TGAM1 Spec Sheet

May 9, 2016

NeuroSky
Brain-Computer Interface Technologies

The NeuroSky® product families consist of hardware and software components for simple integration of this biosensor technology into consumer and industrial end-applications. All products are designed and manufactured to meet consumer thresholds for quality, pricing, and feature sets. NeuroSky sets itself apart by providing building block component solutions that offer friendly synergies with related and complementary technological solutions.

Contents

Technical Specifications

General

Classification	Specification	Notes
Product Family	ThinkGear-AM	A = ASIC, M = Module
Model Number	TGAM1	
Revision Number	2.9A	
Module Dimension (Max)	27.9mm x 15.2mm x 2.5mm	1.10in x 0.60in x 0.10in (L x W x H)
Module Weight (Max)	130mg	0.0045 ounces
Operating Voltage	2.97V ~ 3.63V	Stuff Option* SP6200 3.0~6.0V MAX1595 1.8~5.5V
Max Input Voltage Noise	10mV Peak to Peak	
Max Power Consumption	15mA @ 3.3V	
ESD Protection	4kV Contact Discharge 8kV Air Discharge	Tested at EEG, REF, GND
Output Interface Standard	UART(Serial)	TX, RX, VCC(+), GND(-)
Output Baud Rate	57600	
#EEG Channels	1	3 contacts (EEG, REF, GND)
Sampling Frequency	512 Samples per second	
Frequency Range	3 to 100Hz	
On-board Crystal	24.90368MHz	

* *Check with NeuroSky Sales for price addition.*

I/O Pins

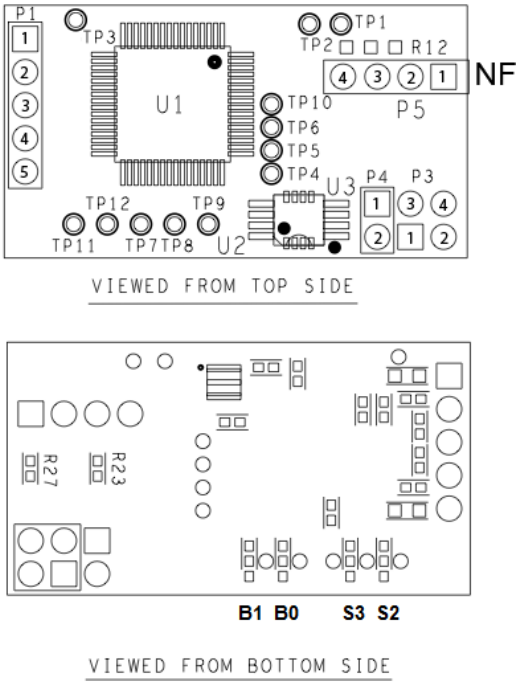

Figure 1.1: Pin outs

Header P1 (Electrode)
Pin1: EEG Electrode "EEG"
Pin2: EEG Shield
Pin3: Ground Electrode
Pin4: Reference Shield
Pin5: Reference Electrode "REF"

Header P3 (UART/Serial)
Pin1: GND "-"
Pin2: VCC "+"
Pin3: RXD "R"
Pin4: TXD "T"

Header P4 (Power)
Pin1: VCC "+"
Pin2: GND "-"

Header P5 (Notch Filter Configuration)
Pin1: VCC "+"
Pin2: NF Pad
Pin3: GND "-"
Pin4: TGAT OSC_IN

Note: Labels in "" indicated on PCB for convenience.

Serial Communication

This section only outlines parts that are different from the standard ThinkGear API. Please refer to the ThinkGear API and Reference Manual for more details.

ThinkGear CODE

The code that may appear in the ThinkGear packets are listed in the following table.

Code	Length	Value	Default Setting
0x02	N/A	Poor Quality (0-200)	On
0x04	N/A	eSense Attention (0-100)	On
0x05	N/A	eSense Meditation (0-100)	On
0x80	2	12-bit Raw EEG	On
0x83	24	EEG Powers (integer)	On

Configurable Default Settings

TGAM1 R2.9A has configuration pads that can be used to change default settings that are applied at chip power up. It can change following:

- Notch Filter Frequency

Notch Filter Frequency Configuration

The Notch Filter (NF) pad configures the notch filter frequency, after the TGAM1 powers up. Those pads are located on the top side of PCB. Figure 3.1 shows the location of those pads.

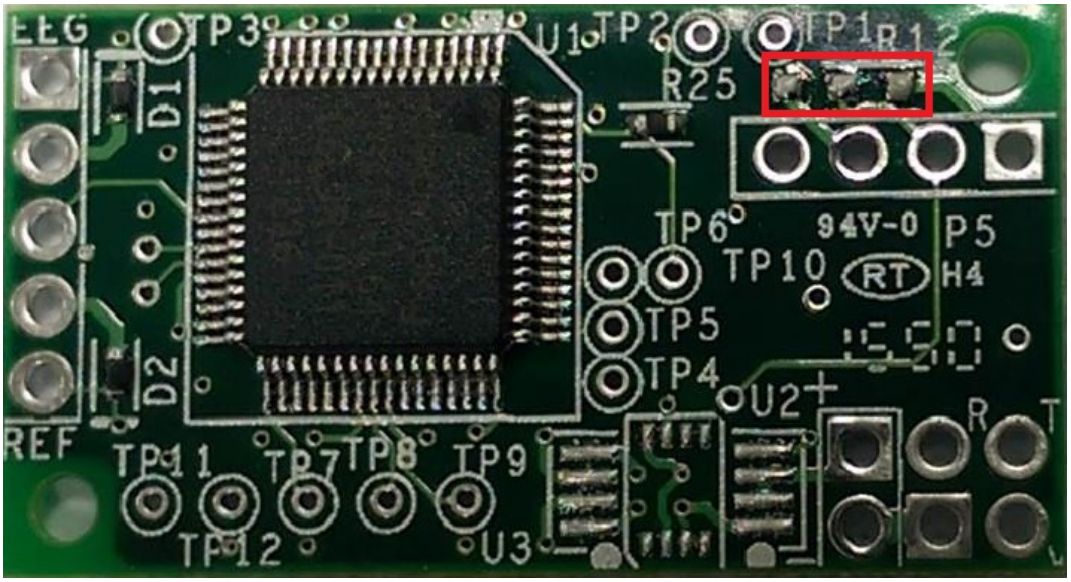

Figure 3.1: Notch Filter Configuration Pads

As mentioned earlier, TGAM1's notch filter frequency can be configured with the NF configuration pads. It is used to select either 50Hz or 60Hz to reduce the AC noise specific to a targeted market. As indicated in Figure 3.2, the left pad is GND and right pad is VCC. Tie the NF pad to VCC pad to select 60Hz, and to GND pad to select 50Hz notch filtering frequency.

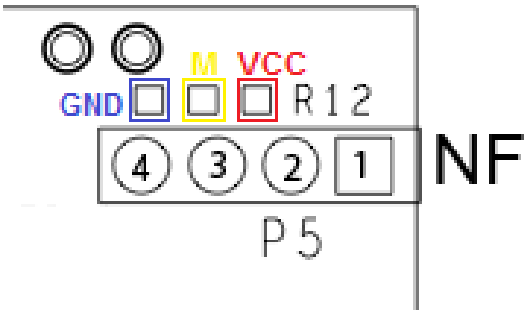

Figure 3.2: NF Pad

Also when modifying the notch filter frequency, use appropriate shorting wire on P5. For reference, the schematic for the NF pad and the P5 is shown in Figure 3.3.

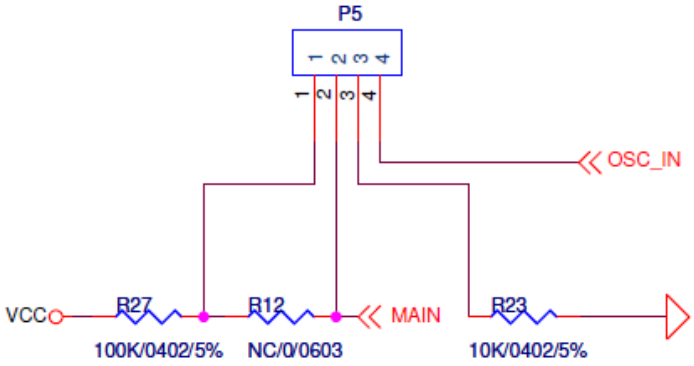

Figure 3.3: NF pad Schematic

Mechanical Drawing

The dimensions and major components of the TGAM1 is shown in the mechanical drawing in Figure 4.1. There are two mounting holes at the upper right and lower left corner. They can be used to secure the TGAM1 to your system housing.

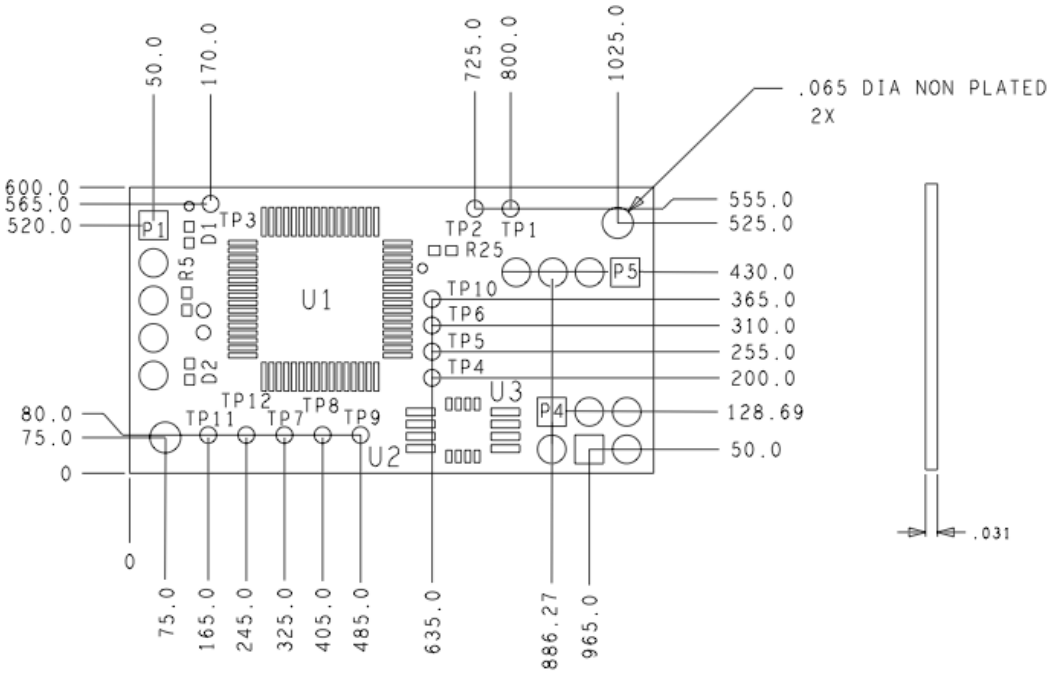

Figure 4.1: Mechanical Drawing & Thickness