

Feature

- 6th order 72MHz(-3dB) Butterworth video filter
- 6 dB DC gain
- Allowed drive 2 video channels (drive 75ohm load)
- AC or DC coupled input
- DC & AC coupled Rail to Rail output
- 3.3V or 5V power supply operation
- Attenuation -39dB @144MHz
- Quiescent current(no load): 12mA(3.3V)
- Chip available in SOT23-6 and SC70-5 Package

General Description

The SC6619B is a low power consuming, 6th order Butterworth Filter, it's suitable for the application in DAC reconstruction, such as FHD TVI/AHD/CVI video camera.

SC6619B supports AC or DC coupling input for the filter, it applies 80mV level shift.

The LPF applies 6dB gain in pass band, and it applies attenuation -20dB @100MHz/-39dB@144MHz, the high attenuation is great useful for Improving the quality of the image , reducing the noise;

Applications

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

Package

The package of SC6619B is SOT23-6 and SC70-5.

Block diagram

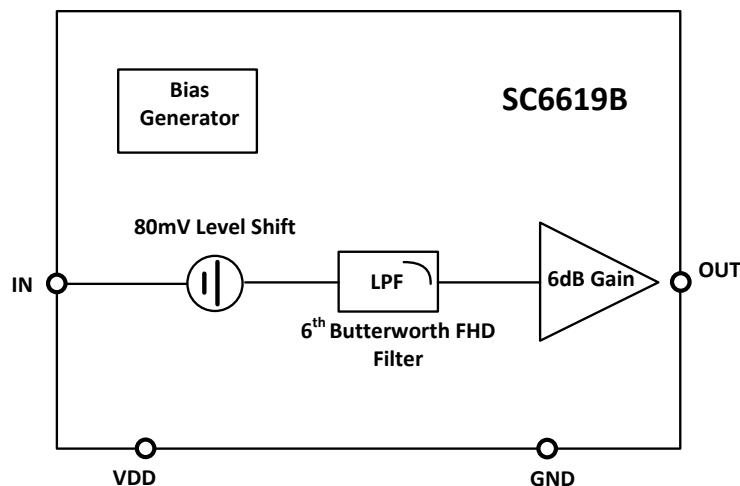


Fig.1 block diagram of SC6619B

REV. 1.4

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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)		10		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	If AC Couple, output offset Voltage ($V_{in}=0V$,no load, input referred)		150		mV
	If DC Couple, output Level Shift Voltage (input referred)		100		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
PSRR	Power supply rejection ratio ($f=50Hz$)		-58		dB
	Power supply rejection ratio ($f=1MHz$)		-39		

AC Characteristics (FHD)

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

Table 4

Symbol	Parameter	Min	Typ	Max	Unit
BW(-1dB)	The Band width of -1dB		68		MHz
BW(-3 dB)	The Band width of -3dB		72		MHz
Att(f=100MHz)	Stop band Attenuation at 100MHz		-20		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 ($V_{in}=1V$, 20%~80%)		210		V/us

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

Typical Characteristic Curves:

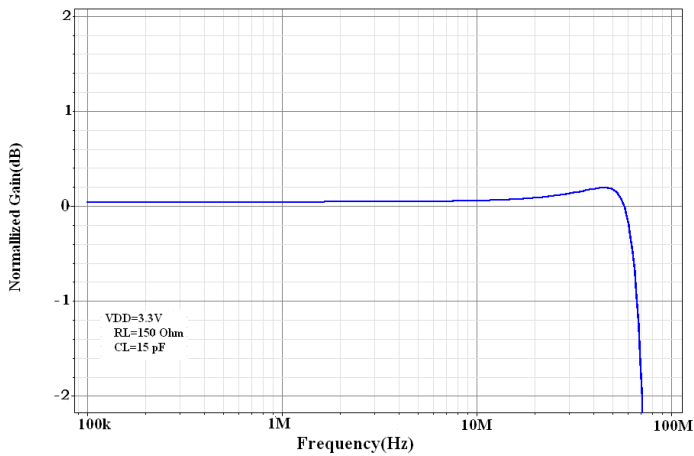


Fig2 Small Signal AC frequency response

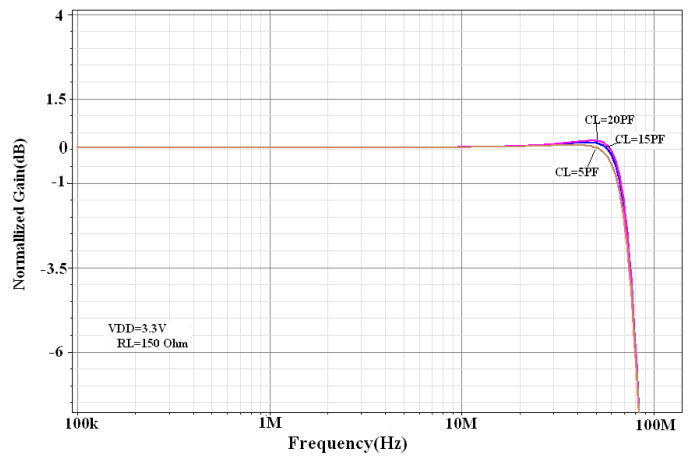


Fig3 Load Variation For Gain Vs Frequency

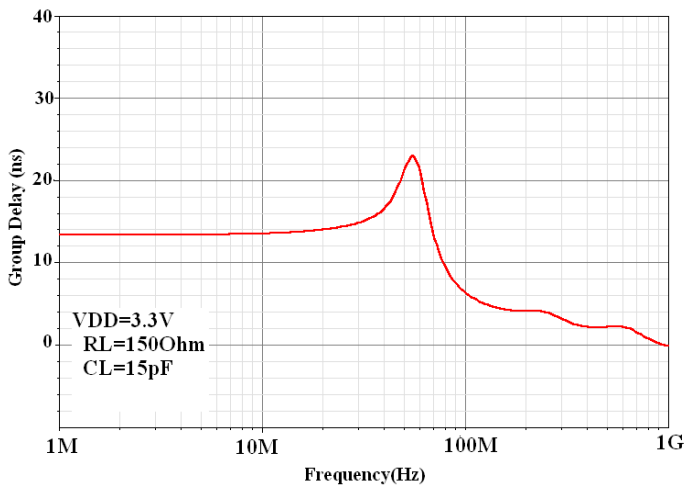


Fig4 Group Delay Vs Frequency

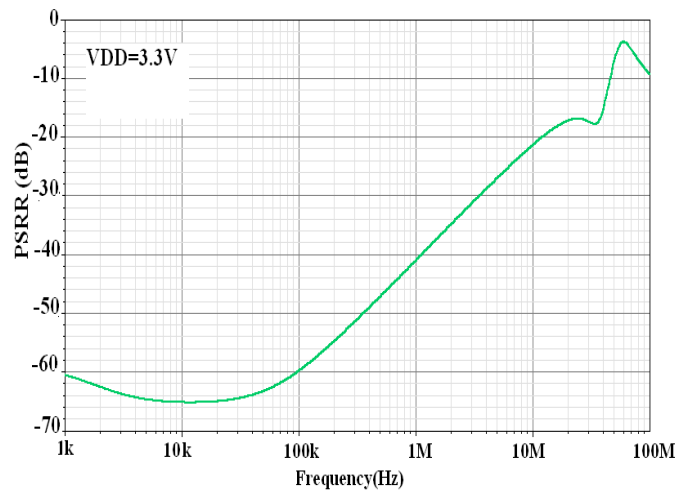


Fig5 PSRR Vs Frequency

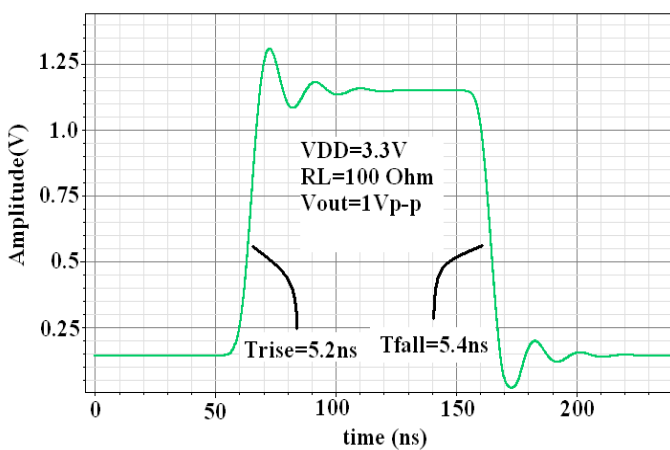


Fig6 Large Signal Transient Response

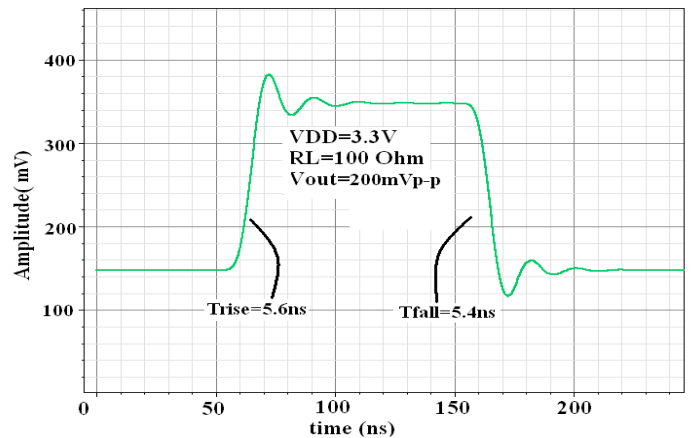


Fig7 Small Signal Transient Response

PAD Definition

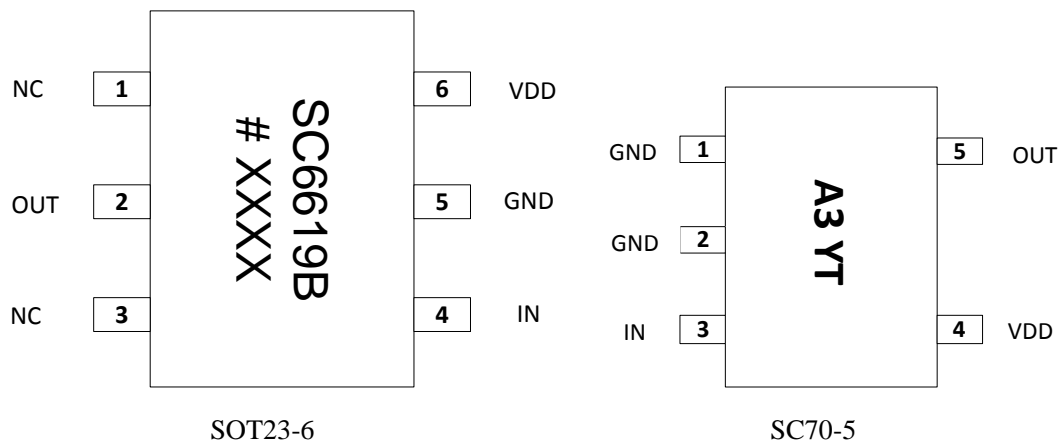


Fig 8. Pad definition of SC6619B

Table 5. Pad definition

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 could drive 75ohm load for 2 channel video.
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

Application Circuits

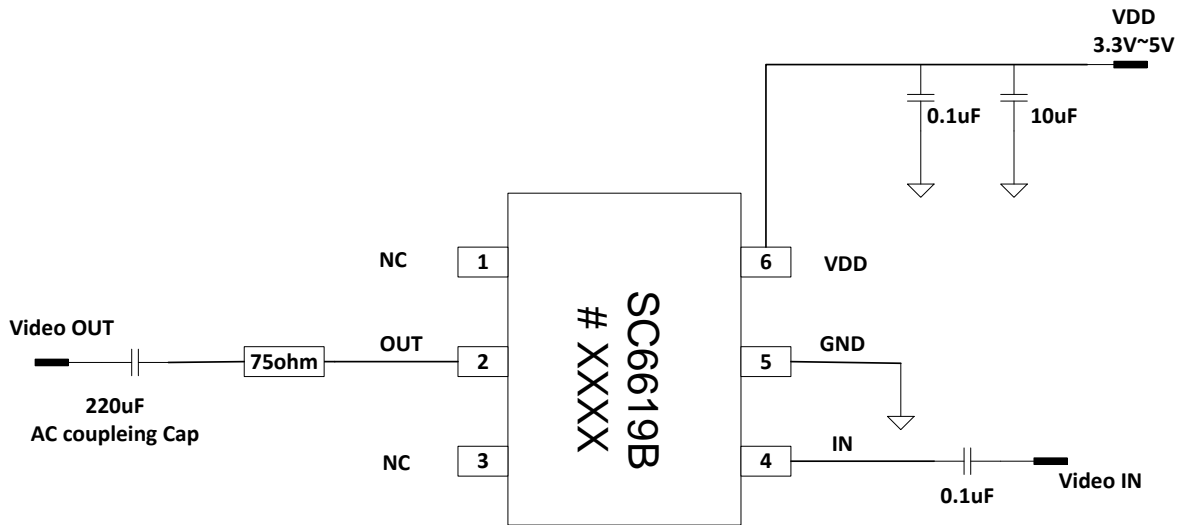


Fig. 9 AC couple Input and AC couple Output Application Circuit

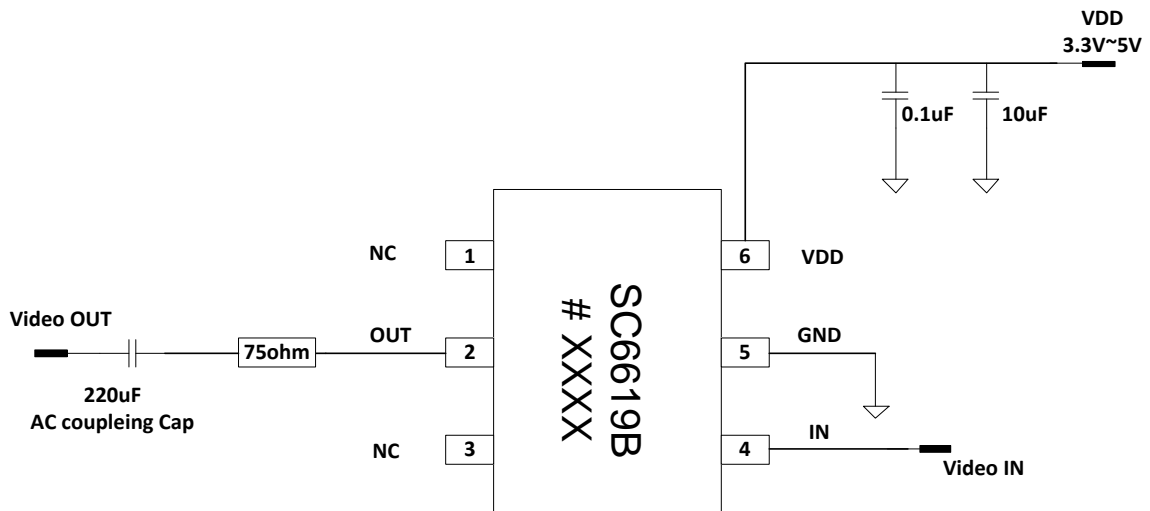


Fig. 10 DC couple Input and AC couple Output Application Circuit

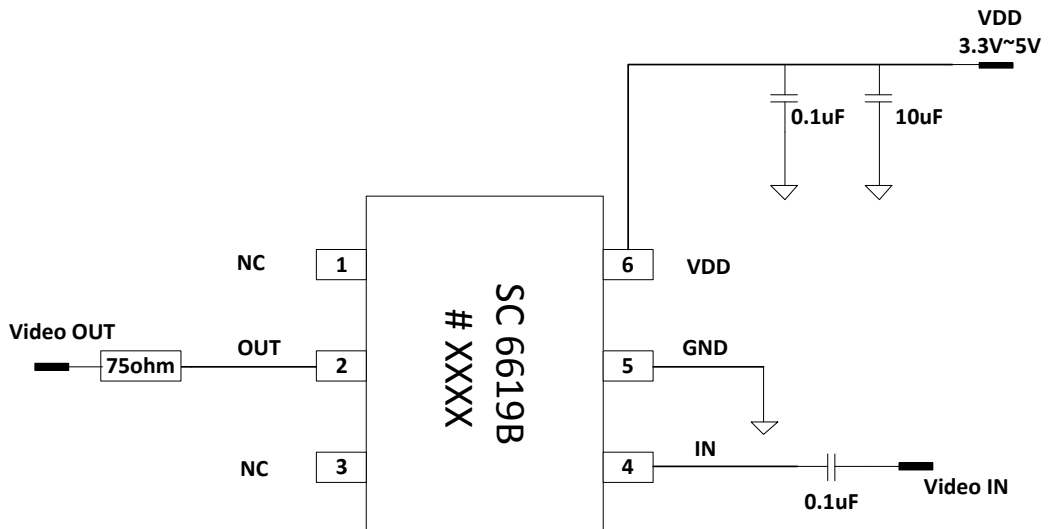


Fig.11 AC couple Input and DC couple Output Applications Circuit

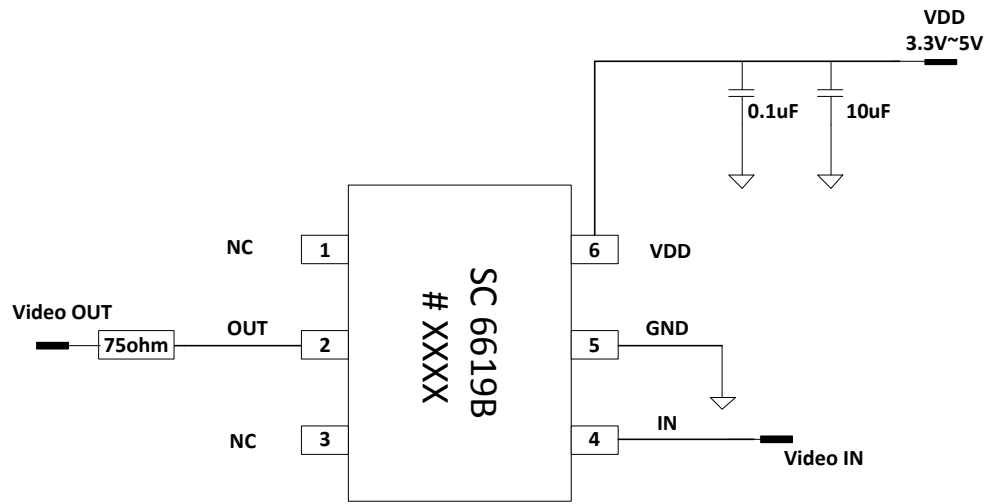
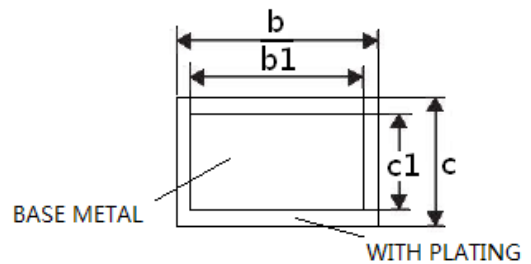
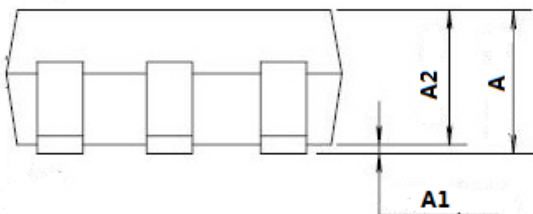
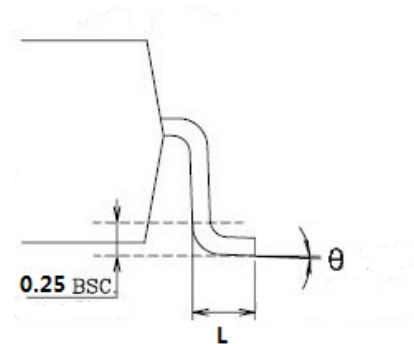
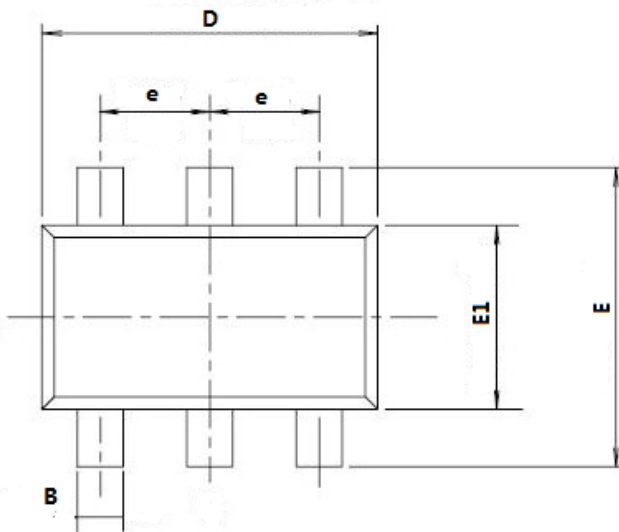


Fig.12 DC couple Input and DC couple Output Applications Circuit

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.13 Package of SC6619B

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
θ	0°	-	8°

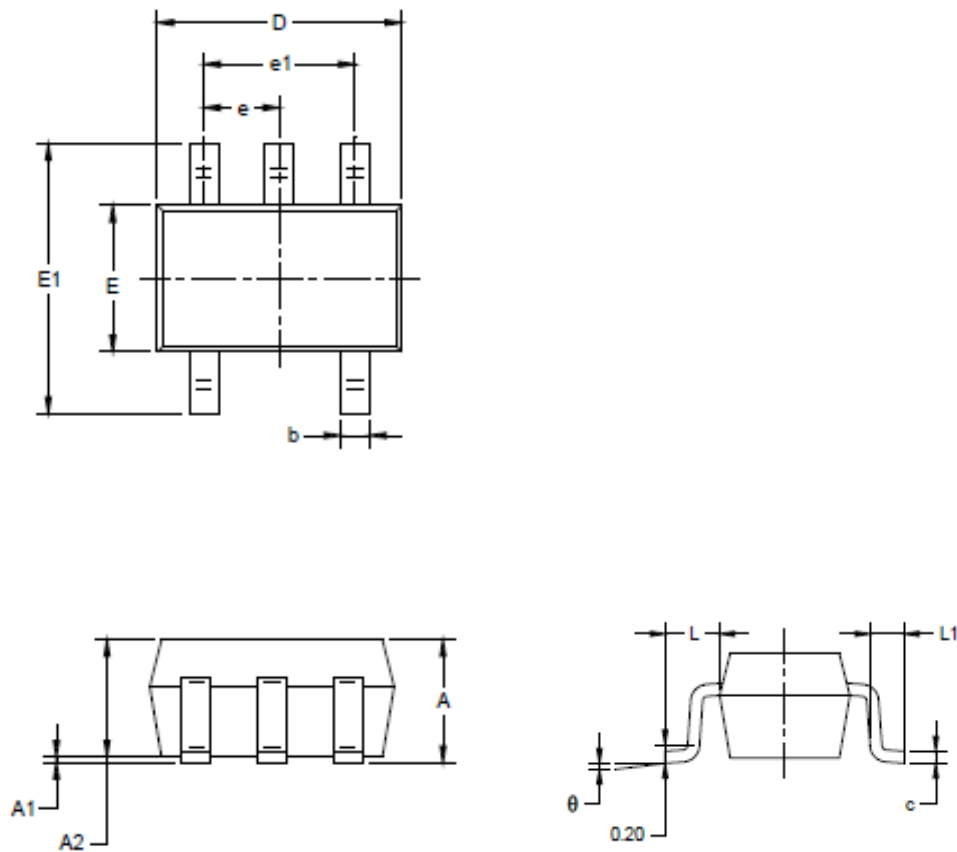
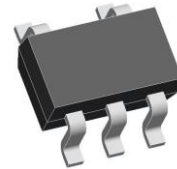


Fig.14 Package of SC70-5