

FEATURES

- dual channel signal processing
- reflowable hybrid
- 4th order state variable filter
- adjustable crossover frequency
- adjustable compression ratio from 1:1 to 4:1
- independent compression ratio adjustment for low and high frequency band
- adjustable AGC threshold levels
- unique twin average detectors
- > 95dB dynamic range
- low THD and IMD distortion
- drives class D integrated receivers
- MPO range externally adjustable

thinSTAX™ PACKAGING

Hybrid Typical Dimensions:

0.190 x 0.105 x 0.050in.
(4.83 x 2.67 x 1.27mm)

DEVICE DESCRIPTION

The DynamEQ®II hybrid family is a second generation Wide Dynamic Range Compression (WDRC) system.

The small hybrid design makes it particularly suitable for CIC applications. GA3202 hybrid incorporates 24dB/oct filtering. The gain and frequency response is dependant on the user's environment.

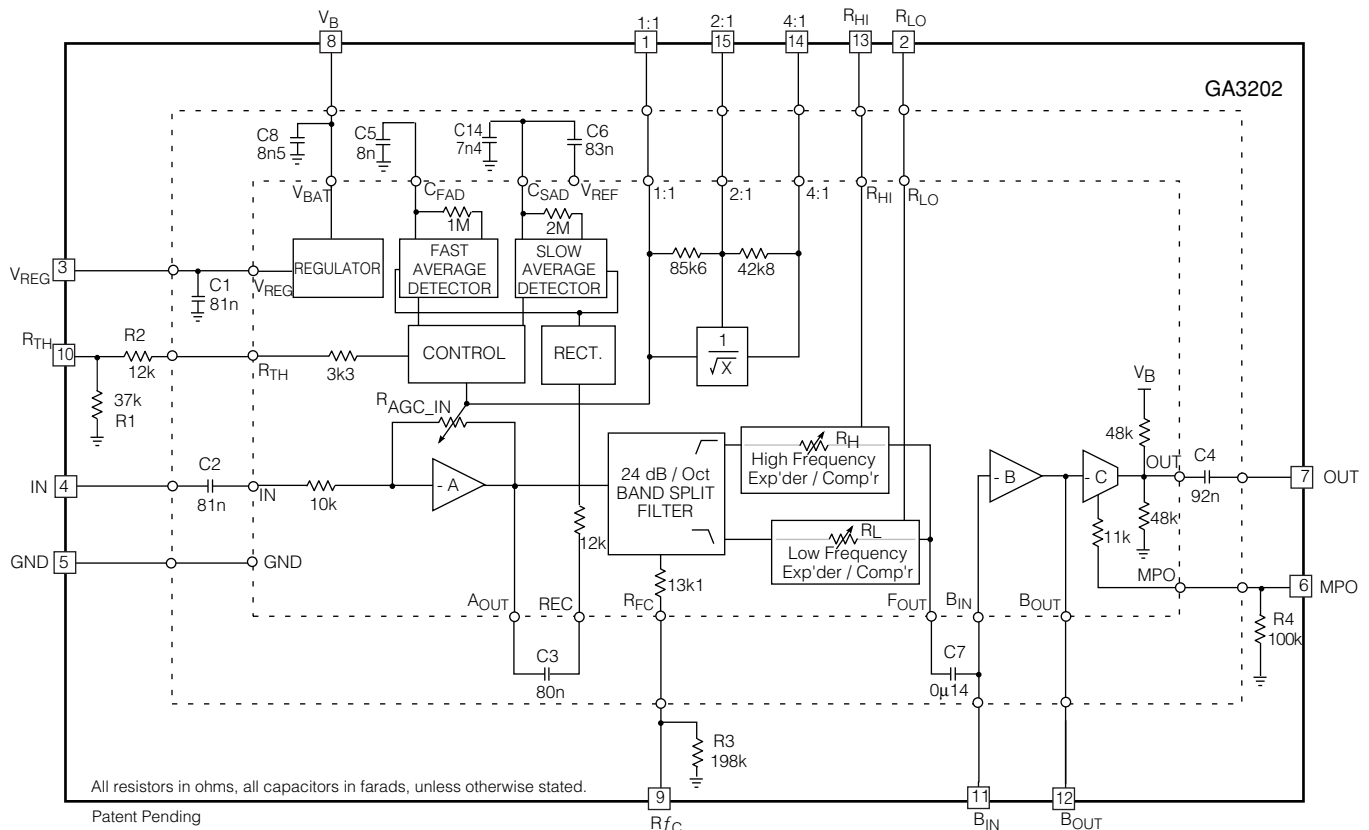
Twin averaging detector circuits are optimized for sound quality during normal listening, without sacrificing comfort during sudden loud inputs.

All input signals to DynamEQ®II are processed by 2:1 compression before subsequent band splitting.

The 24 dB/oct band split filter ahead of the expander/compressor circuits allows for independent compression ratio adjustments (1:1 to 4:1) in high and low frequency channels.

The gain setting stage is followed by a class D integrated receiver preamplifier stage. Symmetrical peak clipping is used to achieve MPO adjustment.

The GA3202 is designed as a CIC alternative to GS3032, GR3032 and GS3028 with MPO adjustment range modifications.



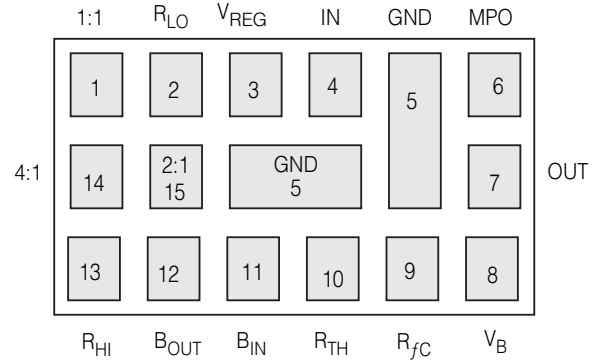
BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE
Supply Voltage	3 VDC
Power Dissipation	25 mW
Operating Temperature Range	-10° C to 40° C
Storage Temperature Range	-20° C to 70° C

CAUTION ELECTROSTATIC SENSITIVE DEVICES DO NOT OPEN PACKAGES OR HANDLE EXCEPT AT A STATIC-FREE WORKSTATION	
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PAD CONNECTION



ELECTRICAL CHARACTERISTICS

Conditions: Supply Voltage $V_B = 1.3$ V, Frequency = 1 kHz, Temperature = 25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Hybrid Current	I_{AMP}		-	380	530	μA
Minimum Voltage	V_b		-	-	-	V
Total Harmonic Distortion	THD	$V_{IN} = -40dBV$ at 1kHz	-	0.2	1.0	%
THD with Maximum Allowable Input	THD _M	$V_{IN} = -23dBV$, $R_{vc} = 47k\Omega$	-	2	-	%
Input Referred Noise	IRN	Aweight	-	3.0	-	μV_{RMS}
Total System Gain	A_V	$V_{IN} = -90dBV$	45	48	51	dB
Regulator Voltage	V_{REG}	$I_{LOAD} = 30\mu A$	890	930	1000	mV
AGC						
Lower Threshold	TH _{LO}		-91	-87	-83	dBV
Upper Threshold	TH _{HI}		-36	-32	-28	dBV
Compression Gain Range	ΔA	Gain(-90dBV _{IN}) - Gain(-30dBV _{IN})	37.5	40.5	43.5	dB
System Gain in Compression	A_{60}	$V_{IN} = -60dBV$	26	29	32	dB
Min. Compression Ratio	CMP _{1:1}	$V_{IN} = 3kHz$, -60dBV to -40dBV, $R_{hp} = 1:1$ $R_{lp} = 1:1$	0.9	1.0	1.1	Ratio
Max. Comp. Ratio	CMP _{4:1}	$V_{IN} = 3kHz$, -60dBV to -40dBV, $R_{hp} = 4:1$ $R_{lp} = 4:1$	3.6	4.0	4.3	Ratio
Fast Detector Time Constant	τ_{FAST}		-	8	-	ms
Slow Detector Time Constant	τ_{SLOW}		-	180	-	ms
FILTER						
Maximum Cross-over Frequency	f_{c_0}	$R_{fc} = 0\Omega$	3.0	3.9	-	kHz
Nominal Cross-over Frequency	$f_{c_{22}}$	$R_{fc} = 22k\Omega$	1.5	1.9	2.3	kHz
Minimum Cross-over Frequency	$f_{c_{220}}$	$R_{fc} = 220k\Omega$	-	0.9	1.4	kHz
Filter Rolloff Rate			-	24	-	dB/oct
STAGE A and B						
Open Loop Gain (B)	A_{OL_B}		-	52	-	dB
Input Impedance (A)	R_{IN}		-	11	-	k Ω
OUTPUT STAGE						
Stage Gain	A_C	$V_{IN} = -30dBV$	7.0	9	11.0	dB
Max Output Level	MPO	$R_{VC} = 220k\Omega$, $V_{IN} = -25dBV$	-16	-14	-12	dBV
MPO Range	ΔMPO	$R_{MPO} = 0\Omega$ to 100k Ω	17	19	21	dB
Output Resistance	R_{OUT}		-	24	-	k Ω

All conditions and parameters remain as shown in Test Circuit unless otherwise stated in "Conditions" column.

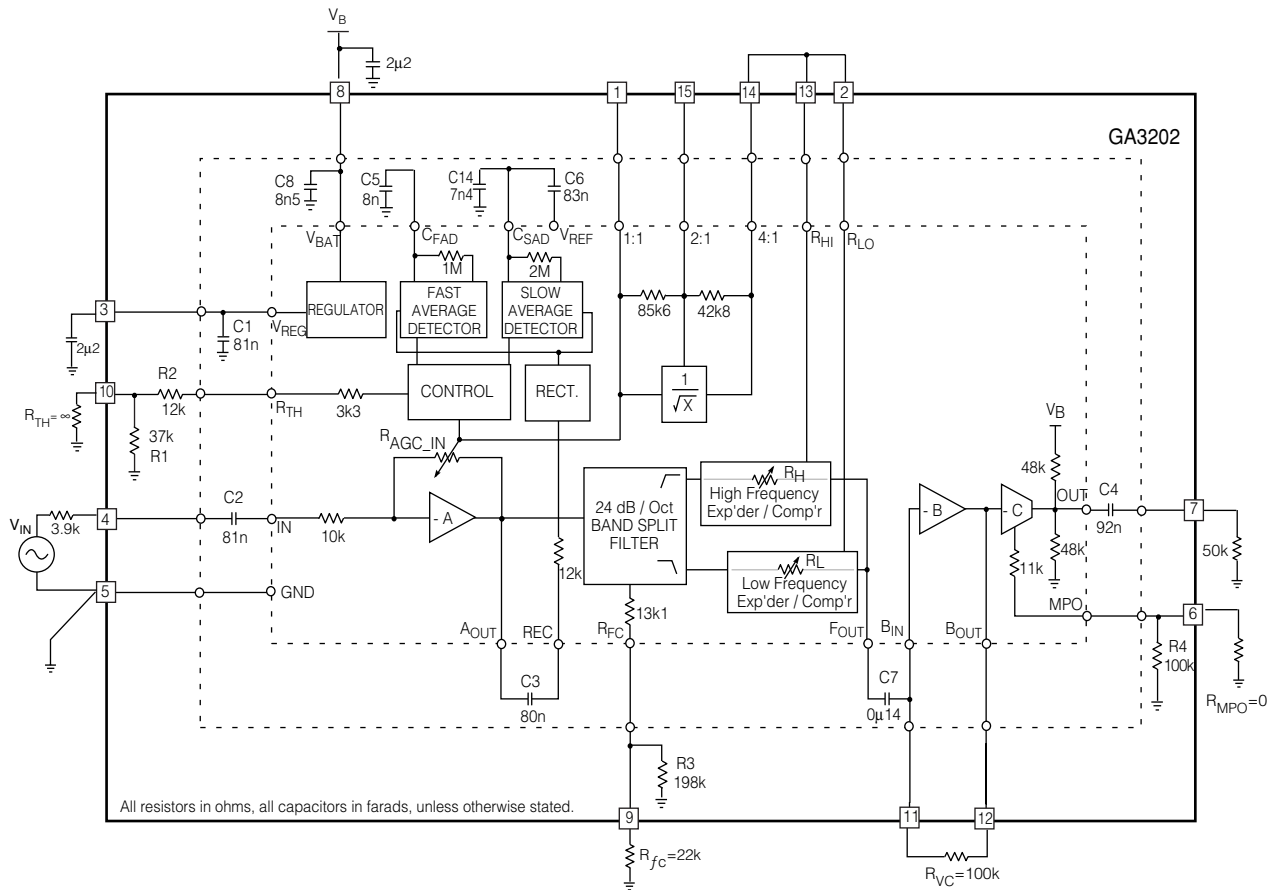


Fig. 1 Production Test Circuit

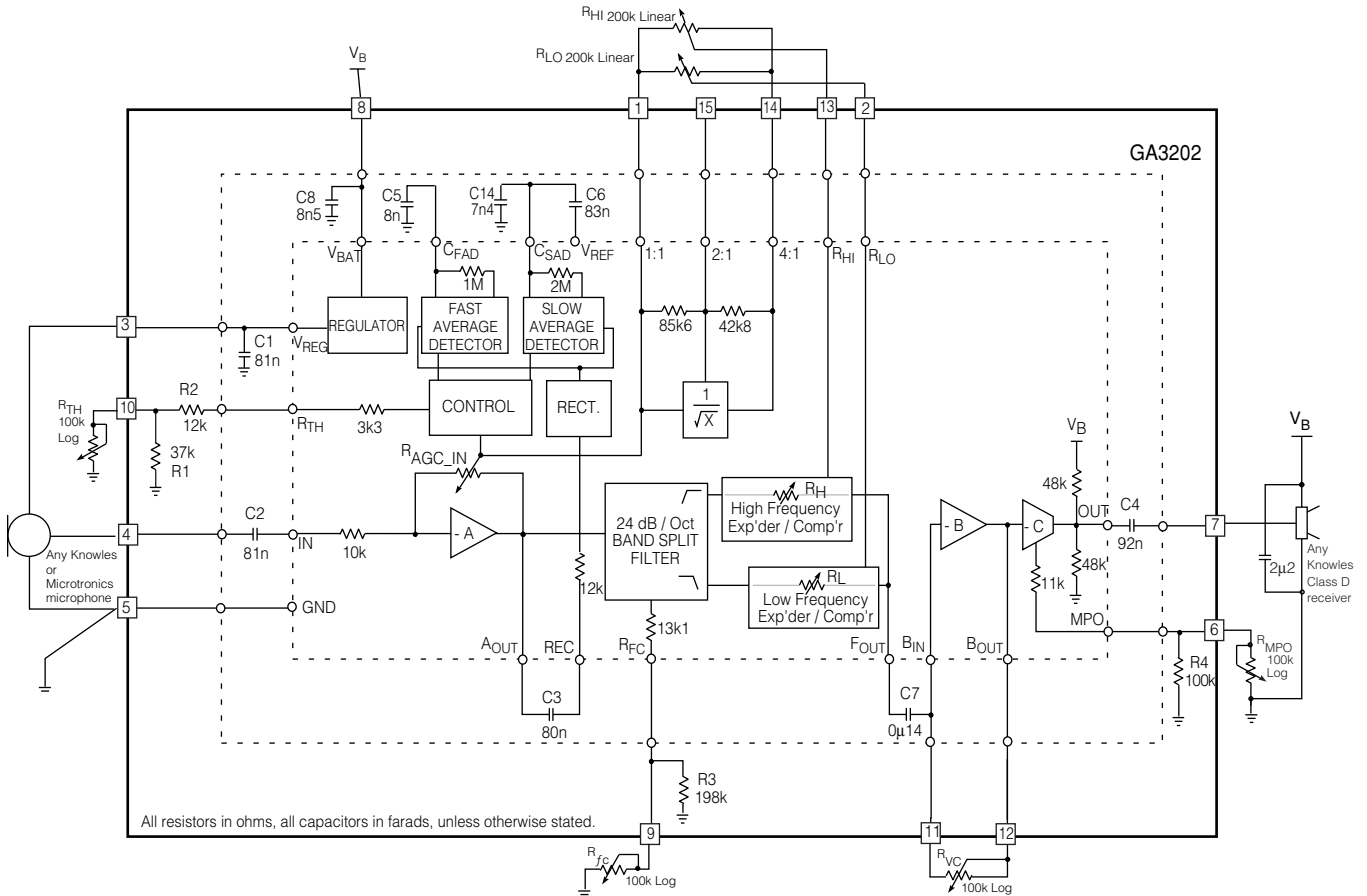


Fig. 2 Typical Application Circuit

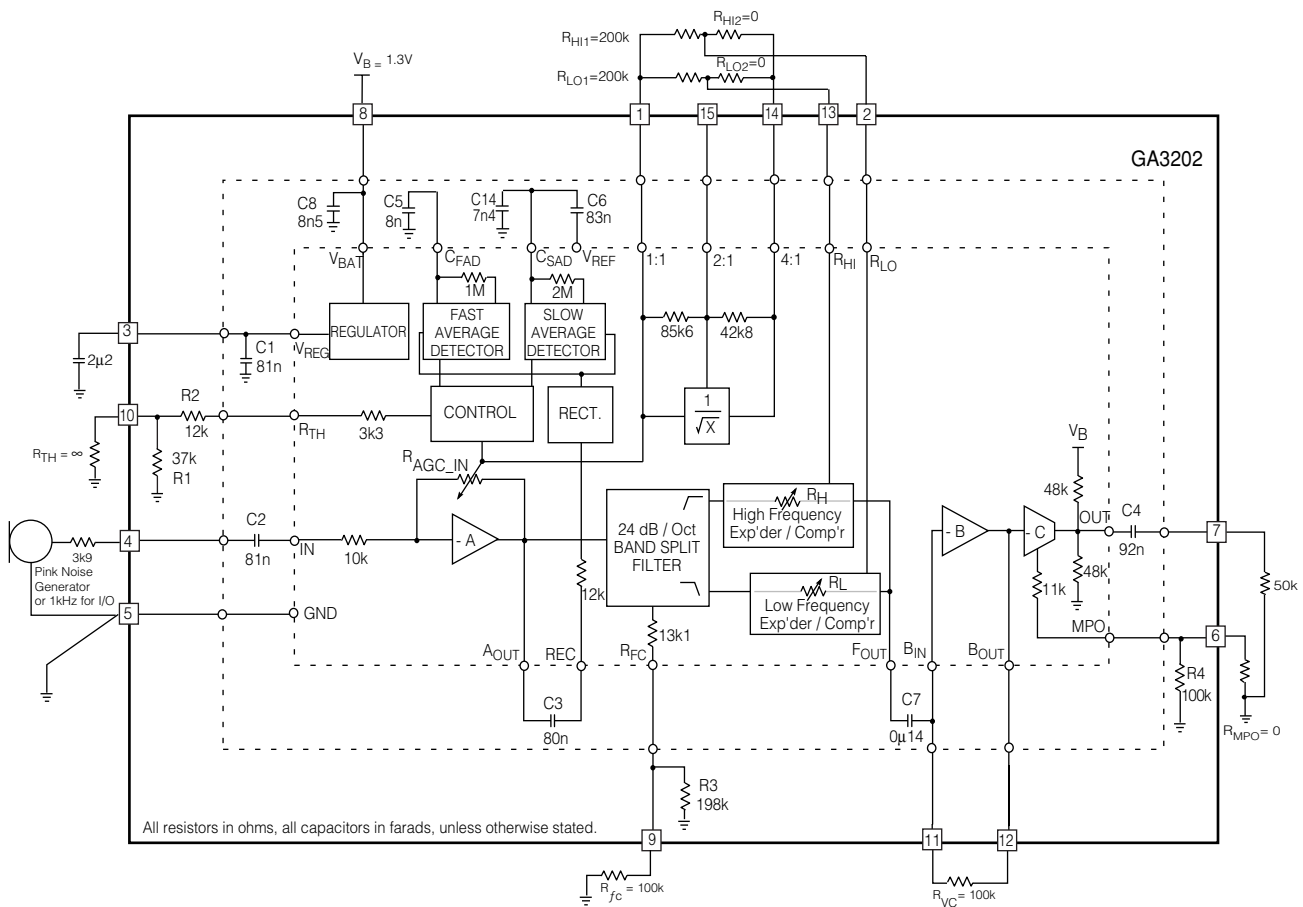


Fig. 3 Characterization Circuit (Used to generate typical curves)

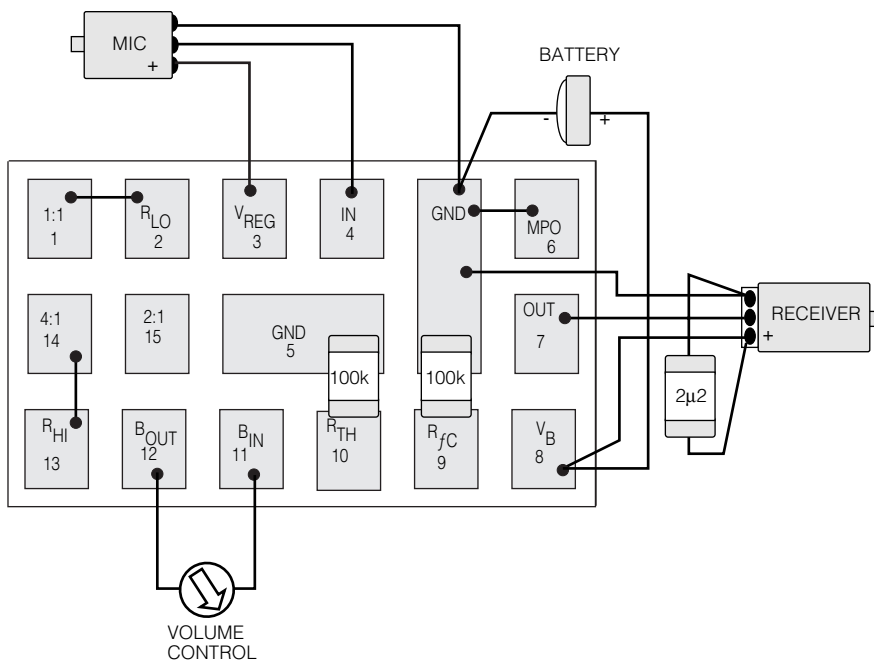


Fig. 4 Typical Assembly Diagram

TYPICAL PERFORMANCE CURVES

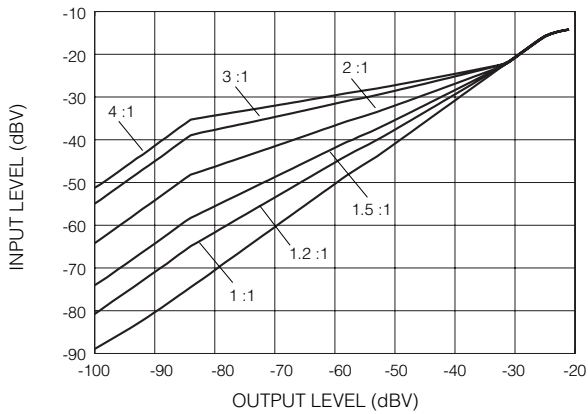


Fig. 5 I/O Transfer function for Different Compression Ratios

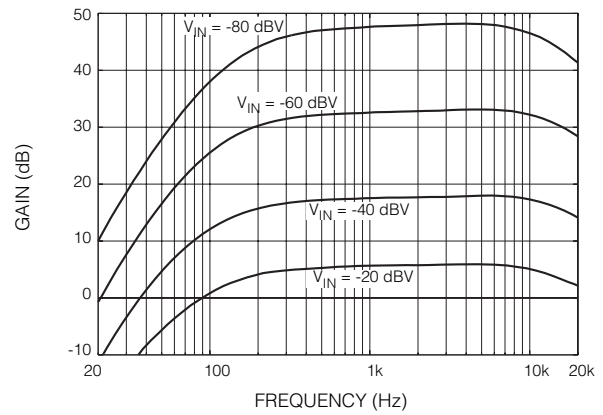


Fig. 6 Frequency Response for Different Input Levels

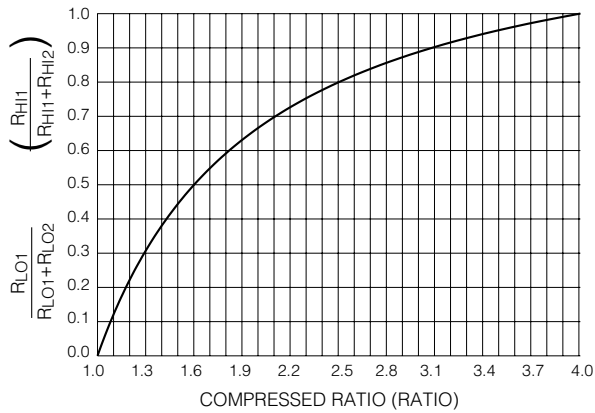
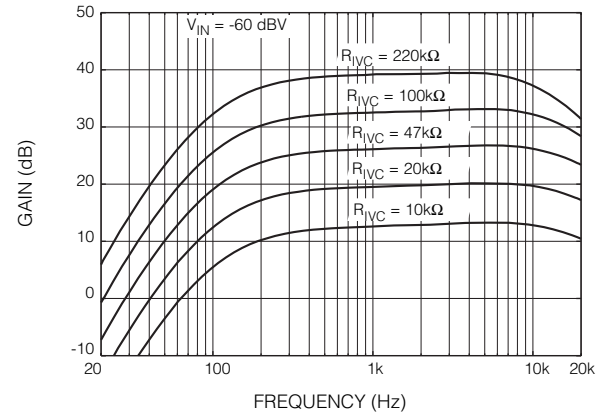
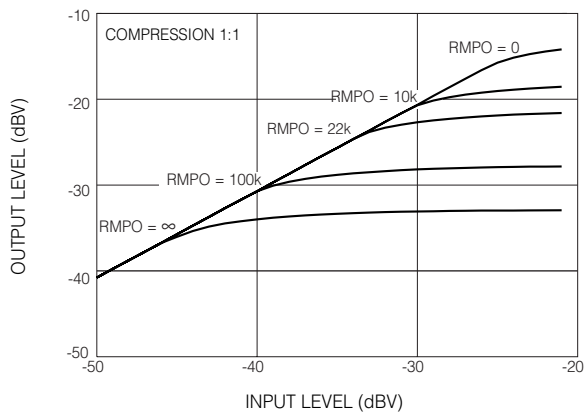
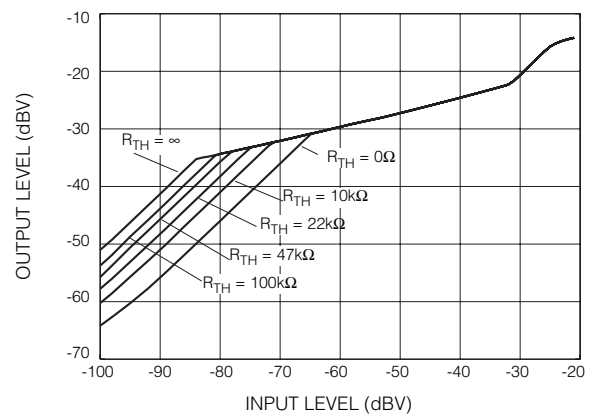
Fig. 7 Compression Settings Resistor Ratio for High Pass Channel (R_{HI1} & R_{HI2}) and Low Pass Channel (R_{LO1} & R_{LO2})Fig. 8 Frequency Response for Different R_{VC} Values

Fig. 9 I/O Transfer Function for Different RMPO Resistors

Fig. 10 I/O Transfer Function for Different R_{TH} Resistors

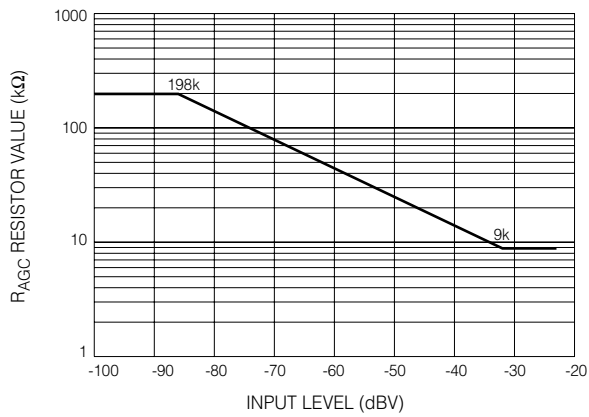


Fig. 11 Stage A Compressor Feedback Resistor Value

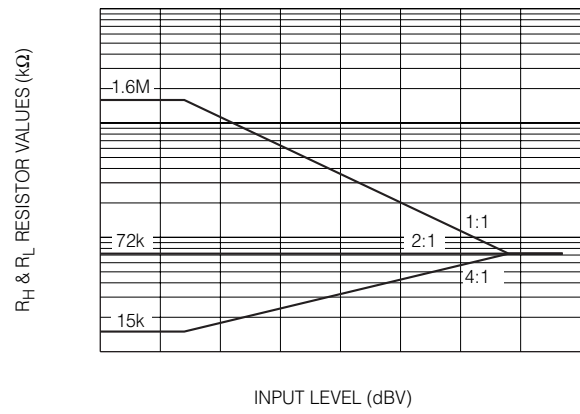


Fig. 12 Expander / Compressor Resistors Values

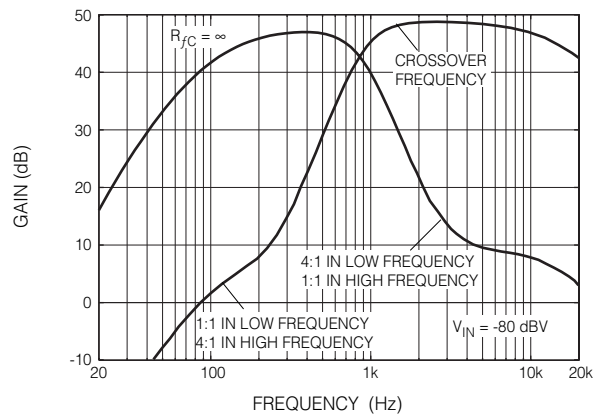


Fig. 13 Crossover Frequency Representation

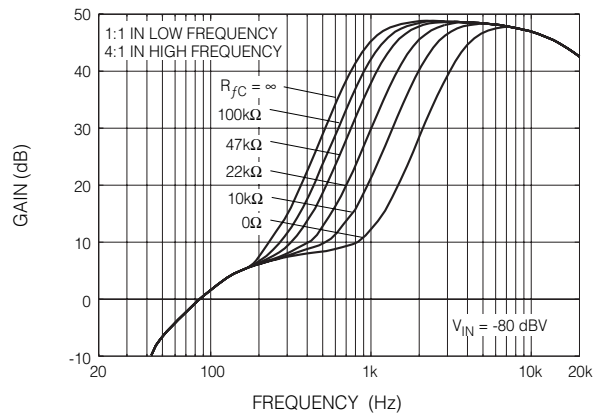


Fig. 14 Frequency Response for Different R_{fC} Resistor Values

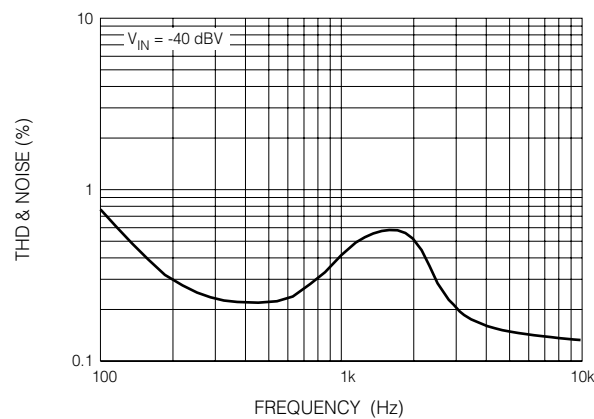


Fig. 15 THD and Noise vs Frequency

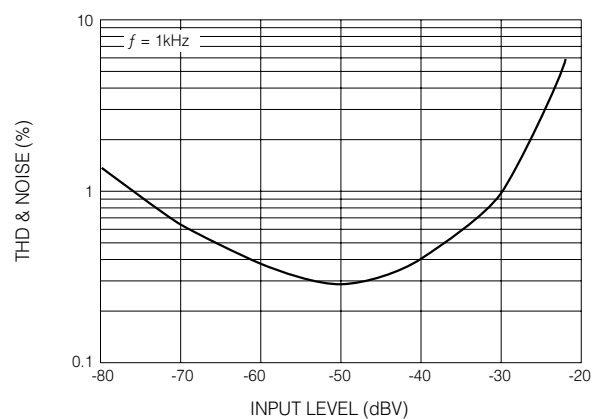


Fig. 16 THD and Noise vs Input Level

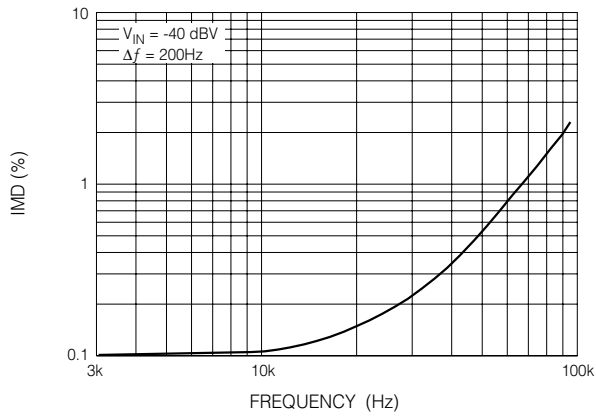


Fig. 17 Intermodulation Distortion (CCIF) vs Frequency

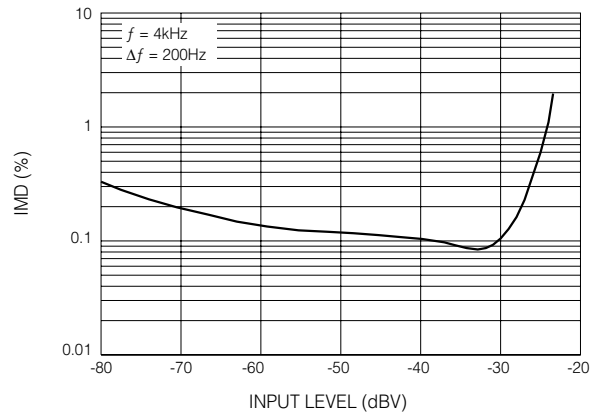
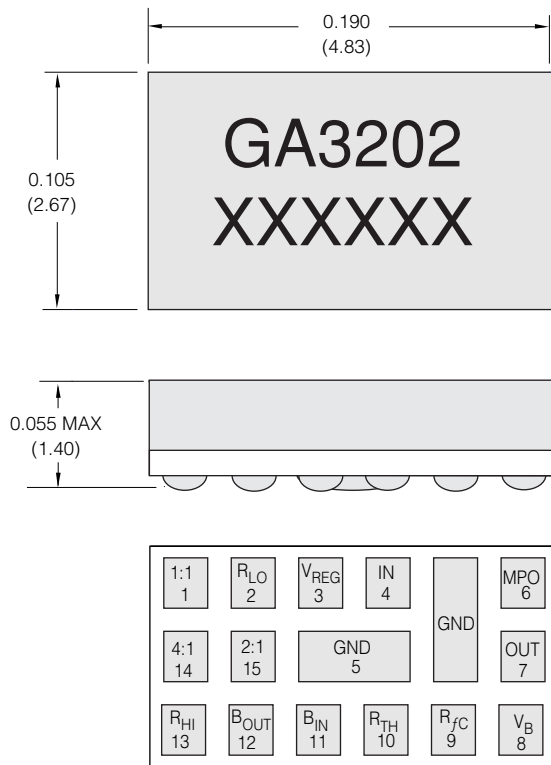


Fig. 18 Intermodulation Distortion (CCIF) vs Input Level

PACKAGE DIMENSIONS



Dimensions are in inches.

Dimensions in parenthesis are in millimetres converted from inches and include minor rounding errors.

1.0000 inches = 25.400 mm.

Dimension tolerances ± 0.003 (± 0.08) unless otherwise stated.

Minimum pad size: 0.022 x 0.025 (0.56 x 0.64)

XXXXXX - work order number.

This hybrid is designed to be reflowed according to Gennum's recommended reflow process (Information Note 521-45).

GENNUM CORPORATION

MAILING ADDRESS:

P.O. Box 489, Stn. A, Burlington, Ontario, Canada L7R 3Y3

Tel. +1 (905) 632-2996 Fax +1 (905) 632-2814

SHIPPING ADDRESS:

970 Fraser Drive, Burlington, Ontario, Canada L7L 5P5

GENNUM JAPAN CORPORATION

C-101, Miyamae Village, 2-10-42 Miyamae, Suginami-ku, Tokyo 168-0081,

Japan Tel. +81 (3) 3334-7700 Fax: +81 (3) 3247-8839

REVISION NOTES:

Converted to Data Sheet.

DOCUMENT IDENTIFICATION:

DATA SHEET