

Datasheet

CT101 line stage / linear preamplifier module

CT101 2-channel line stage / linear preamplifier module

CT101 is designed specifically for high-end audio. It's superb sound, compact design, low power consumption, and ability to drive difficult loads, makes it universal for line level audio applications. Mount a DACT stepped audio attenuator directly in the CT101 PCB, and you have an active high-end preamplifier. (Please observe that CT101 requires an external DC power supply, which is not included) For a preamplifier with more features, add a DACT CT4 audio balance control and a DACT CT3 audio input selector switch externally to CT101.

- ★ Compact, dual-mono design
- ★ Very short signal path
- ★ Use of low noise SMD metal film resistors
- ★ Use of SMD decoupling capacitors
- ★ Very low inductance and stray capacitance
- ★ Dual on-board voltage regulators for each channel
- ★ No magnetic parts in the signal path
- ★ All PCB traces and connectors gold plated
- ★ User settable gain 0, 6 or 12dB
- ★ Wide operating supply range $\pm 5V$ to $\pm 100V$
- ★ Large bandwidth, DC to 25 MHz at 0dB gain
- ★ Low Total Harmonic Distortion 0.0002%
- ★ Low noise, -115dB at 0dB gain
- ★ Large channel separation 120dB
- ★ High slew rate 500V/us
- ★ Drives difficult loads (output impedance 0.1ohm)
- ★ Large output voltage swing $\pm 14V$
- ★ Close channel matching $\pm 0.05dB$

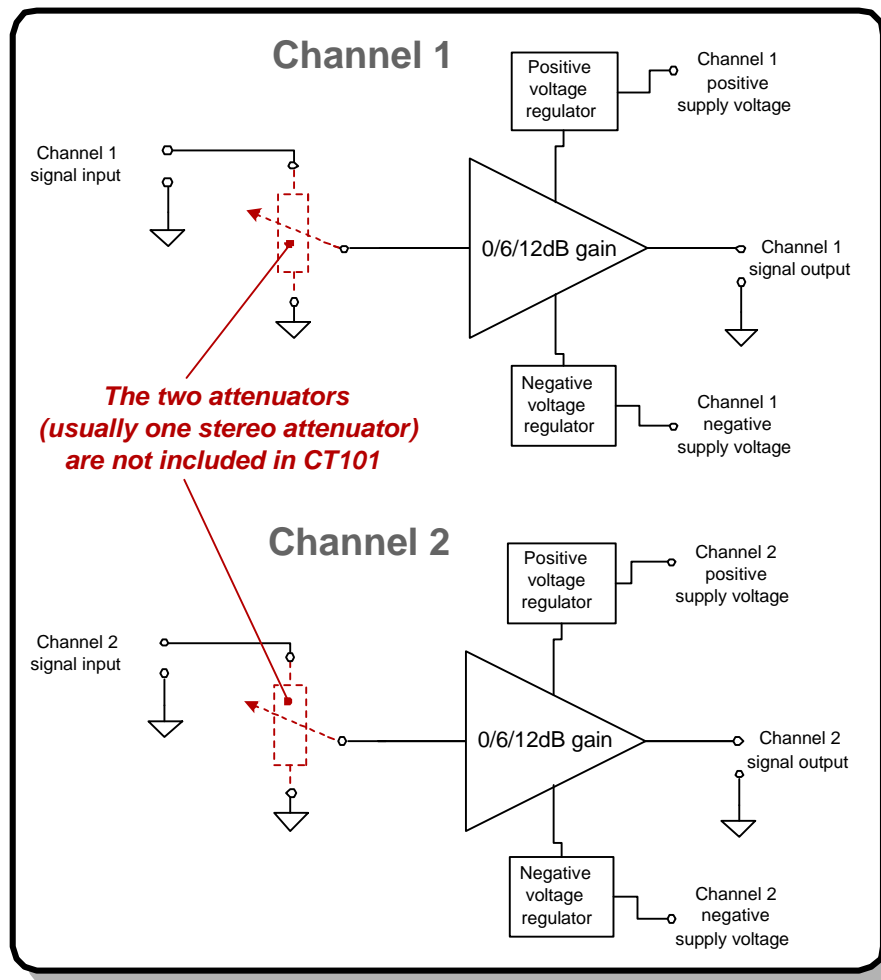
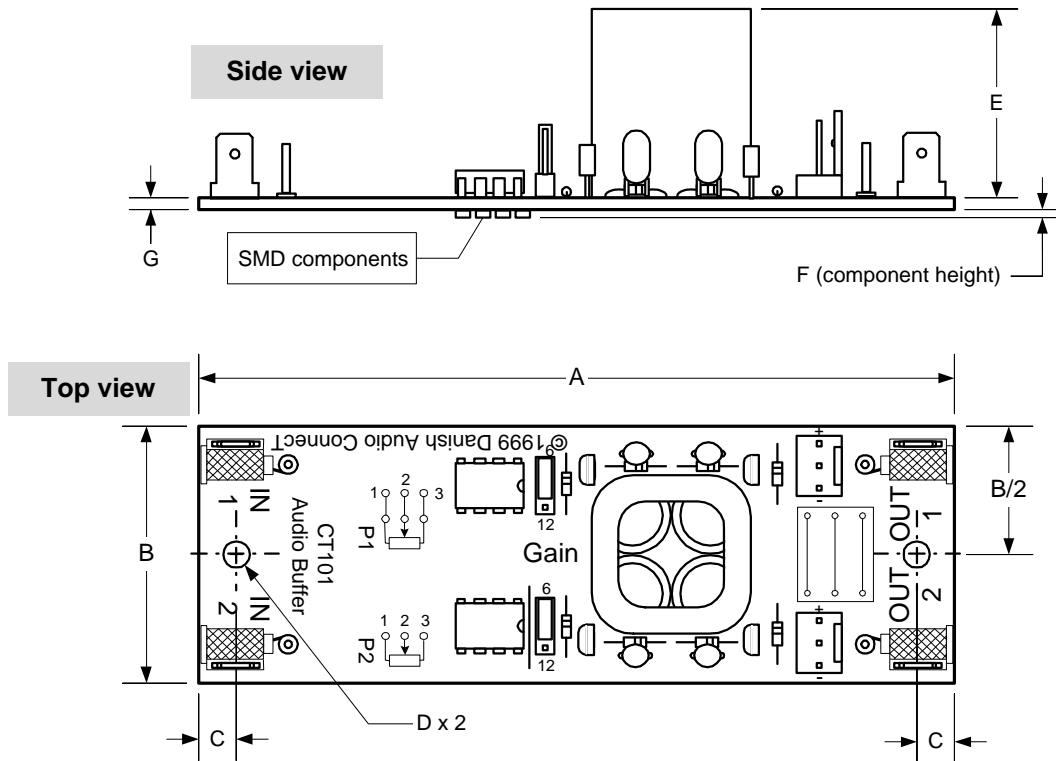


Fig. 1. CT101 block diagram

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Fig. 2. CT101 layout drawing and dimensions.



Symbol	Dimensions, mm	Dimensions, inch.
A	100mm	3.94"
B	34mm	1.34"
C	5mm	0.20"
D	Ø3.5mm	Ø0.14"
E	25 ± 5mm	0.98 ± 0.20"
F	< 3mm	< 0.12"
G	1.5mm	0.06"

CAUTION

Please be very cautious when connecting the CT101 to your audio equipment. CT101 is an active module, and in case of wrong connections or in case of failures, there is a risk of getting up to 14-15V DC offset on the output of CT101. High levels of DC offset may cause damages to power amplifiers, loudspeakers or any other connected equipment. Special attention is required when using DC-coupled power amplifiers.

Before connecting the outputs of CT101, make sure of proper operation and check the DC-voltage at the CT101 outputs. The DC voltage should be no more than a few mVs. In case of any doubt, use a coupling capacitor in series with the CT101 output.

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Table 1. CT101 specifications

MAXIMUM RATINGS

Notes	Symbol	Parameter	Comment	Value	Unit
1	V_S	Supply voltage		± 120	V
1	V_{IN}	Input voltage	$A_V = 0/6/12\text{dB}$	± 10	V
1	T_S	Storage temperature range		-40 to +85 (-40 to 185)	$^{\circ}\text{C}$ F

MAXIMUM OPERATING RATINGS

Notes	Symbol	Parameter	Comment	Value	Unit
2	V_S	Supply voltage range		± 5 to ± 100	V
2	T_A	Ambient temperature range		-25 to +70 (-13 to 158)	$^{\circ}\text{C}$ F

RECOMMENDED OPERATING RATINGS

Notes	Symbol	Parameter	Comment	Value	Unit
3	V_S	Supply voltage range		± 17 to ± 35	V
3	T_A	Ambient temperature range		0 to +50 (32 to 122)	$^{\circ}\text{C}$ F

DC ELECTRICAL CHARACTERISTICS

Typical values at $T_A = +25^{\circ}\text{C}$ (77F), $V_S = \pm 20\text{V}$, $R_L = 1\text{ k}\Omega$ unless otherwise specified

Notes	Symbol	Parameter	Comment	Value	Unit
	A_V	Voltage gain	Set by jumper	0, 6 or 12	dB
	V_{OS}	Input offset voltage		1	mV
	I_b	Input bias current		0.2	μA
	R_{IN}	Input resistance		100	Mohm
	C_{IN}	Input capacitance		3	pF
3, 4	PSRR	Power supply rejection ratio	$A_V = 0/6/12\text{dB}$, 10Hz to 20kHz	120	dB
	R_O	Output resistance	$A_V = 0\text{dB}$, DC to 20kHz	0.1	ohm
	V_O	Output voltage swing	$R_L = 10\text{k}\Omega$	± 14.2	V
	I_O	Output current swing	$R_L = 100\text{ohm}$	± 25	mA
	I_S	Supply current, each channel	$R_L = 5\text{k}\Omega$ or greater	± 3	mA

AC ELECTRICAL CHARACTERISTICS

Typical values at $T_A = +25^{\circ}\text{C}$ (77F), $V_S = \pm 20\text{V}$, $R_L = 1\text{ k}\Omega$ unless otherwise specified

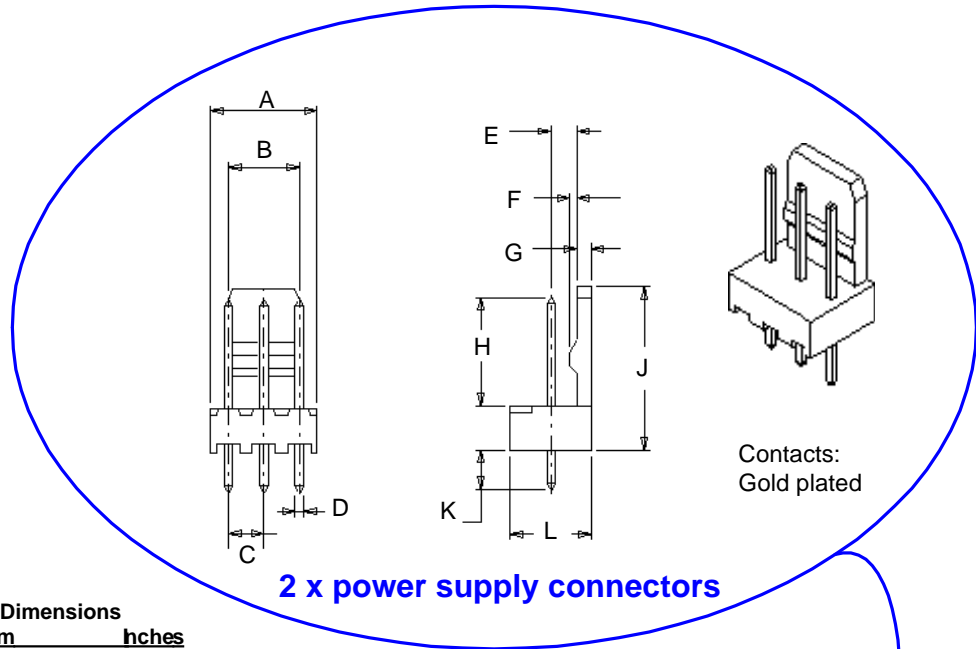
Notes	Symbol	Parameter	Comment	Value	Unit
	BW	Bandwidth	-3dB, $A_V = 0/6/12\text{dB}$	25/10/4	MHz
	SR	Slew rate		500	V/ μs
	t_s	Settling time	0.1%	100	ns
	t_r, t_f	Rise and fall time		8	ns
	e_n	Input noise voltage density	$f = 1\text{kHz}$	8	$\text{nV} \cdot \sqrt{\text{Hz}}$
	I_n	Input noise current density		1	$\text{pA} \cdot \sqrt{\text{Hz}}$
4, 5	S/N	Signal to noise ratio	$A_V = 0/6/12\text{dB}$	115/112/107	dB
4, 6	CS	Channel separation	$A_V = 0/6/12\text{dB}$, 10Hz to 20kHz	120	dB
4	THD	Total harmonic distortion	$A_V = 0/6/12\text{dB}$, $f_o = 1\text{kHz}$	0.0002	%

Notes

- 1 Exposure to maximum rating conditions for extended periods of time may affect device reliability.
- 2 Operating ratings indicate conditions for which other device parameters may not apply.
- 3 Probably greater. Limited by measuring instrument.
- 4 Measuring instrument: Panasonic Audio Analyzer VP-7722P.
- 5 Input short-circuited. Reference: 1V. Response: RMS. Weighting: IHF-A.
- 6 Average value over specified frequency range.

Most specifications are guaranteed by design and therefore not tested.

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Symbol	Dimensions	
	mm	hches
A	7.62mm	3/10"
B	5.08mm	2/10"
C	2.54mm x 2	1/10" x 2
D	0.63mm x 0.63mm	1/40" x 1/40"
E	1.88mm	0.74"
F	0.53mm	0.021"
G	1.00mm	0.039"
H	7.50mm TYP.	0.30" TYP.
J	11.7mm	0.46"
K	3.56mm TYP.	0.14" TYP.
L	5.8mm	0.23"
M	4.8mm	0.19"
N	Ø1.4mm	Ø0.055"
P	9mm	0.35"
Q	6.3mm	0.25"
R	0.8mm	0.031"
S	Ø1.3mm	Ø0.051"
T	6.5mm	0.26"

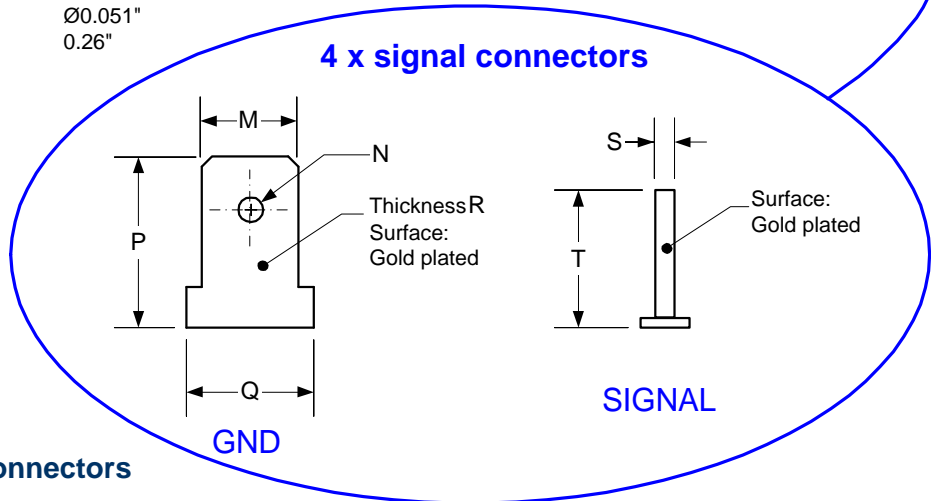
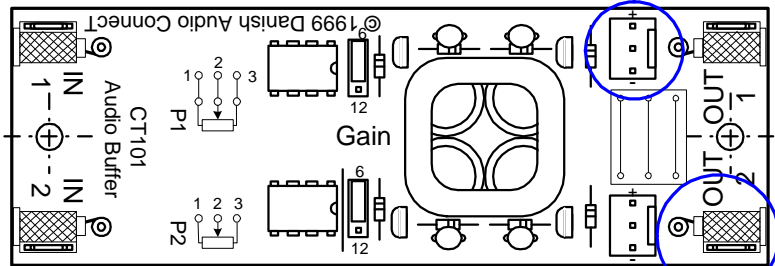


Fig. 3. CT101 connectors

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