Littelfuse®

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Personal care and healthcare devices

Appliances

Healthcare

REV0722

Personal care and healthcare products are becoming important aspects of everyday life

The personal care and healthcare monitoring device market is growing globally at a CAGR of ~6%

Market trends and drivers

Personal care and healthcare monitoring devices are becoming smarter, smaller, and battery powered with many electronic and sensing features

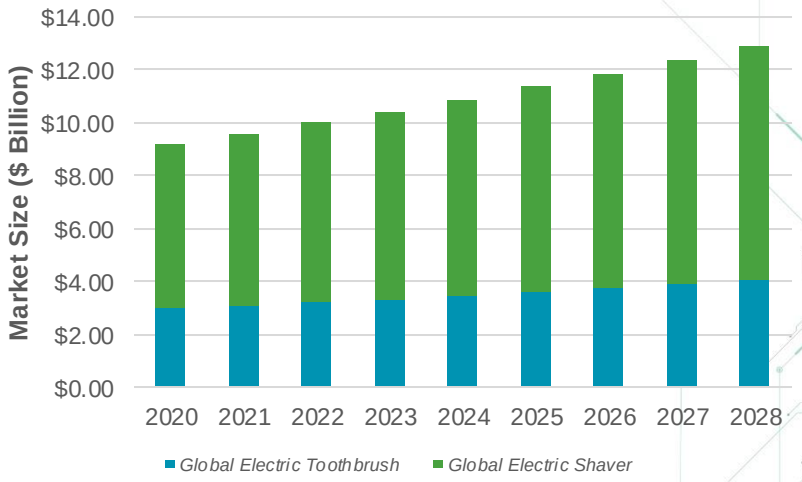
The personal care electrical appliances market size was valued at $19.6 billion in 2020 and is projected to reach $42.5 billion by 2031, at CAGR 7%

The global market for consumer healthcare devices has been estimated reach $21.8 billion by 2027, steadily growing at a steady CAGR of 5%

Global health and wellbeing awareness is driving strong market growth of devices such as electric toothbrushes, blood pressure meters, heart rate monitors, as well as other innovative electronic healthcare products

Increased emphasis on incorporating AI technologies with use of real-time monitoring, recording, and reporting of information ➔ increased use of electronic components and connectivity with mobile devices

Personal care market projection



Sources: Electric Toothbrush Market, Electric Shaver Market, Personal Care Market Report, Self-care Medical Devices Market Report

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Design complexities increasing as personal care and healthcare devices include more capabilities

Key design challenges	Littelfuse value proposition
Faster time to market → engineers are under pressure to release new designs more frequently with new and advanced features	Littelfuse UL/IEC certified devices can help reduce customer qualification time + Littelfuse can assist with global certifications, regulatory standards, and testing
Extended battery life → Longer battery life and faster charging to extend equipment up-time	Low resistance battery protection devices can help provide overcurrent and over-temperature protection while maximizing battery device run time & charging
Innovative and compact designs → small PCB designs needed to meet new ergonomic and aesthetic features + improve user end-product experience	Features such as small SMD packages enable for more compact designs and greater layout flexibility

Littelfuse helps designers improve safety, reliability, and efficiency + offers more design flexibility

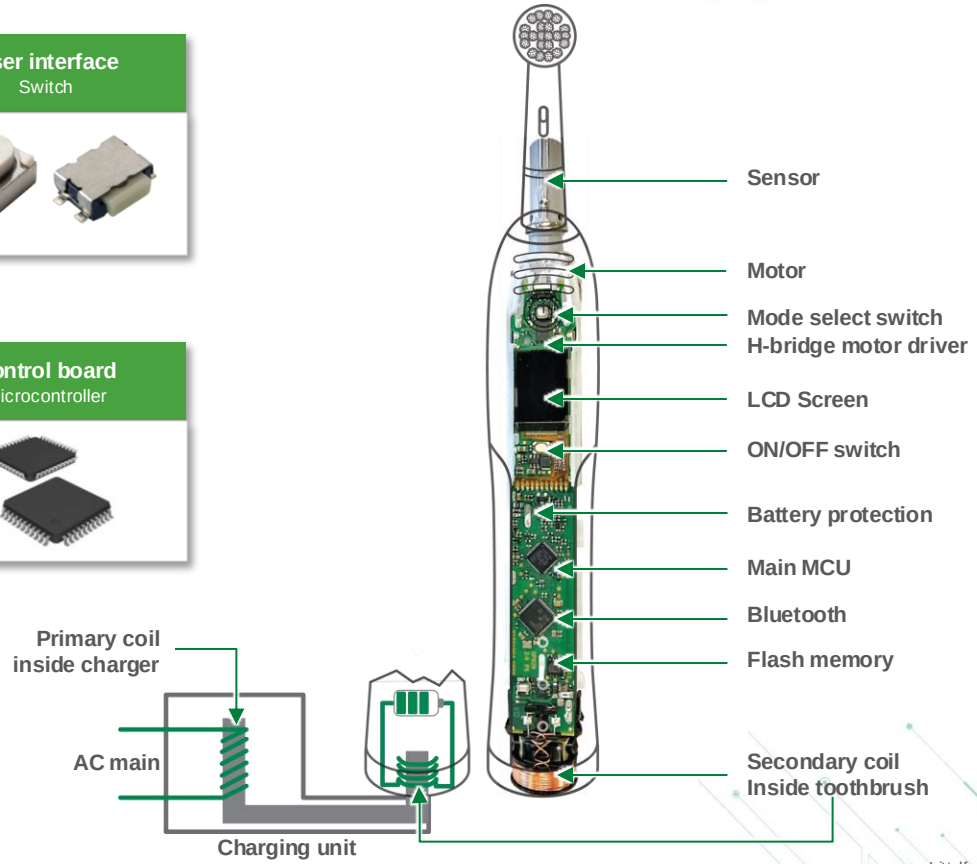
Examples of Littelfuse products found in personal care and healthcare devices

AC input protection
Fuse

User interface
Switch

Battery protection
PPTC, TVS Diode, NTC

Control board
Microcontroller



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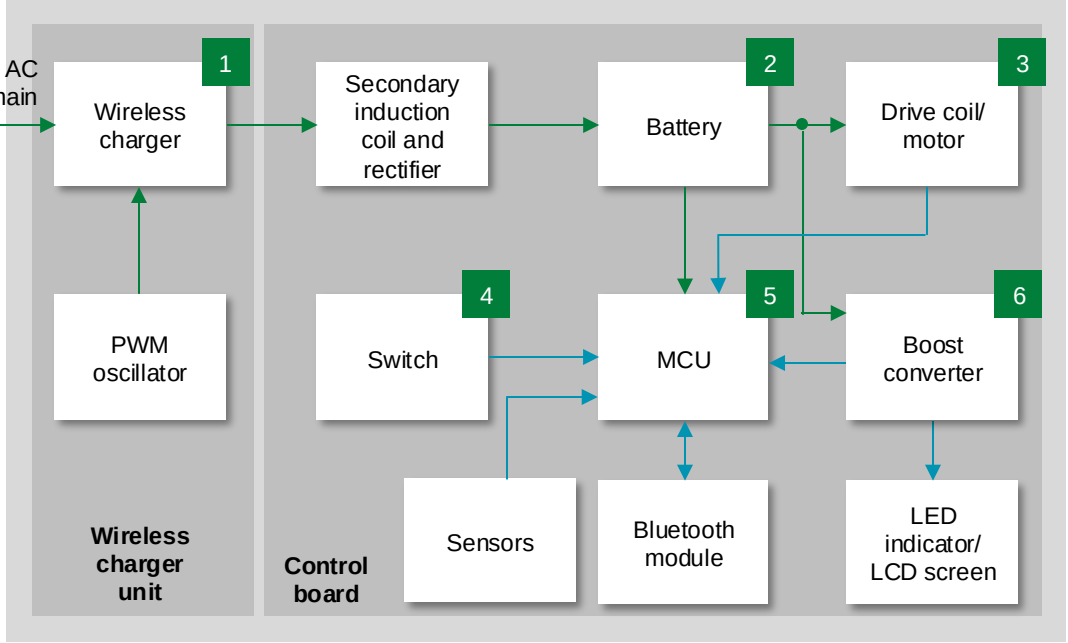
Many personal care and healthcare devices share a similar system architectures

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



	Technology	Series
1	UL, IEC listed AC fuse	Axial/Radial (875) TR/TE (389)
2	PPTC	0805L, 1210L
	Fuse	494
	TVS Diode	P4SMA12A
	NTC	KR
3	PPTC	0805L, 1210L
4	Switch	PTS815, KMS
5	MCU	S3F8S15, S3F8S19, S3F8S24, S3F8S28, S3F8S35, Z8F1625*
6	PPTC	0805L, 1210L

** New product, please contact sales for detail*

Features and benefits of Littelfuse products found in typical personal care and healthcare devices

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

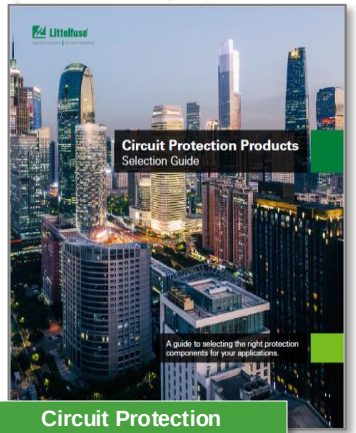
	Technology	Function in application	Product series	Benefits	Features
1	AC fuse	Protects the power stage from overcurrent events	Axial/Radial (875) TR/TE (389)	Reduces customer qualification time by complying with regulatory safety standards, such as UL/IEC	Compliant with UL/IEC standards; low internal resistance; shock safe; vibration resistant
2	PPTC	Protects battery from short circuit or over-current events	0805L, 1210L	Resettable protection, space-saving by enabling use of smaller TVS diode, low resistance enables longer battery life and faster charging	PolySwitch devices with low internal resistance; higher current holding in smallest SMD package
	Fuse		494	Allows for space saving	Surface mount, compact form factor, wide selection of current rating
	TVS diode	Input protection against voltage transients	P4SMA12A	Saves space; promotes more robust operation	Small form factor; excellent clamping
	NTC	Temperature sensing	KR	Promotes more robust operation; allows design flexibility	Surface mountable; small form factor
3	PPTC	Protects motor drive MOSFETs from overcurrent such as short-circuit or across the motor windings	0805L, 1210L	Resettable devices protects when needed and can resume operation when OK again, board space saving; enables overall better user experience	Low internal resistance; higher current holding in smallest SMD package
4	Switch	Turns unit on/off, selects speed, and function	PTS815, KMS	Saves space; reliable and repeatable haptic performance elevates end-users' experience	C&K Switch Microminiature, short travel, PCB mount tactile with a minimum of 100 k-operations
5	MCU	Controlling specific functions such as turning on/off motor function and others	S3F8S15, S3F8S19, S3F8S24, S3F8S28, S3F8S35, Z8F1625*	Simplifies design; low power consumption; smaller compared with 32-bit MCU (20-SSOP/SOP); available in pellet/die for chip on board	Robust to EFT (4 kV) and ESD; low power 5 V operation; LCD ON & IDLE mode: 2.5 µA; Precision Internal Oscillator : ±1% @1.8 V~5.5 V and 25 ºC; STOP mode: 1 µA
6	PPTC	Protects the boost converter and LCD screen from inrush current damage during startup	0805L, 1210L	Board space saving; promotes robust operations	Low internal resistance; higher current holding in smallest SMD package

Select standards that may be applicable for personal care and healthcare medical devices

Standard	Title	General scope	Region
UL 1431	Standard for personal hygiene and health care appliances	These requirements cover household electric products with personal hygienics or health care applications, such as hydromassage units, contact lens disinfectors & cleaners, and toothbrushes, rated at 250 V or less, for use on premises that have wiring in accordance with the National Electrical Code	North America
IEC 60335	Household and similar electrical appliances−Safety–Part 1: General requirements	This standard deals with the safety of electrical appliances for household and similar purposes and their rated voltage being not more than 250 V for single-phase appliances and 480 V for other appliances, including direct current (DC) supplied appliances and battery-operated appliances	Global
UL 2054/1642	Household and commercial batteries	Safety standards that deal with cells and small portable batteries; UL1642 is applied to individual cells, whereas UL2054 is for small rechargeable battery packs	North America
IEC 62133-2 & UL 62133-2	Safety requirements for portable sealed secondary lithium cells	Evaluating protection during various battery-fault scenarios	Global
IEC 62368-1	Audio/video, information, and communication technology equipment–Part 1: safety requirements	This part of IEC 62368 is a product safety standard that classifies energy sources; prescribes safeguards against those energy sources; and provides guidance on the application of, and requirements for, those safeguards	Global

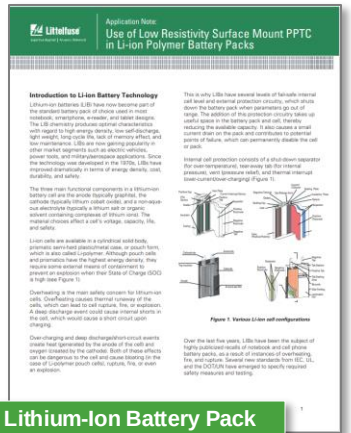
Additional information can be found at Littelfuse.com

Explore the world of Littelfuse products and applications with eCatalogs (ecatalogs.littelfuse.com)

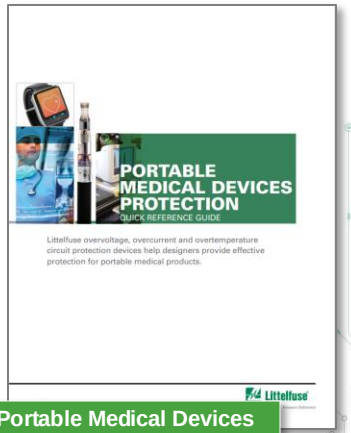


Circuit Protection Selection Guide

Sensing Products Selection Guide

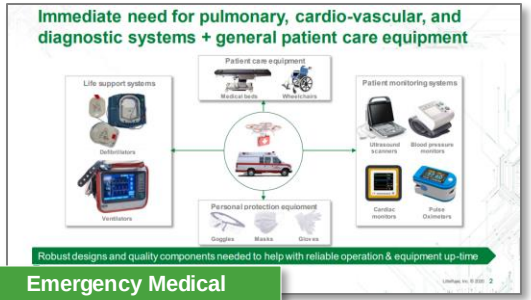


Lithium-Ion Battery Pack Protection with PPTC

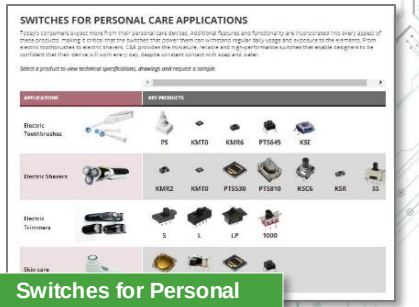


Portable Medical Devices Protection Guide

Click on images for more information



Emergency Medical Equipment Spotlight



Switches for Personal Care Applications

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Legend

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- *R&D*
- *Manufacturing*

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