

### THAT 202XT, 202XTC, 202R

#### FEATURES

- Wide Dynamic Range: >124 dB
- Wide Gain Range: > 130 dB
- Logarithmic Gain Control
- Very Low Distortion: (0.003% @0 dB gain, 0.02% @20dB gain)
- Temperature Compensated (202XTC)
- Package Compatible with dbx 202

#### APPLICATIONS

- Faders
- Console Automation
- Panners
- Compressors
- Expanders
- Filters
- Oscillators

#### Description

The **THAT 202XT, 202XTC and 202R2** modular voltage-controlled amplifiers (VCAs) are extremely high performance current-in/current-out devices with negative-sense control ports. Intended for the most demanding of applications, these parts require almost no external support circuitry and are packaged on small, 1" X 2" circuit boards. Their pin configurations are identical to that of the original dbx 202 VCA, as well as later dbx models 202C, 202X, 202XL and 2001. The **202XTC** has a control constant of -20dB/Volt, and is internally tempera-

ture compensated for very low thermal drift. The **202XTC** is recommended for all new designs. The **202XT** is intended to replace a dbx 202C, 202X or 202XL in designs where control-voltage temperature compensation was provided externally. Like the 202C, -X and -XL, the **202XT** has a control constant of -20dB/Volt, with a predictable +0.33%/°C temperature drift. The **202R** is intended to replace the original dbx 202. The **202R** matches the dbx 202's control sensitivity of -6mV/dB and its predictable +0.33%/°C temperature drift

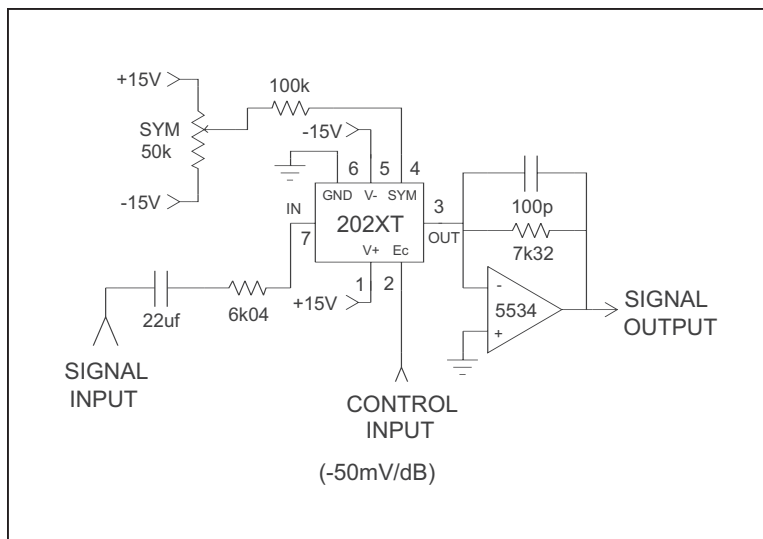


Figure 1. 202XT, 202XTC Typical Application Circuit

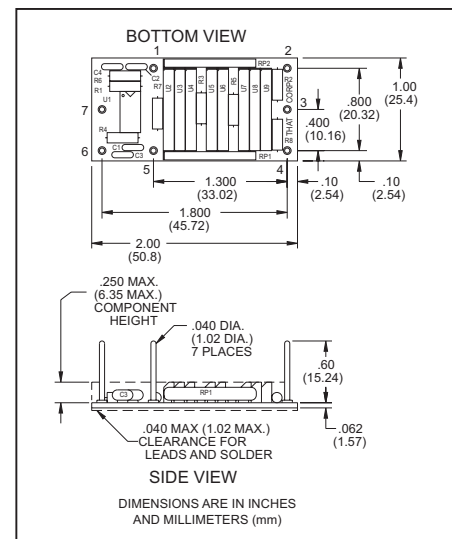


Figure 2. 202XT, 202R, 202XTC Physical Outline

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# SPECIFICATIONS<sup>1</sup>

<b><u>Absolute-Maximum Ratings (T<sub>A</sub> = 25°C)</u></b>			
Positive Supply Voltage (V <sub>CC</sub> )	+18 V	Power Dissipation (P <sub>D</sub> )	1.5 W
Negative Supply Voltage (V <sub>EE</sub> )	-18 V	Operating Temperature Range (T <sub>OP</sub> )	-20 to +75°C
Supply Current (I <sub>CC</sub> )	40 mA	Storage Temperature Range (T <sub>ST</sub> )	-40 to +125°C

<b><u>Recommended Operating Conditions</u></b>												
Parameter	Symbol	Conditions	<u>202XT</u>			<u>202R</u>			<u>202XTC</u>			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Positive Supply Voltage	V <sub>CC</sub>		+12	+15	+16	12	+15	+16	+12	+15	+16	V
Negative Supply Voltage	V <sub>EE</sub>		12	-15	-16	-12	-15	-16	-12	-15	-16	V
Signal Current		V <sub>CC</sub> =-V <sub>EE</sub> =15 V	—	1.4	6.0	—	1.4	6.0	—	1.4	6.0	mA

<b><u>Electrical Characteristics<sup>2</sup></u></b>												
Parameter	Symbol	Conditions	<u>202XT</u>			<u>202R</u>			<u>202XTC</u>			Units
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Supply Current	I <sub>CC</sub>	No Signal	—	26	33	—	26	33	—	26	33	mA
Input Impedance	R <sub>IN</sub>		1.18	1.25	1.32	1.18	1.25	1.32	1.18	1.25	1.32	kΩ
Equiv. Input Bias Current	I <sub>B</sub>	No Signal	—	40	64	—	40	64	—	40	64	nA
Input Offset Voltage	V <sub>OFF(IN)</sub>	No Signal	—	+10	—	—	+10	—	—	+10	—	mV
Output Offset Voltage	V <sub>OFF(OUT)</sub>	R <sub>out</sub> =7.32 kΩ										
		-100 dB < gain < 0 dB	—	1	2	—	1	2	—	1	2	mV
		+20 dB gain	—	5	10	—	5	10	—	5	10	mV
Gain-Control Constant	dB gain/E <sub>C</sub>	T <sub>A</sub> =27°C -100 dB < gain < +40 dB	19.3	20	20.7	161.0	166.7	172.6	19.3	20	20.7	dB/V
Gain-control TempCo	ΔGain/ΔT <sub>A</sub>	0°C < T <sub>A</sub> < 70°C E <sub>C</sub> constant	—	-0.33	—	—	-0.33	—	-0.04	0.0	+0.04	%/°C
Gain-Control Linearity		-60 to +40 dB gain	—	0.5	2	—	0.5	2	—	0.5	2	%
Off Isolation		E <sub>C</sub> = -6V	110	115	—	—	—	—	110	115	—	dB
		E <sub>C</sub> = -.72V	—	—	—	110	115	—	—	—	—	dB
Output Noise	e <sub>n(OUT)</sub>	20Hz-20kHz, R <sub>out</sub> = 7.32kΩ										
		0 dB gain	—	-98	-95	—	-98	-95	—	-98	-95	dBV
		+20 dB gain	—	-85	-82	—	-85	-82	—	-85	-82	dBV
Total Harmonic Distortion	THD	I <sub>IN</sub> +I <sub>OUT</sub> =700 mA, 1kHz										
		0 dB gain	—	0.003	0.01	—	0.003	0.01	—	0.003	0.01	%
		±20 dB gain	—	0.02	0.05	—	0.02	0.05	—	0.02	0.05	%
Symmetry Control Voltage	V <sub>SYM</sub>	A <sub>V</sub> =0dB, THD<0.01%	-8	0	+8	-8	0	+8	-8	0	+8	mV
Symmetry Port Impedance	R <sub>SYM</sub>	T <sub>A</sub> = 27°C	48.4	51	53.6	48.4	51	53.6	48.4	51	53.6	Ω
Control Port Impedance	R <sub>C</sub>	T <sub>a</sub> = 27°C	813	822	831	200	203	206	798	842	885	Ω

1. All specifications subject to change without notice.
2. Unless otherwise noted, T<sub>A</sub>=25°C, V<sub>CC</sub> = +15V, V<sub>EE</sub>= -15V. Test circuit is as shown in Figure 1.