Le Centre Français de Fiabilité

Expertises - synthèse

Mettre en gras le ou les champs concernés

Structure : STMicroelectronics

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Type

Académique
Industriel
Cluster
Société savante

Domaines

Modélisation et simulation
Expérimental
Cycle de vie

I'm working in STMicroelectronics since 2002 inside the Power Transistor Division.
My experience is linked with designer and reliability aspect:

- Power Bipolar Transistor;
- Power Mosfet ;
- Rad-hard design of Power device for space application (developping rad-hard tecnologies and products)
- Radiation expert (Co60, xray, heavy ion, alpha particles) on power devices in any semiconductor material
- Cosmic ray expert for automotive and avionics application
- Gate oxide defect with impact on reliability stress
- Failure mechanism in Reliability stress in particular HTRB and humidity stress

Participez vous à des groupes de normalisation ?

✓ Non ❑ Si oui, lesquels :

Thématiques :

Fiabilité des composants électroniques de puissance et leur packaging
Fiabilité des technologies liées à la connectique et à l'assemblage (connectiques, PCB, Busbars…)
Fiabilité des systèmes mécatroniques

Expertises :

Connaissances et moyens d'investigations sur les matériaux « électriques » et les composants
Ingénierie de l'environnement (mécanique, climatique et Compatibilité électromagnétique [CEM])
Management thermique
DataScience, Statistique et IA
Analyse de construction
Analyse de défaillance

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Expertises

Présentation de votre structure

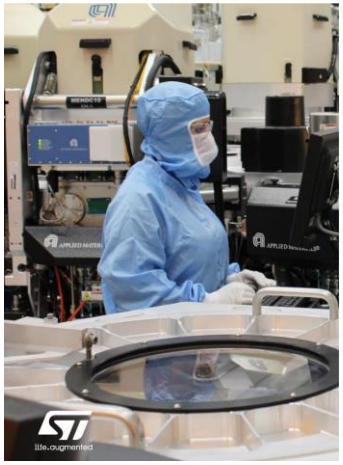
STMicroelectronics

Semiconductor solutions: one of the industry's broadest product portfolios

We create innovative semiconductor solutions based on:

- Dedicated Automotive ICs
- Analog, Industrial & Power Conversion ICs
- General Purpose MCUs & MPUs, Secure solutions
- Discrete & Power Transistors
- MEMS & Optical sensing solutions
- ASICs based on ST proprietary technologies

Differentiated technologies are our foundation



- MEMS for sensors & Micro-actuators
- Smart Power: BCD (Bipolar - CMOS - Power DMOS)
- FD-SOI CMOS FinFET through Foundry
- Discrete, Power MOSFET, IGBT Silicon Carbide, Gallium Nitride
- Analog & RF CMOS
- Vertical Intelligent Power
- eNVM CMOS
- Optical sensing solutions
- Packaging technologies: Leadframe – Laminate – Sensor module – Wafer level

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Our strategic objectives

Automotive	Industrial	Personal electronics	Communications Equipment, Computers & Peripherals
Lead in **car electrification**	Lead in **embedded processing**	Lead in **selected** high-volume **smartphone** applications with differentiated products or custom solutions	Address **selected** high-volume **applications** with differentiated products or custom solutions
Lead in **car digitalization**	Accelerate growth in **analog & sensors**	Leverage **broad portfolio** to address high-volume applications	Address selected applications in **cellular** and **satellite communication** infrastructure
	Expand in **power & energy** management		Leverage **broad portfolio** to address high-volume applications
	Accelerate growth with **industrial OEMs**		

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Manufacturing facilities

We believe in the benefits of owning manufacturing facilities and operating them in close proximity and coordination with its R&D operations.

France (Crolles, Rousset, Tours)	**Singapore**
Italy (Agrate, Catania)	**Malaysia** (Muar)
Malta (Kirkop)	**China** (Shenzhen)
Morocco (Bouskoura)	**Philippines** (Calamba)

- Front End (Wafer processing)
- Back End (Assembly and test)

More details : click here.

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Expertises

Présentation de votre structure

STMicroelectronics – Automotive Discrete Group

Department: R&D Power & Discrete Group - Power Transistor Division

Main focus is developping new technology and power products: HV-Silicon Power Mosfet, IGBT, SiC Power Mosfet and GAN Power

The site is placed in Palermo - Sicily- Italy, (about 52 employees) and it is strictly linked with Catania STMicroelectronics site where there are a design and production silicon and SiC wafers with about 4500 employees.

Palermo site born on year 2002 for Central R&D of Memory Group with focus on design of No-volatile memory. In the year 2008 the focus of the site has been moved on both design of automotive product with memory embedded and the validation and develop of test program.

In the year 2020, in addition to digital products, the development of power transistors is also supported.

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Expertises

Expertises pour chaque thématique

Publication

- *Investigation of the Impact of Neutron Irradiation on SiC Power MOSFETs Lifetime by Reliability Tests – Mdpi sensor 2021*
- *Accelerated Tests of Si and SiC Power Transistors with Thermal, Fast and Ultrafast neutron – Mdpi sensor 2020*
- *SiC robustness face to atmospheric radiation – NRTW 2020*
- *Prototyping and characterization of radiation hardened SiC MOS structures – IEEE – 2019 ESPC*
- *TID test results of radiation hardened SiC MOS structures pre-temperature stressed– IEEE – 2019 ESPC*
- *SEGR and PIGS Failure Analysis of SiC Mosfet – IEEE- 2019 ESPC*
- *SiC Power Discretes in Space and Avionics –invited talk in ESRF 2019*
- *Heavy Ion Induced Degradation in SiC Schottky Diodes: Incident Angle and Energy Deposition Dependence – IEEE 2017*
- *Incident angle effect on heavy ion induced reverse leakage current in SiC Schottky diodes – IEEE – RADECS2016*
- *Heavy Ion Induced Degradation in SiC Schottky Diodes: Incident Angle and Energy Deposition Dependence – IEEE 2017*
- *Charge Transport Mechanisms in Heavy-Ion Driven Leakage Current in Silicon Carbide Schottky Power Diodes – IEEE 2016*
- *Relative Humidity Effects on High Voltage Power Mosfet - HAST performances -- Seventeenth Annual Automotive Electronics Reliability Workshop 2015*
- *Enhanced Low Dose Rate Sensitivity Analysis of Vertical BJT-STMicroelectronics – IEEE- RADECS 2015*
- *The "Livio Scarsi" X-Ray Facility at University of Palermo for Device Testing – IEEE – RADECS 2015*
- *SEGR in SiO 2 -Si 3 N 4 stacks – IEEE 2014*
- *Semi-empirical model for SEGR prediction – IEEE 2013*
- *Statistical Analysis of Heavy-Ion Induced Gate Rupture in Power MOSFETs Methodology for Radiation Hardness Assurance – IEEE 2012*

Research Project

- *Characterization of Gate oxide of Silicon and SiC Power Mosfet by X-ray source -- Physical and Chimistry Department of Palermo's University:*
- *Characterization of Silicon and SiC Power Device by atmospheric neutron and alpha particle-- Physical and Chimistry Department of Palermo's University:*
- *SICRET (SiC – Reliability and Transportation) project – Radiation expert and Technical Interface for STMicroelctronics*
- *SiC Power Mosfet for innovative Motor Control for Avionics application with AIRBUS T&R - Toulose*

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Expertises

Expertises pour chaque thématique

***Cosmic Ray test**: STM has his neutron tester system for power device, we need to access the external neutron beam.*

***Reliability test**: STM is able to perform reliability test internally. We have HTRB,HTGB Oven up to 200°C. Many equipment for standard reliability (pressure pot, H3TRB equipment) and relibility on wafer level as well.*

***Failure Analysis**: Full capability to address non desctructive analysis (SAM, XRay), fault localization (IR techniques, EOTPR), sample preparation (grinding, lapping, ionic beam, chemical deprocessing...) and physical and chemical analysis (SEM,EDX, TEM, FTIR...)"*

Notre site internet :
Centre-francais-fiabilite

Un compte LinkedIn :
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Severine COUPE