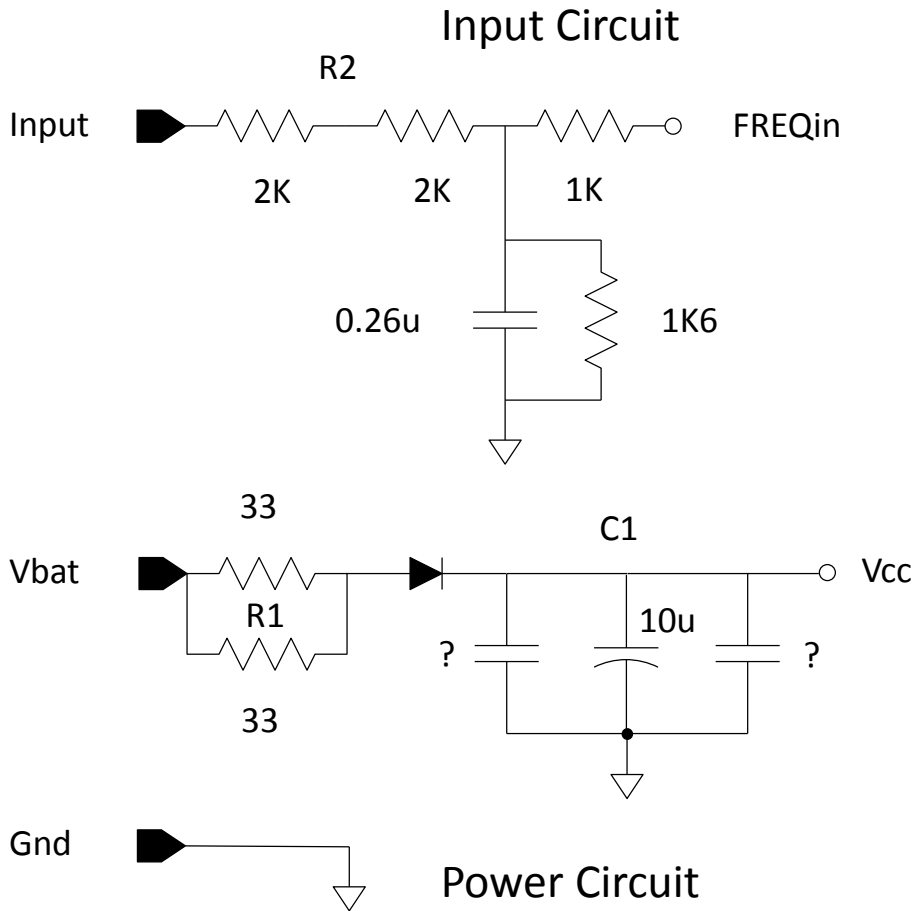# VDO 333051D Teardown

"The Good, the Bad and the Ugly

VDO 333051D Details

- The tach is based on an industry standard part
  - ON Semi CS8190 in a 20 pin SOIC package
  - Tach movement is an air core Sine/Cosine gauge
- CS8190 can be ordered from DigiKey
  - http://www.digikey.com/product-detail/en/CS8190EDWFR20G/CS8190EDWFR20GOSCT-ND/2120588
- Datasheet link:
  - http://www.onsemi.com/pub_link/Collateral/CS8190-D.PDF
- All circuit board components are surface mount
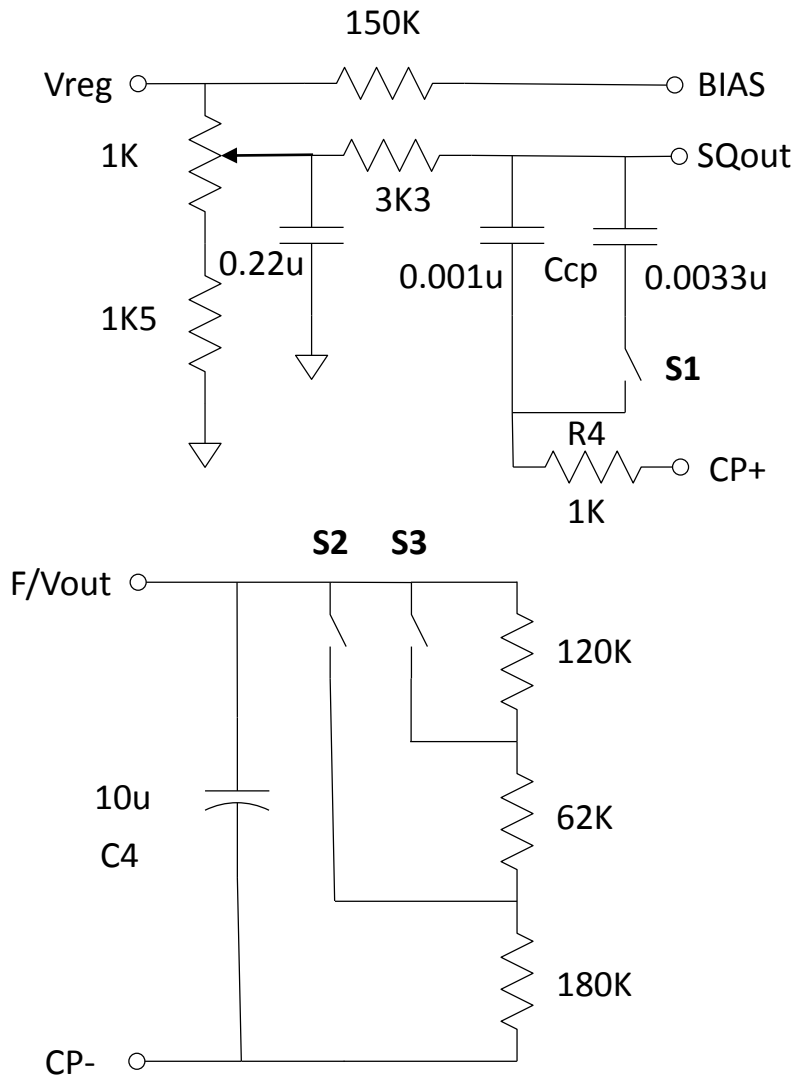 - Surface mount parts CAN be soldered by hand

VDO 333051D Schematics (1)

Input Circuit

Input ▶ —/\/\/\— R2 —/\/\/\— •—/\/\/\— ○ FREQin

2K   2K   1K

0.26u ⊥⊤   /\/\ 1K6

Power Circuit

33

Vbat ▶ —/\/\/\—▶|— C1 —○ Vcc

R1   ? ⊥⊤   10u ⊥⊤   ? ⊥⊤

33

Gnd ▶ —▽

- Notes:
  - Input circuit inadequate for points ignitions
  - Power circuit inadequate to protect from spikes
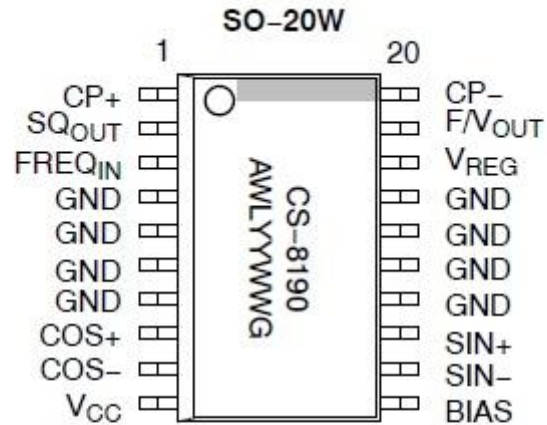 - Caps marked '?' are too small to measure in parallel to 10u

VDO 333051D Schematics (2)

- Timing Circuit Notes:
  - VDO design differs from ON Semi reference design
  - C4 can be changed to 4.7u for better tach response

CS8190 Pinout

SO-20W

1   20

Left (pins 1–10)	Right (pins 20–11)
CP+	CP−
SQ$_{OUT}$	F/V$_{OUT}$
FREQ$_{IN}$	V$_{REG}$
GND	GND
GND	GND
GND	GND
GND	GND
COS+	SIN+
COS−	SIN−
V$_{CC}$	BIAS

CS-8190
AWLYYWWG

A	= Assembly Location
WL	= Wafer Lot
YY	= Year
WW	= Work Week
G	= Pb−Free Package