Karma Sutra

Based on:
Catalinbread Karma Suture

Amount of parts:
Low, total 27 components

Enclosure type:
125b

Effect type:
Harmonic fuzz

Technology:
Silicon/germanium transistors

Get your board at:
Karma Sutra

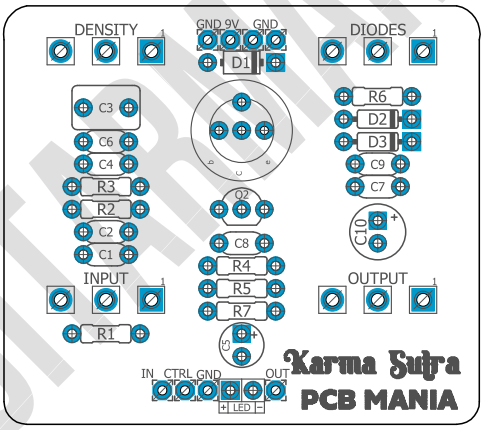
Build difficult:
Easy

Power consumption:
9V

Get your kit at:
Das Musikding (Europe)

Project overview:

Inspired by Catalinbread Karma Suture. This circuit delivers an abundance of fuzz with lots of harmonic content bringing out each note definition. Two pedals in one board! Build either Germanium or Silicon version.



Index

Introduction

Much more than a dirt box! This pedal delivers from calm to extreme and has a wide range of different sounds to offer. Once you compare it with other fuzz/overdrive pedals, you will notice how those extra harmonics that the Karma Sutra brings make all the difference in richness and sound clarity. Get ready for a plethora of harmonic distortion responses from heavily saturated fuzz tones, big and open overdrive, to a sparkling boost. And just as important, no matter how you have the pedal set, the tone and response always flourish, sensitive to your settings and desires.

What makes the Karma Sutra more interesting is that it is both an overdrive and fuzz at the same time. The Diodes, Input, and Density controls help you manage the exact sound you want to get of this pedal.
The Input works as gain modifying the input level (fuzz) and Output controls volume, but the Diodes control is undoubtedly one the most exciting features out there:
As you turn it up, you introduce more diode clipping into the circuit, compressing the sound making it sound smoother at lower volumes. The Density control makes this pedal work in almost any rig; you can use it to control your amplifier's response to get the perfect match.

Another marvelous thing about this build is that you can choose between two versions of this pedal with one board: the more vintage germanium approach or the modern silicon type. If you want a smoother and warmer sound that tends towards an amp overdrive-like, with more touch sensitivity, and that reacts well to your guitar's volume and tone knobs, you should choose the germanium version. If you prefer a pedal that tends to have more top-end treble, is good at cutting through mixes, and has more gain capabilities, pick the silicon approach.

Regardless of the version you choose, once you build it, you will realize all the potential this pedal gives to enhance your pedalboard in a wide variety of ways, fulfilling the craziest and most exotics of sound fantasies.

Controls

- Density
- Diodes
- Input
- Output

Bill of materials - Silicon version

Resistors	
Part	**Value**
R1	4k7
R2	150k
R3	33k
R4	470k
R5	91k
R6	5k6
R7	4k7

Capacitors	
Part	**Value**
C1	47pF
C2	4n7
C3	1uF
C4	47pF
C6	1n
C7	100pF
C8	100n
C9	47n

Electrolytics Capacitors	
Part	**Value**
C5	47uF
C10	220uF

Potentiometers	
Part	**Value**
DENSITY	500k C
DIODES	50k B
INPUT	100k B
OUTPUT	100k A

Transistors	
Part	**Value**
Q1	2N5401*
Q2	BC550B

Diods	
Part	**Value**
D1	1n5817
D2	1n914
D3	1n914
Led	3mm red LED

Shopping list - Silicon version

Resistors		
Qty	**Value**	**Parts**
1	150k	R2
1	33k	R3
1	470k	R4
2	4k7	R1, R7
1	5k6	R6
1	91k	R5

Capacitors		
Qty	**Value**	**Parts**
1	100n	C8
1	100pF	C7
1	1n	C6
1	1uF	C3
1	47n	C9
2	47pF	C1, C4
1	4n7	C2

Electrolytics Capacitors		
Qty	**Value**	**Parts**
1	220uF	C10
1	47uF	C5

Potentiometers		
Qty	**Value**	**Parts**
1	100k A	OUTPUT
1	100k B	INPUT
1	500k C	DENSITY
1	50k B	DIODES

Transistors		
Qty	**Value**	**Parts**
1	2N5401*	Q1
1	BC550B	Q2

Diods		
Qty	**Value**	**Parts**
1	1n5817	D1
2	1n914	D2, D3
1	3mm red LED	LED

Bill of materials - Germanium version

Resistors	
Part	**Value**
R1	4k7
R2	220k
R3	33k
R4	750k
R5	91k
R6	jumper
R7	4k7

Capacitors	
Part	**Value**
C1	220pF
C2	4n7
C3	220n
C4	47pF
C6	1n
C7	330pF
C8	100n
C9	47n

Electrolytics Capacitors	
Part	**Value**
C5	47uF
C10	220uF

Potentiometers	
Part	**Value**
DENSITY	500k C
DIODES	50k B
INPUT	100k B
OUTPUT	100k A

Transistors	
Part	**Value**
Q1	1T308A
Q2	P2N2222A (flip 180 over the silkscreen)

Diods	
Part	**Value**
D1	1n5817
D2	1n914
D3	Ge
LED	3mm red LED

Shopping list - Germanium version

Resistors		
Qty	**Value**	**Parts**
1	220k	R2
1	33k	R3
2	4k7	R1, R7
1	jumper	R6
1	750k	R4
1	91k	R5

Capacitors		
Qty	**Value**	**Parts**
1	100n	C8
1	1n	C6
1	220n	C3
1	220pF	C1
1	330pF	C7
1	47n	C9
1	47pF	C4
1	4n7	C2

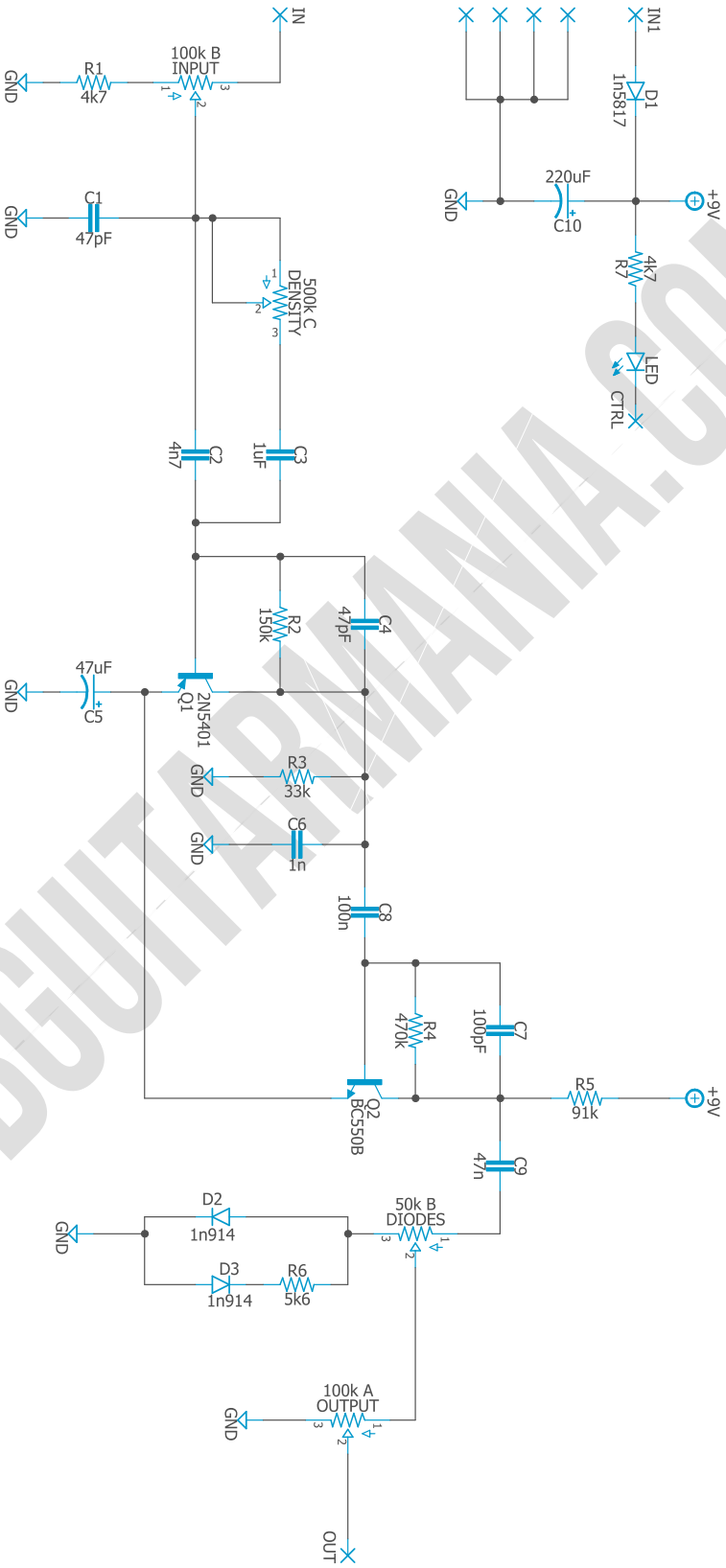
Electrolytics Capacitors		
Qty	**Value**	**Parts**
1	220uF	C10
1	47uF	C5

Potentiometers		
Qty	**Value**	**Parts**
1	100k A	OUTPUT
1	100k B	INPUT
1	500k C	DENSITY
1	50k B	DIODES

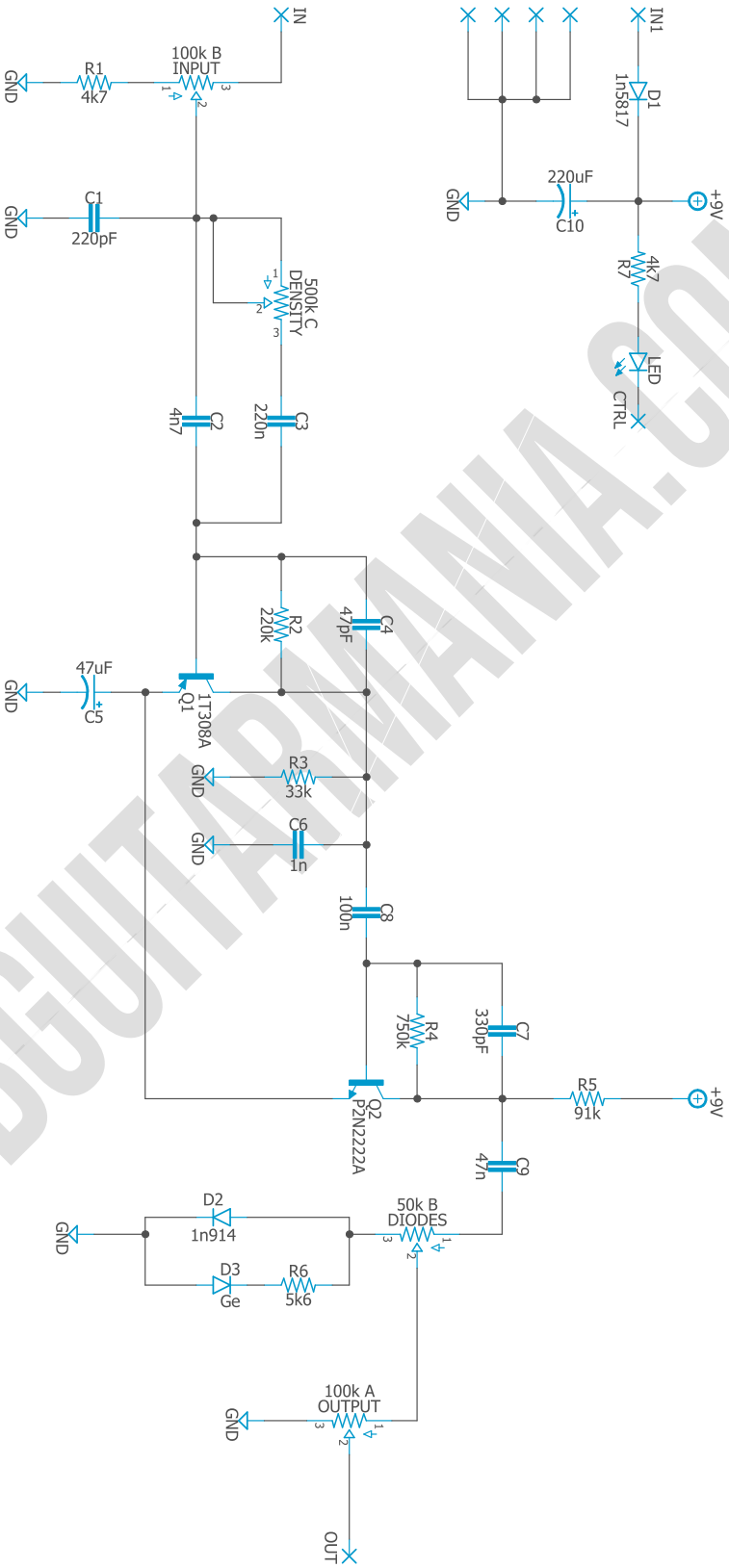
Transistors		
Qty	**Value**	**Parts**
1	1T308A	Q1
1	P2N2222A (flip 180 over the silkscreen)	Q2

Diods		
Qty	**Value**	**Parts**
1	1n5817	D1
1	1n914	D2
1	Ge	D3
1	3mm red LED	LED

Schematic - Silicon version



Schematic - Germanium version



Components Recommendations

As many people like to experiment with some pedals with higher voltage, always ensure your **electrolytic capacitors'** max tolerance is over 25v.

This board has been tested using Film box capacitors for most of the values over 1nf and ceramics discs for those under 1nf. However, high-quality components such as Wima's Capacitors and Panasonic's electrolytics can deliver a better performance.

All the resistors used for testing this project are 1/4W Metal Film.

The BOM and Shopping list are exclusive regarding this project. It doesn't include all the hardware like the 3PDT bypass switch, audio/dc jacks, enclosure, etc.

2n5401* Good alternatives to this transistor are 2n3906 or the higher gain 2n5087. Always take special care of matching the pin out accordingly!

Build Notes

If this is one of your first projects, I recommend you to take a look at our Pedal Building Guide.

For a successful and tidy build, it's recommended the following order:

1. Resistors & diodes
2. Capacitors, starting with the smaller ones and the ceramic ones.
3. Electrolytic capacitors (always check the polarity)
4. Transistors
5. Wires
6. Potentiometers and switches
7. Off-board wiring

Wiring Diagram

All our projects include a free 3PDT Board to make the wiring easier and tidier. Also, all of our PCBs feature the status LED on board.

The pad named "Ctrl" or "LED" is the one that controls the status of the led; wire it to the "LED" pad on the 3PDT board or in the control slug of your 3PDT.

This board has been designed to match our EZ 3PDT PCB; check it here to access our Pedal Wiring Guide.

Drill Template

This Project has been planned to fit into a 125b enclosure type.

Check the Attached “Drilling templates” to drill the box properly. The files are on Scale 1:1, ready to print on an A4 page.

Licensing and Usage

We really appreciate your trust and support in buying this PCB, as well as your will to dive into the DIY electronics world. For us, that's why you can make this project work properly and enjoy not only the building process but also experiment and play with it on your rig.

We try to reply to every question we receive on our email or our social media. Still, we try to encourage all our customers to join our PCB Guitar Mania – Builders Group on Facebook to post all your doubts, issues, suggestions, or requests, share your builds, and have some feedback from other fellow builders and us!

We tested all our projects following this same guide on their standard configurations. Although, not all of the variations and mods have necessarily been checked. These are suggestions based on the schematic analysis and the experiences and opinions of others. Feel free to share with us your views and recommendations regarding the mods your personal experimentation.

These boards may be used for commercial endeavors in any quantity unless expressly noted. No attribution is necessary, though accreditation or a link back is always much appreciated.

If you are a builder planning to make your own run of pedals, we also offer the service of custom-made boards with your brand and logo, design according to your specifications.

The only usage restrictions are that, first, you cannot resell the PCB as part of a kit without prior arrangement with us, and second, you cannot scratch off the silkscreen or other way of trying to hide our logos and the source of the PCBs. Like it's written above, if you want to have your designs with your brand and logo, we could undoubtedly reach an agreement.

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