ISD9160 Demo Board
Rev B User's Manual

新唐科技 NUVOTON INTELLECTUAL PROPERTY

Publication Release Date: Aug. 16, 2013
Revision V0.3

The information described in this document is the exclusive intellectual property of
Nuvoton Technology Corporation and shall not be reproduced without permission from Nuvoton.

Nuvoton is providing this document only for reference purposes of ISD ChipCorder microcontroller based system design. Nuvoton assumes no responsibility for errors or omissions.

All data and specifications are subject to change without notice.

For additional information or questions, please contact: Nuvoton Technology Corporation.

新唐科技 NUVOTON INTELLECTUAL PROPERTY

Table of Contents

1 INTRODUCTION 4
2 JUMPER AND BUTTONS 5
3 DEMO CODE 6
3.1 Operation 6
4 BOARD SCHEMATIC 7
5 REVISION HISTORY 8

Table of Figures

Figure 1: Demo board and ISD-9160_Touch 4

新唐科技 NUVOTON INTELLECTUAL PROPERTY

1 Introduction

The ISD9160 demo board is a small board, its dimension is around 35mm by 50mm. All function pins are layout to the connectors for easy expansion. It is convenient for demo use, and also could be used for development with ISD-Nu-Link-dongle.

This document only describes demo code, demo board hardware, jumper function and schematic. User can refer to the "Introduction to ISD9160 Development Environment" for the project development & tools function to get the overall development concept.

Below is the picture of ISD9160 Demo Board and Touch Board, all components are on the top side except the SPI-flash related which are on the back.

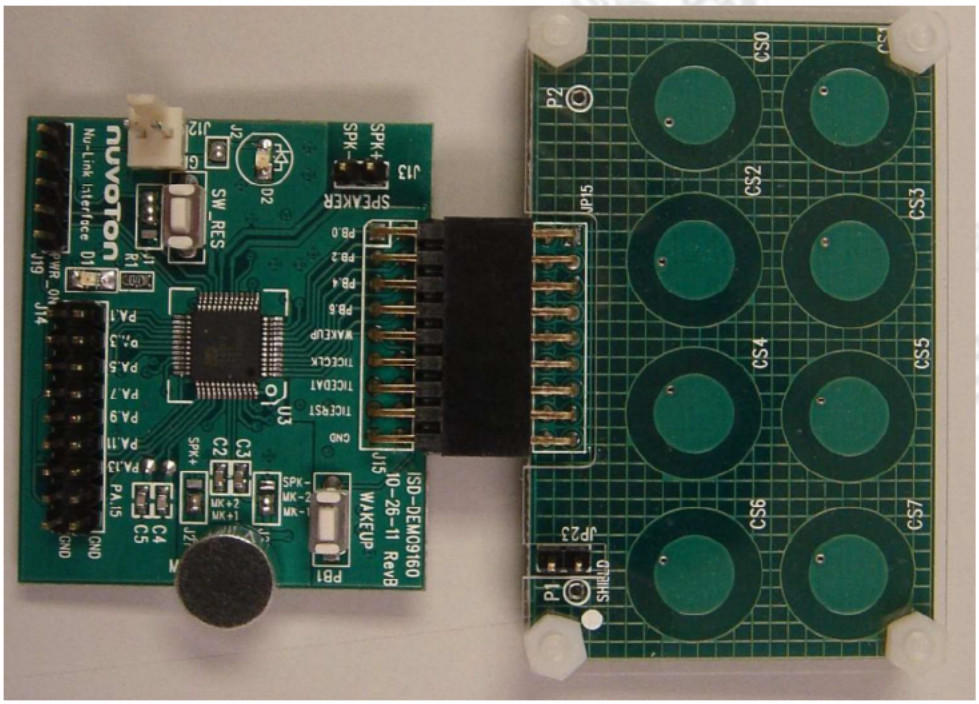


Figure 1: Demo board and ISD-9160_Touch

Release Date: Aug. 16, 2013
Revision V0.3

2 Jumper and buttons

Component Name	Description	Default
J1	SW_RES button selection for RESETN or GPA6	Pin 1, 2 & 3 short for GPA6 scanning. **No reset key**.
J2	Option for D2 LED driving by GPA12	Short for LED driving by GPA12
J12	Power input	
J13	Speaker signal output.	
J14	GPIOA port connector	
J15	GPIOB port connector. Also can connect with ISD-9160_Touch for touch sensing function.	
J19	ISD dongle interface for programming or debugging	
J21	Option for MIC+ signal input, from microphone or speaker	Signal input from microphone (MK+1)
J22	Option for MIC- signal input, from microphone or speaker	Signal input from microphone (MK-1)
WAKEUP (PB1)	Wakeup key for wakeup from deep power down	Open and pull-high
SW_RES	Reset key or GPA6 key, based on J1 setting	GPA6 key

新唐科技 NUVOTON INTELLECTUAL PROPERTY

3 Demo code

Normally a VR light control demo code was programmed before shipping. User can try the demo code function with default jumper setting.

3.1 Operation

- Capacitive Touch Button Sensing with Audio Feedback

  Touch CS0, CS2, CS4 of Touch Board will play Do, Re, Mi and turn led D2 on/off.

- Play preprogrammed sound (Siren7, 16Kbps, 16K sampling rate)

  There are two pre-programmed sounds in ISD9160 flash and one sound in SPI-flash. CS3 is Play/Stop key. Touch CS3 will cyclically play these sounds. Pressing CS3 can stop playing if sound is being played.

- SPI-flash Record/Play (Siren7, 16Kbps, 16K sampling rate)

  SW_RES button is default set to GPA6 connection (no reset function). This key supports multi functions Record/Play/Stop. Pressing this button can play the recorded sound or stop the playing/recording. Pressing over 2 second will have a prompt sound, and will start recording sound into SPI-flash once button released. Only one recorded sound is allowed in this code, record again will overwrite the previous recorded sound.

- Voice Recognition:

  VR function is always on except Record or Play function is processing. The below table is the command and description.

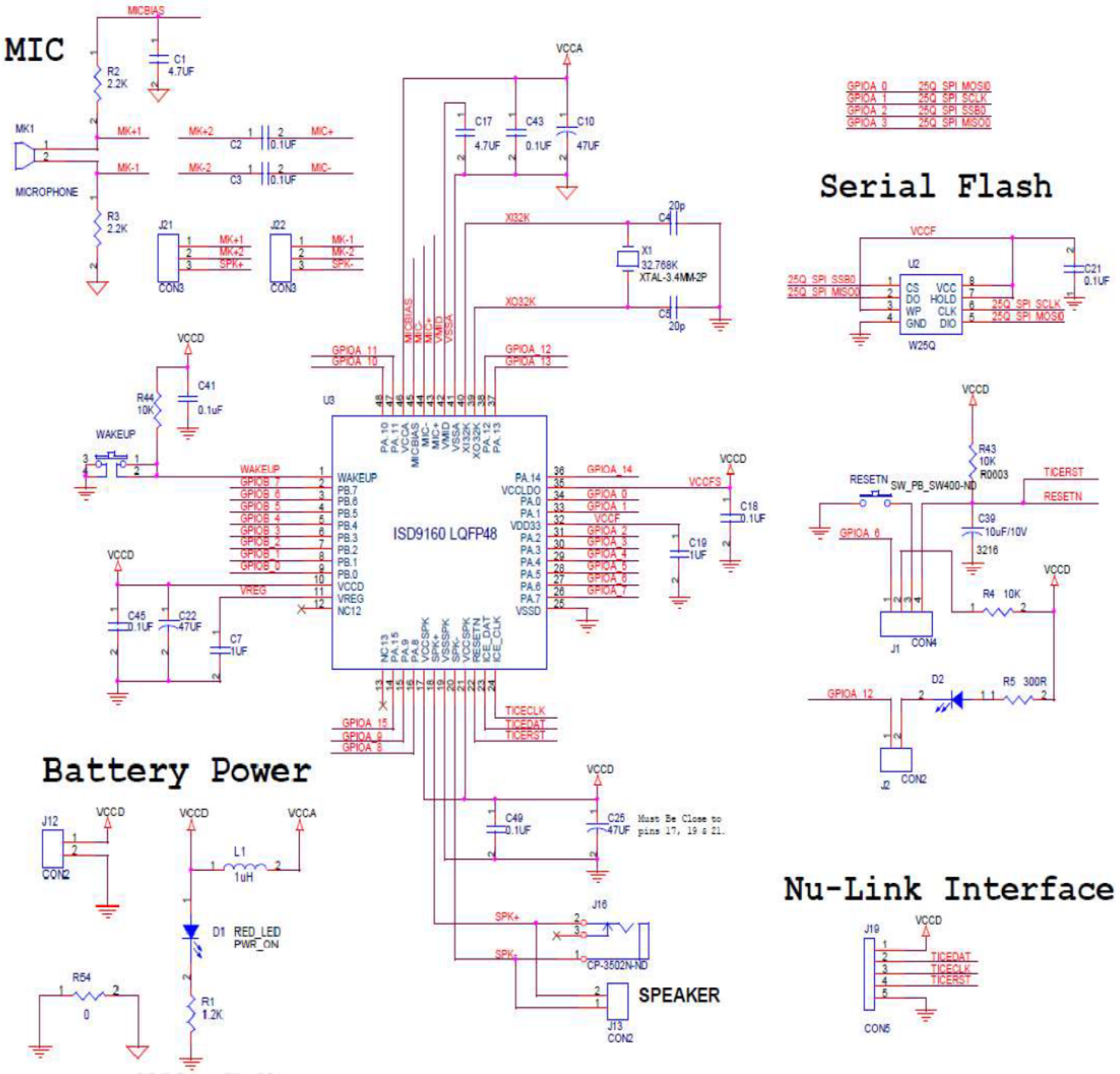
  Environment: Office environment, no loud background sound. (The speaking should be 20dB louder than environment sound.)

  Best Distance: within 30 cm (from MIC).

  Note: Need to adjust the program and trade off the distance under noisy environment.

Voice Command	Description
Cinderella	An ID command to enable the following four action commands, a prompt sound will be played once ID command recognized. User can speak the action command within 2 seconds after the prompt sound.
Lights Off	The D2 LED will be off
Turn Lights On	The D2 LED will be on with full brightness.
Dimmer	Decrease the brightness with prompt sound, 3 stages including full brightness. Only works when lights on
Brighter	Increase the brightness with prompt sound, 3 stages including full brightness. Only works when lights on.

4 Board Schematic



NUVOTON CONFIDENTIAL PROPERTY

Release Date: Aug. 16, 2013
Revision V0.3

5 Revision History

VERSION	DATE	PAGE/ CHAP.	DESCRIPTION
V0.0	Nov. 28, 2011	-	First Release.
V0.1	Mar. 08,2012	-	Add operation environment and distance for VR demo
V0.2	May 30, 2013	-	Removed "Preliminary"
V0.3	Aug 16, 2013	-	Removed jumper setting and added Cap Sensor Audio Feedback

新唐科技 NUVOTON INTELLECTUAL PROPERTY

Important Notice

Nuvoton products are not designed, intended, authorized or warranted for use as components in systems or equipment intended for surgical implantation, atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, or for other applications intended to support or sustain life. Furthermore, Nuvoton products are not intended for applications wherein failure of Nuvoton products could result or lead to a situation where personal injury, death or severe property or environmental damage could occur.

Nuvoton customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Nuvoton for any damages resulting from such improper use or sales.

Please note that all data and specifications are subject to change without notice. All the trademarks of products and companies mentioned in this datasheet belong to their respective owners.

新唐科技 NUVOTON INTELLECTUAL PROPERTY