# UltraStick introduction

## General Description

## UltraStick E1220

| | |
|---|---|
| **Form Factor** | Internal antenna |
| | Size: 65mm X 35mm X 3.3mm |
| | Weight: <30g |
| | Temp: -10~55℃ |
| **Features** | HSDPA: 14.4Mbps(DL)<br>HSUPA: 5.76Mbps(UL) |
| | Plug & Play（HS USB 2.0） |
| | Data，SMS，PCM Voice |
| **Specifications** | HSUPA/HSDPA/WCDMA:<br>-2：2100/900MHz<br>NO Receive Diversity<br>GSM:<br>1800+900 MHz |
| | Chipset : Balong V3R2 |
| | No Micro SD<br>No External antenna interface<br>Standard SIM socket |
| | OS: Android |

# Electrical Specification

## Recommended power supply

| parameter | min | Typ | Max | Units |
|---|---|---|---|---|
| Power supply | 3.5 | 3.8 | 4.2 | V |
| GSM current | - | 0.4 | 2.0 | A |
| WCDMA current | - | 0.4 | 0.7 | A |
| IDLE current | - | - | 3 | mA |
| Shut down curernt | - | 30 | 80 | uA |

## Absolute Maximum Ratings

| Function Group | Related pins | Max | Units |
|---|---|---|---|
| Power supply | VSYS | 4.5 | V |
| I/O signals | Wakeup_in, Wakeup_out, PCM_CLK,PCM_SYNC, PCM_DI,PCM_DOUT, | 2.1 | V |
| Power on signal | Power_on_off | 2.0 | V |
| USB signal | USB DM,USB DP | USB standard | V |

***all value is not guaranteed now, reference only**

# Electrical Specification

## Electrical Characteristics

| Function Group | symbol | min | Typ | Max | Units |
|---|---|---|---|---|---|
| PCM | $V_{ih}$ | 1.5 | 1.8 | 2.1 | V |
| | $V_{il}$ | -0.3 | 0 | 0.6 | V |
| | $V_{oh}$ | 1.35 | 1.8 | - | V |
| | $V_{ol}$ | - | 0 | 0.45 | V |
| Wakeup in | $V_{ih}$ | 1.5 | 1.8 | 2.1 | V |
| | $V_{il}$ | -0.3 | 0 | 0.6 | V |
| Wakeup out | $V_{oh}$ | 1.35 | 1.8 | - | V |
| | $V_{ol}$ | - | 0 | 0.45 | V |
| Power_on_off | $V_{ih}$ | 1.6 | 1.8 | 2.0 | V |
| | $V_{il}$ | -0.3 | 0 | 0.6 | V |

## ESD

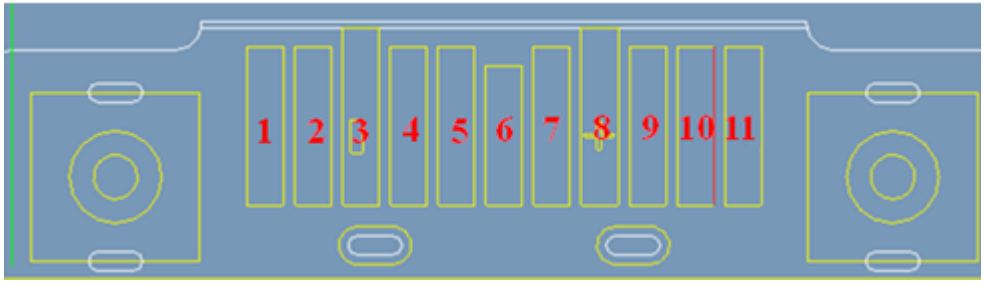
| Function Group | condition | Max | Units |
|---|---|---|---|
| Power supply | a | 6 | kV |
| I/O signals | b | 6 | kV |

**a： Module Level ESD Protection (In-Circuit tested with TVS)**

**b： ESD protection for human body model (In-Circuit tested with MLV)**

***all value is not guaranteed now, reference only**

# Interface definition




| Pin | Name | Definition | Reset state | Detail |
|---|---|---|---|---|
| 1 | HS USB 2.0 | USB_DP | USB standard | HS USB 2.0 , 1.1 supported |
| 2 | HS USB 2.0 | USB_DM | | |
| 3 | GND | Power ground | | |
| 4 | wake up signal | Wakeup_out | Pull-high | Wake up the pad |
| 5 | wake up signal | Wakeup_in | Pull-high | Wake up Ultrastick in deep sleep mode |
| 6 | Power control | Power_on_off | Pull-low | Power on off signal<br>pull high turn on Ultrastick<br>pull low or NC turn off Ultrastick |
| 7 | PCM | PCM_SYNC | Pull-high | PCM SYNC signal |
| 8 | VSYS | Power supply | | max 2.0A, direct connect of charger output is suggested |
| 9 | PCM | PCM_CLK | Pull-high | PCM clock signal |
| 10 | PCM | PCM_DIN | Pull-high | PCM data in |
| 11 | PCM | PCM_DOUT | Pull-high | PCM data out |

# Hardware Requirement

## USB HOST controller

UltraStick only support USB device mode，if pad need to connect PC at the same time，the AP must have 2 USB controllers, one for UltraStick as USB host, the other for PC as USB device.

## PCM

UltraStick do not support any audio signal processing algorithm，audio DSP IC is suggested if audio quality is critical . Currently , suggested DSP is：Audience eS305B。

## Power supply

1）Power supply range from 3.5~4.2V should be guarantied and 150uF cap is needed。

2） Adding a P-MOS as main power switch of UltraStick is recommended，and the DCR of P-MOS should be lower than 50mohm.


eS305B

# Wireless Requirement

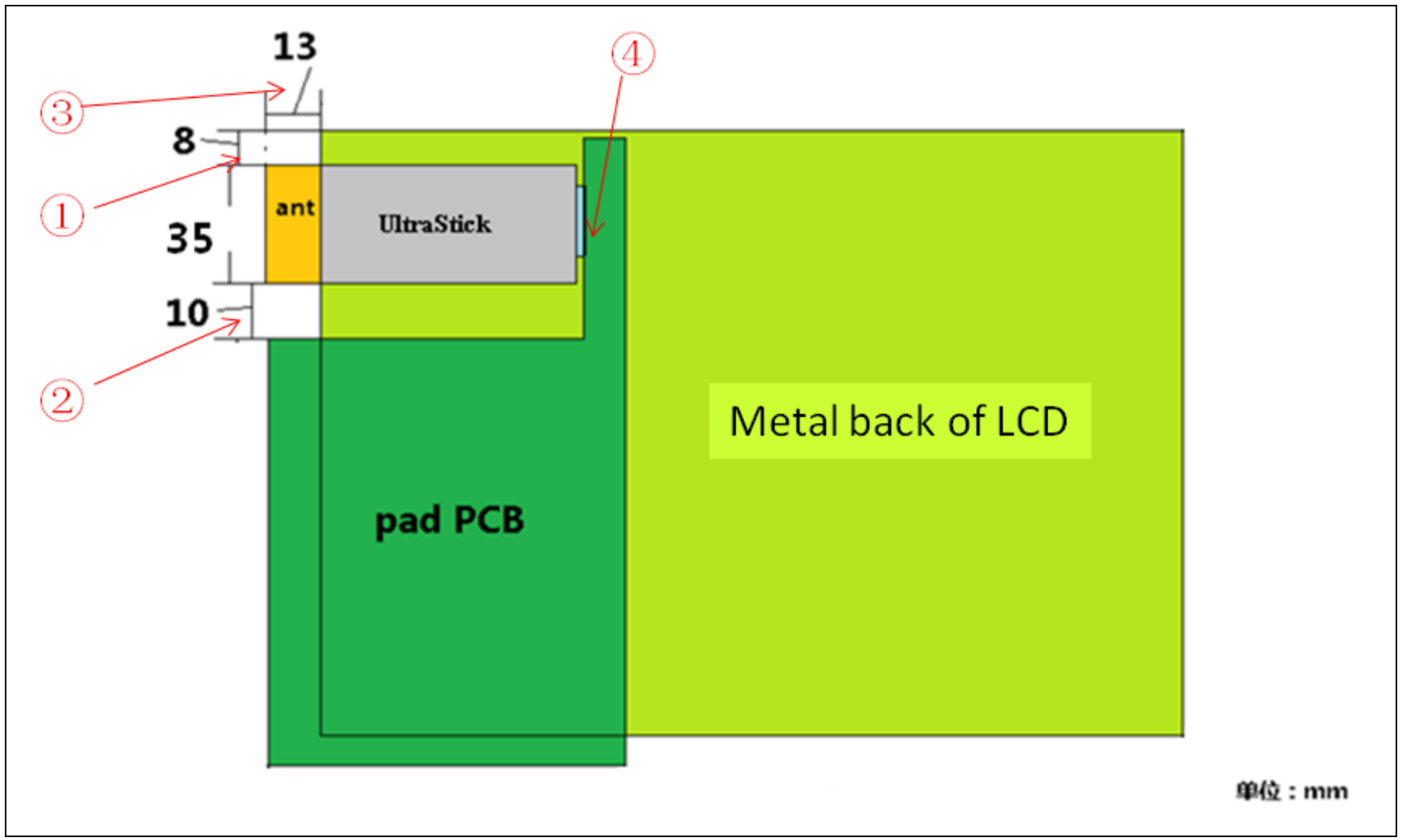
In order to ensure the wireless performance , reference design is as below。This is 8 inch pad reference design , some essentials must be noticed.

①UltraStick should be placed as close as possible to LCD edge

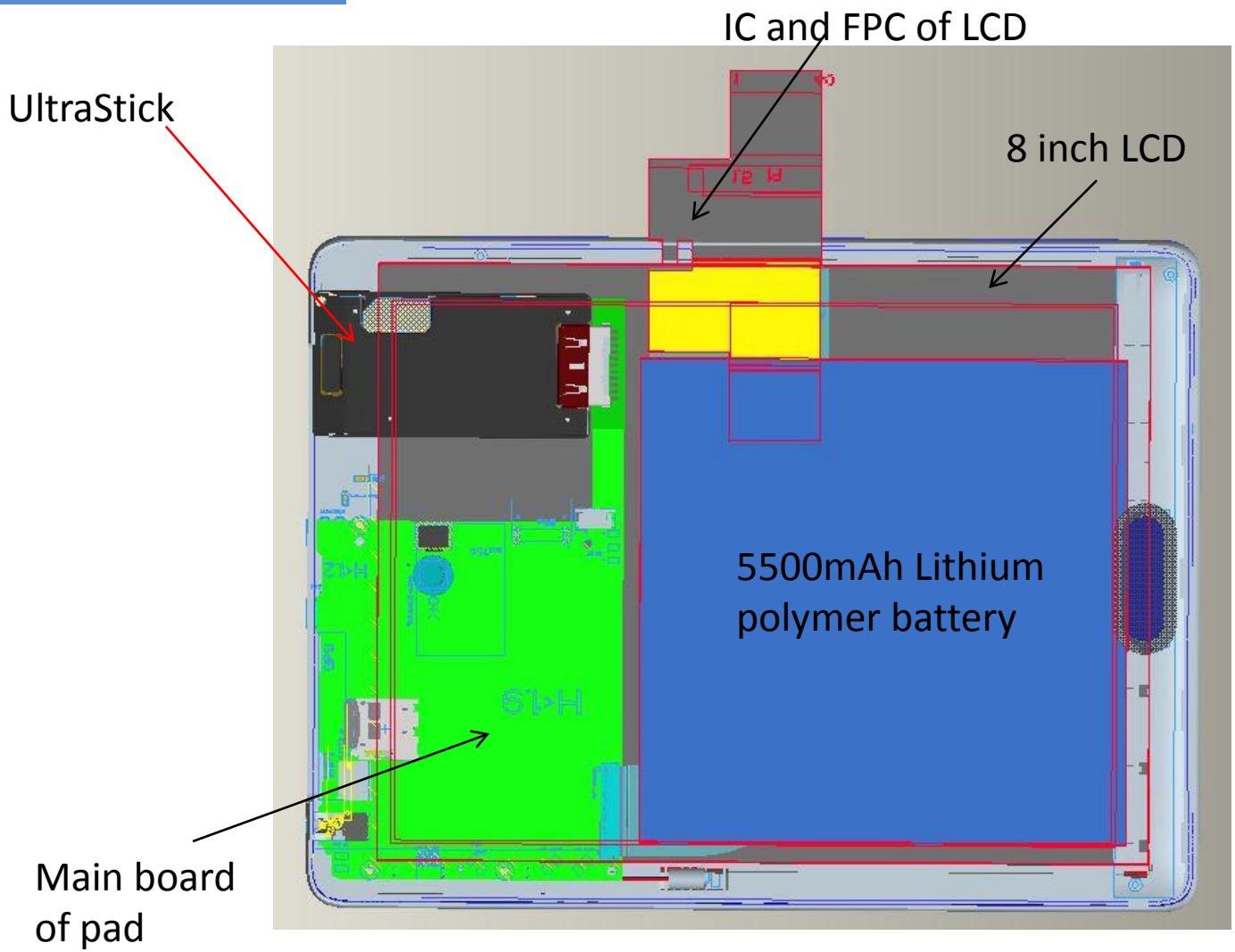
②antenna of UltraStick should keep a distance of 10mm from PCB

③antenna  of UltraStick should leave the edge of LCD at lease 13mm

④the bottom of PCB under socket should be connect with the metal back of LCD by conductive material



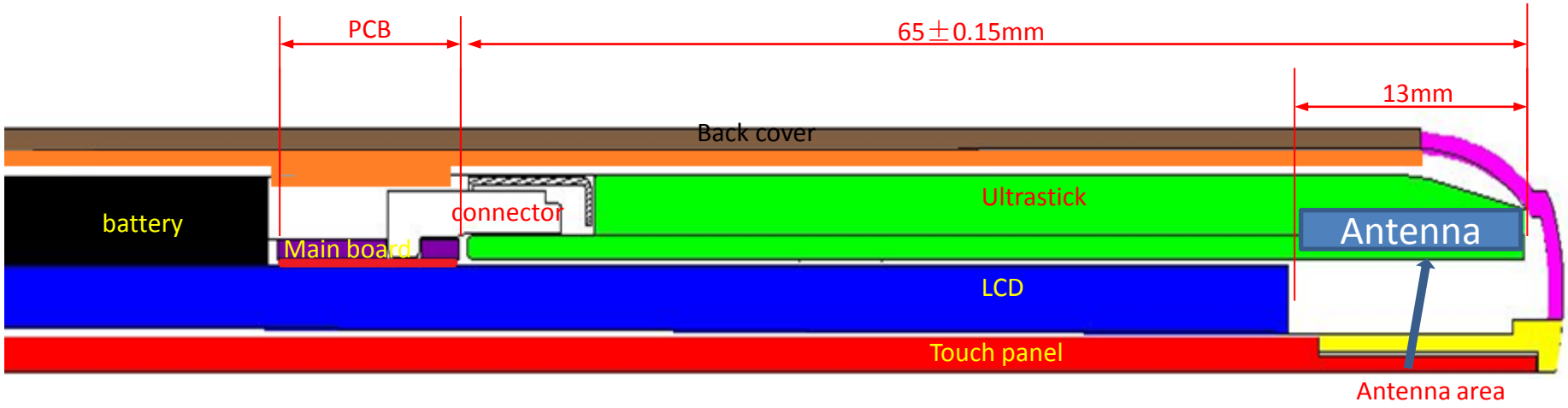
## Reference design



# Reference design

◆Design notices:

- Main board of PAD is suggested to use thickness 0.8mm,
- the bottom of UltraStick should be aligned with main board, both close to LCD, only leaving a gap of 0.1mm。
- Battery should be close to LCD , which thickness is suggested to 3.5mm minimum
- The room surrounding the antenna of UltraStick must be cleared and leave the edge of LCD at lease13mm



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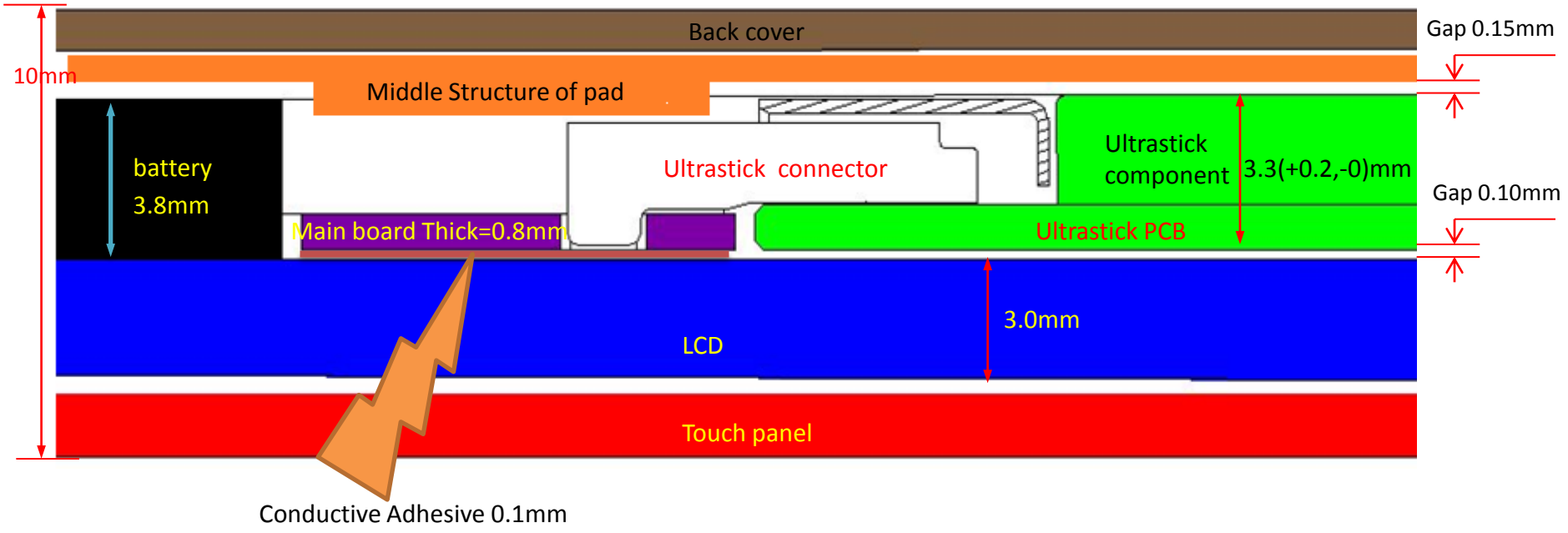

# Reference design