ESK-303 User's Guide

Revision: V1.00 Date: March 29, 2018

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1. Introduction

The ESK-303 is a quick start development board designed for the HT66F2390. The board contains an embedded e-Link Lite which assists users to quickly get started to evaluate the HT66F2390 functions and features, thus providing a means for high efficiency and low risk product prototype design. The ESK-303 outline is shown as in Figure 1.

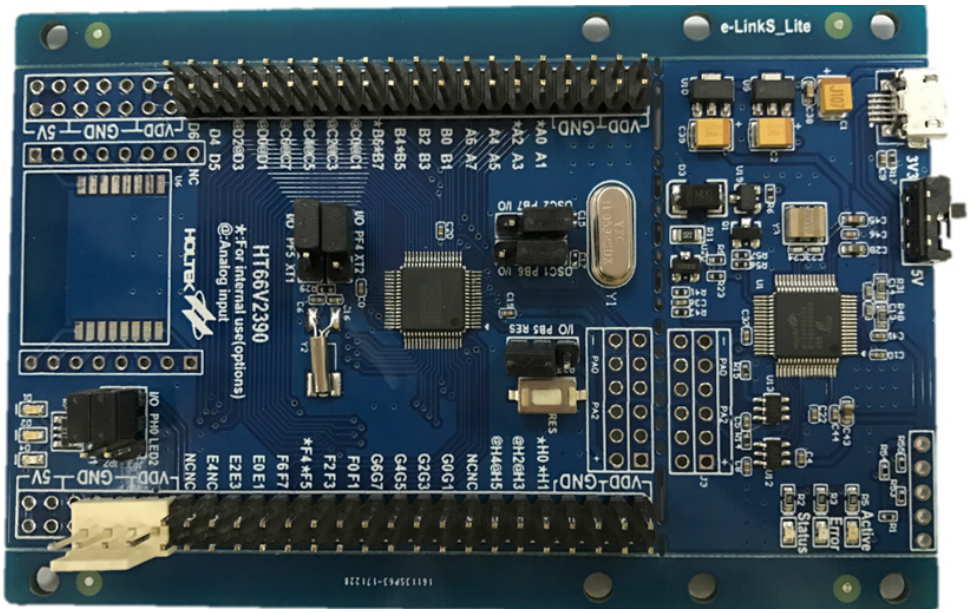


Figure 1 ESK-303 Appearance

Main Features:

- Embedded e-Link Lite has OCDS and ICP functions
- Provides two operating voltages: 3.3V, 5V
- All HT66V2390 I/O pins have extended interfaces

2. Hardware Setup

2.1 Operating Voltages

The ESK-303 provides only 3.3V and 5V operating voltages which can be selected using the switch as shown in Figure 2.

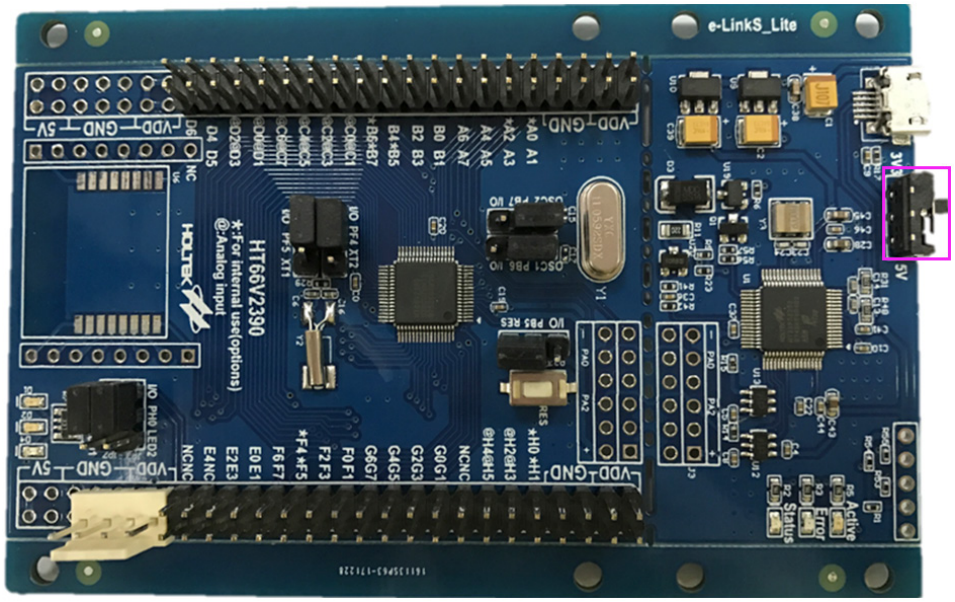


Figure 2 Operating Voltage set to 3.3V

2.2 Jumper Setup

The jumpers on the HT66V2390 system board should be set according to actual application requirements. Refer to Table 1 for more details. The default column indicates the jumper factory default settings.

Jumpers	Silk-screen Name	Description	Default
PB5	RES	Set to RES pin, connected to external REST circuit	RES pin
	I/O	Set to I/O pin	
PB6	OSC1	Set to Crystal 11.0592MHz OSC pin	Crystal 11.0592MHz pin
	I/O	Set to I/O pin	
PB7	OSC2	Set to Crystal 11.0592MHz OSC pin	Crystal 11.0592MHz pin
	I/O	Set to I/O pin	
PF4	XT2	Set to Crystal 32768Hz OSC pin	I/O pin
	I/O	Set to I/O pin	
PF5	XT1	Set to Crystal 32768Hz OSC pin	I/O pin
	I/O	Set to I/O pin	
PH0	LED2	Set to LED2 control pin	I/O pin
	I/O	Set to I/O pin	
PH1	LED1	Set to LED1 control pin	I/O pin
	I/O	Set to I/O pin	

Table 1 Jumper Setup

2.3 e-Link Lite Connector

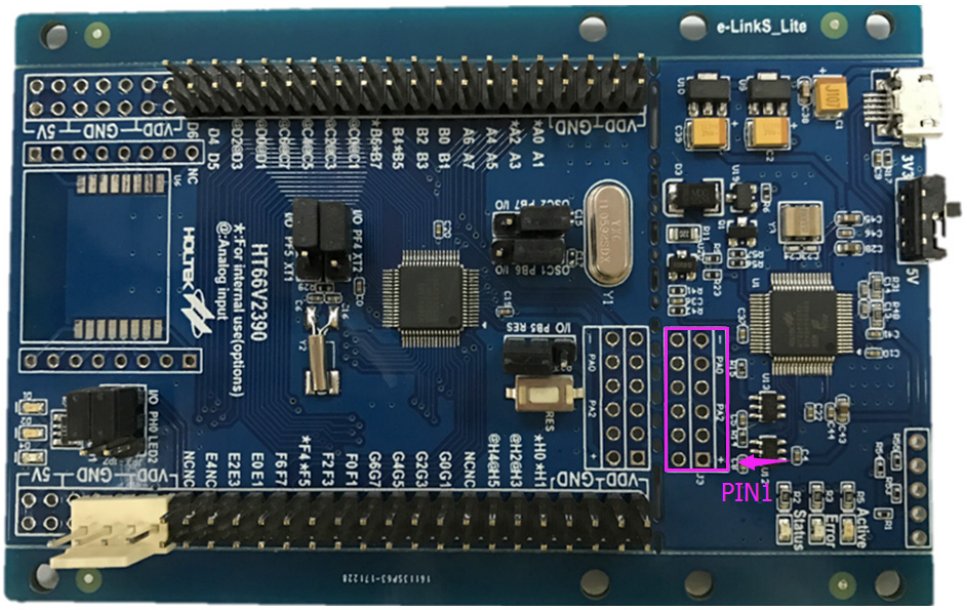


Figure 3 e-Link Lite Connector

Pin Number	OCDS pins	ICP pins
1	VDD	VDD
2	—	—
3	—	—
4	—	—
5	OCDSCK	ICPCK
6	—	—
7	—	—
8	—	—
9	OCDSDA	ICPDA
10	—	—
11	GND	GND
12	—	—

Table 2 e-Link Lite Connector

Note: The e-Link Lite is connected to the HT66V2390 system board via four pins, namely the VDD, GND, PA and PA2 pins, to implement the OCDS or ICP function directly.

3. OCDS Function

3.1 OCDS Usage Introduction

- Download the latest version of HT-IDE3000 from the Holtek website, the download link is as follows:
  http://www.holtek.com/ice-software

Model	Function	Support Hardware	Note
HT-IDE3000 (New release V7.96)	Integrated development Environment software for all series of Holtek MCU	HT-ICE e-ICE e-Link	Click here to download: HT-IDE3000 User's Guide
Keil C51 Development Tools + AGDI Drivers Setup (New release AGDIDriver Setup V50)	Development tool and debug driver setup for Holtek8051 series MCUs emulator	e-Link	Download the latest version on Keil website

Figure 4 HT-IDE3000 Download

- The OCDS user's guide download link is as follows:
  http://www.holtek.com/mcu_tools_users_guide

Document Description	DOC No.
Holtek C Compiler V3 User's Guide	TDOC0023
Holtek C Compiler V3 FAQ	TDOC0024
HT-IDE3000 User's Guide	TDOC0003
HT-ICE Interface Card Reference Manual	TDOC0006
e-ICE User's Guide	TDOC0015
Holtek e-Link for 8-bit MCU OCDS User's Guide	TDOC0016
Holtek e-Link ICP User's Guide	TDOC0030

Figure 5 OCDS User's Guide Download

- After the HT-IDE3000 has started, the prompt dialog will pop up if the ESK-303 has connected successfully, as shown in Figure 6.

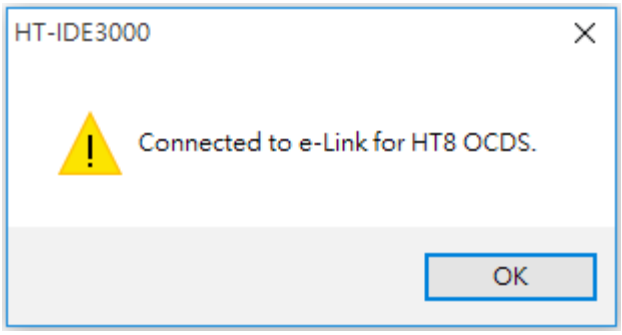


Figure 6 Successful Connection

3.2 OCDS Relevant Configuration

- SysVolt Option
  When the SysVolt configuration option is selected, the voltage should be set to the same as the ESK-303, as shown in Figure 7.

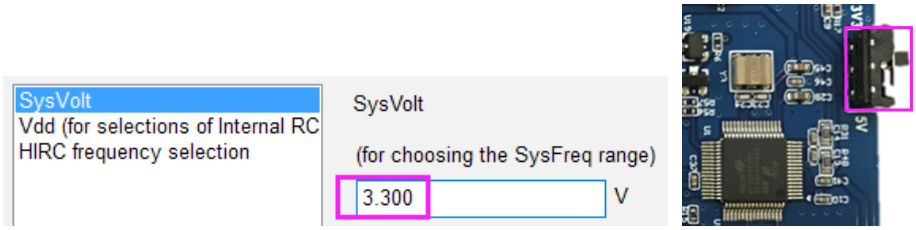


Figure 7 Voltage Set to 3.3V

If the two voltage settings are different, the compile window will appear with a warning prompt as shown in Figure 8.

```
Download option...
C:\Documents and Settings\holtek\My Documents\HTK_Project\HT66F2390\HT66F2390.OPT
Warning:Voltage error is large than 10%
Download C:\Documents and Settings\holtek\My Documents\HTK_Project\HT66F2390\HT66F2390.TSK ...
Loading debug information...
'HT66F2390' - Total 0 error(s), 1 warning(s)
```

Figure 8 Compile warnings

- OSC Configuration

  When the high frequency clock is selected to be the HXT oscillator, the PB6 and PB7 jumpers should be set to the OSC1 and OSC2 pins respectively.

  When the low frequency clock is selected to be the LXT oscillator, the PF4 and PF5 jumpers should be set to the XT1 and XT2 pins respectively.

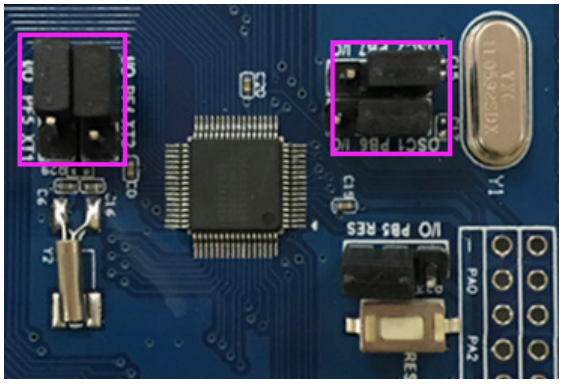


Figure 9 HXT Oscillator Clock Source

- I/O or RESB Option

  When PB5 is selected to have the RESB function, the jumper should be set to RES.

  When PB5 is selected to have the I/O function, the jumper should be set to I/O.

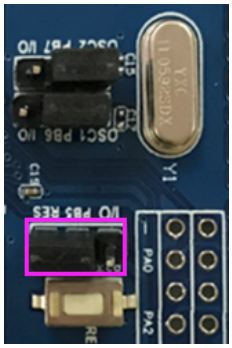


Figure 10 RESB Function

4. ICP Function

4.1 ICP Usage Introduction

- Download the latest version of the HOPE3000 for e-Link from the Holtek website, the download link is as follows:
  http://www.holtek.com/programmer-software

Model	Function	Support Hardware	Note
HOPE3000 (New release V3.23.3)	Integrated software for Holtek e-Writer series Programmers	e-WriterPro e-WriterPlus	
HOPE3000 For e-Link (New release V1.14)	Engineering programmer for HT8 Flash MCU	e-Link	e-Link programming only applies to engineering verification , can not be used for mass production program
HOPE3000 For HT8051 (New release V1.64)	e-Writer programmer software for Holtek8051 series MCUs	e-WriterPro	

Figure 11 HOPE3000 For e-Link Download

- The ICP user's guide download link is as follows:
  http://www.holtek.com/mcu_tools_users_guide

Document Description	DOC No.
Holtek C Compiler V3 User's Guide	TDOC0023
Holtek C Compiler V3 FAQ	TDOC0024
HT-IDE3000 User's Guide	TDOC0003
HT-ICE Interface Card Reference Manual	TDOC0006
e-ICE User's Guide	TDOC0015
Holtek e-Link for 8-bit MCU OCDS User's Guide	TDOC0016
Holtek e-Link ICP User's Guide	TDOC0030
Holtek e-Link Q&A	TDOC0031

Figure 12 ICP User's Guide Download

4.2 ICP Relevant Configuration

The ICP programming voltage should be set to be the same as the ESK-303, otherwise programming will fail.

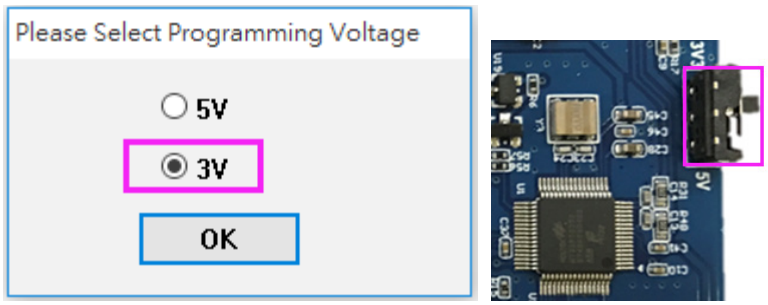


Figure 13 Programming Voltage set to 3.3V

5. e-Link Lite Independent Usage

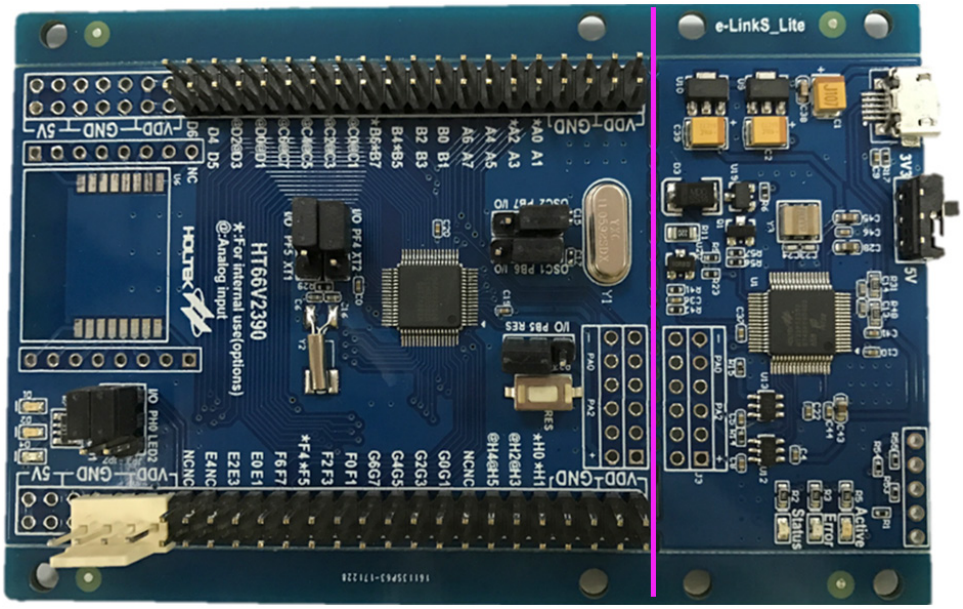


Figure 14 e-Link Lite Independent Usage

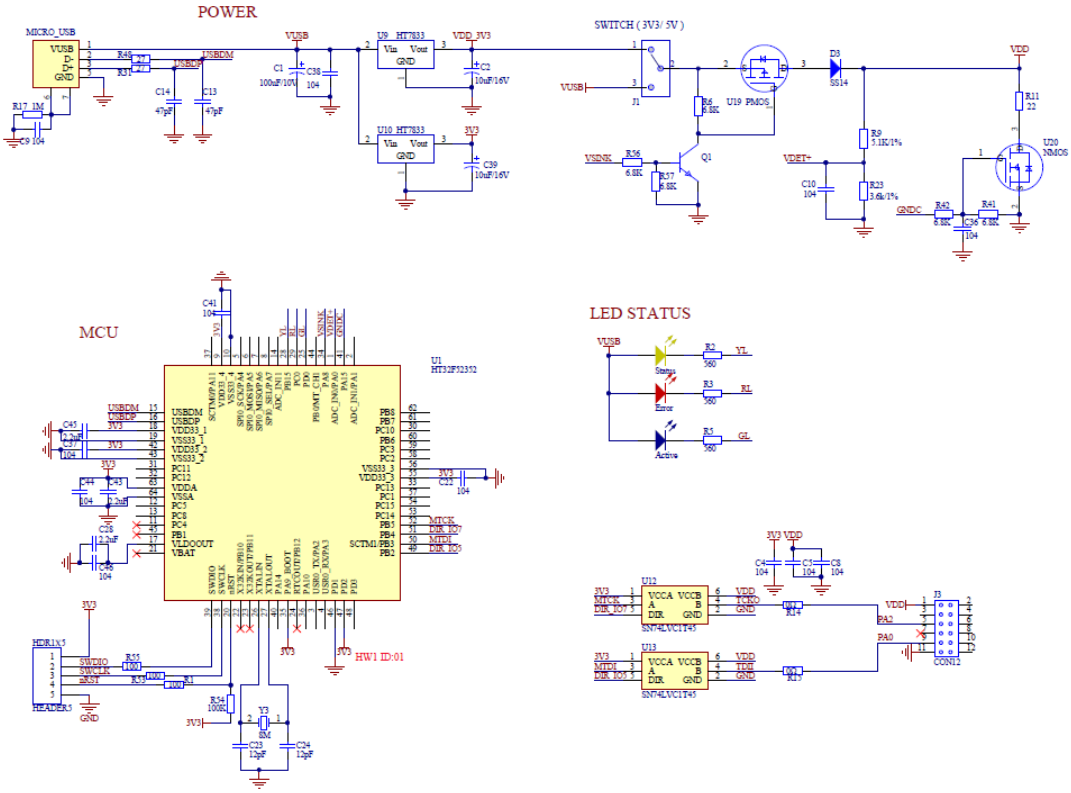
The ESK-303 contains an embedded e-Link Lite which can be used independently for other HT8 Flash MCU device OCDS and ICP functions. The e-Link Lite should be separated to avoid signal interference, as shown in Figure 14.

6. Considerations

- There is no voltage directly output to the HT66V2390 system board when its power is supplied by the e-Link Lite USB interface. The voltage will be output only when the HT-IDE3000 is running at full speed.
- The e-Link Lite output voltage is about 3.3V/5V with a voltage error of about 0.3V. The 5V voltage is derived directly from the USB interface, users should select the USB interface with the higher voltage on the PC.

7. Schematics

- e-Link Lite



- HT66V2390 system board