

---

## CH7103B HDMI to YPbPr Converter

---

### FEATURES

- HDMI Receiver compliant with HDMI 1.4 specification
- Support HDTV format (YPbPr output) for 480p, 576p, 720p, 1080i and 1080P
- On-chip Audio encoder which support 2 channel IIS/ SPDIF audio output
- MCU embedded to handle the control logic
- Support device boot up by automatically loading firmware from on-chip flash Boot ROM
- Integrated EDID Buffer
- Crystal Free architecture
- TV connection detection supported
- HDMI input detection supported
- Support Auto Power Saving mode and low stand-by current
- Support RGB to YCC conversion in ITU-R BT.601 and 709 color space
- IIC slave interface and HDMI DDC interface are available for debug and firmware update.
- Low power architecture
- RoHS compliant and Halogen free package
- Offered in 40-Pin QFN package (5 x 5 mm)

### APPLICATION

- Car Infotainment Device
- Tablet Device
- Handheld/Portable Device
- Digital Video Systems
- HDMI to YPbPr Adapter/Docking Station
- Notebook/Ultrabook
- 

### GENERAL DESCRIPTION

Chrontel's CH7103B is a low-cost, low-power semiconductor device that consists of HDMI receiver, three separate 9-bit video Digital-to-Analog Converters (DACs), HDTV(YPbPr) encoder, and audio encoder, which can convert HDMI signals into HDTV outputs with IIS or SPDIF audio output.

The HDMI Receiver integrated is compliant with HDMI 1.4b. With sophisticated MCU and the on-chip flash, CH7103B supports auto-boot and EDID buffer. Leveraging the firmware auto loaded from the on-chip flash, CH7103B can support HDMI input detection, DAC connection detection and determine to enter into Power saving mode automatically.

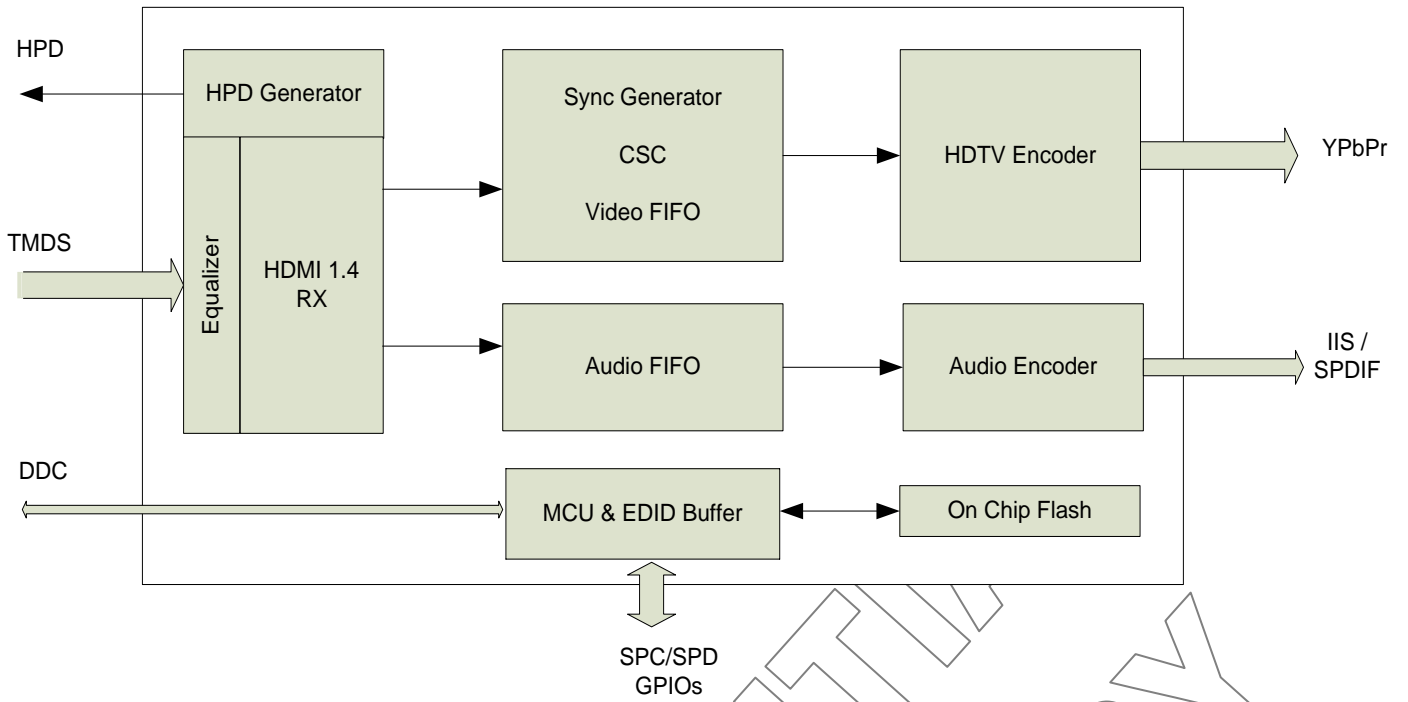


Figure 1: CH7103B Functional Block Diagram

CONFIDENTIAL  
DO NOT COPY

1.0 PIN-OUT

1.1 Package Diagram

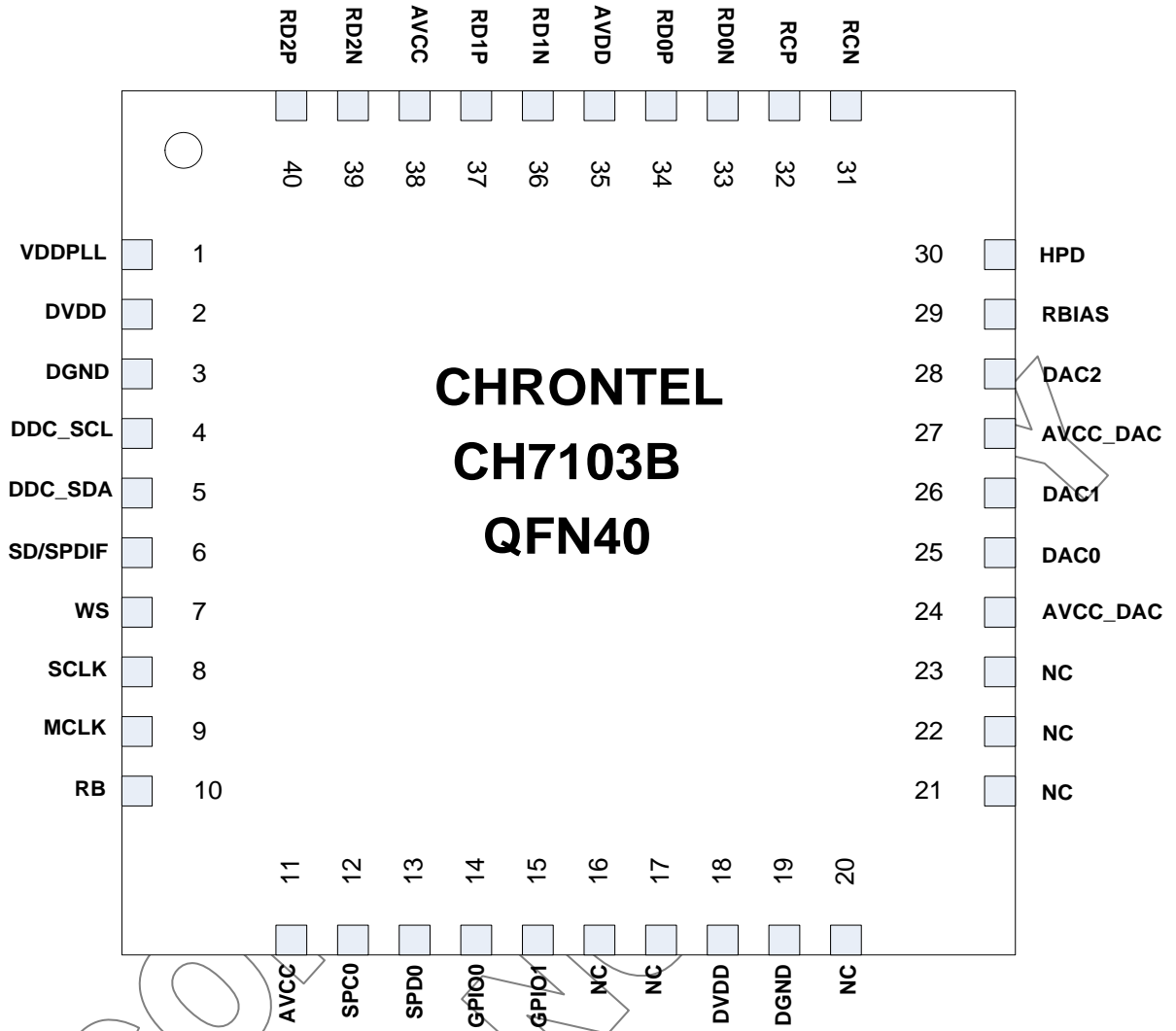


Figure 2: CH7103B 40-pin QFN pin out

**1.2 Pin Description**

**Table 1: Pin Name Descriptions**

Pin #	Type	Symbol	Description
4	In	DDC_SCL	<b>Serial Port Clock to HDMI/DVI Transmitter</b> This pin functions as the clock bus of the serial port to HDMI or DVI DDC transmitter. This pin requires a pull-up 47 kΩ resistor to the desired voltage level.
5	In/out	DDC_SDA	<b>Serial Port Data to HDMI/DVI Transmitter</b> This pin functions as the data bus of the serial port to HDMI or DVI DDC transmitter. This pin requires a pull-up 47 kΩ resistor to the desired voltage level.
6	Out	SD/SPDIF	<b>I2S Serial Data or SPDIF Output</b>
7	Out	WS	<b>I2S Word Select</b>
8	Out	SCLK	<b>I2S Continuous Serial Clock</b>
9	Out	MCLK	<b>I2S System Clock</b>
10	In	RB	<b>Chip Reset</b> Low to 0V for reset. Typical High level is 3.3V
12	In	SPC0	<b>Serial Port Clock Input</b> This pin functions as the clock pin of the serial port. External pull-up 6.8 KΩ resistor is required
13	In/out	SPD0	<b>Serial Port Data Input / Output</b> This pin functions as the bi-directional data pin of the serial port. External pull-up 6.8 KΩ resistor is required
14,15	In/Out	GPIO	<b>General Purpose Input/Output</b>
16,17,20, 21,22,23	NC	NC	<b>Not Connected</b>
25	Out	DAC0	<b>HDTV Pb Component DAC output</b>
26	Out	DAC1	<b>HDTV Y Component DAC output</b>
28	Out	DAC2	<b>HDTV Pr Component DAC output</b>
29	In	RBIAS	<b>Current Set Resistor Input</b> This pin sets the DAC current. A 10 KΩ, 1% tolerance resistor should be connected between this pin and AVSS using short and wide traces
30	Out	HPD	<b>HDMI Receiver Hot Plug output</b>
31,32,33, 34,36,37, 39,40	In	RD[2;0]P/N RCP/N	<b>HDMI TMDS Input</b> HDMI differential clock and data input pairs
1	Power	VDDPLL	<b>PLL Power Supply (1.2V)</b>
2,18	Power	DVDD	<b>Digital IO Power Supply (1.2V)</b>
3,19	Power	DGND	<b>Digital Ground</b>
11, 38	Power	AVCC	<b>Analog Power Supply (3.3V)</b>
24,27	Power	AVCC_DAC	<b>Analog DAC Power Supply (3.3V)</b>
35	Power	AVDD	<b>HDMI Receiver Analog Power Supply (1.2V)</b>
Pad	Power	GND	<b>Power Supply Ground</b>

2.0 PACKAGE DIMENSION

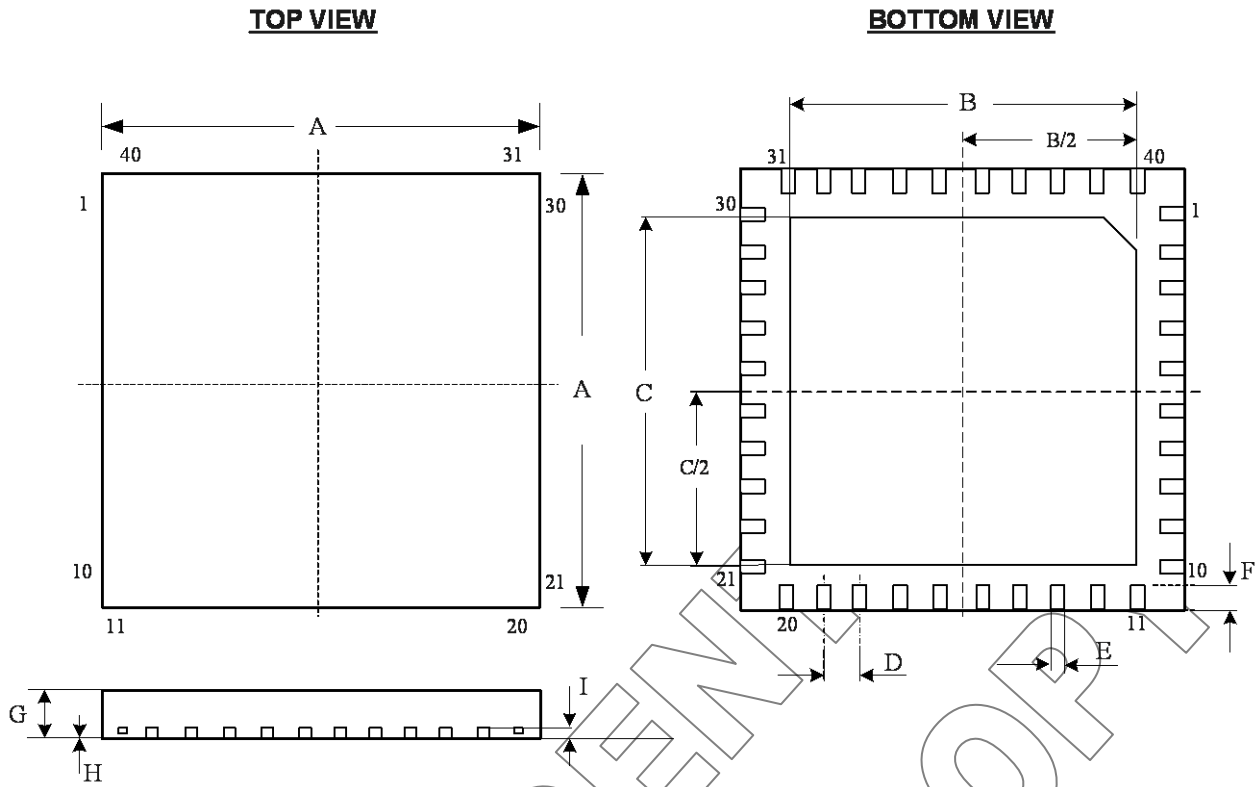


Figure 2: 40 Pin QFN Package

Table 2: Table of Dimensions

No. of Leads		SYMBOL								
40 (5 X 5 mm)		A	B	C	D	E	F	G	H	I
Milli-meters	MIN	4.90	3.20	3.20	0.4	0.15	0.35	0.8	0	0.203
	MAX	5.10	3.40	3.40		0.25	0.45	1.0	0.05	REF

Notes:

1. Conforms to JEDEC standard JESD-30 MO-220.

**Disclaimer**

This document provides technical information for the user. Chrontel reserves the right to make changes at any time without notice to improve and supply the best possible product and is not responsible and does not assume any liability for misapplication or use outside the limits specified in this document. CHRONTEL warrants each part to be free from defects in material and workmanship for a period of one (1) year from date of shipment. Chrontel assumes no liability for errors contained within this document. The customer should make sure that they have the most recent data sheet version. Customers should take appropriate action to ensure their use of the products does not infringe upon any patents. Chrontel, Inc. respects valid patent rights of third parties and does not infringe upon or assist others to infringe upon such rights.

Chrontel PRODUCTS ARE NOT AUTHORIZED FOR AND SHOULD NOT BE USED WITHIN LIFE SUPPORT SYSTEMS OR NUCLEAR FACILITY APPLICATIONS WITHOUT THE SPECIFIC WRITTEN CONSENT OF Chrontel. Life support systems are those intended to support or sustain life and whose failure to perform when used as directed can reasonably expect to result in personal injury or death.

<b>ORDERING INFORMATION</b>					
<b>Part Number</b>	<b>Package Type</b>	<b>Content Protection</b>	<b>Operating Range</b>	<b>Temperature</b>	<b>Minimum Order Quantity</b>
CH7103B-BF	40 QFN, Lead-free	None	Commercial : 0 to 70°C		<b>490/Tray</b>
CH7103B-BFK	40 QFN, Lead-free	HDCP 1.4	Commercial : 0 to 70°C		<b>490/Tray</b>
CH7103B-BFI	40 QFN, Lead-free	None	Industrial : -40 to 85°C		<b>490/Tray</b>
CH7103B-BFIK	40 QFN, Lead-free	HDCP 1.4	Industrial : -40 to 85°C		<b>490/Tray</b>

**Chrontel**

[www.chrontel.com](http://www.chrontel.com)

**E-mail: sales@chrontel.com**