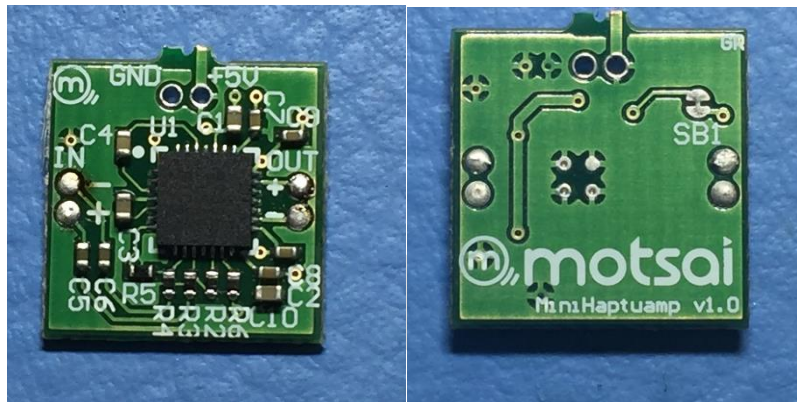


Mini-Haptuamp

Overview

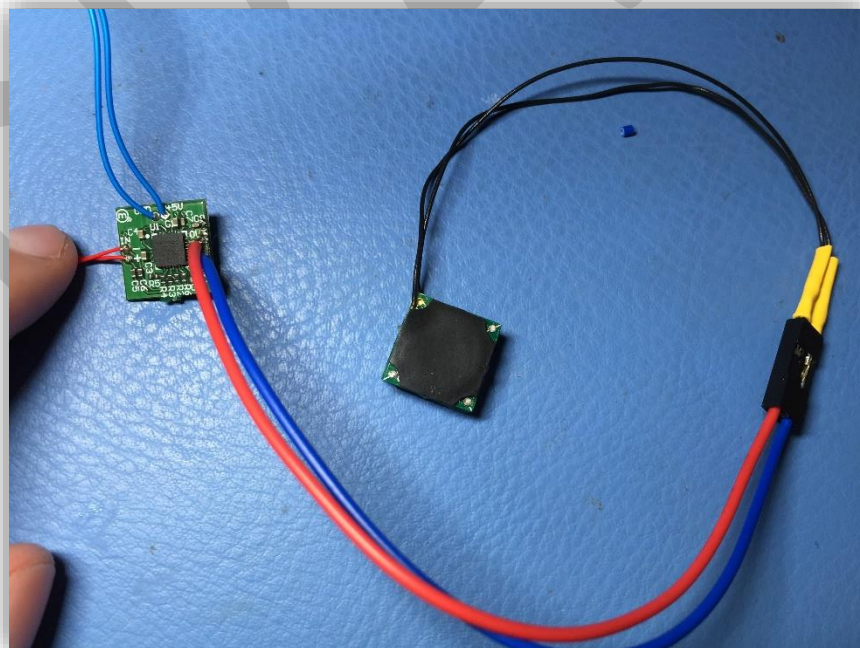
The Mini-Haptuamp is a Class G haptic amplifier board meant for amplification of signals to fed into the Planar Haptuator while using as little a space as possible.



Typical Usage

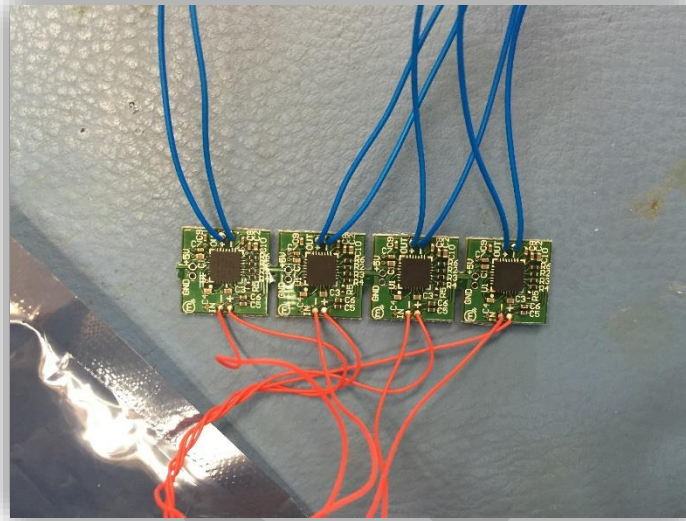
Connecting to a Haptuator

Connecting a haptuator requires that you solder on two Haptuator leads to the output pins.



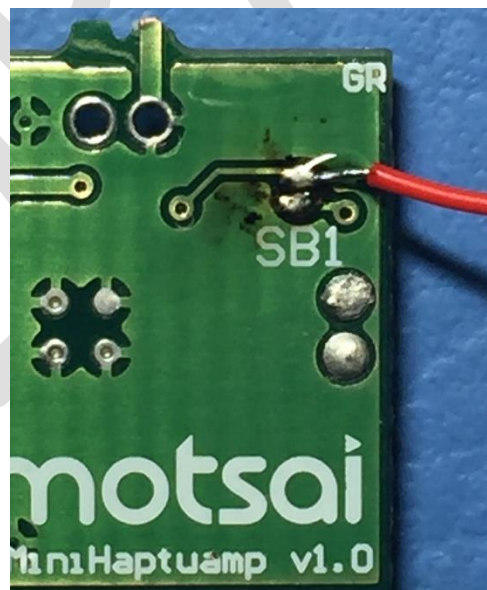
Connecting to multiple Haptuators

The Mini-Haptuamps can be connected by up to 5 at a time and can be fed power through a single +5V/GND power input pins on one of the connected amplifier boards.



Controllable shutdown

It is also possible to control the enable state of the amplifier by cutting the SB1 solder bridge and soldering an external lead on its top side.



Thermal Considerations

The amplifier board should not be applied in direct contact with human skin or sensitive material because it can generate a significant amount of heat when being fed signals with a large amplitude.

Pin Descriptions

Name	Function
+5V	Supply Voltage between 2.7V and 5.5V
GND	Ground
IN+	Positive Amplifier Input
IN-	Negative Amplifier Input
OUT+	Positive Amplifier Output
OUT-	Negative Amplifier Output
SB1	Solder bridge 1. Initially shorted, shutdown mode is disabled by default.

Characteristics

Size & Weight

Parameter	Value	Units
Length	12	mm
Width	12	mm
Height	2	mm
Weight	0.40	g

Electrical Characteristics

Parameter	Min	Typ	Max	Units
Supply Voltage Range	2.7		5.5	V
Quiescent Current		8	12	mA
Chip Power Dissipation		1		W
Shutdown Current		0.3	5	μ A
Turn-On Time		50		ms
Input DC Bias Voltage Range	1.1	1.24	1.4	V
SPEAKER AMPLIFIER				
Output Offset Voltage		\pm 3	\pm 15	mV
Common-Mode Rejection Ratio (1kHz)		68		dB
Voltage Gain	11.5	12	12.5	dB
Continuous Output Power (8 Ω load)	V _{CC} = 5V		2.4	W
	V _{CC} = 4.2V		1.67	
	V _{CC} = 3.6V		1.25	
	V _{CC} = 3V		0.8	

Electrical Characteristics (continued)

Parameter	Min	Typ	Max	Units
Output Voltage (1kHz)	V _{cc} = 5V	7.1		V _{rms}
	V _{cc} = 4.2V	5.9		
	V _{cc} = 3.6V	5.1		
	V _{cc} = 3V	4.2		
Power-Supply Rejection Ratio (V _{CC} = 2.7V to 5.5V)	63	77		dB
Total Harmonic Distortion + Noise (1kHz/0.4V _{rms})		0.007		%
Total Harmonic Distortion + Noise (1kHz/1V _{rms})		0.12		
Signal-to-Noise Ratio (0.5V _{rms})		95		dB
Dynamic Range (22Hz to 22kHz)		96		dB

Absolute Maximum Ratings

Parameter	Value	Units
V _{cc}	-0.3 to +6	V
OUT ₊ , OUT ₋	-6.3 to +6.3	V
IN ₊ , IN ₋	-0.3 to (V _{cc} + 0.3)	V
Continuous Power Dissipation	2000	mW
Operating Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C
CONTINUOUS CURRENT INTO/OUT OF		
OUT ₊ , OUT ₋ , V _{cc} , GND	800	mA
Any Other Pin	20	mA