

# Temperature sensing for infotainment and cluster



Automotive manufacturers place a strategic focus on infotainment systems as they seek to improve both the driver and passenger experience. Today's infotainment systems consist of the head unit, cluster, premium audio and media interfaces. Prevalent features include voice activated navigation, large touch screens, wireless connectivity and advanced audio/video capabilities.

Head units are located in the center console between the driver and front passenger seat, while clusters are located behind the steering wheel. These small enclosures limit airflow and increase the risk of damage to the application processors and LCD displays due to high temperatures. The [TMP235](#) has a wide operating temperature range and can monitor the system temperature with  $\pm 2.0^{\circ}\text{C}$  accuracy. The [TMP235](#) is currently in production, and there is an automotive qualification to follow.

The audio system consists of multiple speakers that are driven by high power audio amplifiers. The [LMT87-Q1](#) is a precision low-power analog output device that can help mitigate the risk of overheating the audio system by monitoring the amplifier temperature with a  $2.7^{\circ}\text{C}$  (max) accuracy.

The USB charging port is located in the media interface, which is positioned in front of the center console.

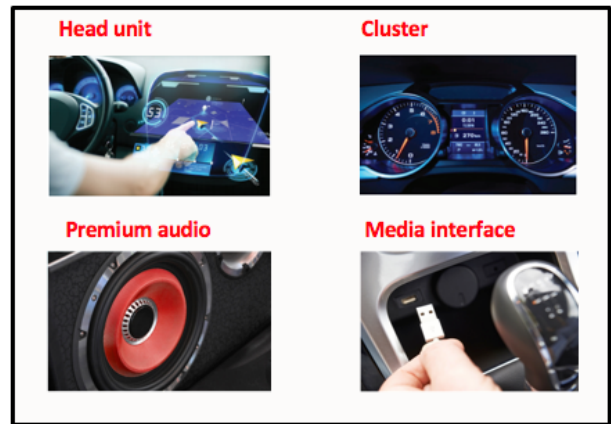


Figure 1. Automotive infotainment system

The DC/DC converters and charge port controllers may overheat due to excessive heat dissipation during charging. The alert signal of the [TMP302-Q1](#) temperature switch can be connected to the charge port controller, which will disable charging when a temperature threshold is exceeded.

The TI automotive temperature sensor portfolio features both low cost and high accuracy temperature sensor products that simplify temperature measurement. Additionally, TI's integrated circuit solutions have the following advantages over thermistors:

- No device-level calibration required
- Highly linear temperature response
- Fewer external support components required

Part number	Interface	Accuracy	Supply range	Package type	Package footprint
<a href="#">*TMP235-Q1</a>	Analog	2.0°C, -40°C to +150°C	2.3 V to 5.5 V	SC70	2.00 x 1.25 mm
<a href="#">LMT87-Q1</a>	Analog	2.7°C, -50°C to +150°C	2.7 V to 5.5 V	SC70	2.00 x 1.25 mm
<a href="#">TMP302-Q1</a>	Switch	2.0°C, 40°C to +125°C	1.4 V to 3.6 V	SOT-563	1.60 x 1.20 mm

\*pending automotive qualification

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale ([www.ti.com/legal/termsofsale.html](http://www.ti.com/legal/termsofsale.html)) or other applicable terms available either on [ti.com](http://ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2018, Texas Instruments Incorporated