

FEATURES

- **4 different modes of operation:**
 - **directional**
 - **directional equalized**
 - **1 mic omnidirectional**
 - **2 mic omnidirectional**
- **allows for mic port spacing from 6mm to 13mm**
- **calibration software automatically trims out mic sensitivity mismatches**
- **variable time delay/directivity pattern**
- **4 memories**
- **variable low frequency equalization (0 to 20dB)**
- **small package size**
- **compatible with all hearing aids**

thinSTAX™ PACKAGING

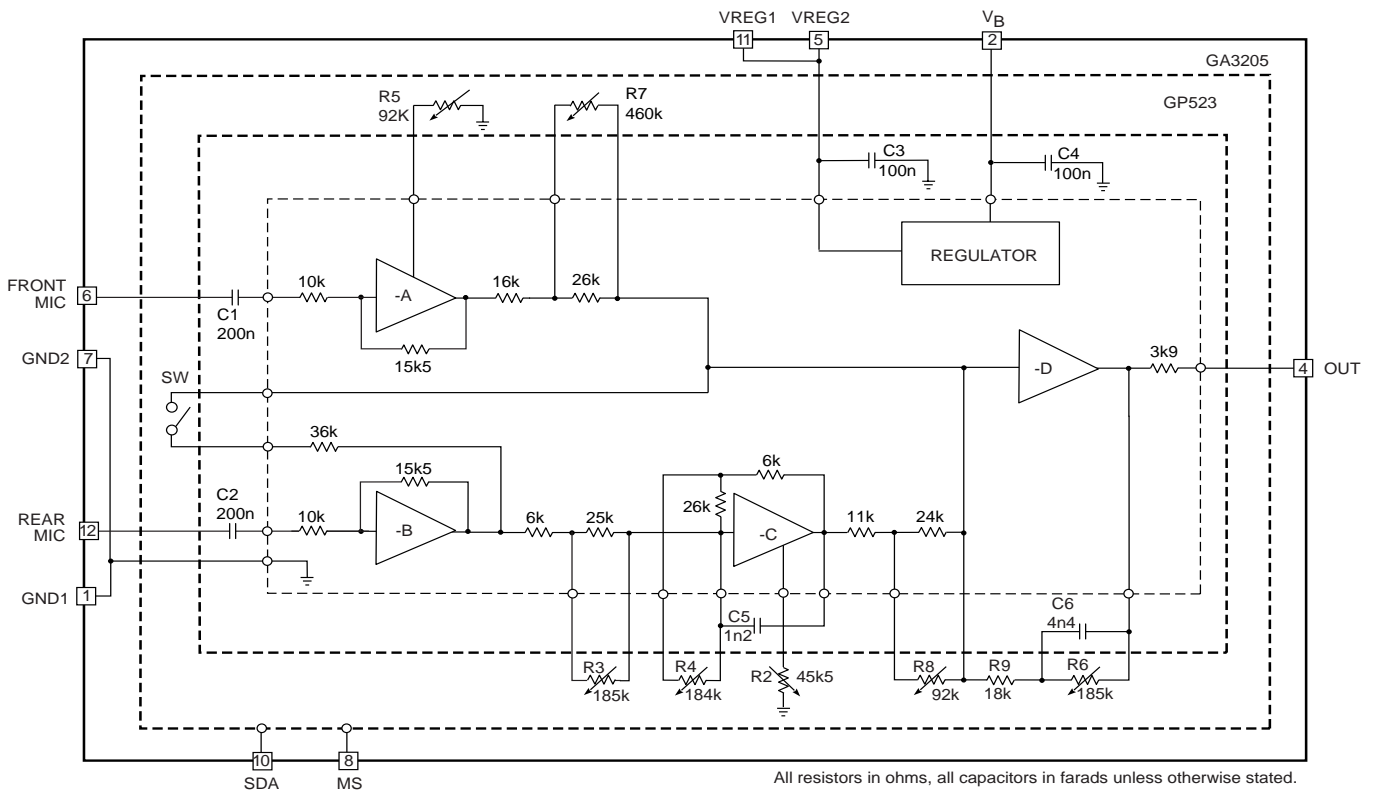
Hybrid Typical Dimensions:
 0.205 x 0.110 x 0.060in.
 (5.21 x 2.79 x 1.52mm)

DESCRIPTION

The GA3205 is a multi-memory hybrid that, with the addition of two microphones, can be used to produce a directional response in any hearing aid. The four available memories can be programmed to include any of the 4 modes of operation: 1 mic omnidirectional, 2 mic omnidirectional, directional, and directional equalized. The variable time delay of the circuit gives it the flexibility to offer a wide range of directivity patterns (ie. cardioid to hypercardioid) for microphone port spacings from 6mm to 13mm. Variable low frequency equalization gives the flexibility to trade-off between bass response and noise performance.

Calibration software automatically configures the hybrid for the desired directivity pattern and adjusts the gain trim resistors to compensate for microphone sensitivity mismatches enabling maximum directivity.

The GA3205 hybrid code programmed into the GP523 is "2".




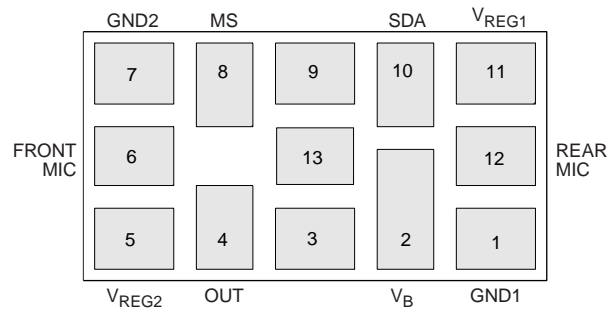
All resistors in ohms, all capacitors in farads unless otherwise stated.

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE
Supply Voltage	2VDC
Power Dissipation	25mW
Operating Temperature	-10 to +40°C
Storage Temperature	-20 to +70°C

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


PAD CONNECTION**ELECTRICAL CHARACTERISTICS**

Conditions: Temperature 25 °C, Frequency = 1 kHz. R1 - Tap 15; R2 - Tap 15; R3 - Tap 0; R4 - Tap 0; R5 - Tap 0; R6 - Tap 0; R7 - Tap 3; R8 - Tap 14

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Hybrid Current	I_{AMP}		140	250	400	μA
Minimum Voltage	V_B		-	1.1	-	V
Regulator Voltage	V_{REG}		860	920	980	mV
Nominal System Gain	GAIN		-	0	-	dB
Maximum Low Frequency Boost		@ 100Hz	18	20	22	dB
Front Channel Gain Adjustment Range	ΔG_{FRONT}		-	8	-	dB
Rear Channel Gain Adjustment Range	ΔG_{REAR}		-	22	-	dB
Minimum Time Delay	t_{MIN}	R2 - Tap 0	4.5	7.2	10	μs
Maximum Time Delay	t_{MAX}	R2 - Tap 0, R4 - Tap 15	25	33.0	45	μs
Power Supply Rejection Ratio of System	PSRR _{SYS}		-	50	-	dB
Power Supply Rejection Ratio of Regulator	PSRR _{REG}		-	70	-	dB
Total Harmonic Distortion	THD		-	0.1	1.0	%
Input Referred Noise	IRN	SW = closed, R7 - Tap 13	-	3.5	-	μV
Output Resistane	R_{OP}		-	3.9	-	k Ω

(All conditions and parameters remain as shown in test circuit unless stated in condition column)

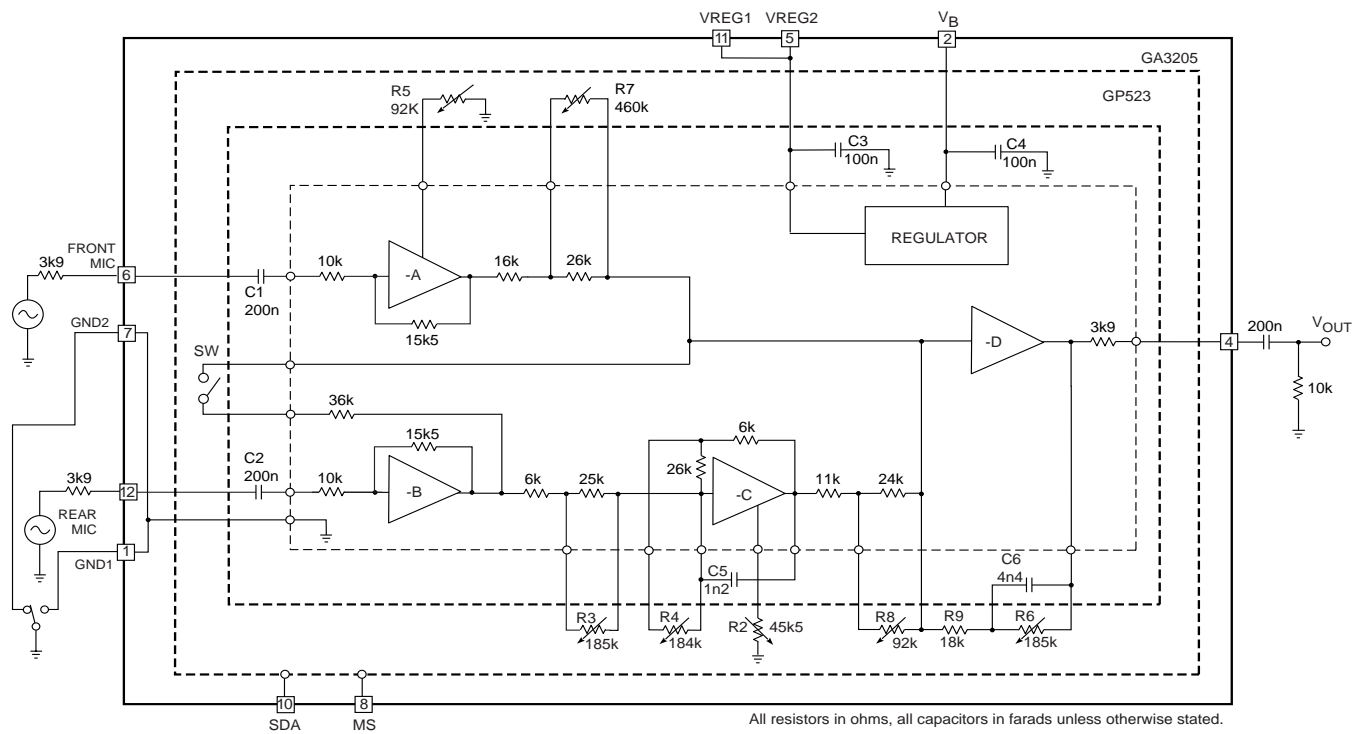


Fig. 1 Production Test Circuit

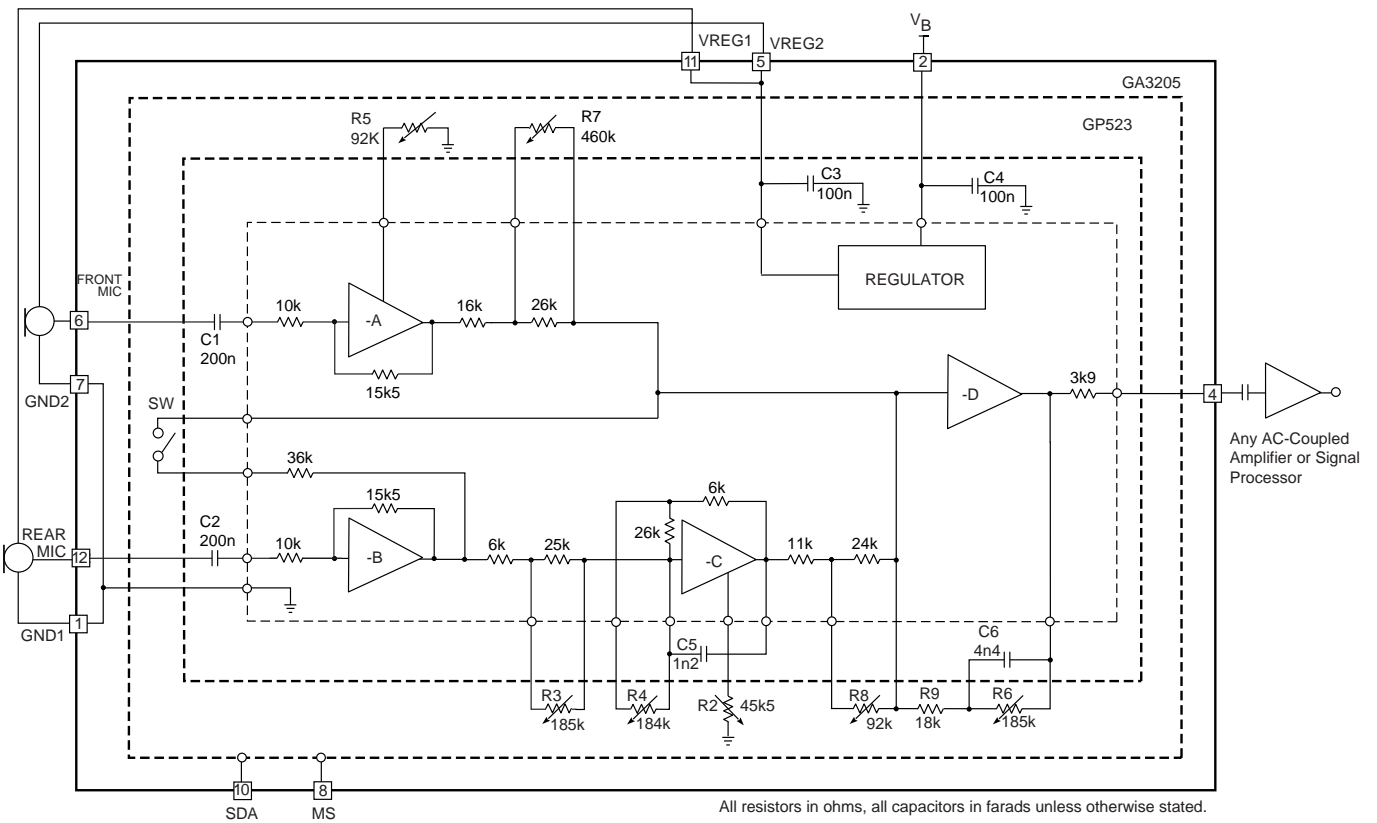


Fig. 2 Typical Hearing Instrument Application

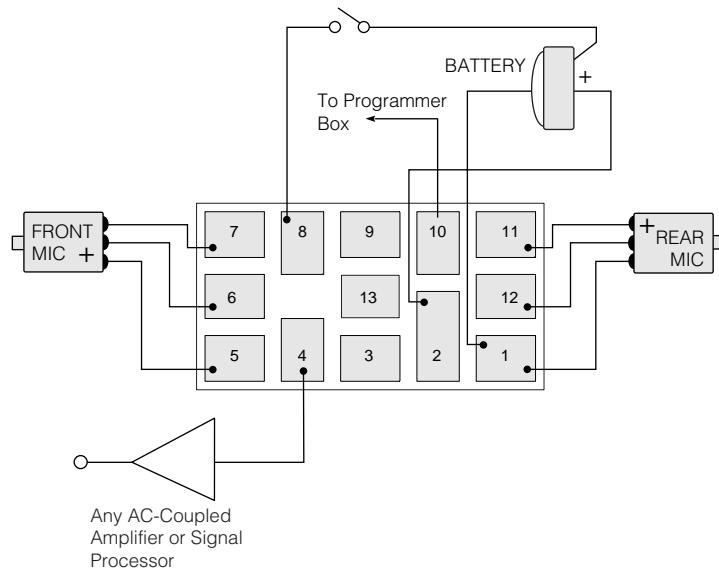
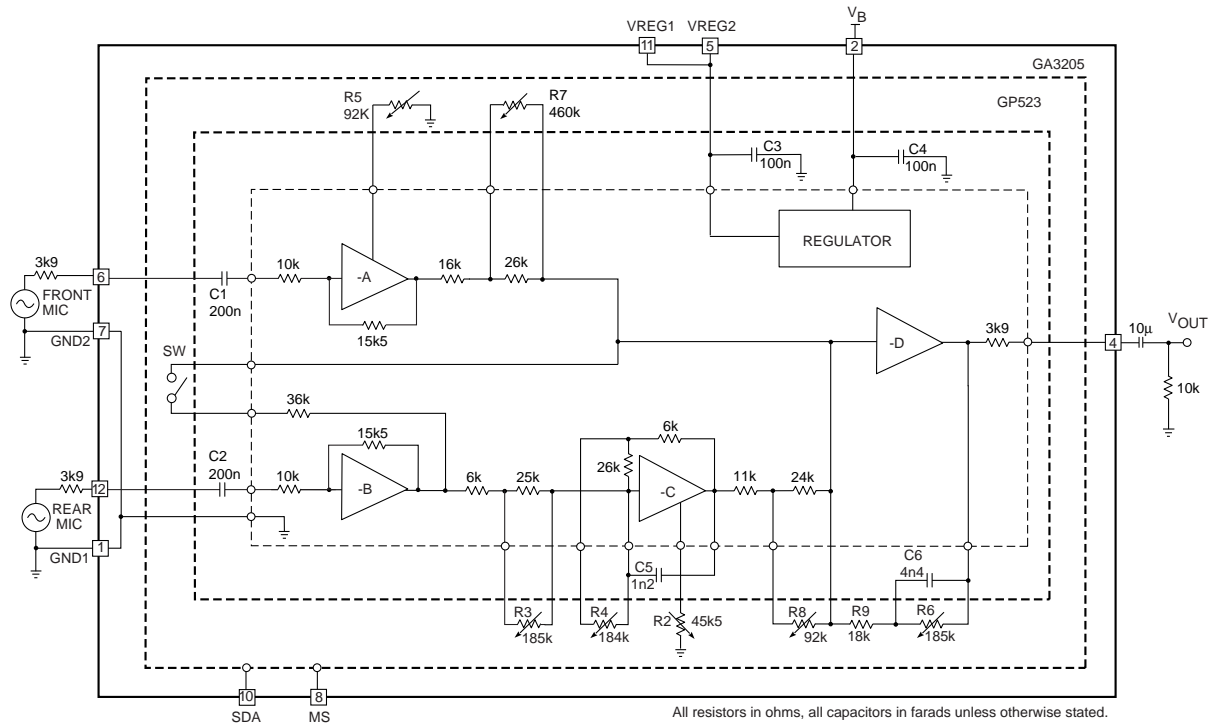


Fig. 3 Typical Hearing Instrument Assembly Diagram



R1 - Tap 15	R5 - Tap 0
R2 - Tap 15	R6 - Tap 0
R3 - Tap 0	R7 - Tap 3
R4 - Tap 0	R8 - Tap 14

Fig. 4 Characterization Circuit (used to generate typical curves)

TYPICAL PERFORMANCE CURVES

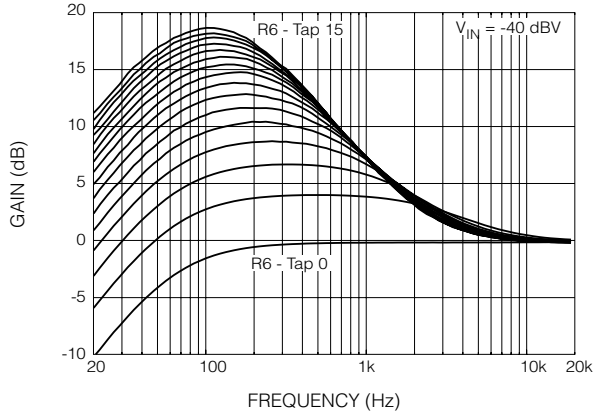


Fig. 5 Frequency Response for Different R6 Tap Settings (Front Channel)

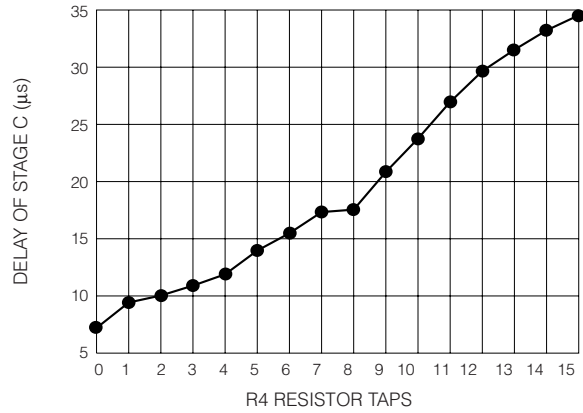


Fig. 6 Stage C Time Delay Adjustment

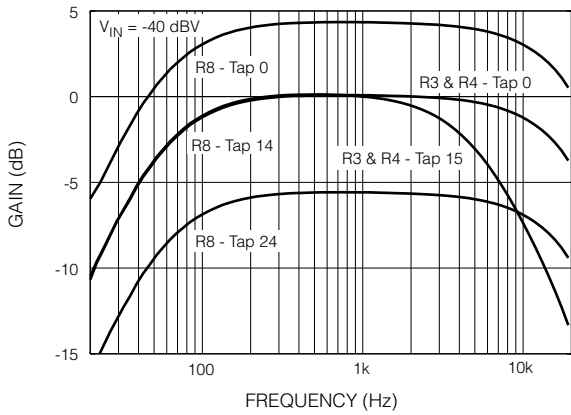


Fig. 7 Frequency Response (Rear Channel)

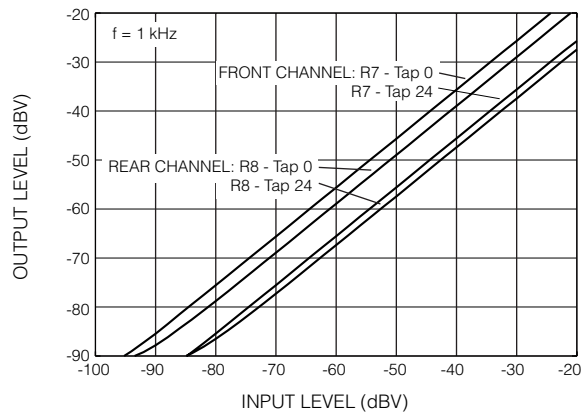


Fig. 8 I/O Transfer Function for Front and Rear Channels

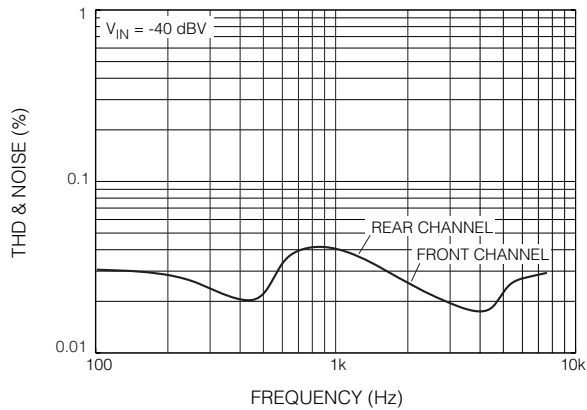


Fig. 9 THD and Noise vs Frequency

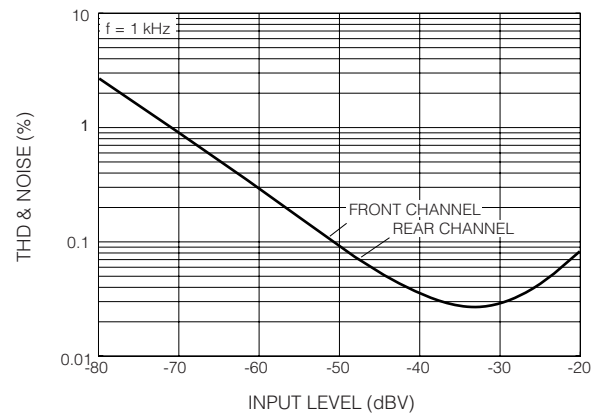
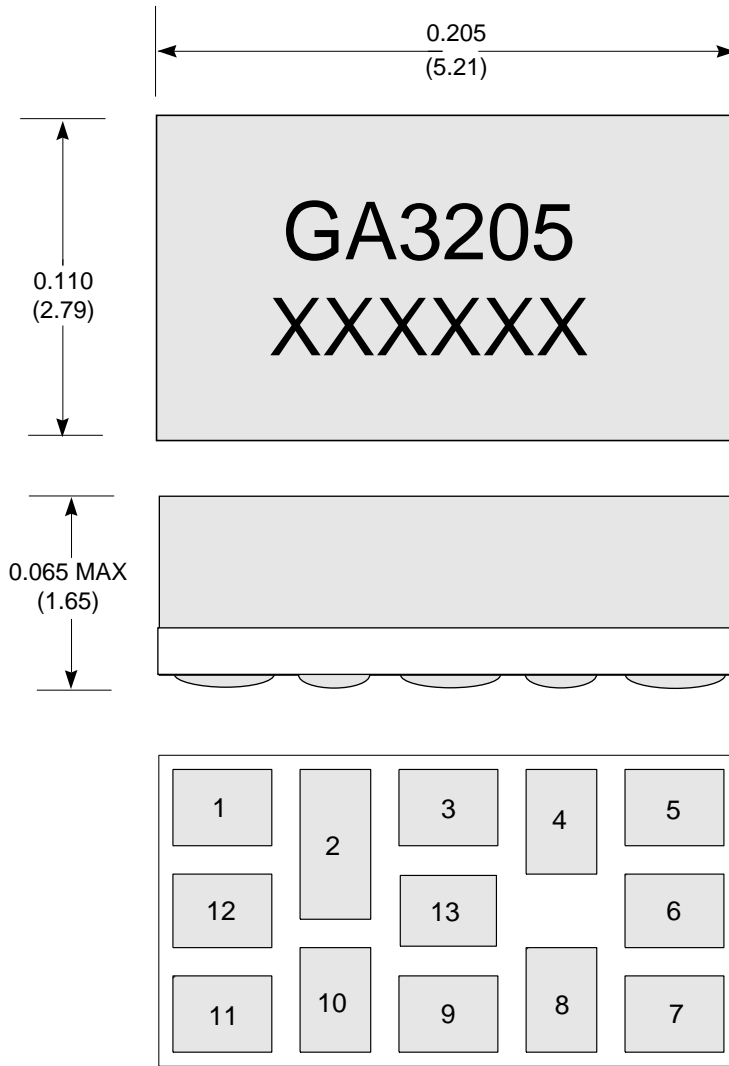


Fig. 10 THD and Noise vs Input Level

PACKAGE DIMENSIONS

GA3205



Dimensions are in inches.
 Dimensions in parenthesis are in millimetres, converted from inches and include minor rounding errors.
 1.0000 inches = 25.400mm.
 Dimension tolerances ± 0.003 (± 0.08) unless otherwise stated.
 Smallest pad 0.026 x 0.035 (pad 1).
 Largest pad 0.025 x 0.053 (pad 2).
 XXXXXX - work order number.
 This hybrid is designed for either point-to-point manual soldering or it can 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

DOCUMENT IDENTIFICATION:
 PRELIMINARY DATA SHEET
 The product is in a preproduction phase and specifications are subject to change without notice.

REVISION NOTES:
 Cosmetic changes.
 thinSTAX™ notation added. Change to max. supply voltage.