

High Speed Rail to rail Output Comparator

1. Feature

- 30ns propagation delay (@100mV Overdrive)
- Rail to Rail output, CMOS/TTL Compatible
- Internal Hysteresis to ensure clean switching
- DC coupled Input
- Offset voltage: +/-3mV Max.
- Low HYS voltage Temperature Drift: 5uV/°C.
- 2.7~5.5V power supply Voltage.
- Low quiescent current: 200uA
- Chip available in SOT23-5 Package

2. Applications

- High speed Line Receivers;
- Threshold Detector /Discriminators;
- Sampling Circuits;
- IR Receivers.

3. General Description

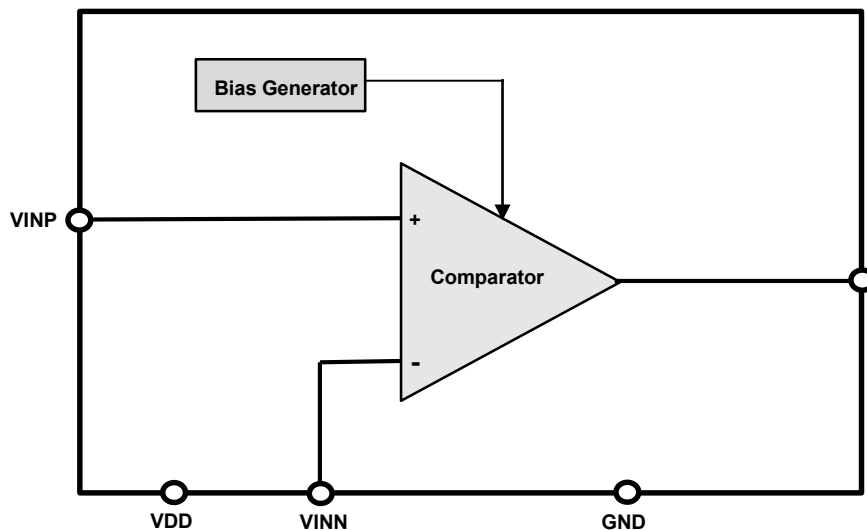
SC8941N is a high speed, low power dissipation comparator. It applies 30ns Propagation Delay at 100mV Overdrive voltage.

SC8941N is DC coupled normally, and It includes internal hysteresis(5mV) to ensure clean output switch, the HYS voltage has a ultra-low temperature drift 5uV/°C;

SC8941N consists of a high speed Class AB structure, which supports rail to rail output.

4. Device Information

Part Number	Package	Body Size
SC8941N	SOT23-5	2.8mm x 2.92mm



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5. Pin Configuration

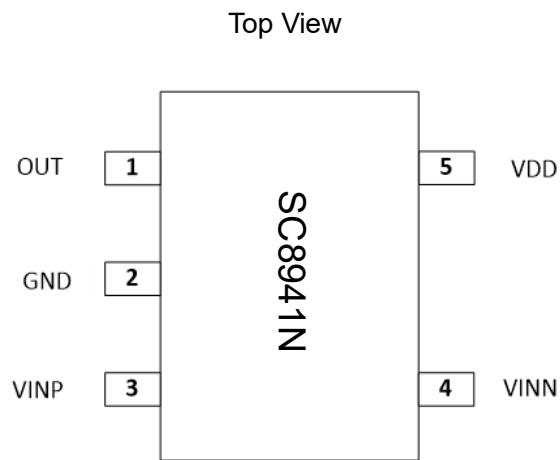


Fig. 1 Pin Definition

Table. 1 Pin Function Description

PIN NO.	PIN NAME	TYPE	Description
1	OUT	Output	Comparator Output PAD, High Voltage level is Pulled to VDD, Low Voltage is GND;
2	GND	GND	Ground pin. Connect to the most negative supply, ALL GND pads are connected on die.
3	VINP	Input	Video signal input PAD, DC coupled
4	VINN	Input	DC Reference voltage input PAD;
5	VDD	Power supply	Power supply (3.3V/5V) ,connect to positive voltage supply

6. Specifications

6.1. Absolute Maximum Ratings

(Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device.)

SYMBOL	PARAMETER	MIN	MAX	UNITS
V _{DD}	Power supply	-0.3	6	V
T _A	Operating ambient Temperature Range	-40	85	°C
T _{STG}	Storage Temperature	-65	150	°C

6.2. Recommended Operating Conditions

SYMBOL	PARAMETER	MIN	MAX	UNITS
V _{DD}	Device power supply voltage	2.7	5.5	V
T _A	Operating ambient Temperature Range	-40	85	°C

6.3. Electrical Characteristics

1) DC Characteristics (FHD)

Specifications are at TA=+25°C, , VDD=+2.7V~+5.5V Vin+=VDD, Vin-=1.2V RL=10Kohm CL=15pF (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	SPEC			UNITS
			MIN	TYP	MAX	
VDD	Operating Supply Voltage		2.7	3.3	5.5	V
VOS	Quiescent current	VDD =3.3V ,NO input& load		10		mA
Isc	Short to GND or VDD current	vin=VDD, Output to VDD		72		mA
		vin=VDD, Output to GND		85		
Vols	output offset Voltage	AC coupled Vin=0V, input referred		150		mV
		DC coupled Vin=0V, input referred		100		mV
VOH	Output Voltage High Swing	VDD=3.3V		2.8		V
		VDD =5V		4.5		V
VOL	Output Voltage Low Swing	VDD=3.3V/5V		224		mV
Av	Output Voltage Gain			6		dB
PSRR	Power supply rejection ratio	f=50Hz		-58		dB
		f=1MHz		-39		

SYMBOL	PARAMETER	TEST CONDITIONS	SPEC			UNITS
			MIN	TYP	MAX	
VDD	Operating Supply Voltage		2.7	3.3	5.5	V
VOS	Input Offset Voltage		-3	+/-0.15	+3	mV
VOS_TC	Input Offset voltage Temp Drift		0.64	1.96	4.7	uV/°C
Vhyst	Input Hysteresis Voltage		4	5	10.8	mV
Vhyst_TC	Input Hysteresis Voltage Temp Drift			4.8	5.4	uV/°C
CIN	Input Capacitance	Differential		1.8		pF
		Common Mode		3.6		
RIN	Input Resistance			>100		GΩ
IQ	Quiescent Current			200		uA
ISC	Output short to VDD			25		mA
Vin_cm	Common mode Input voltage		GND+0.2	-	VDD-0.2	V
VOH	Output Voltage High Swing		VDD-0.3			V
VOL	Output Voltage Low Swing				GND+0.3	mV
CMRR	Common Mode Rejection Ratio			70		dB
PSRR	Power supply rejection ratio			63		dB
tR	Rising time	20%~80%		3.5		ns
tF	Falling time	20%~80%		2.8		ns
TPD+	Propagation Delay(Low to High)			30		ns
TPD-	Propagation Delay(High to Low)			28.5		ns
TPDSKEW	Propagation Delay Skew			1.5		ns

*Note1: 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.

*Note2: Propagation Delay Skew is defined as: TPD+-TPD-;

7. Typical Application

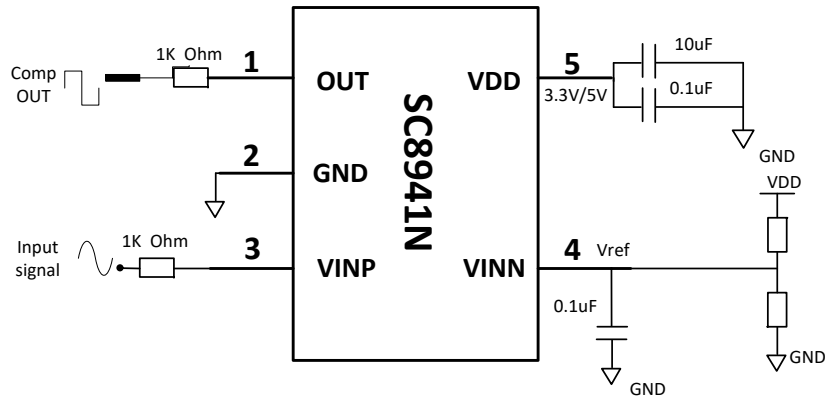
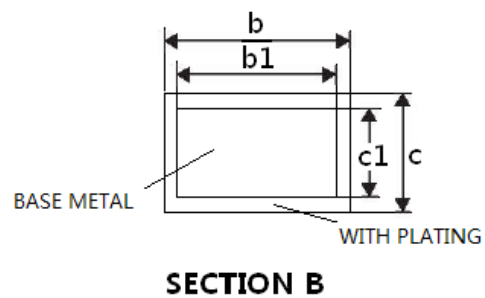
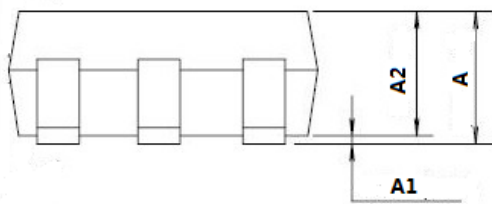
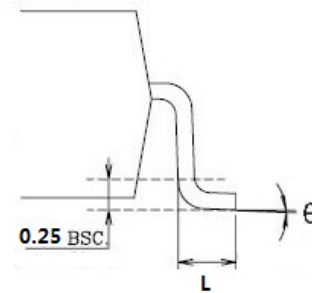
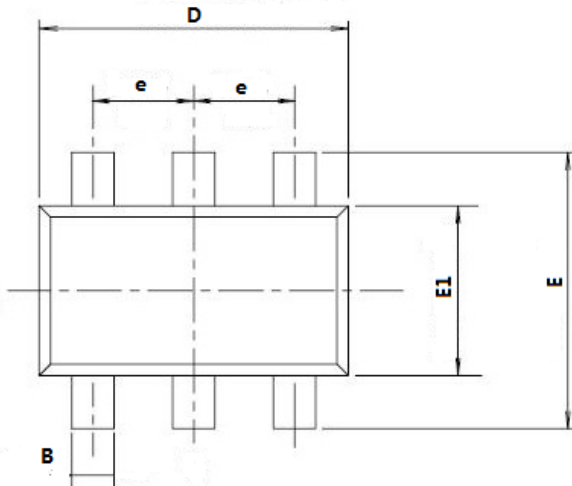


Fig. 2 Applications Circuits of SC8941N

Package Outline Dimensions

SOT23-5- 2.8mmx2.92mm

Symbol	Unit(mm)		
	MIN	NOM	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



REVISION HISTORY

DATE	REVISION	CHANGES
	1.0	Initial Release.
2022-4-16	1.2	Update the document template.

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