During some initial testing with the TPS65987D we found what appears to be an error in the datasheet.

According to the datasheet the I2C address for I2C1, and I2C2 are defined as follows:

Table 2. I²C Default Unique Address I2C1

Default I²C Unique Address							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	0	0	I2C_ADDR_DECODE[2:0]			R/W
Note 1: Any bit is maskable for each port independently providing firmware override of the I²C address.							

For the I2C2 interface, the unique I²C address is a fixed value as shown in Table 3.

Table 3. I²C Default Unique Address I2C2

Default I²C Unique Address							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	1	1	0	0	0	R/W
Note 1: Any bit is maskable for each port independently, providing firmware override of the I²C address.							

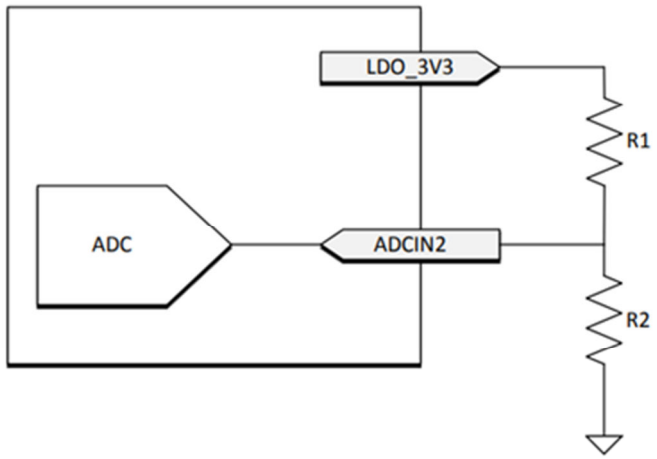

Figure 32. I²C Address Divider

Table 4 lists the external divider needed to set bits [3:1] of the I²C Unique Address.

Table 4. I²C Address Selection

DIV = R2/(R1+R2)(1)		I²C UNIQUE ADDRESS [3:1]
DIV_min	DIV_max	I2C_ADDR_DECODE
Short ADCIN2 to GND		000b
0.20	0.38	001b
0.40	0.58	010b
Short ADCIN2 to LDO_3V3		011b

Based on our testing though, I2C2 is behaving as I2C1 from and address perspective.

If "ADCIN2" is 3.3V I2C2 ACK's at 0x23,
If "ADCIN2" is 0.0V I2C2 ACK's at 0x20.

This is what I would expect if we were interfacing to I2C1.

But since we are connected to I2C2. ADCIN2 should have no effect on I2C2 address, which based on the table should be fixed at 0x38.

Let me know what you think, and if I am missing something.