1.0 I2C Validation

In revision 2 of the ADXL372 (as indicated by the REVID register), when the ADXL372 shares the I2C bus with other parts, it can seize control of the bus even when not being addressed, interrupting communication with the other parts. This happens when a data byte equal to the ADXL372's addressing byte is transmitted for any reason on the SDA bus (even if it doesn't follow an I2C start condition). This can be replicated on the bench with the following experiment

- 2 ADXL372 are connected to the same I2C bus. One is connected such that the device address is 0x1D, the other is connected such that the device address is 0x53.
- When addressing the part that has address 0x53, various operations are done containing the hex codes 0x3A and 0x3B. These are equivalent to a device address of 0x1D (the address of the other part on the bus) shifted left, with either a 1 or 0 in the LSB. When addressing the part that has address 0x1D, various operations are done containing the hex codes 0xA6 and 0xA7. These are equivalent to a device address of 0x53 shifted left, with either a 1 or 0 in the LSB.

Revision 3 no longer seizes control of the bus when not being addressed. For validation, the same tests were performed on several Rev 2 and Rev 3 parts, and the results are shown and compared below.

Table 1: I2C communication bench testing results and comparison

Action	**Rev 2 Result**	**Rev 3 Result**
When addressing part with address 0x53		
Write data to register 3A	Pass for all data	Pass for all data
Write data to register 3B	Fail for all data	Pass for all data
Write 0x3A to any register	Pass for all registers	Pass for all registers
Write 0x3B to any register	Pass for all registers	Pass for all registers
Read data from register 3A (that was written beforehand while part was only part on bus)	Pass for all register values except 3A and 3B	Pass for all register values
Read data from register 3B (that was written beforehand while part was only part on bus)	Pass for all register values except 3A and 3B	Pass for all register values
Read any register that contains value 0x3A	Fail for all registers	Pass for all registers
Read any register that contains value 0x3B	Fail for all registers	Pass for all registers
When addressing part with address 0x1D		
Write 0xA6 to any register	Pass for all registers	Pass for all registers
Write 0xA7 to any register	Pass for all registers	Pass for all registers
Read any register that contains value 0xA6	Fail for all registers	Pass for all registers
Read any register that contains value 0xA7	Fail for all registers	Pass for all registers