

Aviation Platforms



Aerospace and Defense

Commercial aircraft & eVTOL* subsystems overview

Shared electrical subsystems with diverging power architecture: AC centralized vs. HVDC distributed

Commercial aircraft

Power sources

- 115/200 VAC 3 Φ
- Engine/APU generator

Primary AC distribution



Power conversion

- TRU AC \rightarrow 28 VDC
- Inverter
- DC-DC

Avionics

(Flight control systems, Autopilot, Radar, etc.)

DC distribution

Commonly shared subsystems

Cabin & lighting systems

Thermal management

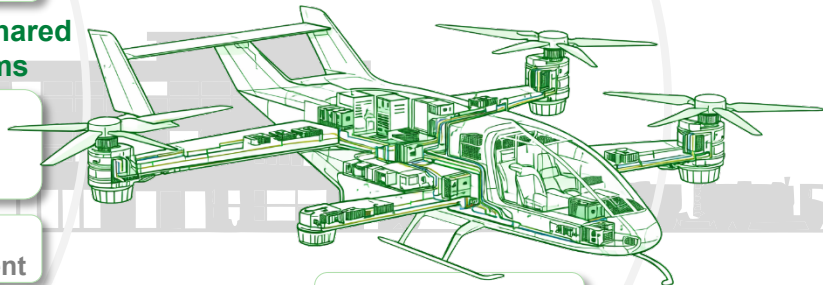
LV Battery + emergency power

eVTOL

HV battery pack

- 400-800 VDC

HVDC junction box



Inverter + electric motor

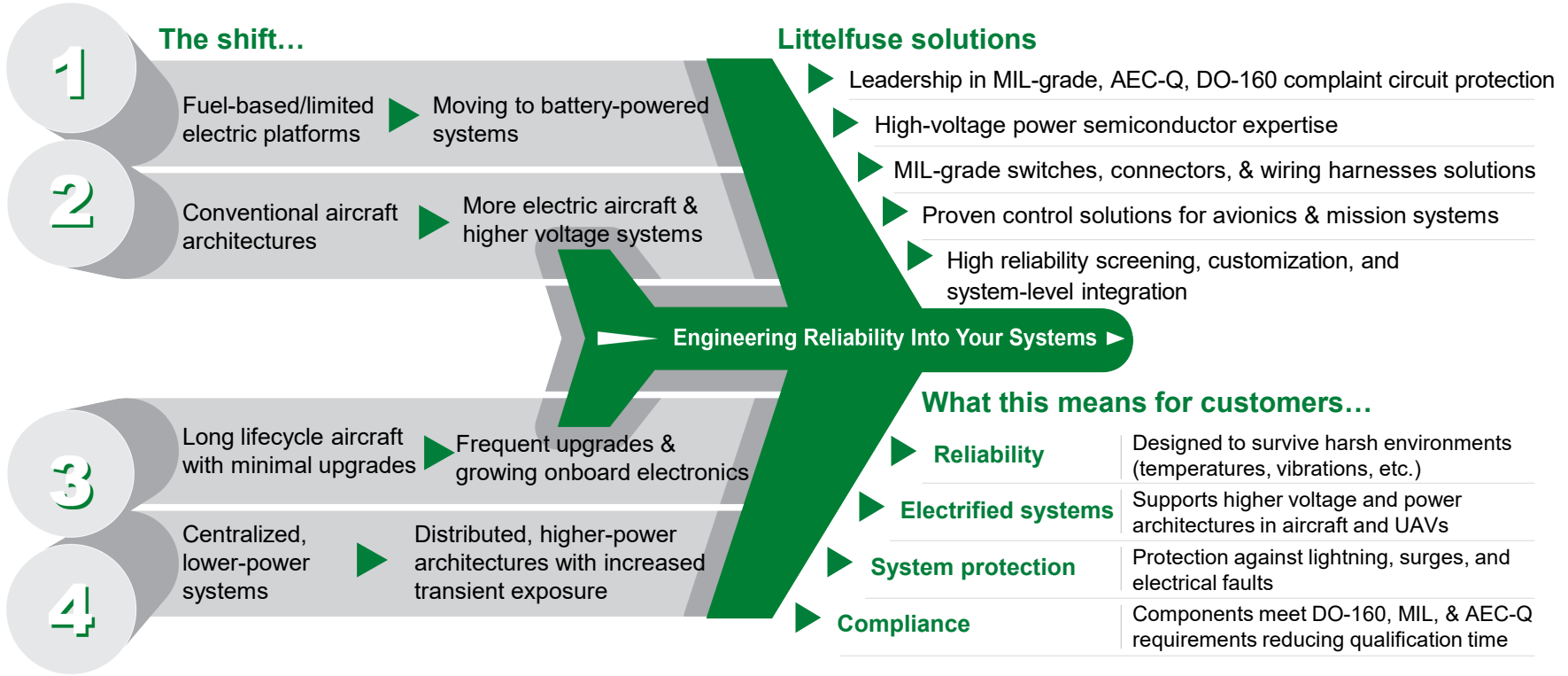
Power conversion

- HV to LV conversion
- LDO

* Electric Vertical Take-off and Landing Aircraft

Powering the evolution of aviation systems

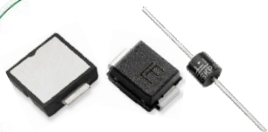
MIL-grade, DO-160, AEC-Q expertise | Power & protection devices | MIL-grade interconnect & control



Littelfuse portfolio for aviation systems

Enabling protection, power conversion, and robust interconnects

Circuit protection solutions



TVS Diodes



Fuses



MOVs

C&K® switches



Pushbutton Switch



Tactile Switch

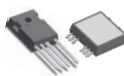


Toggle Switch

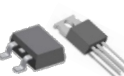
Power Semiconductors



Si/SiC Diodes



Silicon Carbide MOSFETs



Silicon MOSFETs



IGBTs



Power Modules



Gate Drivers

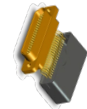
Connectors and wire harnesses



AeroSplice® Wire-to-wire



D-Sub Connectors



Micro-D Connectors



Accessories



Wire Harnesses

Portfolio complies with MIL-grade, DO-160, & AEC-Q



End-to-end system solutions from power entry to signal I/Os



HV power solutions enabling next-gen electrification (eVTOL)



Rugged HMI solutions and high reliability interconnects



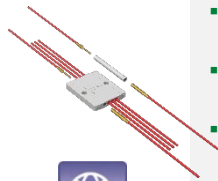
New and featured products for aviation systems

High reliability TVS Diodes



- 15 kW & 30 kW peak pulse capability
- DO-160 5a Level 5 protection in low-profile SMT SPD4-1 high-thermal package
- Excellent clamping capability
- Protects I/O interfaces, V_{CC} bus & other vulnerable circuits in avionics/aviation & eVTOL

AeroSplice® Wire-to-Wire Solutions



- Exceeds MIL-DTL-24308 specifications
- Eliminates traditional manual splicing
- Withstands high vibration, extreme temperatures, and harsh conditions
- Supports a wide range of standard wire gauges

Toggle Switches (MIL-DTL-83731F)



MIL-DTL-83731F

- Fully certified according to MIL-DTL-83731F
- Special Au plating on contact area: 50 min
- Approved by DLA on specific versions: /9, /10, /15, /16
- Sealed and non-sealed level or panel designs
- Wide range of configurations

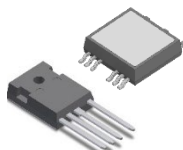
Custom Wire Harnesses



Custom

- Custom cable harnesses based on customer requirements
- Applications include lavatories, overhead compartments, etc.
- Capability to build sealed and shielded harnesses
- On-site support

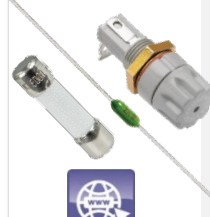
SiC MOSFETs



650-1700 V SiC MOSFETs

- 650~1700 V MOSFETs 13~750 mΩ
- Discrete packages: TO-247-4L, TO263-7L, TOLL
- Multi-chip, isolated packages (SOT227, SMPD)
- SiC MOSFETs Half Bridges in SMPD package: 1200 V

Fuse + Fuseholder



Fuse

- Midget Fuse/5AG: 250-500 VAC; high interrupt rating suitable for feeder and branch protection
- Fast-acting and time-delay
- Micro & PICO® Fuses up to 120 VDC suitable for PCBs

Littelfuse solutions for commercial aircraft



1

AC power sources

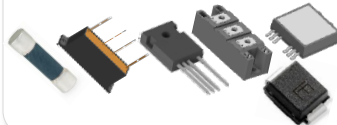
AC Fuse, Fuseholder, MOV



2

Power conversion box

Fuse, AC Bridge, MOSFET, Diode Module, Power Module, TVS Diode



3

DC distribution & control

Fuse, TVS Diode



4

Avionics

Fuse, TVS Diode, C&K® switch, IGBT, Module, Si/SiC MOSFET, Gate Driver



5

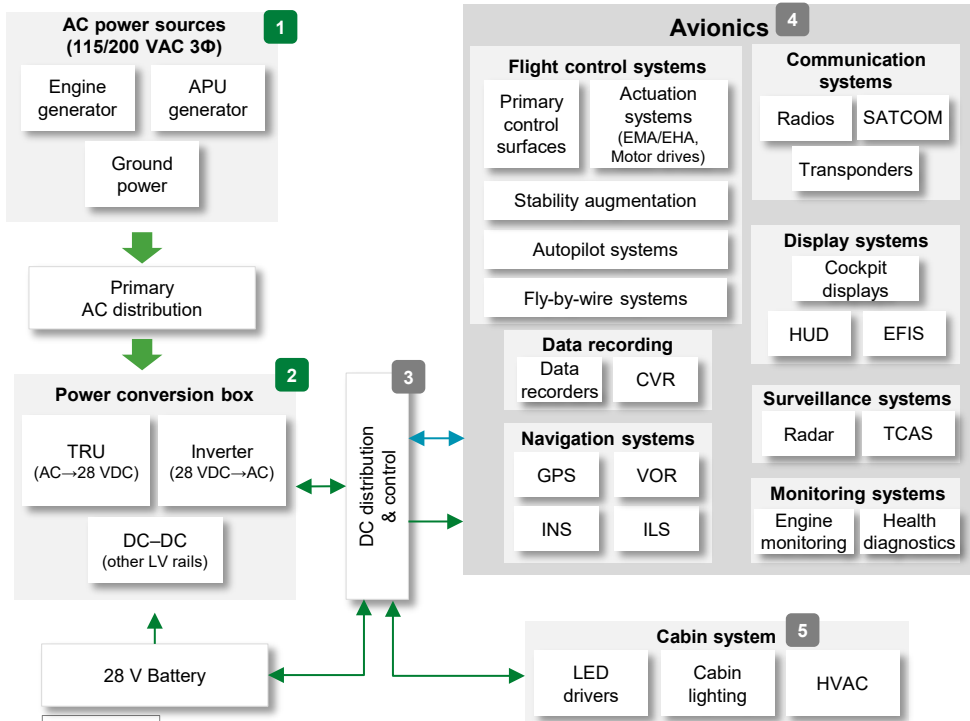
Cabin system

TVS Diode, MOSFET, Switch, Connectors, Wire Harness



Commercial aircraft block diagram & Littelfuse solutions

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



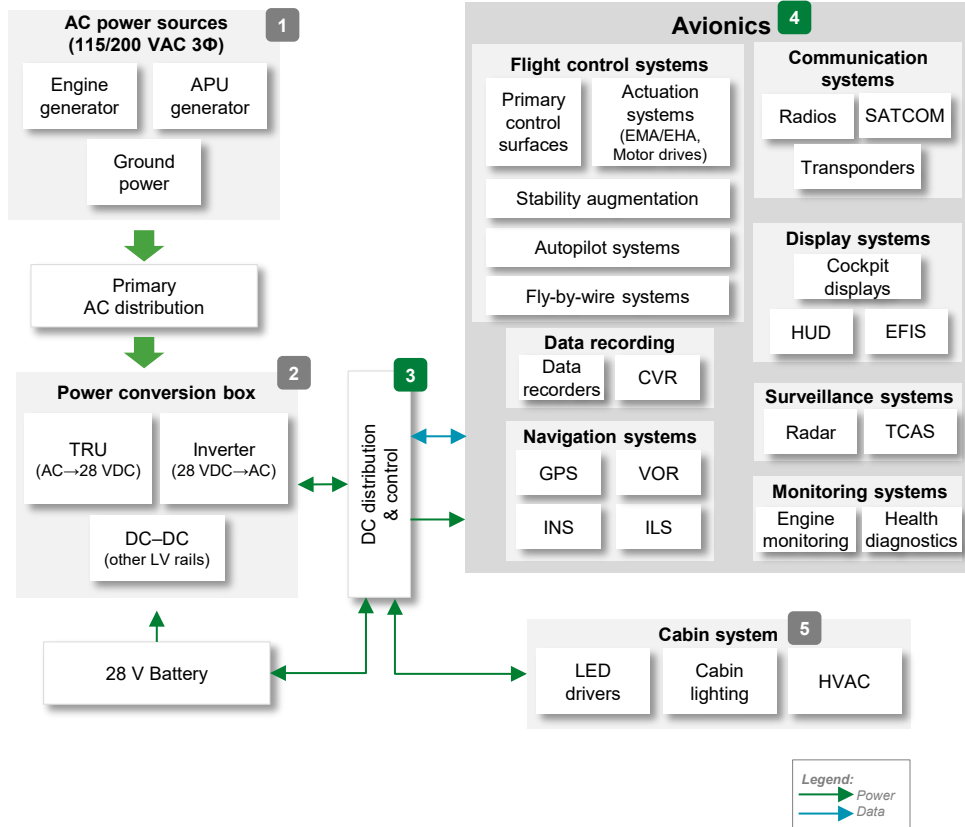
Acronyms:

- APU: Auxiliary Power Unit
- TRU: Transformer Rectifier Unit
- CVR: Cockpit Voice Recorder
- GPS: Global Positioning System
- VOR: VHF Omnidirectional Range
- INS: Inertial Navigation System
- ILS: Inertial Landing System
- SATCOM: Satellite Communication
- HUD: Head-Up Display
- EFIS: Electronic Flight Instrument System
- TCAS: Traffic Collision Avoidance System
- HVAC: Heating, Ventilation, & Air Conditioning

	Technology	Function in application	Product series
1	Fuse	AC feeder (250–500 VAC) branches overcurrent protection; time delay only for inrush (transformers, motor loads)	592/594 (fast), 593 (time delay) (MIL-grade Fuses)
	MOV	AC distribution hubs to absorb high-energy lightning/inductive surges before they propagate	AUMOV , SM10 (AEC-Q qualified) QPL , TX Hi-Rel (DSCC Qualified)
2	Rectifier Diode	Converts AC line voltage to DC	AC Bridges , Diode Modules , Rectifier
	Power Diode	Rectification	Power Diode
	IGBT Discrete	AC–DC and DC–AC power conversion	IGBT
	IGBT Module OR SMPD		IGBT Module OR SMPD
	Si MOSFET		Si MOSFET
	SiC MOSFET	High power switching with efficiency, thermal capability, and reliability	SiC MOSFET
	Gate Driver	Controls SiC and IGBTs switching safely and efficiently	IX4352NEAU
	Fuse	Isolates TRU faults from 28 V bus	263 PICO® Fuse , MICRO™ 262/268/269 (MIL-grade Fuses)
	TVS Diode	Clamps fast-switching spikes from DC–DC converters	SMBJ-HR/HRA , SMDJ-HR/HRA (DO-160 compliant)

Commercial aircraft block diagram & Littelfuse solutions

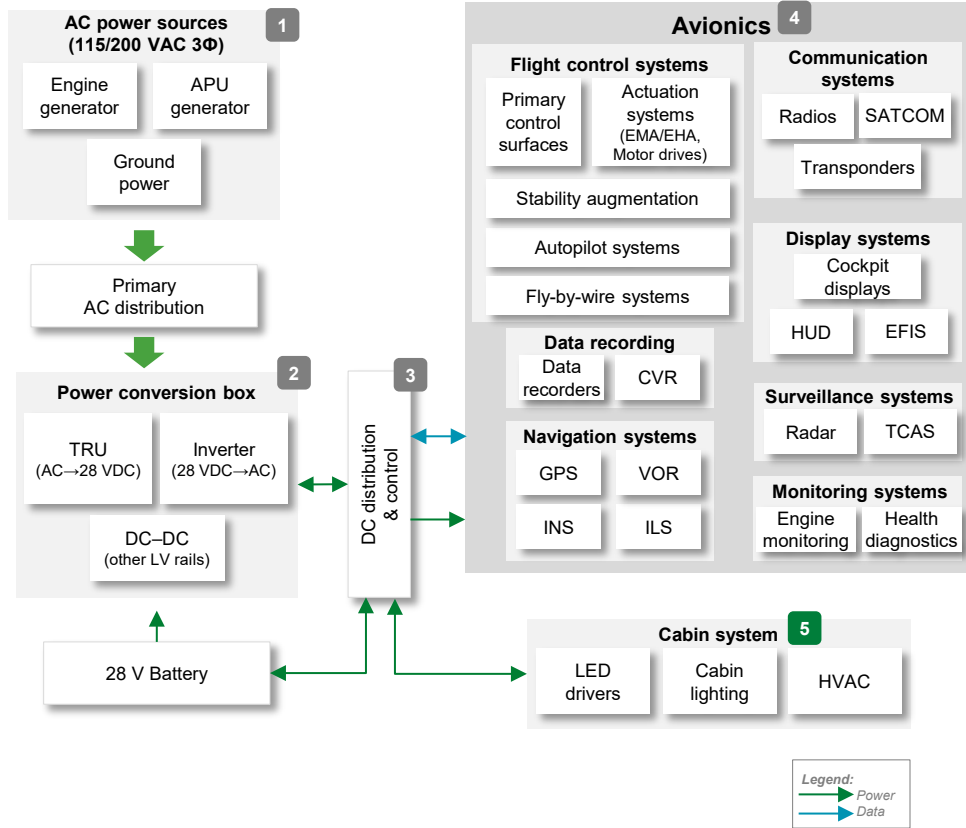
Click on the product series in the table below for more info



	Technology	Function in application	Product series
3	Fuse (Branch)	Source-end branch fusing protects wiring and isolates LRU faults	441A, 501A (AEC-Q compliant) 263 PICO® Fuse, MICRO™ (MIL-grade Fuses)
	TVS Diode	Fast transient protection on feeders and control I/O	SMBJ/SMDJ-HR/HRA (DO-160 compliant)
	MOSFET	Semiconductor switch	Si/SiC MOSFET
4	Fuse	PCB-level, low-amp electronics protection	441A, 501A (AEC-Q compliant) 263 PICO® Fuse, MICRO™ (MIL-grade Fuses)
	TVS Diode	ESD protection on power rails, sensor inputs, & I/O interfaces	SMBJ-HR, SMDJ-HR (DO-160 compliant)
	TVS Diode	High-energy transient separation on avionics power and I/Os	SM15KPA-HR/HRA, SM30KPA-HR/HRA, SMLCE/SMCLCE-HR/HRA (DO-160 compliant)
	C&K® Switch	Controls for avionics & cockpit interfaces	MIL-DTL-83731F (Toggle) 8020, PBA (Pushbutton)
	IGBT Discrete	AC-DC and DC-AC power conversion	IGBT
	IGBT Module OR SMPD		IGBT Module OR SMPD
	Si MOSFET		Si MOSFET
	SiC MOSFET	High-power switching with efficiency, thermal capability, and reliability	SiC MOSFET
Gate Driver	Controls SiC and IGBTs switching safely and efficiently	IX4352NEAU	

Commercial aircraft block diagram & Littelfuse solutions

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



	Technology	Function in application	Product series
5	TVS Diode	LED drivers and lighting power transient protection	SMBJ-HR/SMDJ-HR (DO-160 compliant)
	Power Diode	Rectification	Power Diode
	C&K® switch	User interface for cabin systems (lighting, HVAC, etc.)	MIL-DTL-83731F (Toggle) 8020, PBA (Pushbutton)
	Connectors	MIL-Grade wire-to-wire interconnects	AeroSplice® (MIL-grade)
	Si MOSFET	Semiconductor switch	P-Channel
	EIS Wiring Harness	Custom aircraft wiring system	Custom Wiring Harness

Littelfuse solutions for eVTOL



1

HV battery pack

Fuse, TVS Diode, TTape™



2

HVDC junction box

Fuse, Current Sensor, TVS Diode, HVDC Contactor



3

Power management

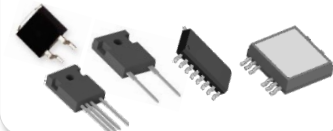
Fuse, TVS Diode, MOSFET, Gate Driver



4

Inverter

IGBT, SiC MOSFET, SiC Diode, Gate Driver, SMPD



5

Avionics

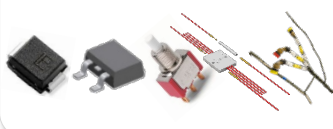
Fuse, TVS Diode, C&K® switch



6

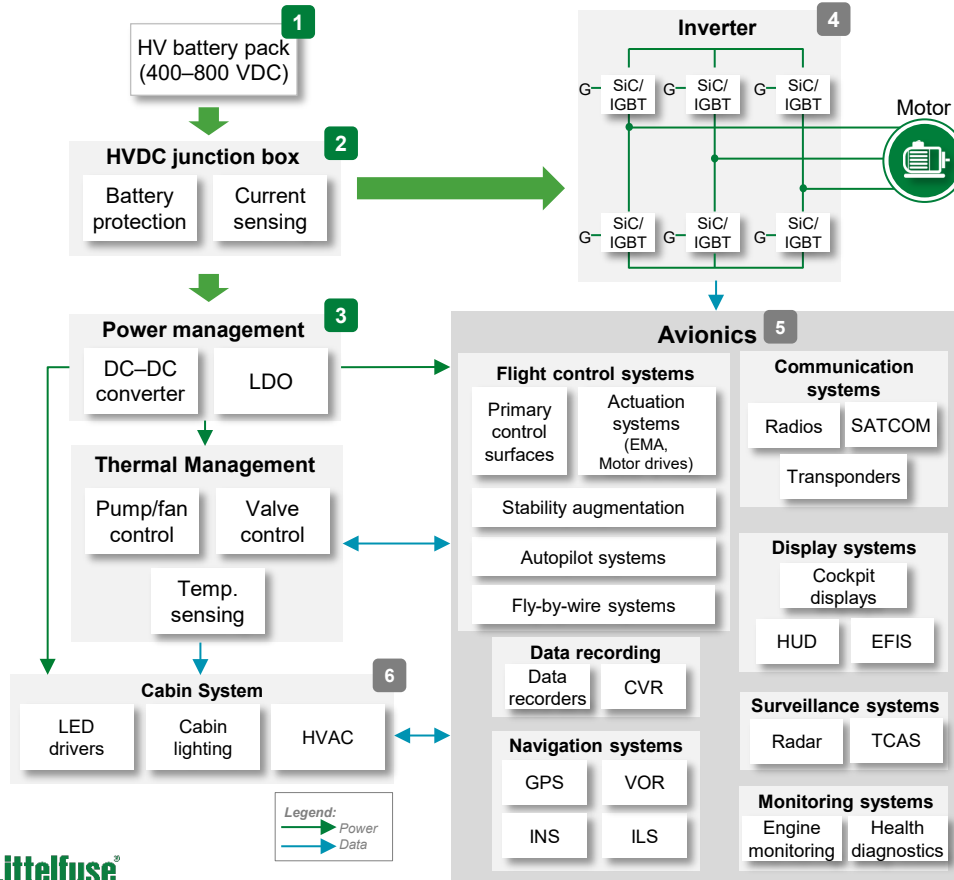
Cabin system

TVS Diode, MOSFET, Switch, Connectors, Wire Harness



eVTOL block diagram & Littelfuse solutions

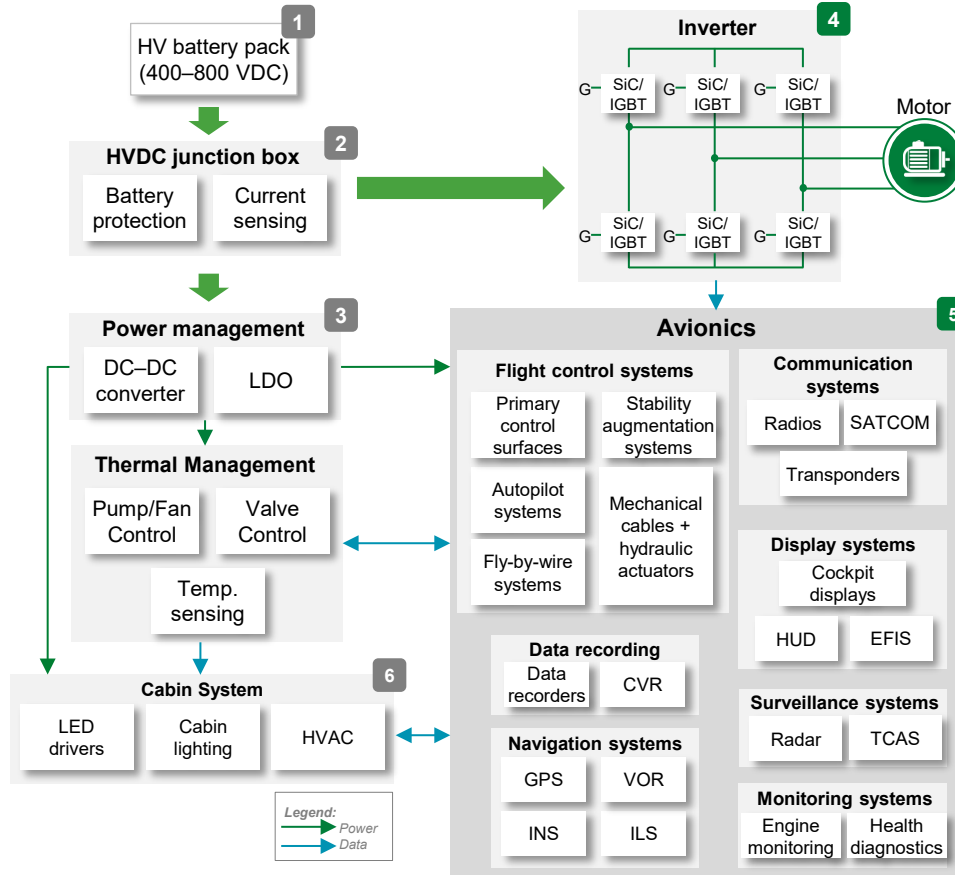
Click on the product series in the table below for more info



	Technology	Function in application	Product series
1	Main Fuse	Main traction protection at the battery output (400–1000 VDC)	30EV1K, 25EV1K (AEC-Q compliant)
	Sense-line Fuse	Protects cells and BMS components from overcurrent	437A, 483A, 438A (AEC-Q compliant)
	TTape™ Platform	Overtemperature monitoring	TTP
	TVS Diode	Transient suppression to protect BMS electronics and sensor I/O	TPSMA6L/SD05 (AEC-Q compliant) SMBJ-HR/SMCJ-HR (DO-160 compliant)
	TVS Diode Array	Protects from ESD, EFT, and voltage transient	AQ05C/AQ1205, AQ24COM-02, AQ24COM-01 (AEC-Q compliant)
2	Main Fuse	Short circuit and overload circuit protection	30EV1K, 25EV1K, 38EV (AEC-Q compliant)
	Auxiliary Fuse	HV Fuse (branch to inverters/auxiliary HV loads)	827, 828 (AEC-Q compliant)
	Current Sensor	Measure the overall current in the system	CH1S01xB, CH1B02xB, CH1B03xB, CH1B04xB
	HVDC Contactor	Protects main contactors from excess inrush current	DCNHExx
	TVS Diode	Surge and transient protection	TP5_0SMDJ (AEC-Q compliant) 441A, 501A (AEC-Q compliant)
3	Fuse	Protects LV feeder (avionics and flight control)	263 PiCO® Fuse, MICRO™ (MIL-grade Fuses)
	TVS Diode	Clamps fast switching spikes from DC–DC converters	SMBJ-HR/HRA, SMDJ-HR/HRA (DO-160 compliant)
	MOSFET	High-efficiency switching for DC–DC converter	Si/SiC MOSFET
	Power Diode	Rectification	Power Diode
	Gate Driver	Controls MOSFETs switching safely & efficiently	IXD 6xxSI, IX4352NEAU (AEC-Q compliant)

eVTOL block diagram & Littelfuse solutions

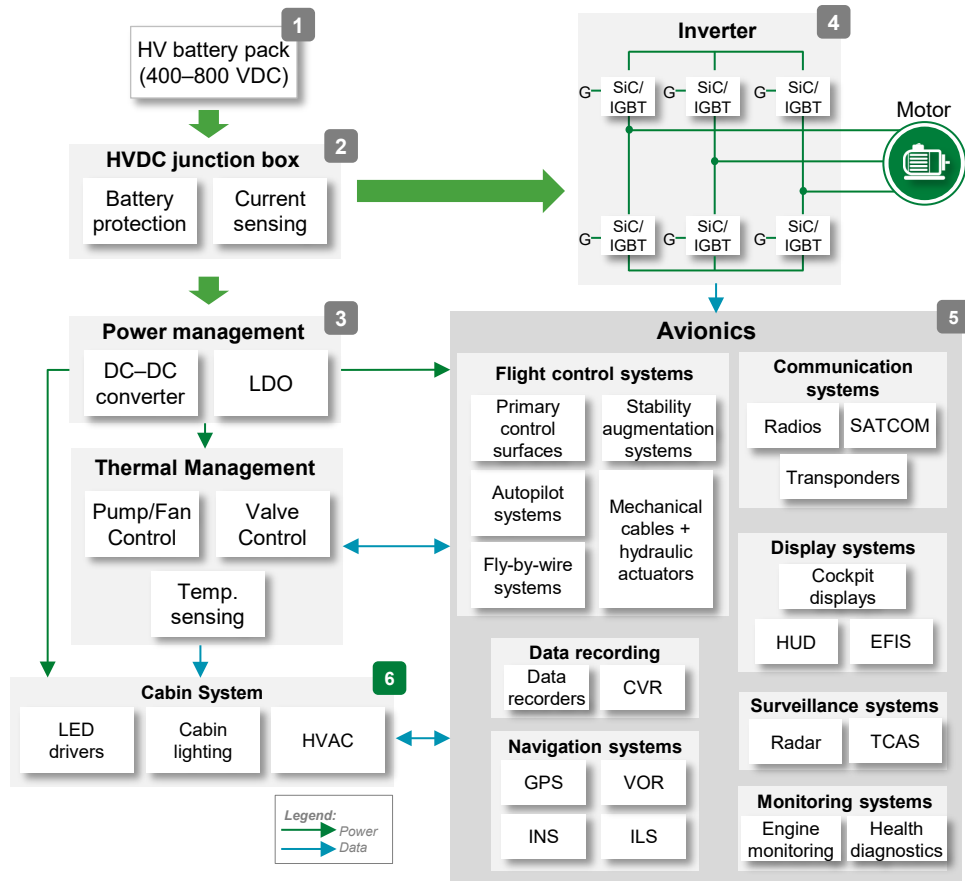
Click on the product series in the table below for more info



	Technology	Function in application	Product Series
4	IGBT Discrete	High-efficiency switching for inverter stage driving eVTOL propulsion motor; SiC technology allows for smaller die size per voltage or current rating and better efficiency	IGBT
	IGBT Module Or SMPD		IGBT Module OR SMPD
	SiC MOSFET		SiC MOSFET , SMPD
	Si/SiC Diode		Si/SiC Diode
	Gate Driver		IXD 6xxSI , IX4352NEAU (AEC-Q compliant)
5	TVS Diode	Active clamping for IGBT; gate protect for SiC MOSFET	TPSMB , SZ1SMB , SZP6SMB , TPSMBASY
	Fuse	PCB-level, low-amp electronics protection	253 or 262/268/269 (MIL-grade Fuses) 437A , 483A , 438A (AEC-Q compliant)
	TVS Diode	ESD protection on power rails, sensor inputs, & I/O interfaces	SMBJ-HR/SMDJ-HR (DO-160 compliant) SM15KPA-HR/HRA , SM30KPA-HR/HRA , SMBLCE/SMCLCE-HR/HRA (DO-160 compliant)
	TVS Diode	High-energy transient separation on avionics power & I/Os	MIL-DTL-83731F (Toggle) 8020 , PBA (Pushbutton)
	C&K® switch	Controls for avionics & cockpit interfaces	
	IGBT Discrete	AC-DC and DC-AC power conversion	IGBT
	IGBT Module OR SMPD		IGBT Module OR SMPD
	Si MOSFET		Si MOSFET
	SiC MOSFET	High-power switching with efficiency, thermal capability, and reliability	SiC MOSFET
	Gate Driver	Controls SiC and IGBTs switching safely and efficiently	IX4352NEAU

eVTOL block diagram & Littelfuse solutions

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



	Technology	Function in application	Product series
6	TVS Diode	LED drivers and lighting power transient protection	SMBJ-HR/SMDJ-HR (DO-160 compliant)
	Power Diode	Rectification	Power Diode
	C&K® switch	User interface for cabin systems (lighting, HVAC, etc.)	MIL-DTL-83731F (Toggle) 8020, PBA (Pushbutton)
	Connectors	MIL-Grade wire-to-wire interconnects	AeroSplice® (MIL-grade)
	Si MOSFET	Semiconductor switch	P-Channel
	EIS Wiring Harness	Custom aircraft wiring system	Custom Wiring Harness

Manufacturing capabilities for aerospace and defense

Bremerhaven, Germany



- EWIS and electronics products for aviation and defense systems
- Production, QA, and testing
- **Quality certifications:**
 - ISO 14001
 - **EN 9100**
 - EASA/LBA

Dole, France



- Switches and connectors for aerospace and defense
- Production, QA & testing, and logistics
- **Quality certifications:**
 - ISO 9001, ISO 14001,
 - **EN9100/AS9100D/JISQ 9100**
 - ESA, MIL, and NASA

Wuxi, China

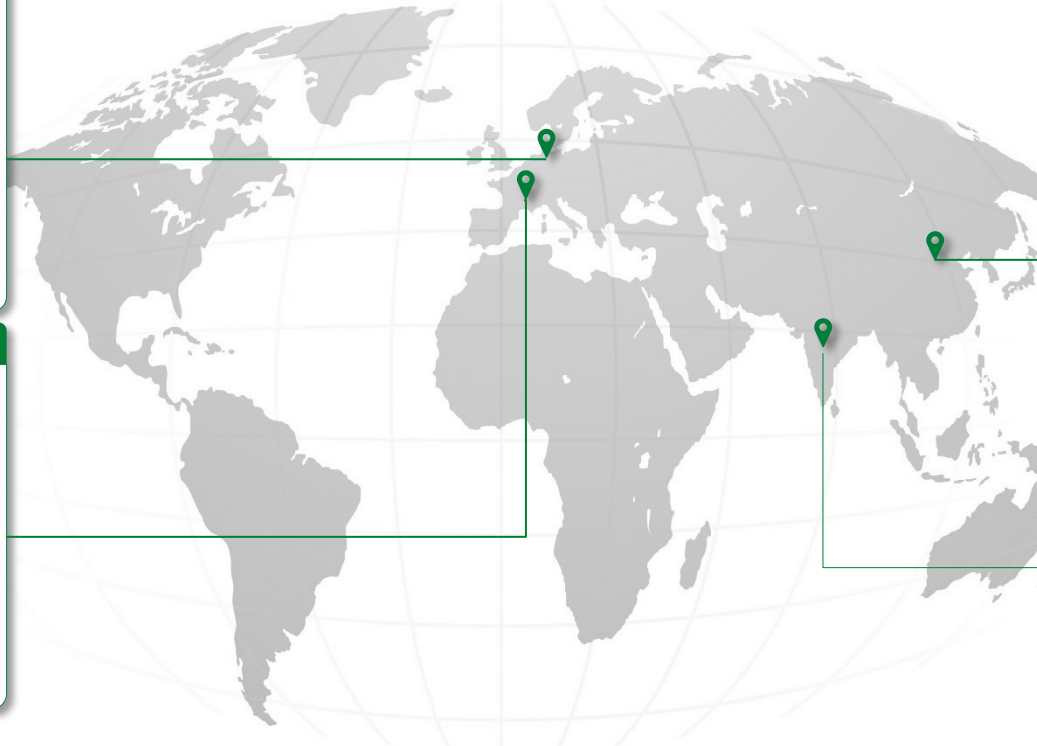


- **Quality certifications:**
 - RTCA/DO-160 Standard (Environmental conditions and test procedures for airborne equipment)
 - MILSTD-704
 - MIL-PRF-19500
 - **AS9100**

Kanpur, India



- EWIS for aviation and defense systems
- Production, QA & testing, and logistics
- **Quality certifications:**
 - ISO 14001
 - **AS 9100D**

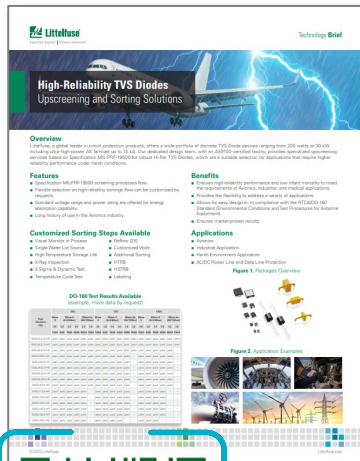


Additional information can be found at Littelfuse.com

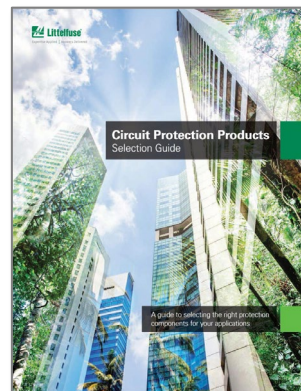
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Aerospace Application Guide

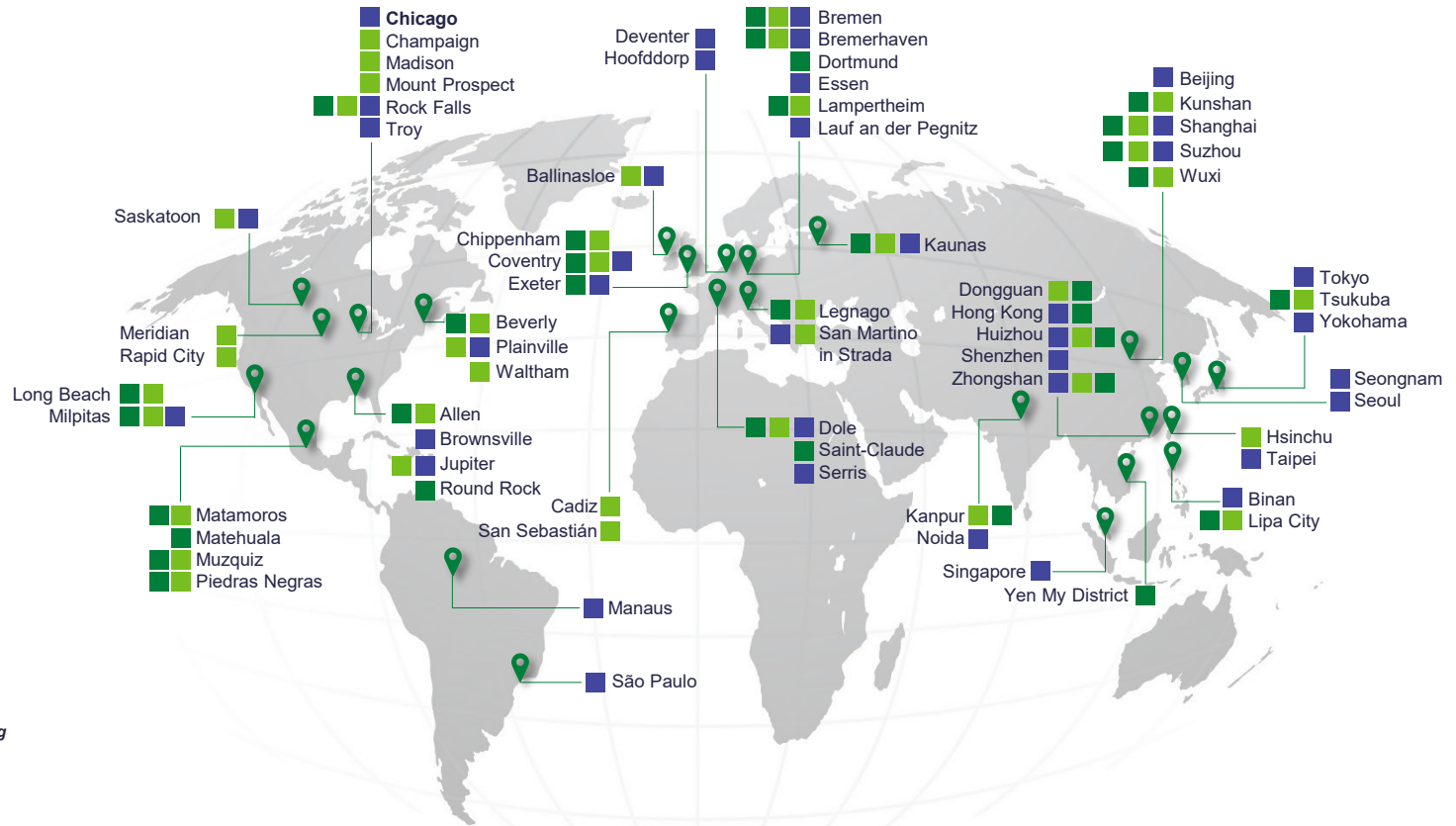


High-Reliability TVS Diode Guide



eCatalogs

Local resources supporting our global customers



Legend
 ■ Sales
 ■ R&D
 ■ Manufacturing

Partner for tomorrow's electronic systems

Broad Product Portfolio

We are an industrial technology manufacturing company empowering a sustainable, connected, safer world.

Testing Capabilities

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

Application Expertise

Our engineers partner directly with customers to help accelerate product design and to meet their unique needs.

Compliance and Regulatory

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

Global Customer Service

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

Global Manufacturing

Our high-volume manufacturing is committed to the highest quality standards.



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