

iND10051 Features

- USB 2.0
 - Certified HUB operation
 - Device with I2S interface and HID Class microcontroller interface
- Downstream ports: 2
- Host-to-Host Bridge enables dual role functionality for Apple CarPlay®
- Arm® Cortex® M0 core with 160kB FLASH and 8kB SRAM memory
- Integrated Dual USB PD 3.1 controller and support for Type-C connectors
- Flexible USB Charging Emulator Terminations enables DCP/CDP and multiple proprietary DCP charging detection
- 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)
- Integrated power management for core digital
- I2C/SPI Master, UART and LIN interfaces

Applications

- USB 2.0 Hi-Speed HUB
- USB HUB with Apple CarPlay and Android Auto support
- USB PD Charging Downstream Ports with support for Type A and Type C connectors

iND10051

Automotive USB Hub

iND10051 is an Automotive USB HUB with advanced functionality including high-speed 480 MB/S ports, Apple CarPlay and Android Auto, and USB Type C power delivery capabilities.

The device is a USB Hub with an integrated USB Device supporting I2S audio interface and a HID Class microcontroller access side-channel. iND10051 can support up to two external downstream ports, each of which can withstand an indefinite short of the DP/DM pins to 5V.

iND10051 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.

iND10051 features two integrated USB-PD 3.1 controllers and port control and configuration channel (CC) for support of USB Type-C connectors.

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. In addition, the dual integrated USB PD 3.1 controllers reduce the cost of implementing a data plus power solution.

iND10051 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) directed connected to the car battery, from which all the supplies require by the device are generated.

The iND10051 also contains an I2C, SPI master interface, UART, and LIN interface, all of which can be used to communicate with other integrated circuits on a product board.

Ordering Information

Part Number	Operating Temperature	Package
iND10051CDB	-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 iND10051, indie offers additional automotive USB HUB solutions iND10049 and iND10050. 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

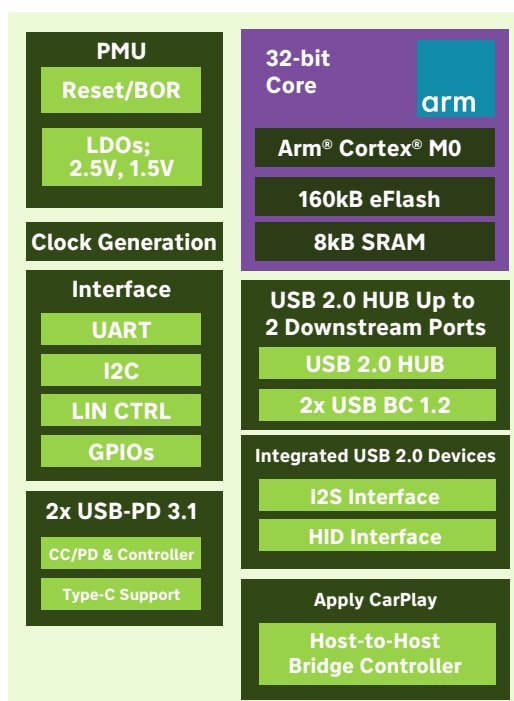


Figure 1. iND10051 Functional Diagram