low
10	GPIO	IO	General purpose input/output	1.8V
11	USIM_DATA	IO	USIM IO Data	
12	USIM_CLK	DO	USIM Clock	
13	USIM_RESET	DO	USIM Reset	
14	USIM_VCC	PO	USIM Power Out	
15	USB_VBUS	PI	Voltage DC for USB (+5V)	

16	Ear Jack GND		Ear Jack Connector Ground	
17	SPK	AO	Audio Output	
18	MIC	AI	Audio Input	
19	RS232_RTS	DI	Request to send	RS232 Level
20	RX232_CTS	DO	Clear send	RS232 Level
21	RS232_TXD	DO	Serial data transmission	RS232 Level
22	RS232_RXD	DI	Serial data reception	RS232 Level
23	GND		Ground	
24	UART1_TX	DO	Serial data transmission	TTL Level (1.8V)
25	UART1_RX	DI	Serial data reception	TTL Level (1.8V)
26	RESERVED		Not Connected	
27	RESERVED		Not Connected	
28	MAIN_PWR	PI	Power input DC(+5V)	
29	MAIN_PWR	PI	Power input DC(+5V)	
30	MAIN_PWR	PI	Power input DC(+5V)	

Table 3-4 30Pin B to B Connector Descriptions



**\*\* Pin 16 은 반드시 Ear Jack Connector 전용 Ground로 사용**

## 4. PCB Layout Guide

### 4.1. PCB Layout

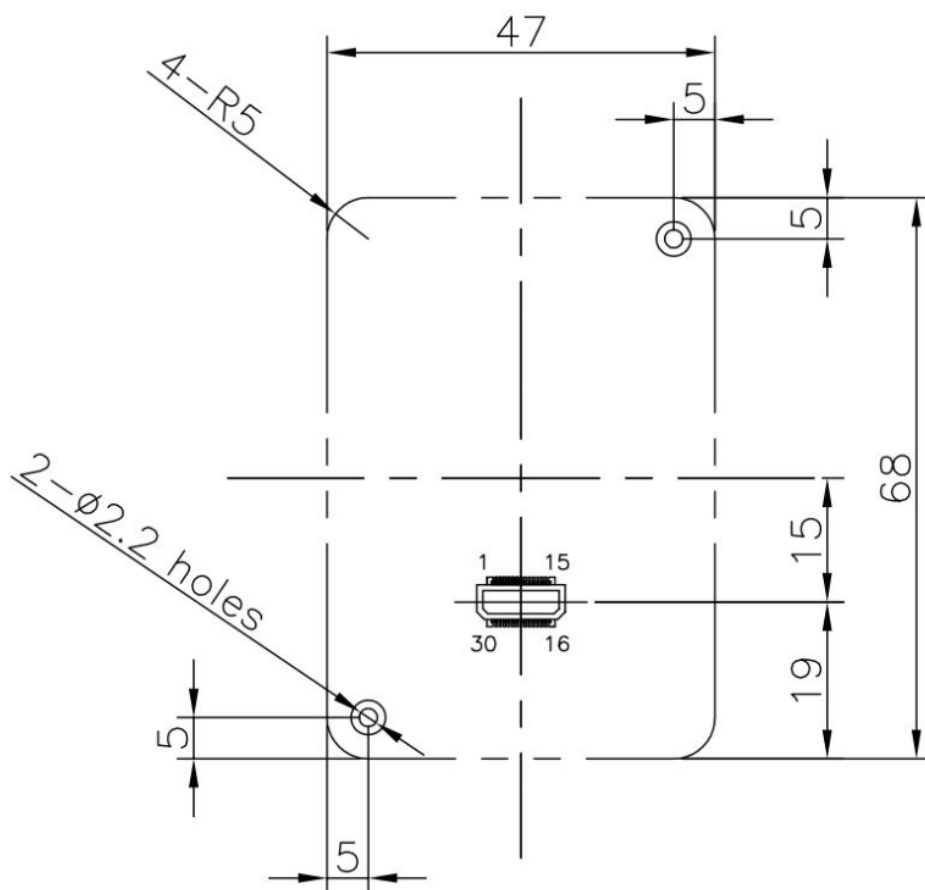


Figure 4-1 PCB Lay Out

#### SCREW SPEC

NO	SPECIFICATION	D	H	L	d	REMARK
1	TAPTITE B, $\phi 2.0 \times L8.0$ , PH, +, BLACK, HD $\phi 3.5 \times 0.8$	3.5	0.8	8.0	2.0	

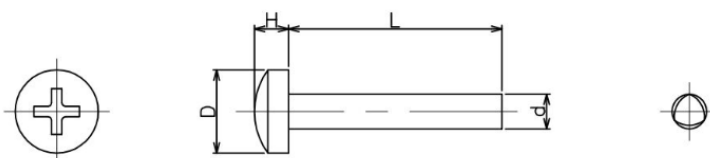


Figure 4-2 SCREW Specification