

FEATURES

- high power applications
- highly configurable, versatile DSP platform
- high fidelity multi-channel AGC signal processing
- 95dB input dynamic range with HRX™ Headroom Extension
- fully programmable via serial data interface
- high performance data converters - dual, over-sampled A/Ds; over-sampled D/A with efficient switched-mode output power amp
- drives zero-bias 2-terminal receivers
- multiple communication rates up to 85.3kb/s
- multi-memory
- internal/external volume control
- volume control taper determined by external VC
- 2 memory select pads
- tri-state memory select operation
- audible memory change indicator

thinSTAX™ PACKAGING

Hybrid typical dimensions:

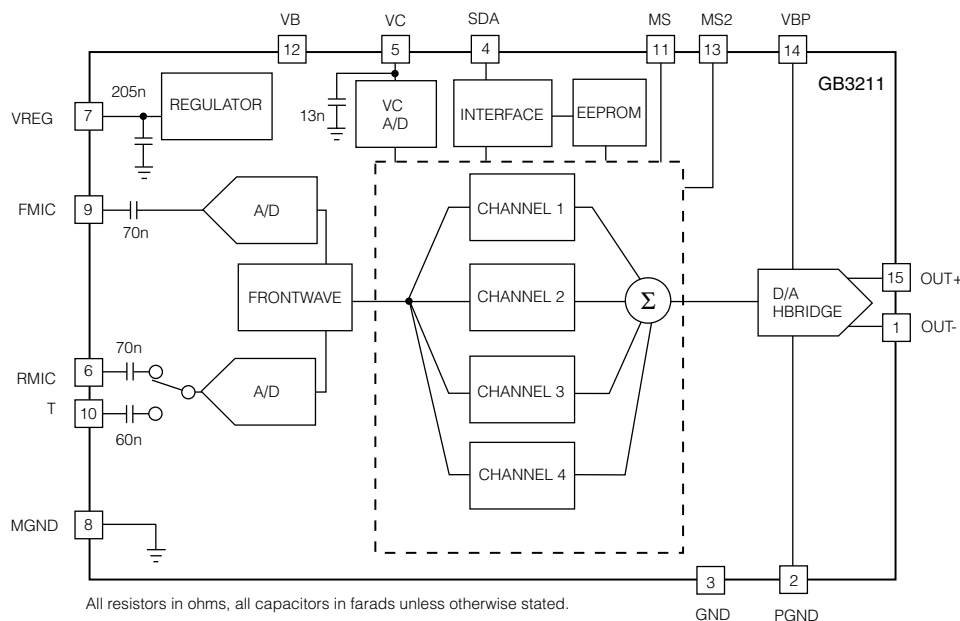
0.227 x 0.125 x 0.060 in
(5.76 x 3.18 x 1.52 mm)

DESCRIPTION

The GB3211 hybrid is a programmable DSP system based on a multi-channel compression circuit. This hybrid is designed for low impedance receivers. It can be used as a platform for a wide range of hearing aid applications. It also offers a separate supply line to the A/D and H-Bridge circuits. The reflowable thinSTAX™ packaging enables easy integration into BTE applications. This versatile DSP hybrid is capable of multiple configurations and has a wide range of functions.

The GB3211 hybrid code programmed into the GC5051 controller chip is "7".

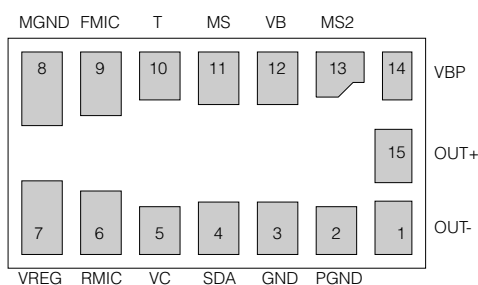
This data sheet is a part of a set of documents available for this product. Please refer to "Getting Started with PARAGON™ DIGITAL" information note for a list of other documents.



BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATING

Operating Temperature Range:	-10°C to 40°C
Storage Temperature Range:	-20°C to 70°C
Absolute Maximum Power Dissipation:	25mW
Maximum Operating Supply Voltage:	1.5VDC
Absolute Maximum Supply Voltage:	2VDC

PAD CONNECTION**ELECTRICAL CHARACTERISTICS**

Conditions: Supply Voltage $V_B = 1.3V$; Temperature = 25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Hybrid Current	I_{AMP}	See current consumption section	-	700	-	μA
Minimum Operating Supply Voltage	V_{BOFF}	Ramp down	0.94	1.0	1.05	V
Supply Voltage turn on threshold	V_{BON}	Ramp up	1.06	1.10	1.16	V
Supply Voltage Hysteresis			90	100	110	mV
Supply Voltage during Communication	V_{BC}	During Communication	1.19	1.35	1.5	V
Hybrid Current during Communication	I_P	Programming (<5 ms)	-	3.7	-	mA
EEPROM Burn Cycles		Note 2	100k	-		cycles
Low Frequency System Bandwidth			-	125	-	Hz
High Frequency System Bandwidth			-	16	-	kHz
Total Maximum System Gain	A_V	$V_{IN} = -95$ dBV @ 3kHz; squelch disabled See Note 1.	-	83	-	dB
Converter Gain	A_{CONV}	A/D + D/A gain.	-	29	-	dB
Total Harmonic Distortion	THD	$V_{IN} = -40$ dBV	-	-	1	%
THD at Maximum Input	THD _M	$V_{IN} = -15$ dBV, HRX - ON	-	-	3	%
Clock Frequency	f_{clk}		1.945	2.048	2.151	MHz
REGULATOR						
Regulator Voltage	V_{REG}		0.90	0.95	1.00	V
Regulator Supply Rejection	PSRR _{REG}		-	50	-	dB
INPUT						
Input Referred Noise	IRN	Bandwidth 100Hz - 8kHz	-	-	-106	dBV
Input Impedance	Z_{IN}		-	16	-	k Ω
Anti-alias Filter Rejection (input referred)		$f = f_{clk} - 8kHz$, $V_{IN} = -40dBV$	-	80	-	dB
Maximum Input Level			-	-15	-	dBV
Input Dynamic Range		HRX - ON, Bandwidth 100Hz - 8kHz	-	95	-	dB
Audio Sample Rate			-	32	-	kHz
A/D Dynamic Range		Bandwidth 100Hz - 8kHz	-	86	-	dB

ELECTRICAL CHARACTERISTICS (Continued)Conditions: Supply Voltage $V_B = 1.3V$; Temperature = 25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
OUTPUT						
Maximum RMS Output Voltage		0dBFS $f = 1kHz$	-	-1	-	dBV
D/A Dynamic Range		Bandwidth 100Hz - 8kHz	80	-	-	dB
Output Impedance	Z_{OUT}	Note 2	-	-	20	Ω
VOLUME CONTROL						
Volume Control Resistance	R_{VC}		-	200	-	k Ω
Volume Control Range	ΔA		47	48	49	dB
MS INPUT						
Low State	Lo		0	-	$V_{REG}/3$	V
Open State	Z		$V_{REG}/3$	-	$2V_{REG}/3$	V
High State	Hi		$2V_{REG}/3$	-	V_B	V
MS2 INPUT						
Pull Down Resistance			-	1	-	M Ω
Logic 1 Voltage			V_{REG}	-	V_B	V
Rising Edge Threshold			0.5	0.69	0.9	V
Falling Edge Threshold			0.25	0.45	0.5	V
Hysteresis			0.1	0.24	0.4	V
SDA INPUT						
Logic 0 Voltage		Note 2	0	-	0.3	V
Logic 1 Voltage		Note 2	1	-	1.3	V
SDA OUTPUT						
Standby Pull Up Current			1.4	2	2.6	μA
Sync Pull Up Current			450	500	550	μA
Logic 0 Current (Pull Down)			225	250	275	μA
Logic 1 Current (Pull Up)			225	250	275	μA
Synchronization Time (Synchronization Pulse Width)	T_{SYNC}	Baud = 0	237	250	263	μs
		Baud = 1	118	125	132	μs
		Baud = 2	59	62.5	66	μs

NOTE 1: Total System Gain consists of: *Wideband System Gain + High and Low Independent Channel Gains + Converter Gain*

Total System Gain is calibrated during Cal/Config process.

NOTE 2: Sample tested.

SUPPORT SOFTWARE

All support software for the GB3211 is available from Gennum
Web Site www.gennum.com/hip/software/paragon_sw.htm.

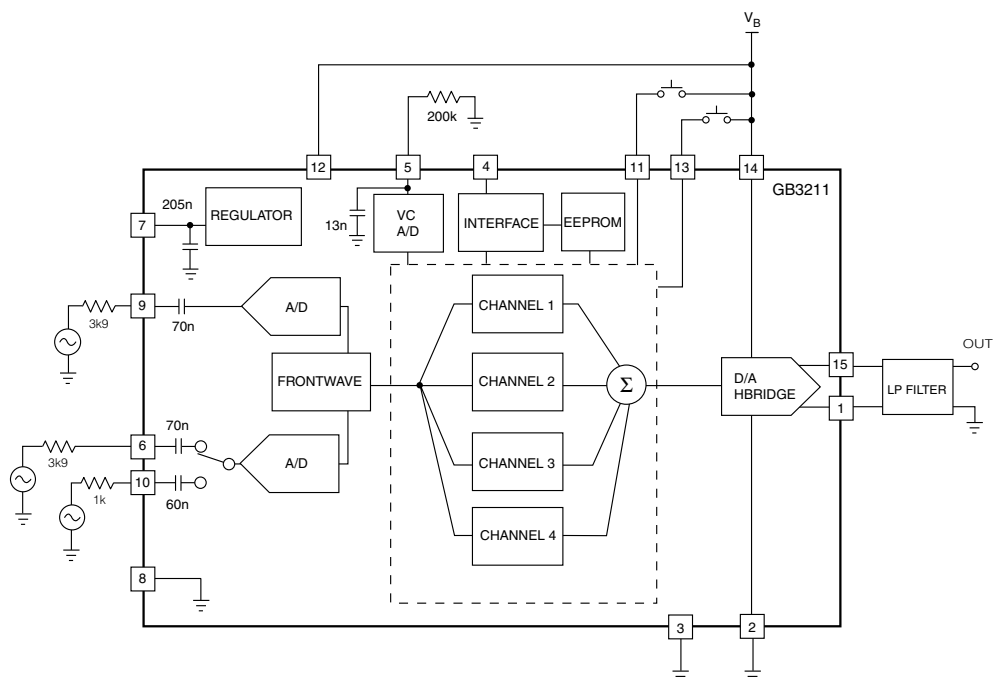


Fig. 1 Test Circuit

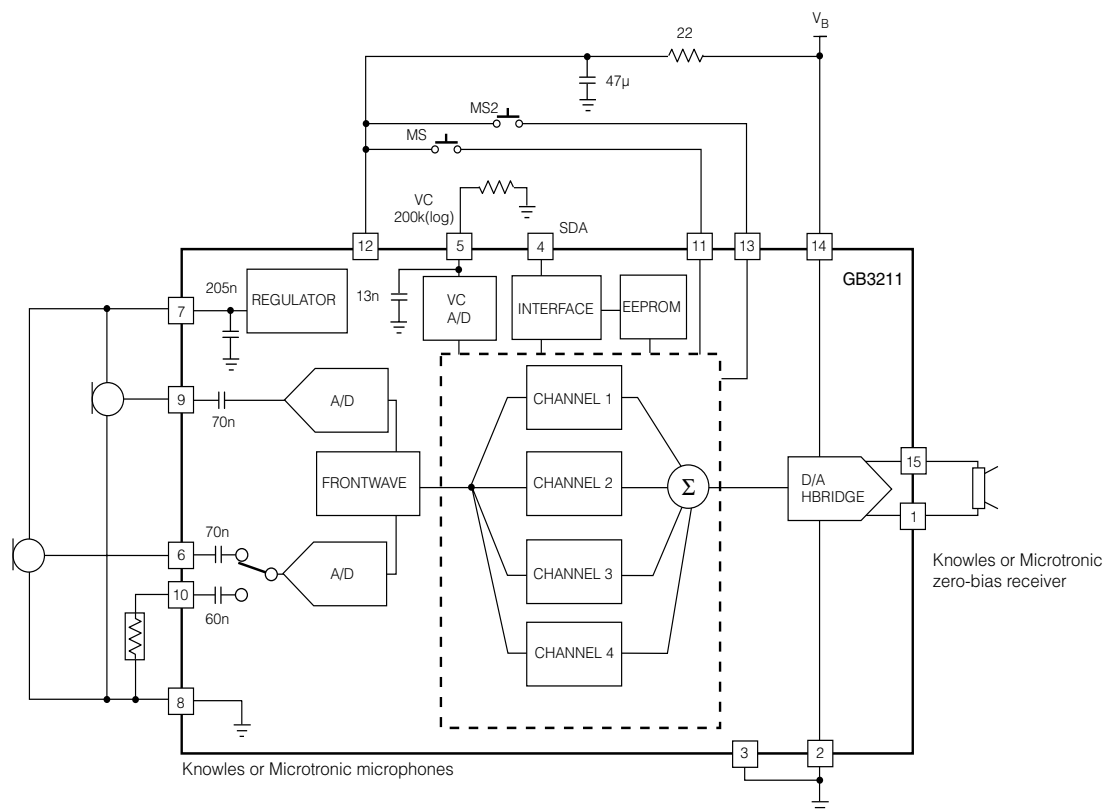


Fig. 2 Sample Application Circuit

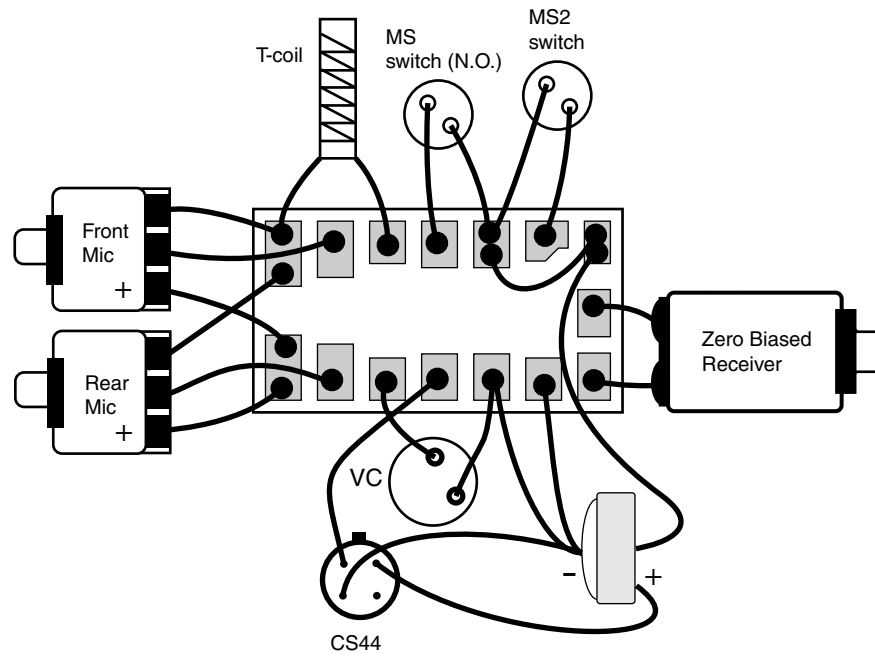
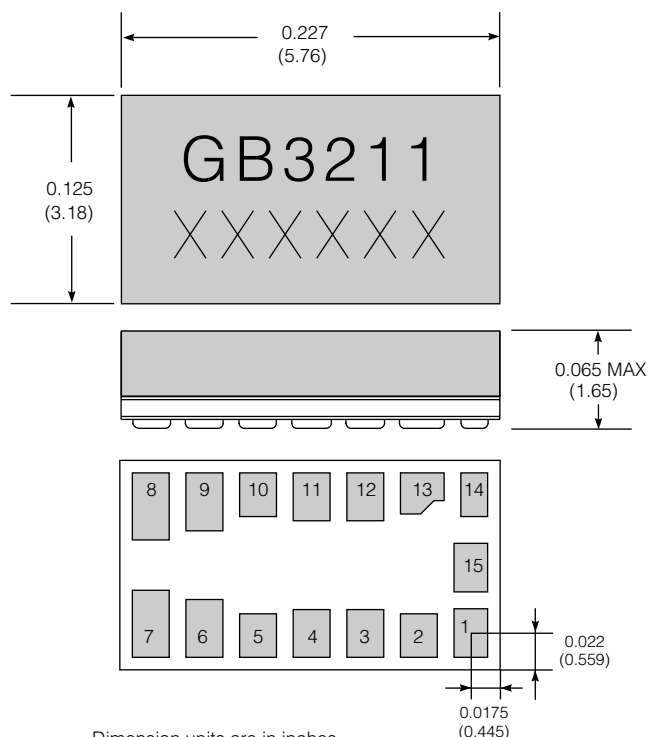


Fig. 3 Assembly Diagram

PACKAGE DIMENSIONS



Dimension units are in inches.
 Dimensions in parentheses 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.
 Work order number: XXXXXX
 Minimum Pad Size: 0.016 x 0.026 (0.41 x 0.66)
 This Hybrid is designed for either point-to-point manual soldering or for reflow according to Gennum's reflow process (Information Note 521-45).

PAD LOCATIONS

PAD NO.	PAD POSITION		PAD DIMENSION		
	X	Y	Xdim	Ydim	
1	0	0	20	29	MIL
2	-31	-1.5	22	26	
3	-63	-0.25	22	28.5	
4	-95	-0.25	22	28.5	
5	-127	-1.5	22	26	
6	-159	2.75	22	34.5	
7	-191	5.5	22	40	
8	-191	75.5	22	40	
9	-159	78.25	22	34.5	
10	-127	82.5	22	26	
11	-95	81.25	22	28.5	
12	-63	81.25	22	28.5	
13	-30	85.5	26	24.5	
14	2	82.5	16	26	
15	0	39	20	29	
1	0	0	0.508	0.737	mm
2	-0.787	-0.038	0.559	0.660	
3	-1.600	-0.006	0.559	0.724	
4	-2.413	-0.006	0.559	0.724	
5	-3.226	-0.038	0.559	0.660	
6	-4.039	0.070	0.559	0.876	
7	-4.851	0.140	0.559	1.016	
8	-4.851	1.918	0.559	1.016	
9	-4.039	1.988	0.559	0.876	
10	-3.226	2.0965	0.559	0.660	
11	-2.413	2.0638	0.559	0.724	
12	-1.600	2.0638	0.559	0.724	
13	-0.762	2.172	0.660	0.622	
14	0.051	2.096	0.406	0.660	
15	0	0.991	0.508	0.737	

GB3211

CAUTION

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



DOCUMENT IDENTIFICATION

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

REVISION NOTES:

Tri-state memory switch.

For latest product information, visit www.gennum.com

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