ANALOG DEVICES

High Common-Mode Rejection Differential Line Receiver

SSM2141

FEATURES
High Common-Mode Rejection
  DC: 100 dB typ
  60 Hz: 100 dB typ
  20 kHz: 70 dB typ
  40 kHz: 62 dB typ
Low Distortion: 0.001% typ
Fast Slew Rate: 9.5 V/µs typ
Wide Bandwidth: 3 MHz typ
Low Cost
Complements SSM2142 Differential Line Driver

APPLICATIONS
Line Receivers
Summing Amplifiers
Buffer Amplifiers–Drives 600 Ω Load

FUNCTIONAL BLOCK DIAGRAM

PIN CONNECTIONS

**8-Pin Plastic Mini-DIP
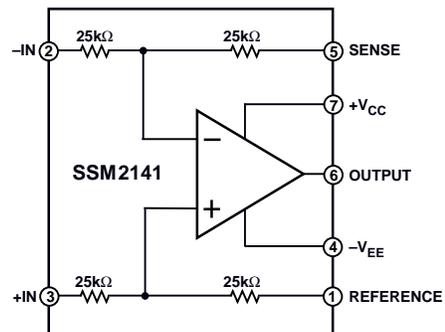(P Suffix)
Narrow Body SO
(S Suffix)**

NC = NO CONNECT

GENERAL DESCRIPTION
The SSM2141 is an integrated differential amplifier intended to receive balanced line inputs in audio applications requiring a high level of noise immunity and optimum common-mode rejection. The SSM2141 typically achieves 100 dB of common-mode rejection (CMR), whereas implementing an op amp with four off-the-shelf precision resistors will typically achieve only 40 dB of CMR—inadequate for high-performance audio.

The SSM2141 achieves low distortion performance by maintaining a large slew rate of 9.5 V/µs and high open-loop gain. Distortion is less than 0.002% over the full audio bandwidth. The SSM2141 complements the SSM2142 balanced line driver. Together, these devices comprise a fully integrated solution for equivalent transformer balancing of audio signals without the problems of distortion, EMI fields, and high cost.
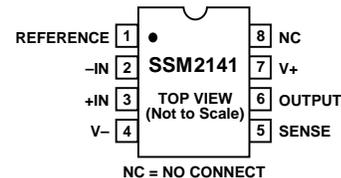
Additional applications for the SSM2141 include summing signals, differential preamplifiers, and 600 Ω low distortion buffer amplifiers. For similar performance with G = 1/2, see SSM2143.

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SSM2141–SPECIFICATIONS

ELECTRICAL CHARACTERISTICS ($@ \ V_S = \pm18$ V, $T_A = +25°C$, unless otherwise noted)

Parameter	Symbol	Conditions	SSM2141 Min	Typ	Max	Units
OFFSET VOLTAGE	V_{OS}	$V_{CM} = 0$ V	–1000	25	1000	µV
GAIN ERROR		No Load, $V_{IN} = \pm10$ V, $R_S = 0 \ \Omega$		0.001	0.01	%
INPUT VOLTAGE RANGE	IVR	(Note 1)	±10			V
COMMON-MODE REJECTION	CMR	$V_{CM} = \pm10$ V	80	100		dB
POWER SUPPLY REJECTION RATIO	PSRR	$V_S = \pm6$ V to ±18 V		0.7	15	µV/V
OUTPUT SWING	V_O	$R_L = 2 \ k\Omega$	±13	±14.7		V
SHORT-CIRCUIT CURRENT LIMIT	I_{SC}	Output Shorted to Ground	+45/–15			mA
SMALL-SIGNAL BANDWIDTH (–3 dB)	BW	$R_L = 2 \ k\Omega$		3		MHz
SLEW RATE	SR	$R_L = 2 \ k\Omega$	6	9.5		V/µs
TOTAL HARMONIC DISTORTION	THD	$R_L = 100 \ k\Omega$ $R_L = 600 \ \Omega$		0.001 0.01		%
CAPACITIVE LOAD DRIVE CAPABILITY	C_L	No Oscillation		300		pF
SUPPLY CURRENT	I_{SY}	No Load		2.5	3.5	mA

NOTES
[1]Input Voltage Range Guaranteed by CMR test.
Specifications subject to change without notice

ELECTRICAL CHARACTERISTICS ($@ \ V_S = \pm18$ V, $-40°C \leq T_A \leq +85°C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFFSET VOLTAGE	V_{OS}	$V_{CM} = 0$ V	–2500	200	2500	µV
GAIN ERROR		No Load, $V_{IN} = \pm10$ V, $R_S = 0 \ \Omega$		0.002	0.02	%
INPUT VOLTAGE RANGE	IVR	(Note 1)	±10			V
COMMON-MODE REJECTION	CMR	$V_{CM} = \pm10$ V	75	90		dB
POWER SUPPLY REJECTION RATIO	PSRR	$V_S = \pm6$ V to ±18 V		1.0	20	µV/V
OUTPUT SWING	V_O	$R_L = 2 \ k\Omega$	±13	±14.7		V
SLEW RATE	SR	$R_L = 2 \ k\Omega$		9.5		V/µs
SUPPLY CURRENT	I_{SY}	No Load		2.6	4.0	mA

NOTES
[1]Input Voltage Range Guaranteed by CMR test.
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