

Log Video Amplifier

GENERAL DESCRIPTION

The XR-7000 is a universal logarithmic video amplifier chip. Because of its extremely wide bandwidth, it can be used in systems ranging from audio applications to radar subsystems. The XR-7000 utilizes seven separate precision logarithmic elements. These elements may be used separately for small dynamic ranges or cascaded to offer an extremely wide dynamic range of operation.

The XR-7000 has an internal band-gap voltage reference, a differential video summing amplifier, and a precision die temperature sensor, to aid in its system interfacing. Also included are internal power supply regulators to provide excellent power supply rejection.

The XR-7000 is available in a 40-Pin ceramic or plastic package. It is designed to operate from dual 11 to 15 volt power supplies

FEATURES

- Seven Uncommitted Logging Elements
- Internal Band-Gap Voltage Reference
- Dual Tracking Regulators On-Board
- Precision Die Temperature Sensor

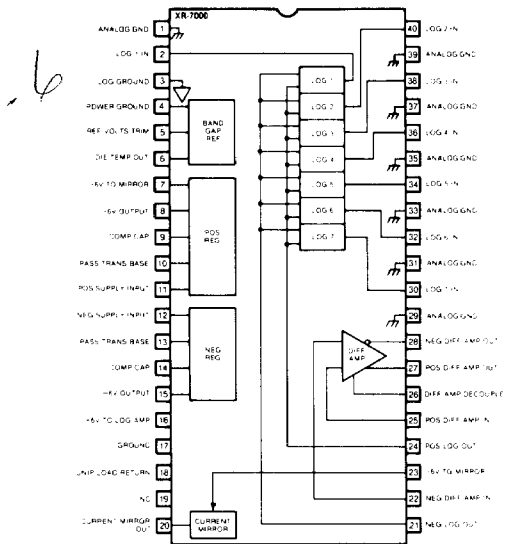
APPLICATIONS

- Receiver Subsystems
- Radar Subsystems
- Spectrum Analyzers
- Power Meters
- Test Equipment
- Video Cartridge Tape Recorders
- Audio Tape Recorders
- Smoke Detectors
- Chemical Process Systems
- Ultrasonic Imaging
- Medical Equipment (Tomography)

ABSOLUTE MAXIMUM RATINGS

Power Supply	30V
Power Dissipation	1.0W
Derate Above at 25°C	5 mW/°C
Operating Temperature	
Ceramic	-55°C to +125°C
Plastic	0°C to +70°C
Any Input Voltage	V _{CC} + .5V to V _{EE} - .5V

FUNCTIONAL BLOCK DIAGRAM



ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-7000M	Ceramic	-55°C to +125°C
XR-7000CP	Plastic	0°C to +70°C

SYSTEM DESCRIPTION

The main section of the XR-7000 comprises seven logarithmic sections. Each section has a dynamic range of approximately 12 dBV. For wide range applications, the seven sections may be cascaded to provide a total dynamic range of over 90 dBV. The logarithmic sections provide current outputs, which can be summed and converted to voltages, using the on-board summing amplifiers. A unipolar output with built-in offset is also available for use with an external I to V converter.

The precision die temperature sensor is useful in dc-coupled applications to provide stability over its temperature range.

XR-7000

ELECTRICAL CHARACTERISTICS

Test Conditions: With $V_{CC} = +12V$, $V_{EE} = -12V$, $T_{AMB} = 25^{\circ}C$, dual polarity output load resistances = 100 ohms, unipolar internal load resistance = 200 ohms, unless specified otherwise.

SYMBOL	PARAMETERS	MIN	TYP	MAX	UNIT	CONDITIONS
V_{CC}	Positive Supply Voltage	11	12	15	V	
V_{EE}	Negative Supply Voltage	11	12	15	V	
I_{CC}	Positive Supply Current		15		mA	
I_{EE}	Negative Supply Current		15		mA	
$+V_{out}$	Positive Regulator Output Voltage	5.8	6.0	6.2	V	Reference Untrimmed
$-V_{out}$	Negative Regulator Output Voltage	-5.8	-6.0	-6.2	V	Reference Untrimmed
LOG SECTION						
LG	Log Range per Element		12		dB	Dual Polarity Output
BW	Bandwidth	14	30		MHz	100 Ω Diff. Load
T_r	Risetime		12	25	ns	10% Points
T_{pd}	Prop. Delay	6	10	12	ns	
T_{rec}	Saturation Recovery		20		ns	
I_{in}	Input Bias Current		2		μA	
PSRR	Power Supply Rejection Ratio	60	65		dBV	DC to 100 MHz
V_{TRAC}	Tracking of Regulators		20		ppm	
T_{tcv}	Output Tempco		50		ppm	Trimmed
V_{out}	Output Voltage per Stage		118		mV	Unipolar
V_{out}	Output Voltage per Stage		120		mV	Bipolar each Output
R_{out}	Unipolar Output Resistance	150	200	250	ohms	
N_{out}	Output Noise		100		μV rms	Unipolar connection