HDMI to CVBS Converter

1 Features

CVBS Output

720x576i@60Hz supported
Compliant with VESA VSIS 1.2

HDMI Input

HDMI 1.4a supported
RGB444/YCbCr444/YCbCr422 supported
Pixel clock up to 166MHz
2-channel audio supported
Support Hot-Plug Detect
Adaptive equalization

Clock

Refless clock system

Misc

On-chip 5V to 1.2V regulator
Built-in video test patter

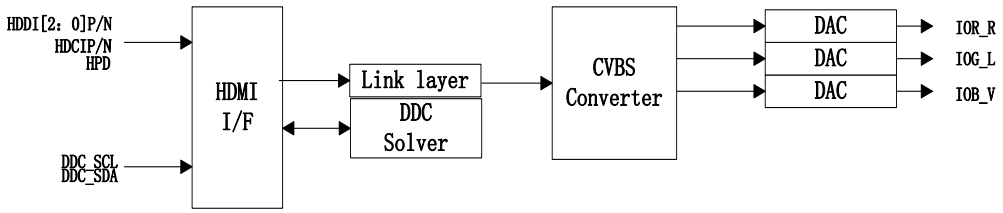
Power

1.2V core supply
2.5V or 3.3V IO supply
Power consumption ~ **150mA**
Deep-sleep mode power <1mW

Package

QFN-32 (4mm x 4mm) package
RoHS Compliant

2 Block Diagram



3 General Description

NCS8827 is a low-cost, low-power semiconductor device that consists of HDMI receiver,three separate 9-bit video Digital-to-Analog Converters (DACs) and audio encoder, which can convert HDMI signals into CVBS outputs at a maximum conversion rate of 200MHz with DAC audio output.

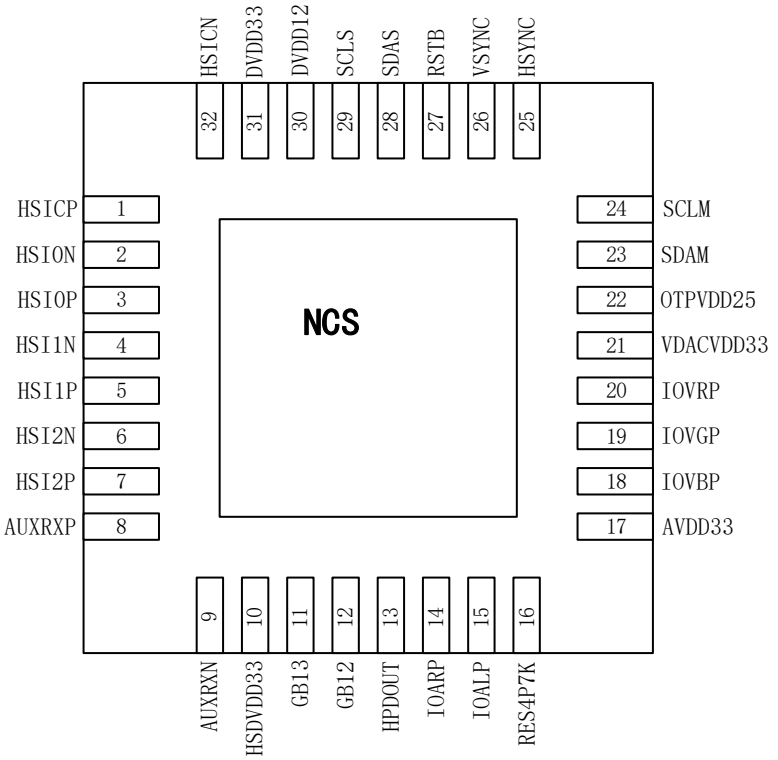
The HDMI Receiver integrated is compliant with HDMI 1.4a and support HDCP 1.4 specifications with internal HDCP key.

NCS8827 is designed for Notbook/Ultrabook, Tablet Device,Handheld/Portable Device,Digital Video Systems,HDMI to VGA Adapter/Docking Station,Car Entertainment Device,etc.

The DACs are based on current source architecture. With sophisticated MCU and the Boot ROM embedded, NCS8827 support auto-boot and EDID buffer. Take the advantage of Firmware auto loaded from the embedded Boot ROM, NCS8827 can support HDMI input detection, DAC connection detection and determine to enter into Power saving mode automatically.

All the functions pack into a small 4mm*4mmQFN32 package which saves the precious space in mobile devices.

4 Pin Diagram



(Top view)

5 Pin Description

No.	Pin Name	Description
1	HSICP	HDMI clock channel positive
2	HSION	HDMI data channel 0 negative
3	HSIOP	HDMI data channel 0 positive
4	HSI1N	HDMI data channel 1 negative
5	HSI1P	HDMI data channel 1 positive
6	HSI2N	HDMI data channel 2 negative
7	HSI2P	HDMI data channel 2 positive
8	AUXRXP	AUX channel positive
9	AUXRXN	AUX channel negative
10	HSDVDD33	3.3V power supply for HDMI
11	GB13	GPIO13
12	GB12	GPIO12
13	HPDOUT	Hot-Plug Detect output
14	IOARP	DAC_R Output
15	IOALP	DAC_L Output
16	RES4P7K	Rvref
17	AVDD33	3.3V power supply for analog
18	IOVBP	VGA Blue Output
19	IOVGP	VGA Green Output
20	IOVRP	VGA Red Output
21	VDACVDD33	3.3V power supply for VGA
22	OTPVDD25	2.5V power supply for analog
23	SDAM	Master I2C data
24	SCLM	Master I2C clock
25	HSYNC	Horizontal synchronization
26	VSYNC	Vertical synchronization
27	RSTB	Reset, active low
28	SDAS	Slave I2C data
29	SCLS	Slave I2C clock
30	DVDD12	1.2V power supply for digital
31	DVDD33	3.3V power supply for digital
32	HSICN	HDMI clock channel negative
Thermal	GND	Ground

6 Electrical Specifications

6.1 Operating Conditongs

6.2 Power Consumptoin

6.3 eDP Main Channel Electrical Specification

6.4 Edp AUX channel Electrical Specifications

6.5 Type-c Electrical Specification

7 Register Table

8 Applications

8.1 Typical Application Schematics

a. HDMI Connector Mode:

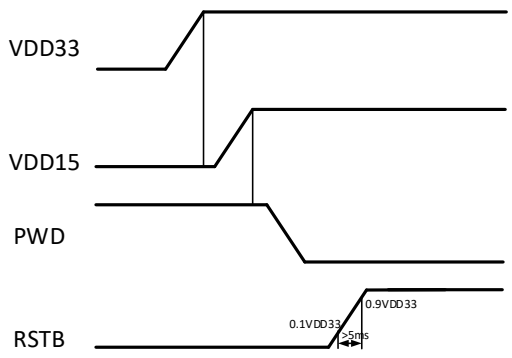
8.2 PCB Layout Rules

a. Due to the high data rate of the Type-c signal, characteristic impedance throughout the signal path needs to be well controlled.

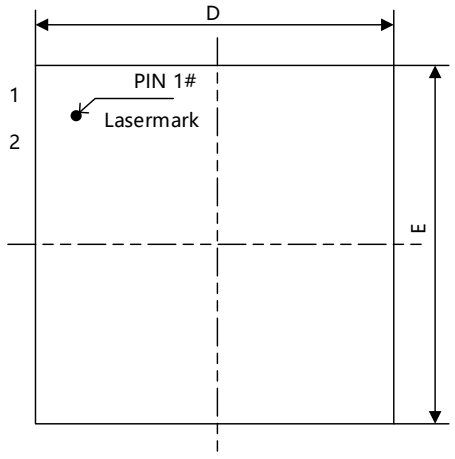
b. The intra-pair mismatch in all differential pairs needs to be avoided.

c. Type-c inter-lane skew is suggested to be controlled under 50mil.

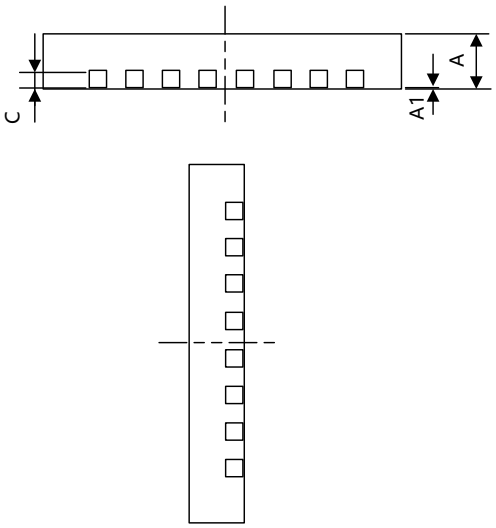
8.3 Power-on Sequence



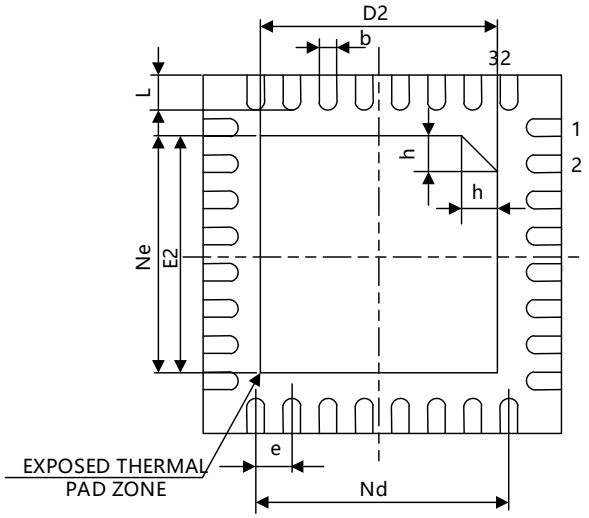
9 Package



TOP VIEW



SIDE VIEW



BOTTOM VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
b	0.15	0.20	0.25
c	0.18	0.20	0.25
D	3.90	4.00	4.10
D2	2.70	2.80	2.90
e	0.40BSC		
Ne	2.80BSC		
Nd	2.80BSC		
E	3.90	4.00	4.10
E2	2.70	2.80	2.90
L	0.25	0.30	0.35
h	0.30	0.35	0.40
L/F载体尺寸	122*122		