

nonlinearcircuits

1U MulCho Build & BOM

This is a 1U version of the chopper multipliers in ChoMul, so the description is pretty much the same:

This module is inspired by an article from Harald Bode discussing ring modulators and multipliers. I can't seem to find it atm but pretty sure it was AES, anyway it was one of those things that stuck in my head. Bode stated there are two types of multipliers, ones like the diode ring modulator which he states are suitable for use in modular synths and switching or chopper types which are only good for driving AC motors and NOT suitable for use in modular synths.

Ahem, so here is a switching or chopper type multiplier for use in a modular synth.

Usually with a switching multiplier, one input will be a pulse signal but don't feel obliged, patch in whatever you like. These circuits work nicely with CV signals and are good at creating interesting envelopes. Looking on a scope, you will see gaps or steps where the diode and FET inherent V-on has an effect.

Please note, the PCBs only have eurorack 10 pin power connectors, not the Pulp Logic 3 pin type.



BOM

Component	quantity	notes
Euro rack 10 pin power connector	1	Tayda: A-198 cut to size
Schottky, power rectifier or 10R, optional - for reverse voltage protection...or not. BAT54GWX	2	SMD, Schottky dot on PCB indicates CATHODE (stripe on component) Mouser: 841-BAT54GWX
3.5MM SOCKET Kobiconn style	3	Tayda: A-2563 (PJ-3001F 3.5mm Mono Phone Jack)
2.54mm single row pin header strip	2x 3 pins	Tayda: A-197 cut to size
3mm LED	1	
LL4148 diodes	2	Tayda: A-1213
TL072 or TL082	1	Soic Tayda: A-1139
NFET J309	2	Mouser Part No 863-MMBFJ309LT1G
PFET J270	2	Mouser Part No 512-MMBFJ270 see notes
10uF	2	0805, minimum 25V rating. For decoupling, you can substitute any value 100nF or higher if 10uF are a pita to source
RL	1	0805 Resistor to suit LED, I usually use 4k7 - 10k these days
1k	1	0805
100k	5	0805
390k	1	0805
1M	2	0805

Other sources for sockets are Synthcube, Modular addict and Thonk.

Additional notes:

1. Schottky (best option) or standard power rectifier diode 50-600V 1A or more, or use a resettable fuse or just a 10R (worst option). Examples: BAT54GWX, PMEG2005EGWX, AEC-Q101, 20V, SOD-123, PMEG2005EH DIODE, SCHOTTKY, 0.5A, 20V, 1N400x or S1JL or similar.
2. The chips, resistors, caps are cheapest from Tayda. Schottky diodes, CMOS & 1uF, 10uF 25V 0805 caps from Mouser/E14/Farnell/etc.
3. Join the Nonlinearcircuits Builders Guild on FB:
<https://www.facebook.com/groups/174583056349286/> and ask questions there if you have any. If you prefer not to FB then email is fine.
4. I haven't tried but expect many P channel JFETs will work, as long as in the sot23-3 package and same pinout. I used J270 because the specs looked ok and it was the cheapest.

