

Feature

- 6th order 52MHz(-1dB) Butterworth video reconstruction filter
- 6 dB gain & rail to rail output
- Allowed drive 2 video channels or drive 75ohm load
- Transparent Input clamping for AC couple
- AC coupled Input with 230mV level shift
- DC & AC coupled Output
- 3.3V or 5V power supply operation
- Power dissipation: 15mA/17mA low Power Consumption(3.3V/ 5V)
- Quiescent Current(NO load): 12mA(3.3V)
- Chip available in SOT23-6 Package

General Description

The SC6619 is 6th order Butterworth reconstruction filter, it's suitable for the application in DAC reconstruction, such as FHD video camera.

Using AC coupling input, the clamp module apply 230mV voltage level shift.

The LPF apply 6dB gain in pass band, while attenuation is $< -25\text{dB}$ ($f_{\text{Att}}=100\text{MHz}$);

Applications

- FHD Camera
- FHD DVD video players, device of communication, Digital Set Top Box, etc.

Package

The package of SC6619 is SOT23-6.

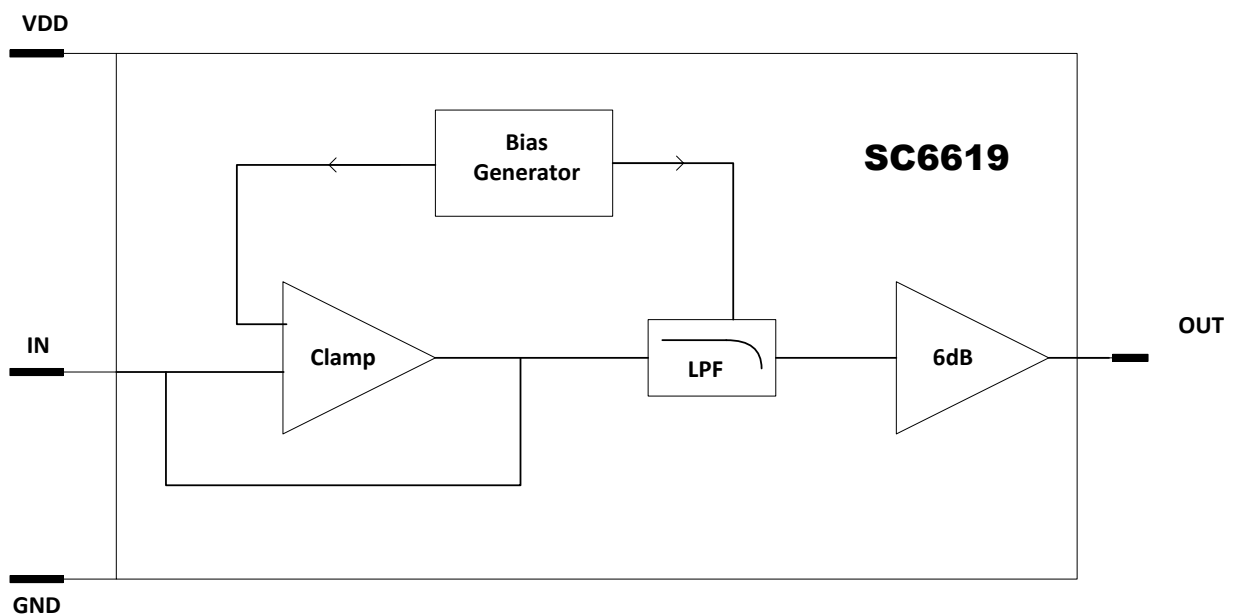


Fig.1 block diagram of SC6619

REV. 1.1

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Absolute Maximum Ratings

(if out of these ratings , the filter may be fail or damaged)

Table 1

Symbol	parameter	rating	units
VDD	Power supply	6	V
T _A	Operating ambient Temperature Range	-40~+85	°C
T _{STG}	Storage Temperature	-65~+150	°C

Recommended Operating Conditions

Table 2

Symbol	parameter	rating	units
VDD	Power supply	2.7~5.5	V
T _A	Operating ambient Temperature Range	-40~+85	°C

Electrical Characteristics

DC Characteristics (FHD)

(Typical values are simulated at $R_L=150\Omega$ $V_{in}=1V_{pp}$ $C_{in}=0.1\mu F$ output coupling cap= $220\mu F$, $T=40^\circ C$, $V_{DD}=3.3V$)

Table 3

Symbol	parameter	Min	Typ	Max	Units
ICC	Total supply current ($V_{dd}=3.3V$)		15		mA
	Total supply current ($V_{dd}=5V$)		17		
IQ	Quiescent current ($V_{dd}=3.3V$,NO input& load)		12		mA
Isc	Output short to VDD($v_{in}=V_{DD}$, Output to VDD)		72		mA
	Output short to GND($v_{in}=V_{DD}$, Output 10ohm to GND)		85		mA
Vols	Output Level Shift Voltage ($V_{in}=0V$,no load, input referred)		234		mV
VOH	Output Voltage High Swing ($V_{DD}=3.3V$)		2.8		V
	Output Voltage High Swing ($V_{DD}=5V$)		4.5		V
VOL	Output Voltage Low Swing ($V_{DD}=3.3V/5V$)		224		mV
AV	Output Voltage Gain		6		dB
Iclamp-up	Pull up clamp current		6		mA
Iclamp-down	Pull down clamp current		160		nA
PSRR	Power supply rejection ratio ($f=50Hz$)		-58		dB
	Power supply rejection ratio ($f=1MHz$)		-39		

AC Characteristics (FHD)

(Typical values are simulated at $R_L=150\text{ohm}$ $V_{in}=1\text{Vpp}$ $C_{in}=0.1\mu\text{F}$ output coupling cap= $220\mu\text{F}$, $T=40\text{ }^\circ\text{C}$, $V_{DD}=3.3\text{V}$)

Table 4

Symbol	Parameter	Min	Typ	Max	Unit
BW(-1dB)	The Band width of -1dB		51.3		MHz
BW(-3 dB)	The Band width of -3dB		56.8		MHz
Att(f=100MHz)	Stop band Attenuation at 100MHz		-31		dB
Att(f=50MHz)	Stop band Attenuation at 50MHz		0		dB
dG	Differential Gain (at Gain=6dB)		0.1		%
dP	Differential Phase(at Gain=6dB)		1		°
THD	Total Harmonic Distortion(50M , 0.6Vpp)		-42.4		dB
SNR	Signal to Noise Ratio* ¹		75		dB
T _{GD}	Group Delay Variation [100k~46MHz]		6		ns
Rout	Output Impedance at f=10MHz		1.5		ohm
SR	Slow Rate ($V_{in}=1\text{V}$, 20%~80%)		210		V/us

*1: White Signal, 100 kHz~30MHz, SNR=20*Log (714mV/RMS noise)

Typical Characteristic Curves:

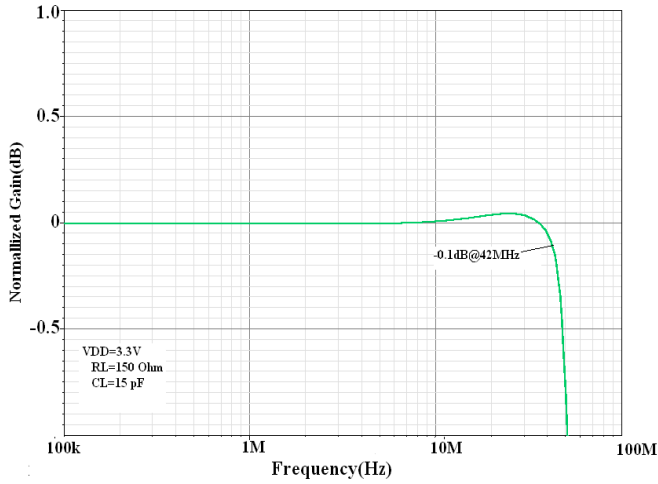


Fig2 Small Signal AC frequency response

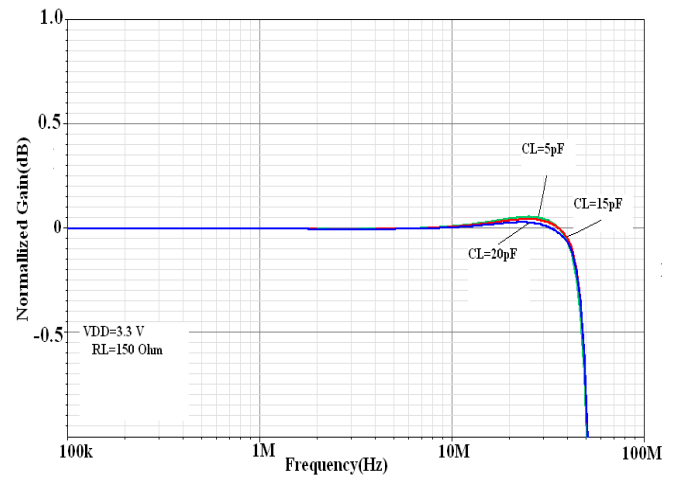


Fig3 Cloud Variation For Gain Vs Frequency

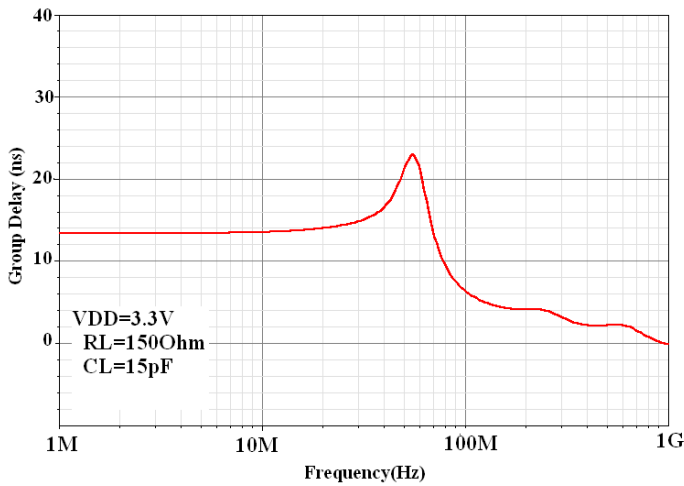


Fig4 Group Delay Vs Frequency

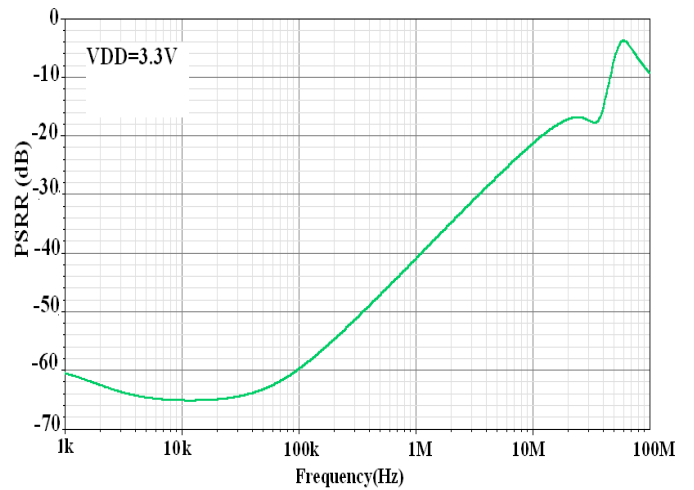


Fig5 PSRR Vs Frequency

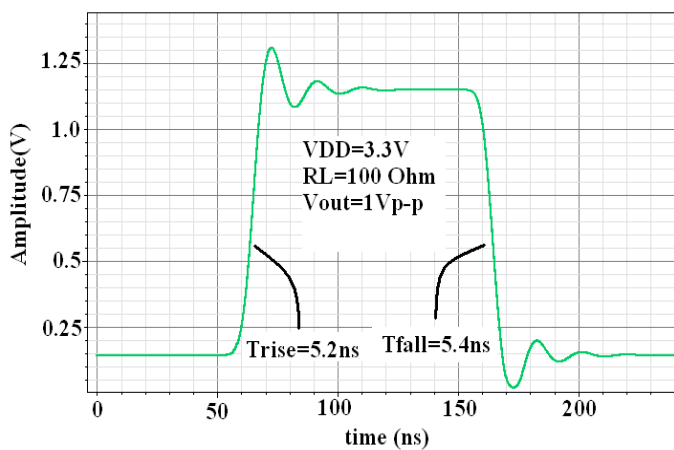


Fig6 Large Signal Transient Response

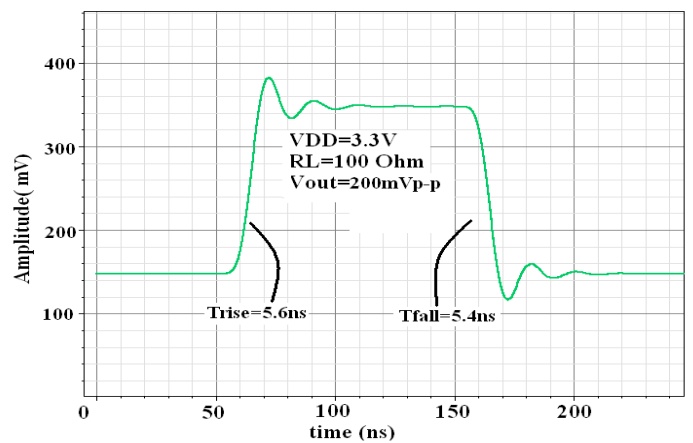


Fig7 Small Signal Transient Response

PAD Definition

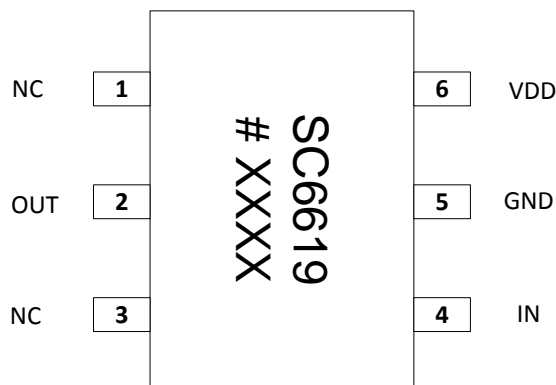


Fig 8. Pad definition of SC6619

Table 5. Pad definition

Pin	Name	I/O	Analog/Digital	Description
1,	NC	-	-	Floating Pad
2	OUT	O	A	Video signal output Pin, typical load is 150ohm, however could drive 75ohm load for 2 channel video.
3	NC	-	-	Floating Pad
4	IN	I	A	Video signal input Pin, AC coupled in;
5	GND	GROUND	GROUND	Ground pin. Connect to the most negative supply, ALL GND pads are connected on die.
6	VDD	POWER	POWER	Power supply (3.3V/5V) ,connect to positive voltage supply

Application Circuits

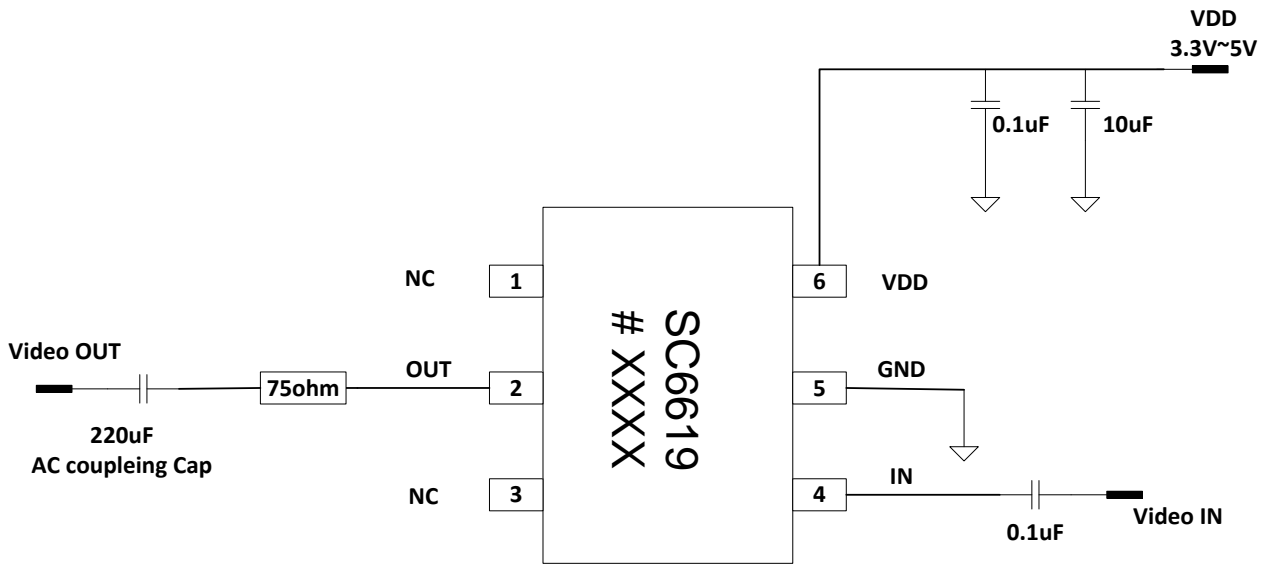


Fig. 9 AC couple Output Application Circuit

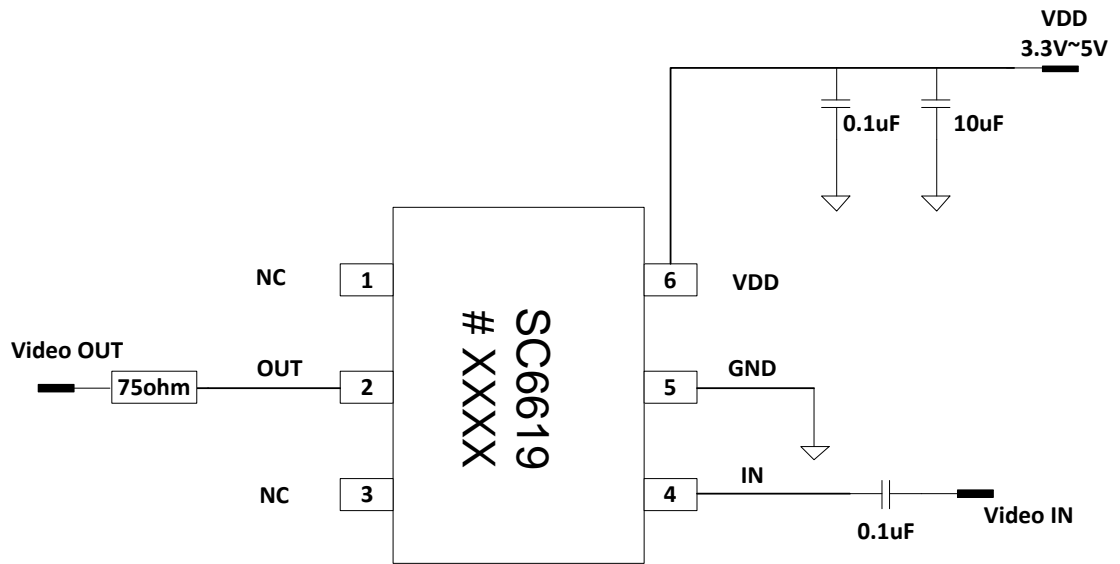
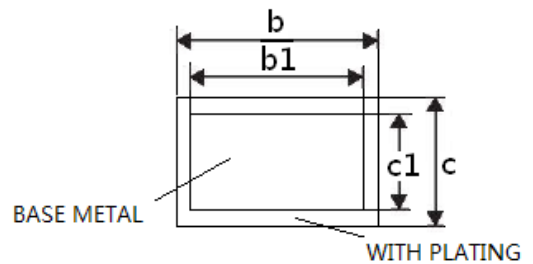
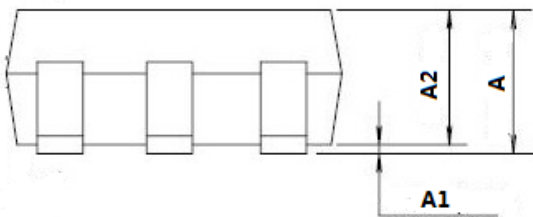
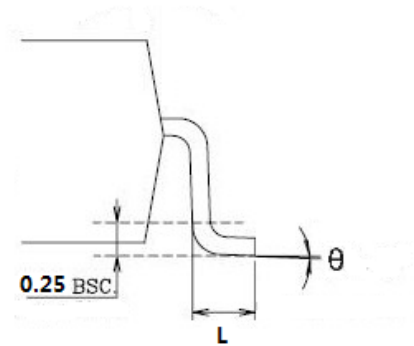
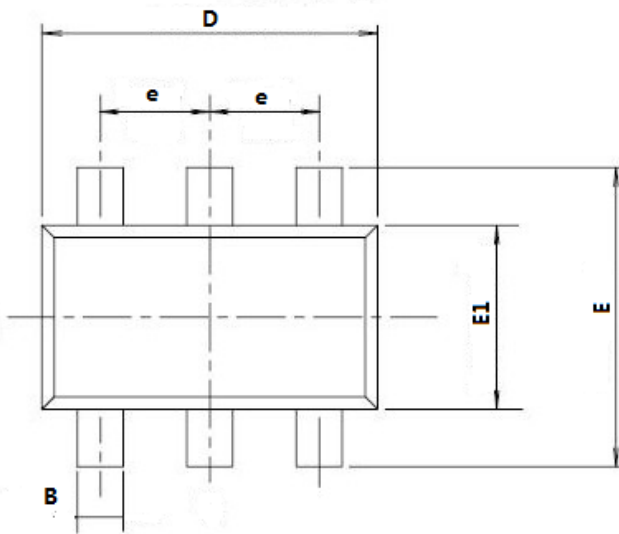


Fig.10 DC couple Output Applications Circuit

Package

SOT23-6

Symbol	Unit(mm)		
	Min	Typ	Max
A	-	-	1.35
A1	0.04	-	0.15
A2	1.00	1.10	1.20
b	0.38	-	0.48
b1	0.37	0.40	0.43
c	0.11	-	0.21
c1	0.10	0.13	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
θ	0°	-	8°
L	0.30	-	0.60



SECTION B

Fig 11. Package of SC6619