

EEPROM for Automotive



EEPROM Memory for Automotive



- Objectives :
 - Confirm to be a **long term EEPROM quality supplier**
 - Show EEPROM as most **flexible** and **reliable** NVM for automotive
- How?
 - Quality programs to enable **0 defect**
 - Re-enforce technical **partnership** with our **customers**
 - Serve customer with **application specific memories**

1st Supplier for Automotive EEPROM

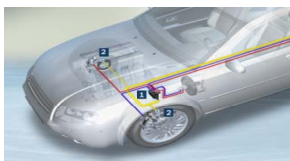


ST EEPROM in all automotive applications

- Global understanding of customer needs
- Product robustness across applications

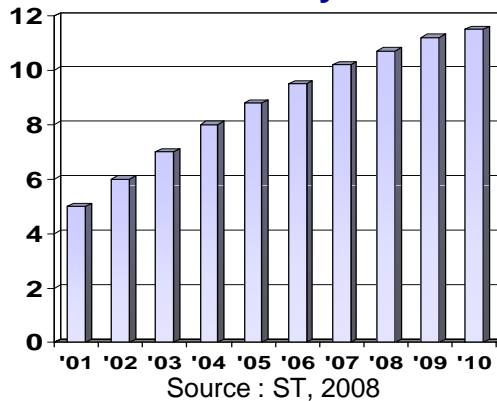


Power train



Chassis

WW market: Estimated Qty of EEPROM per Car



Audio/Navigation



Cluster/ Body



Safety

Competitive & innovative solutions

- Broad density range 1K to 1Mbit
- All standard families SPI, I2C, Microwire
- All Package, SO8N, TSSOP, MLP, bare die
- Broad temp range (-40°C to +150°C)

ST EEPROM in Automotive Applications



PARAMETER STORAGE: Traceability, identification, serial numbers, look-up table, manufacturing settings, user settings, error codes, ...



	Microwire® Bus	I ² C Bus	SPI Bus
Chassis (ABS, ESP, ESC)	1-16 Kbit		4-64 Kbit
Safety / AirBag	1-16 Kbit		8-256 Kbit
Powertrain (Engine Mgt / Transmission)	2-16 Kbit		4-512 Kbit
Car Audio / Navigation		1-512 Kbit	8-64 Kbit
Driver Information / Odometer	1-16 Kbit	1-16 Kbit	1-16 Kbit
Car Body & Comfort	1-16 Kbit		1-256 Kbit





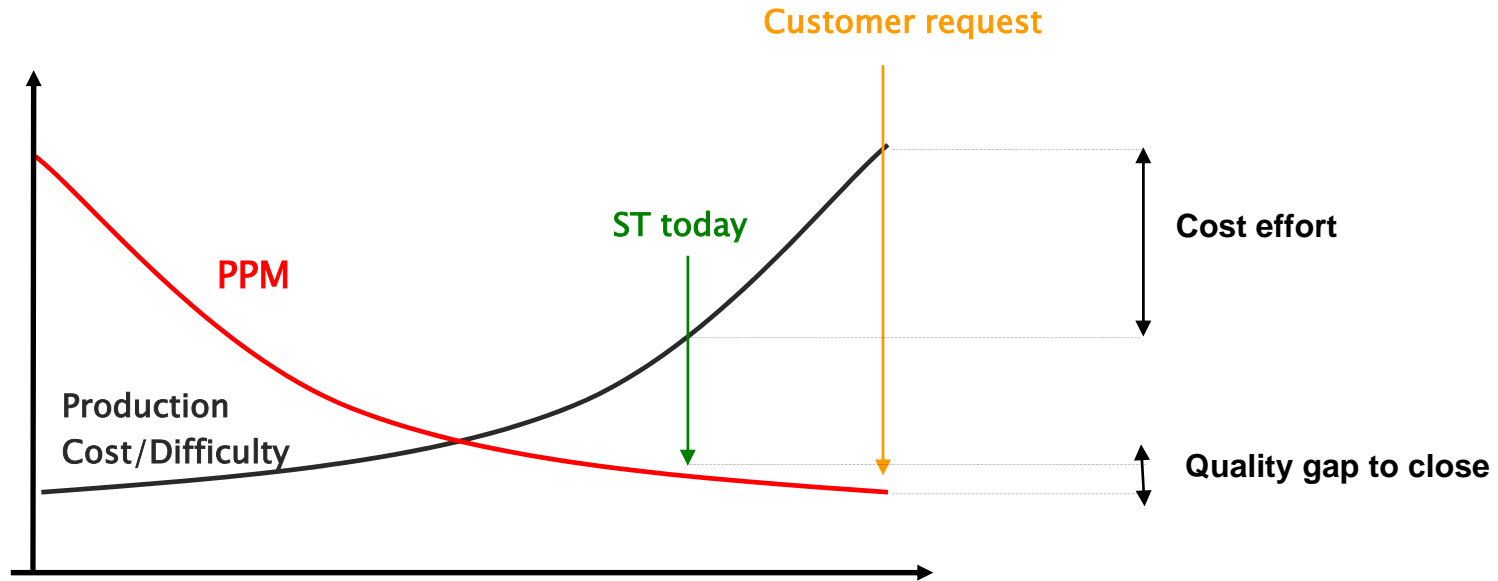
Customer requirements are translated into Automotive Strategy...

Automotive Grade meets customer expectations

Grade 3 EEPROM



- Automotive Electronics industry targets 0 defect
- ST offers Grade3 EEPROM



BUILT-IN INTRINSIC ROBUSTNESS

- Robust and Known Technology from mature Flash/Micro technology
- Robust Automotive Design for all (same die)
- High Volume Wafer Fab common to standard and automotive
- High Volume Assembly common to standard and automotive

ROBUST QUALIFICATION and VALIDATION

- AEC-Q100 compliant
- ST automotive qualification: intrinsic & extrinsic trials allow Early Failure to Wear-out coverage

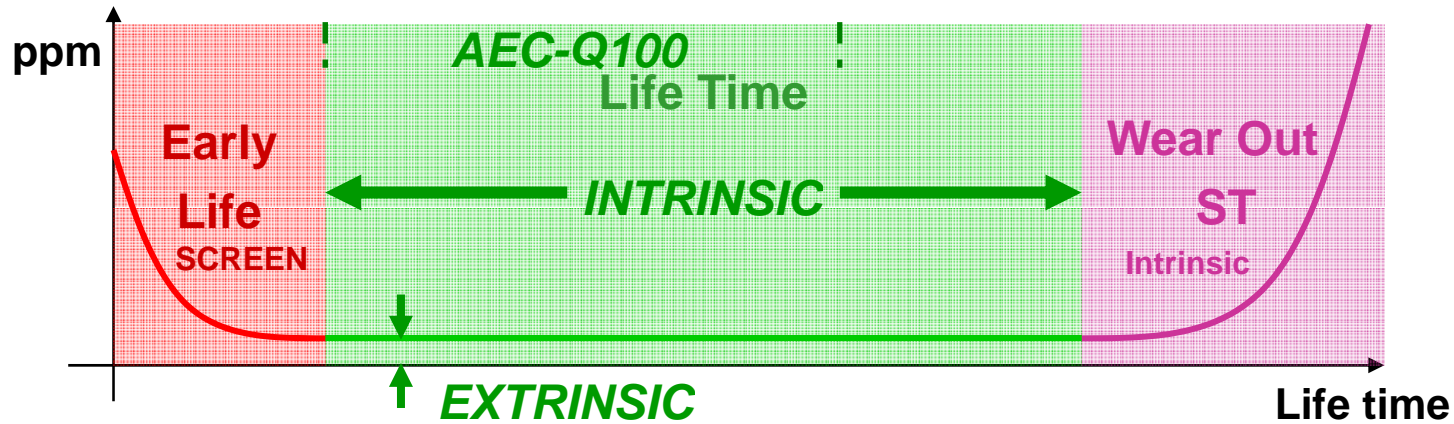
FOCUS ON EXTRINSIC DETECTION AND SCREEN

- Dedicated Automotive EWS test flow including Statistical prediction
- Dedicated Automotive Final Test flow.

ST Qualification Coverage



- AEC-Q100 guaranty product intrinsic Reliability (small sample size)
- AEC-Q100 explore only part of the Life Time
- AEC-Q100 does not explore Early failure and Wear Out



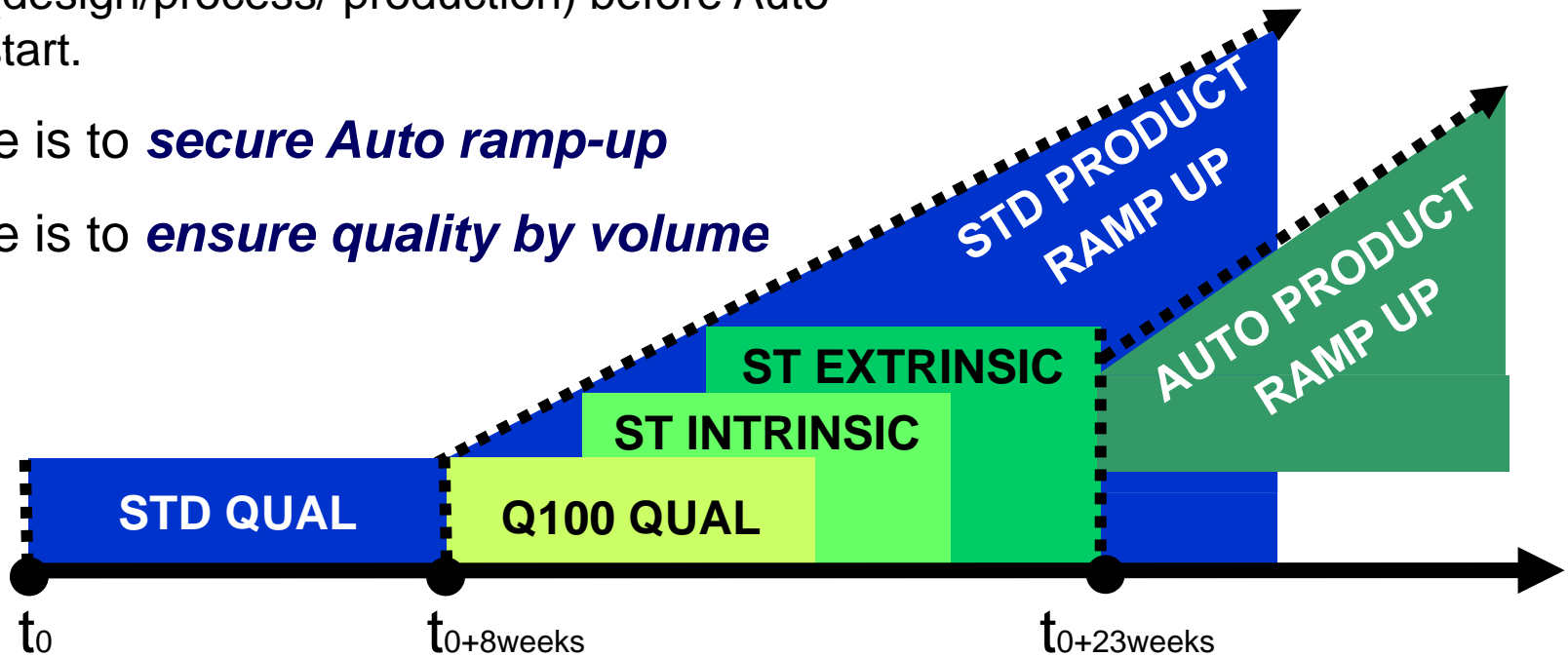
ST Automotive qualification covers Early failure, complete life time, Wear out and Extrinsic failures

Safe Ramp-up & Production



Automotive Qualification was designed to detect any marginality (design/process/ production) before Auto production start.

- Objective is to **secure Auto ramp-up**
- Objective is to **ensure quality by volume**

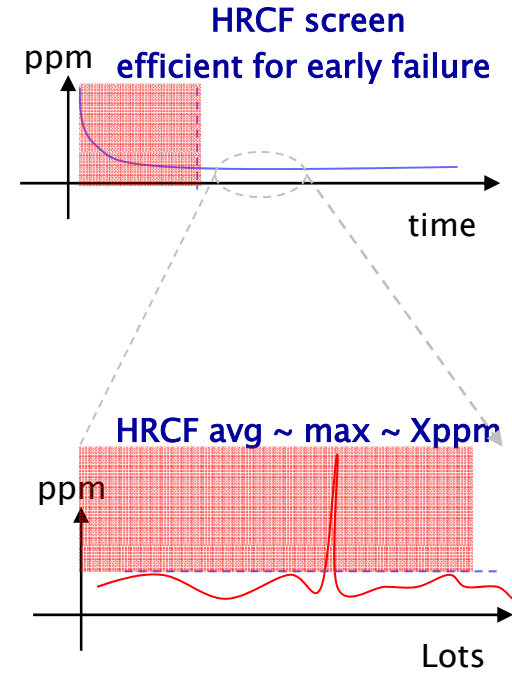


High Reliability Test flow

0 PPM target



- HRTF flow
 - Extend **early failure screen**
 - Focus on wafer
 - smallest homogenous population
 - tighten focus to weakest population
 - Evaluate endurance & data retention
 - at wafer level
 - at cell level
- Detection of abnormal wafer/lot.
 - **Statistical Bin Limits** focused on reliability Bins
 - **Geographic Part Average Testing** (cluster recognition)
 - **Parametric Part Average Testing**





- Application automotive dedicated support
 - **EEPROM user's guide AN2014**
 - Close partnership for **schematic validation**
 - Fast and accurate email support at **ST Online**
- Quality & Reliability customer support
 - **In-Product full traceability**
 - **Failure analysis with short cycle time**
 - **Corrective actions with efficiency follow up**