



# EMDB6812 V2.0 MANUAL

## VERSION 1.0

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## 1. INTRODUCTION

This document describes EMDB6812 Demoboard for EM6812 microcontroller.

This board contains a Flash EM6812 microcontroller and additional parts to evaluate EM6812 product and test your application.

You will be able to :

- Program with external programmer the Flash EM6812 through the dedicated In-System-Programming connector or by On-Socket insertion mode
- Evaluate or run your application with the help of the existing components assembled on the board (push-button, leds, buzzer, RS232 interface, switches) and open extensions (connectors, user area).

## 2. HARDWARE DESCRIPTION

### 2.1 PARTS

The EMDB6812 is based on two PCBs:

- Main board (DemoBoard 6812)
- Socket for EM6812 Flash microcontroller (SampleBoard 6812)

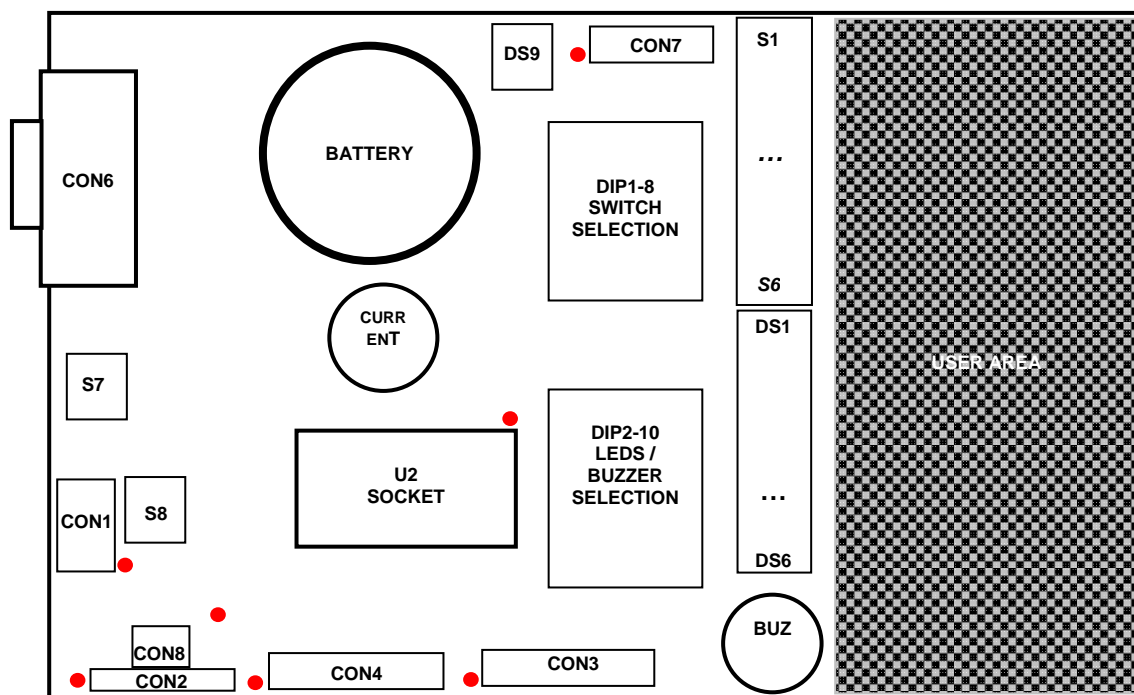
### 2.2 HARDWARE BOARD VERSIONING

DemoBoard V2.0

SampleBoard V1.0

### 2.3 DEMOBOARD DESCRIPTION

PCB size : 160 mm x 100 mm





# EMDB6812

<b>USER AREA</b>	Free user area (2.54 mm and 1.27 mm) with power lines (GND and VDD_IN)
<b>S1...S6</b>	6 Push-Buttons connected to PA0...PA5 through DIP1-8 switches
<b>DS1...DS6</b>	8 Low-power red leds connected to PB0...PB5 through DIP2-10 switches
<b>BUZ1/BUZ2</b>	Buzzers connected to PB0 through DIP2-10 switches
<b>DIP1-8</b>	Switches for S1...S6 connections (PA0...PA5), RX (PA6), TX (PA7)
<b>DIP2-10</b>	Switches for DS1...DS6 connections (PB0...PB5), Buzzers (PB0), I <sub>MEAS</sub>
<b>BATTERY</b>	Battery socket (2032)
<b>U2</b>	Socket (DIL24) for Sample Board
<b>DS9</b>	Low-power red led connected to EXT_VDD
<b>S8</b>	Switch for programming / application mode
<b>S7</b>	Reset Push-Button
<b>CON1</b>	In-System-Programming connector
<b>CON2</b>	User connections (Ground, Power, Reset, ...) and External oscillator connections
<b>CON3 &amp; CON4</b>	Port A, Port B user connector
<b>CON6</b>	DB9 connector for RS232
<b>CON7</b>	Power / Reset configuration connector

## 2.3.1 Connector description

### 2.3.1.1. CON1

In-System-Programming connector (compatibility Elnec programmer ISP cable)  
Header 2x5 male – 2.54 mm

1	Power	VDD_IN	EM6812 VDD supply
2	X	N.C.	No Connect
3	In	RST_EXT	External reset
4	X	N.C.	No Connect
5	X	N.C.	No Connect
6	Inout	SDIO	Data IO program.
7	Power	GND	Ground
8	In	SCLK	Clock program
9	Power	GND	Ground
10	Power	VPP/TESTISP	VPP/TESTISP program.

### 2.3.1.2. CON2

User connector  
Header 1x8 male – 2.54 mm

1	Power	GND	Ground
2	Power	VDD_EXT	External VDD supply
3	In	RST_EXT	External reset
4	In	OSCIN_EXT	External OSCIN connection
5	In	OSCOUT_EXT	External OSCOUT connection
6	Power	VBAT	Battery
7	Power	VDD_IN	EM6812 VDD supply
8	Power	GND	Ground

### 2.3.1.3. CON3

Port user connector  
Header 2x8 male – 2.54 mm

1	Inout	PA0	Port A bit 0
2	Inout	PA0	Port A bit 0
3	Inout	PA1	Port A bit 1
4	Inout	PA1	Port A bit 1
5	Inout	PA2	Port A bit 2
6	Inout	PA2	Port A bit 2
7	Inout	PA3	Port A bit 3
8	Inout	PA3	Port A bit 3
9	Inout	PA4	Port A bit 4
10	Inout	PA4	Port A bit 4
11	Inout	PA5	Port A bit 5
12	Inout	PA5	Port A bit 5
13	Inout	PA6	Port A bit 6
14	Inout	PA6	Port A bit 6
15	Inout	PA7	Port A bit 7
16	Inout	PA7	Port A bit 7

## 2.3.1.4. CON4

Port user connector  
Header 2x8 male – 2.54 mm

1	Inout	<b>PB0</b>	Port B bit 0
2	Inout	<b>PB0</b>	Port B bit 0
3	Inout	<b>PB1</b>	Port B bit 1
4	Inout	<b>PB1</b>	Port B bit 1
5	Inout	<b>PB2</b>	Port B bit 2
6	Inout	<b>PB2</b>	Port B bit 2
7	Inout	<b>PB3</b>	Port B bit 3
8	Inout	<b>PB3</b>	Port B bit 3
9	Inout	<b>PB4</b>	Port B bit 4
10	Inout	<b>PB4</b>	Port B bit 4
11	Inout	<b>PB5</b>	Port B bit 5
12	Inout	<b>PB5</b>	Port B bit 5
13	Inout	<b>PB6</b>	Port B bit 6
14	Inout	<b>PB6</b>	Port B bit 6
15	Inout	<b>PB7</b>	Port B bit 7
16	Inout	<b>PB7</b>	Port B bit 7

## 2.3.1.5. CON6

RS232 User connector  
DB9 female

1	X	<b>N.C.</b>	No Connect
2	Out	<b>TX</b>	RS232 Transmitter output
3	In	<b>RX</b>	RS232 Receiver input
4	X	<b>N.C.</b>	No Connect
5	Power	<b>GND</b>	Ground
6	X	<b>N.C.</b>	No Connect
7	X	<b>N.C.</b>	No Connect
8	X	<b>N.C.</b>	No Connect
9	X	<b>N.C.</b>	No Connect

## 2.3.1.6. CON7

Configuration connector  
Header 2x7 male – 2.54 mm

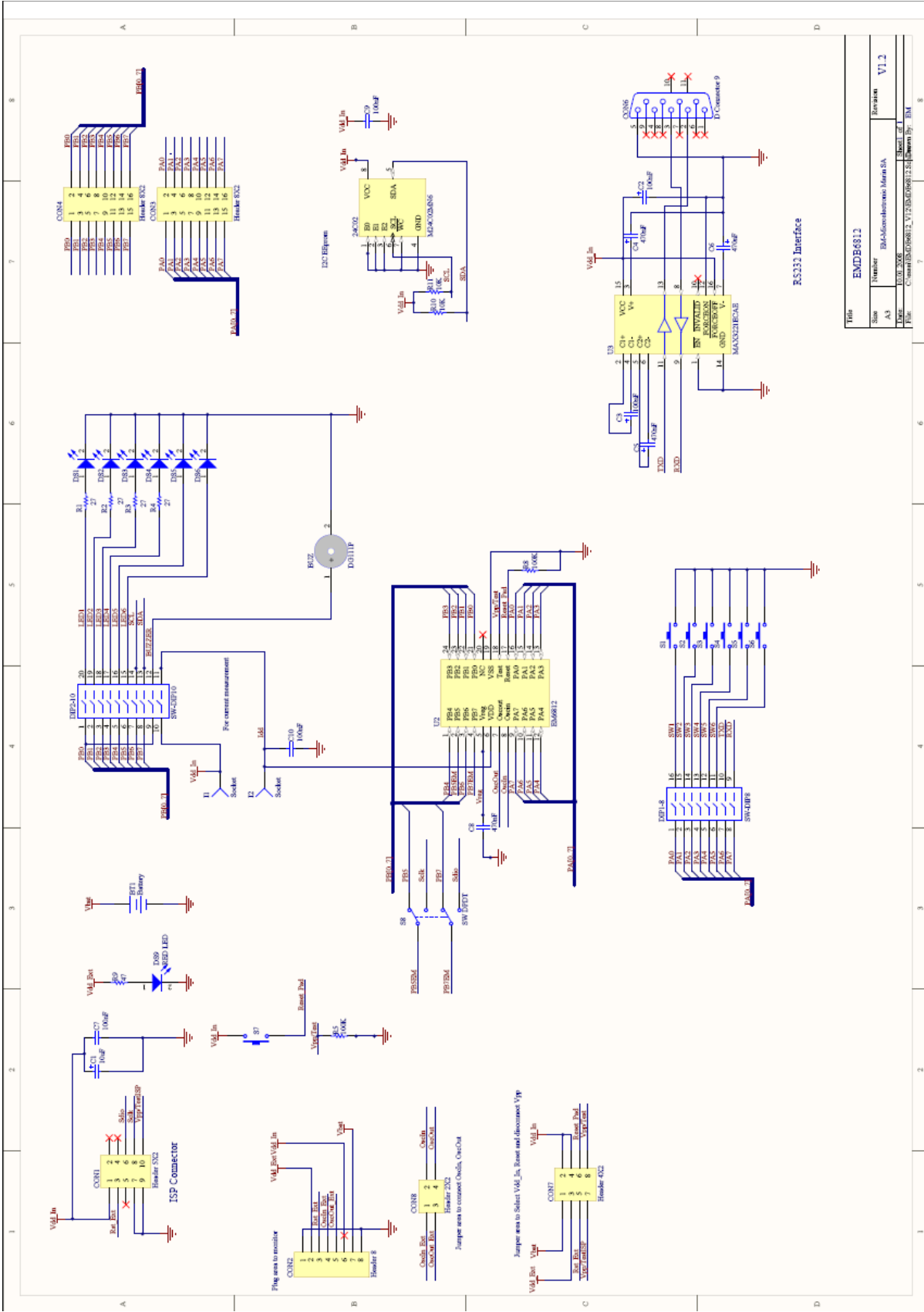
1	Power	<b>VBAT</b>	Battery power supply
2	Power	<b>VDD_IN</b>	EM6812 VDD supply
3	Power	<b>VDD_EXT</b>	External VDD supply
4	Power	<b>VDD_IN</b>	EM6812 VDD supply
5	In	<b>RST_EXT</b>	External reset
6	In	<b>RST</b>	EM6812 reset
7	Power	<b>VPP_ISP</b>	VPP from ISP program.
8	Power	<b>VPP</b>	EM6812 VPP/TEST

## 2.3.1.7. CON8

External oscillator connector  
Header 2x2 male – 2.54 mm

1	In	<b>OSCIN_EXT</b>	External OSCIN connection
2	In	<b>OSCIN</b>	EM6812 OSCIN
3	In	<b>OSCOUT_EXT</b>	External OSCOUT connection
4	In	<b>OSCOUT</b>	EM6812 OSCOUT

## 2.3.2 Demoboard Schematic



Title: EMDB6812			
Size: A3	Number: 8046806812	Revision: V1.2	Sheet of: 8
Date: 02.01.2008	File: C:\emul\8046806812_V12\8046806812.dwg	Drawn by: EM	

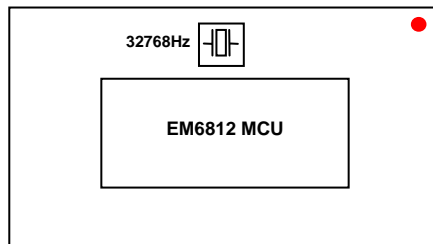
## 2.4 SAMPLE BOARD DESCRIPTION

PCB size: 35.56 mm x 24.88 mm

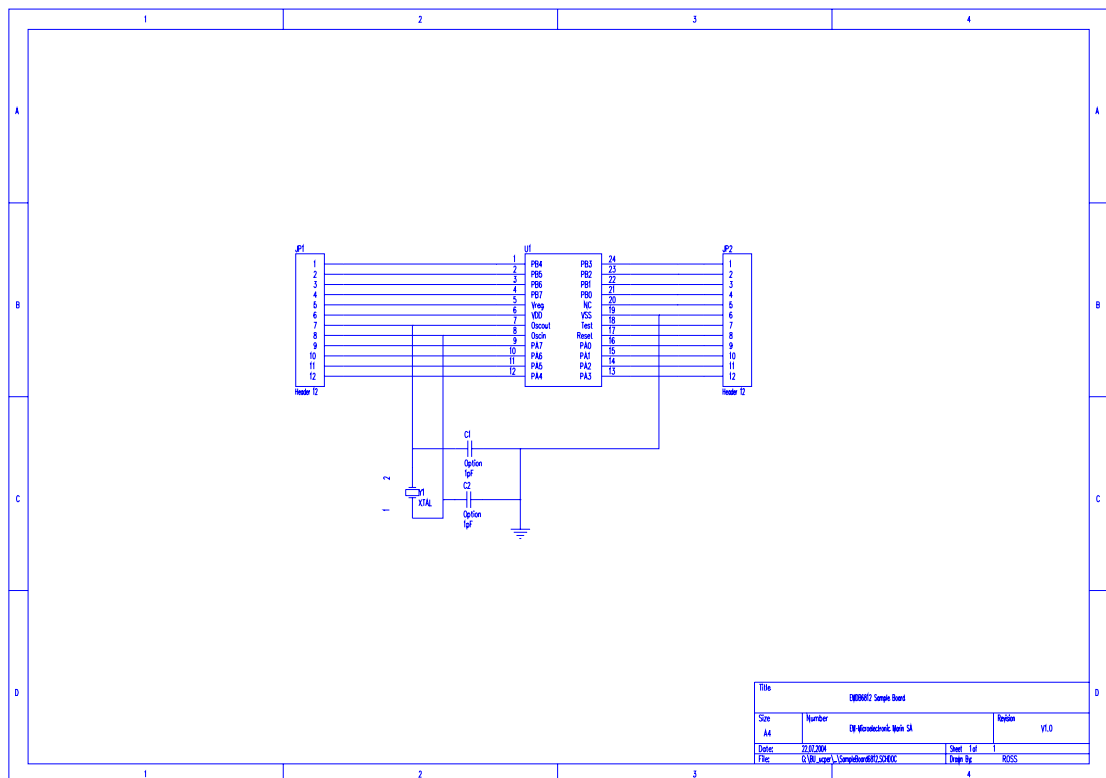
Existing SampleBoard are one to one wired converter:

- DIL24 (600 mils width) to SOIC24 (1.27 mm pitch – 300 mils body width)
- DIL24 (600 mils width) to TSSOP24 (0.65 mm pitch – 4.4mm body width)

Each SampleBoard contains an EM6812 Flash Microcontroller and a Crystal 32768 Hz.



### 2.4.1 SampleBoard schematic





## 2.5 PARTLIST

Designator	Description	Footprint	Value	Constructor	Ref Constructor
BT1	Battery Support for Typ 2032	BAT-2		KEYSTONE	
C1	Polarized Capacitor (Surface Mount)	2917	10uF		
C2	Polarized Capacitor (Surface Mount)	1206	100nF		
C3	Polarized Capacitor (Surface Mount)	1206	100nF		
C4	Polarized Capacitor (Surface Mount)	1411	470nF		
C5	Polarized Capacitor (Surface Mount)	1411	470nF		
C6	Polarized Capacitor (Surface Mount)	1411	470nF		
C7	Capacitor (Semiconductor SIM Model)	1206	100nF		
C8	Capacitor (Semiconductor SIM Model)	1206	470nF		
C9	Capacitor (Semiconductor SIM Model)	1206	100nF		
CON1	Header, 5-Pin, Dual row	HDR2X5			
CON2	Header, 8-Pin	HDR1X8			
CON6	DB9, Right Angle	DSUB1.385-2H9			
CON7	Header, 7-Pin, Dual row	HDR2X4			
DIP1-8	DIP Switch	DIP-16		Multicomp	MCNDI-08S
DIP2-10	DIP Switch	DIP-20		Multicomp	MCNDI-10S
DS1	RED GaAs LED	LED		Temic	TLMT3100
DS2	RED GaAs LED	LED		Temic	TLMT3100
DS3	RED GaAs LED	LED		Temic	TLMT3100
DS4	RED GaAs LED	LED		Temic	TLMT3100
DS5	RED GaAs LED	LED		Temic	TLMT3100
DS6	RED GaAs LED	LED		Temic	TLMT3100
DS9	RED GaAs LED	LED		Temic	TLMT3100
CON3	Header, 8-Pin, Dual row	HDR2X8			
CON4	Header, 8-Pin, Dual row	HDR2X8			
CON8	Header, 2-Pin, Dual row	HDR2X2			
R1	Resistor	1206	27		
R2	Resistor	1206	27		
R3	Resistor	1206	27		
R4	Resistor	1206	27		
R5	Resistor	1206	100K		
R8	Resistor	1206	100K		
R9	Resistor	1206	47		
R10	Resistor	1206	10K		
R11	Resistor	1206	10K		
S1	Switch	SPST-2		ITT Canon	KSC421J
S2	Switch	SPST-2		ITT Canon	KSC421J
S3	Switch	SPST-2		ITT Canon	KSC421J
S4	Switch	SPST-2		ITT Canon	KSC421J
S5	Switch	SPST-2		ITT Canon	KSC421J
S6	Switch	SPST-2		ITT Canon	KSC421J
S8	Switch	DPDTOS2020		ITT Canon	OS202011MS2QN1
U2	Low profil support 600 Mils DIL24	DIP24			
U3	RS-232 Transceiver with AutoShutdown	SSO-G16/X.4		Maxim	MAX3221CAE

## 3. HARDWARE CONFIGURATION

### 3.1 POWER-SUPPLY

EM6812 samples can be powered (VDD\_IN) with two different sources:

- Battery : VBAT
- External Power-supply : VDD\_EXT

Selection is done with a jumper configuration on CON7

	Jumper CON7-1 / CON7-2	Jumper CON7-3 / CON7-4
<b>Battery configuration</b>	ON	OFF
<b>External configuration</b>	OFF	ON

VBAT:

- Requires CR2032 3V battery in socket BT1
- Can be measured on CON7-1

VDD\_EXT:

- Can be applied or measured on CON2-2
- When applied will light on DS9 red led

VDD\_IN / IDD\_IN:

- VDD\_IN is the operating power supply for the EM6812
- IDD\_IN current measurement can be done by placing amperemeter between I+ and I- . in such case be sure that DIP2-10 position 10 is put on I<sub>MEAS</sub> position

Notes: For In-System-programming step refer to ISP programming application note for power-supply details. Safe operation procedure is to apply VDD\_IN EM6812 from the programmer power-supply (CON1): No other VBAT and VDD\_EXT supplied and no load on the In-System-Programming connections.

### 3.2 VPP/TEST

During programming sequence a jumper is needed on CON7-7 / CON7-8  
This jumper does not need to be removed after programming.

### 3.3 PORT A SWITCHES

S1...S6 switches can be connected to EM6812 Port A (Port A bit 0 ... 5). Select ON position for the corresponding DIP1-8 position (1...6).

When the switch is activated, corresponding Port A bit is tied to '0'.

RS232 transceiver (TX) can be connected to Port A bit 6. Select ON for the DIP1-8 position 7.

RS232 transceiver (RX) can be connected to Port A bit 7. Select ON for the DIP1-8 position 8.



## 3.4 PORT B LEDS

DS1...DS6 leds can be connected to EM6812 Port B (Port B bit 0 ... 6). Select ON position for the corresponding DIP2-10 position (1...6).

Buzzer can be connected to Port B bit 0. Select ON for the DIP2-10 position 9.

## 3.5 OSCILLATOR

By default, a 32768Hz crystal is assembled on each SampleBoard. Optionally crystal capacitance can be added (2 empty footprints).

For specific EM6812 modes, it can be necessary to use OSCIN/OSCOUT for other purpose. If necessary connect external signals on CON2-4 (OSCIN\_EXT) or CON2-5 (OSCOUT\_EXT) and place jumpers on CON8-1/CON8-2 or CON8-3/CON8-4.

## 3.6 PROGRAMMING

During In-System-Programming it is recommended to isolate pins PB5 (SCLK) and PB7 (SDIO) from the application connections. Refer to ISP programming application note for details.

A slide switch S8 selects the mode (programming or application) for both pins. For the current mode to be executed, you must ensure the appropriate switch position selection.

## 3.7 RESET

A reset switch S7 reset the EM6812. It is also possible to add an external reset. This external reset (RST\_EXT) must be applied on CON2-3 and must be enabled by adding a jumper on CON7-5/CON7-6.

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