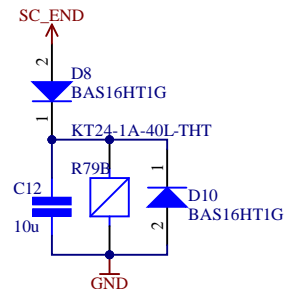




⚠ Precharge detection logic states:

PC open: PCHRG\_ACT = GND  
PC closed: PCHRG\_ACT = 3.3V



Peak current at 556V (Limited by PTCs' R25):  $556V / (2 * 500\Omega) = 0.55A$   
Tolerance of PTCEL = 30% -> Peakcurrent at least resistance:  $0.55 / 0.7 = 0.79A$

MOSFET cont. current: 1.8A at 100°C die-temp  
MOSFET pulsed current: 5A

^ This is the same calculation as for the discharge as both have to absorb the same energy:

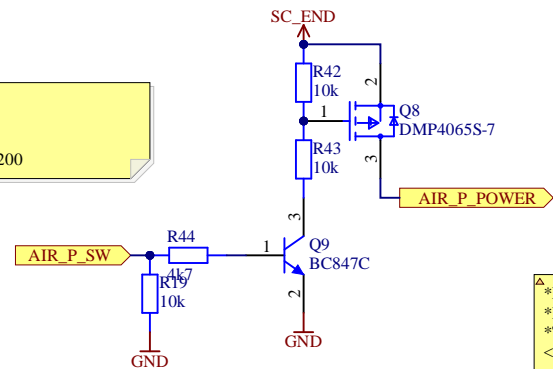
$$1/2 * (550V)^2 * 2 * 200\mu F = 62J$$

(DTI Inverter has 200uF DC bus, two are installed; other capacitances in the vehicle are negligible)

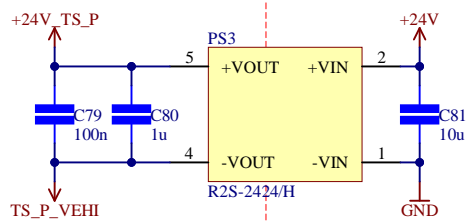
Two PCTEL are going to be used in series, so each absorb's half the bus energy (31J)  
According to datasheet table "CONSECUTIVE ENERGY / LOAD-DUMPS AT DIFFERENT TAMB FOR PCTEL17":  
3.5 consecutive dumps at 85°C, 31J

This ensures three consecutive dumps in the 5 minutes required for scrutineering.  
PCTEL13 could also be used, but the required space for PCTEL17 isn't much greater and the cost is negligible.

Alternative to PTCEL: TDK EPCOS B59219J0130A020  
(Other footprint)



- \*Monitor SC
- \*Precharge if SC closed
- \*Turn on AIR if SC closed AND voltage difference over AIR is  $< 10\%$  of max TS voltage



Car Number: 22

Title: <a href="#">precharge</a>		 <b>BALTIC RACING</b> ENGINEERED FOR SUCCESS
Projekt: <a href="#">tsac-distribution.PrlPcb</a>	Revision: <a href="#">xx.xx</a>	
Author: <a href="#">Leon Loeser</a>	Baltic Racing	
Checked by: <a href="#">Nico Bieberlich</a>	Zur Schwedenschanze 15	
Rules: <a href="#">EV5.7</a>	Haus 18	
Sheet <a href="#">6</a> of <a href="#">9</a>	Size: A4	18435 Stralsund
Date: <a href="#">31.05.2023</a>		Time: <a href="#">17:50:15</a>

