

Feature

- 6th order 26MHz/52MHz(-1dB) Butterworth video reconstruction filter
- Pin available for HD & FHD mode switch
- 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 SC6617 is 6th order Butterworth reconstruction filter, it's suitable for the application in DAC reconstruction, such as HD/FHD video camera.

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

The LPF has HD/FHD MODE, when MODE=VDD the BW (-1dB) of SC6617 is 26MHz; while if MODE=0 the BW (-1dB) of SC6617 is 52MHz.

The LPF apply 6dB gain in pass band, while attenuation is <-25dB (MODE=0, f_{Att}=100MHz; MODE=VDD, f_{Att}=50MHz);

Applications

- TVI FHD/HD Camera
- CVI FHD/HD Camera
- AHD FHD/HD Camera
- DVD video players, device of communication, Digital Set Top Box, etc.

Package

The package of SC6617 is SOT23-6.

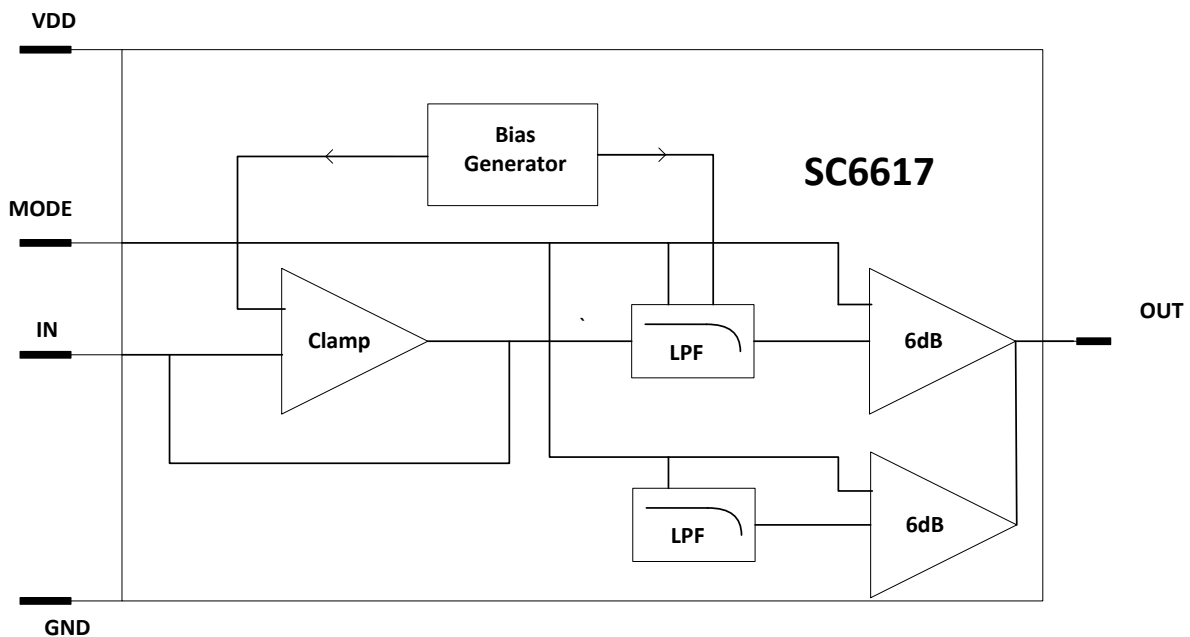


Fig.1 block diagram of SC6617

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

HD mode DC Characteristics

(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 ($f=1MHz$)		-36		

HD mode AC Characteristics

(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		26.2		MHz
BW(-3 dB)	The Band width of -3dB		28.6		MHz
Att(f=50MHz)	Stop band Attenuation at 50MHz		-30		dB
Att(f=25MHz)	Stop band Attenuation at 25MHz		0		dB
dG	Differential Gain (at Gain=6dB)		0.4		%
dP	Differential Phase(at Gain=6dB)		1		°
THD	Total Harmonic Distortion(25M , 0.6Vpp)		-48		dB
SNR	Signal to Noise Ratio* ¹		64		dB
T _{GD}	Group Delay Variation [100k~21MHz]		8		ns
Rout	Output Impedance at f=10MHz		1		ohm
SR	Slow Rate ($V_{in}=1\text{V}$, 20%~80%)		110		V/us

FHD mode DC Characteristics

 (Typical values are simulated at $R_L=150\Omega$ $V_{in}=1V_{pp}$ $C_{in}=0.1\mu F$ output coupling cap= $220\mu F$, $T=30^\circ C$, $V_{DD}=3.3V$)

Table 5

Symbol	parameter	Min	Typ	Max	Units
ICC	Total supply current (Vdd=3.3V)		15		mA
	Total supply current (Vdd=5V)		17		
IQ	Quiescent current (NO input & load)		12		mA
Isc	Output short to VDD	-	72	-	mA
	Output short to GND		85		mA
Vols	Output Level Shift Voltage ($V_{in}=0V$, no load, input referred)		234		mV
VOH	Output Voltage High Swing(VDD=3.3V)		2.8		V
	Output Voltage High Swing (VDD=5V)		4.5		V
VOL	Output Voltage Low Swing		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)		-57		dB
	Power supply rejection ratio (f=1MHz)		-39		

FHD mode AC Characteristics

 (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 6

Symbol	Parameter	Min	Typ	Max	Unit
BW(-1dB)	The Band width of -1dB		52.3		MHz
BW(-3 dB)	The Band width of -3dB		56.3		MHz
Att(f=100MHz)	Stop band Attenuation at 50MHz		-30		dB
Att(f=50MHz)	Stop band Attenuation at 25MHz		0		dB
dG	Differential Gain (at Gain=6dB)		0.4		%
dP	Differential Phase(at Gain=6dB)		1		°
THD	Total Harmonic Distortion(50M , 0.6vpp)		-40		dB
	Total Harmonic Distortion(10M , 1.4vpp)		-46		
SNR	Signal to Noise Ratio* ¹		64		dB
T _{GD}	Group Delay Variation [100k~46MHz]		6.0		ns
Rout	Output Impedance at f=10MHz		1		ohm
SR	Slew Rate ($V_{in}=1V$, 20%~80%)		212		V/us

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

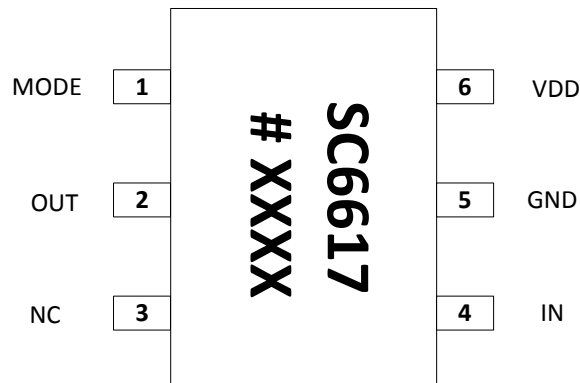
PAD Definition


Fig 2. Pad definition of SC6617

Table 7. Pad definition

Pin	Name	I/O	Analog/Digital	Description
1	MODE	I	D	HD/FHD mode select Pin: MODE=3.3V(5V), the BW(-1dB)=26MHz(HD mode); MODE=0v, the BW(-1dB)=52MHz (FHD mode) ; MODE=floating, the BW(-1dB)=52MHz (FHD mode);
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 or DC coupled;
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

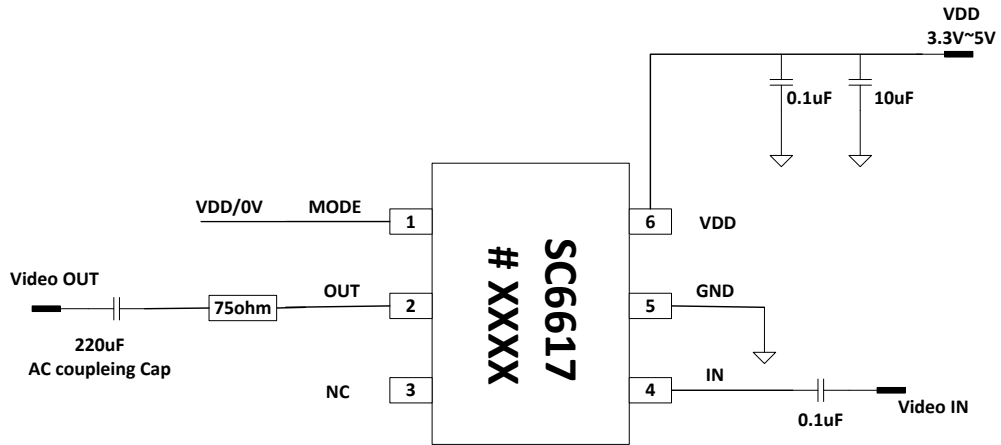


Fig. 3 AC couple Output Application Circuit

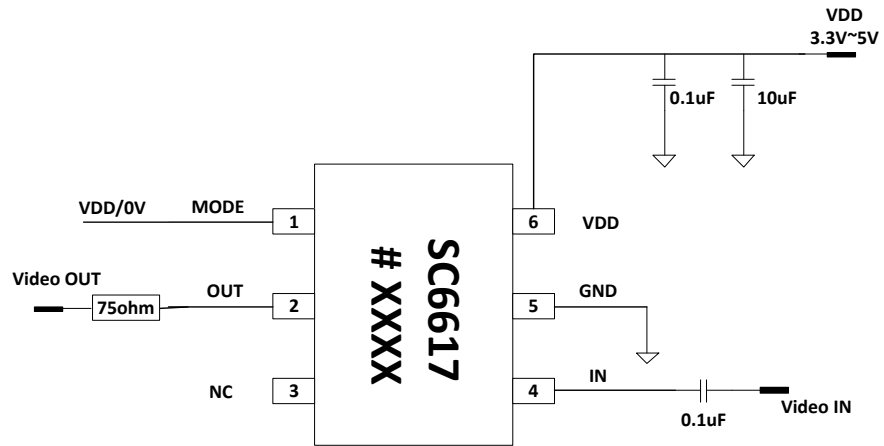
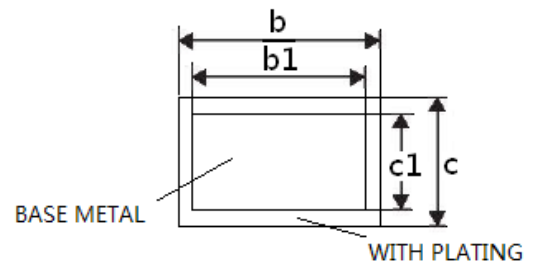
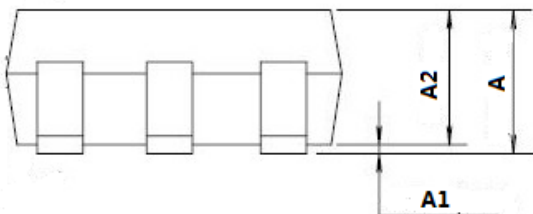
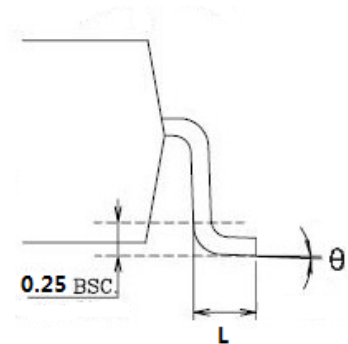
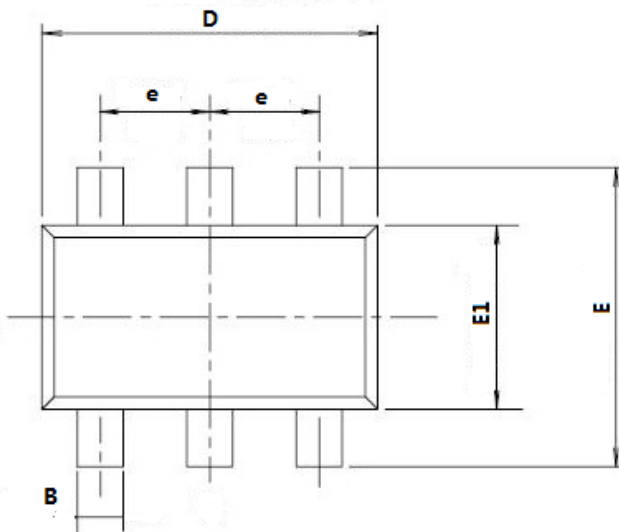


Fig.4 DC couple Output Applications Circuit

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 5. Package of SC6617