

Input from 14 SunPower C60 (0.22m²) Target output is 20V Input is up to 6Amps 20m will produce 0.7W and 120mV The ampli works up to 500mV (150mV rated) STM32 ADC is 5Msmps - 0.6V MPP 0.7V OC - 5.7A MPP 6.0A CC Therefore, at most, 2.4A @ 20V We can safely consider 500 kHz. Otherwise, starting from cell voltage 6A Add capability for gain on output to use 10m Without gain, output max is 3.2V As regulator freg is 600Khz Nominal 8.4V @ 5.7A (48W) We should handle 48W/6A/20V (not all same time) Let's set the low pass to around 60Khz 50kHz provides 33k resistors L201 O TP206 1u5 V_{SW} -Power SRP0620-1R5K VIN D-C201____ C202 15u BST C203 15u U201 C204 TPS61178 R201 100n 10mA max should be equivalent VCC Provider. 1Meg SW 12 10 VCC GND Caps mandatory. u1_VCC BST 13 to full output range (12V) So R top should be min O TP204 12*100 = 1.2kSW 7 TP202 V_{OUT} C205 R202 RILIMIT GND Trying with 1mA full range (12k) 3 ILIMIT VOUT 8 1Meg -⊳Vout 1 FREQ ⊤Analog ○ TP205 4 COMP R203 DISDRV 9 C206-C207-C208 V_{FB} 12k FB VFB 1.1V 15u 15u 15u RV201 R205 R206 Analog 200k (80k) ___220k 68k **d**Ctrl GND GND \rightarrow \Rightarrow C209 GND GND O TP203 R207 470p TP201 +3.37 U202 V_{CTRL} Freq = approx 0.6MHz ___ 10k V_{BJT} $I_{LIM} = 9A (6A + ripple max)$ VBE 660mV TSV911xxLx R209 **≻**Analog Analog See datasheet for details GND GND 200k R208 Q201 +3.3V 1k8 BC846 C210 R210 100n ... 10k R211 1Meg \rightarrow C211 GND 100n \rightarrow \rightarrow GND GND GND GND With 1.66V as full scale Divider by 2 Allows 3.3V input R = h₆ * (1.66 -0.66) / 0.001 R = h₆ * 1000 R in [200k;400k] While avoiding Vout > 20V Sheet: /Core/ File: power_supply_core.kicad_sch Title: Size: A4 Date: Rev: KiCad E.D.A. kicad 7.0.0-rc2-unknown-90e759e738~164~ubuntu22.04.1 ld: 2/4



