

ON Semiconductor

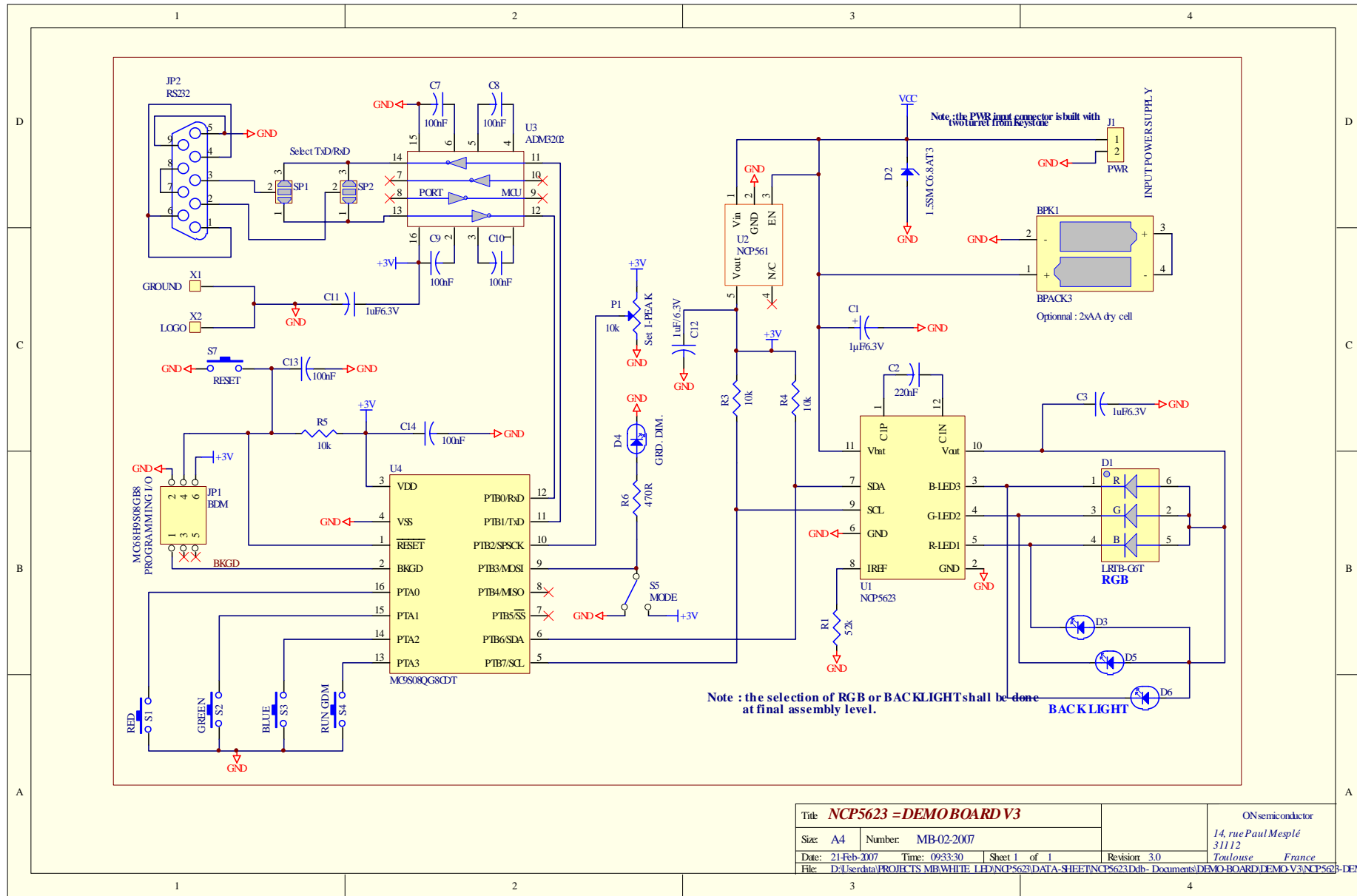
NCP5623 - DEMO BOARD VERSION 3.0

BILL OF MATERIAL

Documents Included:

- **Bill Of Materials**
- **NCP5623 Demo Board V3.0 schematic diagram**
- **NCP5623 Demo Board V3.0 GERBER views**
- **Manufacturers web addresses**
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Titre NCP5623 = DEMO BOARD V3		ON Semiconductor 14, rue Paul Mesplé 31112 Toulouse France
Size: A4	Number: MB-02-2007	
Date: 21-Feb-2007	Time: 09:33:30	Sheet 1 of 1
File: D:\Userdata\PROJECTS\MR\WHITE_LED\NCP5623\DATA-SHEET\NCP5623Dtlb- Documents\DEMO-BOARD\DEMO V3\NCP5623-DEM		Revisiort 3.0

QTY	Designator	Description	Footprint	Manufacturer	PART NUMBER	COMMENTS
3	R3, R4, R5	10kΩ	0603	Vishay Draloric		Any other suppliers possible
3	R2, R7, R8	47kΩ	0603			Any other suppliers possible
1	R1	52kΩ	0603			Any other suppliers possible
1	R6	470Ω	0805			Any other suppliers possible
1	P1	10kΩ Pot.	POT_CMS	BOURNS		
4	C1, C3, C11, C12	1μF/6.3V	0603	TDK	C1005X5R1C105MT	Reference design
6	C7, C8, C9, C10, C13, C14	100nF	0603			
1	C2	220nF	0603			
1	U1	NCP5623	LLGA12	ON Semiconductor	NCP5623	Reference design
1	U2	NCP561	SOT23-5	ON Semiconductor	NCP561SN30T1	Reference design
1	U3	ADM3202	TSSOP16	Analog Device	ADM3202ARU	Reference design, TSSOP16
1	U4	MC9S08QG8	TSSOP16	Freescale	MC9S08QG8CDT	Reference design
		LWY87S	OSRAM_LED	OSRAM	LWY87S	Reference design
1	D1	LRTB-G6T	PLCC-6	OSRAM		
3	D3, D5, D6	LED	OSRAM_LED		LHN974	RS = 444-4808 Any other suppliers possible
1	D2	SMC	Zener diode	ON Semiconductor	1.5SMC6.8AT3	
		Test Point	TEST_POINT	KEYSTONE	5005 (THM)	RS = 203-4910 <i>Do not assemble</i>
		Control Port	IDC10	3M Electronique ANSLEY	2510-6002 UG 4-1437044-3	RS = 120-7230 <i>Do not assemble</i> RS = 461-742
1	J1	PWR connector	AXIAL-0.4	KONTEK COMATEL	3110014000500	RS = 305-0907 (J1 is built with two pins as depicted in the photo)
5	S1, S2, S3, S4, S7	Push Button	PUSH_BUT_CMS			
1	S5	Switch	SIP3			
1	JP1	Connector	IDC6			
1	JP2	RS232	DB9RA/M			Sub D, 9 pins Male, right angle <i>Do not assemble</i>
2	SP1, SP2	Solder pad	SOLDERPAD	<i>Not a part</i>	<i>Not a part</i>	<i>Do not assemble</i>
1	X1	GROUND	GND_TEST	HARWIN	D3082-01 (tin) D3082-05 (gold)	RS = 160-3745 (tin)

Note 1: RS = Radio Spares

Note 2: any resistors with same footprint, tolerance up to $\pm 5\%$ together with $TC < 500\text{ppm}$ and $+105^\circ\text{C}$ operating temperature range can fit the application.

Note 3 : using X5R type ceramic capacitor is preferred. Using X7R brings extended operating temperature range. Using Y5R material shall be avoided due to the wide tolerance spread over the temperature range. Using smaller foot print capacitor is discouraged to avoid audible noise issue with the ceramic.

DIGIKEY REFERENCE

QTY	Designator	Description	Footprint	Manufacturer	PART NUMBER	COMMENTS	Digi-Key Part Number
3	R3, R4, R5	10kΩ	603	Vishay Draloric		Any other suppliers possible	P10.0KHCT-ND
3	R2, R7, R8	47kΩ	603			Any other suppliers possible	P47.5KHCT-ND
1	R1	52kΩ	603			Any other suppliers possible	P52.3KHCT-ND
1	R6	470Ω	805			Any other suppliers possible	P475HCT-ND
1	P1	10kΩ Pot.	POT_CMS	BOURNS	3386F-1-103TLF		3386F-103TLF-ND
4	C1, C3, C11, C12	1μF/6.3V	603	TDK	C1005X5R1C105MT	Reference design	445-1604-1-ND (16V)
6	C7, C8, C9, C10, C13, C14	100nF	603			Any supplier	445-1317-1-ND (16V)
1	C2	220nF	603			Any supplier	445-1318-1-ND (16V)
1	U1	NCP5623	LLGA12	ON Semiconductor	NCP5623	Reference design	
1	U2	NCP561	SOT23-5	ON Semiconductor	NCP561SN30T1	Reference design	
1	U3	ADM3202	TSSOP16	Analog Device	ADM3202ARU	Reference design	ADM3202ARUZ-ND
1	U4	MC9S08QG8	TSSOP16	Freescale	MC9S08QG8CDT	Reference design	MC9S08QG8CDTERCT-ND
	D3, D5, D6	LWY87S	OSRAM_LED	OSRAM	LWY87S	Reference design	475-1173-1-ND
1	D1	LRTB-G6T	PLCC-6	OSRAM		<i>do not assemble</i>	
3	D4	LED	OSRAM_LED		LHN974	Any other suppliers possible	516-1440-1-ND
1	D2	Zener diode	SMC	ON Semiconductor	1.5SMC6.8AT3	Reference design	
		Test Point	TEST_POINT	KEYSTONE	5005 (THM)	<i>Do not assemble</i>	5005K-ND
		Control Port	IDC10	3M Electronique ANSLEY	2510-6002 UG 4-1437044-3	<i>Do not assemble</i> RS = 461-742	2510-6002UG-ND
1	J1	PWR connector	AXIAL-0.4	KONTEK COMATEL	3110014000500	RS = 305-0907 (J1 is built with two pins as depicted in the photo)	CAMBION:160-1724-02-05-00

5	S1, S2, S3, S4, S7	Push Button	PUSH_BUT_ CMS		B3S-1000		SW415-ND
1	S5	Switch	SIP3		09.03290.01		EG2481-ND
1	JP1	Connector	IDC6				WM8121-ND
1	JP2	RS232	DB9RA/M		D9P13B4GL00	Sub D, 9 pins Male, right angle	609-1476-ND
						<i>Do not assemble</i>	
2	SP1, SP2	Solder pad	SOLDERPAD	Not a part	Not a part	<i>Do not assemble</i>	
1	X1	GROUND	GND_TEST	HARWIN	D3082-01 (tin) D3082-05 (gold)	RS = 160-3745 (tin)	WM8072-ND

ASSEMBLY

Note : the here attached photos are used as a visual reference.

- 1- Assemble the NCP5623 (LLGA12 package) , Hot Air Flow Process mandatory
- 2- Assemble all the passive parts
- 3- Assemble all the White LED
- 4- Assemble the GROUND reference point
- 5- Assemble the BDM port IDC6 connector, make sure the connector is properly oriented : the white triangle, on the PCB, is the pin 1 reference
- 6- Assemble the power supply pins.

At this point, the system is ready to operate.

TEST CONDITIONS

Power Supply : The system can accommodate either two standard AA battery (using the back side battery holder), or a standard DC power supply. In any case, one single source of power shall be connected : either the batteries or the power supply, but not simultaneously. If a DC power supply is used, make sure it can supply 500mA continuous output current across the two pins built with connector J1. Make sure the polarity is properly respected : **although a built-in zener prevent for such failure, reverse polarity might destroy the board.**

Set up the power supply to any value between 3.2 V minimum to 5.0V maximum. Typically, the supply voltage shall be adjusted between 3.2V – 4.2V to emulate standard Li-Ion battery.

Manufacturing Final Test :

- 1 - Double check the power supply is set up at 3.6V, *maximum rating is 5.0V*. The MCU chip is powered by a LDO chip to make sure the voltage is limited to 3.3Vat MCU level.
- 2 – Download the NCP5623 demo software into the MCU flash memory. Use the P&E standard hardware and software tools.
- 2 – Turn ON the power supply : the input current shall be in the 4mA to 10mA range, no LED shall be ON. Reset the MCU if necessary by pushing the RESET button S7
- 3 – Toggle S5 switch to the Right position : LED D4 shall be OFF
- 4 – Push control button S1 : diode D3 shall be activated.
- 5 - Push control button S2 : diode D5 shall be activated.

- 6 – Push control button S3 : diode D6 shall be activated.
- 7 – Push control button S4 : the gradual dimming shall activate the three LED D3, D5 and D6 shall be activated.
- 8 - Turn off the power supply to complete the sequence.

At this point, the final test is completed and considered PASS if all the LED have been properly activated.

Digital Control : it is possible to drive the NCP5623 demo board by means of a Window™ based software dedicated to the chip. To operate such mode of operation, the board shall be connected to the RS232 port of the host PC with a standard SUBD 9 pin (female on both side) attached to the board serial port.

System operation :

- 1- Double check the power supply is set up between 3.0V to 5.5V
- 2- Turn ON the power supply
- 3 - Send the appropriate data frame to control the three LED

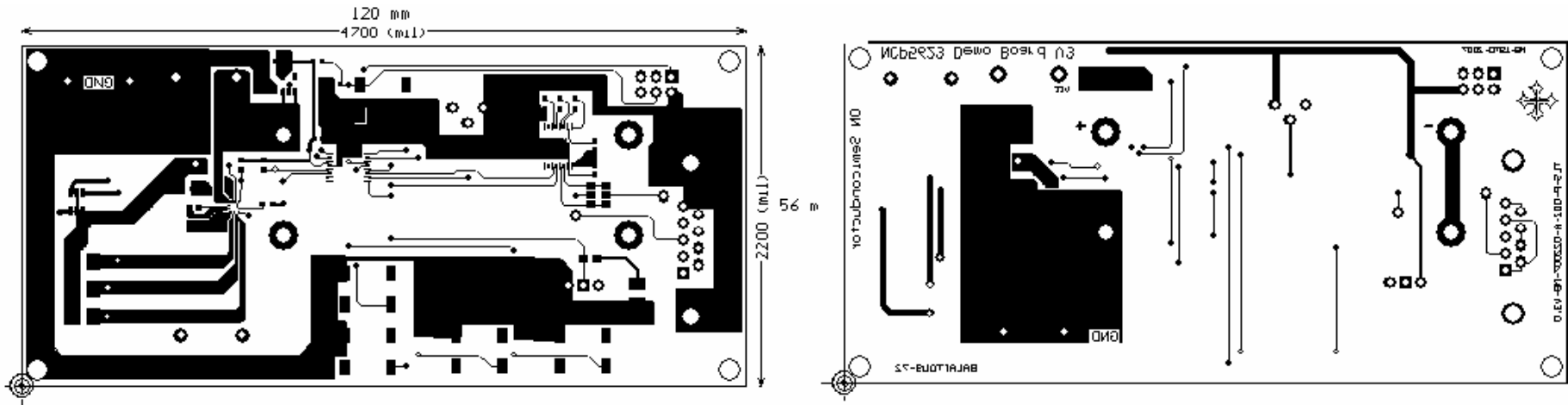


Figure 1: NCP5623 demo board : TOP Layer & BOTTOM Layer

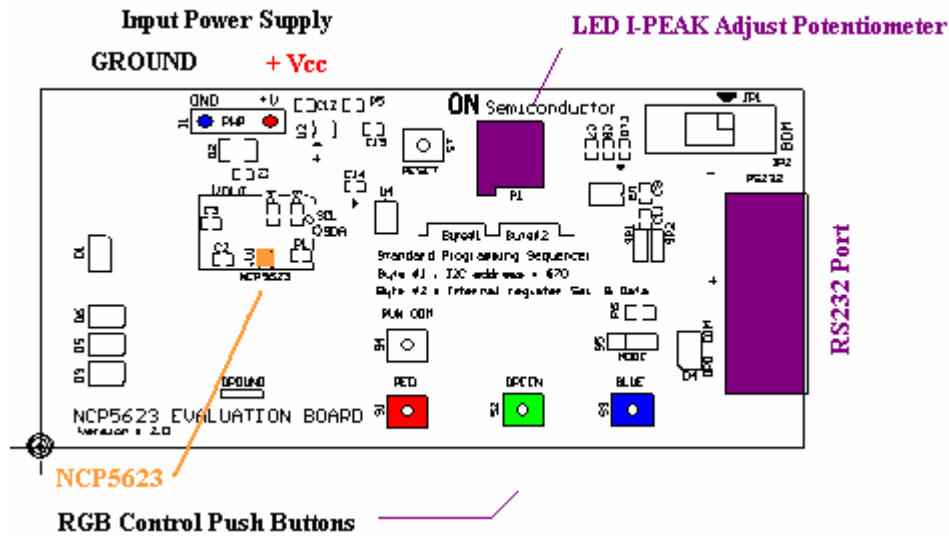


Figure 2 : NCP5623 Demo Board Silk View

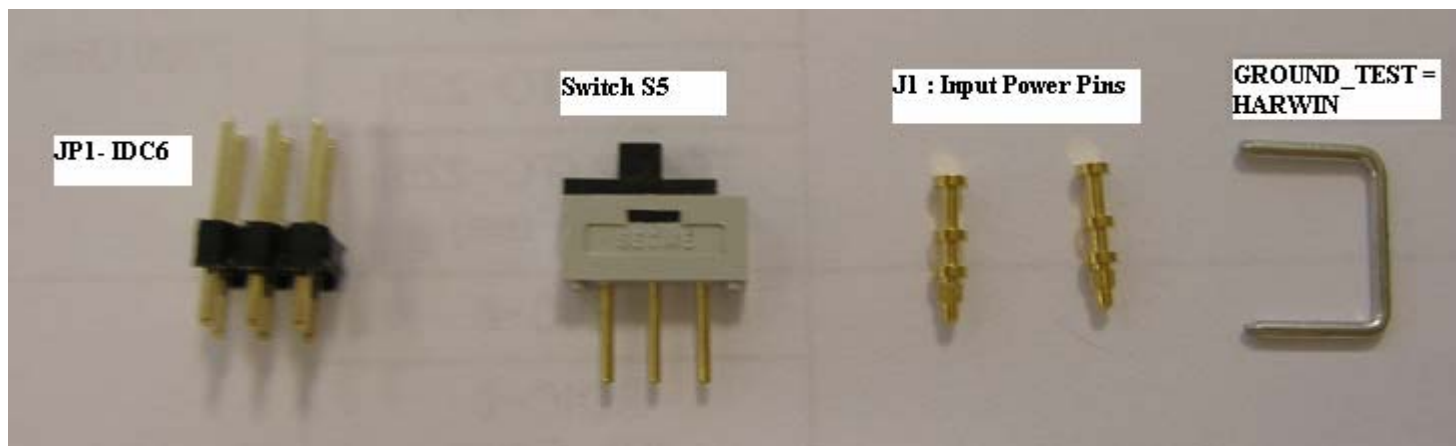


Figure 3 : Typical switches and pins used to built the EVB board

COMPONENT MANUFACTURERS

VISHAY – DRALORIC
TDK
BC Components

<http://www.vishay.com/resistors-discrete/>
<http://www.component.tdk.com>
<http://www.bccomponents.com/>

Radio Spares : in the USA, see **ALLIED ELECTRONICS Inc.**
7410, Pebble Drive
Fort Worth / Texas / 76118-6997
Phone : 817-595-3500