
AEHR
TEST SYSTEMS
Setting the Test Standard for Tomorrow
Nasdaq: AEHR

Forward Looking Statements

This presentation contains forward-looking statements that involve risks and uncertainties relating to projections regarding industry growth and customer demand for the Company's products. Actual results may vary from projected results. These risks and uncertainties include without limitation, acceptance by new customers of the FOX™ wafer level burn-in and test system, world economic conditions, the Company's ability to maintain sufficient cash to support operations, and the potential emergence of alternative technologies, which could adversely affect demand for the Company's products in fiscal year 2024. See the Company's recent 10-K and 10-Q reports filed with the SEC for a more detailed description of the risks facing the Company's business. The Company disclaims any obligation to update information contained in any forward-looking statement to reflect events or circumstances occurring after the date of this presentation.

AEHR TEST SYSTEMS

Presenting Today

Gayn Erickson
CEO, Aehr Test Systems

AEHR TEST SYSTEMS

Aehr Test Systems Company Overview

Production Semiconductor Test & Burn-in for over 40 Years!

- Technology leader in massively parallel test and burn-in systems
- World-wide leader in wafer-level burn-in and test systems
- Unique full-wafer test and burn-in systems and contactors

AEHR TEST SYSTEMS

Worldwide Customer Base

Aehr has been a leader in burn-in test solutions for over 40 years with thousands of systems shipped worldwide

AEHR TEST SYSTEMS

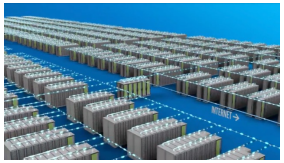
(Partial Customer List)

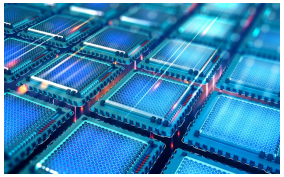
AEHR TEST SYSTEMS

Aehr Test Systems Market Drivers

Need for cost-efficient wafer level and singulated die burn-in, stabilization, & testing are creating significant revenue opportunities for Aehr Test in the following key markets

- **Electric Vehicle & Electrification of Transportation Infrastructure** driving motor control, charging infrastructure, and power conversion using **Silicon Carbide & Gallium Nitride semiconductors**
- **Electrification of the World's Power Infrastructure and Shift to Clean Energy** driving efficient and economical electrical power conversion using **Silicon Carbide & Gallium Nitride semiconductors**
- **Data Center Infrastructure** and unstoppable growth in **Data Storage** driving **Silicon Photonics, Flash Memory** Based Solid State Data Storage, and new **Photonics Assisted Hard Disk Drive Storage**
- **Worldwide 5G Infrastructure** build out using **Silicon Photonics** fiber optic transceivers and new **Optical Network Switches**
- **Datacenter, Healthcare, Robotics and Generative Artificial Intelligence** applications driving exponential increase in data I/O exceeding the limits of electrical signal bandwidths driving **Silicon Photonics I/O** using CoPackaged/Heterogeneous Integraton/Multi-Chip Module Integration
- **Heterogeneous Integration of semiconductors** and **3D fabrication and stacking** driving technology and cost roadmaps pushing known good die with test and burn-in of device in wafer form prior to packaging

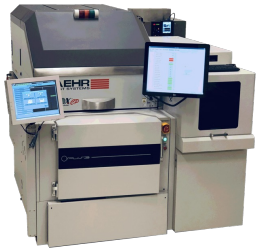




AEHR TEST SYSTEMS

FOX Family of Wafer Level Test & Burn-in Systems

Solutions for Engineering to Production



FOX-CP

Single Wafer Stepping
Test & Burn-In System

FOX-NP

Dual WaferPak & Dual DiePak
Test & Burn-In System

FOX-XP

Multi WaferPak & Multi DiePak
Test & Burn-In Systems

FOX WaferPak Contactor

FOX DiePak Carrier

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Aehr Wafer Level Test & Burn-in Patents

- WaferPak temperature control methods
- Vacuum & pressure-based WaferPaks
- Maintaining probe contact over temperature
- Electrical components in WaferPak
- Individual DUT power supplies
- Per Die Current Protection
- Redundant power supplies
- Portable WaferPaks
- And more . . .

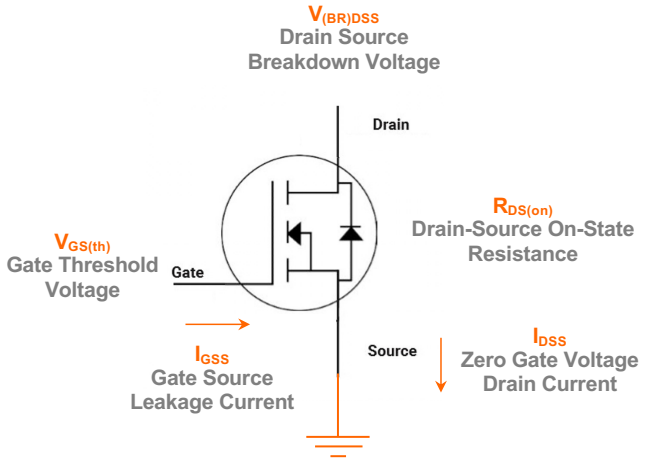
AEHR TEST SYSTEMS

Critical SiC MOSFET Parameters & Stress Tests

Higher than acceptable extrinsic (infant mortality) failure rates of silicon carbide MOSFETs require 100% production stress / burn-in testing to achieve automotive and industrial quality levels

Example Stress / Burn-in Tests

- **Positive Gate Stress (HTGB+)**
  - Positive Gate Voltage (Vgs)
- **Negative Gate Stress (HTGB-)**
  - Negative Gate Voltage (Vgs)
- **Drain Stress (HTRB)**
  - Positive Drain Voltage (Vds)
- **Body Diode Stress**
  - High Current Source from Source to Drain



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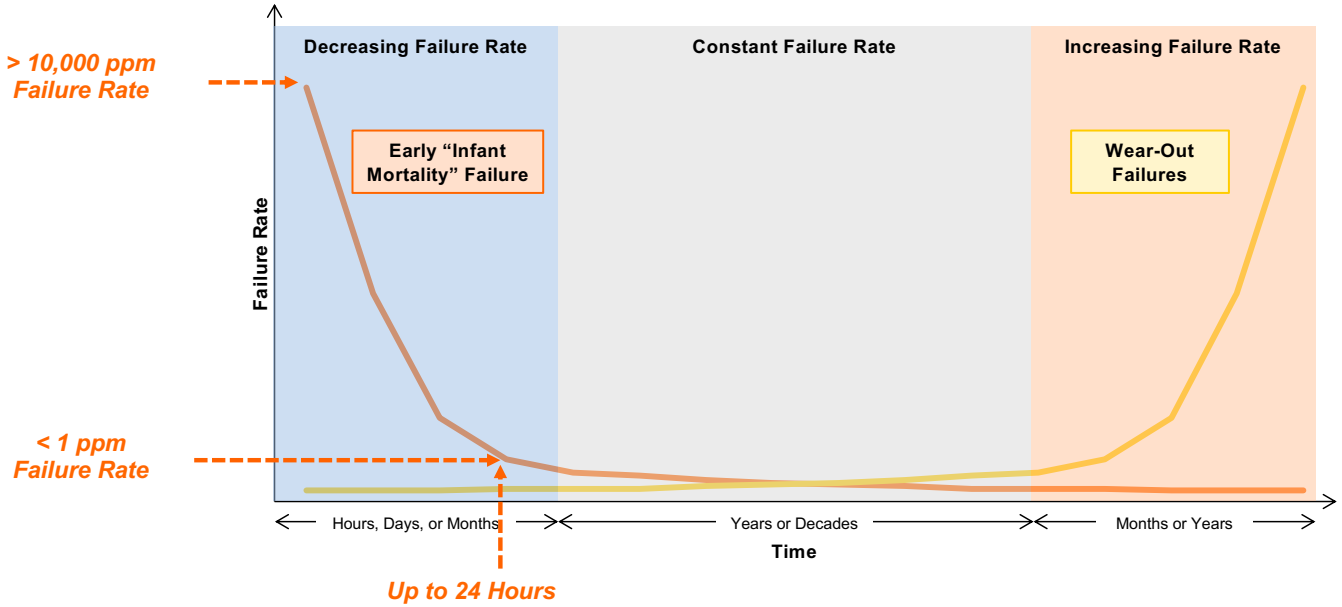
Burn-in Testing – The Bathtub Curve

Example Silicon Carbide Failure Rate



- **Burn-in:** A functional test in which electronic components are subject to elevated voltages and/or temperatures for a duration of time (2 – 48 hours) to screen for reliability and early failure
- Burning-in components exposes them to a high-stress level and screens out "Infant Mortality" failure in electronic components prior to the components making it into a module

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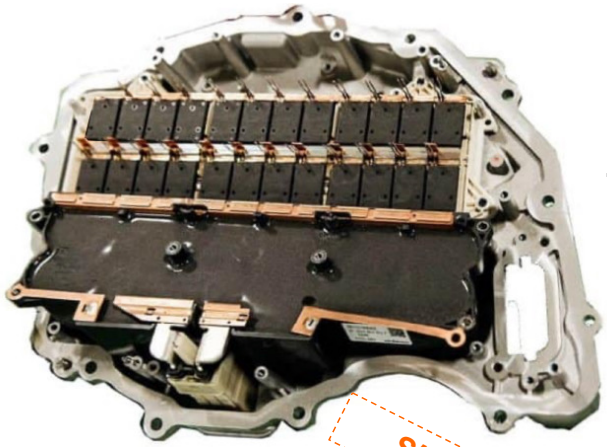
SiC and Multi-Die Packages / Modules



Tesla Traction Inverter
with 24 2-die modules

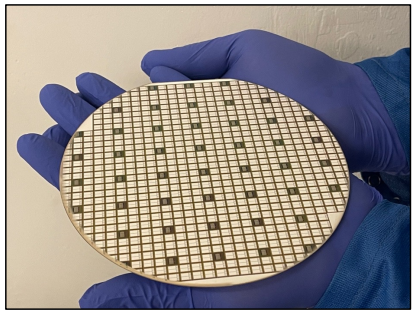
Lucid Traction Inverter
with 3 10-die modules

Onsemi Traction Inverter
with 1 24-die module

Traction Inverter
with 3 8-die modules

Silicon Carbide 3-Phase EV Traction Inverter Integration

Package/Module yield loss cost much greater than cost of wafer level burn-in



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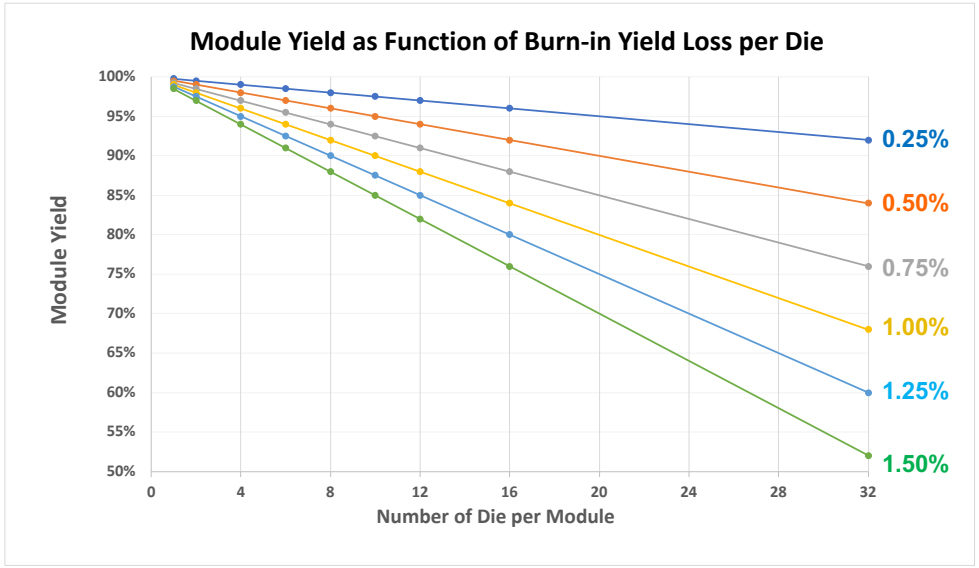

- Infant Mortality Yield loss of Modules linear with yield loss per die times number of die per module
- Cost of yield loss much greater than cost of burn-in test
- This is why the industry is driving to Wafer Level Burn-in

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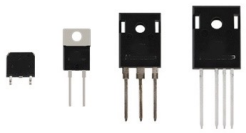
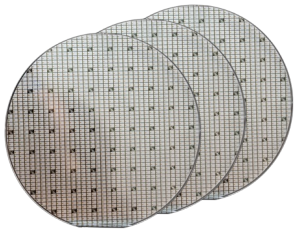
Package Part vs Wafer Level Burn in

Package / Module Part Burn-in



- Up to ~ 2,500 SiC devices per system
- Individual device handling with limited life sockets and scrub marks on device leads
- Convection Thermal Control (Oven)
- Equipment depreciation cost of ~ $0.01 per hour burn-in cost (fixed with standard discrete packages)

Wafer Level Burn-in



x18

- Up to ~ 45,000 SiC devices per system
- 1000s of devices handled at a time with micro-pogo contact to die >> 100,000 cycle life
- Conduction Thermal Control (Thermal Chuck)
- Equipment depreciation cost of ~ $0.01 per hour burn-in cost (typical 500 die per wafer inverter MOSFET) and ~ $0.002 per (2500 die per wafer charger or photovoltaic application MOSFET)

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FOX-NP SiC Gate and Drain Stress Test Solution

FOX-NP Dual Wafer Test & Burn-In System

- **SiC MOSFET Gate Stress (HTGB)**
  - Programmable Gate voltage -30V to +40V
  - Pulsing Gate Voltages
  - Up to 150C
- **SiC MOSFET Drain Stress (HTRB)**
  - Programmable Drain voltage up to 2000V
  - Anti-arcing Inert Gas Control Across Entire Wafer
  - Up to 150C
- **SiC MOSFET Body Diode Stress**
  - Programmable Source current up to > 1000A per wafer
  - Up to 150C

FOX WaferPak Contactor

AEHR TEST SYSTEMS

FOX-XP Multi-Wafer Production Test & Burn-In System

FOX-XP 18 Wafer SiC Test & Burn-In System
configured for SiC Gate Stress Test

- **9 / 18 Wafer System for High Volume Production**
  - 100% compatible using the same Blade resources as FOX-NP
  - Configurable for Gate, Drain, and Body Diode Stress tests
  - Integrated standard 20ºC to 150ºC thermal control unit
- **FOX WaferPak Contactors**
  - Robust full wafer contactor with >> 100,000 cycle life
  - Very high compliance / robust micro pogo pins
  - Offline or online wafer alignment via Aehr proprietary WaferPak aligners

AEHR TEST SYSTEMS

Proprietary Wafer Level Enabling Technology

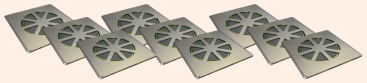
- **Aehr's FOX-XP is capable of both functional burn-in and test solutions – leverages proprietary aligner and contactor technology**
- **Multi-wafer technology enables customers to achieve an overall decrease in test equipment cost and fab footprint – while increasing die yield and throughput**

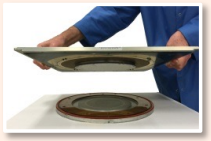
MULTI-WAFER TESTER

FOX-XP Multi-Wafer Test System

- May be configured with up to 18 Blades, enabling 18 wafers to be tested in parallel – driving cost efficiency and throughput
- High performance thermal chucks allow uniform temperature control of the wafers
- Footprint similar to single wafer automated test equipment – reducing lab test space

CONTACTOR





FOX-XP WaferPaks

- Houses the wafer and distributes signals and power to the wafer itself
- The WaferPak contactor is capable of over 50,000 contacts in a single touchdown on up to 300mm wafers
- Consumable input into the test system driving recurring revenue from the installed base

ALIGNER

FOX WaferPak Aligner

- Integral piece of test cell as it loads the wafer in the WaferPak at immense levels of precision
- By perfectly setting the wafer in a cartridge it ensures perfect contact
- Performs wafer alignment "offline" which eliminates the need for one wafer prober per wafer during long burn-in and test times

AEHR TEST SYSTEMS

Testing without Compromise

Reliability, Stress, and DFT Testing without compromise

- Solutions for **package parts, modules, panels,** or **wafers** allow testing at optimal process point
- **Confirm** which devices received desired test with **per device measurements, monitoring, & feedback**
- **100% traceability** with die location (wafer) or device ID read back (module) and electronic tracking ensures knowledge of “good” devices
- Thermal range, uniformity, and capacity permit **reduced test times** & **confidence** in target **test conditions**
- Vast system resources allow for minimal sharing (**higher sample size, higher yields, fewer hostage failures**)
- **Economical solutions** and **customizations** allow required testing to be performed at the **lowest cost**

AEHR TEST SYSTEMS

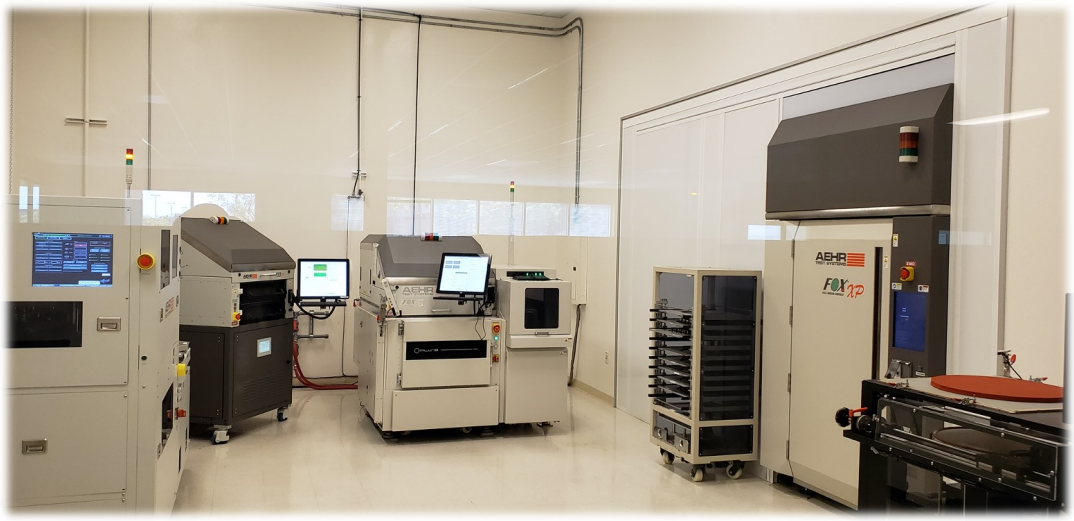
Aehr's New Fully Automated WaferPak Aligner

- Available in stand-alone as well as fully integrated with FOX-XP System configurations
- Provides customers fully hands-free operation up to lights out SECS/GEM factory automation and integration
- Expands Aehr markets & opportunities
- Both stand-alone and integrated configurations have now shipped to customers

FOX-XP with Integrated WaferPak Aligner
(Shown with 150mm/200mm Wafer Cassettes)

AEHR TEST SYSTEMS

Aehr Fremont Applications Lab



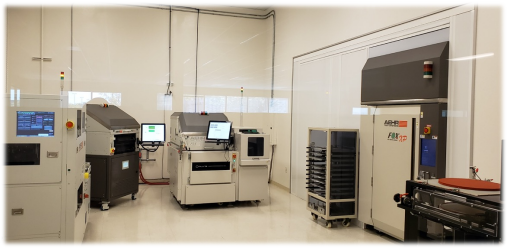
- FOX-XP Multi-Wafer WLBI System
- FOX-NP Dual-Wafer WLBI System
- FOX-CP Single Wafer Test Burn-in System with integrated high-power thermal chuck fully automated wafer prober
- FOX WaferPaks, DiePaks, & TLBs
- FOX WaferPak Automated Aligner
- FOX WaferPak Manual Aligner
- WaferPaks Racks & Accessories

AEHR TEST SYSTEMS

Aehr's SiC WLBI Qualification Program

- Customer and Aehr define success criteria for SiC wafer level qualification
- Aehr will develop and build a custom WaferPak and test program with monitoring for wafer level test and burn-in
- All development and testing can be done "remote and contact free" at Aehr Test Fremont facility
  - FOX-XP or NP Systems
  - Expert Test Engineering resources
  - Equipment and Devices in Aehr Fremont Clean Rooms
  - Remote access and video conferencing
  - 100% secure with restricted access, locks, and cameras

Aehr Fremont, CA Applications Lab



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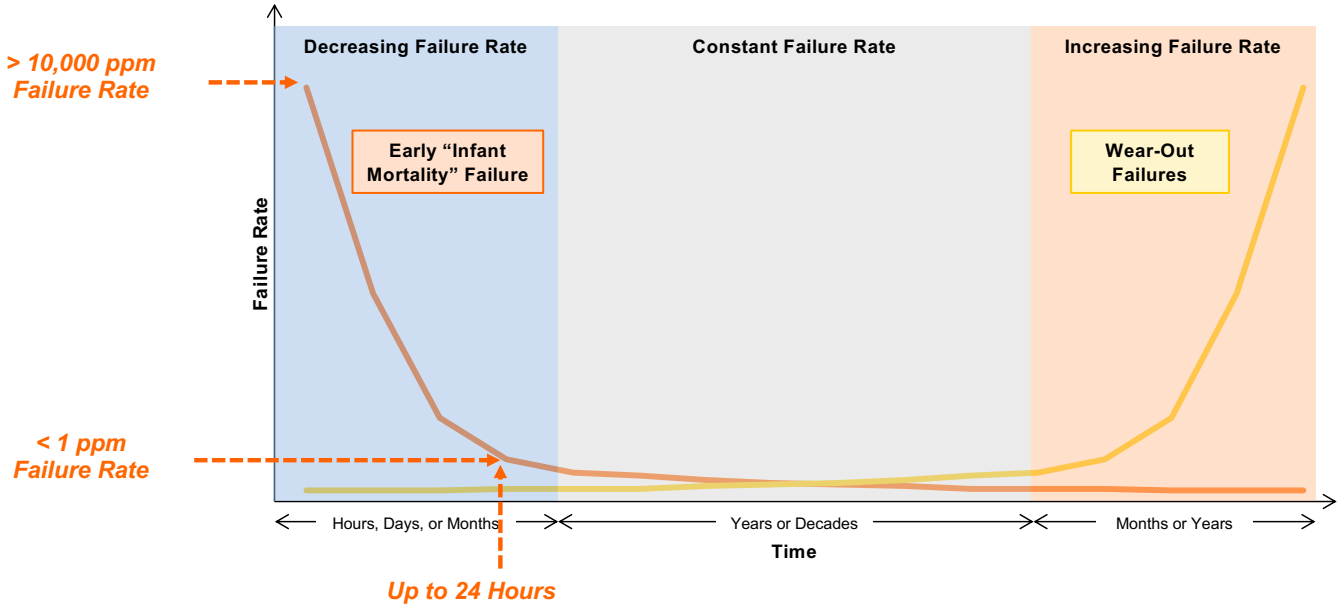

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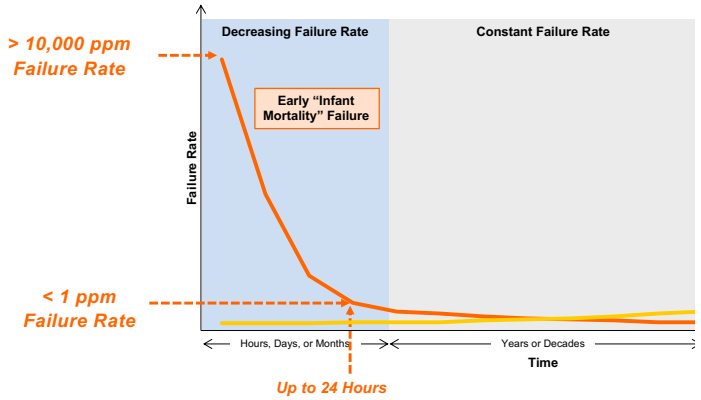
What Quality Level is Really Needed?

Silicon Carbide in Electric Vehicles

- 1 FIT = 10 ppm
- ~ 10 Failures per million on typical automotive / EV mission profile
- Example published FIT rates of silicon carbide MOSFETs = 3.7 FIT, 0.6 FIT
- 3.7 FIT = 37 ppm!
- Tesla's Model S PLAID has 144 SIC MOSFETs in the 3 Inverters!
- At 37 ppm, 5328 out of 1,000,000 would fail over the EV expected lifetime?



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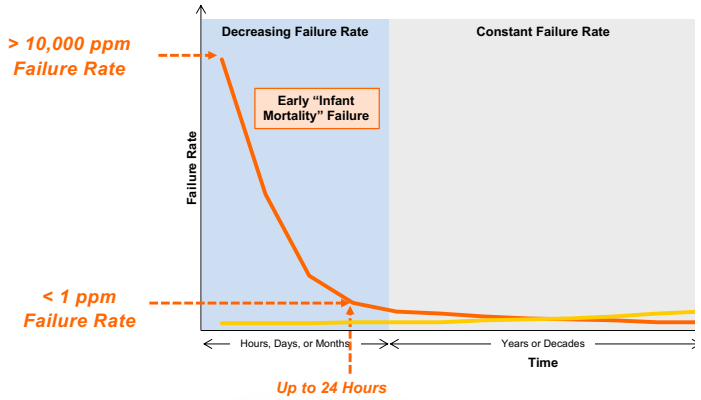

37 ppm =

37 "Walk Homes per Million"

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