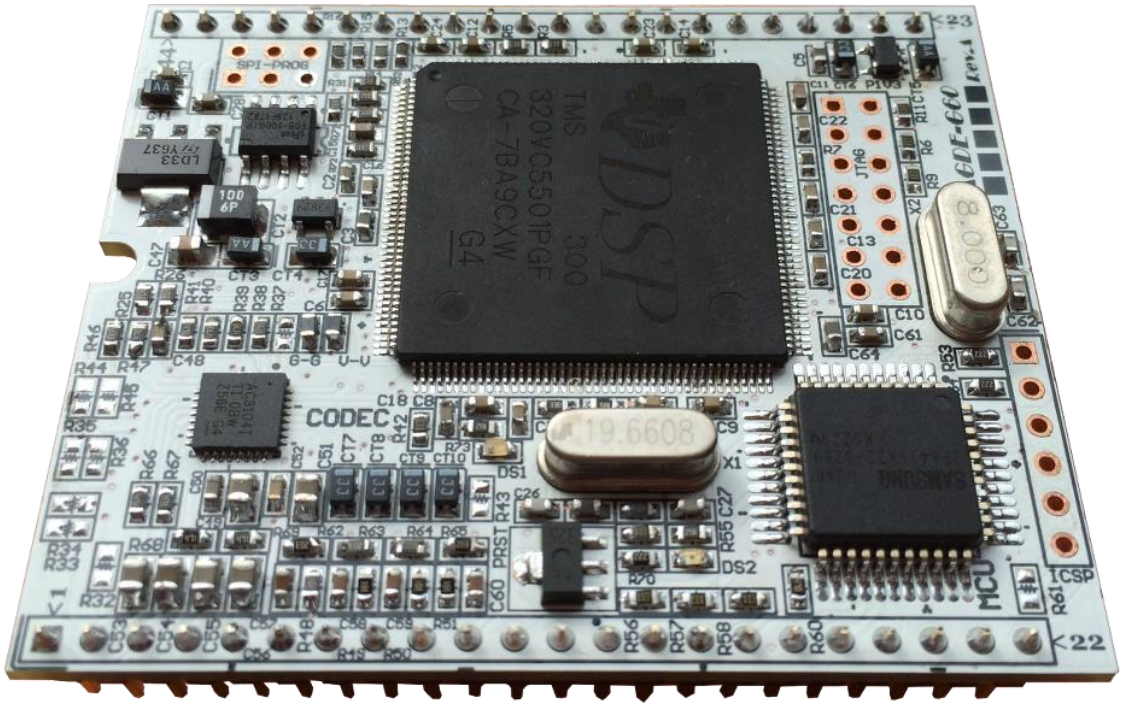
Premium Digital Audio Signal Processing Module

AGDE-G60



Datasheet

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ALTONICS
adventure on the leading technology for sonics™

AGDE-G60 Overview

The AGDE, Altonics Genuine Digital Effect is Altonics' newest line of high-quality/performance multi effects processors. Although many users of the AGDE-G60 will be looking for a solution for high-end multi-effectors or guitar & bass related sound processing, the wide range of effects provided by the AGDE-G60 is suitable for various applications including mixers, karaoke amplifiers and other sound enhancement products.

Instilled with Altonics' about 20 years of know-how in digital sound processing, the AGDE-G60 provides the best audio quality and performance possible for whichever application you choose. With the Altonics name behind it, you know you can trust the quality of this audio signal processor.

The AGDE-G60 is an all-in-one effects solution. It supports filters that can be used for such as EQ, spatial effects such as delay and reverb, the whole range of modulation effects including chorus, flanger, phaser, wah-wah, tremolo, auto pan, vibrato and more. It also encompasses dynamics processing with a noise gate, compressor, and limiter. Fuzz, overdrive, and distortion are all provided in their full crunchiness while still maintaining crisp clear digital sound. Of course, a chromatic tuner can be provided. By real-time 32-bit digital processing, and you won't need to look any further for all your sound enhancement needs.

In the following pages you will find our reference design implementing AGDE-G60's functions to the fullest. Just pick the functions you want and match them with your custom control and display.

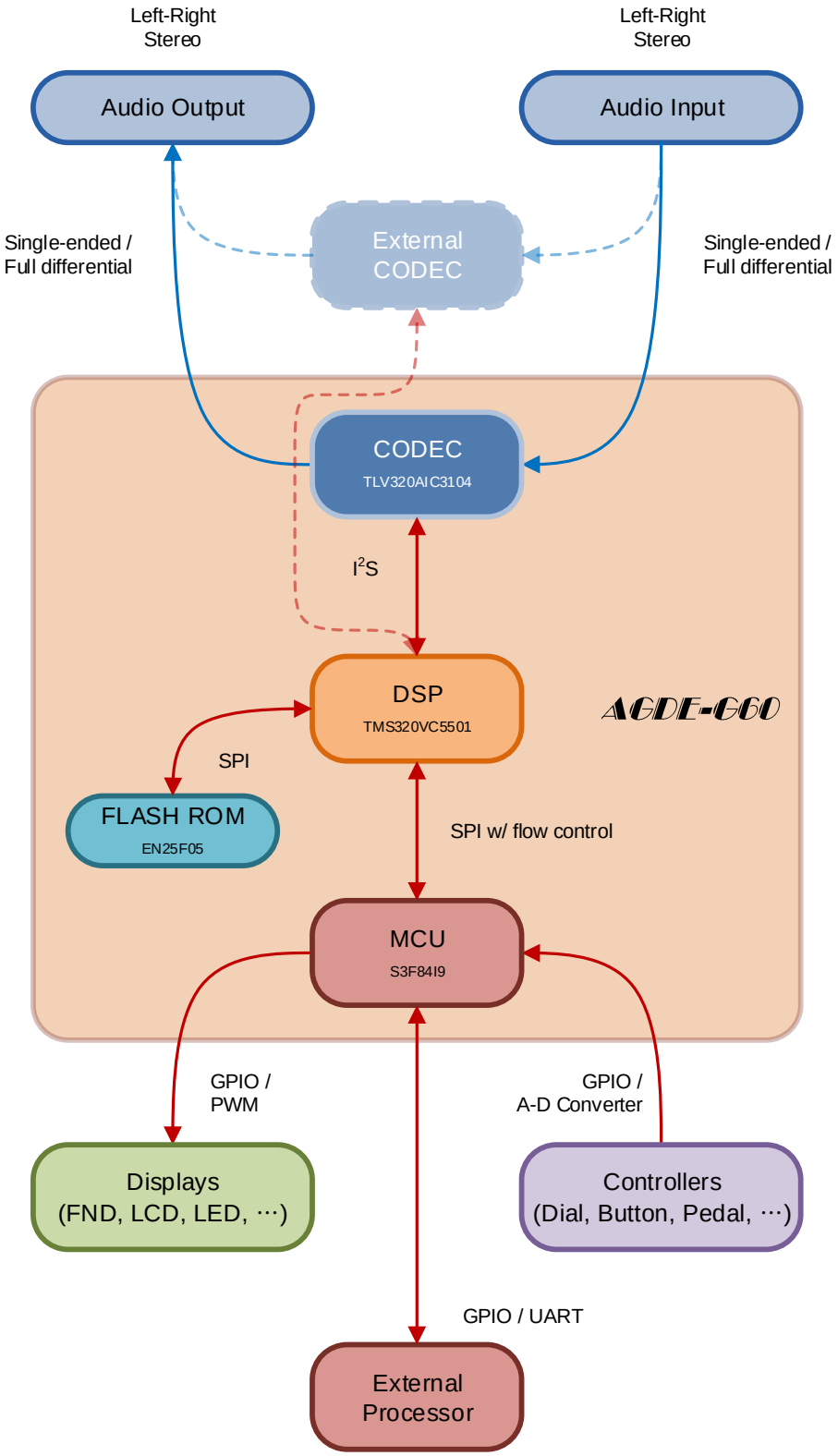
AGDE-G60 Features

- Premium effects solution for guitar/bass amplifiers, multi-effectors, mixers and more.
- Accurate simulation of the hottest effectors, amplifiers and signature sounds from top musicians.
- 32-bit full digital processing, 24-bit AD/DA conversion, and sampling rates of up to 96 kHz.
- RoHS (PB-free)

AGDE-G60 Specification

- **Pin-to-pin compatible with AGDE-E20 (3x DSP performance, a lot more RAM)**
- Analog Audio Input / Output : 2-in 2-out
  - Fully Differential Input and Output (or Single-ended Input and Fully Differential Output)
  - Nominal Level : 1.414Vrms = 4Vpp (Fully Differential I/O) / 0.707Vrms = 2Vpp (Single-ended Input)
  - Frequency Response : 20Hz - 20kHz +/- 0.5 dB
  - S/N Ratio : >90dB
- Internal AD/DA converter : 24-bit / 48kHz, up to 96kHz
  - External AD/DA can be used (AGDE-G60-□D□)
- DSP arithmetic: 32-bit
- 5V single-powered
- 3.3V power outputs for analog/digital peripherals
- 24 general-purpose I/O with pull-up, and up to 7 A-D converting (10-bit) inputs
- 1x UART
- Connection: Single-line 22-pin Header, 2.54mm-pitch, Down-sided (optional 22-pin available)
- Power Consumption : 170mA (module only)
- Operating Temperature : -25 to 75 ℃
- Dimension : 60mm x 50mm

Block Diagram



Processing Algorithms

- FIR/IIR Filter
- Multi-band Parametric EQ / Tone (Lo/Hi/Band-pass, Peaking-EQ, Notch, Lo/Hi-Shelving)
- Dynamics: Noise gate, Compressor, Expander, Limiter, …
- Non-linear: Overdrive, Distortion, Octave Doubler, … (with sound modeling / circuit simulating)
- Modulation: Chorus, Flanger, Phaser, Tremolo, Auto-Pan, Wah-wah, …
- Delay, Ping-pong Delay, Reverse Delay, Multi-tap Delay, … (with time-smoothing)
- Reverb: Room, Hall, Plate, Gate, …
- Chromatic Tuner
- Peak/RMS Level Meter
- Stereo Image
- Vocal Remover, …

* Custom algorithm can be applied.

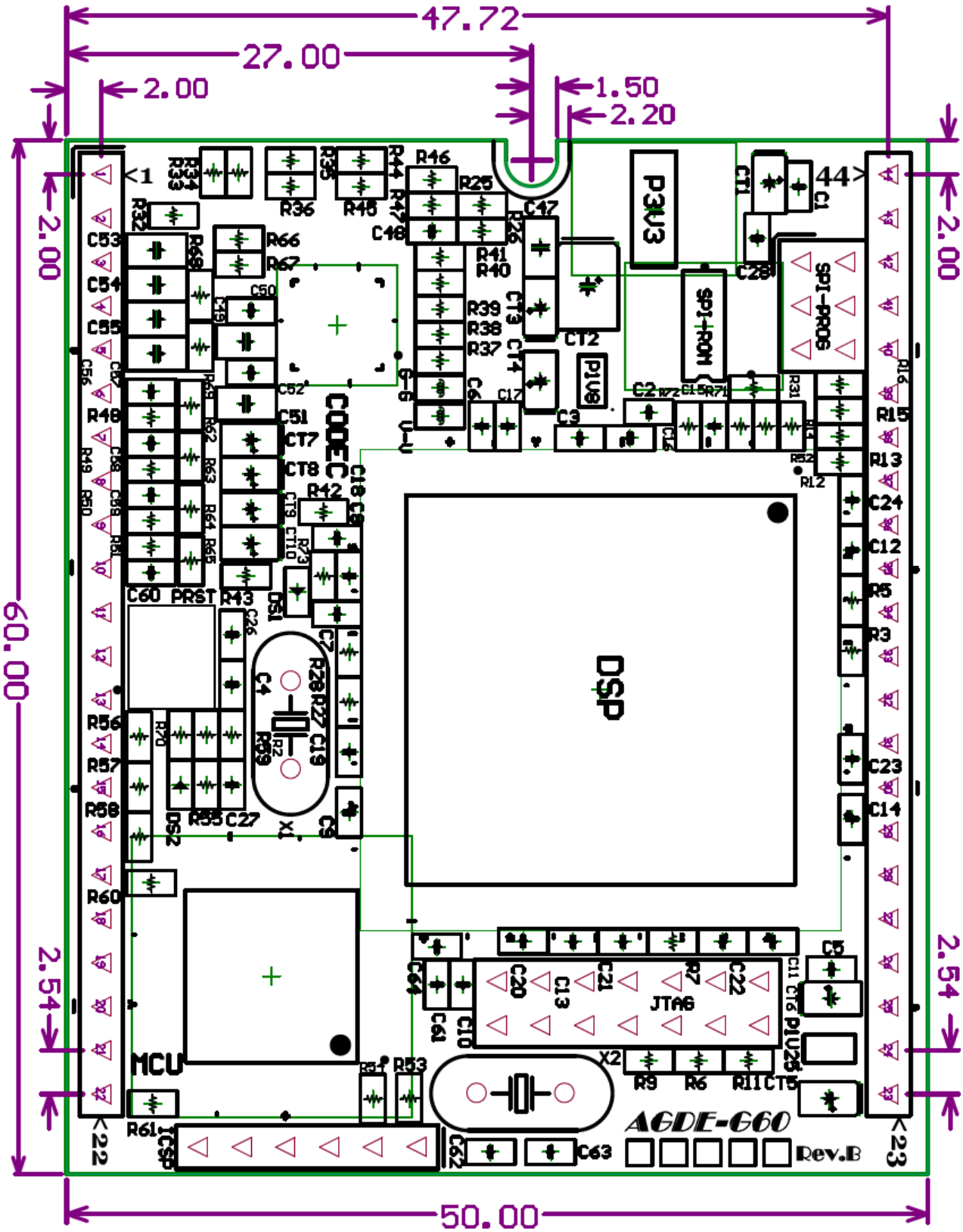
Drive & Sound Models

No.	Model	Remark
1	JC	Based on Roland JC-120 Jazz Chorus Amp
2	TS	Model from Ibanes TS808
3	FF	Model from Dallas-Arbeiter Fuzz Face
4	OC	Model from Tycobrahe Octavia
5	DD	Model from DOD 250
6	RT	Model from ProCo RAT
7	DS	Model from Boss DS-1
8	MT	Model from Boss MT-2

* More drive & sound models would be added.

Dimension

(Top-side View, Pin header: Bottom-side)



(mm)

Pin Connection – Audio I/O : ANALOG (AGDE-G60-□A□)

CN1

No.	Name	Remark
1	5V	5V input
2	**AIL+**	**Analog audio input – left, positive**
3	**AIL-**	**Analog audio input – left, negative (can be shorted to AGND)**
4	**AILR+**	**Analog audio input – right, positive**
5	**AINR-**	**Analog audio input – right, negative (can be shorted to AGND)**
6	AGND	Analog ground
7	**AOUTL+**	**Analog audio output – left, positive**
8	**AOUTL-**	**Analog audio output – left, negative (can be ignored)**
9	**AOUTR+**	**Analog audio output – right, positive**
10	**AOUTR-**	**Analog audio output – right, negative (can be ignored)**
11	A3V3	3.3V output for analog circuit
12	TxD	UART Tx
13	RxD	UART Rx
14	DGND	Digital ground
15	D3V3	3.3V output for digital circuit
16	GPIO1	General-purpose I/O with 10-bit A-D converter, and pull-up
17	GPIO2	General-purpose I/O with 10-bit A-D converter, and pull-up
18	GPIO3	General-purpose I/O with 10-bit A-D converter, and pull-up
19	GPIO4	General-purpose I/O with 10-bit A-D converter, and pull-up
20	GPIO5	General-purpose I/O with 10-bit A-D converter, and pull-up
21	GPIO6	General-purpose I/O with 10-bit A-D converter, and pull-up
22	GPIO7	General-purpose I/O with 10-bit A-D converter, and pull-up

CN2 (optional)

No.	Name	Remark
23 (1)	GPIO8	General-purpose I/O with external interrupt, and pull-up
24 (2)	D3V3	3.3V output for digital circuit
25 (3)	EXIO1	General-purpose I/O with pull-up
26 (4)	EXIO2	General-purpose I/O with pull-up
27 (5)	EXIO3	General-purpose I/O with pull-up
28 (6)	EXIO4	General-purpose I/O with pull-up
29 (7)	EXIO5	General-purpose I/O with pull-up
30 (8)	EXIO6	General-purpose I/O with pull-up
31 (9)	EXIO7	General-purpose I/O with pull-up
32 (10)	EXIO8	General-purpose I/O with pull-up
33 (11)	DGND	Digital ground
34 (12)	MSIO1	General-purpose I/O with pull-up
35 (13)	MSIO2	General-purpose I/O with pull-up
36 (14)	MSIO3	General-purpose I/O with pull-up
37 (15)	MSIO4	General-purpose I/O with pull-up
38 (16)	MSIO5	General-purpose I/O with pull-up
39 (17)	MSIO6	General-purpose I/O with pull-up
40 (18)	MSIO7	General-purpose I/O with pull-up
41 (19)	MSIO8	General-purpose I/O with pull-up
42 (20)	D3V3	3.3V output for digital circuit
43 (21)	DGND	Digital ground
44 (22)	5V	5V input

Pin Connection – Audio I/O : DIGITAL (AGDE-G60-□ D □)

CN1

No.	Name	Remark
1	5V	5V input
2	**MCLK**	**Master clock output**
3	**BCLK**	**Audio serial data bus bit clock input/output**
4	**WCLK**	**Audio serial data bus word clock input/output**
5	**DIN**	**Audio serial data bus data input**
6	AGND	Analog ground
7	**DOUT**	**Audio serial data bus data output**
8	**SDA**	**I2C serial data input/output**
9	**SCL**	**I2C serial clock output**
10	**1V8**	**1.8V output for digital circuit**
11	A3V3	3.3V output for analog circuit
12	TxD	UART Tx
13	RxD	UART Rx
14	DGND	Digital ground
15	D3V3	3.3V output for digital circuit
16	GPIO1	General-purpose I/O with 10-bit A-D converter, and pull-up
17	GPIO2	General-purpose I/O with 10-bit A-D converter, and pull-up
18	GPIO3	General-purpose I/O with 10-bit A-D converter, and pull-up
19	GPIO4	General-purpose I/O with 10-bit A-D converter, and pull-up
20	GPIO5	General-purpose I/O with 10-bit A-D converter, and pull-up
21	GPIO6	General-purpose I/O with 10-bit A-D converter, and pull-up
22	GPIO7	General-purpose I/O with 10-bit A-D converter, and pull-up

CN2 (optional)

No.	Name	Remark
23 (1)	GPIO8	General-purpose I/O with external interrupt, and pull-up
24 (2)	D3V3	3.3V output for digital circuit
25 (3)	EXIO1	General-purpose I/O with pull-up
26 (4)	EXIO2	General-purpose I/O with pull-up
27 (5)	EXIO3	General-purpose I/O with pull-up
28 (6)	EXIO4	General-purpose I/O with pull-up
29 (7)	EXIO5	General-purpose I/O with pull-up
30 (8)	EXIO6	General-purpose I/O with pull-up
31 (9)	EXIO7	General-purpose I/O with pull-up
32 (10)	EXIO8	General-purpose I/O with pull-up
33 (11)	DGND	Digital ground
34 (12)	MSIO1	General-purpose I/O with pull-up
35 (13)	MSIO2	General-purpose I/O with pull-up
36 (14)	MSIO3	General-purpose I/O with pull-up
37 (15)	MSIO4	General-purpose I/O with pull-up
38 (16)	MSIO5	General-purpose I/O with pull-up
39 (17)	MSIO6	General-purpose I/O with pull-up
40 (18)	MSIO7	General-purpose I/O with pull-up
41 (19)	MSIO8	General-purpose I/O with pull-up
42 (20)	D3V3	3.3V output for digital circuit
43 (21)	DGND	Digital ground
44 (22)	5V	5V input

Ordering Information

Part Number :

AGDE-G60-①②③

①	Max Delay Time (approx., at 48kHz)
0	
4	over 20 second (32-bit, stereo)
8	over 40 second (32-bit, stereo)
F	over 80 second (32-bit, stereo)

②	Audio I/O
A	analog signal
D	digital serial interface

	Pin Header	
③	CN1	CN2
S	O	X
C	O	O

Ex> AGDE-G60-8AC : max delay time = over 40 second, audio I/O = analog, CN1 and CN2

Contact Point

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Datasheet Revision History

v 0.1	12 July 2014	The first preliminary
v 0.2	21 August 2014	* Ordering Information
v 1.0	08 February 2015	The first release.