**PRODUCT REQUIREMENTS DOCUMENT**

**(HARDWARE & PLATFORM) V.0.1**

Product: ANDA WATCH

Product line: ELDERLY WATCH

Scope: HARWARE, FIRMWARE & PLATFORM

Date: July 12, 2018

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Content:

The following PRD contains **only hardware andplatform requirements for the product. Product requirements for software features, mechanical design, ID and others are not part of this document.**

**Hardware requirements** will cover every part or block that conforms the product’s embedded system.

**Firmware and platform requirements** will cover OS details, software build requirements and low-level interfaces among any other type of platform customizations and optimizations. Platform customizations and optimizations can also include continuous support in tasks related to power management, system performance, system configurations, telephony management and carrier customizations.

PRODUCT’S EMBEDDED SYSTEM

**BLOCK DIAGRAM**

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4PIN charging

Suggest a capacity of 600mAh per the users’ experience.

Both 2100 and 2500 platform can not support 5G-WIFI.

PARTRON：PPSI263

Based on functional requirements, we need to add an external MCU. All sensors are mounted on the MCU.

Compare with a little improvement in signal receiving, we do not suggest to add LNA, which will lead to a higher cost, larger size layout as well as the increase in power consumption.

OK

For the platform, just digital MIC could be used.

1. -OK Pmu has class D amplifier itself.// 2500-- Need external intelligent PA.

PRODUCT’S EMBEDDED SYSTEM

**HARDWARE REQUIREMENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **BLOCK** | **BLOCK DESCRIPTION** | **CHARACTERISTICS** | **SPECIFICATIONS** |
| 1 | CPU | TYPE | MSM8909W - ARM Cortex A7 1.2 GHz 2 Core Qualcomm ® Adreno™ 304 GPU |
| 2 | MEMORY & STORAGE | TECHNOLOGY | EMBEDDED |
| CAPACITY | RAM 512MB + ROM 4GB |
| 3 | SCREEN | TECHNOLOGY | AMOLED |
| TYPE | ROUND. GORILLA GLASS 3 MINIMUM |
| DIMENSIONS | 1.39" DIAMETER |
| SIZE | 400x400px |
| 4 | TOUCH PANEL | TECHNOLOGY | CAPACITIVE |
| TYPE | MULTI-TOUCH -  Waterproof is a standard requirement,water drops do not explode. |
| 5 | INERTIAL SENSORS | TYPE | MODULE (ACC, GYRO, --two functions integrated  in one chip  . ； COMPASS—one single IC.) (ANDA\_R: W1 uses one single MCU for all 3) |
| ADDITIONALS | FREE FALL DETECTION------- Need external MCU and algorithm. (ANDA\_R: W1 uses one single MCU for all 3) |
| SIGNIFICANT MOTION-------Pls clarify what motions. Need external MCU and algorithm. (please check the LSM6DS3 datasheet for reference, It’s an iNEMO inertial module: always-on 3D accelerometer and 3D gyroscope. It give us preprocessed information and indicates events such “significant motion”, “tilt”, “step detector”, “free-fall” among others. |
| STEP COUNTER |
| EVENTS DETECTION---- Pls clarify what events. (free fall detection, significant motion and glance) |
| INTERFACE TO ACCESS TO SENSOR DETAILS AND SENSOR PARAMETER CONFIGURATIONS IN HIGH LEVEL IS NEEDED |
| COMMENTS | COMPONENT TO BE SELECTED CONSULTING ANDA |
| 6 | HEALTH MONITORING SENSORS | TYPE 1 | MODULE - PREFERRED (PPG, ECG, BLOOD PRESSURE). OTHERWISE, INDIVIDUAL---- Need external MCU and algorithm (you mean the PPS1263 right?) |
| TYPE 2 | SLEEP MONITOR (FOR SLEEP QUALITY) |
| ADDITIONALS | INTERFACE TO ACCESS TO SENSOR DETAILS AND SENSOR PARAMETER CONFIGURATIONS IN HIGH LEVEL IS NEEDED |
| COMMENTS | COMPONENT TO BE SELECTED WITH ANDA |

PRODUCT’S EMBEDDED SYSTEM

**HARDWARE REQUIREMENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| 7 | POWER MANAGEMENT | TECHNOLOGY | EMBEDDED |
| TYPE | NO SPECIFIED |
| 8 | POWER SUPPLY | TECHNOLOGY | USB 5V ==>Suggest the current be eaqual or less than 0.7A (0.7 for charging current? Or as the maximum capacity of the wall charger adapter?) our current watch’s charging current is 0.21A and the wall charger capacity is 5V, 1A. |
| TYPE | POGO PIN CONNECTOR WITH 4 PIN MAGNETIC ATTACHMENT. |
| ADDITIONALS | ATTACHMENT/DETACHMENT FORCE MUST BE STRONG. MEASUREMENTS TO BE PROVIDED BY ANDA. |
| 9 | BATTERY | TECHNOLOGY | USB 5V |
| CAPACITY | 600mAh |
| TYPE | LI-POLYMER BATTERY. |
| 10 | CODEC (AUDIO) | TECHNOLOGY | EMBEDDED -- 2100 platform integrates CODEC./ 2500 platform need external CODEC. (which one would you recommend 2100 or 2500?) |
| ADDITIONALS | ALLOW BIDIRECTIONAL COMMUNICATION WITHOUT ECHO/FEEDBACK INTERFERENCE BETWEEN MIC AND SPEAKER |
| 11 | MIC | TECHNOLOGY | NO SPECIFIED |
| ADDITIONALS | HIGH FIDELITY INPUT AND POSSIBILITY TO INCREASE GAIN WHEN NEEDED. MEASUREMENTS TO BE PROVIDED BY ANDA. |
| 12 | SPEAKER | TECHNOLOGY | NO SPECIFIED |
| ADDITIONALS | HIGH FIDELITY OUTPUT AND POWER. MEASUREMENTS TO BE PROVIDED BY ANDA. |
| COMMENTS | WE REQUIRE SAMPLES TO TEST AUDIO OUTPUT GIVEN ELDERLY PEOPLE DIFFICULT HEARING  ---- High power loudspeaker is recommended. We will look for the model. Or you provide the speaker indicators which we will evaluate. (Better you give us a sample of the loudspeaker for us to test) |
| 13 | BLUETOOTH | TECHNOLOGY | 4.1 BLE / -----Need support EDR --- 4.1 + BLE? Could you explain? |
| ADDITIONALS | INTEGRATED AUDIO CODEC FOR HIGH FIDELITY AUDIO TRANSMISSIONS |
| POSSIBILITY TO PAIR WITH ANOTHER SIMILAR DEVICE, ANDROID AND IOS |
| 14 | WIFI | TECHNOLOGY | 802.11 B/G/N |
| TYPE | 2.4GHZ |
| 15 | VIBRATOR | COMMENTS | COMPONENT TO BE SELECTED WITH ANDA – recommend 0720 |

PRODUCT’S EMBEDDED SYSTEM

**HARDWARE REQUIREMENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| 16 | KEY: POWER BUTTON | COMMENTS | COMPONENT TO BE SELECTED WITH ANDA, DESIRED: HAPTIC FEEDBACK WITH LESS MECHANICAL PARTS FOR LONGER PART LIFE |
| ADDITIONALS | INTERFACE TO ACCESS TO KEY EVENTS IN HIGH LEVEL IS NEEDED |
| ENABLE THE POSSIBILITY TO INTERCEPT BUTTON EVENTS FOR DIFFERENT PURPOSES |
| 17 | SIM CARD | TYPE | NANO (4FF) |
| SIM SOCKET TYPE | COMPONENT TO BE SELECTED WITH ANDA |
| ADDITIONALS | ENABLE HOT PLUG |
| ALLOWED TO ENABLE/DISABLE SIM LOCK FROM HARDWARE AND PROVIDE TOOL |
| 18 | POWER TRACKER | TYPE | ENVELOPE TRACKING PREFERRED |
| 19 | TRANSCEIVER | TECHNOLOGY | 2G, 3G, 4G LTE |
| TRANSCEIVER FOR THE AMERICAS  For this band part, pls refer to the mail content | 2G GSM BANDS | 850, 1900 推荐： 850 1900 |
| CDMA | B0, B1 BC0 BC1 |
| UMTS | 1, 2, 3, 4, 5 B2. B4. B5 |
| 4G BANDS | MANDATORY: BANDS 2 AND 4 (FDD) |
| 4G BANDS | DESIRED IN ORDER OF PREFERENCE: BAND 28, 3, 7 (FDD) |
| TRANSCEIVER FOR EUROPE | 2G GSM BANDS | 900, 1800 |
| UMTS | 1, 2, 3, 4, 5 |
| 4G BANDS | MANDATORY: BAND 20 (FDD) |
| 4G BANDS | DESIRED IN ORDER OF PREFERENCE: BAND 7, 3 (FDD) |
| TRANSCEIVER FOR CHINA | 2G GSM BANDS | 900, 1800 |
| UMTS | 1, 2, 3, 4, 5 |
| 4G BANDS | MANDATORY: BAND 41 (TDD) |
| 20 | GPS -- P.S: For AGPS, use Qualcomm service. | TYPE | GPS, GLONASS \ GALILEO, BEIDOU |
| ACCURACY | TO BE PROVIDED BY ANDA |

PRODUCT’S EMBEDDED SYSTEM

**FIRMWARE AND PLATFORM REQUIREMENTS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ITEM** | **RELATED TO BLOCK Nº** | **ITEM DESCRIPTION** | **CHARACTERISTICS** | **SPECIFICATIONS** |
| 1 | 1 | OS | TYPE | ANDROID 7+ |
| 2 | 3, 4 | SCREEN EVENTS | WAKE UP | ENABLE: TILT/GLANCE TO WAKE UP |
| ENABLE: TOUCH TO WAKE UP  ==>TP IS need to support this function |
| SLEEP | ENABLE: PALM ON SCREEN TO SLEEP  ==>Do not recommend this function, the actual key control is suggested. |
| ENABLE: TILT/GLANCE TO SLEEP  ==>Do not recommend this function, the actual key control is suggested. |
| 3 | 5 | INERTIAL SENSOR EVENTS | CAPTURE AND BROADCAST EVENTS | FREE FALL DETECTION  ==>Need external MCU and algorithm |
| SIGNIFICANT MOTION  Pls clarify which motions, need external MCU and algorithm. |
| STEP COUNTER |
| OTHERS  Pls clarify the detailed events. |
| ALLOW ACCESS TO COMPONENT DATA AT HIGH LEVEL | ENABLE: BRIDGE TO ACCESS AND CONFIGURE COMPONENT PARAMETERS (SUCH AS EVENT THRESHOLDS) DIRECTLY FROM ANDROID. |
| 4 | 6 | HEALTH MONITORING EVENTS | CAPTURE AND BROADCAST EVENTS | PPG  need external MCU and algorithm. |
| ECG  need external MCU and algorithm. |
| BLOOD PRESSURE  Need to add Two electrodes on the watch，need external MCU and algorithm. |
| OTHERS |
| ALLOW ACCESS TO COMPONENT DATA AT HIGH LEVEL | ENABLE: BRIDGE TO ACCESS AND CONFIGURE COMPONENT PARAMETERS (SUCH AS EVENT THRESHOLDS) DIRECTLY FROM ANDROID. |
| 5 | 10 | CODECS | AUDIO | ENABLE: HIGH QUALITY AUDIO REPRODUCTION |
| VIDEO | ENABLE: VIDEO REPRODUCTION |
| 6 | 11 | MIC | TECHNOLOGY | NO SPECIFIED |
| ADDITIONALS | HIGH FIDELITY INPUT AND POSSIBILITY TO INCREASE GAIN WHEN NEEDED. MEASUREMENTS TO BE PROVIDED BY ANDA. |

PRODUCT’S EMBEDDED SYSTEM

**FIRMWARE AND PLATFORM REQUIREMENTS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7 | 12 | SPEAKER | TECHNOLOGY | NO SPECIFIED |
| ADDITIONALS | HIGH FIDELITY OUTPUT AND POWER. MEASUREMENTS TO BE PROVIDED BY ANDA. |
| 8 | 13 | BLUETOOTH | TECHNOLOGY | 4.1 BLE-----Need to support EDR |
| ADDITIONALS | INTEGRATED AUDIO CODEC FOR HIGH FIDELITY AUDIO TRANSMISSIONS |
| POSSIBILITY TO PAIR WITH ANOTHER SIMILAR DEVICE, ANDROID AND IOS |
| 9 | 14 | WIFI | TECHNOLOGY | 802.11 B/G/N |
| TYPE | AT LEAST ONE TYPE: 2.4GHZ |
| 10 | 15 | VIBRATOR | COMMENTS | COMPONENT TO BE SELECTED WITH ANDA |
| 11 | 16 | KEY: POWER BUTTON | COMMENTS | COMPONENT TO BE SELECTED WITH ANDA |
| ADDITIONALS | INTERFACE TO ACCESS TO KEY EVENTS IN HIGH LEVEL IS NEEDED |
| ENABLE THE POSSIBILITY TO INTERCEPT BUTTON EVENTS FOR DIFFERENT PURPOSES |
| 12 | 18 | SIM CARD | TYPE | NANO (4FF) |
| SIM SOCKET TYPE | COMPONENT TO BE SELECTED WITH ANDA |
| ADDITIONALS | ENABLE HOT PLUG |
| ALLOW TO ENABLE/DISABLE SIM LOCK FROM HARDWARE AND PROVIDE TOOL |
| 13 | 21 | GPS | TYPE | GPS, GLONASS \ GALILEO, BEIDOU  1. can support GPS、GLONASS、BEIDOU at the same time.  2. BEIDOU need to be used with GPS, can not be used separately. |
| ADDITIONALS | ENABLE A-GPS  USE QUALCOMM SERVICE XTRA |
| ENABLE: LBS, IZAT |
| 14 | - | PHONE CALLS | TYPE | VOICE CALLS SUPPORT |
| ADDITIONALS | ENABLE: VOLTE |
| 15 | - | CELLULAR, RF AND NETWORK | TYPE | CARRIER CUSTOMIZATIONS  Pls provide carrier’s required doc. |
| DETAIL | CHECK CARRIER CUSTOMIZATION AND NETWORK PARAMETER DETAILS  Pls provide carriers customized bands and parameters. |

PRODUCT’S EMBEDDED SYSTEM

**TESTS AND CERTIFICATIONS**

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| --- | --- | --- | --- | --- |
| 1 | - | TESTS AND CERTIFICATIONS | TESTS | ENDURANCE, DESTRUCTIVE TEST  Pls provide the testing requirements. |
| NON-ALLERGY. MEDICAL GRADE  Pls provide the requirements for reference.(Since the sensor is not medical grade, so do not recommend this certification.) –Materials should not produce allergies and should be tested |
| RF TUNNING  We follow 3GPP standard. |
| BATTERY SECURITY REPORT  UN38.3 |
| CERTIFICATES OR PROVING MATERIALS | IP67 (or superior) COMPLIANCE |
| GORILLA GLASS 3 COMPLIANCE |
| BATTERY TRANSPORTATION CERT: UN38.3  Battery vendor provide. |
| FCC  Customer lead the certificate, we provide support. – do you have a lab recommendation? |
| PTCRB (Test)  Customer lead the certificate, we provide support. – do you have a lab recommendation? |
| UL (for charger adapter)  Charger vendor provide. – will the vendor provide de certification? |
| CE (for europe)  Customer lead the certificate, we provide support. – do you have a lab recommendation? |
| GSM TAC  ANDA WILL PROVIDE TAC  Customer provide IMEI. --OK |
| WIFI Alliance (opc)  Suggest customer to lead this certificate, If not, we have to avoid the logo or words on all the package or UI or the housing in case of customs inspection. |
| Bluetooth SEC (opc)  Suggest customer to lead this certificate, If not, we have to avoid the logo or words on all the package or UI or the housing in case of customs inspection. |