Ground noise isolation Amplifier with Adjustable Differential Gain

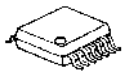
■ GENERAL DESCRIPTION

The **NJM2795** is a ground noise isolation amplifier. It contains dual channel differential amplifier with Adjustable Differential Gain.

It is developed for those car audio applications where long connections between head unit and other components are necessary and ground noise has to be eliminated.

Further the **NJM2795** allow the user to alter the gain to optimize the signal-to-noise ratio of their system. It is useful in microphone amplifier applications.

■ PACKAGE OUTLINE

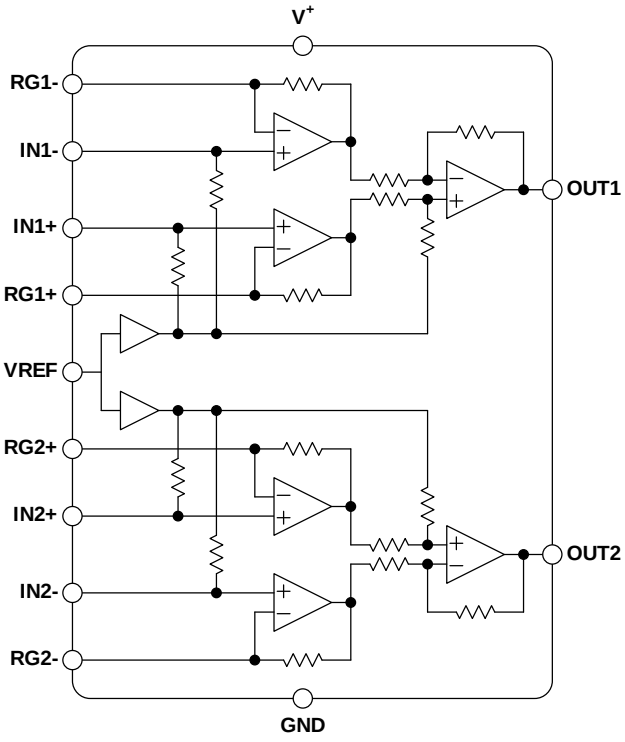


NJM2795V

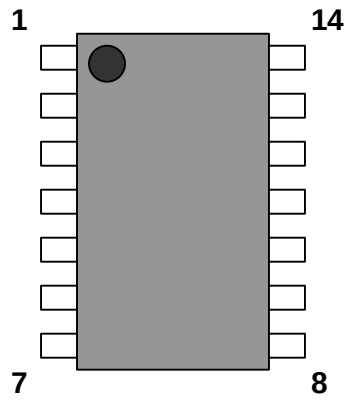
■ FEATURES

- Dual Channel Differential Amplifier
- Adjustable Differential Gain +6dB to +52dB
- Operating Voltage 4.3 to 20V
- Operating Current 7mA typ.
- Maximum Output Voltage 2Vrms min., @ THD=1%
- Common mode rejection ratio 80dB typ.
- Supply Voltage Rejection Ratio 65dB typ.
- Total Harmonic Distortion 0.005% typ.
- Equivalent Input Noise Voltage 2μVrms typ. @ Gv=+20dB
- Bipolar Technology
- Package Outline SSOP14

■ BLOCK DIAGRAM



■ **PIN CONFIGURATION**



No.	端子名	機能
1	OUT1	**Output1**
2	RG1-	**Gain Adjustment 1+**
3	GND	**Ground**
4	VREF	**Reference Voltage**
5	V^+	**Power Supply**
6	RG2+	**Gain Adjustment 2+**
7	OUT2	**Output2**
8	IN2+	**+Input2**
9	RG2-	**Gain Adjustment 2-**
10	IN2-	**-Input2**
11	NC	**No Connect**
12	IN1-	**-Input1**
13	RG1+	**Gain Adjustment 1+**
14	IN1+	**+Input1**

■ **ABSOLUTE MAXIMUM RANGES** (Ta=25°C)

PARAMETER	SYMBOL	RANGE	UNIT
Supply Voltage	V^+	+22	V
Maximum Input Voltage	V_{IM}	0 to $V^{+(*)}$	V
Power Dissipation	P_D	SSOP14 : 555* NOTE: EIA/JEDEC STANDARD Test board (76.2x114.3x1.6mm, 2layer, FR-4) mounting	mW
Operating Temperature	Topr	-40 to +85	°C
Storage Temperature	Tstg	-40 to +150	°C

(*) For the maximum input voltage less than 0 toV^+

■ **ELECTRICAL CHARACTERRISTIC** (V^+=9V, Ta=25°C)

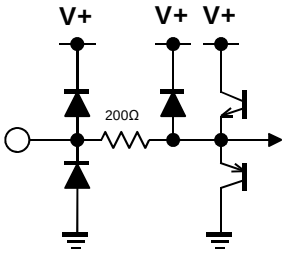
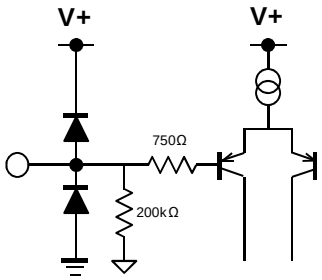
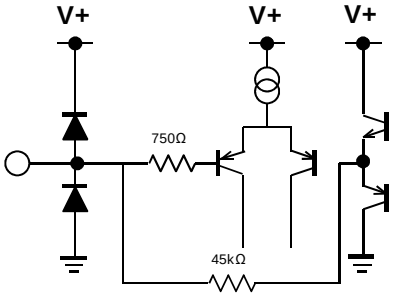
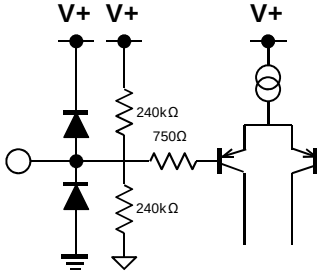
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
DC CHARACTERRISTIC						
Operating Voltage	V^+		4.3	9	20	V
Operating Current	I_{CC}	No Signal	-	7	10	mA
Reference Voltage	V_{REF}		4.0	4.5	5.0	V
AC CHARACTERRISTIC (Non-inverting circuit, f=1kHz, V_{in}=100mVrms, Rg=0Ω, R_G=10kΩ, R_L=10kΩ unless otherwise specified)						
Voltage Gain 1	G_{V1}	R_G=91kΩ	+4.0	+6.0	+8.0	dB
Voltage Gain 2	G_{V2}	R_G=10kΩ	+18.0	+20.0	+22.0	dB
Voltage Gain 3	G_{V3}	R_G=220Ω, V_{in}=2.5mVrms	+50.0	+52.0	+54.0	dB
Channel Separation	CS	V_O=2Vrms, A-weighted	90	100	-	dB
Channel Balance	BAL		-	-	0.5	dB
Roll-off High Frequency	f_{RH}	-3dB	100	-	-	kHz
Input Resistance	R_{IN}		160	200	240	kΩ
Output Resistance	R_{OUT}		-	200	-	Ω
Maximum Output Voltage 1	V_{OM1}	THD=1%	2	2.5	-	Vrms
Maximum Output Voltage 2	V_{OM2}	Inverting, THD=1%	-	2.5	-	Vrms
Equivalent Input Noise Voltage	V_{NI}	Rg=600Ω, A-weighted, Gv=+20dB	-	2	3	μVrms
Total Harmonic Distortion	THD	V_O=1Vrms, BW=400Hz to 30kHz	-	0.005	0.05	%
Common Mode Rejection Ratio (*)	CMRR	V_{ICM}=1Vrms	70	80	-	dB
Supply Voltage Rejection Ratio	SVR	f=100Hz , V_{ripple}=100mVrms	55	65	-	dB

Note (*):

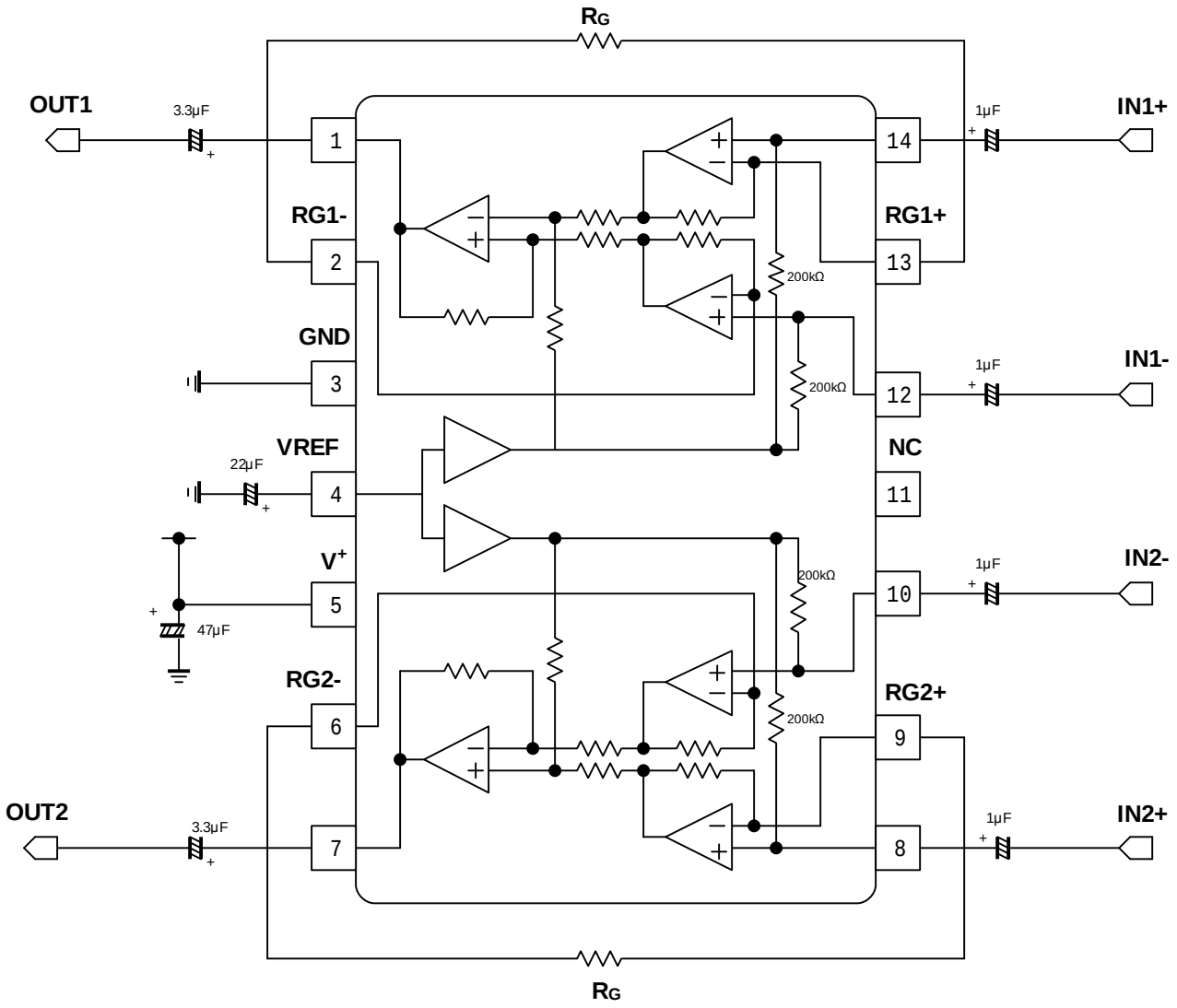
$CMRR = \frac{G_{V2}}{G_{VCM}}$, Where G_{V2} is the Differential Mode Gain and G_{VCM} is the Common Mode Gain.

$G_{VCM} = 20 * \log\left(\frac{V_{OCM}}{V_{ICM}}\right)$, Where V_{OCM} is the Common Mode Output and V_{ICM} is the Common Mode Input.

■ TERMINAL DESCRIPTION

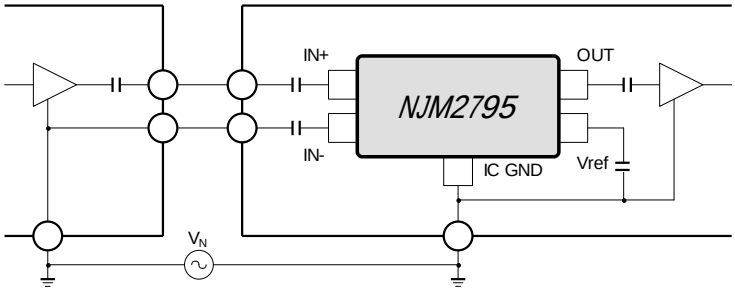
PIN NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	TERMINAL DC VOLTAGE
1 7	OUT1 OUT2	Output1 Output2		V^+ x 0.5
2 6 9 13	RG1- RG2- RG2+ RG1+	Gain Adjustment 1- Gain Adjustment 2- Gain Adjustment 2+ Gain Adjustment 1+		V^+ x 0.5
8 10 12 14	IN2+ IN2- IN1- IN1+	+Input2 -Input2 -Input1 +Input1		V^+ x 0.5
4	VREF	Reference Voltage		V^+ x 0.5

■ APPLICATION CIRCUIT

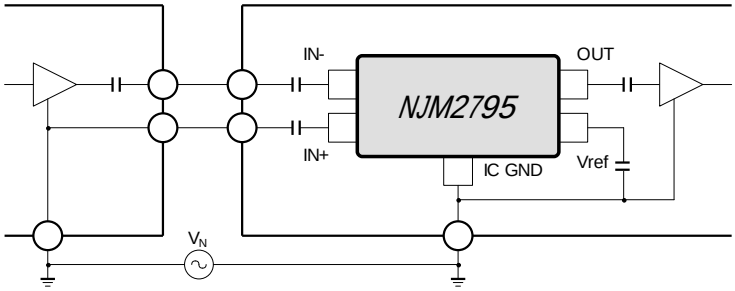


■ APPLICATION BLOCK DIAGRAM

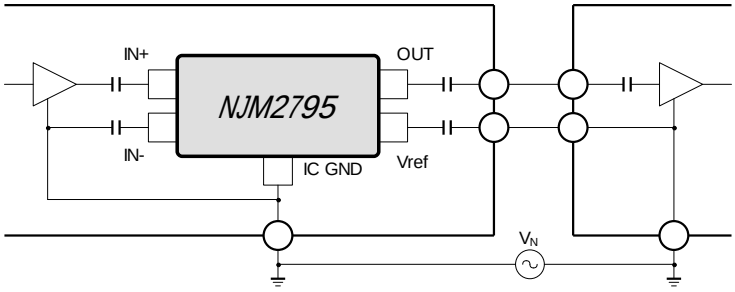
(1) Non-inverting line input



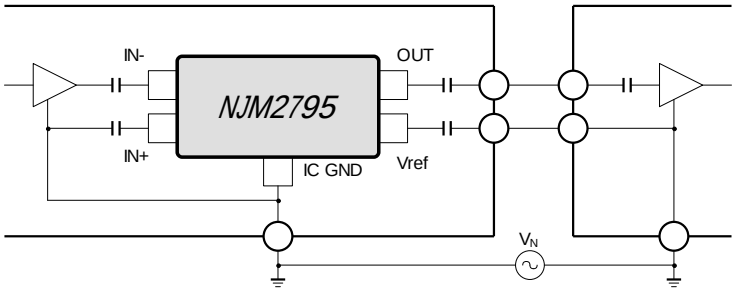
(2) Inverting line input



(3) Non-inverting line output



(4) Inverting line output



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