

# CS59201

## Winchester Servo Pre-amplifier with Low Current Drain

The CS59201 is a low noise servo pre-amplifier for use with ferrite heads. It is a differential input, differential output design with fixed gain of approximately 100. Features include low noise, wide bandwidth and low current drain.

### Features

- 50 MHz Bandwidth
- Operates From Any of Three Standard Supply Voltages:
  - 8.3 V (IBM Compatible)
  - 10 V
  - 12 V
- Available in SO-8 Package

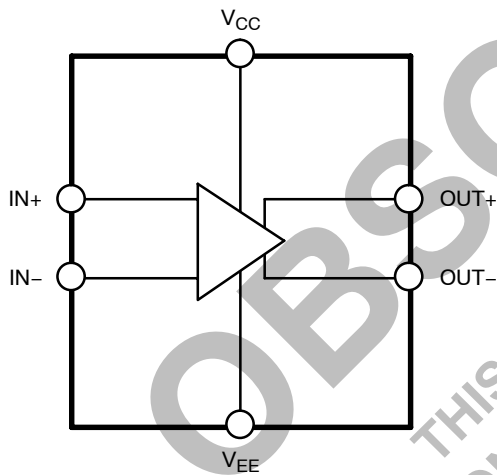


Figure 1. Block Diagram



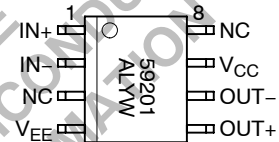
ON Semiconductor™

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SO-8  
D SUFFIX  
CASE 751

### PIN CONNECTION AND MARKING DIAGRAM



A = Assembly Location  
WL, L = Wafer Lot  
YY, Y = Year  
WW, W = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
CS59201GD8	SO-8	95 Units/Rail
CS59201GDR8	SO-8	2500 Tape & Reel

**MAXIMUM RATINGS\***

Rating	Value	Unit
Power Supply Voltage ( $V_{CC} - V_{EE}$ )	14	V
Differential Input Voltage	5.0	V
Storage Temperature Range	-65 to +150	°C
Operating Temperature Range	0 to 70	°C
Thermal Resistance, Junction-to-Case, $R_{\theta JC}$	45	°C/W
Thermal Resistance, Junction-to-Ambient, $R_{\theta JA}$	165	°C/W
ESD Susceptibility (Human Body Model)	1.4	kV

\*The maximum package power dissipation must be observed.

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ , ( $V_{CC} - V_{EE}$ ) = 7.0 V to 13.2 V; unless otherwise specified.)

Characteristic	Test Conditions	Min	Typ	Max	Unit
<b>General</b>					
Gain (Differential)	-	80	100	120	V/V
Bandwidth (3.0 dB)	$V_{IN} = 2.0 \text{ mV}$	30	50	-	MHz
Input Resistance	-	1040	1300	1560	$\Omega$
Input Capacitance	-	-	20	30	pF
Input Dynamic Range	-	3.0	-	-	mV
Power Supply Current	$(V_{CC} - V_{EE}) = 12 \text{ V}$	-	20	25	mA
Output Offset (Differential)	$R_S = 0, R_L = 130 \Omega$	-	-	200	mV
Equivalent Input Noise	$BW = 4.0 \text{ MHz}$ , Note 1	-	0.7	1.0	nV/Hz
PSRR, Input Referred	$R_S = 0, f \leq 5.0 \text{ MHz}$ , Note 1	55	60	-	dB
Gain Sensitivity (Supply)	$(V_{CC} - V_{EE}) = \pm 10\%$	-	-	$\pm 0.5$	%/V
Gain Sensitivity (Temp.)	$T_A = 25^\circ\text{C}$ to $70^\circ\text{C}$ , $R_L = 130 \Omega$	-	-0.1	-	%/°C
CMRR, Input Referred	$f \leq 5.0 \text{ MHz}$	60	70	-	dB
<b>Recommended</b>					
Supply Voltage ( $V_{CC} - V_{EE}$ )	-	7.45	8.3	9.15	V
	-	9.0	10	11	V
	-	10.8	12	13.2	V
Input Signal, $V_{IN}$	-	-	2.0	-	mV <sub>PP</sub>
Ambient Temperature, $T_A$	-	0	-	70	°C

1. 1.0 nV/root Hz and a bandwidth of 4.0 MHz equals 2.0  $\mu\text{VRMS}$ .

## PACKAGE PIN DESCRIPTION

Pin Number		
SO-8	Pin Symbol	Function
1	IN+	Positive input to preamplifier.
2	IN-	Negative input to preamplifier.
3, 8	NC	No connection.
4	V <sub>EE</sub>	Negative supply voltage.
5	OUT+	One of the amplifier outputs.
6	OUT-	One of the amplifier outputs.
7	V <sub>CC</sub>	Positive supply voltage.

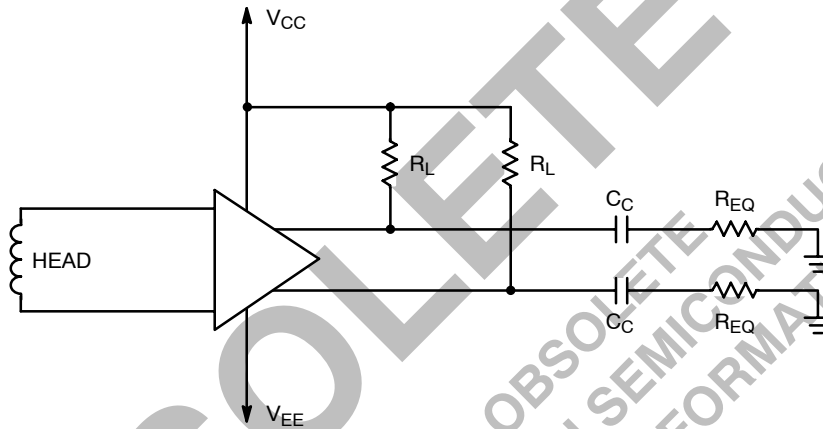


Figure 2. Applications Diagram

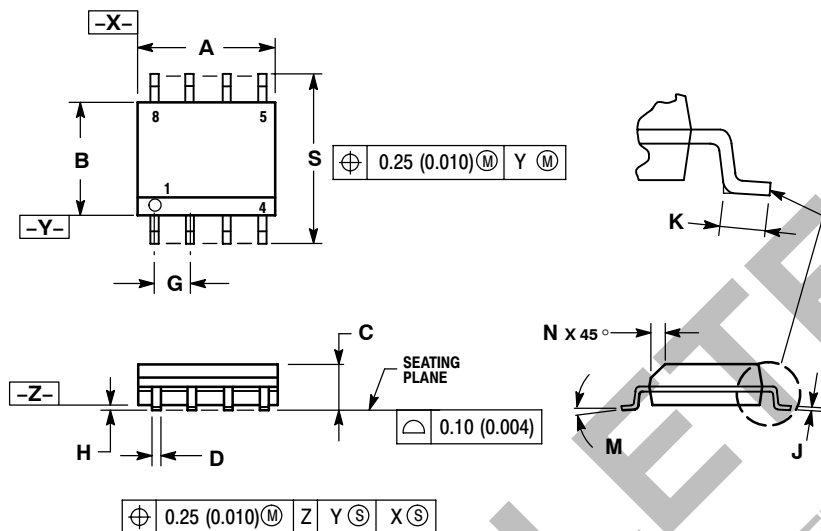
**Recommended Load Conditions**

1. Input must be AC coupled.
2. C<sub>C</sub>'s are AC coupling capacitors.
3. R<sub>L</sub>'s are DC bias and termination resistors, (recommended 130 Ω).
4. R<sub>EQ</sub> represents equivalent load resistance.
5. For gain calculations  $R_P = (R_L \times R_{EQ}) / (R_L + R_{EQ})$ .
6. Differential gain = 0.72 R<sub>P</sub> (±18%) (R<sub>P</sub> in Ω).
7. Ceramic capacitors (0.1 μF) are recommended for good power supply noise filtering.

# CS59201

## PACKAGE DIMENSIONS

SO-8  
D SUFFIX  
CASE 751-07  
ISSUE W



### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

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