

iND10049 Features

- Arm® Cortex® M0 core with 160kB FLASH and 8kB SRAM memory
- USB 2.0
 - Certified HUB operation with 3 downstream ports
 - Device supporting I2S interface, Mass Storage Class SD Card Read/Write Operation and HID Class microcontroller interface
- Host-to-Host Bridge enables dual role functionality for Apple CarPlay®
- Flexible USB Charging Emulator Terminations enables USB BC1.2 DCP/CDP and support for Apple and Samsung charging detection
- Port-by-port integrated current measurement circuitry
- Protection against USB DP/DM pins to shorted ground and VBUS as well as protection against CC port shorts to ground
- Integrated USB frequency synthesis (external crystal required)
- I2C/SPI Master interface
- Integrated power management unit supports core digital and low-voltage interface
- Robust reset circuitry for automotive environment
- AEC-Q100 Qualified

Applications

- USB 2.0 Hi-Speed HUB with SD Card Reader
- USB HUB with Apple CarPlay and Android Auto support

iND10049

Automotive USB Hub

iND10049 is an Automotive USB HUB with advanced functionality including high-speed 480 MB/S ports, Apple CarPlay and Android Auto, capabilities.

The device is a combination of USB Hub with an integrated USB Device supporting three interfaces: I2S audio interface, Mass Storage Class SD Card Host and a HID Class microcontroller access side-channel. iND10049 can support up to three external downstream ports, each of which can withstand an indefinite short of the DP/DM pins to 5V.

iND10049 also implements a USB Host to Host Bridge component that enables dual role functionality at a downstream USB Hub port, allowing them to connect to a vehicles infotainment system via Apple CarPlay without requiring a special cable.

The device contains a flexible charging emulator termination (FCET) that allow each port to independently function as a USB battery charger. The FCET supports USB BC1.2 DCP/CDP specification as well as support for Apple and Samsung proprietary Charging Modes.

The chip contains a charge measurement function that measures the voltage across an off-chip power control switch to calculate current consumption from VBUS. The charge measurement function also has the ability to issue a microcontroller interrupt if an overcurrent or an over-charge event occurs.

iND10049 features an integrated Arm® Cortex® M0 microcontroller that mediates data transfers to and from the USB Device. The Arm® Cortex® M0 microcontroller can also mediate the handshaking required for successful flexible charging emulator termination implementation. It also includes an integrated power management block (PMU) that allows direct connection to the car battery, from which all the supplies required by the device are generated.

The iND10049 also contains an I2C and a SPI master interface, all of which can be used to communicate with other integrated circuits on a product board.

Ordering Information

Part Number	Operating Temperature	Package
iND10049CDA	-40°C to +125°C	8x8mm, 56-pin QFN 0.5mm pitch

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Preliminary – Features and specifications are subject to change at the discretion of indie Semiconductor.
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In addition to the iND10049, indie offers additional automotive USB HUB solutions iND10050 and iND10051. The table below outlines the unique properties of each device.

Feature Description	iND10049	iND10050	iND10051
SD Card Reader	Yes	No	No
Apply CarPlay / Android Auto Support	Yes	Yes	Yes
Data Hub	Yes	Yes	Yes
Downstream Facing Ports	3	3	2
USB 2.0 HUB	Yes	Yes	Yes
USB Data Rate	480 Mbps	480 Mbps	480 Mbps
USB BC v1.2	Yes (7.5W)	Yes (7.5W)	Yes (7.5W)
USB Type-C Support	No	Yes (15W)	Yes (15W)
USB-PD PHY Controller v3.1	No	Yes	Yes
USB Power Delivery	No	w/External Supply	w/External Supply
LIN/UART/I2C	No	Yes	Yes
SPI, I2S Audio	Yes	Yes	Yes
Package	8x8 mm 56-Pin QFN	8x8 mm 56-Pin QFN	8x8 mm 56-Pin QFN

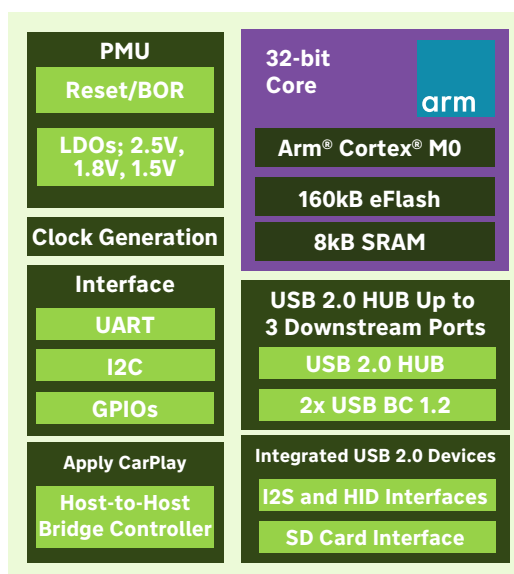


Figure 1. iND10049 Functional Diagram