

# Circuit Protection Infotainment Application Examples

Navigation, Audio, Video, ...

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# Navigation System – Infotainment

(car audio, video, nav systems, fleet management, ...)

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- A lot of sensitive components in a human driven interface
  - Our portfolio of circuit protection devices help protect them
- See next slide



# Our Devices Protect Infotainment Functions

<http://www.circuitprotection.com/applications/navigation.asp>

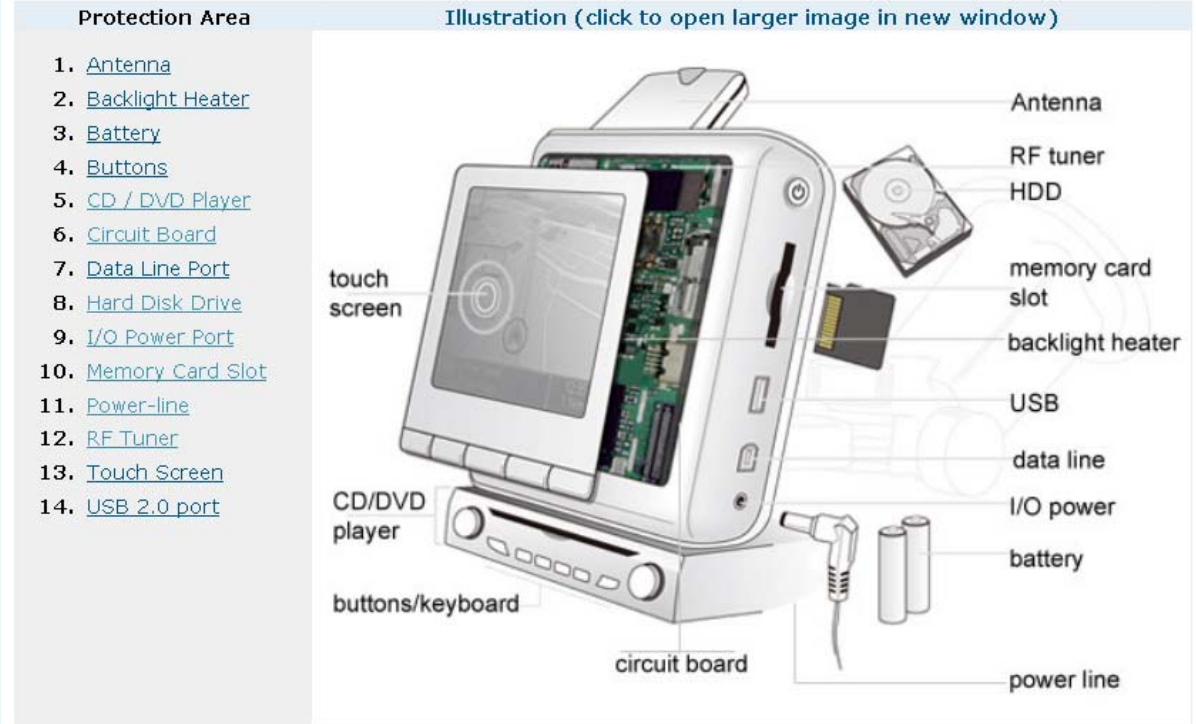
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## In-Car Navigation System

**System View** | Block Diagram



# Our Devices Protect Infotainment Functions

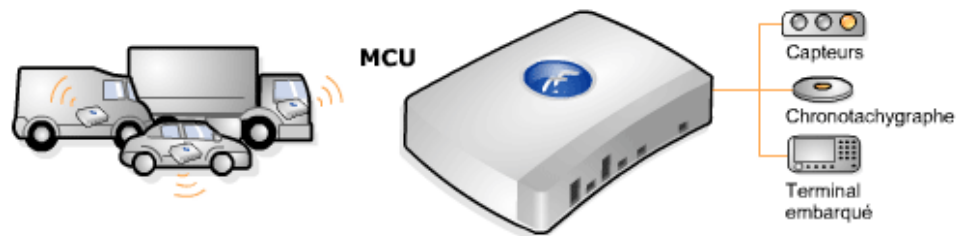
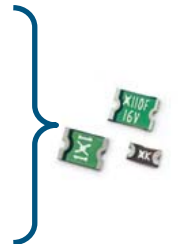
Function	Problem	Solution
Antenna	ESD	PESD
Backlight Heater	Thermal runaway	PolySwitch
Battery	over temperature, overcurrent	PolySwitch
Buttons	ESD	PESD
CD/VDV Player	overtemperature, overcurrent (solenoid, spindle motor)	PolySwitch
Circuit Board	over temperature, overcurrent	PolySwitch
Data Line Port	overcurrent	PolySwitch
Hard Disk Drive	overtemperature, overcurrent (solenoid, spindle motor)	PolySwitch, chip fuses, PolyZen
I/O Power Ports	Inductive voltage spikes and overcurrent from a short-circuit	PolySwitch, PolyZen
Memory Card Slot	ESD, Overcurrent (in-rush) Limiting	PESD, PolySwitch
Power-line	over temperature, overcurrent	PolySwitch
RF/TV Tuner	ESD	PESD
Touch Screen	ESD	PESD
USB 2.0 Port	ESD, Inductive voltage spikes and overcurrent from a short-circuit	PESD, PolySwitch

# Fleet Management System

(truck tracking, GPS, navigation, local radio, ...)

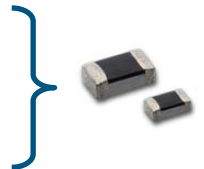
## Overcurrent

- Pwer Supply protection (36V): SMD150 x 2
- Output Relay protection: SMD100 x 2
- Antenna protection: miniSMDC050 x 2
- CAN Bus protection: miniSMDC050
- USB port protection: miniSMDC110



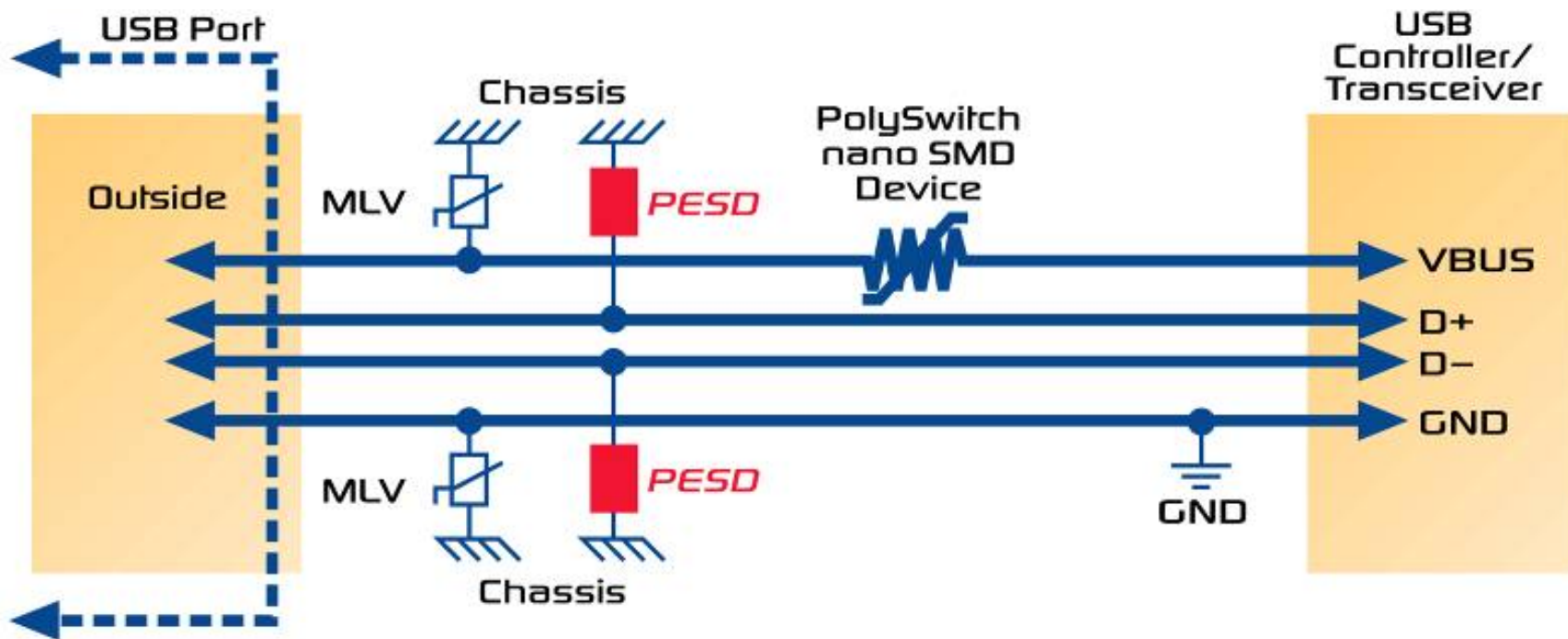
## ESD

- Antenna protection: PESD0402
- Touch screen protection: PESD0402

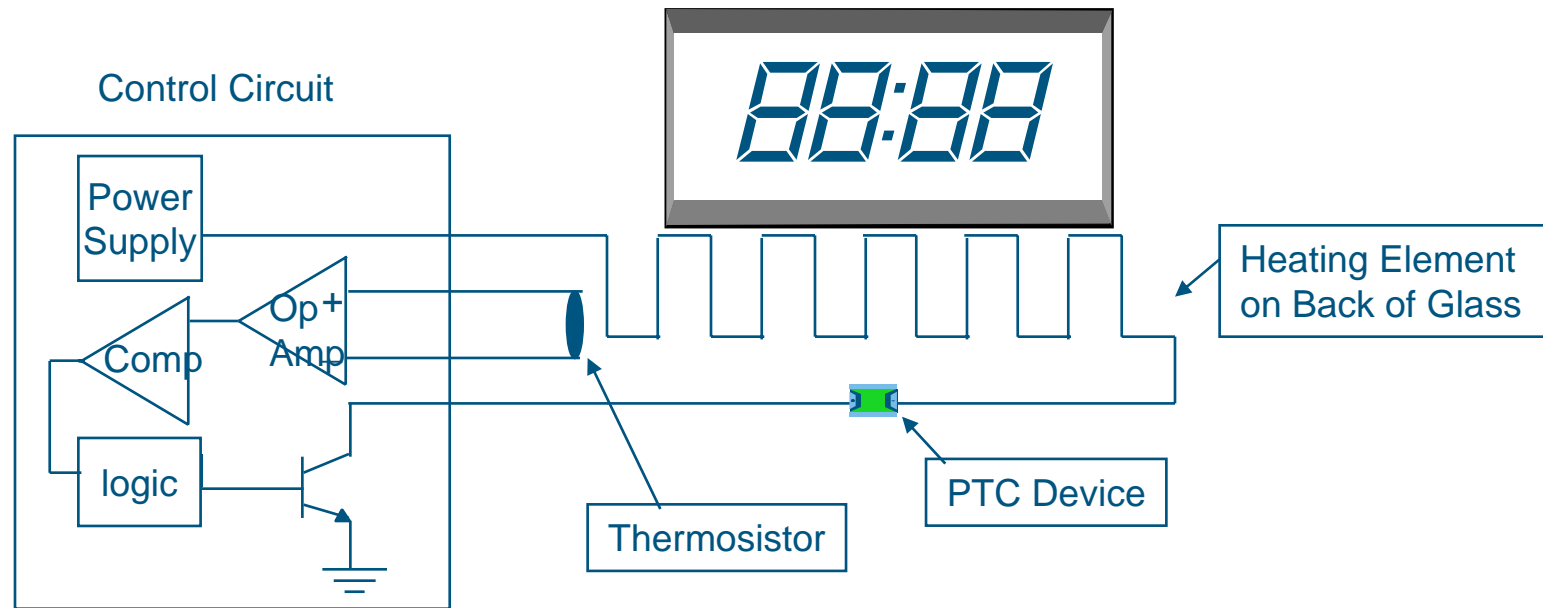


# Portable USB 2.0 ESD Protection

- Power lines: capacitance is not an issue → MLVs
- Data lines: capacitance is critical → PESD devices



# Over Temperature - Thermal Run-Away Protection of LCD Heater Element



PPTC device thermally linked to LCD glass

→ If the control circuitry fails to turn off heating element, the PPTC device will “thermally trip” and reduce current flowing through the heating element

# Portable GPS System

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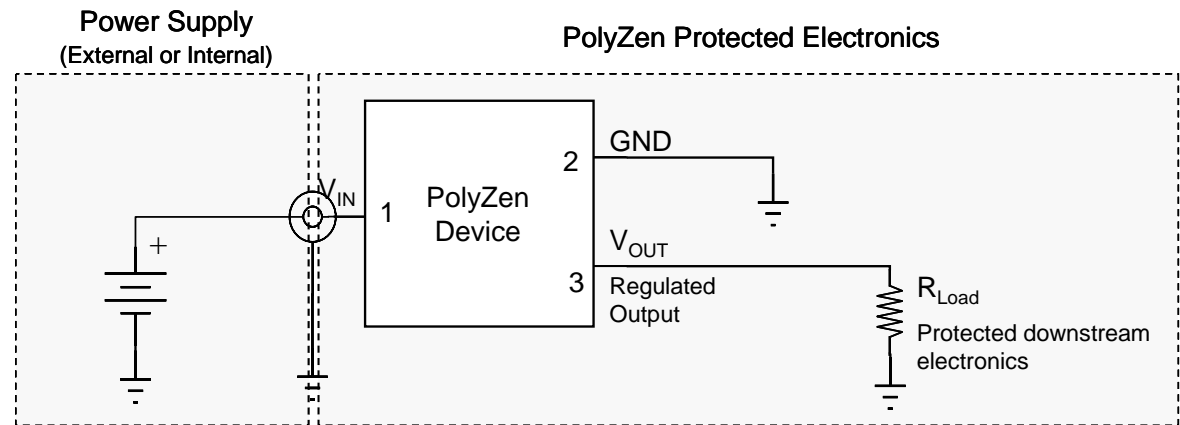
- In Automotive environment, the power supplied by the cigarette lighter can be very unstable  
→ Our Polyzen provides great and complete protection; it helps improve the equipment reliability by protecting the DC input jack
- Designers can also replace their high voltage DC-DC IC to a lower voltage DC-DC IC and save total system cost
- ZEN056V130A24LS replaces the previous PPTC + TVS solution





# GPS+GPRS Automotive Terminal

- The PolyZen ZEN132V130A24LS device protects the power port against O/C and O/V



# Cigarette-Lighter Adapters Vehicle Power Adapters

## After-Market

- Resettable circuit protection devices are ideal to counter possible customer abuse
  - PolySwitch RTEF120, RTEF135 or RTEF190 in CLA or VPA for cell phones
  - PolyZen ZEN056V130A24LS in CLA for Ipod and iPhone; tune base FM transmitter



# Forward/Feed-Thru Protection/Isolation

Typical circuit where power is passed through the module to the load

- Ex: car radio feeding power to remote CD changer

