TI CAN Transceivers

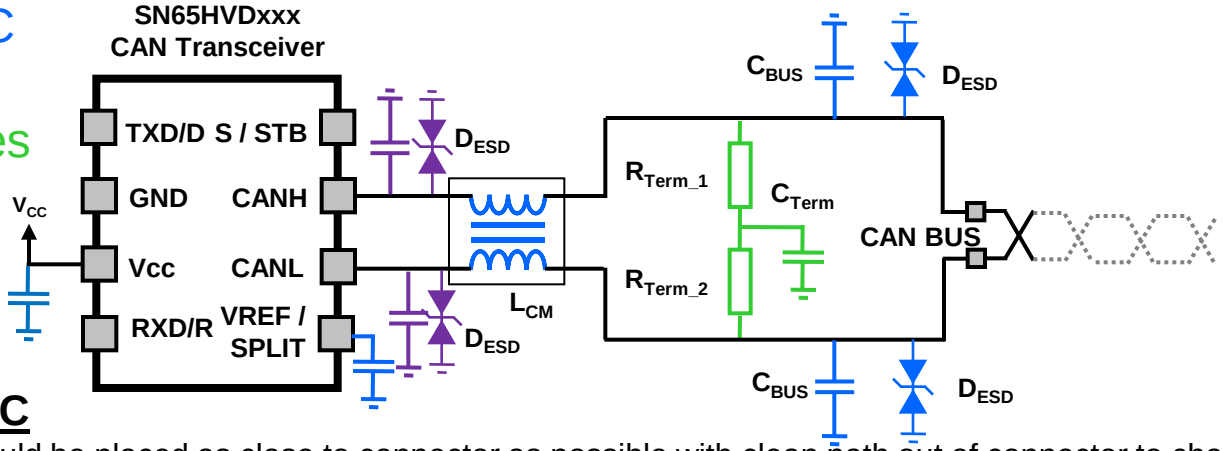
PCB Design Options

June 11, 2013

Protection, Filtering and Termination

Optional for EMC

Terminating Nodes



Optional For EMC

• D_{ESD}: TVS diodes should be placed as close to connector as possible with clean path out of connector to chassis ground to avoid ESD current and voltage entering PCB. Clamping voltage should be as low as possible to protect transceiver.

• C_{BUS}: optional bus capacitor to aid TVS diode and provide filtering if necessary.

•LCM: Common mode choke. Option for filtering if necessary. Pads should be arranged so a zero ohm resistor can be populated if the CM choke is not needed.

• V_{CC} bypass cap: should be in the 4.7-100nF to ensure proper energy reserves at the transceiver supply pin for the in rush current of the recessive to dominant state.

• VREF/SPLIT: bypass cap to GND if it is un-used will stabilize it if is not used in the application.

BUS TERMINATION

•If the bus is terminated in modules the footprints should be on the PCB. Either for 120 ohm single termination (only R_{TERM} between CANH/L) or split termination as shown here where each RTERM is 60 ohm and the C_{TERM} is between 4.7 and 100nF depending on the CM filter frequency desired. They should be rated for the possible power during system short circuits.

Optional for EMC

•Secondary TVS diode to clamp possible CM choke generated transients if the bus is shorted to battery / GND and another bus capacitor may be used to build a pi filter. These functions could be combined in a varistor.