



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





ON Semiconductor®

<http://onsemi.com>

LV5609V

Bi-CMOS LSI

Vertical Clock Driver for CCD

Overview

The LV5609V is vertical clock driver for CCD.

Functions

- Ternary output ×2ch
- Binary output ×2ch
- SHT output ×1ch
- Output ON resistance : 30Ω typ

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$, $V_{SS} = V_M = 0\text{V}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|--------------|----------------------------|-------------|------|
| Maximum supply voltage | V_{DD} max | | 6 | V |
| | VH max | | 20 | V |
| | VL max | | -10 | V |
| | VH-VL max | | 24 | V |
| Allowable power dissipation | P_d max | with specified substrate * | 0.67 | W |
| Operating temperature | T_{opr} | | -20 to +80 | °C |
| Storage temperature | T_{stg} | | -40 to +125 | °C |

* : Specified substrate : 114.3×76.1×1.6mm³, glass epoxy board

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Allowable Operating Ratings at $T_a = 25^\circ\text{C}$, $V_{SS} = V_M = 0\text{V}$

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|-------------------------|-----------|------------|-------------|------|----------|------|
| | | | min | typ | max | |
| Supply voltage | V_{DD} | | 2.0 | 3.3 | 5.5 | V |
| | VH | | | 15 | 17 | V |
| | VL | | -8.5 | -7.5 | -4 | V |
| | VH-VL | | | | 23.5 | V |
| CMOS input High voltage | V_{INH} | | $0.8V_{DD}$ | | V_{DD} | V |
| CMOS input Low voltage | V_{INL} | | -0.1 | | 0.4 | V |

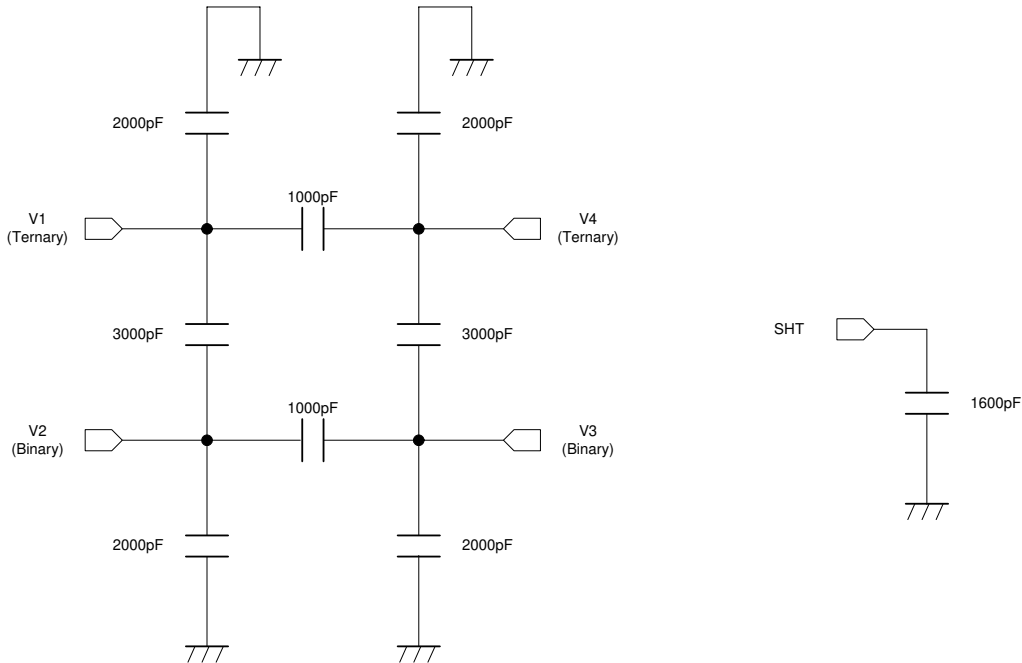
LV5609V

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{DD} = 3.3\text{V}$, $V_{SS} = 0\text{V}$, $V_H = 15\text{V}$, $V_L = -7.5\text{V}$, $V_M = 0\text{V}$,
Unless otherwise specified

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|------------------------|-----------|--------------------------------------|---------|-----|-----|---------------|
| | | | min | typ | max | |
| Static current drain | I_{DD} | V_{DD} pin | | | 1 | μA |
| | I_H | V_H pin | | | 10 | μA |
| | I_L | V_L pin | | | 1 | μA |
| Dynamic current drain | I_{DD} | V_{DD} pin See *1 and *2. | | | 1 | mA |
| | I_H | V_H pin See *1 and *2. | | 2.4 | 4.5 | mA |
| | I_L | V_L pin See *1 and *2. | | 3 | 5 | mA |
| Output ON resistance | R_L | $I_O = +10\text{mA}$ | | 20 | 30 | Ω |
| | R_M | $I_O = \pm 10\text{mA}$ | | 30 | 45 | Ω |
| | R_H | $I_O = -10\text{mA}$ | | 30 | 40 | Ω |
| | R_{SHT} | $I_O = -10\text{mA}$ | | 30 | 40 | Ω |
| Propagation delay time | T_{PLM} | No load | | | 200 | ns |
| | T_{PMH} | No load | | | 200 | ns |
| | T_{PLH} | No load | | | 200 | ns |
| | T_{PML} | No load | | | 200 | ns |
| | T_{PHM} | No load | | | 200 | ns |
| | T_{PHL} | No load | | | 200 | ns |
| Rise time | T_{TLM} | $V_L \rightarrow V_M$ V1, V3 See *1. | | | 800 | ns |
| | | $V_L \rightarrow V_M$ V2, V4 See *1. | | | 800 | ns |
| | T_{TMH} | $V_M \rightarrow V_L$ V1, V3 See *1. | | | 800 | ns |
| | T_{TLH} | $V_L \rightarrow V_H$ SHT See *1. | | | 200 | ns |
| Fall time | T_{TML} | $V_M \rightarrow V_L$ V1, V3 See *1. | | | 800 | ns |
| | | $V_M \rightarrow V_L$ V2, V4 See *1. | | | 800 | ns |
| | T_{THM} | $V_H \rightarrow V_M$ V1, V3 See *1. | | | 800 | ns |
| | T_{THL} | $V_H \rightarrow V_L$ SHT See *1. | | | 200 | ns |

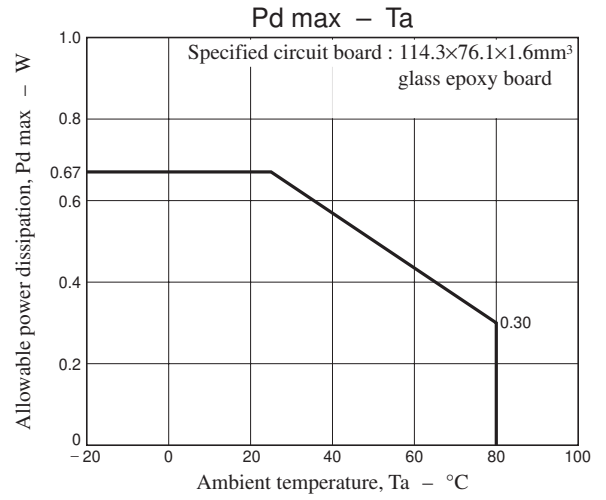
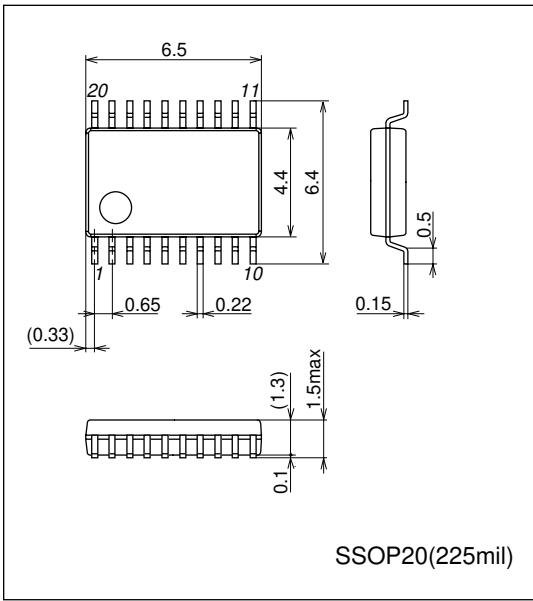
*1 : Refer to the CCD equivalent load shown below.

*2 : Refer to the timing waveform on Page 7.



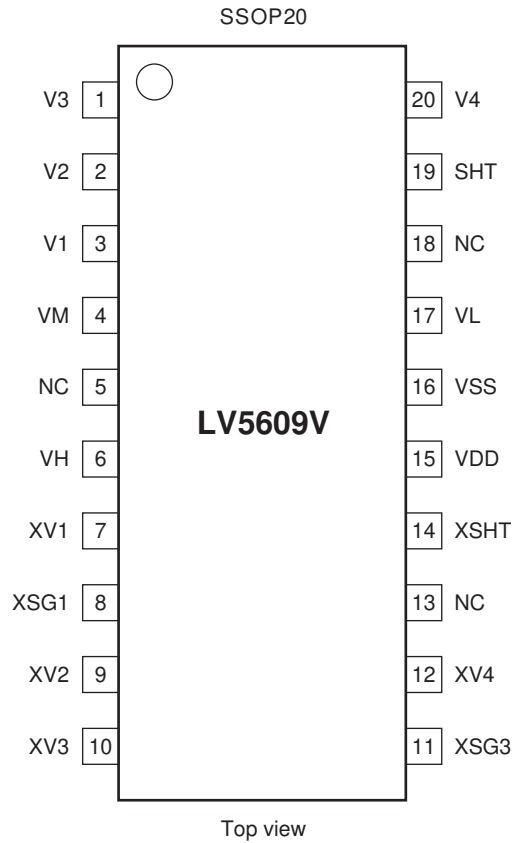
Package Dimensions

unit : mm (typ)
3179C



LV5609V

Pin Assignment

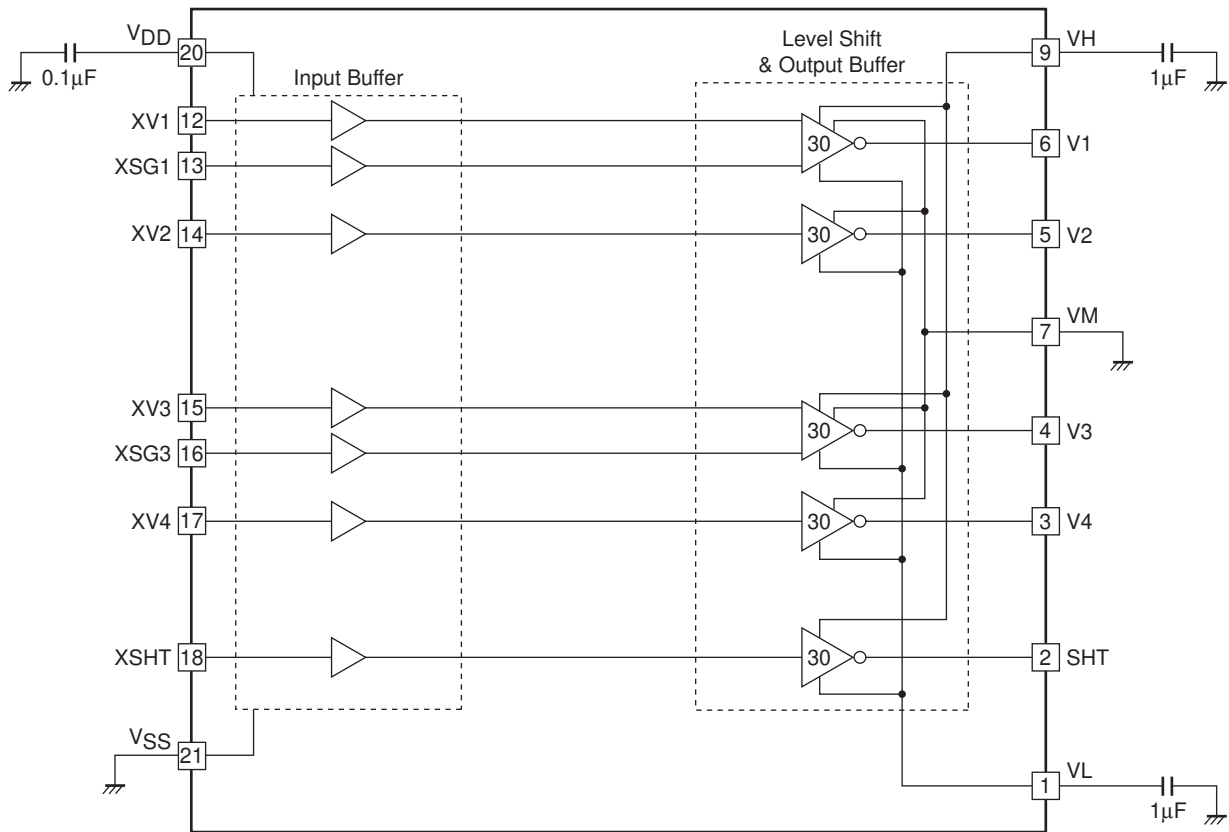


Pin Function

| Pin No. | Name | Mode |
|---------|-----------------|---|
| 1 | V3 | Level shift output (ternary VH, VM, VL) |
| 2 | V2 | Level shift output (binary VM, VL) |
| 3 | V1 | Level shift output (ternary VH, VM, VL) |
| 4 | VM | GND for output |
| 5 | NC | |
| 6 | VH | Hi power supply (15V system) for output |
| 7 | XV1 | V1 transfer pulse input |
| 8 | XSG1 | V1 read pulse input |
| 9 | XV2 | V2 transfer pulse input |
| 10 | XV3 | V3 transfer pulse input |
| 11 | XSG3 | V3 read pulse input |
| 12 | XV4 | V4 transfer pulse input |
| 13 | NC1 | |
| 14 | XSHT | SHT pulse input |
| 15 | V _{DD} | Power supply (3.3V system) for input buffer |
| 16 | V _{SS} | GND for input buffer |
| 17 | VL | LO power supply (-7.5V system) for output |
| 18 | NC | |
| 19 | SHT | Level shift output (binary VH, VL) |
| 20 | V4 | Level shift output (ternary VM, VL) |

LV5609V

Block Diagram

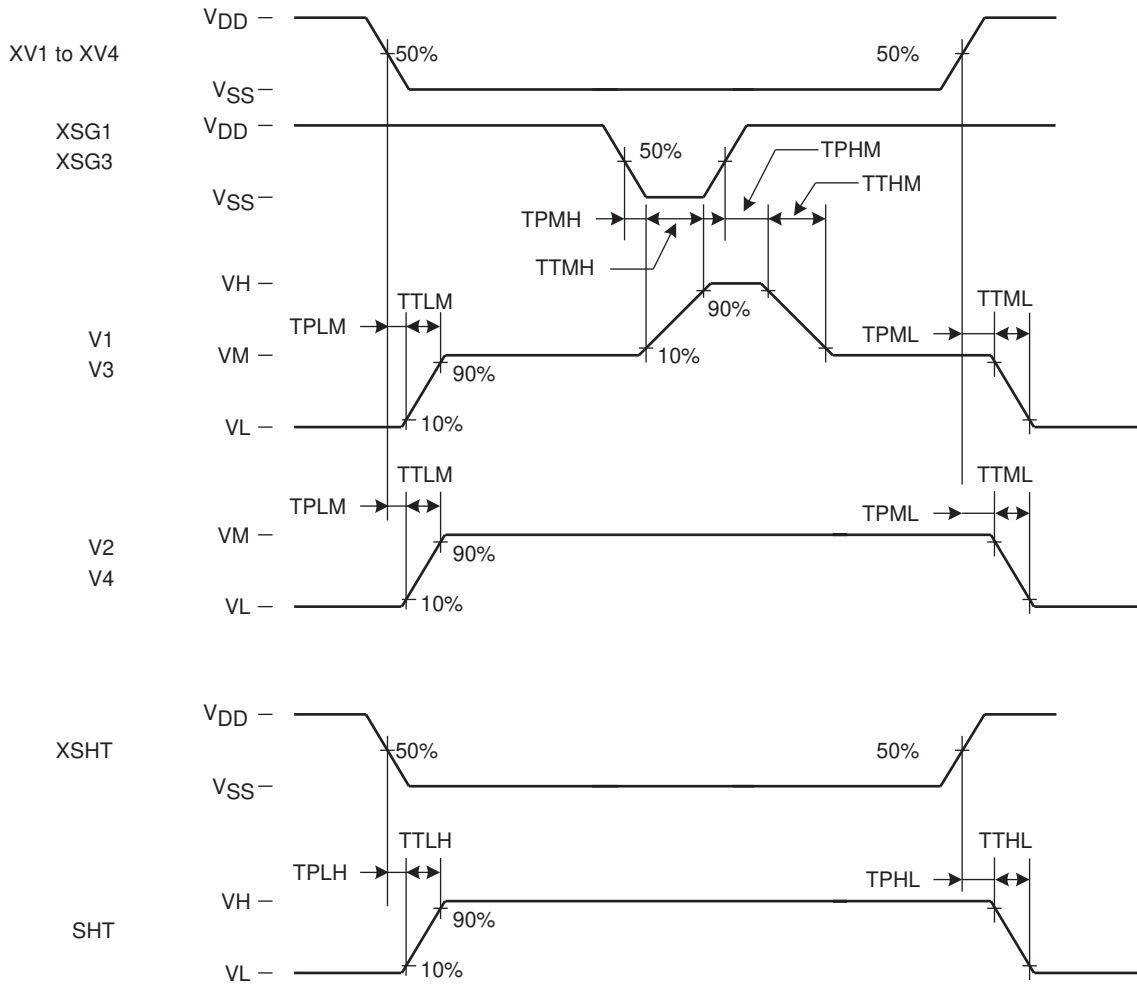


Logical Function Table

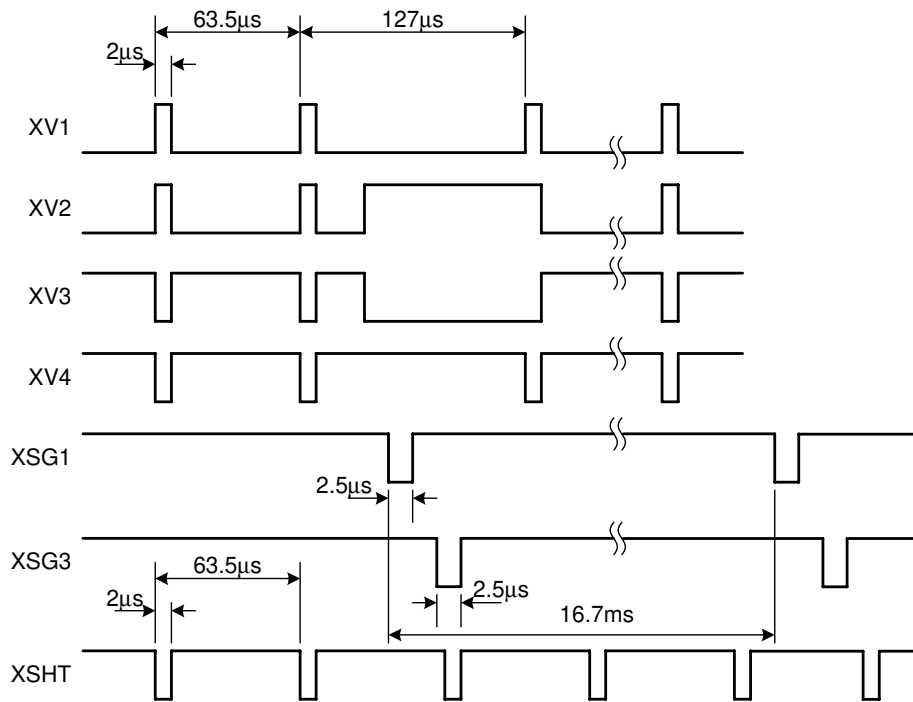
| Input | | | | Output | | |
|----------------|------------------|----------------|--------|--------------|--------------|-------|
| $XV1$ $XV3$ | $XSG1$ $XSG3$ | $XV2$ $XV4$ | $XSHT$ | $V1$ $V3$ | $V2$ $V4$ | SHT |
| L | L | X | X | VH | X | X |
| L | H | X | X | VM | X | X |
| H | L | X | X | VL | X | X |
| H | H | X | X | VL | X | X |
| X | X | L | X | X | VM | X |
| X | X | H | X | X | VL | X |
| X | X | X | L | X | X | VH |
| X | X | X | H | X | X | VL |

LV5609V

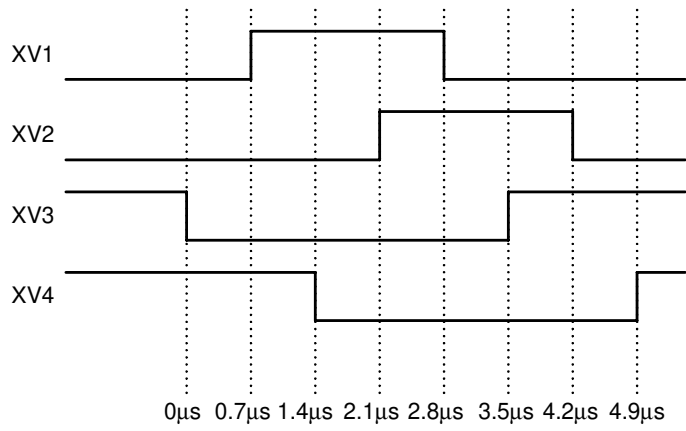
Timing Chart



CCD Equivalent Load Measurement Timing Waveform



Enlarged View of overlapped portion



ON Semiconductor and the ON logo are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.