

# Acceleration Sensing Module

A

B

C

D

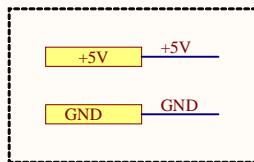
A

B

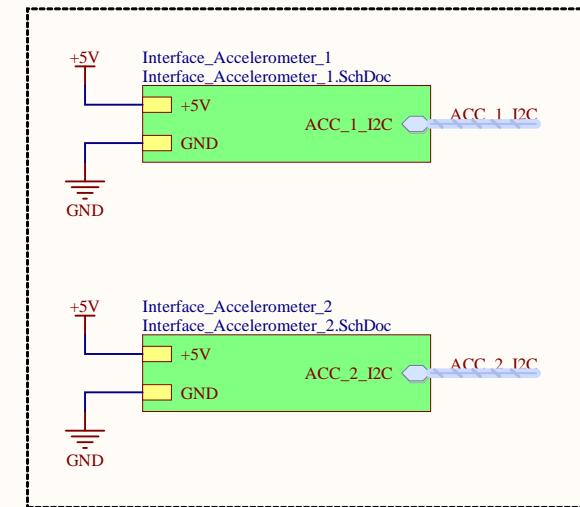
C

D

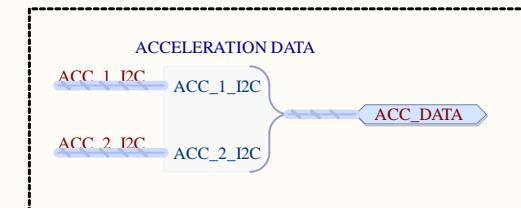
**Input Power Ports**



**Accelerometers Interfaces**



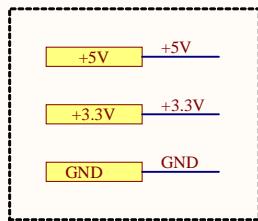
**Data Output Signals**



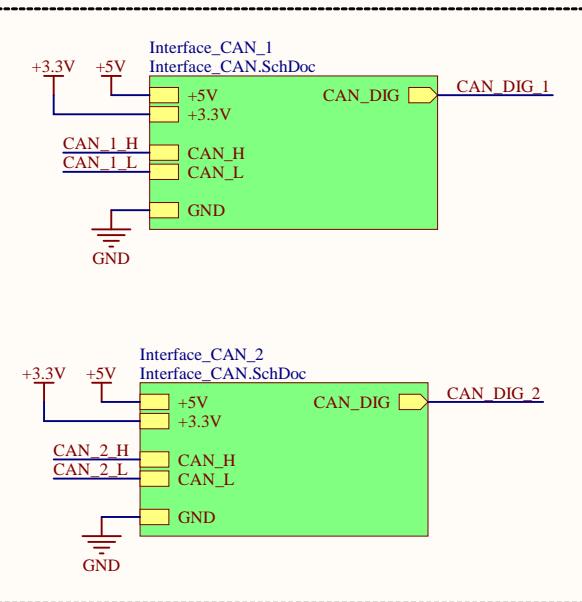
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Size	Number	Revision
A4		
Date: 7/01/2024	Sheet of	
File: C:\Users\..\Acceleration_Sensing_Module.SchDoc		

# CAN Activity Module

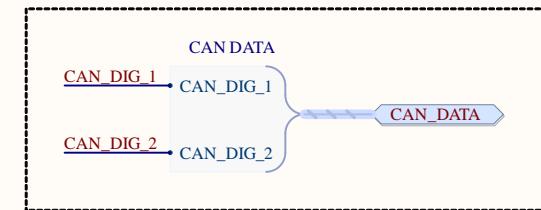
**Input Power Ports**



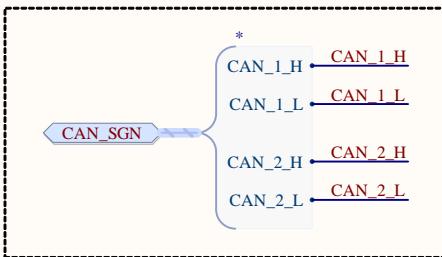
**Bus CAN Interfaces**



**Data Output Signals**



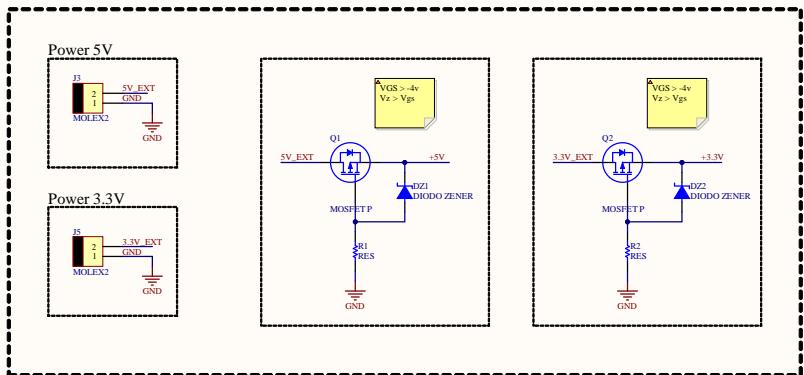
**CAN Signals**



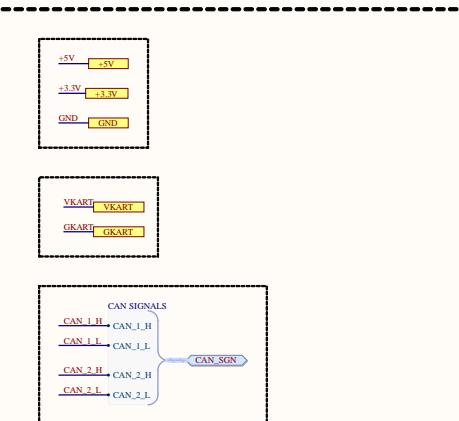
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A4		
Date: 7/01/2024	Sheet of	
File: C:\Users\..\CAN_Activity_Module.SchDoc	Drawn By:	

## Connectors

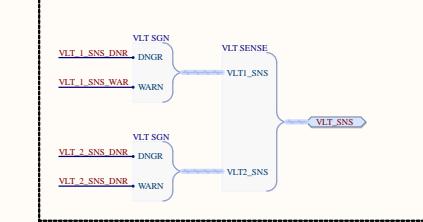
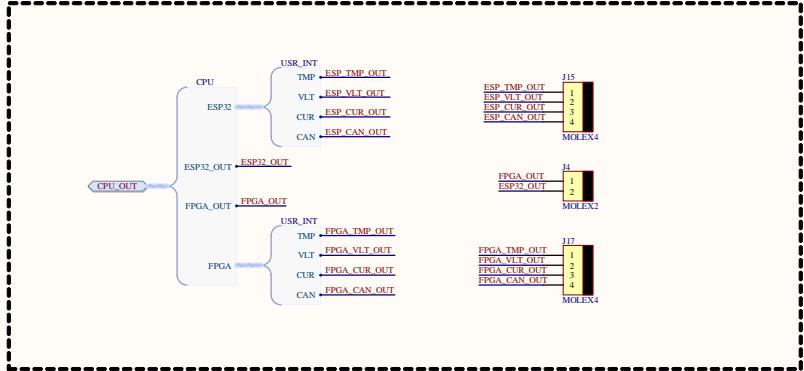
### Input Power



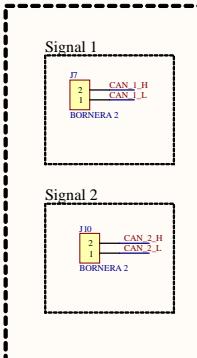
### Output Signals



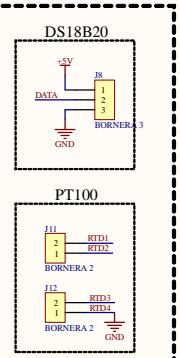
### User Interface Output



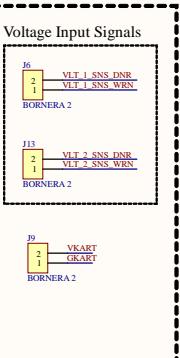
### Bus CAN



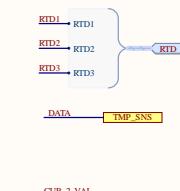
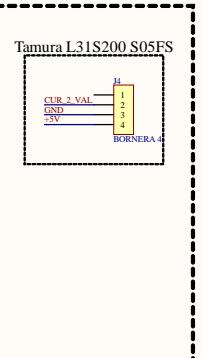
### Temperature Sensors



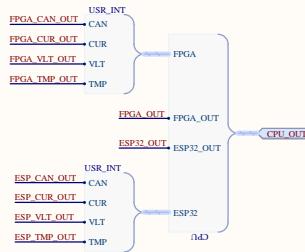
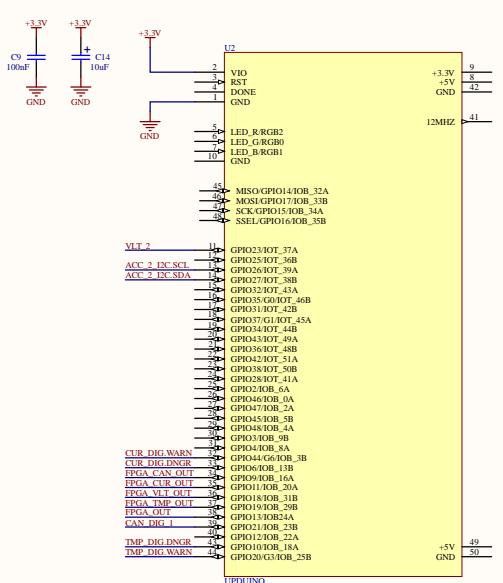
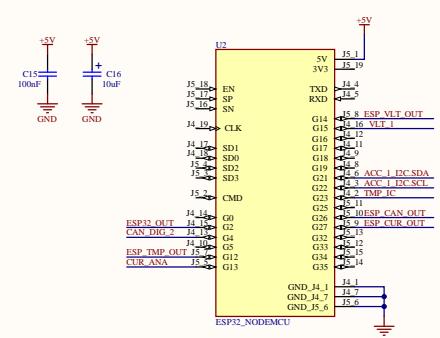
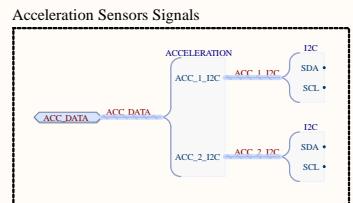
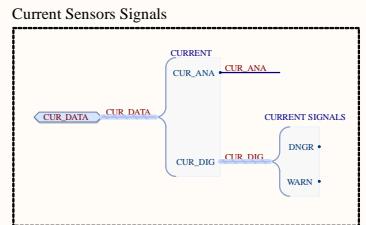
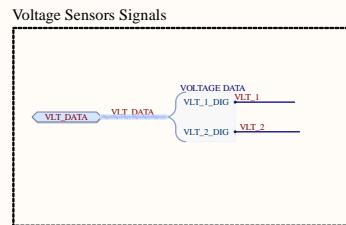
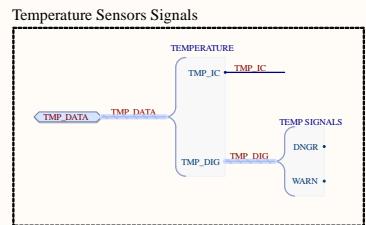
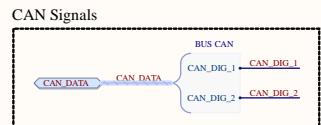
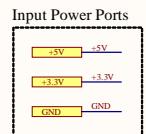
### Voltage Sensors



### Current Sensors



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File: C:\Users\Connectors.SchDoc		Drawn By:

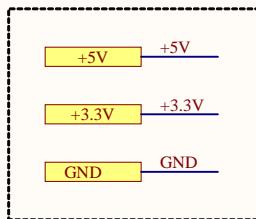


Size A2	FCSM No.	DWG No.
Scale		Sheet

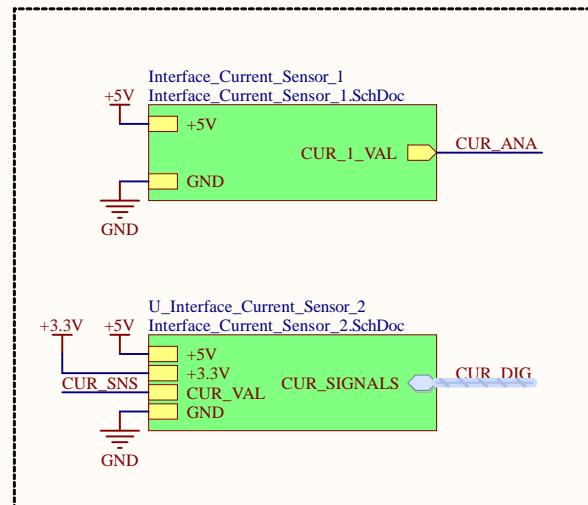
# Current Sensing Module

A

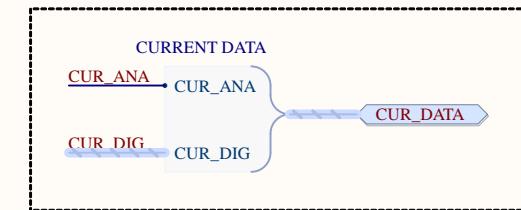
**Input Power Ports**



**Current Sensors Interfaces**

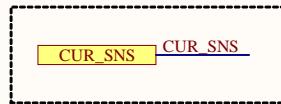


**Data Output Signals**



B

**Input Signal**



A

B

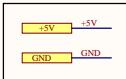
C

D

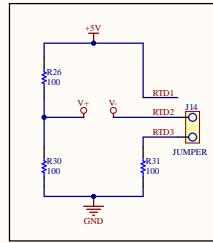
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## PT100 Interface

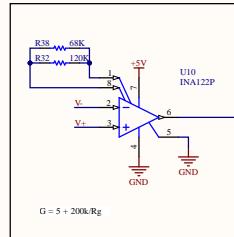
Input Power Ports



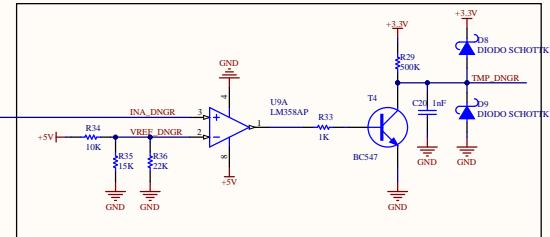
Wheatstone Bridge



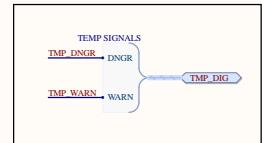
Instrumentation Amplifier



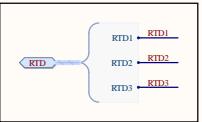
Comparator: DANGER (Max 120Ω)



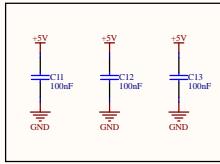
Output Signals



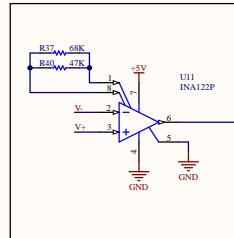
Sensor Signals RTD



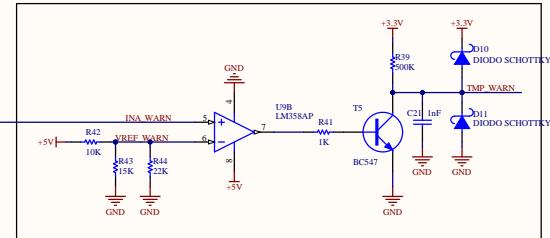
Capacitor Bypass



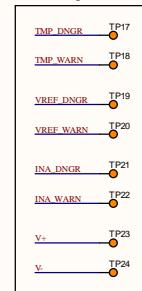
Instrumentation Amplifier



Comparator: Warning (Max 90Ω)



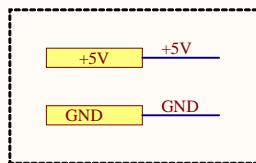
Testpoints



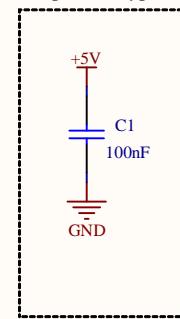
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Date: 7/01/2024		Sheet of
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# Accelerometer Interface

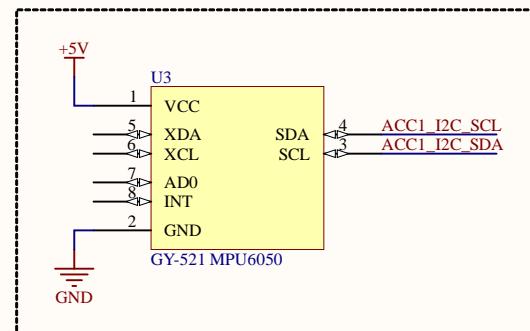
**Input Power Ports**



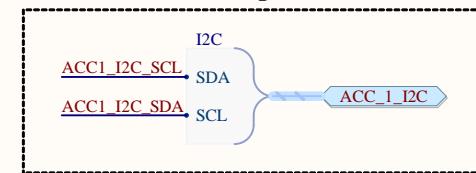
**Capacitor Bypass**



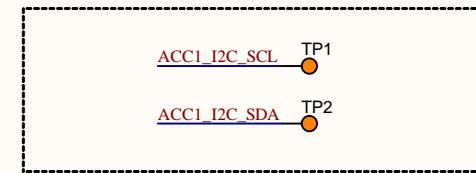
**GY-521 MPU6050 Dev Board**



**I2C Output Port**



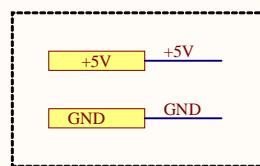
**Testpoints**



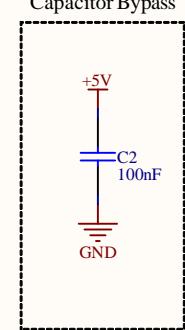
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# Accelerometer Interface

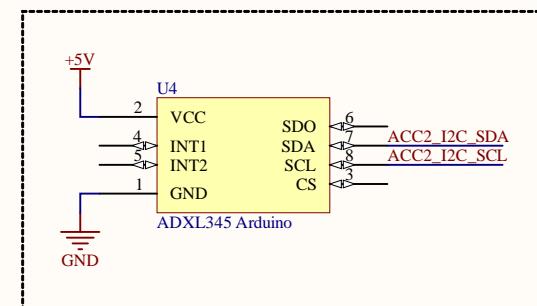
**Input Power Ports**



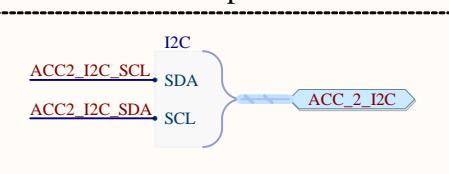
**Capacitor Bypass**



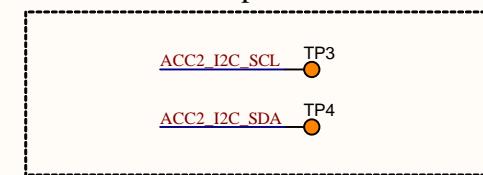
**ADXL345 Dev Board**



**I2C Output Port**



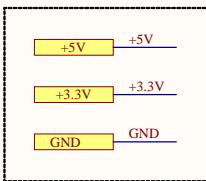
**Testpoints**



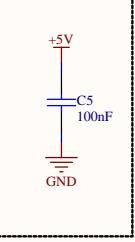
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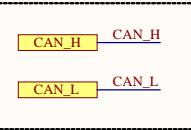
**Input Power Ports**



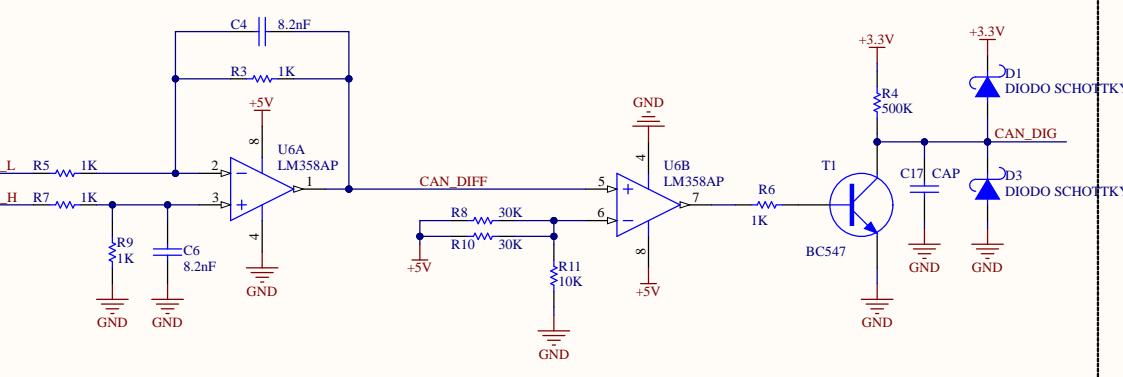
**Capacitor Bypass**



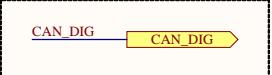
**CAN Signals**



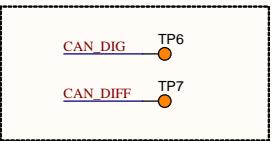
**Schmitt Trigger**



**Output Signal**



**Testpoints**



Title

Size  
Legal

Number

Revision

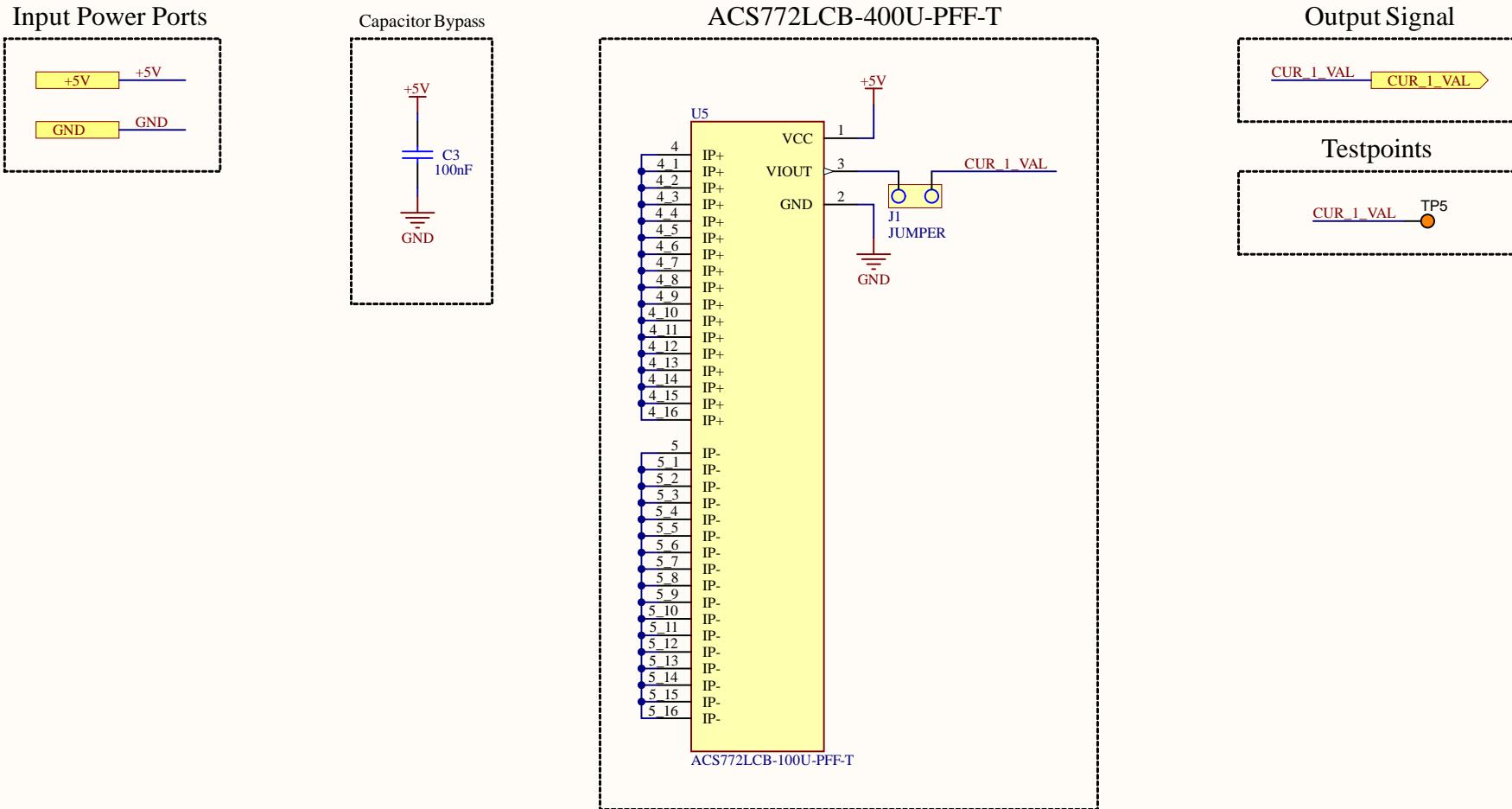
Date: 7/01/2024

Sheet of

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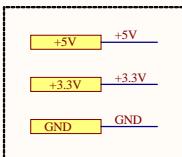
## Current Sensor Interface



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File:	C:\Users\...\Interface_Current_Sensor_1.sldprt	Download By:

# Current Sensor Interface

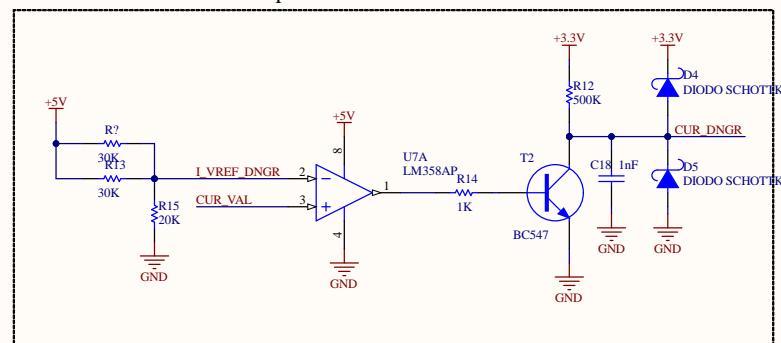
A  
Input Power Ports



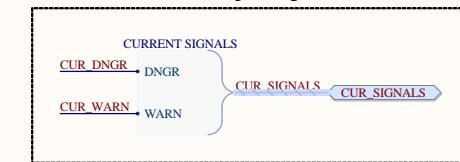
B  
Input Signal



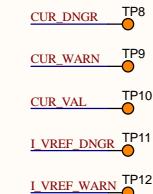
C  
Comparator: DANGER (Max 160A)



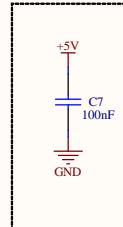
D  
Output Signal



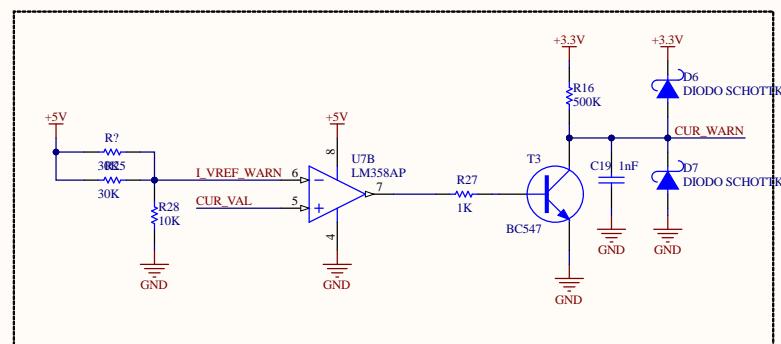
E  
Testpoints



F  
Capacitor Bypass



G  
Comparator: WARNING (Max 100A)



H  
Title

I  
Size

J  
Number

K  
Revision

L  
Date:

M  
File:

N  
Sheet of

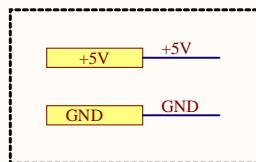
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C:\Users\...\Interface\_Current\_Sensor\_2

# DS18B20 Interface

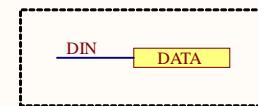
A

A

Input Power Ports



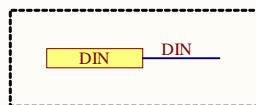
Output Signal



B

B

Input Signal



C

C

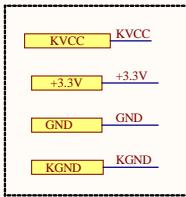
D

D

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# Voltage Sensor Interface

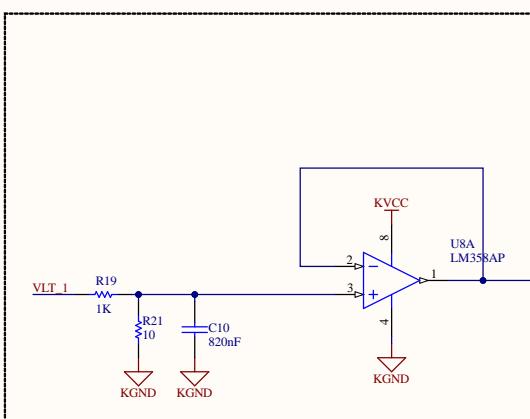
## A Input Power Ports



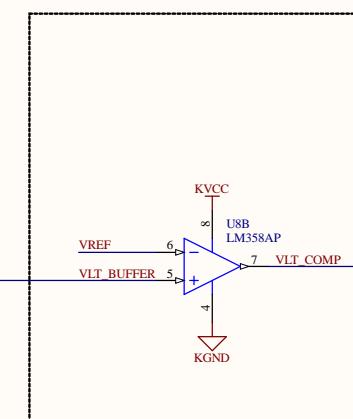
## A Output Signal



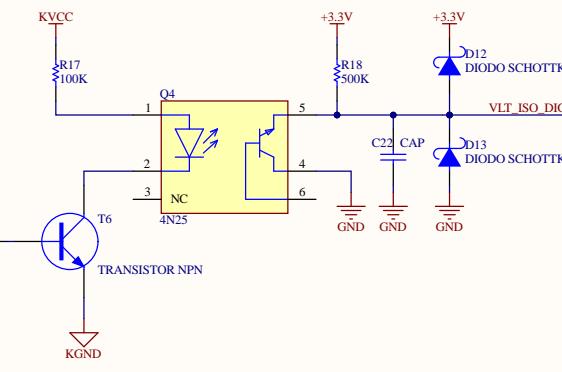
## Buffer Stage



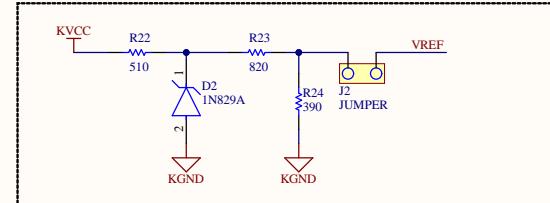
## Comparator Stage



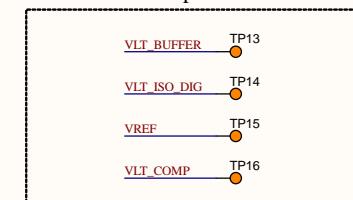
## Isolation Stage



## B Voltage Reference



## C Testpoints



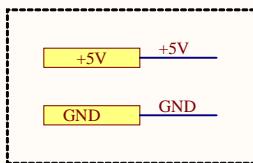
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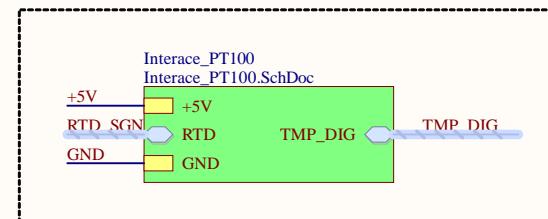
# Temperature Sensing Module

A

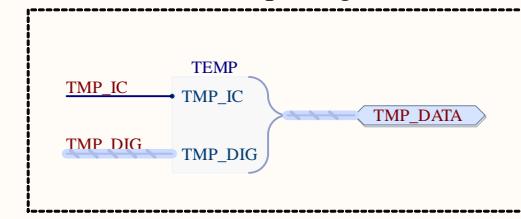
**Input Power Ports**



**PT100 Interface**

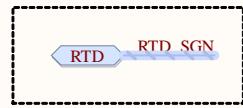


**Data Output Signals**

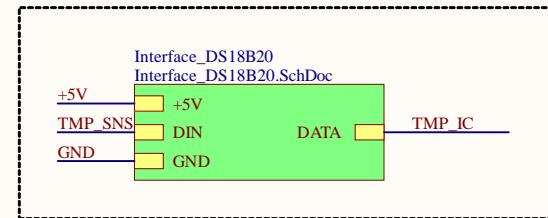


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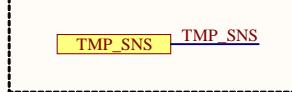
**Sensor Signals RTD**



**DS18B20 Interface**



**Sensor Signals IC**



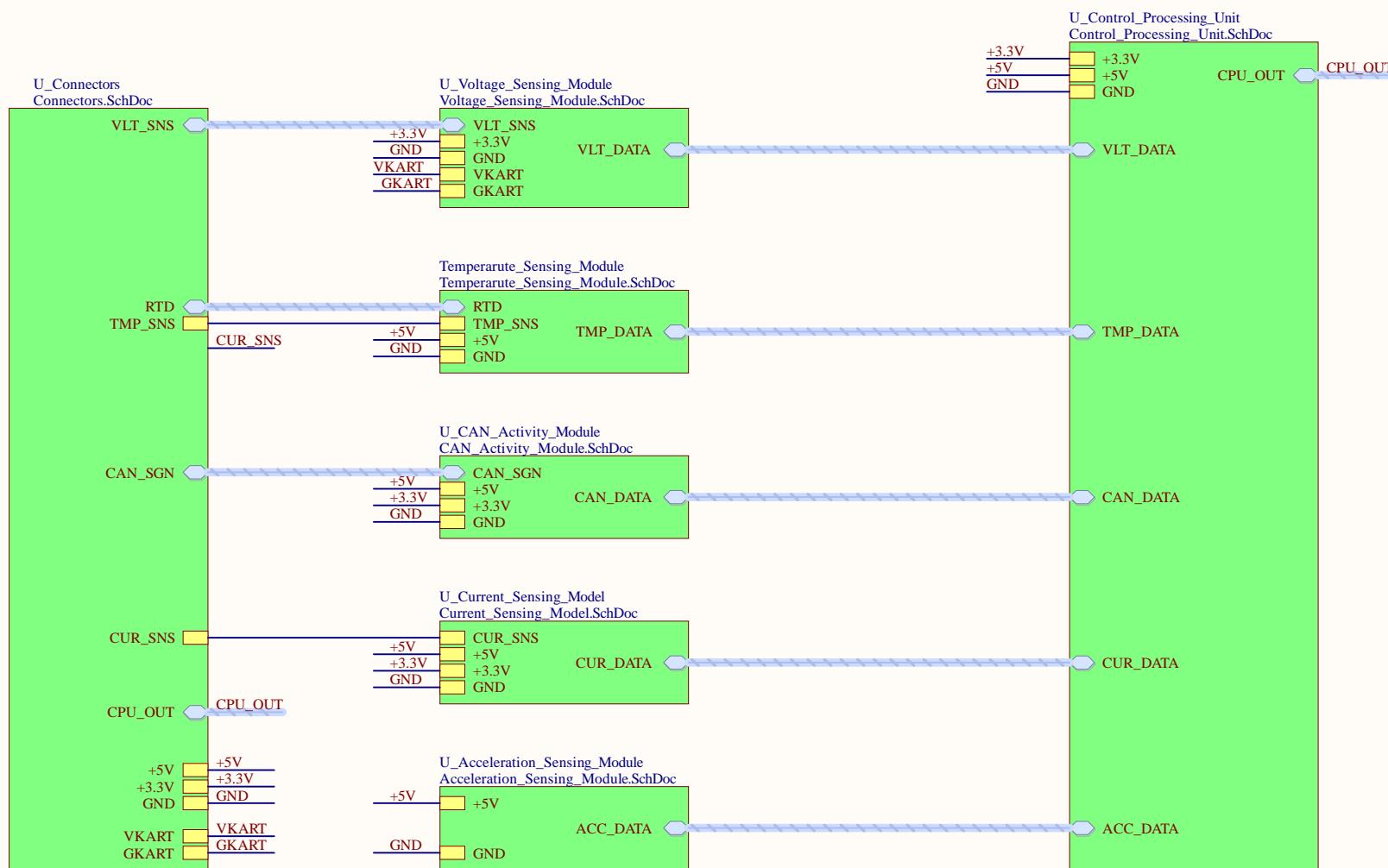
A

B

C

D

Title		
Size	Number	Revision
A4		
Date: 7/01/2024	Sheet of	
File: C:\Users\..\Temperarute_Sensing_Module.SchDocBy:		



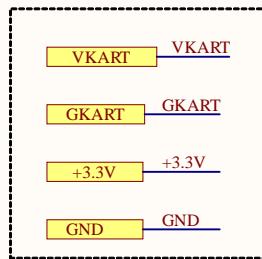
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1 2 3 4

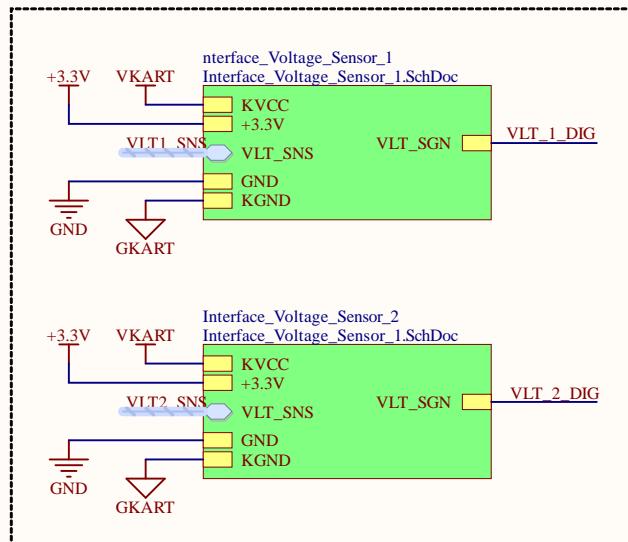
1 2 3 4

# Voltage Sensing Module

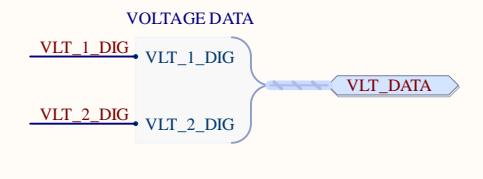
**Input Power Ports**



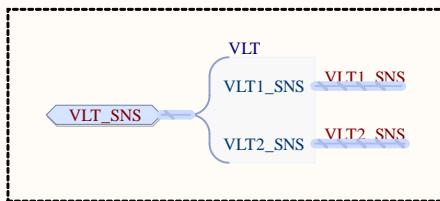
**Voltage Sensors Interfaces**



**Data Output Signals**



**Sensor Signals RTD**



Title		
Size	Number	Revision
A4		
Date: 7/01/2024	Sheet of	
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Designator	Quantity	Description	Value	Footprint	PartNumber	Digi-Key_Part_Number
C3, C7, C10, C11, C13, C17, C20, C22, C25, C28	13			CAP200		
C4	2			CAP100RP		
C5, C9, C21, C23	4			CAP200		
C12, C15, C16, C19	4			CAP200		
C14, C18, C24, C27	4			CAP200		
C26, C29	2			CAP200		
D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D16, D17	16			DO41		
D15, D18	2	Zener Diode, 6.2V/V(Z) 4.84% 0.5W, Silicon, DO-204AA		FP-DO-35-MFG		
DZ1, DZ2	2			DO41		
J1, J2, J4	3			MOLEX2		
J3, J5	2			MOLEX4		
J6, J7, J10, J11, J12, J13, J14	7			BORNERA2		
J8	1			BORNERA3		
J9	1			BORNERA4		
J15, J16, J17, J18	4			JUMPER2		
Q1, Q2	2			TO-220 V		
Q3, Q4	2	VISHAY 4N25 Transistor Output Optocoupler, 1 Channel, DIP, 6 Pins, 60mA, 5kV, 20%		FP-4N25-MFG		
R1, R2	2	MOS		RES400		
R3, R4	2			RES400		
R5	1			RES400		
R6, R14, R21, R20, R23, R12, R47, R50	8			RES400		
R7, R11, R19	3			RES400		
R7, R12, R20, R21, R23, R24, R25, R26, R27, R28, R30, R31, R46, R49, R50, R57	18	1%		RES400		
R8, R17, R23, R27, R45	5			RES400		
R9, R18	2	15K		RES400		
R10, R19	2	22K		RES400		
R25	1			RES400		
R26, R27, R24, R28	8	30K		RES400		
R29, R13, R14, R20				RES400		
R41	1	20K		RES400		
R46, R54	2			RES400		
R50, R58	2	10		RES400		
R54, R59	2	510		RES400		
R52, R60	2	820		RES400		
R53, R57	2			RES400		
T1, T2, T4, T5, T6	6			TO92		
T7, T8	2			TO92		
U1	1	NodeMCU is an open source IoT platform. ESP32 is a series of low cost, low power system-on-chip (SoC) microcontrollers with integrated Wi-Fi & dual-mode Bluetooth.		MODULE_ESP32_NODEMCU		
U2	1	Lattice UltraPlus ICE40UP5K FPGA with 5.3K LUTs, 1Mb SRAM, 120kb DRAM, 8 Multipliers		UPDUINO		
U3	2	Instrumentation Amplifier, 1 Func, 250uV Offset Max, 0.12MHz Band Width, PDIP8		P0008A		
U4, U5, U6, U8, U11, U12	6	Dual Operational Amplifier, 3 to 32V, 0 to 70 degC, 8-Pin PDIP (P), Pb-Free (RoHS), Tube		P0008A		
U3	1	3-Axis Accelerometer Gyroscope Module 6 DOF 6-Axis Acceleration Sensor Gyroscope Sensor Module 16 Bit AD Converter Data Output IIC for Arduino		GY-521 MPU6050		
U7	1	3-axis accelerometer with high resolution (13-bit) measurement at up to ±16g. Digital output data is formatted as 16-bit two's complement and is accessible through SPI or I2C digital interface.		GY-521 MPU6050		
U10	1	Current Sensor 100A 1 Channel Hall Effect Unidirectional 5-CB Formed Leads, PFF		XDOR_AC5772LCB-100UPFF-T		

