

# DIO2564

## Four-Channel, High Definition/Standard Definition Selectable Video Filter Driver

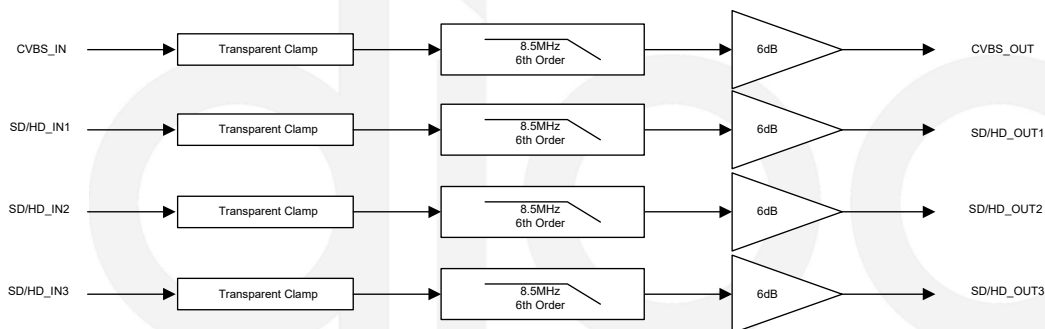
### Features

- One CVBS channel with 6<sup>th</sup>-order, 8.5MHz filter
- Three channels with per channel a selectable 6<sup>th</sup>-order, 8.5/34MHz filter
- Transparent Input Clamping
- Fixed 6dB Gain
- AC or DC Coupled Inputs
- AC or DC Coupled Outputs
- Operates from 3.135V to 5.25V Single Power Supply
- RoHS or Green TSSOP-14 Package
- 8kV ESD protection

### Applications

- DVD Players
- Video Amplifiers
- Cable set-top boxes
- Personal Video Recorders
- Communications Devices
- Video on Demand

### Block Diagram



### Ordering Information

| Order Part Number | Top Marking |               | T <sub>A</sub> | Package  |                   |
|-------------------|-------------|---------------|----------------|----------|-------------------|
| DIO2564TP14       | DIO2564     | RoHS or Green | -40 to +85°C   | TSSOP-14 | Tape & Reel, 2500 |

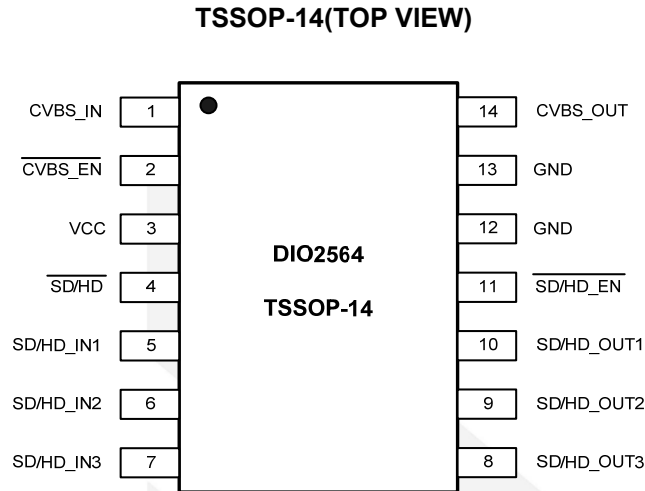
### Descriptions

DIO2564 is a low voltage, four channels video amplifier with integrated 6dB reconstruction filter and input clamps. In fact, DIO2564 integrates a single CVBS (SD) video driver plus a triple SD/HD selectable video driver. Two enable pins are provided to reduce power consumption. DIO2564 can improve image quality compared to the passive LC filters.

All channels can be directly driven by a DC-coupled or an AC-coupled signal. Internal diode-like clamps and bias circuitry may be used if AC-coupled inputs are required. The output in DIO2564 can also drive AC or DC coupled single (150Ω) or dual (75Ω) loads. The DC coupling capacitors can be removed.

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## Pin Assignments



**Figure 1 Pin Assignment**

## Pin Description

| Pin | Name       | Type   | Description  |
|-----|------------|--------|--|
| 1   | CVBS_IN    | Input  | Channel SD Video Input   |
| 2   | CVBS_EN    | Input  | SD Channel Enable/Disable<br>Low=Enable (default); High=Disable    |
| 3   | VCC        | Power  | Power Supply   |
| 4   | SD/HD      | Input  | Selection for Channels SD/HD<br>Low=Channel SD; High= Channel HD   |
| 5   | SD/HD_IN1  | Input  | Selectable Channel SD or HD Video Input1                           |
| 6   | SD/HD_IN2  | Input  | Selectable Channel SD or HD Video Input2                           |
| 7   | SD/HD_IN3  | Input  | Selectable Channel SD or HD Video Input3                           |
| 8   | SD/HD_OUT3 | Output | Channel SD or HD Video Output3                                     |
| 9   | SD/HD_OUT2 | Output | Channel SD or HD Video Output2                                     |
| 10  | SD/HD_OUT1 | Output | Channel SD or HD Video Output1                                     |
| 11  | SD/HD_EN   | Input  | SD/HD Channel Enable/Disable<br>Low=Enable (default); High=Disable |
| 12  | GND        | Ground | Ground   |
| 13  | GND        | Ground | Ground   |
| 14  | CVBS_OUT   | Output | Channel SD Video Output  |

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## Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Rating” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

| Parameter                 |                         | Rating               | Unit |
|---------------------------|-------------------------|----------------------|------|
| Supply Voltage            |                         | -0.3 to 6.0          | V    |
| Input Voltage             |                         | -0.3 to $V_{CC}+0.3$ | V    |
| Storage Temperature Range |                         | -65 to 150           | °C   |
| Junction Temperature      |                         | 150                  | °C   |
| Lead Temperature Range    |                         | 260                  | °C   |
| TSSOP-14 $\Theta_{JA}$    |                         | 125                  | °C/W |
| ESD                       | HBM, JEDEC: JESD22-A114 | 8                    | kV   |

## Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation to ensure optimal performance to the datasheet specifications. DIOO does not recommend exceeding them or designing to Absolute Maximum Ratings.

| Parameter                   |  | Rating        | Unit |
|-----------------------------|--|---------------|------|
| Supply Voltage              |  | 3.135 to 5.25 | V    |
| Operating Temperature Range |  | -40 to 85     | °C   |



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Four-Channel, High Definition/Standard Definition Selectable Video Filter

## Electrical Characteristics

Typical value:  $T_A = 25^\circ\text{C}$ ,  $V_{CC}=3.3\text{V}$ ,  $R_{SOURCE}=37.5\Omega$ ,  $R_L=150\Omega$  loads; referenced to 400kHz, all inputs are AC couple with  $0.1\mu\text{F}$ ; all outputs are AC coupled with  $220\mu\text{F}$ ; unless otherwise specified.

| Symbol   | Parameter                                     | Conditions                                     | Min. | Typ. | Max.            | Unit |
|--|---|--|------|------|-----------------|------|
| <b>DC ELECTRICAL CHARACTERISTICS</b>   |   |  |      |      |                 |      |
| I <sub>CC</sub>  | Supply Current                                | SD Channels Selected + C <sub>vbs</sub>        |      | 45   | 55              | mA   |
|  |   | HD Channels Selected + C <sub>vbs</sub>        |      | 52   | 61              |      |
| I <sub>SD</sub>  | Shutdown Current<br>CVBS_EN and SD/HD_EN High |  |      | 1    | 1.2             | μA   |
| V <sub>IN</sub>  | Input Common Mode Voltage Range               |  | GND  |      | 1.4             | V    |
| V <sub>IH</sub>  | Input High level for Control Pin              |  | 2.4  |      | V <sub>CC</sub> | V    |
| V <sub>IL</sub>  | Input Low level for Control Pin               |  | 0    |      | 0.8             | V    |
| V <sub>OH</sub>  | Output High Voltage                           |  |      | 3    |                 | V    |
| V <sub>OL</sub>  | Output High Voltage                           |  |      | 200  |                 | mV   |
| I <sub>o</sub>   | Output Current                                |  |      | 50   |                 | mA   |
| PSRR   | Power Supply Rejection                        |  |      | -50  | -60             | dB   |
| <b>HIGH DEFINITION AC PERFORMANCE</b> (V <sub>in</sub> = 1 V <sub>PP</sub> , SD/HD = High )    |   |  |      |      |                 |      |
| AV   | Channel Gain                                  |  | 5.8  | 6.0  | 6.2             | dB   |
| BW   | Band Width                                    | ±0.5dB, R <sub>SOURCE</sub> =75Ω               | 24   | 26   |                 | MHz  |
|  |   | -1dB, R <sub>SOURCE</sub> =75Ω                 | 26   | 30   |                 |      |
|  |   | -3dB, R <sub>SOURCE</sub> =75Ω                 | 30   | 34   |                 |      |
| AR   | Attenuation                                   | f=37.125MHz, R <sub>SOURCE</sub> =75Ω          | 4.6  | 5.8  |                 | dB   |
|  |   | f=44.25MHz, R <sub>SOURCE</sub> =75Ω           | 10.0 | 12.5 |                 |      |
|  |   | f=74.25MHz, R <sub>SOURCE</sub> =75Ω           | 31.2 | 33.2 |                 |      |
| THD  | Output Distortion                             | V <sub>OUT</sub> =1.4V <sub>PP</sub> , f=10MHz |      | 0.6  | 1.1             | %    |
|  |   | V <sub>OUT</sub> =1.4V <sub>PP</sub> , f=20MHz |      | 0.8  | 1.7             |      |
| X <sub>TALK</sub>  | Crosstalk                                     | f=1MHz, V <sub>IN</sub> =1.4V <sub>PP</sub>    |      | -70  |                 | dB   |
| SNR  | Signal to Noise Ratio                         | 100kHz to 30MHz,<br>100% White Signal          |      | 65   |                 | dB   |
|  | Group Delay                                   | 100kHz to 30MHz                                |      | 5    |                 | ns   |
|  | Propagation Delay                             | Input to Output                                |      | 20   |                 | ns   |
| SR   | Slew Rate                                     | 2V Output 80% to 20%                           |      | 100  |                 | V/μs |
| <b>STANDARD DEFINITION AC PERFORMANCE</b> (V <sub>in</sub> = 1 V <sub>PP</sub> , SD/HD = Low ) |   |  |      |      |                 |      |
| AV   | Channel Gain                                  |  |      | 6.0  |                 | dB   |
| BW   | Bandwidth                                     | -1dB   | 6.0  |      | 7.0             | MHz  |
|  |   | -3dB   | 8.0  |      | 9.0             |      |
| AR   | Attenuation                                   | f=27MHz  |      | -50  |                 | dB   |
| DG   | Differential Gain                             |  |      | 0.6  |                 | %    |

Specifications subject to change without notice.

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Four-Channel, High Definition/Standard Definition Selectable Video Filter

## Electrical Characteristics(continue)

| Symbol            | Parameter             | Conditions                       | Min. | Typ. | Max. | Unit |
|-------------------|-----------------------|----------------------------------|------|------|------|------|
| DP                | Differential Phase    |                                  |      | 1.2  |      | °    |
| THD               | Output Distortion     | f=4MHz                           |      | 1.5  |      | %    |
| X <sub>TALK</sub> | Crosstalk             | f=1MHz                           |      | -74  |      | dB   |
| SNR               | Signal to Noise Ratio |                                  |      | 65   |      | dB   |
| t <sub>PD</sub>   | Propagation Delay     |                                  |      | 80   |      | ns   |
|                   | Group Delay           | f=400kHz, 6.5MHz                 |      | 10   |      | ns   |
| CLG_SD            | Chroma Luma Gain      | f=3.58MHz ref to SD in at 400kHz | 95   | 100  | 105  | %    |
| CLD_SD            | Chroma Luma Delay     | f=3.58MHz ref to SD in at 400kHz |      | 5.5  |      | ns   |

Notes: SNR=20 • log (714mV / rms noise).

Specifications subject to change without notice.



## CONTACT US

Dioo is a professional design and sales corporation for high-quality and performance analog semiconductors. The company focuses on industry markets, such as, cell phone, handheld products, laptop, and medical equipments and so on. Dioo's product families include analog signal processing and amplifying, LED drivers and charger IC. Go to <http://www.dioo.com> for a complete list of Dioo product families.

For additional product information, or full datasheet, please contact with our Sales Department or Representatives.

