

LAMPIRAN-LAMPIRAN

Lampiran 1 Bentuk alat dari sistem presensi



Lampiran 2 Kondisi alat dari sistem presensi ketika menggunakan energi baterai



Lampiran 3 Listing program

```
#include <WiFi.h>
#include <HTTPClient.h>
#include <LiquidCrystal_I2C.h>
#include <SPI.h>
#include <Wire.h>
#include <MFRC522.h>

#define SS_PIN 27
#define RST_PIN 14

MFRC522 mfrc522(SS_PIN, RST_PIN);
LiquidCrystal_I2C lcd(0x27, 16, 2);

const int httpPort = 80;
const char* ssid = "HUAWEI nova 5T";
const char* password = "1234567891011";
const char* host = "192.168.43.173";
const int pinBuzzer = 2;
String content = "";
String feedback = "";

void setup() {
  Serial.begin(9600);
  Wire.begin(4, 15);
  lcd.begin();
  lcd.setCursor(0, 0);
  lcd.print("PRESENSI || RFID");
  delay(1000);

  WiFi.hostname("PRESENSI-RFID");
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(200);
    Serial.println("Menghubungkan...");
  }
  Serial.println("Wifi Connected");
  Serial.println("IP Address : ");
  Serial.println(WiFi.localIP());
  lcd.clear();
  lcd.setCursor(3, 0);
```

```

lcd.print("TERHUBUNG");
delay(1000);

pinMode(pinBuzzer, OUTPUT);

SPI.begin();
mfrc522.PCD_Init();
}

void loop() {
lcd.clear();
lcd.setCursor(1, 0);
lcd.print("SELAMAT DATANG");
lcd.setCursor(1, 1);
lcd.print("-SCAN TAG UID-");
delay(100);

if (WiFi.status() == WL_CONNECTED) {
  if ( ! mfrc522.PICC_IsNewCardPresent())
  {
    return;
  }
  if ( ! mfrc522.PICC_ReadCardSerial())
  {
    return;
  }

  content = "";
  Serial.println();
  Serial.print("UID tag :");
  byte letter;
  for (byte i = 0; i < mfrc522.uid.size; i++)
  {
    Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? "0" : "");
    Serial.print(mfrc522.uid.uidByte[i], HEX);
    content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? "0" : ""));
    content.concat(String(mfrc522.uid.uidByte[i], HEX));
  }
  content.toUpperCase();
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("ID: ");

```

```

lcd.print(content);
lcd.setCursor(0, 1);
lcd.print("Please Wait...");
int httpResponseCode;
feedback = "";
HTTPClient http;
http.begin("http://192.168.43.173/presensi/config/presensi.php");
http.addHeader("Content-Type", "application/x-www-form-urlencoded");
httpResponseCode = http.POST("id="+content);
delay(100);
if (httpResponseCode > 0) {
  feedback = http.getString();
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("STATUS PRESENSI");
  lcd.setCursor(0, 1);
  lcd.print(feedback);
  digitalWrite(pinBuzzer, HIGH);
  delay(1000);
  digitalWrite(pinBuzzer, LOW);
  delay(1000);
} else {
  lcd.clear();
  lcd.setCursor(1, 0);
  lcd.print("PRESENSI GAGAL");
}
delay(1000);
http.end();
}else{
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("KONEKSI GAGAL");
}
}

```

Lampiran 4 Datasheet mikrokontroler ESP-32

1 Overview

- 520 KB SRAM
- 16 KB SRAM in RTC
- QSPI supports multiple flash/SRAM chips

1.4.2 Clocks and Timers

- Internal 8 MHz oscillator with calibration
- Internal RC oscillator with calibration
- External 2 MHz ~ 60 MHz crystal oscillator (40 MHz only for Wi-Fi/Bluetooth functionality)
- External 32 kHz crystal oscillator for RTC with calibration
- Two timer groups, including 2 × 64-bit timers and 1 × main watchdog in each group
- One RTC timer
- RTC watchdog

1.4.3 Advanced Peripheral Interfaces

- 34 × programmable GPIOs
- 12-bit SAR ADC up to 18 channels
- 2 × 8-bit DAC
- 10 × touch sensors
- 4 × SPI
- 2 × I2S
- 2 × I2C
- 3 × UART
- 1 host (SD/eMMC/SDIO)
- 1 slave (SDIO/SPI)
- Ethernet MAC interface with dedicated DMA and IEEE 1588 support
- TWAI[®], compatible with ISO 11898-1 (CAN Specification 2.0)
- RMT (TX/RX)
- Motor PWM
- LED PWM up to 16 channels
- Hall sensor

1.4.4 Security

- Secure boot
- Flash encryption
- 1024-bit OTP, up to 768-bit for customers

- Immediate Block ACK
- Defragmentation
- Automatic Beacon monitoring (hardware TSF)
- 4 × virtual Wi-Fi interfaces
- Simultaneous support for Infrastructure Station, SoftAP, and Promiscuous modes
Note that when ESP32 is in Station mode, performing a scan, the SoftAP channel will be changed.
- Antenna diversity

Note:

For more information, please refer to Section 3.5 *Wi-Fi*.

1.3 Bluetooth Key Features

- Compliant with Bluetooth v4.2 BR/EDR and Bluetooth LE specifications
- Class-1, class-2 and class-3 transmitter without external power amplifier
- Enhanced Power Control
- +9 dBm transmitting power
- NZIF receiver with -94 dBm Bluetooth LE sensitivity
- Adaptive Frequency Hopping (AFH)
- Standard HCI based on SDIO/SPI/UART
- High-speed UART HCI, up to 4 Mbps
- Bluetooth 4.2 BR/EDR Bluetooth LE dual mode controller
- Synchronous Connection-Oriented/Extended (SCO/eSCO)
- CVSD and SBC for audio codec
- Bluetooth Piconet and Scatternet
- Multi-connections in Classic Bluetooth and Bluetooth LE
- Simultaneous advertising and scanning

1.4 MCU and Advanced Features

1.4.1 CPU and Memory

- Xtensa® single-/dual-core 32-bit LX6 microprocessor(s)
- CoreMark® score:
 - 1 core at 240 MHz: 504.85 CoreMark; 2.10 CoreMark/MHz
 - 2 cores at 240 MHz: 994.26 CoreMark; 4.14 CoreMark/MHz
- 448 KB ROM

1 Overview

ESP32 is a single 2.4 GHz Wi-Fi-and-Bluetooth combo chip designed with the TSMC ultra-low-power 40 nm technology. It is designed to achieve the best power and RF performance, showing robustness, versatility and reliability in a wide variety of applications and power scenarios.

The ESP32 series of chips includes ESP32-D0WD-V3, ESP32-D0WDR2-V3, ESP32-U4WDH, ESP32-S0WD, ESP32-D0WDQ6-V3 (NRND), ESP32-D0WD (NRND), and ESP32-D0WDQ6 (NRND), among which, ESP32-D0WD-V3, ESP32-D0WDR2-V3, ESP32-U4WDH, and ESP32-D0WDQ6-V3 (NRND) are based on ECO V3 wafer.

For details on part numbers and ordering information, please refer to Section 7.

For details on ECO V3 instructions, please refer to [ESP32 ECO V3 User Guide](#).

1.1 Featured Solutions

1.1.1 Ultra-Low-Power Solution

ESP32 is designed for mobile, wearable electronics, and Internet-of-Things (IoT) applications. It features all the state-of-the-art characteristics of low-power chips, including fine-grained clock gating, multiple power modes, and dynamic power scaling. For instance, in a low-power IoT sensor hub application scenario, ESP32 is woken up periodically only when a specified condition is detected. Low-duty cycle is used to minimize the amount of energy that the chip expends. The output of the power amplifier is also adjustable, thus contributing to an optimal trade-off between communication range, data rate and power consumption.

Note:

For more information, refer to Section 3.7 *RTC and Low-Power Management*.

1.1.2 Complete Integration Solution

ESP32 is a highly-integrated solution for Wi-Fi-and-Bluetooth IoT applications, with around 20 external components. ESP32 integrates an antenna switch, RF balun, power amplifier, low-noise receive amplifier, filters, and power management modules. As such, the entire solution occupies minimal Printed Circuit Board (PCB) area.

ESP32 uses CMOS for single-chip fully-integrated radio and baseband, while also integrating advanced calibration circuitries that allow the solution to remove external circuit imperfections or adjust to changes in external conditions. As such, the mass production of ESP32 solutions does not require expensive and specialized Wi-Fi testing equipment.

1.2 Wi-Fi Key Features

- 802.11 b/g/n
- 802.11 n (2.4 GHz), up to 150 Mbps
- WMM
- TX/RX A-MPDU, RX A-MSDU

- Cryptographic hardware acceleration:
 - AES
 - Hash (SHA-2)
 - RSA
 - ECC
 - Random Number Generator (RNG)

1.5 Applications (A Non-exhaustive List)

- Generic Low-power IoT Sensor Hub
 - Agriculture robotics
- Generic Low-power IoT Data Loggers
- Cameras for Video Streaming
- Over-the-top (OTT) Devices
- Speech Recognition
- Image Recognition
- Mesh Network
- Home Automation
 - Light control
 - Smart plugs
 - Smart door locks
- Smart Building
 - Smart lighting
 - Energy monitoring
- Industrial Automation
 - Industrial wireless control
 - Industrial robotics
- Smart Agriculture
 - Smart greenhouses
 - Smart irrigation
- Audio Applications
 - Internet music players
 - Live streaming devices
 - Internet radio players
 - Audio headsets
- Health Care Applications
 - Health monitoring
 - Baby monitors
- Wi-Fi-enabled Toys
 - Remote control toys
 - Proximity sensing toys
 - Educational toys
- Wearable Electronics
 - Smart watches
 - Smart bracelets
- Retail & Catering Applications
 - POS machines
 - Service robots

MFRC522

Contactless Reader IC

Rev. 3.2 — 22 May 2007
112132

Product data sheet
PUBLIC INFORMATION

1. Introduction

This document describes the functionality of the contactless reader/writer MFRC522. It includes the functional and electrical specifications.

2. General description

The MFRC522 is a highly integrated reader/writer for contactless communication at 13.56 MHz. The MFRC522 reader supports ISO 14443A / MIFARE® mode.

The MFRC522's internal transmitter part is able to drive a reader/writer antenna designed to communicate with ISO/IEC 14443A/MIFARE® cards and transponders without additional active circuitry. The receiver part provides a robust and efficient implementation of a demodulation and decoding circuitry for signals from ISO/IEC 14443A/MIFARE® compatible cards and transponders. The digital part handles the complete ISO/IEC 14443A framing and error detection (Parity & CRC). The MFRC522 supports MIFARE®Classic (e.g. MIFARE® Standard) products. The MFRC522 supports contactless communication using MIFARE® higher transfer speeds up to 848 kbit/s in both directions.

Various host interfaces are implemented:

- SPI interface
- serial UART (similar to RS232 with voltage levels according pad voltage supply)
- I²C interface.

3. Features

- Highly integrated analog circuitry to demodulate and decode responses
- Buffered output drivers to connect an antenna with minimum number of external components
- Supports ISO/IEC 14443A / MIFARE®
- Typical operating distance in Reader/Writer mode for communication to a ISO/IEC 14443A / MIFARE® up to 50 mm depending on the antenna size and tuning
- Supports MIFARE® Classic encryption in Reader/Writer mode
- Supports ISO/IEC 14443A higher transfer speed communication up to 848 kbit/s
- Support of the MFIN / MFOUT
- Additional power supply to directly supply the smart card IC connected via MFIN / MFOUT
- Supported host interfaces



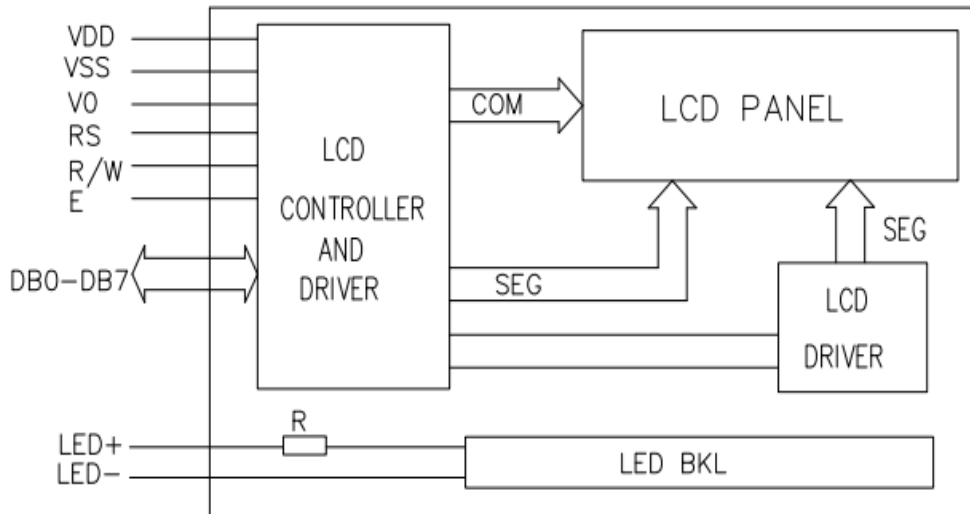
- ◆ SPI interface up to 10 Mbit/s
- ◆ I²C interface up to 400 kbit/s in Fast mode, up to 3400 kbit/s in High-speed mode
- ◆ serial UART in different transfer speeds up to 1228.8 kbit/s, framing according to the RS232 interface with voltage levels according pad voltage supply
- Comfortable 64 byte send and receive FIFO-buffer
- Flexible interrupt modes
- Hard reset with low power function
- Power-down mode per software
- Programmable timer
- Internal oscillator to connect 27.12 MHz quartz
- 2.5 - 3.3 V power supply
- CRC Co-processor
- Free programmable I/O pins
- Internal self test

Lampiran 6 Datasheet LCD 16x2

4. Absolute maximum ratings

Item	Symbol	Standard			Unit
Power voltage	$V_{DD}-V_{SS}$	0	-	7.0	V
Input voltage	V_{IN}	VSS	-	VDD	
Operating temperature range	V_{OP}	0	-	+50	°C
Storage temperature range	V_{ST}	-10	-	+60	

5. Block diagram



6. Interface pin description

Pin no.	Symbol	External connection	Function
1	Vss	Power supply	Signal ground for LCM
2	V _{DD}		Power supply for logic for LCM
3	V ₀		Contrast adjust
4	RS	MPU	Register select signal
5	R/W	MPU	Read/write select signal
6	E	MPU	Operation (data read/write) enable signal
7~10	DB0-DB3	MPU	Four low order bi-directional three-state data bus lines. Used for data transfer between the MPU and the LCM. These four are not used during 4-bit operation.
11~14	DB4-DB7	MPU	Four high order bi-directional three-state data bus lines. Used for data transfer between the MPU
15	LED+	LED BKL power supply	Power supply for BKL
16	LED-		Power supply for BKL

Lampiran 7 Datasheet buzzer

Buzzer

pro-SIGNAL



Features

- Black in colour
- With internal drive circuit
- Sealed structure
- Wave solderable and washable
- Housing material: Noryl

**RoHS
Compliant**

Applications

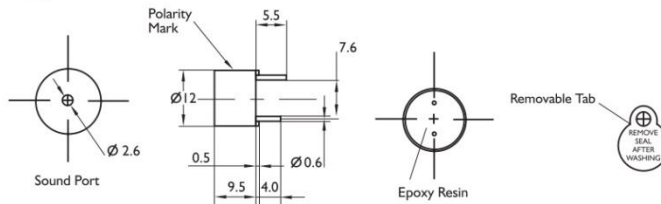
- Computer and peripherals
- Communications equipment
- Portable equipment
- Automobile electronics
- POS system
- Electronic cash register

Specifications:

Rated Voltage	: 6V DC
Operating Voltage	: 4 to 8V DC
Rated Current*	: ≤30mA
Sound Output at 10cm*	: ≥85dB
Resonant Frequency	: 2300 ±300Hz
Tone	: Continuous
Operating Temperature	: -25°C to +80°C
Storage Temperature	: -30°C to +85°C
Weight	: 2g

*Value applying at rated voltage (DC)

Diagram



Dimensions : Millimetres
Tolerance : ±0.5mm

Part Number Table

Description	Part Number
Buzzer, Electromech, 6V DC	ABI-009-RC

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Lampiran 8 Datasheet modul TP4056 lithium ion battery charger



南京拓微集成电路有限公司
NanJing Top Power ASIC Corp.

TP4056 1A Standalone Linear Li-Ion Battery Charger with Thermal Regulation in SOP-8

DESCRIPTION

The TP4056 is a complete constant-current/constant-voltage linear charger for single cell lithium-ion batteries. Its SOP package and low external component count make the TP4056 ideally suited for portable applications. Furthermore, the TP4056 can work within USB and wall adapter.

No blocking diode is required due to the internal PMOSFET architecture and have prevent to negative Charge Current Circuit. Thermal feedback regulates the charge current to limit the die temperature during high power operation or high ambient temperature. The charge voltage is fixed at 4.2V, and the charge current can be programmed externally with a single resistor. The TP4056 automatically terminates the charge cycle when the charge current drops to 1/10th the programmed value after the final float voltage is reached.

TP4056 Other features include current monitor, under voltage lockout, automatic recharge and two status pin to indicate charge termination and the presence of an input voltage.

FEATURES

- Programmable Charge Current Up to 1000mA
- No MOSFET, Sense Resistor or Blocking Diode Required
- Complete Linear Charger in SOP-8 Package for Single Cell Lithium-Ion Batteries
- Constant-Current/Constant-Voltage
- Charges Single Cell Li-Ion Batteries Directly from USB Port
- Preset 4.2V Charge Voltage with 1.5% Accuracy
- Automatic Recharge
- two Charge Status Output Pins
- C/10 Charge Termination
- 2.9V Trickle Charge Threshold (TP4056)
- Soft-Start Limits Inrush Current
- Available **Radiator** in 8-Lead SOP Package, **the Radiator need** connect GND or impending

ABSOLUTE MAXIMUM RATINGS

- Input Supply Voltage(V_{CC}): -0.3V~8V
- TEMP: -0.3V~10V
- CE: -0.3V~10V
- BAT Short-Circuit Duration: Continuous
- BAT Pin Current: 1200mA
- PROG Pin Current: 1200uA
- Maximum Junction Temperature: 145°C
- Operating Ambient Temperature Range: -40°C~85°C
- Lead Temp.(Soldering, 10sec): 260°C

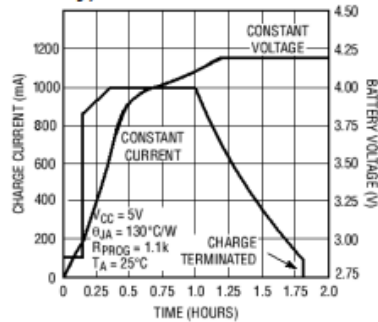
APPLICATIONS

- Cellular Telephones, PDAs, GPS
- Charging Docks and Cradles
- Digital Still Cameras, Portable Devices
- USB Bus-Powered Chargers,Chargers

PACKAGE/ORDER INFORMATION

	<p>SOP-8</p>
	<p>ORDER PART NUMBER TP4056-42-SOP8-PP</p> <p>PART MARKING TP4056</p>

Complete Charge Cycle (1000mAh Battery)



TEMP(Pin 1) :Temperature Sense Input Connecting TEMP pin to NTC thermistor's output in Lithium ion battery pack. If TEMP pin's voltage is below 45% or above 80% of supply voltage V_{IN} for more than 0.15S, this means that battery's temperature is too high or too low, charging is suspended. The temperature sense function can be disabled by grounding the TEMP pin.

PROG(Pin 2): Constant Charge Current Setting and Charge Current Monitor Pin charge current is set by connecting a resistor R_{ISET} from this pin to GND. When in precharge mode, the ISET pin's voltage is regulated to 0.2V. When in constant charge current mode, the ISET pin's voltage is regulated to 2V. In all modes during charging, the voltage on ISET pin can be used to measure the charge current as follows:

$$I_{BAT} = \frac{V_{PROG}}{R_{PROG}} \times 1200 \quad (V_{PROG}=1V)$$

GND(Pin3): Ground Terminal

Vcc(Pin 4): Positive Input Supply Voltage V_{IN} is the power supply to the internal circuit. When V_{IN} drops to within 30mv of the BAT pin voltage, TP4056 enters low power sleep mode, dropping BAT pin's current to less than 2uA.

BAT(Pin5): Battery Connection Pin. Connect the positive terminal of the battery to BAT pin. BAT pin draws less than 2uA current in chip disable mode or in sleep mode. BAT pin provides charge current to the battery and provides regulation voltage of 4.2V.

STDBY(Pin6): Open Drain Charge Status Output When the battery Charge Termination, the \overline{STDBY} pin is pulled low by an internal switch, otherwise \overline{STDBY} pin is in high impedance state.

CHRG(Pin7): Open Drain Charge Status Output When the battery is being charged, the \overline{CHRG} pin is pulled low by an internal switch, otherwise \overline{CHRG} pin is in high impedance state.

CE(Pin8): Chip Enable Input. A high input will put the device in the normal operating mode. Pulling the CE pin to low level will put the YP4056 into disable mode. The CE pin can be driven by TTL or CMOS logic level.

ELECTRICAL CHARACTERISTICS

The ● denotes specifications which apply over the full operating temperature range, otherwise specifications are at $T_A=25^{\circ}\text{C}$, $V_{CC}=5V$, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS	
V_{CC}	Input Supply Voltage		● 4.0	5	8.0	V	
I_{CC}	Input Supply Current	Charge Mode, $R_{PROG} = 1.2k$	●	150	500	μA	
		Standby Mode (Charge Terminated)	●	55	100	μA	
		Shutdown Mode (R_{PROG} Not Connected, $V_{CC} < V_{BAT}$, or $V_{CC} < V_{UV}$)	●	55	100	μA	
V_{FLOAL}	Regulated Output (Float) Voltage	$0^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$, $I_{BAT}=40\text{mA}$	4.137	4.2	4.263	V	
I_{BAT}	BAT Pin Current Text condition: $V_{BAT}=4.0V$	$R_{PROG} = 2.4k$, Current Mode	●	450	500	550	mA
		$R_{PROG} = 1.2k$, Current Mode	●	950	1000	1050	mA
		Standby Mode, $V_{BAT} = 4.2V$	●	0	-2.5	-6	μA
I_{TRIKL}	Trickle Charge Current	$V_{BAT} < V_{TRIKL}$, $R_{PROG}=1.2K$	●	120	130	140	mA
V_{TRIKL}	Trickle Charge Threshold Voltage	$R_{PROG}=1.2K$, V_{BAT} Rising		2.8	2.9	3.0	V
V_{TRHYS}	Trickle Charge Hysteresis Voltage	$R_{PROG}=1.2K$		60	80	100	mV
T_{LIM}	Junction Temperature in Constant Temperature Mode			145		$^{\circ}\text{C}$	


Lampiran 9 Datasheet baterai 18650



Tenergy Corporation

436 Kato Terrace
Fremont CA 94539
Tel: 510-687-0388 Fax: 510-687-0328

TENERGY 18650 2200mAh Li-Ion Cell

Product Name:	Tenergy Lithium Ion 18650 Cell	
Product Number:	30003	
Battery Model:	18650 2200mAh	
Battery Chemistry:	Lithium Ion Rechargeable	
Dimension:	Max Diameter (ϕ): 18.3mm Max Height (H): 65.0mm	

1. Scope

The specification describes the technology parameters and testing standard for the lithium ion rechargeable cell supplied by TENERGY CORPORATION.

2. References

This specification is referenced GB/T18287-2000, UL1642, IEC61960-1:2000.

3. Basic characteristics

3.1 Capacity	Nominal Capacity : 2200mAh (0.2C _A Discharge)
	Minimum Capacity: 2100mAh (0.2C _A Discharge)
3.2 Nominal Voltage	3.7V
3.3 Internal impedance	≤ 80mΩ(with PTC)
3.4 Discharge Cut-off Voltage	3.0V
3.5 Max Charge Voltage	4.20±0.02V
3.6 Standard Charge Current	0.5C _A
3.7 Rapid Charge Current	1C _A
3.8 Standard Discharge Current	0.5C _A
3.9 Rapid Discharge Current	1C _A

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3.10 Max Discharge Current	2.0 C _A
3.11 Weight	45±1g
3.12 Max. Dimension	Diameter(φ): 18.3mm
	Height (H): 65.0mm
3.13 Operating Temperature	Charge 0 ~ 45°C
	Discharge -20 ~ 60°C
3.14 Storage Temperature	Within 1 month -5 ~ 35°C
	Within 6 months 0 ~ 35°C

4. Standard Conditions for Test

Unless specified, all tests should be conducted within one month after the delivery under the following conditions: Ambient Temperature: 25±5°C; Relative Humidity: 65±20%

4.1 Standard Charge:	Constant Current and Constant Voltage (CC/CV) Current = 1100mA End-up Voltage = 4.2 V End Current = 22mA
4.2 Standard Discharge:	Constant Current (CC) Current = 1100mA End Voltage = 3.0V

5. Characteristics

※ In this section, the Standard Conditions of Tests see the part 4.

5.1 Electrical Performances

Item	Test procedure	Requirements
5.1.1 Nominal Voltage	The average value of the working voltage in the whole discharge progress.	3.7V
5.1.2 Discharge Performance	The discharge capacity of the cell, which is measured at 1C ₅ A (or 0.5CA) current discharge to 3.0V within 1 hour after completely charge.	≥57(or 120)min

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Fremont CA 94539

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5.1.3 Capacity Retention	After 28 days storage at 25±5°C after completed charge, the residual capacity is above 90%.	Capacity≥1980mAh
5.1.4 Cycle Life	After 300 cycles in 100% DOD charge and discharge at 0.5CA current, the residual discharge capacity is above 60% of nominal capacity.	≥300 cycles
5.1.5 Storage	(Within 3 months after manufactured) after standard charged 40-50% capacity and stored at ambient temperature 25±5°C、65±20%RH for 12 months, the storage expiry and the cell completely charged, the cell is discharged at 0.2 CA current discharge to 3.0V.	Discharge time≥4h