
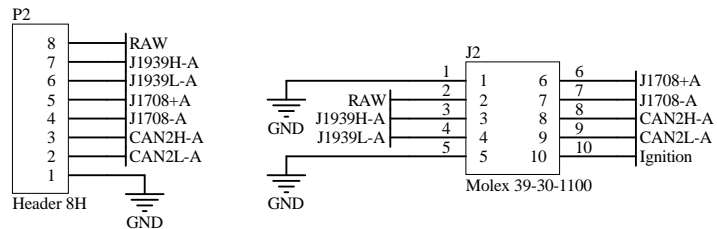
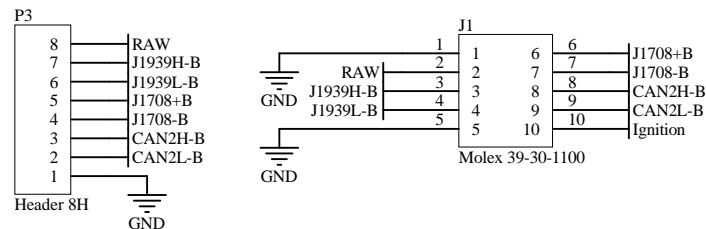




Title <b><i>Beaglebone Black Truck Cape - MITM</i></b>			Dr. Jeremy Daily Mechanical Engineering The University of Tulsa 800 S. Tucker Dr Tulsa, OK 74104	 THE UNIVERSITY OF TULSA
Size: Letter	Number: Headers, J1708 CAN, Power	Revision: 3		
Date: 1/28/2019	Time: 7:39:30 AM	Sheet 1 of 2		
File: C:\Users\jeremy-daily\OneDrive - University of Tulsa\Electronics\Truck Cape\TruckCape BeagleBone Headers v3 - MITM.SchDoc				



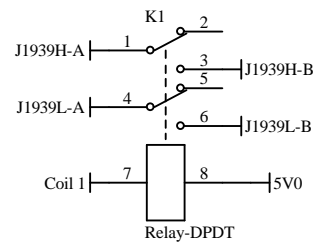
Connector Group A



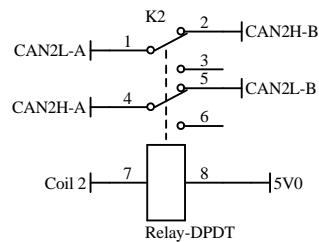
Connector Group B

## 9-Pin connector Interface (Use PG11 Cordgrip)

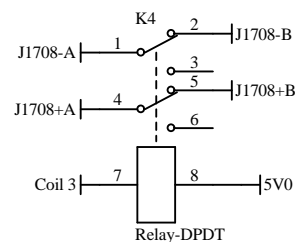
## Man In The Middle Relays



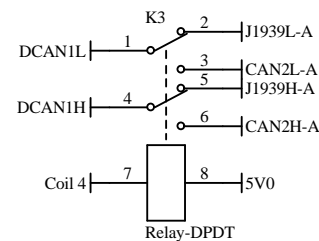
Default has J1939A and J1939B Disconnected



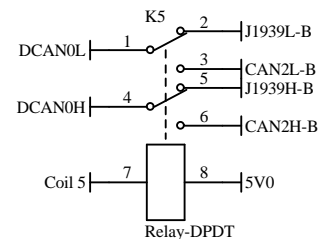
Default has second CAN channel passing through



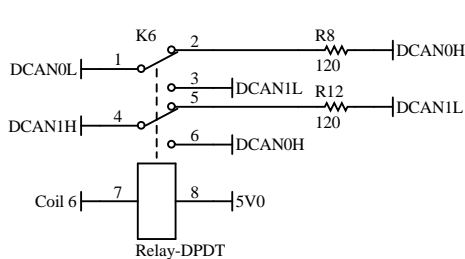
Default has J1708 passing through



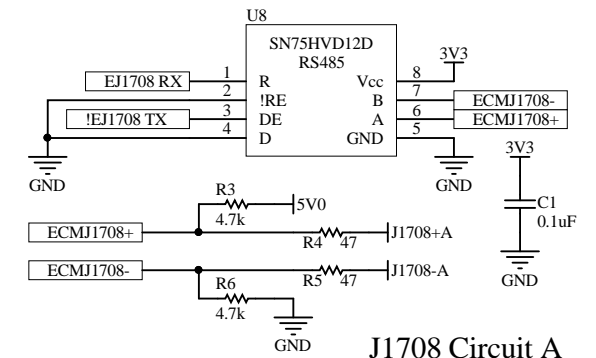
Default has A side J1939 to DCAN1



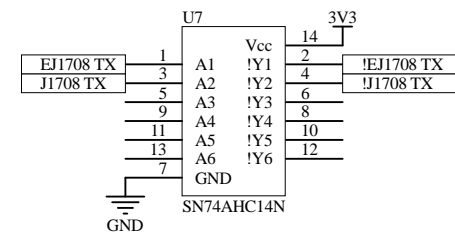
Default has B side J1939 to DCAN0



Default has terminating resistors connected



J1708 Circuit A



J1708 Circuit B

Title **Beaglebone Black Truck Cape - MITM**

Size: Letter

Number: J1708 and Switching Relays

Revision: 3

Date: 1/28/2019

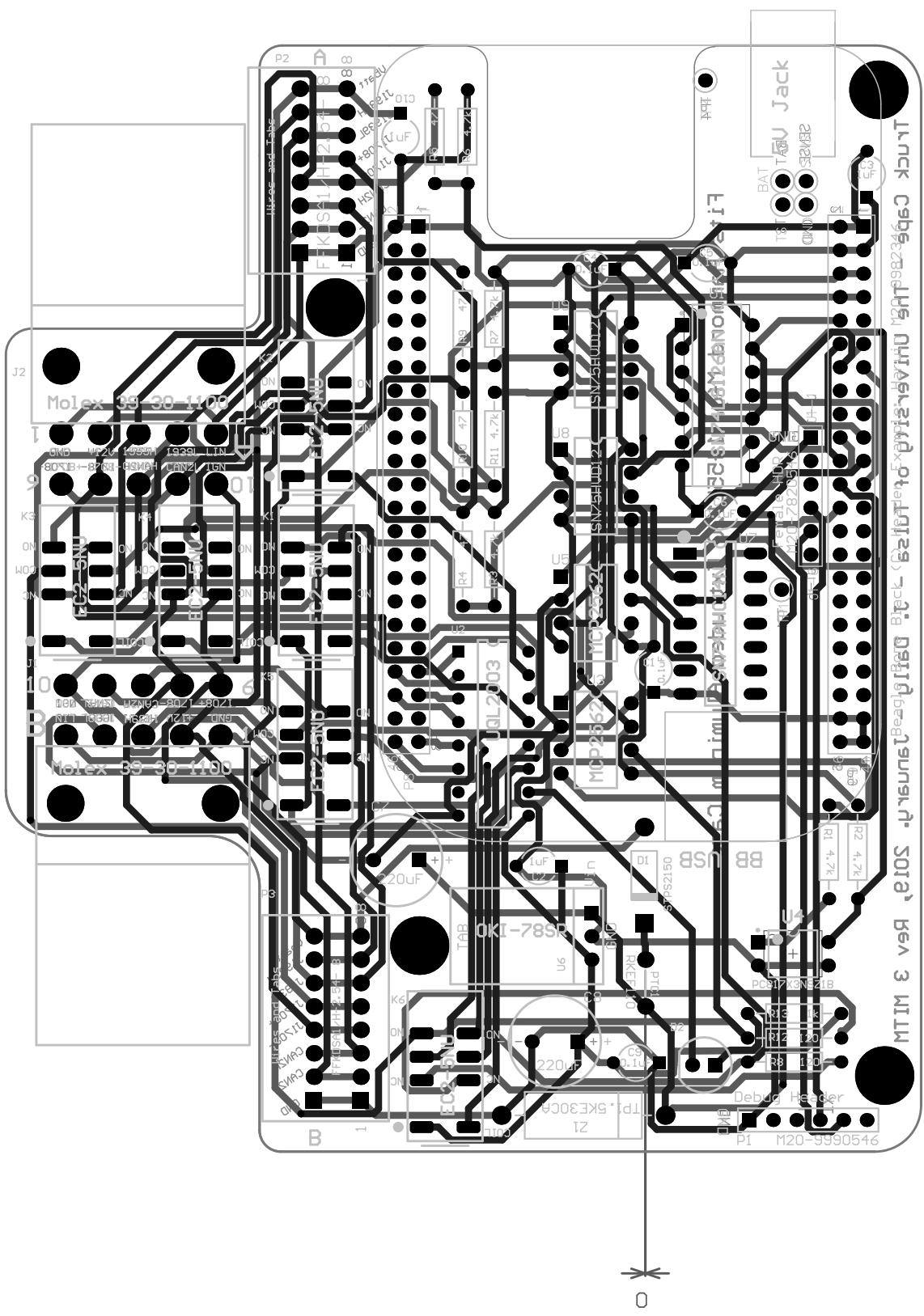
Time: 7:39:31 AM

Sheet 2 of 2

File: C:\Users\jeremy-daily\OneDrive - University of Tulsa\Electronics\Truck Cape\TruckCape J1708 and Relays v3 - MITM.SchDoc

Dr. Jeremy Daily  
Mechanical Engineering  
The University of Tulsa  
800 S Tucker Dr  
Tulsa, OK 74104





Item #	Quantity	Designator	Comment	Footprint	Description	Manufacturer	PartNumber	Supplier 1	Supplier Part Number 1	Name Error:Alt
1	1	BeagleBoneBlack1	BeagleBoneBlack	Beagleboneblack	46 Positions Header, Breakaway Connector 0.100" (2.54mm) Through Hole Tin	Sullins Connector Solutions	PREC023DAAN-RC	Digi-Key	<a href="#">S2012EC-23-ND</a>	
2	5	C1, C4, C5, C6, C9	0.1uF	CAPR5-4X5	CAP CER 0.1UF 100V X7R RADIAL	Vishay BC Components	K104K20X7RH53H5	Digi-Key	<a href="#">BC5139-ND</a>	
3	3	C2, C3, C10	1uF	CAPR5-4X5	CAP CER 1UF 100V X7R RADIAL	Murata Electronics North America	RDER72A105K2M1H03A	Digi-Key	<a href="#">490-9198-1-ND</a>	
4	2	C7, C8	220uF	Elec. Cap 5 x 10mm	220uF 50V Aluminum Electrolytic Capacitors Radial, Can 175 mOhm @ 10kHz 5000 Hrs @ 105°C	EPCOS (TDK)	B41858C6227M000	Digi-Key	<a href="#">495-6000-ND</a>	
5	1	D1	STPS2150	DO-41	Diode Schottky 150V 2A Through Hole DO-15	STMicroelectronics	STPS2150	Digi-Key	<a href="#">497-3213-1-ND</a>	
6	1	D2	LED	LED - 5mm Through Hole	Light Emmitting Diode					
7	2	J1, J2	Molex 39-30-1100	10 pos Mini-Fit Jr. R/A Header	10 Positions Header Connector 0.165" (4.20mm) Through Hole, Right Angle Tin	Molex	39-30-1100	Digi-Key	<a href="#">WM1355-ND</a>	
8	6	K1, K2, K3, K4, K5, K6	Relay-DPDT	RELAY - EC2	Dual-Pole Dual-Throw Relay					
9	1	P1	Use this part in J1-1 to J1-6	HDR1X6	CONN HEADER FEMALE 6POS .1" GOLD	Sullins Connector Solutions	PPPC061LFBN-RC	Digi-Key	<a href="#">S7039-ND</a>	
10	2	P2, P3	Header 8H	8 CKT Spring Header	Header, 8-Pin, Right Angle					
11	1	PTC1	RKEF110	PTC	Polymeric PTC Resettable Fuse 60V 1.1A 1h Through Hole Radial, Disc	Littelfuse Inc.	RKEF110	Digi-Key	<a href="#">RKEF110HF-ND</a>	
12	7	R1, R2, R3, R6, R7, R11, R13	4.7k	Axial-0.4	RES SMD 4.7K OHM 1% 1/10W 0603, Resistor	Yageo, [NoParam]	CFR-25JB-52-4K7, [NoParam]	Digi-Key, [NoParam]	<a href="#">4.7KQBK-ND, [NoParam]</a>	
13	4	R4, R5, R9, R10	47	Axial-0.4	47 Ohms ±5% 0.25W, 1/4W Through Hole Resistor Axial Carbon Film	Yageo	CFR-25JB-52-47R	Digi-Key	<a href="#">47QBK-ND</a>	
14	2	R8, R12	120	Axial-0.4	47 Ohms ±5% 0.25W, 1/4W Through Hole Resistor Axial Carbon Film	Yageo	CFR-25JB-52-47R	Digi-Key	<a href="#">47QBK-ND</a>	
15	1	U1	SN74LS126AN	N14A	Quad 3-State Buffer	Texas Instruments	SN74LS126AN	Digi-Key	<a href="#">296-3643-5-ND</a>	
16	1	U2	UQL2003	DIP16	High voltage, high current Darlington arrays each containing seven open collector Darlington pairs with common emitters.					
17	2	U3, U5	MCP2562	DIP8	1/1 Transceiver Half CAN 8-PDIP	Microchip Technology	MCP2562-E/P	Digi-Key	<a href="#">MCP2562-E/P-ND</a>	
18	1	U4	PC817X3NSZ1B	DIP-4	4-Pin Phototransistor Optocoupler					
19	1	U6	OKI-78SR	OKI-78SR	5V DC/DC Converter (7805 replacement)	Murata Power Solutions Inc.	OKI-78SR-5/1.5-W36H-C	Digi-Key	<a href="#">811-2692-ND</a>	
20	1	U7	SN74AHC14N	DIP14	Inverter IC 6 Channel Schmitt Trigger 14-PDIP	Texas Instruments	SN74AHC14N	Digi-Key	<a href="#">296-4550-5-ND</a>	
21	2	U8, U9	SN75HVD12	DIP8	IC 3.3V DIFF TXRX 8-SOIC	Texas Instruments	SN75HVD12P	Digi-Key	<a href="#">SN75HVD12P</a>	
22	1	Z1	TP1.5KE30CA	DIODE-0.7	TVS DIODE 25.6V 41.4V DO201	Littelfuse Inc.	TP1.5KE30CA	Digi-Key	<a href="#">F7610CT-ND</a>	