ANALOG DEVICES

–6 dB Differential Line Receiver

SSM-2143

FEATURES

- High Common-Mode Rejection
  - DC: 90 dB typ
  - 60 Hz: 90 dB typ
  - 20 kHz: 85 dB typ
- Ultralow THD: 0.0006% typ @ 1 kHz
- Fast Slew Rate: 10 V/μs typ
- Wide Bandwidth: 7 MHz typ (G = 1/2)
- Two Gain Levels Available: G = 1/2 or 2
- Low Cost

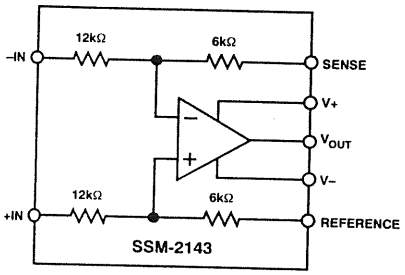
GENERAL DESCRIPTION

The SSM-2143 is an integrated differential amplifier intended to receive balanced line inputs in audio applications requiring a high level of immunity from common-mode noise. The device provides a typical 90 dB of common-mode rejection (CMR), which is achieved by laser trimming of resistances to better than 0.005%.

Additional features of the device include a slew rate of 10 V/μs and wide bandwidth. Total harmonic distortion (THD) is less than 0.004% over the full audio band, even while driving low impedance loads. The SSM-2143 input stage is designed to handle input signals as large as +28 dBu at G = 1/2. Although primarily intended for G = 1/2 applications, a gain of 2 can be realized by reversing the +IN/–IN and SENSE/REFERENCE connections.

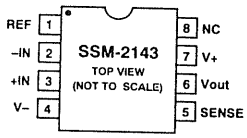
When configured for a gain of 1/2, the SSM-2143 and SSM-2142 Balanced Line Driver provide a fully integrated, unity gain solution to driving audio signals over long cable runs.

FUNCTIONAL BLOCK DIAGRAM



PIN CONNECTIONS

Epoxy Mini-DIP (P Suffix)
and
SOIC (S Suffix)



NC = NO CONNECT

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This is an abridged version of the data sheet. To obtain a complete data sheet, contact your nearest sales office.

REV.0

SSM-2143—SPECIFICATIONS

(V_S = ±15 V, −40°C ≤ T_A ≤ +85°C, G = 1/2, unless otherwise specified. Typical specifications apply at T_A = +25°C.)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
AUDIO PERFORMANCE						
Total Harmonic Distortion Plus Noise	THD+N	V_{IN} = 10 V rms, R_L = 10 kΩ, f = 1 kHz		0.0006		%
Signal-to-Noise Ratio	SNR	0 dBu = 0.775 V rms, 20 kHz BW, RTI		−107.3		dBu
Headroom	HR	Clip Point = 1% THD+N		+28.0		dBu
DYNAMIC RESPONSE						
Slew Rate	SR	R_L = 2 kΩ, C_L = 200 pF	6	10		V/μs
Small Signal Bandwidth	$BW_{-3\ dB}$	R_L = 2 kΩ, C_L = 200 pF				
		G = 1/2		7		MHz
		G = 2		3.5		MHz
INPUT						
Input Offset Voltage	V_{IOS}	V_{CM} = 0 V, RTI, G = 2	−1.2	0.05	+1.2	mV
Common-Mode Rejection	CMR	V_{CM} = ±10 V, RTO				
		f = dc	70	90		dB
		f = 60 Hz		90		dB
		f = 20 kHz		85		dB
		f = 400 kHz		60		dB
Power Supply Rejection	PSR	V_S = ±6 V to ±18 V	90	110		dB
Input Voltage Range	IVR	Common Mode		±15		V
		Differential		±28		V
OUTPUT						
Output Voltage Swing	V_O	R_L = 2 kΩ	±13	±14		V
Minimum Resistive Load Drive				2		kΩ
Maximum Capacitive Load Drive				300		pF
Short Circuit Current Limit	I_{SC}			+45, −20		mA
GAIN						
Gain Accuracy			−0.1	0.03	0.1	%
REFERENCE INPUT						
Input Resistance				18		kΩ
Voltage Range				±10		V
POWER SUPPLY						
Supply Voltage Range	V_S		±6		±18	V
Supply Current	I_{SY}	V_{CM} = 0 V, R_L = ∞		±2.7	±4.0	mA

Specifications subject to change without notice.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage . . . . . ±18 V
Common-Mode Input Voltage . . . . . ±22 V
Differential Input Voltage . . . . . ±44 V
Output Short Circuit Duration . . . . . Continuous
Operating Temperature Range . . . . . −40°C to +85°C
Storage Temperature Range . . . . . −65°C to +150°C
Junction Temperature (T_J) . . . . . +150°C
Lead Temperature (Soldering, 60 sec) . . . . . +300°C
Thermal Resistance
8-Pin Plastic DIP (P): θ_{JA} = 103, θ_{JC} = 43 . . . . . °C/W
8-Pin SOIC (S): θ_{JA} = 150, θ_{JC} = 43 . . . . . °C/W

ORDERING GUIDE

Model	Operating Temperature Range	Package[1]
SSM-2143P	−40°C to +85°C	8-Pin Plastic DIP
SSM-2143S[2]	−40°C to +85°C	8-Pin SOIC

[1]For outline information see Package Information section.
[2]Contact sales office for availability.