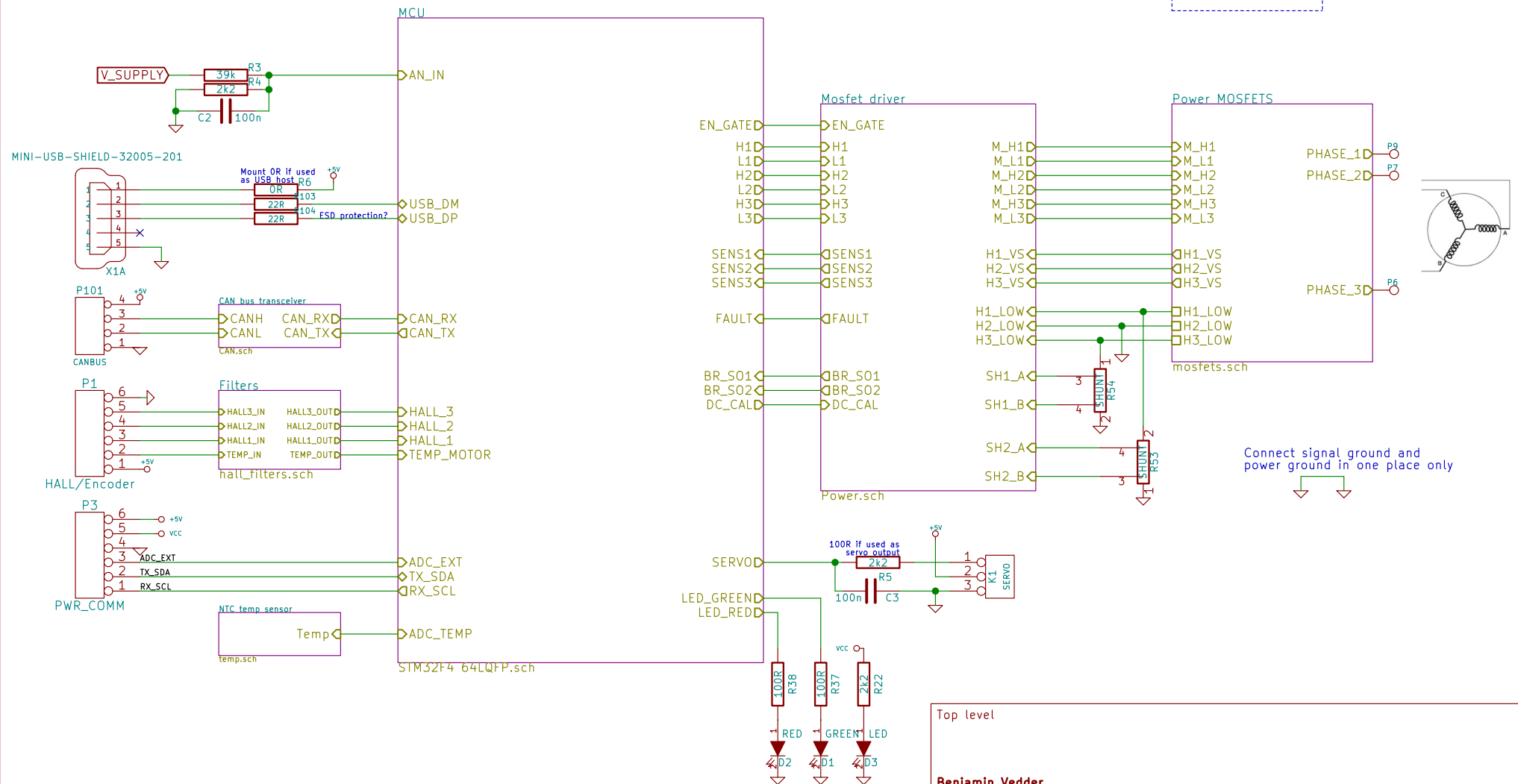


# BLDC motor controller



Top level

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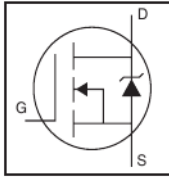
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**Title: BLDC Driver 4.6**

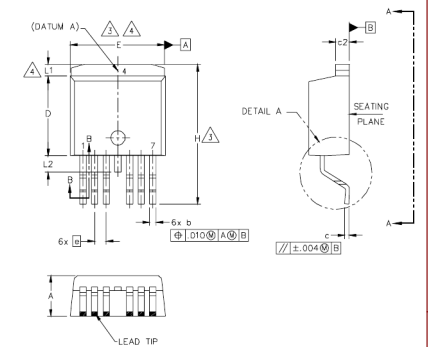
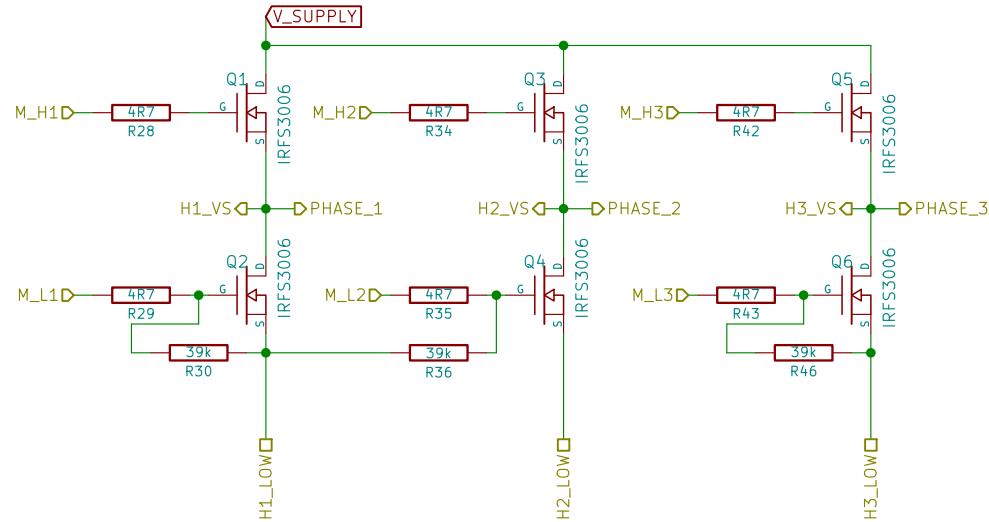
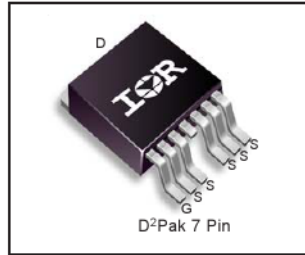
Size: A4 Date: 25 Aug 2014  
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**Rev: 4.6**  
Id: 1/7

# HEXFET® Power MOSFET



$V_{DS}$		60V
$R_{DS(on)}$ typ.		1.5m $\Omega$
	max.	2.1m $\Omega$
$I_D$ (Silicon Limited)		293A①
$I_D$ (Package Limited)		240A



## Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
$I_D$ @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{DS} = 10\text{V}$ (Silicon Limited)	293①	A
$I_D$ @ $T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{DS} = 10\text{V}$ (Silicon Limited)	207 ②	A
$I_D$ @ $T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{DS} = 10\text{V}$ (Package Limited)	240	A
$I_{DS}$	Pulsed Drain Current ③	1172	A
$P_D$ @ $T_C = 25^\circ\text{C}$	Maximum Power Dissipation	375	W
	Linear Derating Factor	2.5	W/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$dV/dt$	Peak Diode Recovery ④	11	V/ns
$T_J$	Operating Junction and Storage Temperature Range	$-55$ to $+175$	°C
$T_{SOL}$	Soldering Temperature, for 10 seconds (1.6mm from case)	300	°C
	Mounting torque, 6-32 or M3 screw	10lb-in (1.1N-m)	

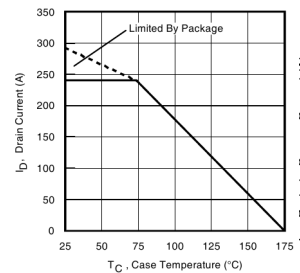


Fig 9. Maximum Drain Current vs. Case Temperature

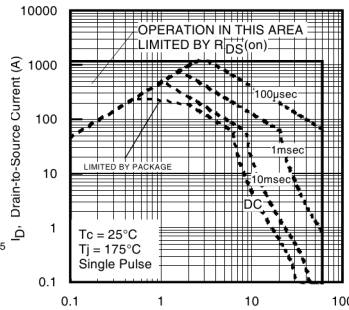


Fig 8. Maximum Safe Operating Area

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Sheet: /Power MOSFETS/

File: mosfets.sch

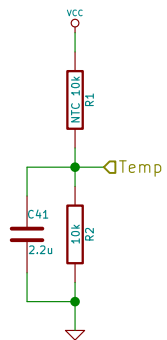
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Size: A4 Date: 25 Aug 2014

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Rev: 4.6

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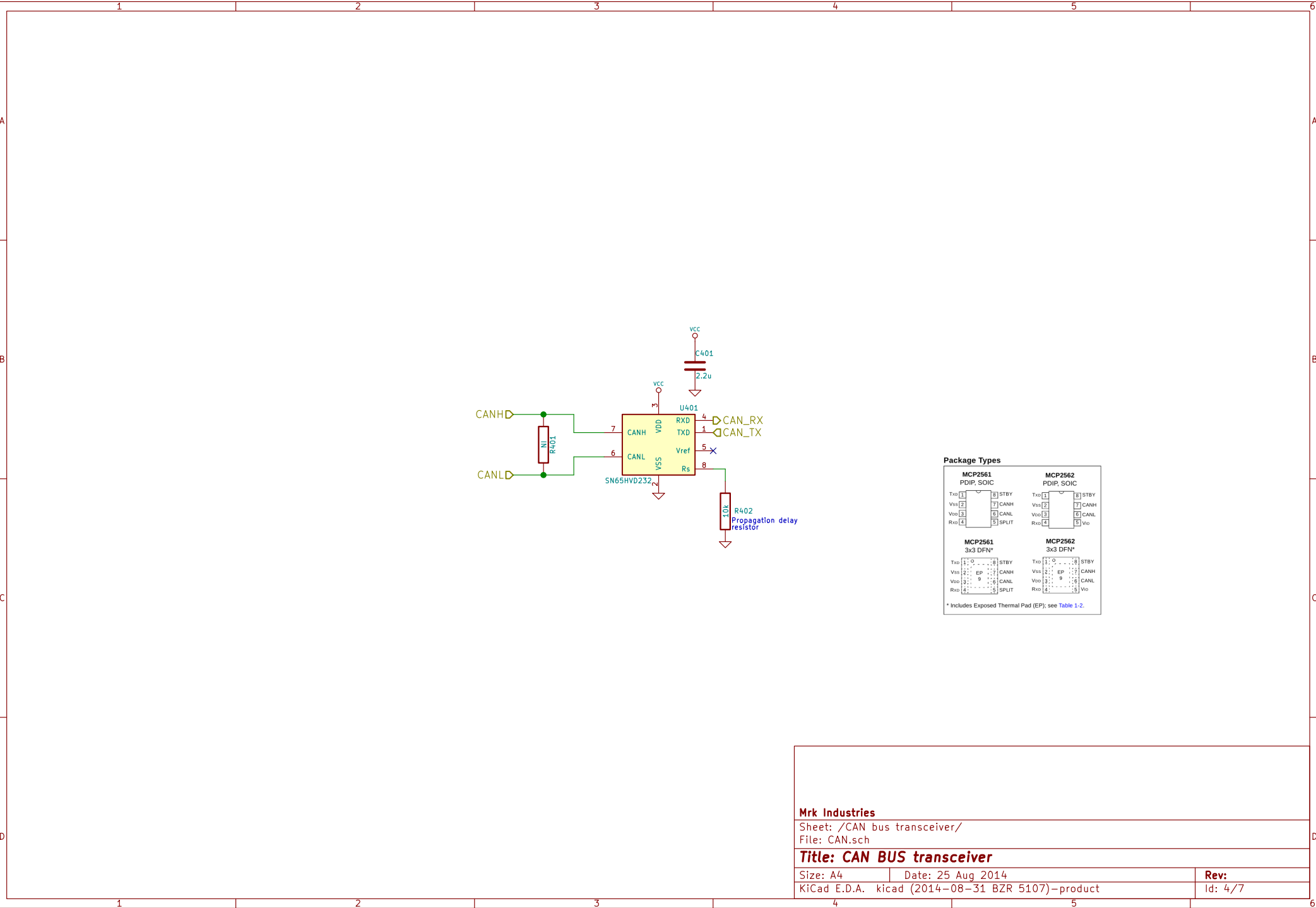
**Mrk Industries**

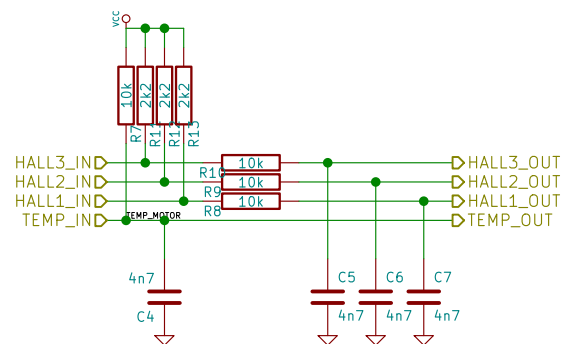
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File: temp.sch

**Title: NTC resistor temperature sensor**

Size: A4      Date: 27 sep 2014  
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**Rev:**  
Id: 3/7





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File: hall\_filters.sch

**Title:**

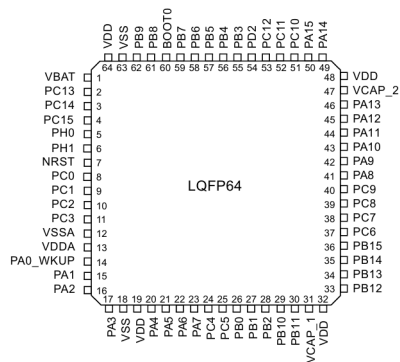
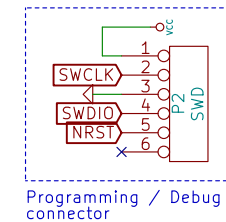
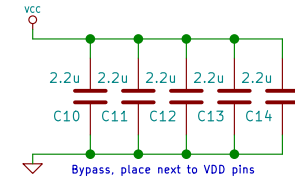
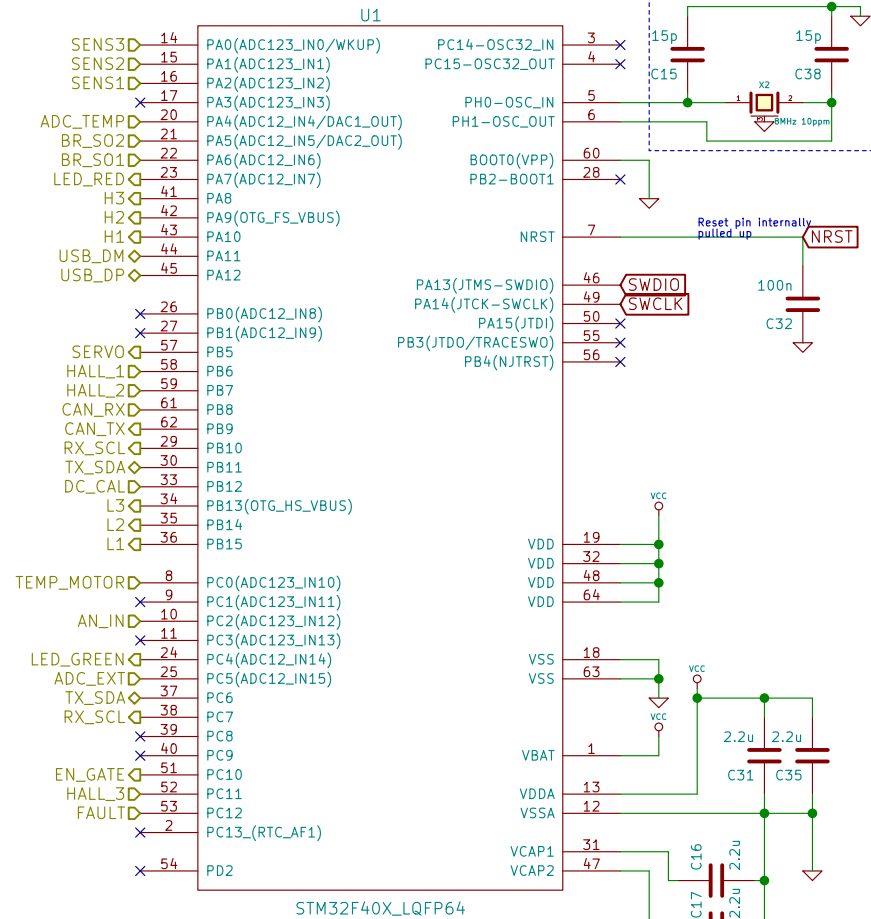
Size: A4 Date: 25 Aug 2014  
KiCad E.D.A. kicad (2014-08-31 BZR 5107)-product

**Rev:**  
Id: 5/7



# STM32F405xx STM32F407xx

ARM Cortex-M4 32b MCU+FPU, 210DMIPS, up to 1MB Flash/192+4KB RAM, USB  
OTG HS/FS, Ethernet, 17 TIMs, 3 ADCs, 15 comm. interfaces & camera



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Sheet: /MCU/

File: STM32F4\_64LQFP.sch

Title: BLDC Driver 4.6

Size: A4 Date: 25 Aug 2014

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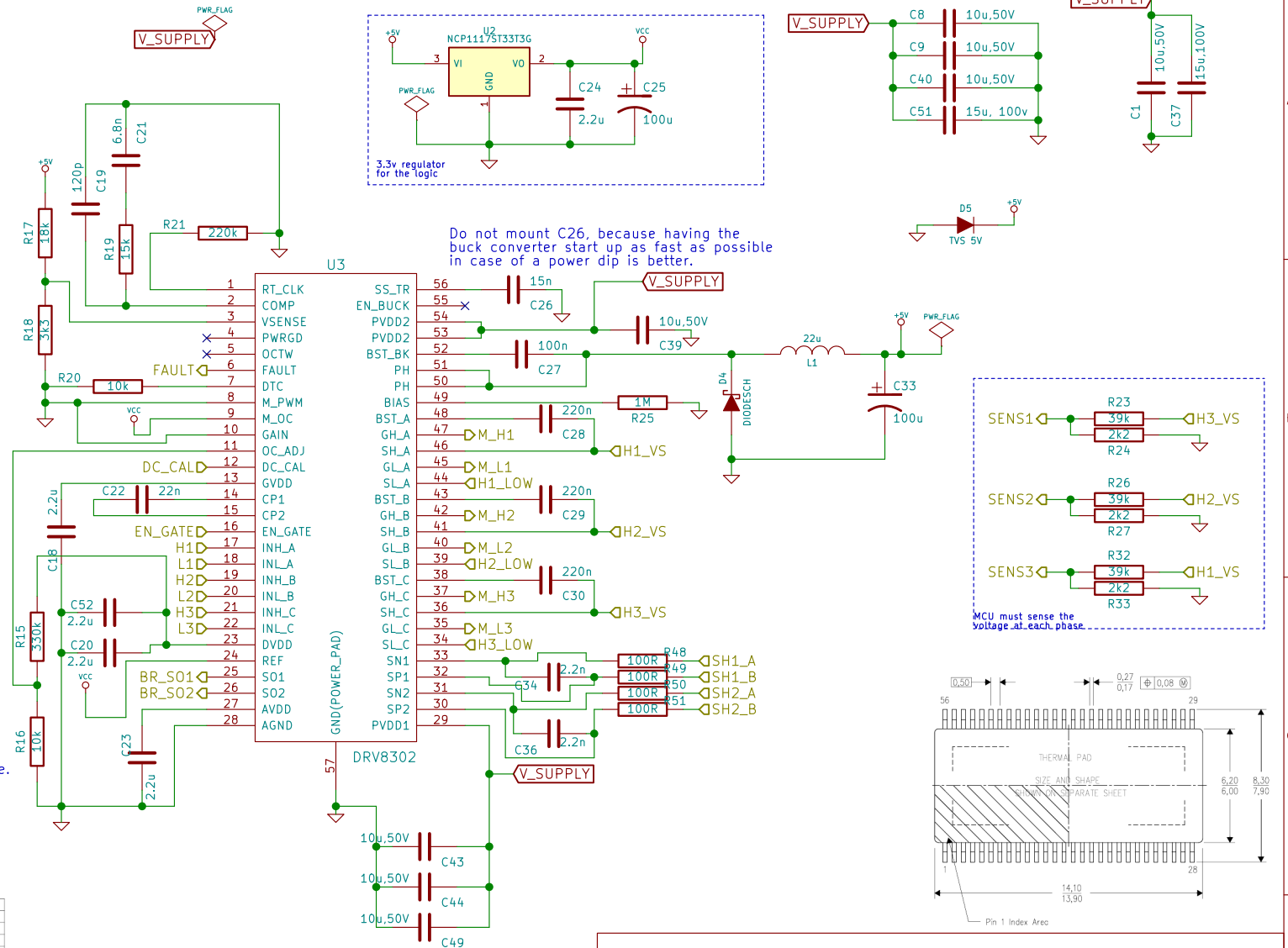
Rev: 4.6

Id: 6/7

## FEATURES

- Operating Supply Voltage 8V–60V
- 2.3A Sink and 1.7A Source Gate Drive Current Capability
- Integrated Dual Shunt Current Amplifiers With Adjustable Gain and Offset
- Integrated Buck Converter to Support up to 1.5A External Load
- Independent Control of 3 or 6 PWM Inputs
- Bootstrap Gate Driver With 100% Duty Cycle Support
- Programmable Dead Time to Protect External FETs from Shoot Through
- Programmable Overcurrent Protection of External MOSFETs
- Thermally Enhanced 56-Pin TSSOP Pad Down DCA Package

Do not mount the resistor R16, because the internal current limit in the DRV8302 does not work with this configuration for some reason. If this resistor is mounted, the DRV8203 will generate faults all the time.



## RECOMMENDED OPERATING CONDITIONS

		MIN	TYP	MAX	UNITS
PVDD1	DC supply voltage PVDD1 for normal operation	8	60		V
PVDD2	DC supply voltage PVDD2 for buck converter	3.5	60		V
CAVDD	External capacitance on AVDD pin (ceramic cap) 20% tolerance		1		µF
CDVDD	External capacitance on DVDD pin (ceramic cap) 20% tolerance		1		µF
CGVDD	External capacitance on GVDD pin (ceramic cap) 20% tolerance		2.2		µF
CCP	Flying cap on charge pump pins (between CP1 and CP2) (ceramic cap) 20% tolerance		22		nF
CBST	Bootstrap cap (ceramic cap)		100		nF
ICM_EN	Input current of digital pins when EN_GATE is high			100	µA
ICM_OIP	Input current of digital pins when EN_GATE is low			1	µA
CCIN	Maximum capacitance on digital input pin		10		pF
CC_OPA	Maximum output capacitance on outputs of shunt amplifier		20		pF
RDT	Dead time control resistor range. Time range is 50ns (-GND) to 500ns (150kΩ) with a linear approximation.	0	150		kΩ
IFAULT	FAULT pin sink current. Open-drain			2	mA
IOCTW	OCTW pin sink current. Open-drain			2	mA
VREF	External voltage reference voltage for current shunt amplifiers	2	6		V
fSW	Operating switching frequency of gate driver			200	kHz
TA	Ambient temperature	-40	125		°C

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Sheet: /Mosfet driver/  
File: Power.sch

## Title: BLDC Driver 4.5

Size: A4 Date: 25 Aug 2014  
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Rev: 4.5  
Id: 7/7