

Rockchip RK821B Datasheet

Revision History

Date	Revision	Description
2023-10-30	1.2	Update R_{pu} and t_{RST} recommend value Update Pin description Update POD
2022-05-13	1.1	Update application circuit and recommend parameter
2022-04-29	1.0	Initial release

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Chapter 1 Introduction

1.1 General Description

The RK821B is a single wire interface integrated device with mask ROM. And it consists of 2 sets of data which contains 72-bits code, respectively.

The RK821B SWP interface requires only a single connection and a ground return. The DATA pin is also the sole power source for the RK821B.

The small surface-mount package option saves printed-circuit-board space, while the low cost makes it ideal for application such as battery pack configuration parameters, record maintenance, asset tracking, product-revision status, and access-code security.

1.2 Features

The features listed below which may or may not be present in actual product, may be subject to the third party licensing requirements. Please contact Rockchip for actual product feature configurations and licensing requirements.

- Working Voltage : 2.65V-5.5V
- Standby current :1uA (Typical)
- 15KV IEC 61000-4-2 ESD Compliance on Data Pin
- Package : SOT-23-3L

1.3 Applications

Typical Application Circuit RK821B

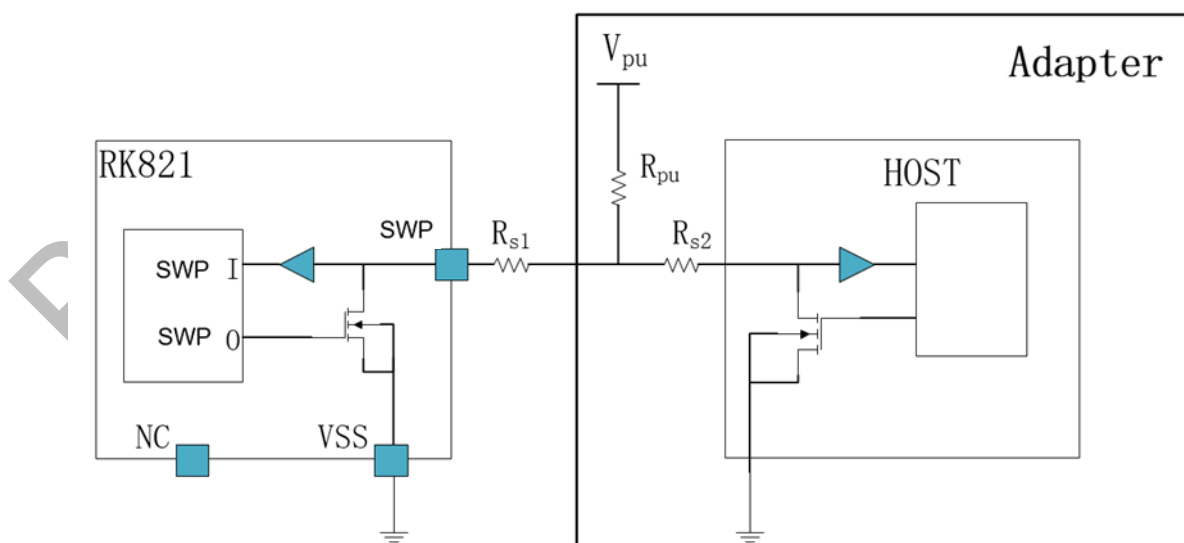
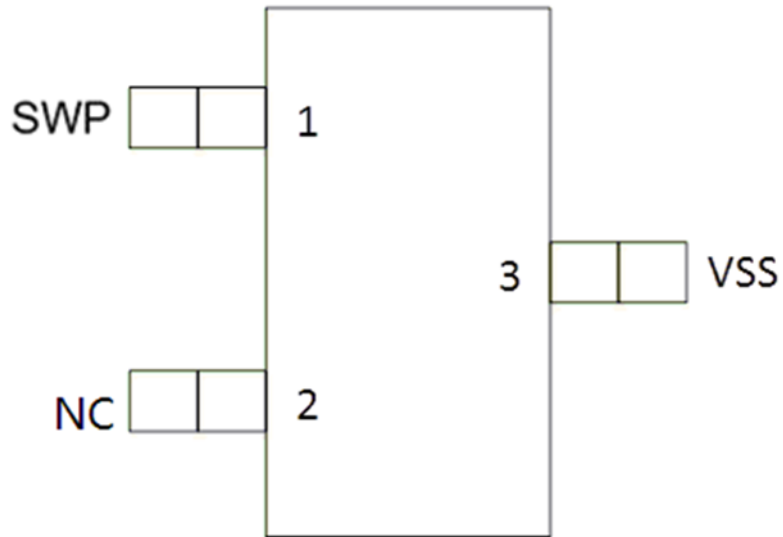


Fig. 1-1 RK821B Application

Chapter 2 Pin Configuration and Functions

2.1 Pin Assignment



SOT-23-3L

Fig. 2-1 Pin Assignment

2.2 Pinout Number Order

3-Pin No	Pin Name	Pin Description
1	SWP	Data.
2	NC	NC
3	VSS	Ground. Both pins should be connected to system ground.

Chapter 3 Electrical Characteristics

3.1 Absolute Maximum Ratings

Parameter	Min	Max	Units
Voltage range on pins SWP:	-0.3	6	V
Low-level output current, I_{OL}		40	mA
ESD IEC 61000-4-2Air discharge, SWP to VSS,VSS to SWP		15	kV
Operating temperature range, T_j	-40	70	°C
Maximum Soldering Temperature, T_{SOLDER}		300	°C

Note 1: Exposure to the conditions exceeded absolute maximum ratings may cause the permanent damages and affect the reliability and safety of both device and systems using the device. The functional operations cannot be guaranteed beyond specified values in the recommended conditions.

3.2 Recommended Operating Conditions

Parameter	Symbol	Min	TYP	Max	Units
Voltage range on pins SWP	V_{PU}	2.65	3.3	5.5	V
Pull up resistor on pins SWP	R_{PU}	4		30	Kohm
Resistor between SWP and host	$R_{S1}+R_{S2}$	0		400	ohm

3.3 DC Characteristics

$T_A = -20^{\circ}\text{C}$ to 70°C ; $V_{PU} = 2.65\text{V}_{DC}$ to 5.5V_{DC} ($V_{PU(TYP)} = 3.3\text{V}_{DC}$), all voltages relative to VSS.

Parameter	Symbol	Min	TYP	Max	Units
Supply current	I_{DATA}			20	uA
Low level output voltage	$V_{OL}(\text{Logic0}, V_{PU}=5.5\text{V}, I_{OL}=4\text{mA}, \text{SWP pin})$			0.4	V
	$V_{OL}(\text{Logic0}, V_{PU}=2.65\text{V}, I_{OL}=2\text{mA})$			0.4	V
High level output voltage	$V_{OH}(\text{Logic1})$		V_{PU}	5.5	V
Low level output current(sink); $V_{OL}=0.4\text{V}$	I_{OL}	4			mA
Low level input voltage	V_{IL}			0.8	V
High level input voltage	V_{IH}	2.2			V

Parameter	Symbol	Min	TYP	Max	Units
Switching Characteristics					
Bit cycle time	t_c	80		120	us
Write start cycle	t_{WSTRB}	1		15	us
Write data setup	t_{WDSU}	t_{WSTRB}		15	us
Write data hold	t_{WDH}	50		60	us
Recovery time	t_{REC}	20		60	us
Read start cycle	t_{RSTRB}	1		13	us
Output data delay	t_{ODD}	t_{RSTRB}		13	us
Output data hold	t_{ODHO}	17		60	us
Reset time	t_{RST}	480		700	us
Presence pulse delay	t_{PPD}	15		60	us
Presence pulse	t_{PP}	60		240	us
Reset recover time	t_{RSTREC}	480		700	us

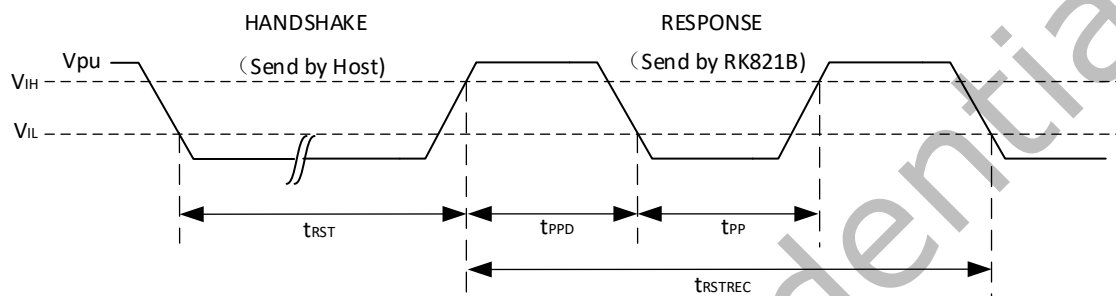
Chapter 4 Detailed Description

4.1 Overview

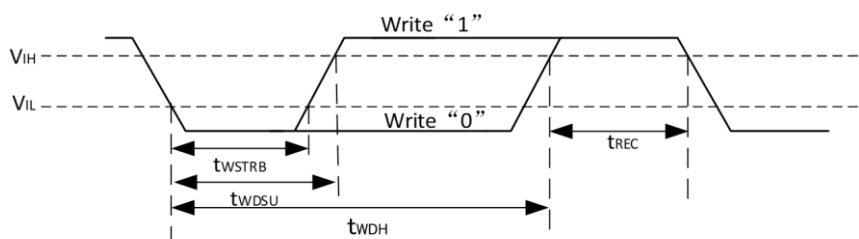
RK821B consists of 2 sets of data which contains 72-bits code, respectively..

4.2 Read And Presence Pulse

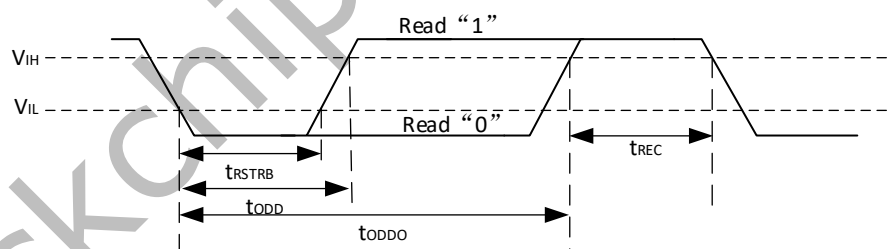
When SWP is pulled down over 480us, RK821B will be reset and send Presence Pulse to answer host.



Write Bit



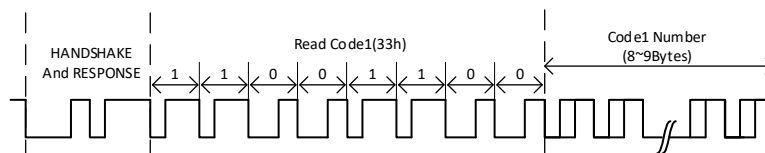
Read Bit



Read Command

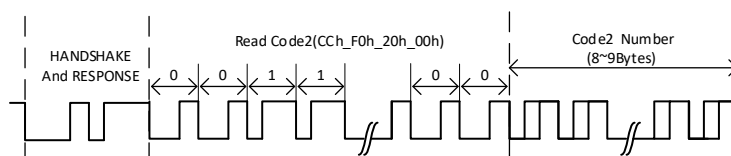
A, Read Code1 Command

Host can send Read Code1 CMD to read 8~9bytes code of RK821B.



B, Read Code2 Command

Host can send READ Code2 CMD (CCh_F0h_20h_00h) to read 8~9Bytes code of RK821B.



C, Command Summary

COMMAND (HEX)	Description
33h	Read Code1
CC_F0_20_00h	Read Code2

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Chapter 5 Thermal Management

5.1 Overview

For reliability and operability concerns, the absolute maximum junction temperature of RK821B has to be below 125°C.

5.2 Package Thermal Characteristics

Table 5-1 provides the thermal resistance characteristics for the package used on this device.

Table 5-1 Thermal Resistance Characteristics

PACKAGE (WLCSP25)	POWER(W)	θ_{JA} (°C/W)	θ_{JB} (°C/W)	θ_{JC} (°C/W)
RK821B	TBD	TBD	TBD	TBD

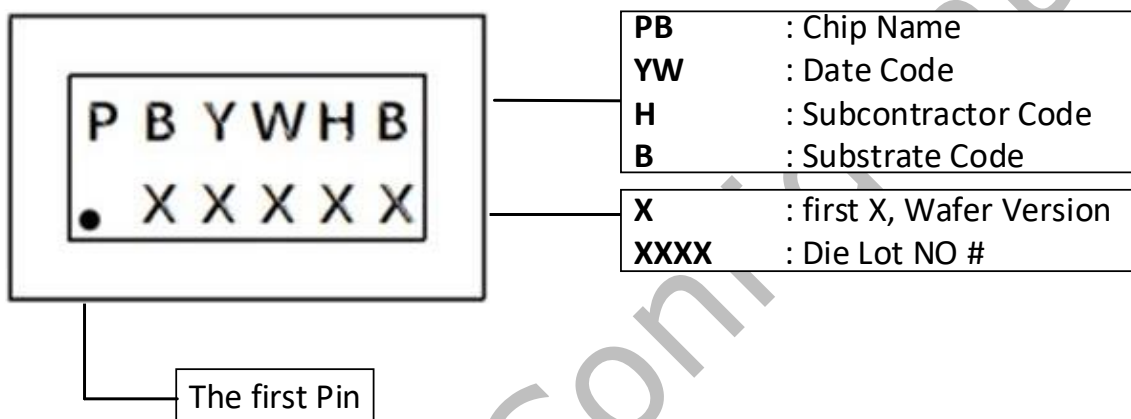
Note: The testing PCB is based on 4 layers, 45mm x 65 mm, 1.6mm thickness, ambient temperature is 85°C.

Chapter 6 Package Information

6.1 Ordering information

Orderable Device	RoHS status	Package	Package Qty	Device Feature
RK821B	RoHS	SOT-23-3L	3000 pcs by tape	E-mark

6.2 Top Marking



6.3 Dimension

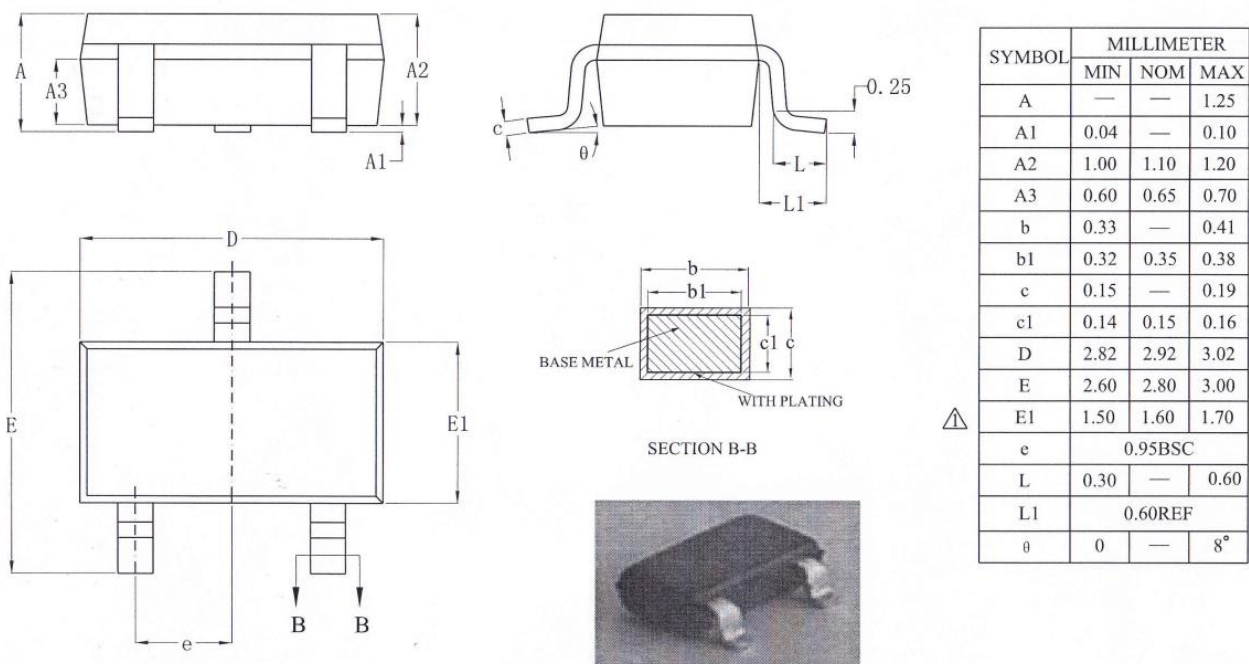


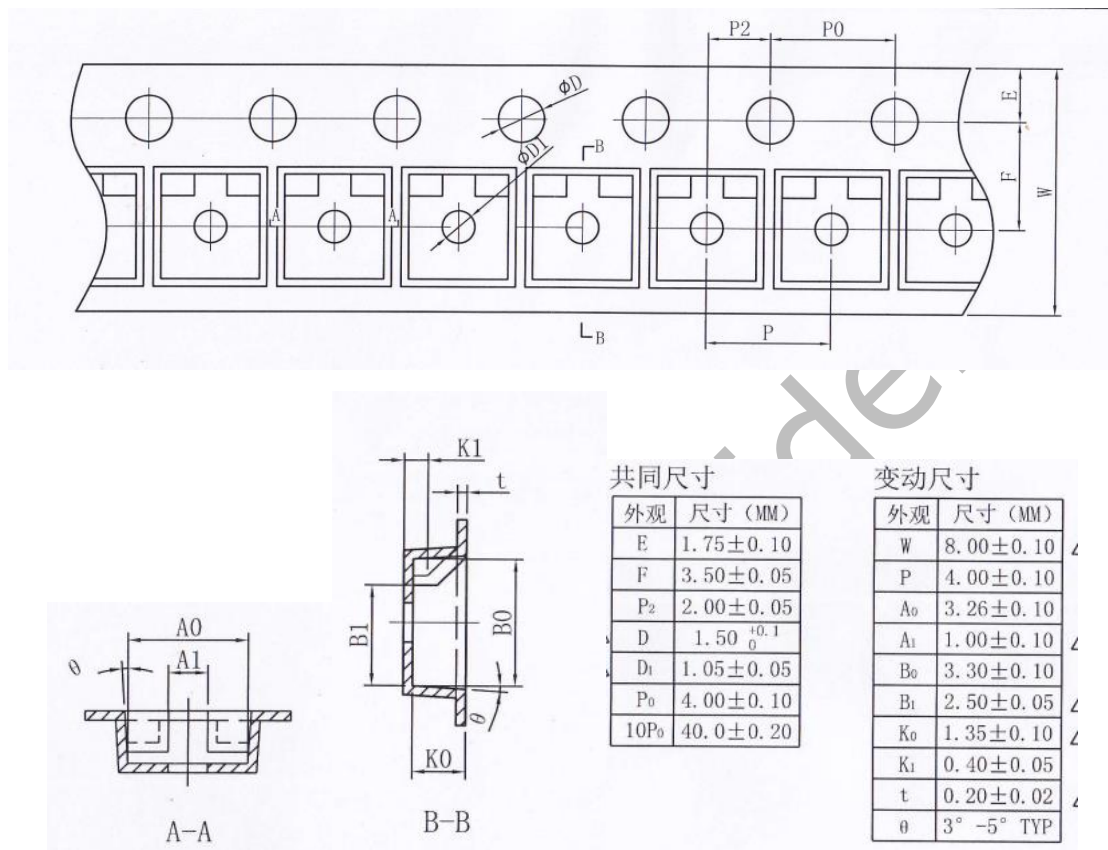
Fig. 6-1 SOT23-3L

Note:

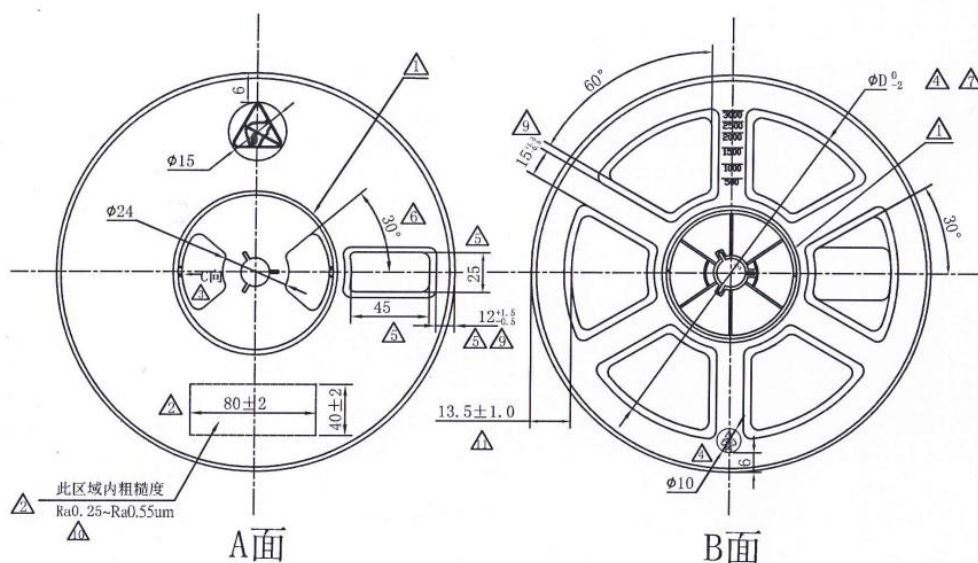
- All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- This drawing is subject to change without notice.

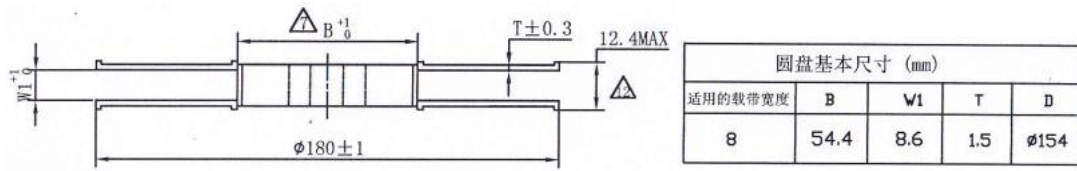
6.4 Tape reel & box information

Tape Dimension



Reel Dimension





Box Dimension

