ANALOG DEVICES

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ADXL362
Ambient Pass Elimination

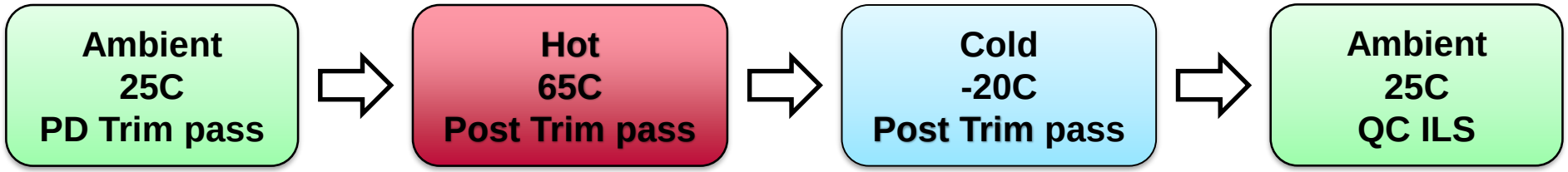
Change Summary:

Product	Overview	Test Flow Change	Date
ADXL362	▪ Ultralow power / Low noise ▪ 3-axis digital output MEMS accelerometer	▪ First Test Pass Elimination – Ambient 25C Trim Pass. ▪ Transfer trim sequence from Ambient (25C) to Hot (65C)	

Proposed Test Flow Changes for ADXL362:

Change: Elimination of First Test Pass – Ambient (25C)

- **Current ADXL362 Test Flow:**



- **Proposed ADXL362 Test Flow:**

Supporting Data and Verification Outline

- Fuse Blow Profiling
  - Compare fuse trimming signal between those performed in ambient tests and hot tests
- Fuse Characterization
  - Sweep through combinations of supply and timing to check effect on trimming quality
- Sensitivity Trim Verification
  - Compare QC readings from ATE with bench readings to assess the sensitivity of the hot trim
- Parametric Comparison
  - Migrate ambient tests to hot set-up and assess parameters that are at risk for transfer
- Yield Validation
  - This is to verify the yield difference between the old and the new test flow

Fuse Blow Profiling

- Through this experiment ADI has ensured that the fuse blow trim sequence is unaffected with the change of temperature.

- Fuse blow profiles for both temperatures are comparable.

Fuse Blow Characterization

- This experiment detects the sensitivity of the trimming test with varying voltage and timings.

Supply	Period	Yield	Issues on fuse blow	Contact issue
4.2V	250ns	36/40	0	4
4.2V	300ns	39/40	0	1
4.2V	350ns	37/40	0	3
4.3V	250ns	37/40	0	3
4.3V	300ns	37/40	0	3
4.3V	350ns	37/40	0	3
4.4V	250ns	37/40	0	3
4.4V	300ns	36/40	0	4
4.4V	350ns	36/40	3	4

- Voltages and timing periods were combined around the 25C process parameters (4.2*V* and 300*ns*)

Voltage Timings	
4.2 V	250 ns
4.3 V	300 ns
4.4 V	350 ns

- Results show that the 4.4*V* & 350*ns* combination shows signs of failure.
- The ambient combination was therefore used for the hot trim parameters.

Sensitivity Trim Validation

This experiment validates the trim settings chosen by comparing the readings between those detected at ATE and those detected at bench for 25C and 65C trim parameters

- Three different test lots from three different fab lots were tested using the new test flow.
  - The X, Y, and Z sensitivity parameters were compared
- The delta in readings between 25C ATE and bench and 65C and bench were compared
- Data was in good agreement

Parametric CPK Comparison:

ADXL362 Parameters	New Hot PD Trim			Old Amb PD Trim			Difference Amb CPK - Hot CPK
	Cpl	Cpu	Cpk	Cpl	Cpu	Cpk	
Supply Current measure mode ultra low	3.649728	2.763241	2.763241	3.357	2.612	2.612	-0.15
Supply Current vdd wake-up mode ultra low	3.400257	2.59008	2.59008	2.563	4.093	2.563	-0.03
Supply Current vdd standby mode	2.693523	12.66088	2.693523	6.29	162.58	6.29	3.60
Resonant Frequency	7.204	4.58	4.58	3.63	3.315	3.315	-1.27
Offset x-axis 2gee	2.097321	2.644493	2.097321	0.628	1.081	0.628	-1.47
Offset y-axis 2gee	2.116656	2.558046	2.116656	1.715	2.285	1.715	-0.40
Offset z-axis 2gee	2.626407	3.770863	2.626407	2.861	4.104	2.861	0.23
Selftest delta x-axis 2gee	4.765582	5.692732	4.765582	5.277	7.075	5.277	0.51
Selftest delta y-axis 2gee	6.834223	6.135721	6.135721	7.595	5.761	5.761	-0.37
Selftest delta z-axis 2gee	8.221445	17.98992	8.221445	10.382	19.434	10.382	2.16
Internal clk frequency	0.867161	1.388963	0.867161	0.934	1.289	0.934	0.07
Gain X-channel 2gee	5.478753	8.009942	5.478753	5.203	8.764	5.203	-0.28
Gain Y-channel 2gee	6.654694	6.965406	6.654694	6.232	7.474	6.232	-0.42
Gain Z-channel 2gee	4.95458	8.759688	4.95458	3.525	8.644	3.525	-1.43
X sensitivity 2gee range	2.011429	2.192583	2.011429	2.359	2.702	2.359	0.35
Y sensitivity 2gee range	2.382133	2.620653	2.382133	2.529	2.859	2.529	0.15
Z sensitivity 2gee range	2.813254	2.778564	2.778564	3.155	1.642	1.642	-1.14

Yield Validation

- 3 test lots were used to compare the test yields, per test pass, of the old versus new flow.
  - No issues were found

Summary:

- ADI has demonstrated parametric trim at 65C, thus elimination the need for the 25C test pass
- This change do not reduce the parts test coverage and will not reduce in any reduction in quality or change to form, fit or function