

DIO2573

Low-Cost, 3-Channel, SD/PS/HD Video Filter Driver

Features

- Three channel 6th-order video filter with bandwidth 8MHz, 16MHz, or 32MHz for SD/PS/HD
- With Wide Bandwidth Bypass Mode
- Supports Component YPrPb or RGB video
- 6dB Gain for 150Ω double terminated video load
- Selectable clamp or bias mode on Pb/B, Pr/R inputs
- Compatible for AC- or DC-Coupled inputs and outputs
- DC-Coupled outputs, no need for coupling capacitors
- Output disable
- Single 5V supply
- 8kV HBM ESD protection

Applications

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

Descriptions

DIO2573 is a comprehensive filter for applications such as set-top box or DVD players. It could be a replacement for passive LC filters and drivers with a low-cost integrated device.

DIO2573 filter channels supports component YPbPr or RGB video signals. Frequency response of the filter channels offers selectable 8, 16, or 32MHz. The filters can also be bypassed for high-frequency operation. DIO2573 also has input biasing mode and output disable.

DIO2573 could be driven directly by DC-coupled DAC output or AC-coupled video load.

DIO2573 has an output amplifier in each channel, which can drive a single 150Ω AC- or DC-coupled video load. These amplifiers can be disabled to save power when DC-coupled.

Ordering Information

Order Part Number	Top Marking		T _A	Package	
DIO2573TP14	DIO2573	RoHS or Green	-40 to +85°C	TSSOP-14	Tape & Reel, 2500
DIO2573XT14	DIO2573	RoHS or Green	-40 to +85°C	EP-TSSOP-14	Tape & Reel, 2500

Pin Assignments

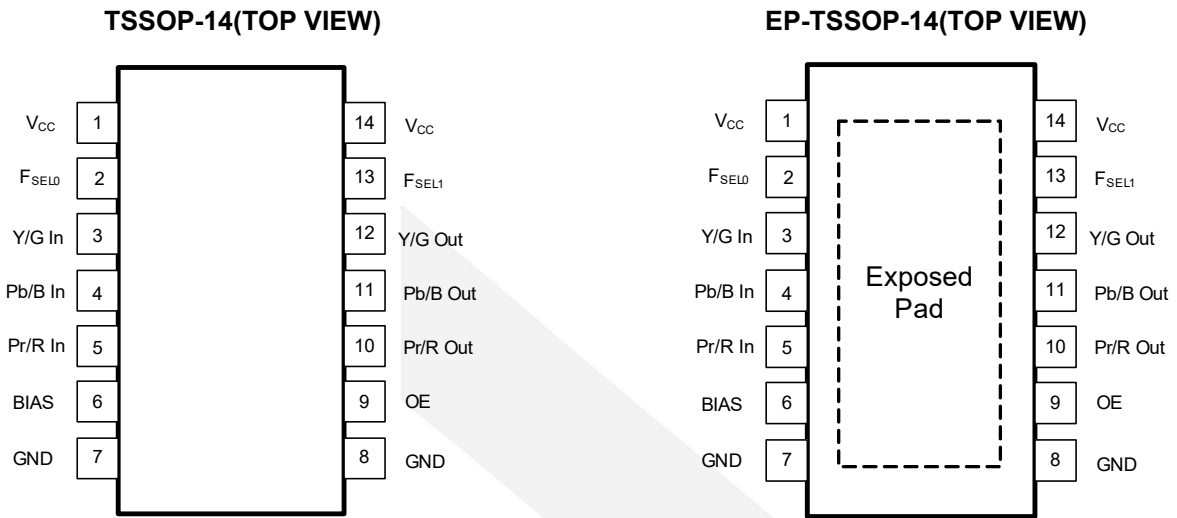


Figure 1 Pin Assignment

Pin Description

Pin	Name	Type	Description
1	Vcc	Power	+5V supply
2	F _{SEL0}	Input	Selects filter corner frequency
3	Y/G In	Input	Selectable video input
4	Pb/B In	Input	Selectable video input
5	Pr/R In	Input	Selectable video input
6	BIAS	Input	Input bias on Pb/B Pr/R: 0=Bias 1=Clamp
7/8	GND	Ground	Must be tied to ground. Do not float
9	OE	Input	Output enable control: 0=Disable, 1=Enable
10	Pr/R Out	Output	Filtered SD, PS, HD, BP video output
11	Pb/B Out	Output	Filtered SD, PS, HD, BP video output
12	Y/G Out	Output	Filtered SD, PS, HD, BP video output
13	F _{SEL1}	Input	Selects filter corner frequency
14	Vcc	Power	+5V supply

Truth Table for Frequency Select

F _{SEL1}	F _{SEL0}	Filter Frequency	Video Format	Sync Format
0	0	8MHz	SD, 480i	Bi-level, 4.7us Pulse Width
0	1	16MHz	PS, 480p	Bi-level, 2.35us Pulse Width
1	0	32MHz	HD, 1080i, 720p	Tri-level, 589ns Pulse Width
1	1	Bypass		

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/ V_{DD}		-0.3 to 6	V
Analog and Digital I/O, V_{IO}		-0.3 to $V_{CC}+0.3$	V
Output Current, Any One Channel, Do Not Exceed/ I_{OUT}		50	mA
Package Thermal Resistance/ θ_{JA}		97	°C/W
Maximum Junction Temperature/ T_{JMAX}		150	°C
Storage Temperature/ T_{STO}		-65 to 150	°C
Maximum Lead Temperature Rating		300	°C
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		4.75 to 5.25	V
Operating Temperature Range		-40 to 85	°C

Electrical Characteristics

Typical value: $T_A = 25^\circ\text{C}$, $V_{CC}=5\text{V}$, $R_{SOURCE}=37.5\Omega$, $R_L=150\Omega$ 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	Parameters	Conditions	Min	Typ	Max	Unit
DC Electrical Characteristics						
I_{CC}	Supply Current	No Load		36	75	mA
I_{CC1}	Supply Current	No Load, Output Disable		15	35	mA
V_{IN}	Video Input Voltage Range	Referenced to GND if DC Coupled		1.0		V_{PP}
V_{IL}	Digital Input Low	F_{SEL0}, F_{SEL1}	0		0.8	V
V_{IH}	Digital Input High	F_{SEL0}, F_{SEL1}	2.4		V_{CC}	V
T_{ENABLE}	Output Enable Time	150Ω DC Load		300		ns
Standard Definition Electrical Characteristics (480i)						
AV_{SD}	Channel Gain Error		-0.4	0	0.4	dB
f_{1dBSD}	-1dB Bandwidth		5.20	7.15		MHz
f_{CSD}	-3dB Bandwidth			8		MHz
f_{SBS}	Attenuation (Stop band Reject)	$f=27\text{MHz}$	40	50		dB
DG	Differential Gain			0.3		%
DP	Differential Phase			1.0		°
THD	Total Harmonic Distortion, Output	$V_{OUT}=1.4V_{PP}, 3.58\text{MHz}$		0.6		%
X_{TALKHD}	Crosstalk (Channel-to-Channel)	1MHz		-70		dB
SNR	Signal-to-Noise Ratio	NTC-7 Weighting, 100kHz to 4.2MHz		75		dB
t_{pdHD}	Propagation Delay	Delay from Input to Output, 4.5MHz		85		ns
Progressive Scan Electrical Characteristics						
AV_{PS}	Channel Gain Error		-0.4	0	0.4	dB
f_{1dBPS}	-1dB Bandwidth		10	13.5		MHz
f_{CSD}	-3dB Bandwidth			16		MHz
f_{SBPS}	Attenuation (Stop band Reject)	$f=54\text{MHz}$	37	44		dB
THD	Total Harmonic Distortion, Output	$V_{OUT}=1.4V_{PP}, 7\text{MHz}$		0.55		%
X_{TALKPS}	Crosstalk (Channel-to-Channel)	1MHz		-75		dB
SNR	Signal-to-Noise Ratio	Unweighted, 100kHz to 4.2MHz		66		dB
t_{pdPS}	Propagation Delay	Delay from Input to Output, 10 MHz		47		ns

Notes: $SNR=20 \cdot \log(714\text{mV} / \text{rms noise})$.

Specifications subject to change without notice.

Electrical Characteristics(continue)

Symbol	Parameters	Conditions	Min	Typ	Max	Unit
High-Definition Electrical Characteristics (1080i)						
AV_{HD}	Channel Gain Error		-0.4	0	0.4	dB
f_{1dBHD}	-1dB Bandwidth		28	31		MHz
f_{3dBHD}	-3dB Bandwidth			32		MHz
f_{SBHD}	Attenuation (Stop band Reject)	$f=74.25MHz$	30	40		dB
THD	Total Harmonic Distortion, Output	$V_{OUT}=0.7V_{PP}, 22MHz, 0dB, 10k\Omega$ Load		0.5		%
		$V_{OUT}=1.4V_{PP}, 22MHz, 6dB, 150\Omega$ Load		0.5		
X_{TALKHD}	Crosstalk (Channel-to-Channel)	1MHz		-75		dB
		30MHz		-57		
SNR	Signal-to-Noise Ratio	Unweighted, 100kHz to 30MHz		66		dB
t_{pDPS}	Propagation Delay	Delay from Input to Output, 20 MHz		25		ns
Bypass Mode Electrical Characteristics						
AV_{BP}	Channel Gain Error	DC	-0.4	0	0.4	
f_{1dBSD}	-1dB Bandwidth			90		MHz
f_{3dBSD}	-3dB Bandwidth			115		MHz
THD	Total Harmonic Distortion, Output	$V_{OUT}=0.7V_{PP}, 22MHz, 0dB, 10k\Omega$ Load		0.3		%
		$V_{OUT}=1.4V_{PP}, 22MHz, 6dB, 10k\Omega$ Load		0.25		
X_{TALKHD}	Crosstalk (Channel-to-Channel)	1MHz		-74		dB
		30MHz		-64		dB
SNR	Signal-to-Noise Ratio	Unweighted, 100kHz to 30MHz		70		dB

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.

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