

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.

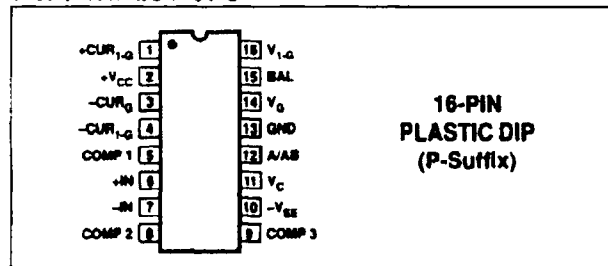
ABSOLUTE MAXIMUM RATINGS

Supply Voltage	36V or $\pm 18V$
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

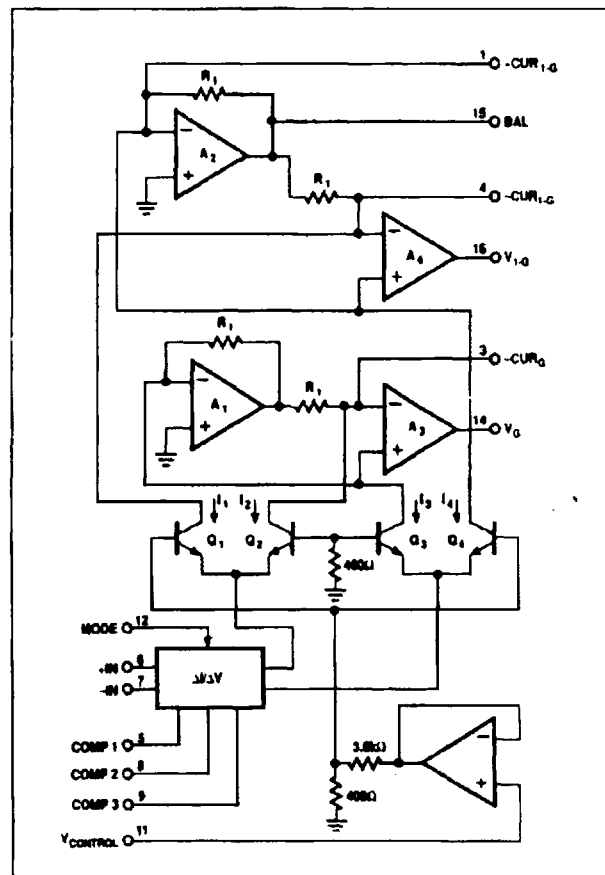


DESCRIPTION

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/ μs
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	–	μV
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)	100Hz Sine Wave Applied to Control Port Causing –30dB to +20dB of Gain	–	2	–	mV
Class A		–	0.5	–	
Class AB		–	1	–	
Control Feedthrough (Untrimmed)	100Hz Sine Wave Applied to Control Port Causing –30dB to +20dB of Gain	–	25	75	mV
Class A		–	5	15	
Class AB (Note 1)		–	15	45	
Intermediate (Note 1)		–	–	–	–
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:

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