

FEATURES

- Wide Dynamic Range 116dB (Class AB)
..... 104dB (Class A)
- 12MHz Effective Gain-Bandwidth Product
- 100dB Open-Loop Gain
- 0.01% THD Class A (Any Gain/Signal) @ = 10dBV_{IN/OUT}
- Minimum External Component Count
- No Trimming In Many Applications
- Low Cost

Not recommended for new designs; replace with SSM-2018.

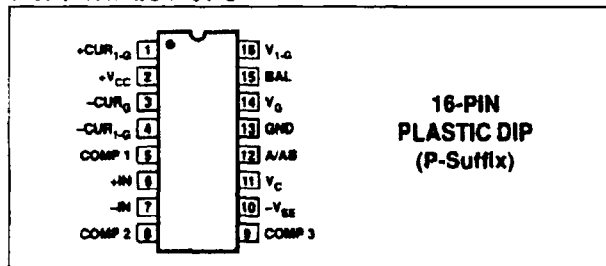
ABSOLUTE MAXIMUM RATINGS

Supply Voltage	36V or ±18V
Junction Temperature	+150°C
Operating Temperature Range	-10°C to +55°C
Storage Temperature Range	-65°C to +150°C
Maximum Current Into Any Pin	10mA
Lead Temperature Range (Soldering, 60 sec)	+300°C

ORDERING INFORMATION

PACKAGE	OPERATING TEMPERATURE RANGE
PLASTIC 16-PIN	
SSM2014P	-10°C to +55°C

PIN CONNECTIONS

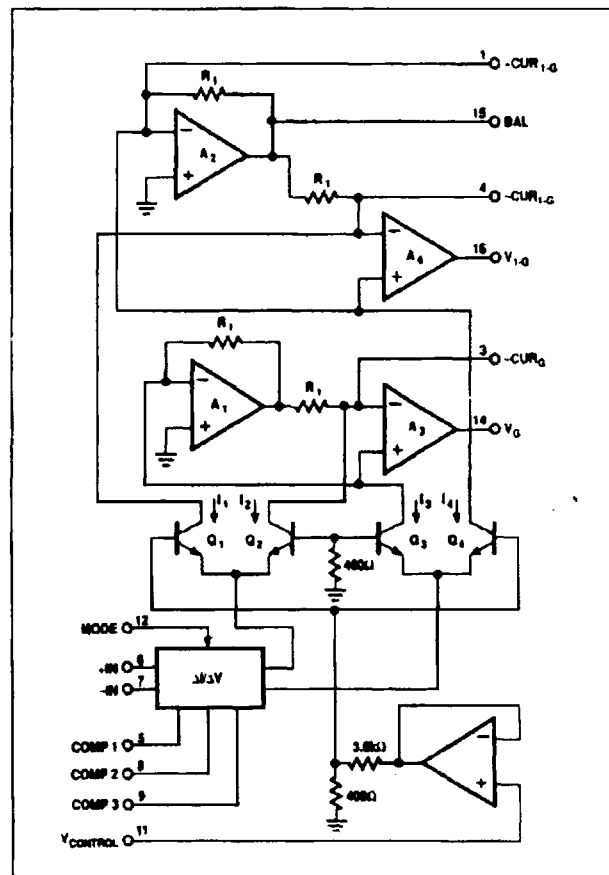


DESCRIPTION

The SSM-2014 is an extremely flexible VCA building block that rivals the best monolithic VCAs while approaching the performance of modular devices. This versatile device acts as a VCA or OVCE (Operational Voltage-Controlled Element) and has inputs and outputs that can operate either in the current or voltage domain. To optimize performance at different signal levels, the SSM-2014 features programmable Class A or Class AB operation. This feature, along with the many configurations possible for operation make the SSM-2014 a unique and powerful signal processing tool. The device can be configured as a VCA or VCP (Voltage-Controlled Panner) and can replace a standard VCA and two or more operational amplifiers. Operation as a standard VCA provides up to 50dB gain and excellent specifications at any signal level.

The SSM-2014 is not recommended for new designs or purchases - the SSM-2018 is a pin-compatible upgrade at a lower cost.

BLOCK DIAGRAM



* Protected by U.S. Patents: 4,471,320 and 4,560,947. Other Patents pending. Mask work protected under the Semiconductor Chip Protection Act of 1983.

SSM-2014

ELECTRICAL CHARACTERISTICS at $V_S = \pm 15V$ and $T_A = \pm 25^\circ C$, unless otherwise specified.

PARAMETER	CONDITIONS	SSM-2014			UNITS	
		MIN	TYP	MAX		
INPUT AMPLIFIER						
Bias Current		-	100	300	nA	
Input Offset Current		-	15	30	nA	
Input Offset Voltage		-	0.5	2	mV	
Input Impedance		0.5	1	-	M Ω	
Equivalent Input Noise	@ 1kHz	-	18	-	nV \sqrt{Hz}	
Common-Mode Range		-	+13, -13	-	V	
Open-Loop Gain		75	100	-	V/mV	
Effective Gain BW Product	VCA Configuration	-	12	-	MHz	
	VCP Configuration	-	5	-		
Slew Rate	VCA Configuration	-	6	-	V/ μ s	
Supply Current - Positive		-	7.5	9	mA	
Supply Current - Negative		-	10	12	mA	
OUTPUT AMPLIFIERS						
Offset Voltage		-	10	20	mV	
Minimum Load Resistor	For Full Output Swing	10	9	-	k Ω	
Output Voltage Swing		-	± 13.5	-	V	
Noise Residual	20kHz Bandwidth	-	8	-	μ V	
CONTROL PORT						
Bias Current		-	150	300	nA	
Input Impedance		-	1	-	M Ω	
Gain Constant	Ratio of Outputs	-	-30	-	mV/dB	
Gain Constant Temperature Coefficient		-	-3300	-	ppm/C	
Gain Linearity		-	0.5	-	%	
Control Feedthrough (Trimmed)	Class A	100Hz Sine Wave Applied to Control Port Causing -30dB to +20dB of Gain	-	2	-	
	Class AB		-	0.5	-	mV
	Intermediate		-	1	-	
Control Feedthrough (Untrimmed)	Class A	100Hz Sine Wave Applied to Control Port Causing -30dB to +20dB of Gain	-	25	75	
	Class AB (Note 1)		-	5	15	mV
	Intermediate (Note 1)		-	15	45	
Off Isolation	@ 1kHz	100	105	-	dB	
Channel Specifications						
Noise - Class A (Note 2)	$R_{PIN 12} = 33k\Omega$, 20kHz BW	-	-85	-81	dBV	
Noise - Class AB (Note 2)	$R_{PIN 12} = 330k\Omega$, 20kHz BW	-	-95	-92	dBV	
Noise - Intermediate (Note 2)	$R_{PIN 12} = 43k\Omega$, 20kHz BW	-	-88	-85	dBV	
THD - A @ $A_V = 0dB$ (Note 3)	$R_{PIN 12} = 33k\Omega$	-	0.005	0.02	%	
THD - A @ $A_V = \pm 20dB$ (Note 3)	$R_{PIN 12} = 33k\Omega$	-	0.02	0.04	%	
THD - AB @ $A_V = 0dB$ (Note 3)	$R_{PIN 12} = 330k\Omega$	-	0.02	0.05	%	
THD - AB @ $A_V = \pm 20dB$ (Note 3)	$R_{PIN 12} = 330k\Omega$	-	0.06	0.12	%	
THD - Intermediate @ $A_V = 0dB$ (Note 3)	$R_{PIN 12} = 43k\Omega$	-	0.01	0.03	%	
THD - Intermediate @ $A_V = \pm 20dB$ (Note 3)	$R_{PIN 12} = 43k\Omega$	-	0.03	0.06	%	

NOTES:

1. Symmetry trim only.
2. Parameter sample lot tested to maximum limits.
3. V_{IN} and/or $V_{OUT} = +10dBV$. Specifications may be subject to change without notice.