

# Spartan Racing BMS Slave Board

Version 1, Revision A

LTC6813

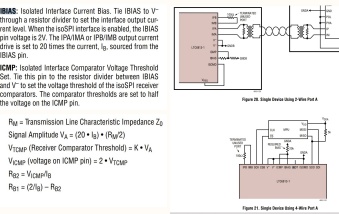
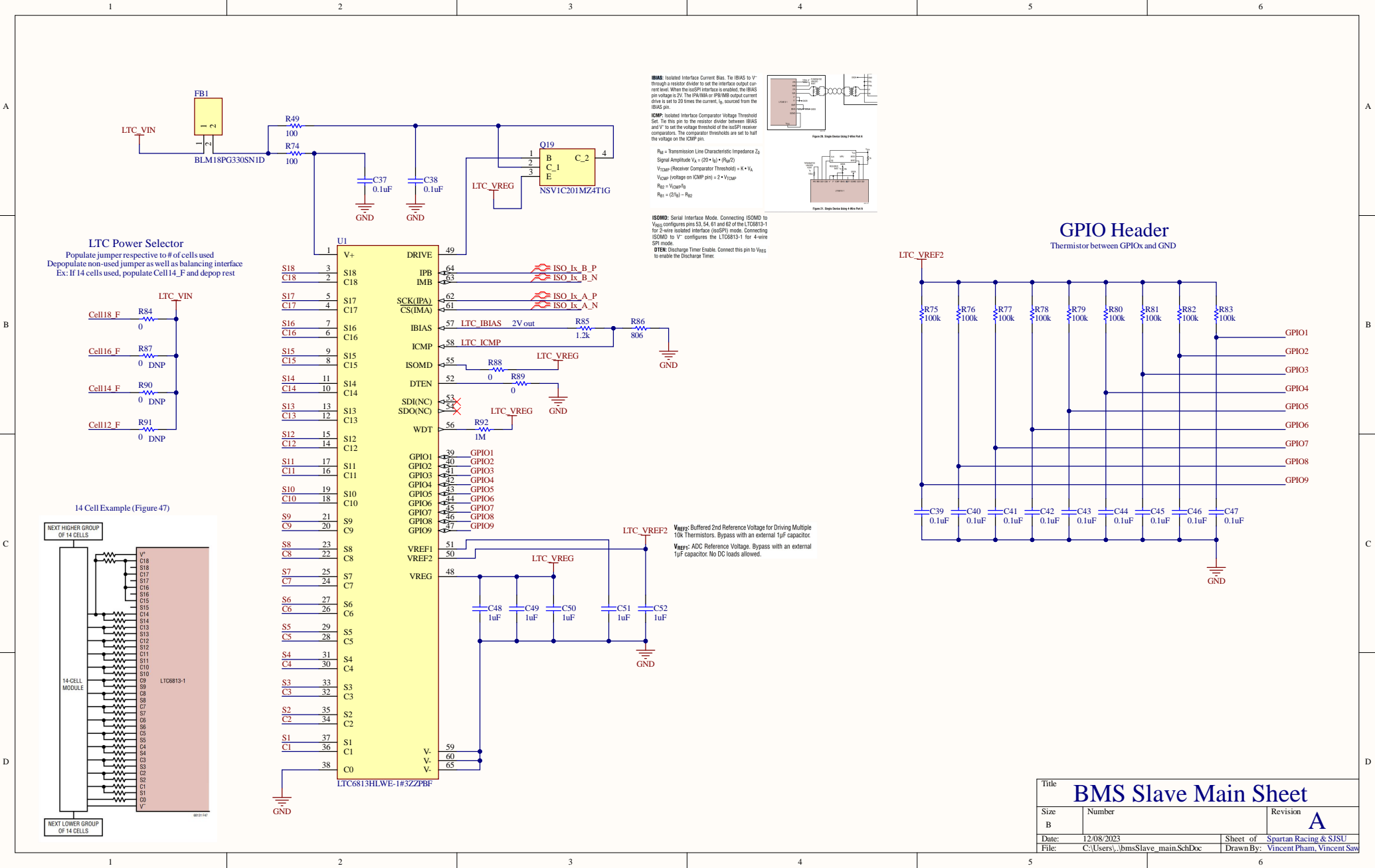
B.S. Senior Project SP23-FA23

Vincent Saw, Vincent Pham, Josh Samoy, Abegail Palad

Advisor: Preetpal Kang

**Designers: Vincent Pham, Vincent Saw**

Title		BMS Slave Cover Sheet	
Size	Number		Revision
A			A
Date:	12/08/2023		Sheet of Spartan Racing & SJSU
File:	C:\Users\...\bmsSlave_cover.SchDoc		Drawn By: Vincent Saw

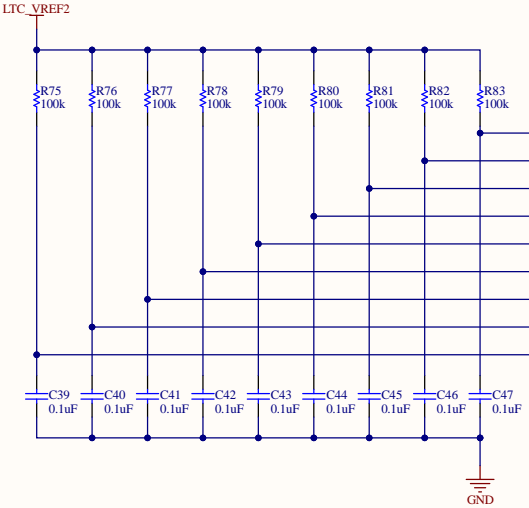


**ISOMD:** Serial Interface Mode. Connecting ISOMD to V<sub>REG</sub> configures pins 53, 54, 61 and 62 of the LTC6813-1 for 2-wire isolated interface (I2C/SPI) mode. Connecting ISOMD to V+ configures the LTC6813-1 for 4-wire SPI mode.

**DTEN:** Discharge Timer Enable. Connect this pin to V<sub>REG</sub> to enable the Discharge Timer.

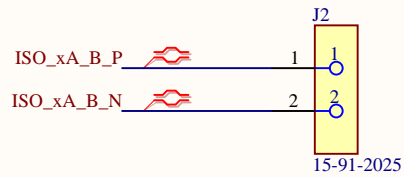
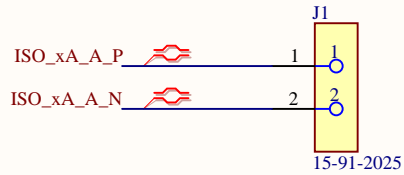
### GPIO Header

Thermistor between GPIOx and GND

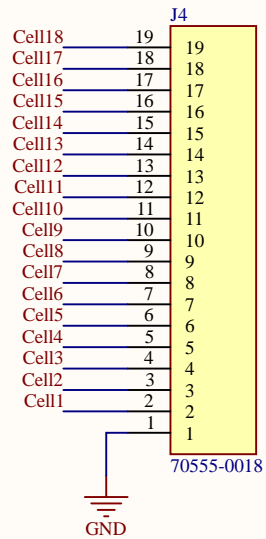


Title			BMS Slave Main Sheet	
Size	B	Number	Revision	
Date:		12/08/2023	Sheet of	
File:		C:\Users\...bmsSlave_main.SchDoc	Spartan Racing & JSJU	
			Drawn By:	
			Vincent Pham, Vincent Sew	

## isoSPI Headers

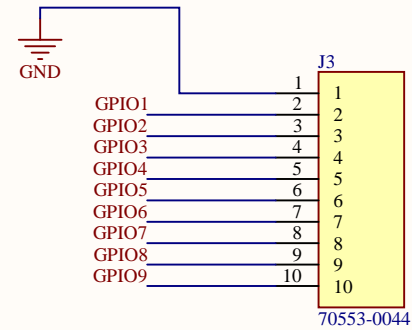


## Cell Connector

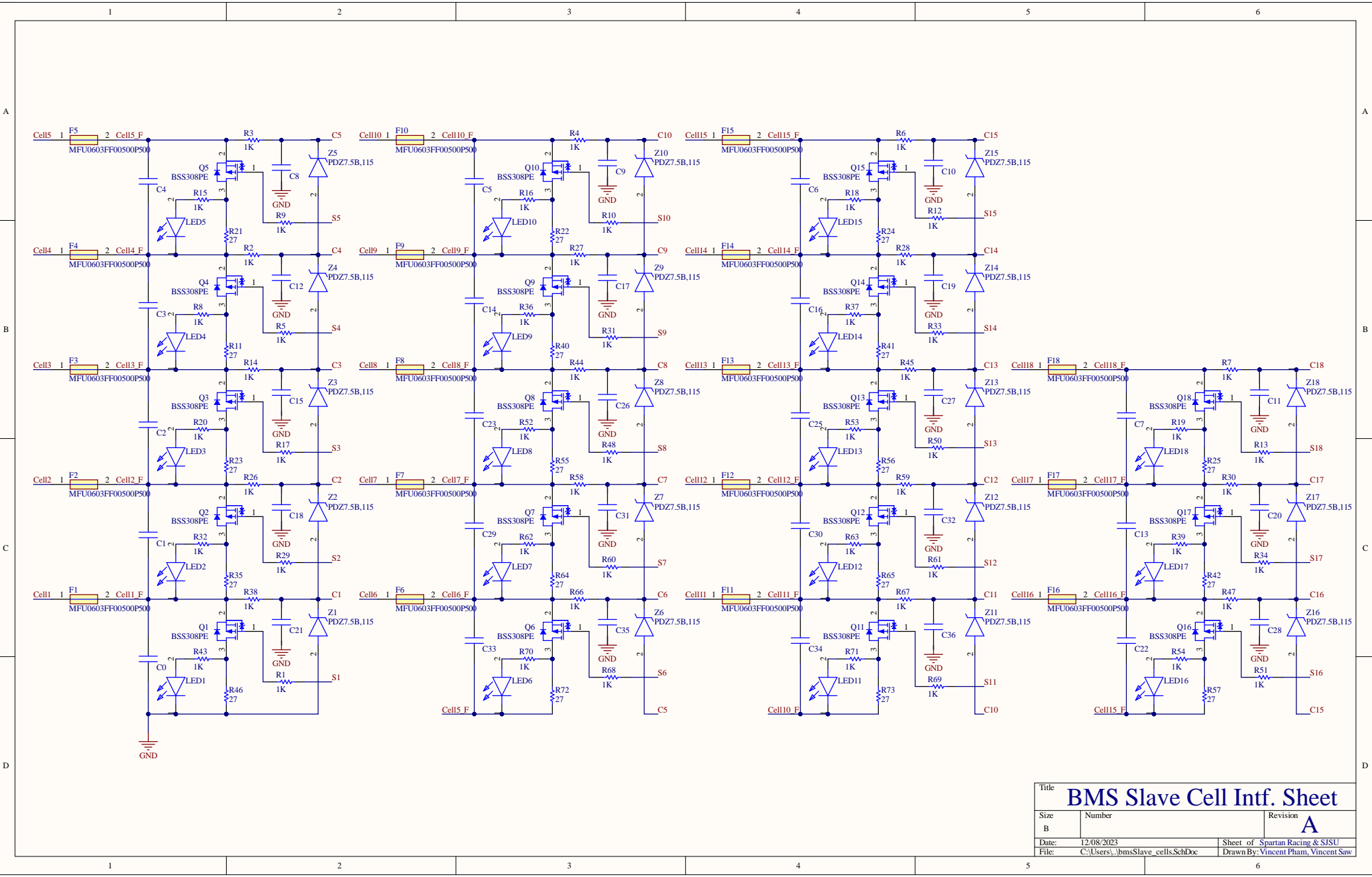


## GPIO Header

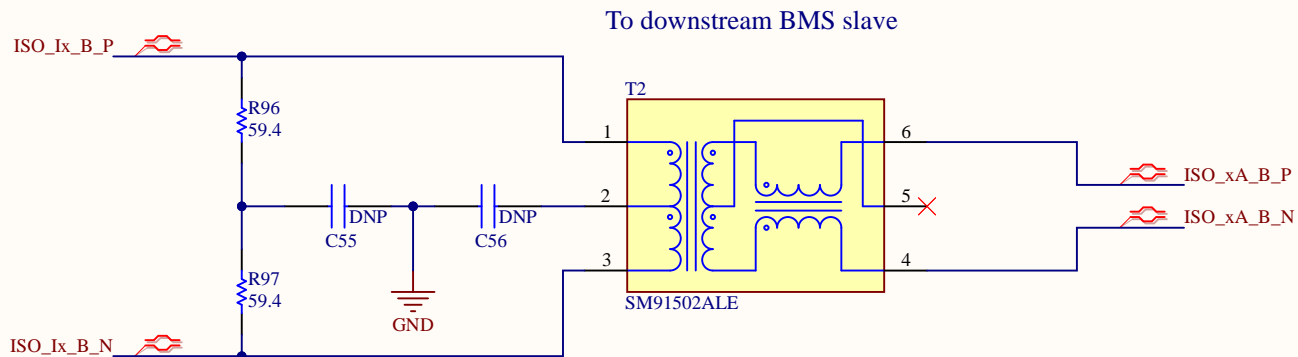
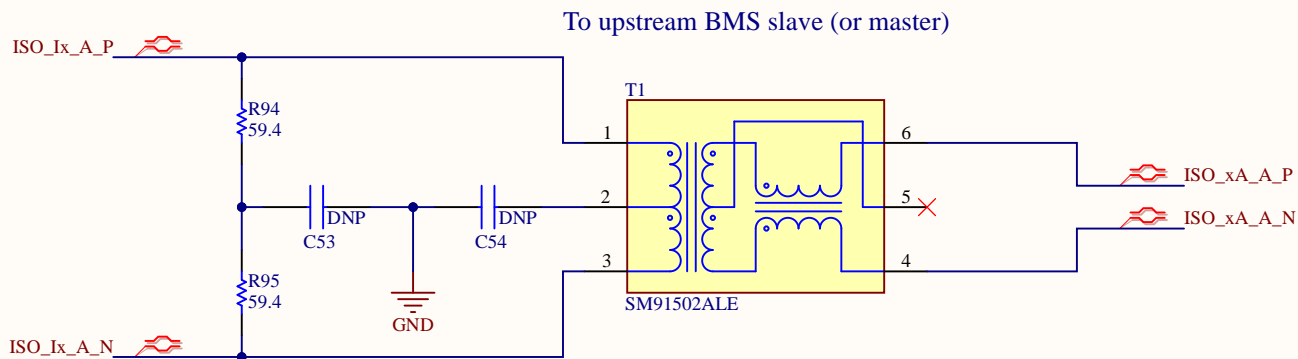
Thermistor between GPIOx and GND



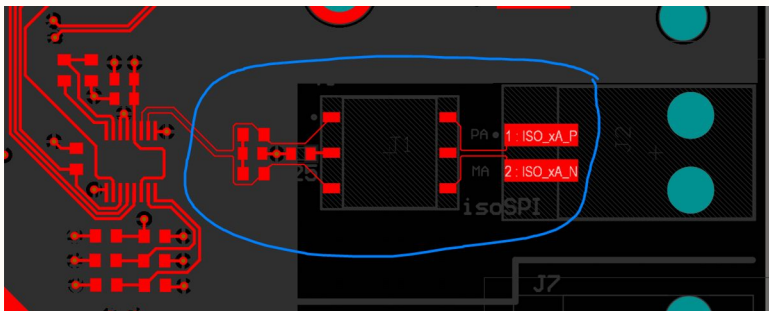
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Size	Number		Revision	
A			A	
Date:	12/08/2023		Sheet of Spartan Racing & SJSU	
File:	C:\Users\...\bmsSlave_conn.SchDoc		Drawn By: Vincent Pham, Vincent Saw	



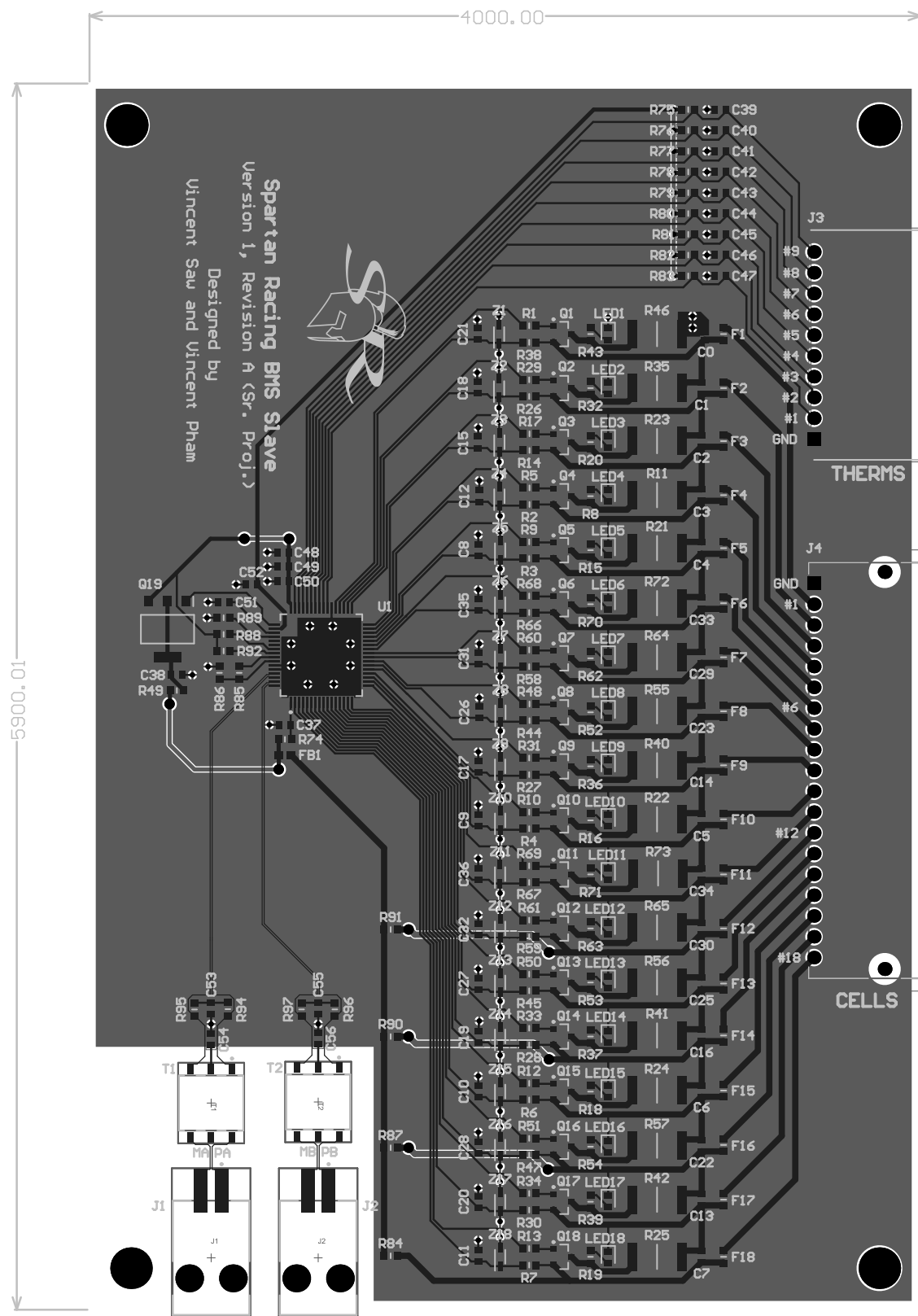
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Size	Number	Revision	
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Date:	12/08/2023	Sheet of Spartan Racing & SJSU	
File:	C:\Users\...bmsSlave_cells\SchDoc	Drawn By: Vincent Pham, Vincent Saw	



FOLLOW DATASHEET LAYOUT GUIDELINES!  
KEEP AREA UNDERNEATH TRANSFORMER EMPTY



Title		
BMS Slave isoSPI Sheet		
Size	Number	Revision
A		A
Date:	12/08/2023	Sheet of Spartan Racing & SJSU
File:	C:\Users\...\bmsSlave_isospi.SchDoc	Drawn By: Vincent Pham, Vincent Saw



Line #	Name	Description	Designator	Quantity	Manufacturer 1	Manufacturer Part Number 1	Manufacturer Lifecycle 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Supplier Subtotal 1
	885382207009	Multilayer Ceramic Chip Capacitor WCAP- CSST Series 0805 10000pF X7R0805103K100DFC T1S000	C0, C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C53, C54, C55, C56	40							
	Capacitor	Capacitor	C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47	11							
	Capacitor	Capacitor	C48, C49, C50, C51, C52	5							
	MFU0603FF00500P500	Fuse	F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18	18							
	BLM18PG330SN1D	Ferrite Bead	FB1	1							
	15-91-2025	CONN HEADER SMD R/A 2POS 2.54MM	J1, J2	2	Molex	15-91-2025	Volume Production	Farnell	3862877	3.08	6.16
	70553-0044	Connector	J3	1							
	70555-0018	Connector	J4	1							
	LS_L29K-G1H2-1	LED	LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8, LED9, LED10, LED11, LED12, LED13, LED14, LED15, LED16, LED17, LED18	18							
	BSS308PE	P-Channel OptiMOS P3 Small-Signal- Transistor, -30 V VDS, 2 A ID -55 to 150 degC, PG-SOT23, Reel, Green	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18	18	Infineon	BSS308PE	Volume Production	Digi-Key	BSS308PEH6327XTSA1CT-ND	0.358	6.44
	NSV1C201MZ4T1G	Transistor	Q19	1							
	Resistor	Resistor	R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R12, R13, R14, R15, R16, R17, R18, R19, R20, R26, R27, R28, R29, R30, R31, R32, R33, R34, R36, R37, R38, R39, R43, R44, R45, R47, R48, R50, R51, R52, R53, R54, R58, R59, R60, R61, R62, R63, R66, R67, R68, R69, R70, R71	54							
	Resistor	Resistor	R11, R21, R22, R23, R24, R25, R35, R40, R41, R42, R46, R55, R56, R57, R64, R65, R72, R73	18							
	Resistor	Resistor	R49, R74	2							
	Resistor	Resistor	R75, R76, R77, R78, R79, R80, R81, R82, R83	9							
	Resistor	Resistor	R84, R87, R88, R89, R90, R91	6							
	Resistor	Resistor	R85	1							
	Resistor	Resistor	R86	1							
	Resistor	Resistor	R92	1							
	Resistor	Resistor	R94, R95, R96, R97	4							
	SM91502ALE	BMS XFORMER 1-CH 1000V AECQ +125	T1, T2	2	Bourns	SM91502ALE	Volume Production	Newark	95AC3538	2.81	5.62
	LTC6813HLWE-1#3ZZPBF	18 CHANNEL MULTICELL BATTERY STA	U1	1	Analog Devices / Linear Technology	LTC6813HLWE-1#3ZZPBF					
	PDZ7.5B,115	Zener Diode	Z1, Z2, Z3, Z4, Z5, Z6, Z7, Z8, Z9, Z10, Z11, Z12, Z13, Z14, Z15, Z16, Z17, Z18	18							