

Feature

- 2.7~3.6V Power Supply Voltage
- Chip available in MSOP-8 Package
- Power dissipation: 15mA low Power Consumption

Comparator:

- 30ns Propagation Delay (100mV Overdrive)
- Rail to Rail Output, CMOS/TTL Compatible
- Internal Hysteresis to Ensure Clean Switching
- AC Coupled Input with 80mV Clamper
- Low Offset Voltage: +/-3mV Max
- Low HYS Voltage Temperature Drift: 5uV/°C
- Low Current Consumption: 251uA

Video Filter:

- 6th order 60MHz(-3dB) Butterworth video reconstruction filter
- 6 dB gain & rail to rail output
- Allowed drive 2 video channels or drive 75ohm load
- AC coupled Input with 230mV level shift
- DC & AC coupled Output

Applications

- TVI FHD Camera and CVI FHD Camera;
- Threshold Detector /Discriminators;
- Sampling Circuits, IR Receivers;
- DVD video players, device of communication, Digital Set Top Box, etc.

General Description

SC8441C is a low power consuming, rail to rail output comparator and Reconstruction Video Filter integrated in a single chip. The comparator apply a low 30ns propagation delay at 100mV overdrive voltage; And the Video Filter apply attenuation -29dB for Full HD mode @100MHz.

SC8441C using AC coupling input for the comparator and filter, it applies internal 80mV clamp voltage for comparator and 230mV for LPF.

SC8441C comparator includes internal hysteresis to ensure clean output switch, and the HYS voltage has a ultra-low temperature drift 5uV/°C.

Ordering Information

MPN	Package	Marking	Packing
SC8441C	MSOP-8	SC8441C XXXX	Tape and Rape, 4000
SC8441C-DFN	DFN-8L	EXX	Tape and Rape, 3000

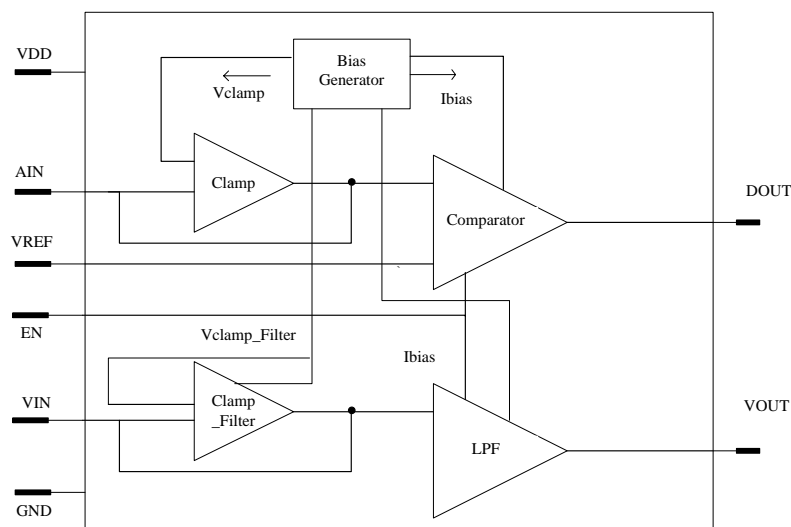


Fig.1 block diagram of SC8441C

REV. 1.0

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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	4	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	2.7~3.6	V
T _A	Operating ambient Temperature Range	-40~+85	°C

Electrical Characteristics Video Filter Part

DC Characteristics

(Specifications are at $R_L=150\Omega$, $V_{in}=1V_{pp}$, $C_{in}=0.1\mu F$, output coupling cap= $220\mu F$, $T=25^\circ C$, $V_{DD}=3.3V$)

Table 3

Symbol	parameter	Min	Typ	Max	Units
ICC	Total supply current		15		mA
I_Q	Quiescent current (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
V_{OH}	Output Voltage High Swing		2.8		V
V_{OL}	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)		58		dB
	Power supply rejection ratio (f=1MHz)		36		

AC Characteristics

(Specifications are at $R_L=150\Omega$, $V_{in}=1V_{pp}$, $C_{in}=0.1\mu F$, output coupling cap= $220\mu F$, $T=25^\circ C$, $V_{DD}=3.3V$)

Table 4

Symbol	Parameter	Min	Typ	Max	Unit
BW(-3 dB)	The Band width of -3dB		55		MHz
Att(f=100MHz)	Stop band Attenuation at 100MHz		-29		dB
Att(f=50MHz)	Stop band Attenuation at 50MHz		-1.5		dB
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 ($V_{in}=1V$, 20%~80%)		110		V/us

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

Electrical Characteristics Comparator Part

(Specifications are at VDD=+2.7V ~ +3.6V, Vin+=VDD, Cin=0.1uF, Vin-=1.2V, RL=10Kohm, CL=15pF, T=25 °C)

Table 5

Symbol	Parameter	Min	Typ	Max	Units
VDD	Operating Supply Voltage	2.7	3.3	3.6	V
V _{OS}	Input Offset Voltage ^{*1}	-3	+/-0.15	+3	mV
V _{OS_TC}	Input Offset voltage Temp Drift	0.6	2.0	4.7	uV/°C
V _{hyst}	Input Hysteresis Voltage	3	5	10	mV
V _{hyst_TC}	Input Hysteresis Voltage Temp Drift		4.8	5.4	uV/°C
C _{IN}	Input Capacitance	Differential	1.8		pF
		Common Mode	3.6		
R _{IN}	Input Resistance		>100		GΩ
I _Q	Quiescent Current		251		uA
I _{SC}	Output short to VDD		25		mA
Vin_cm	Common mode Input voltage	GND+0.2	-	VDD-0.2	V
Vols	Output Level Shift Voltage (Vin=0V,no load, input referred)	70	80	90	mV
V _{OH}	Output Voltage High Swing	VDD-0.3			V
V _{OL}	Output Voltage Low Swing			GND+0.3	mV
I _{clamp-up}	Pull up clamp current		6.7		mA
I _{clamp-down}	Pull down clamp current		126		nA
CMRR	Common Mode Rejection Ratio		70		dB
PSRR	Power supply rejection ratio		63		dB
t _R	Rising time		3.5		ns
t _F	Falling time		2.8		ns
T _{PD+}	Propagation Delay(Low to High)		30		ns
T _{PD-}	Propagation Delay(High to Low)		28.5		ns
T _{PDSKEW}	Propagation Delay Skew ^{*2}		1.50		ns

*1: The input offset voltage is the average of the input-referred trip points. The input hysteresis is the difference between the input-referred trip points.

*2: Propagation Delay Skew is defined as: T_{PD+}-T_{PD-}.

Enable

Symbol	Parameter	Min	Typ	Max	Units
V _L	Logic low threshold			1	V
V _H	Logic high threshold	VDD-1.5			V

PAD Definition

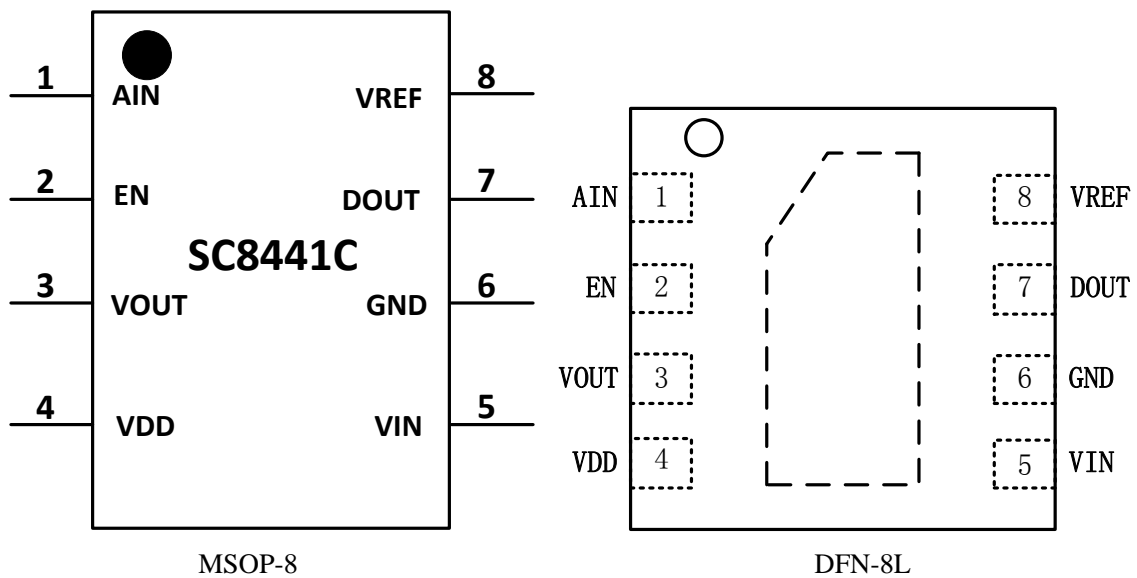


Fig.2 Pad definition of SC8441C

Table 6 Pad definition

Pin	Name	I/O	Analog/Digital	Description
1	AIN	I	A	Input Signal PAD for Comparator
2	EN	I	A	The whole chip enable control pin, EN=high chip work; EN=low chip shut down;
3	VOUT	O	A	Video Filter output PAD
4	VDD	POWER	POWER	Power supply, connect to positive voltage supply
5	VIN	I	A	Video signal input PAD, AC coupled, Apply with 80mV Clamp up voltage
6	GND	GROUND	GROUND	Ground pin. Connect to the most negative supply, all GND pads are connected on die
7	DOUT	O	A	Comparator Output PAD, High Voltage level is pulled to VDD, Low Voltage is GND
8	VREF	I	A	The DC reference voltage input PAD for comparator

Application Circuits

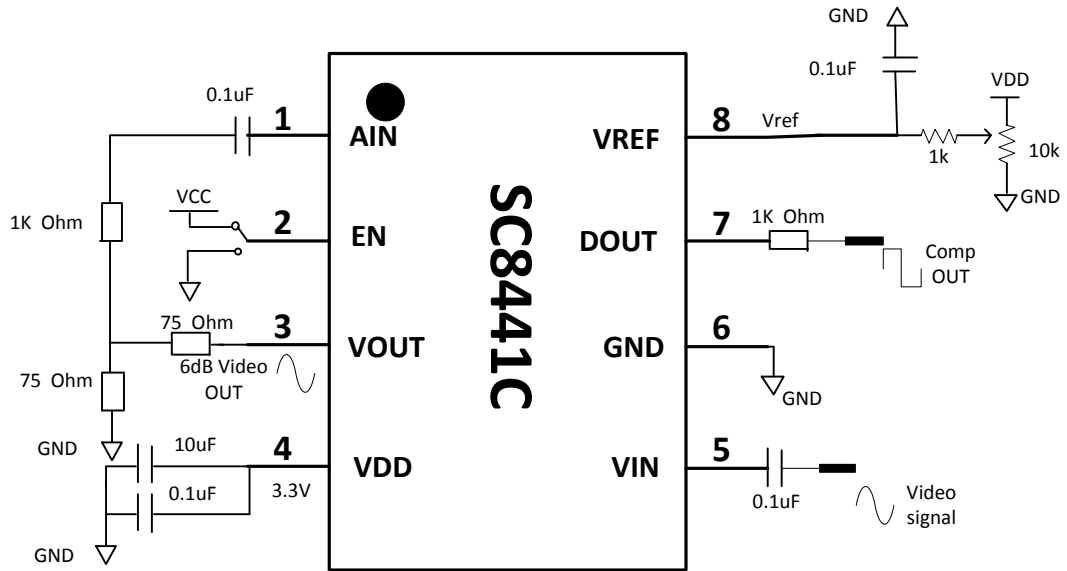
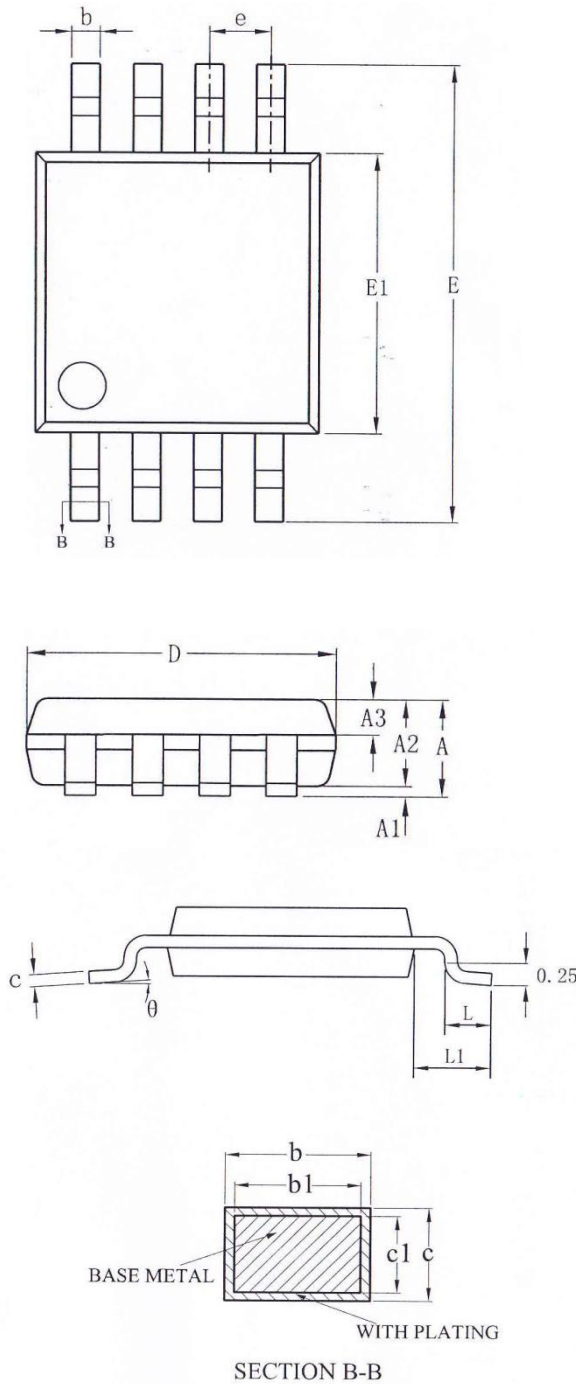


Fig.3 Applications Circuits of SC8441C

Package

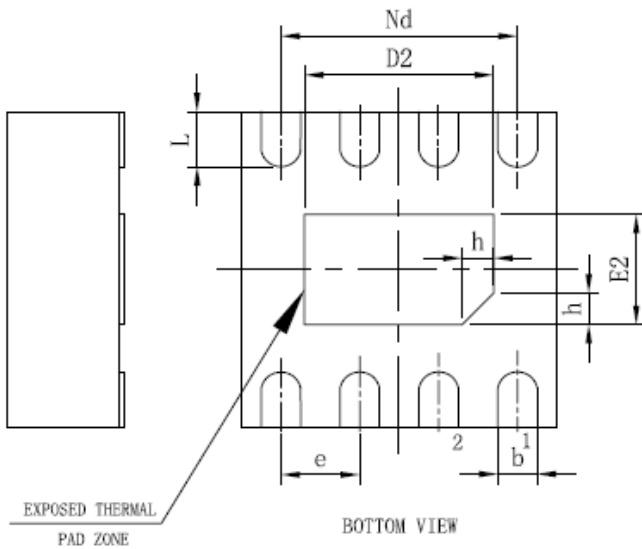
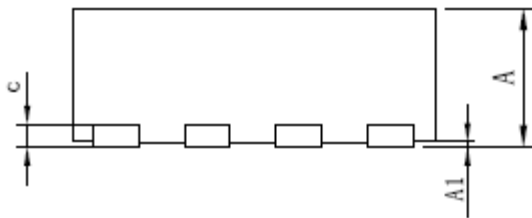
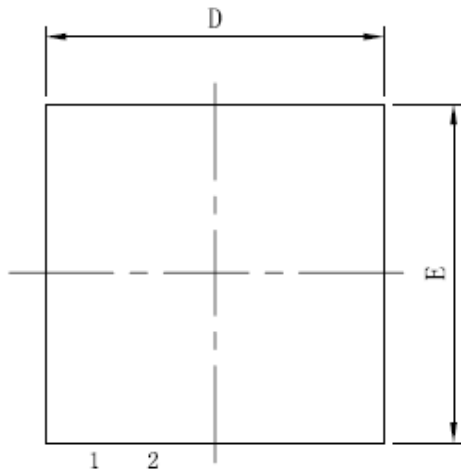
MSOP-8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.10
A1	0.05	—	0.15
A2	0.75	0.85	0.95
A3	0.30	0.35	0.40
b	0.28	—	0.36
b1	0.27	0.30	0.33
c	0.15	—	0.19
c1	0.14	0.15	0.16
D	2.90	3.00	3.10
E	4.70	4.90	5.10
E1	2.90	3.00	3.10
e	0.65BSC		
L	0.40	—	0.70
L1	0.95REF		
θ	0	—	8°

Fig.4 Package of SC8441C

DFN-8L



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.18	0.25	0.30
c	0.18	0.20	0.25
D	1.90	2.00	2.10
D2	1.10	1.20	1.30
e	0.50BSC		
Nd	1.50BSC		
E	1.90	2.00	2.10
E2	0.60	0.70	0.80
L	0.30	0.35	0.40
h	0.15	0.20	0.25
载体尺寸 (mil)	63X39		

Version History :

Ver.	Date	Changes	Author	Notes
Initial(V1.0)	2018-11-12		nyzhang	