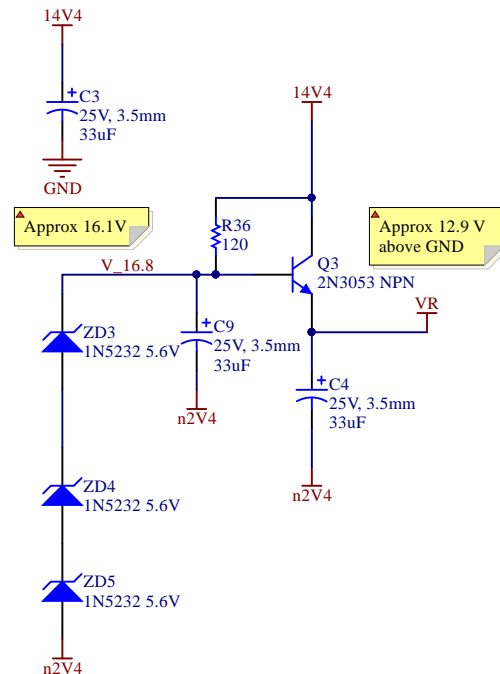


A1B neon with 150k series resistor

## Zener Regulator/Capacitance Multiplier



Title **Power Supply**

Size: A

Number: 09 0400 000

Revision: issue 2

Date: 11/14/2018

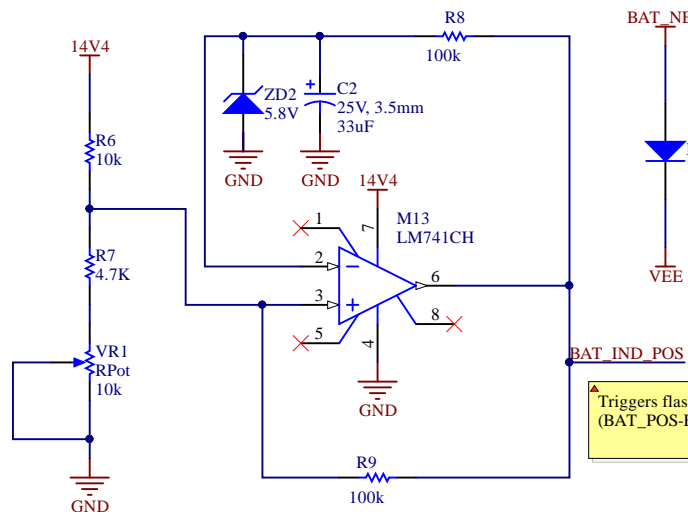
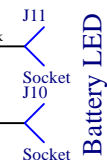
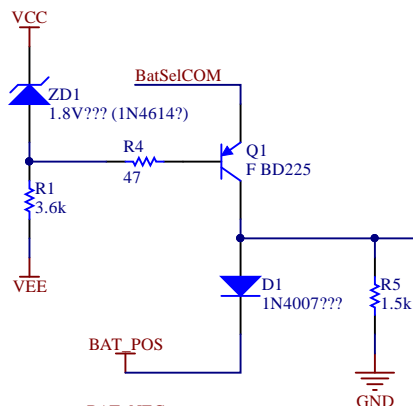
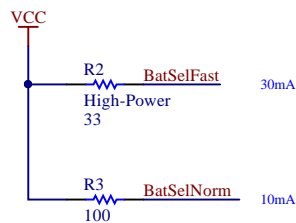
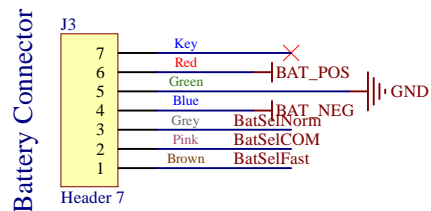
Time: 9:54:20 AM

Sheet 1 of 4

File: C:\Users\Nathan\Documents\PPM\_412\Schematics\AnaloguePCB\Power.SchDoc

PPM 412  
Analogue Board  
Reverse-Engineered  
by N Conrad





Triggers flashing when (BAT\_POS-BAT\_COM) is about 14.0 V.

Title **Battery Charger**

Size: A

Number: 09 0400 000

Revision: issue 2

Date: 11/14/2018

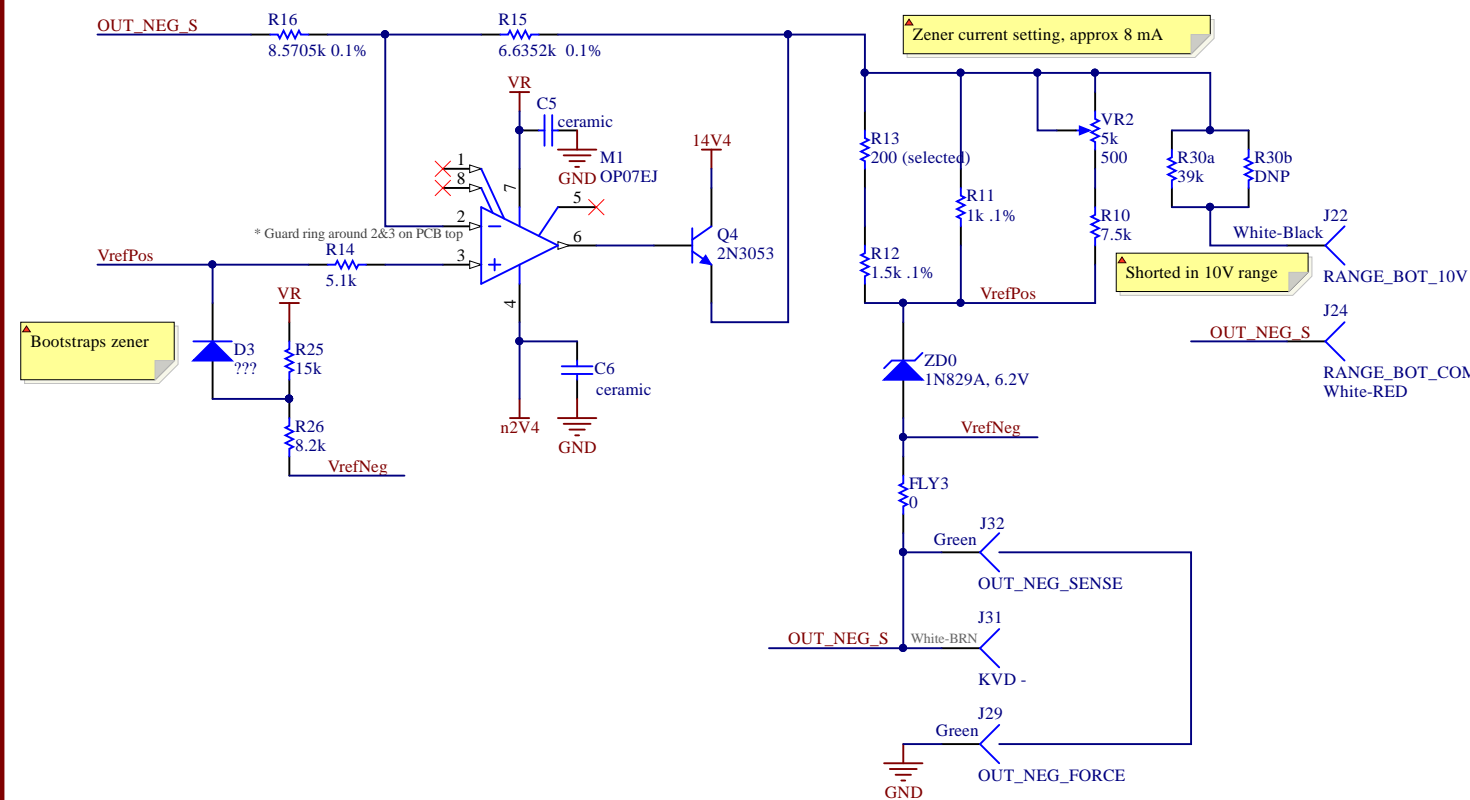
Time: 9:54:21 AM

PPM 412  
Analogue Board  
Reverse-Engineered  
by N Conrad

File: C:\Users\Nathan\Documents\PPM\_412\Schematics\AnaloguePCB\BattCharge.SchDoc



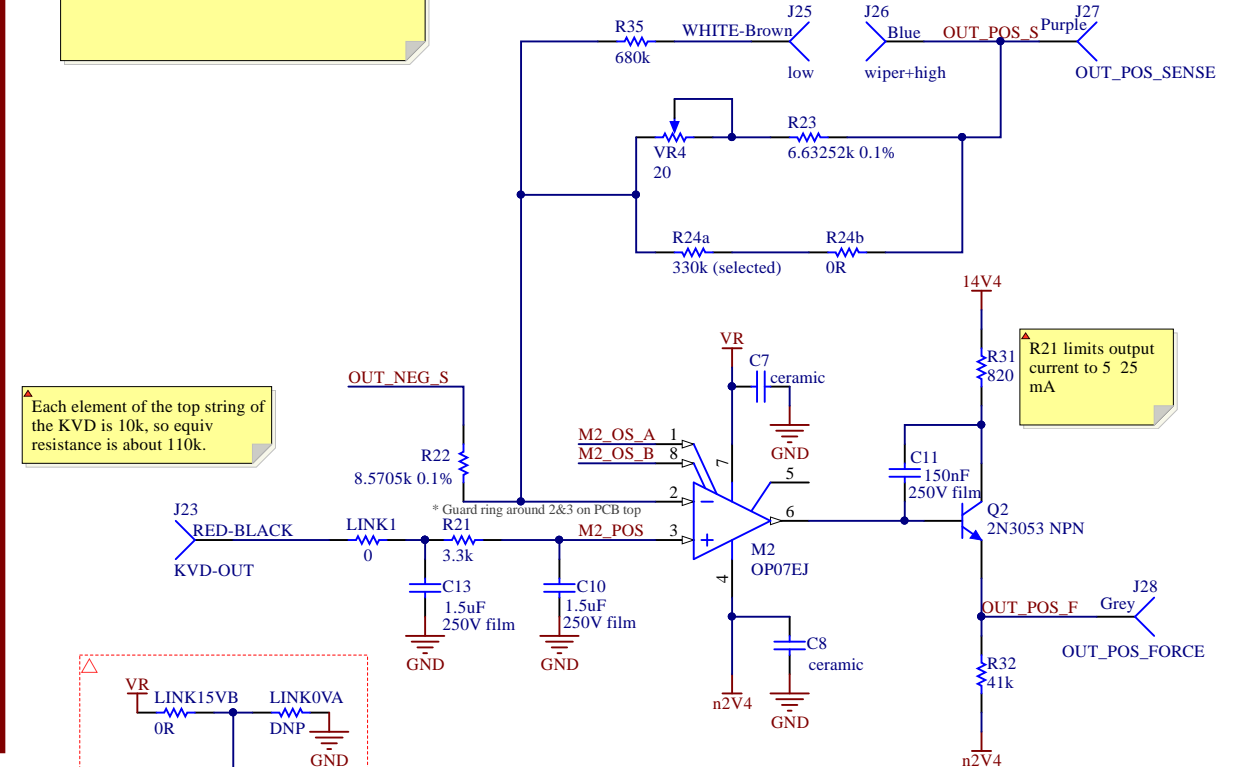
## Zener Reference



V\_R11 = 4.856 V  
 V\_REF = 6.276703 V (old volts)  
 Sum = 11.1337 V  
 KVD\_IN(10V range) = 6.27  
 KVD\_IN(1V range) 0.627  
 R15/R16 sets gain of pull-up

Left pot adjusts overall gain

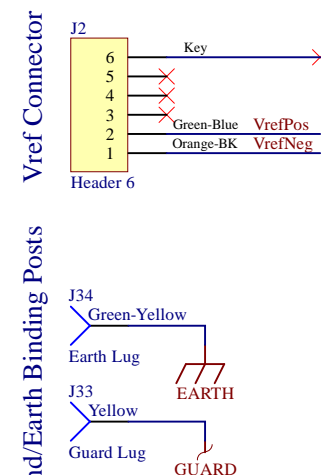
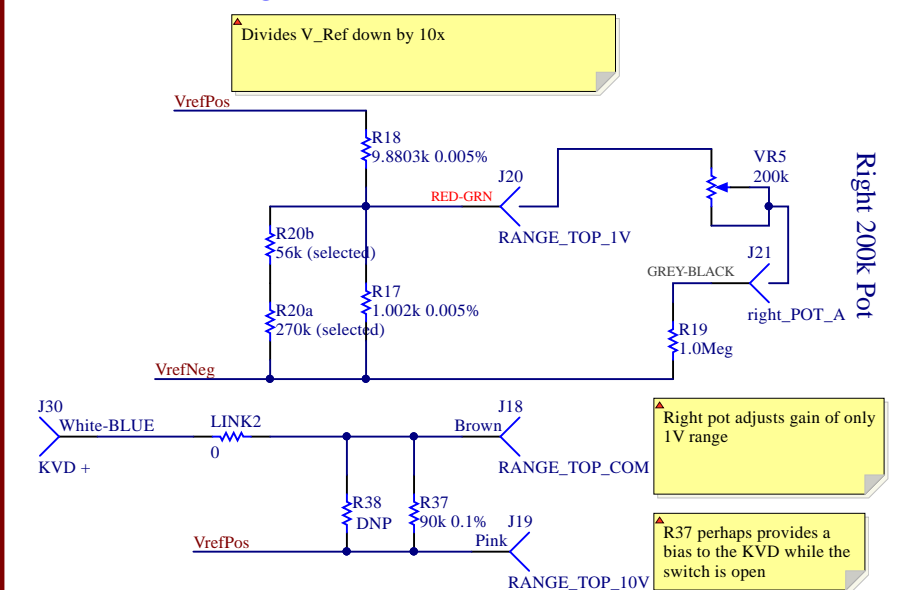
Left 5k Pot



Each element of the top string of the KVD is 10k, so equiv resistance is about 110k.

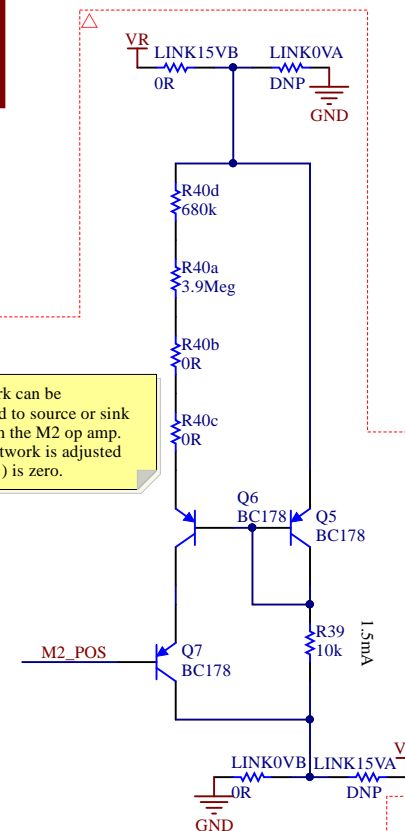
▲ R21 limits output current to 5.25 mA

## 1X/10X Range Switch

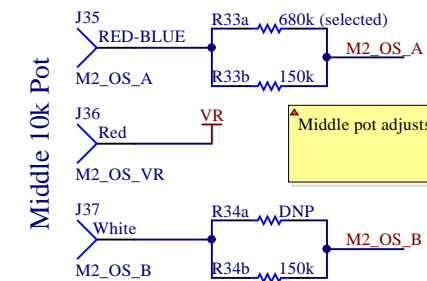


Board had cold solder joints on R30a,R30b


▲ This network can be reconfigured to source or sink current from the M2 op amp. The R40 network is adjusted until  $V(R21)$  is zero.

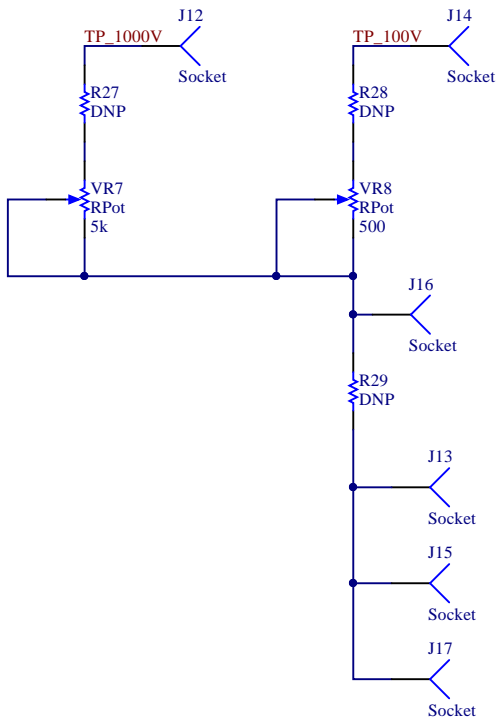


## M2 op-amp offset voltage trim



▲ Middle pot adjusts offset of M2

Title <b><i>Reference Amplifier</i></b>			PPM 412 Analogue Board Reverse-Engineered by N Conrad *	
Size: <b>B</b>	Number: 09 0400 000	Revision: issue 2		
Date: 11/14/2018	Time: 9:54:21 AM	Sheet 3 of 4		
File: C:\Users\Nathan\Documents\PPM 412\Schematics\AnaloguePCB\ReferenceAmp.SchDoc				



Title **Reference Divider**

Size: **A**

Number: **09 0400 000**

Revision: **issue 2**

Date: **11/14/2018**

Time: **9:54:22 AM**

Sheet **4** of **4**

File: **C:\Users\Nathan\Documents\PPM\_412\Schematics\AnaloguePCB\ReferenceDivider.SchDoc**

*PPM 412  
Analogue Board  
Reverse-Engineered  
by N Conrad*

