

## Feature

- 6th order 29MHz(-3dB) Butterworth HD video filter
- 6 dB DC Gain & rail to rail output
- Can drive dual AC or DC coupled video channels (75Ω load)
- AC coupled Input with 230mV level shift
- 3.3V or 5V power supply operation
- Power dissipation: 15mA/17mA (3.3V/ 5V)
- Quiescent Current(No load): 12mA (3.3V)

## Applications

- HD Camera
- DVD video players
- Device of communication
- Digital Set-Top Box, etc.

## General Description

The SC6615 is a 6th order Butterworth HD reconstruction filter; it's suitable for the application in DAC reconstruction, such as HD TVI /AHD video camera.

SC6619 may be directly driven by AC coupled input signal, the internal clamp module provides constant 230mV level shift.

The LPF apply 6dB DC Gain, while attenuation @50MHz is <-25dB; the output can drive AC or DC-coupled single (150Ω) or dual (75Ω) video loads.

## Package

The package of SC6615 is SOT23-6 and SC70-5.

## Block Diagram

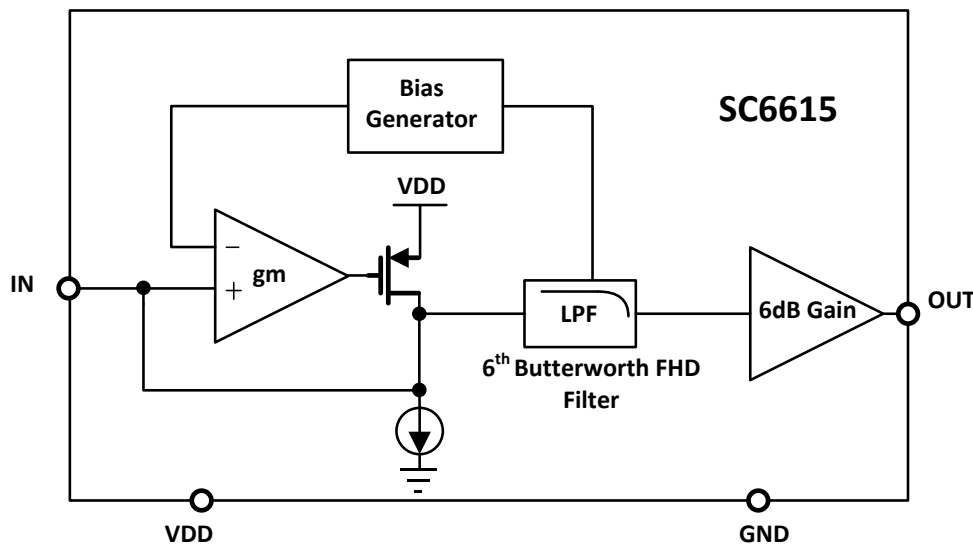


Fig.1 block diagram of SC6615

REV. 1.3

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**Absolute Maximum Ratings**

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

Table 1

<b>Symbol</b>	<b>Parameter</b>	<b>Rating</b>	<b>Units</b>
VDD	Power supply	5.5	V
T <sub>A</sub>	Operating ambient Temperature Range	-40~+85	°C
T <sub>STG</sub>	Storage Temperature	-65~+150	°C

**Recommended Operating Conditions**

Table 2

<b>Symbol</b>	<b>Parameter</b>	<b>Rating</b>	<b>Units</b>
VDD	Power supply	2.7~5.5	V
T <sub>A</sub>	Operating ambient Temperature Range	-40~+85	°C

## Electrical Characteristics

### DC Characteristics

(Typical values are simulated at  $R_L=150\Omega$   $V_{IN}=1V_{pp}$   $C_{in}=0.1\mu F$  output AC coupled 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		

**AC Characteristics**

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

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
Attenuation (@50MHz)	Stop band Attenuation at 50MHz		-30		dB
Attenuation (@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* <sup>1</sup>		64		dB
T <sub>GD</sub>	Group Delay Variation [100k~21MHz]		8		ns
R <sub>out</sub>	Output Impedance at f=10MHz		1		ohm
SR	Slow Rate ( $V_{in}=1V$ , 20%~80%)		110		V/us

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

### Pin Definition

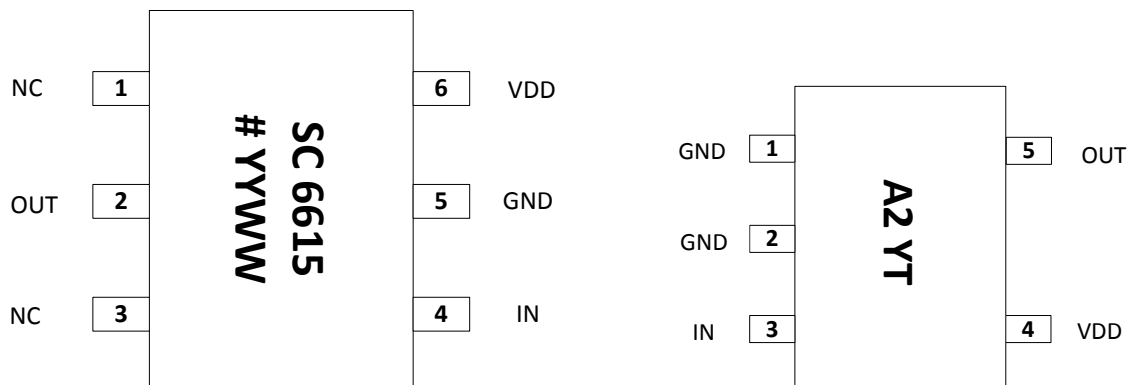


Fig 2. Pin definition of SC6615

NOTE: Mark on chip ( SOT23-6 ) YY=year code WW=week code

Mark on chip ( SC70-5 ) A2 =chip model ( SC6615 ) Y=year code W=week code

Table 5. Pin Description

Pin		Name	I/O	Analog/Digital	Description
SOT23-6	SC70-5				
1	-	NC	-	-	Floating Pad
2	5	OUT	O	A	Video signal output Pin, typical load is 150ohm, However it could drive 75ohm load for 2 channel videos.
3	-	NC	-	-	Floating Pad
4	3	IN	I	A	Video signal input Pin, AC coupled in;
5	1,2	GND	GROUND	GROUND	Ground pin. Connect to the most negative supply, ALL GND pads are connected on die.
6	4	VDD	POWER	POWER	Power supply (3.3V/5V) ,connect to positive voltage supply

Typical Application Circuits

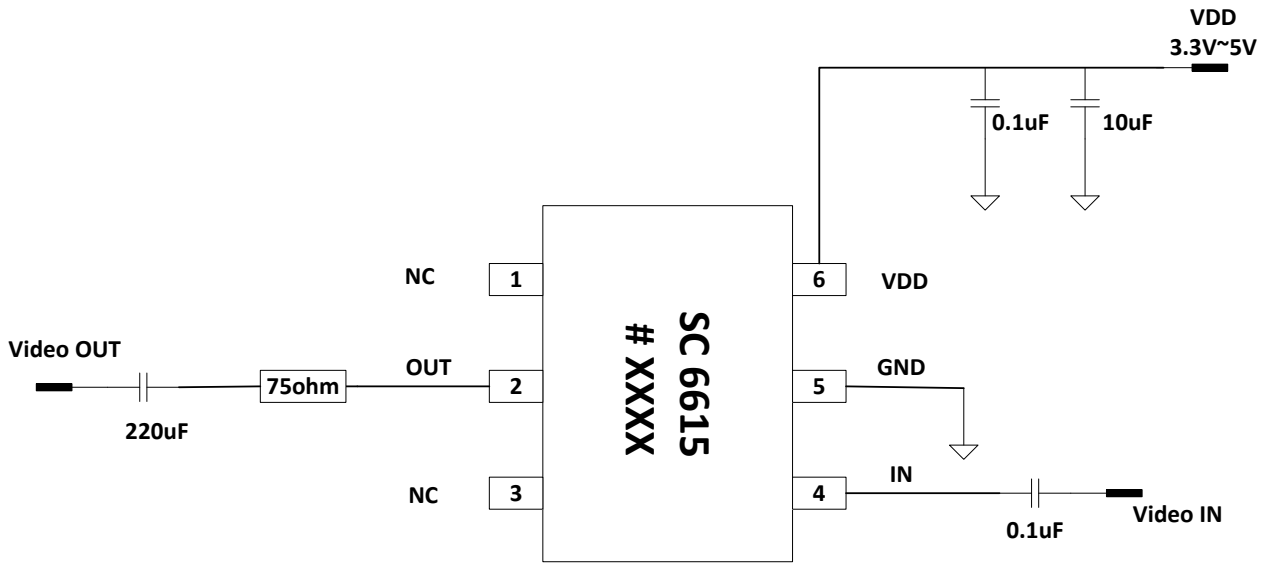


Fig. 3 AC couple Output Application Circuit

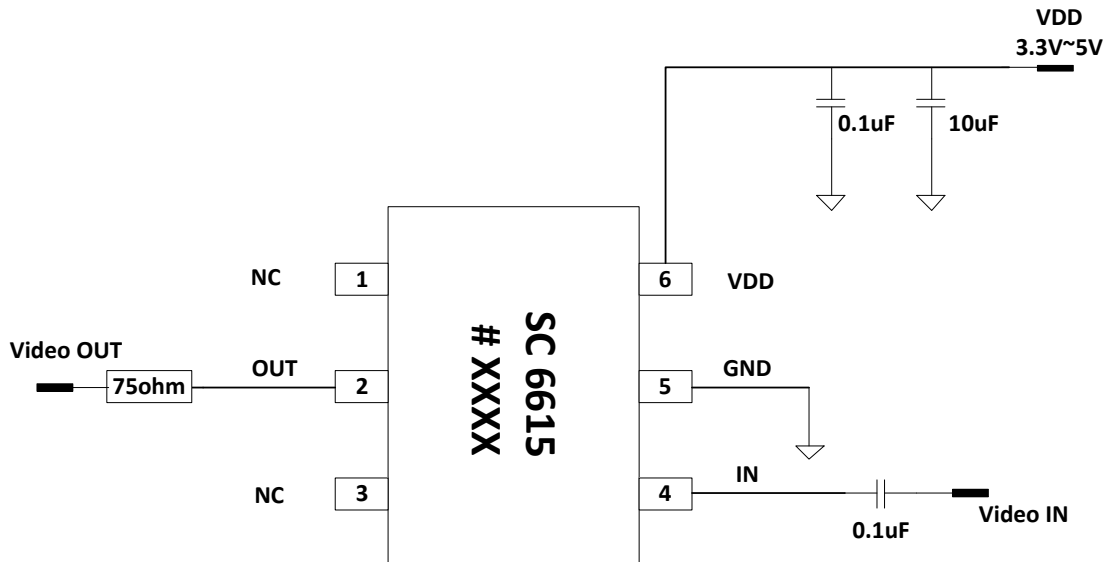


Fig.4 DC couple Output Applications Circuit

## 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		
$\theta$	0°	-	8°
L	0.30	-	0.60

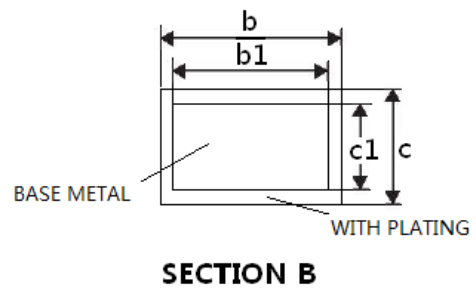
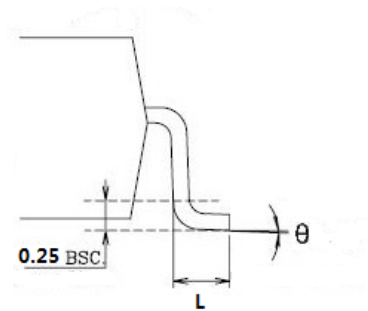
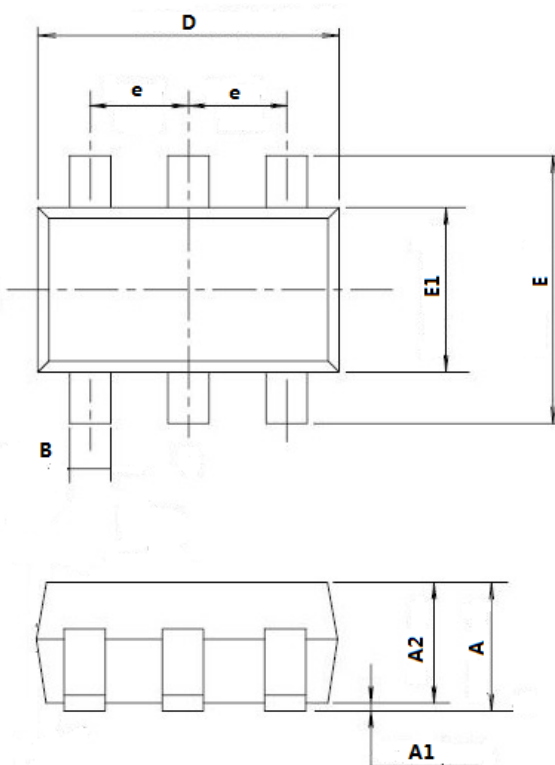


Fig 5. Package of SOT23-6

**SC70-5**

Symbol	Unit(mm)		
	Min	Typ	Max
A	0.900	-	1.100
A1	0.000	-	0.100
A2	0.900	-	1.000
b	0.150	-	0.350
c	0.080	-	0.150
D	2.000	-	2.200
E	1.150	-	1.350
E1	2.150	-	2.450
e	-	0.65	-
e1	1.300BSC		
L	0.525REF		
L1	0.260	-	0.460
$\theta$	0°	-	8°

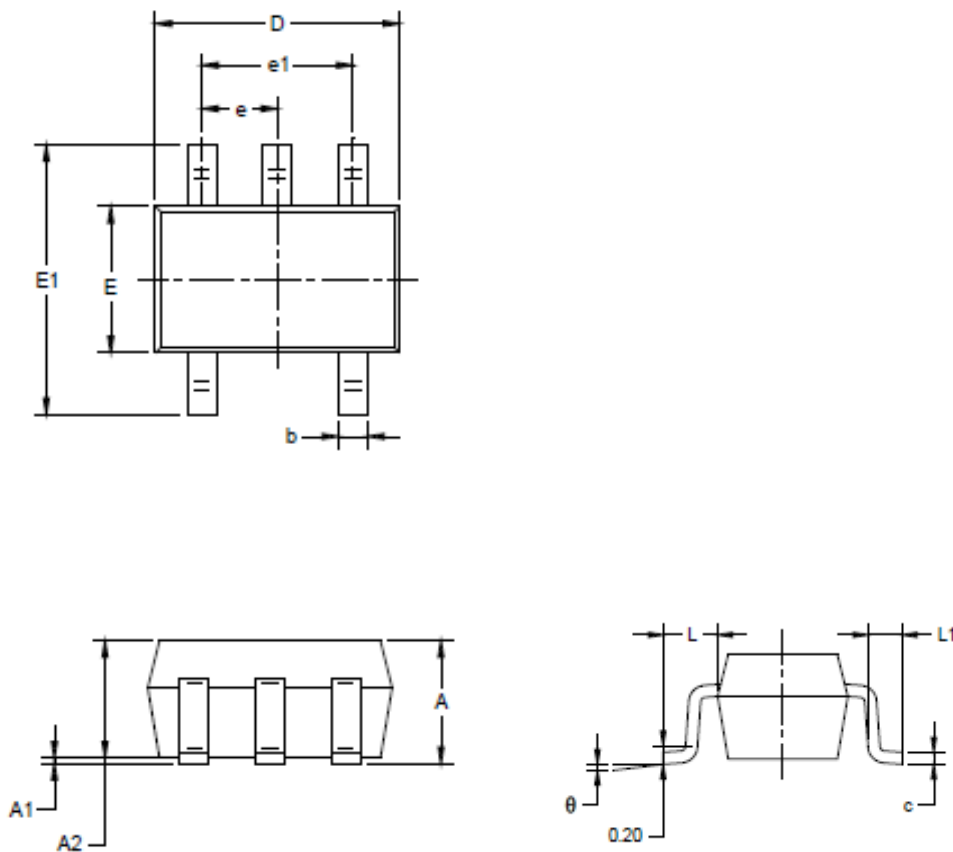
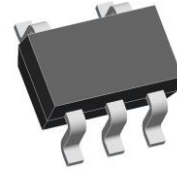


Fig 6. Package of SC70-5