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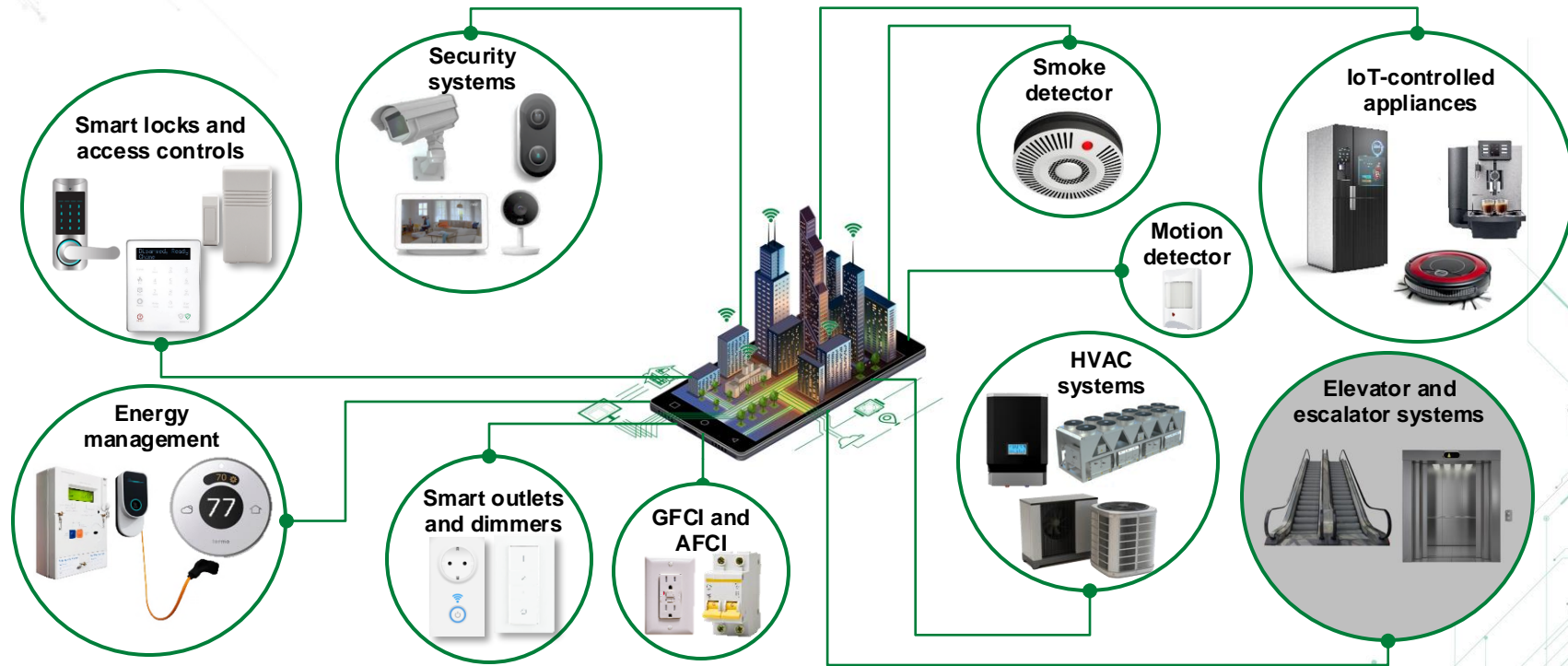
Elevators and Escalators



Building automation

Users must independently evaluate the suitability of and test each product selected for their own specific applications. It is the User's sole responsibility to determine fitness for a particular system or use based on their own performance criteria, conditions, specific application, compatibility with other parts, and environmental conditions. Users must independently provide appropriate design and operating safeguards to minimize any risks associated with their applications and products. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at littelfuse.com/disclaimer-electronics.

Smart homes are equipped with intelligent technologies for convenient and energy-efficient living



Littelfuse offers technologies that sense, control, and protect to improve the safety, reliability, and energy efficiency of buildings.

Market trends of elevators and escalators

Market trends and drivers

Nearly 20 million elevator and escalator systems are operating globally. There were over 1 million new installations in 2021, with China accounting for 66% of those new installations

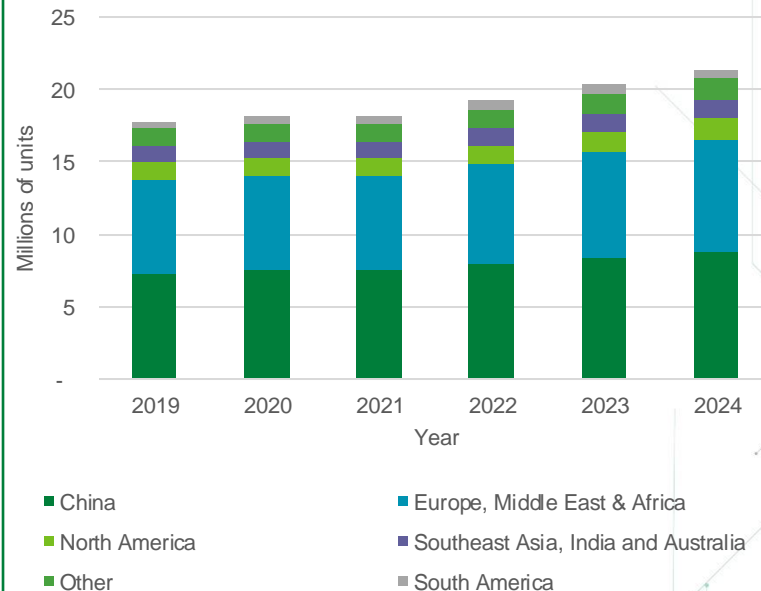
Urbanization is a major growth driver; an estimated 68% of the world population will live in cities by 2050

New systems have intelligent sensors and wireless connectivity to increase convenience for tenants and users and so building managers can quickly identify maintenance needs

Regenerative drives can reduce elevator energy consumption by up to 35% by capturing energy created when an elevator is traveling down and transferring that energy back into the building

Systems are being equipped with long-lasting LED lighting to reduce maintenance costs and occupancy sensors to power down equipment when not in use to provide energy savings

Elevator & escalator systems installed worldwide



Source: [Elevator & Escalators](#) (Statista, 2022)

Recommended products for control panel and hoist motor power control

1 AC input protection

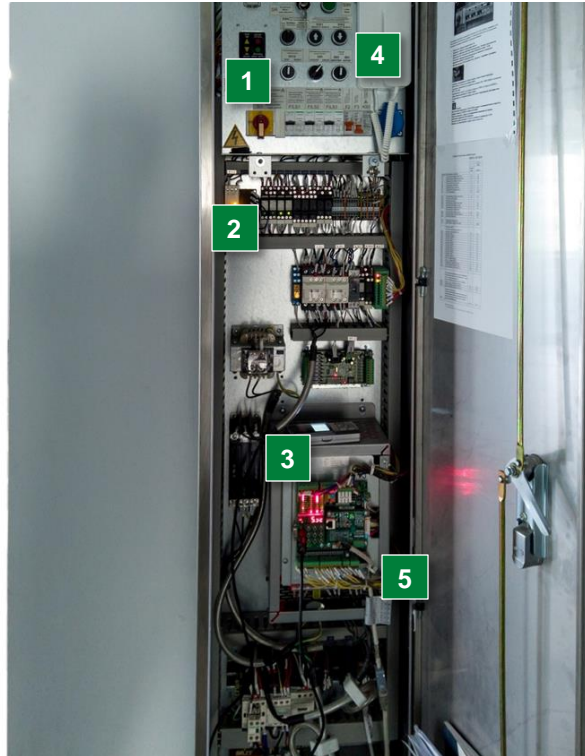
- AC Fuse
- Fuseholder
- MOV

2 Hoist motor control

- Rectifier Diodes
- IGBTs
- Gate Drivers
- Semiconductor Fuse
- TVS Diodes
- Temperature Sensor

3 Auxiliary power supply

- SiC MOSFET
- Gate Driver
- TVS Diode



4 Input switches and sensors

- Tactile Switches
- Magnetic Sensor + Actuator

5 Communication & user interface

- TVS Diode Array
- Polymer ESD

Acronyms:

AC: Alternate Current

MOV: Metal Oxide Varistor

IGBT: Insulated-Gate Bipolar Transistor

TVS: Transient-Voltage Suppression

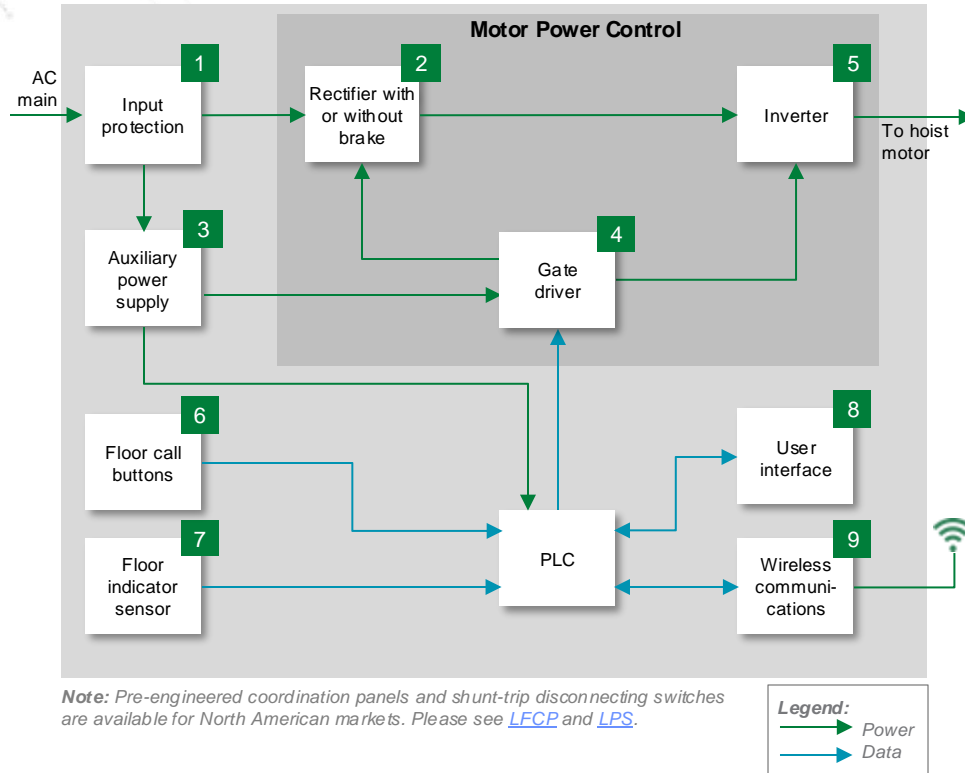
SiC: Silicon Carbide

ESD: Electrostatic Discharge



Click on the product series in the table below for more info

Elevator control panel and motor control systems



Note: Pre-engineered coordination panels and shunt-trip disconnecting switches are available for North American markets. Please see [LFCP](#) and [LPS](#).

	Technology	Product Series
1	Fuse	JLS , JLLS , LDC , L70QS 606 , 504 , 505 , 607
	Fuseholder	LFT , LFJ
	MOV	TMOV , UltraMOV
2	Rectifier Diode without Brake	Module Offerings , Discrete Devices ,
	Rectifier Diode with Brake	VUB , MDMAxxxUB
3	SiC MOSFET	LSIC1MO170E1000
	Gate Driver	IX4351NE
	TVS Diode	SME , 1.5SMC
4	Gate Driver	IXD_6xx
	Semiconductor Fuse	QS , PSR
5	IGBT	IXYN , IXXN
	NTC	USUR1000 , SM
	TVS Diode	SMBJ , SMF4L , 1.5SMC
6	Tactile Switch	KSC , TLS
7	Magnetic Sensor	59140 , 57140
8	TVS Diode Array	SP1012 , SP1003
9	TVS Diode Array	SP3213 , SP3401
	Polymer ESD	XGD

Features and benefits of Littelfuse components

	Technology	Function in Application	Series	Benefits	Features
1	Fuse	AC line fuses for overcurrent or short circuit protection	JLS, JLLS, LDC, L70QS 606, 504, 505, 607	Reduces damage to equipment caused by heating and magnetic effects of short circuit currents	Extremely current-limiting; small footprint; 200 kA interrupting rating; smallest available package
	Fuseholder	Supports fuse protection	LFT, LFJ	DIN rail mountable	Low resistance connection
	MOV	Protects against damage due to lightning-induced surges or harmonic voltage disruptions from the power line	TMOV, UltraMOV	Integrated thermal disconnect enhances safety by disconnecting during MOV EOL caused by continuous abnormal overvoltage from miswiring or loss of neutral	UL-recognized Type 4 surge protection devices; integrated thermal disconnect
2	Rectifier Diode without Brake	Converts AC line voltage supplied to the drive to DC	Module Offerings, Discrete Devices,	Small footprint; multiple package options (high-voltage, isolated, and standard packages)	Planar passivated chips; very low leakage current and forward voltage drop; improved thermal behavior; high commutation robustness
	Rectifier Diode with Brake	Converts AC line voltage supplied to the drive to DC with added overvoltage protection and regenerative drive	VUB, MDMAxxxUB		
3	SiC MOSFET	High-frequency switching	LSIC1MO170E1000	Higher switching frequency; higher efficiency; increased robustness; smaller die size per voltage/current rating	Optimized for high-frequency applications; extremely low gate charge and output capacitance; ultra-low on-resistance
	Gate Driver	Drives SiC MOSFETs and high-power IGBTs	IX4351NE	Eliminates the need for separate negative supply; quick turn-on and turn-off of power SiC MOSFET and IGBT	Separate 9 A peak source and sink outputs; internal negative charge pump regulator for selectable negative gate drive bias
	TVS Diode	Protects SiC MOSFETs from voltage transients	SME, 1.5SMC	Improves system reliability by clamping the voltage at safe levels during transients	200 W peak pulse power capability; excellent clamping capability; low profile
4	Gate Driver	Drives MOSFETs and IGBTs	IXD_6xx	Easy design implementation with various power level MOSFETs; improves inverter reliability and efficiency in harsh environments	Highest operating voltage 4.5–35 V with peak current 1 to 30 Apk; industry standard pinout and wide range of package selection
5	Semiconductor Fuse	Protects power semiconductor components from overcurrent events	QS, PSR	Best-in-class DC performance	Busbar mount
	IGBT	Switches power supplies	IXYN, IXXN	Short-circuit current rating of 10 μ sec; low gate charge; low EMI and competitive low $V_{CE(SAT)}$	Rugged XPT design with thin wafer technology
	NTC	Measures semiconductor temperature	USUR1000, SM	Rapid thermal response and long-time reliability	USUR is a UL-recognized NTC sensor with ring lug mounting; SM NTCs are in a hermetically sealed MELF packaging suitable for operation at up to 220 °C
	TVS Diode	Protects IGBTs from transient overload	SMBJ, SMF4L, 1.5SMC	Improves system reliability by clamping the voltage at safe levels during transients	600 W peak pulse power capability; excellent clamping capability; small footprint

Features and benefits of Littelfuse components

	Technology	Function in Application	Series	Benefits	Features
6	Tactile Switch	Push button switch for elevator call buttons	KSC , TLS	Rugged sealing and resistant to corrosion; very long operating life	Operating life up to 10 million cycles; illumination options available; water- and dust-proof
7	Magnetic Sensor	Detects what floor the elevator cabin is on	59140 , 57140	Application-specific customization available	Magnetically operated proximity sensor in hermetically sealed package
8	TVS Diode Array	Protects against user-induced ESD events	SP1012 , SP1003	Small form factor for compact designs	High ESD withstanding capability
9	TVS Diode Array	Protects wireless chipsets from ESD events	SP3213 , SP3401	Smaller form factor and multi-line protection enables compact designs	Low leakage current; low capacitance per I/O
	Polymer ESD		XGD	Protection without signal distortion	Extremely low capacitance; small size

Recommended Littelfuse products for elevator cabin

1 AC input protection

- Fuse
- MOV

2 Auxiliary power supply

- MOSFET

3 Door motor

- NTC Thermistor

4 Button input

- Tactile Switch



5 Wireless interface

- TVS Diode Array
- Polymer ESD

6 Door position sensing

- Reed Sensor + Actuator

7 Occupancy sensing

- PIR Sensor
- MCU

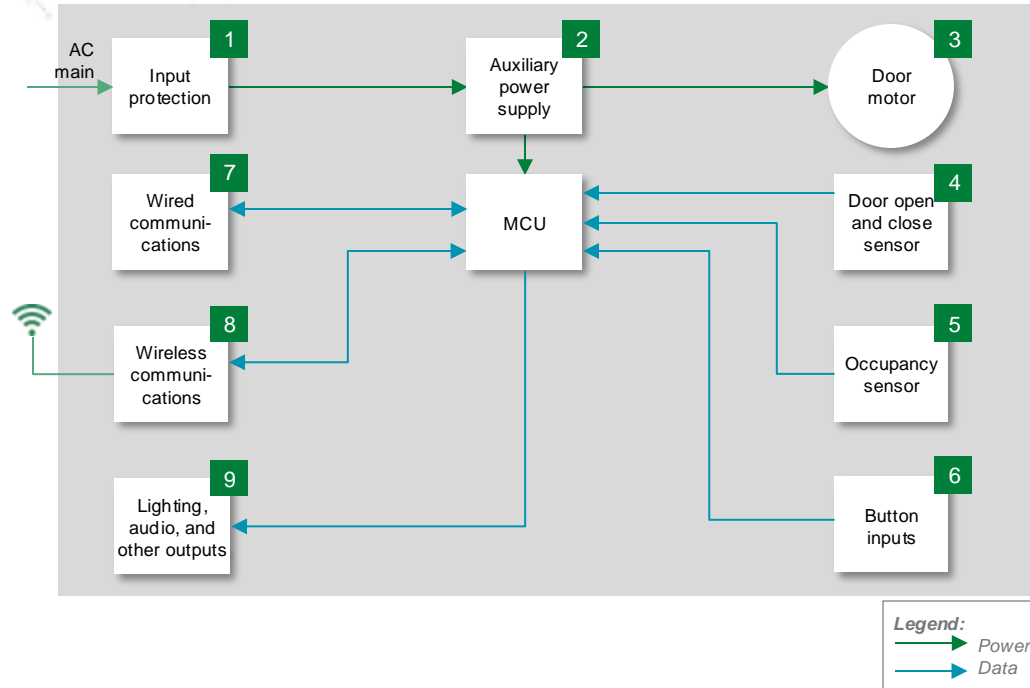
8 Output load control

- Solid State Relay



Click on the product series in the table below for more info

Elevator cabin system



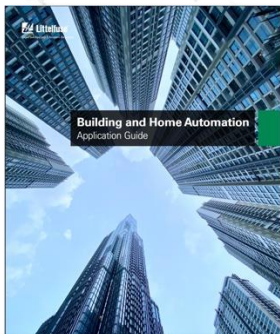
	Technology	Product Series
1	Fuse	215, 835
	MOV	TMOV, UltraMOV
2	MOSFET	X2 Class
3	NTC	SM
4	Magnetic Sensor	59145, 57145
5	PIR Sensor + MCU	ZMOTION
6	Tactile Switch	KSC, TLS
7	TVS Diode Array	SRV05-4HTG, SP0504SHTG
8	TVS Diode Array	SP3213-01UTG
	Polymer ESD	PESD
9	Solid State Relay	CPC1510, CPC1511

Features and benefits of Littelfuse components

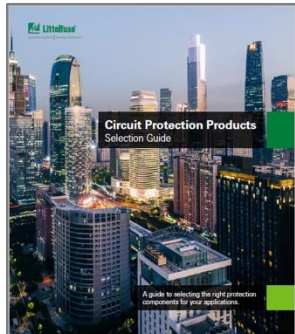
	Technology	Function in application	Product series	Benefits	Features
1	Fuse	Protects equipment and users from hazards due to overcurrent equipment faults	215 , 835	Reduces customer qualification time by complying with regulatory safety standards such as UL/IEC	Compliant with UL/IEC standards; low internal resistance; shock safe; vibration resistant
	MOV	Protects against damage due to lightning-induced surges or harmonic voltage disruptions from the power line	TMOV , UltraMOV	Integrated thermal disconnect enhances safety by disconnecting during MOV EOL caused by continuous abnormal overvoltage from miswiring or loss of neutral	UL-recognized Type 4 surge protection devices; integrated thermal disconnect
2	MOSFET	High-frequency switching	X2 Class	Low power consumption; high efficiency system operation	Ultra low on-resistance $R_{DS(ON)}$ and gate charge Q_g ; fast body diode dv/dt ruggedness
3	NTC Thermistor	Temperature sensing of the door motor	SM	Rapid thermal response and long-time reliability	UL recognized with ring lug mounting; SM NTCs are in hermetically sealed MELF packaging suitable for operation up to 220 °C
4	Magnetic Sensor	Open and close detection of elevator door	59145 , 57145	Application-specific customization available	Magnetically operated proximity sensor in hermetically sealed package
5	PIR Sensor + MCU	Occupancy detection inside the cabin	ZMOTION	Optimized for sensor application; reduces component count and saves space; allows for lower-cost ceramic capacitors	Real-time control of motion sensitivity; serial interface option to host device (e.g., RF, video chipset), over-the-air firmware updates
6	Tactile Switch	Button inputs for floor selection, door open and close, and emergency	KSC , TLS	Rugged sealing and resistant to corrosion; very long operating life	Operating life up to 10 million cycles; illumination options available; water- and dust-proof
7	TVS Diode Array	Protects against user-induced ESD events	SRV05-4HTG , SP0504SHTG	Small form factor for compact designs	High ESD withstanding capability
8	TVS Diode Array	Protects wireless chipsets from ESD events	SP3213-01UTG	Smaller form factor and multi-line protection enables compact designs	Low leakage current; low capacitance per I/O
	Polymer ESD		PESD	Protection without signal distortion	Extremely low capacitance; small size
9	Solid State Relay	Elevator load control for lighting, alarms, etc.	CPC1510 , CPC1511	Eliminates downtime due to installation errors or power cross damage; protects technicians and users from high voltage mains and lightning shock	Integrated active current-limit with thermal shutdown protection; available in surface mount or thru-hole option

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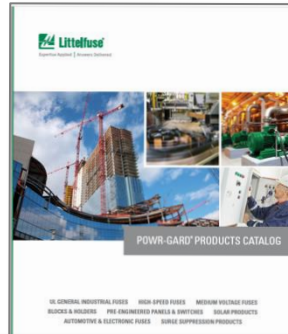
Building Automation
Guide



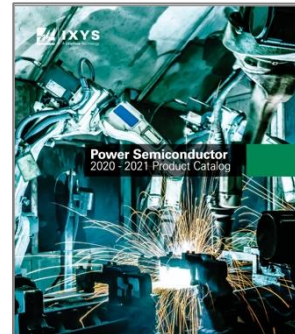
Circuit Protection
Selection Guide



Sensor Selection Guide

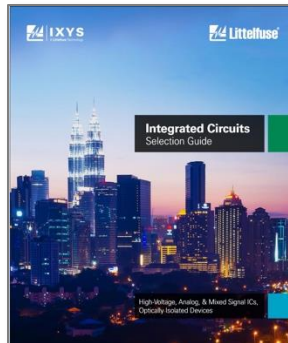


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Elevator Switches
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Legend

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- R&D
- Manufacturing

Partner for tomorrow's electronic systems

Broad Product Portfolio

An industrial technology manufacturing company empowering a sustainable, connected, and safer world

Application Expertise

Our engineers partner directly with customers to help speed up product design and meet their unique needs

Global Customer Service

Our global customer service team is with you to anticipate your needs and ensure a seamless experience

Compliance & Regulatory Expertise

We help customers in the design process to account for requirements set by global regulatory authorities

Testing Capabilities

We help customers get products to market faster, we offer certification testing to global regulatory standards

Global Manufacturing

High-volume manufacturing that is committed to the highest quality standards



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