

## Overview

Faraday is a simple platform designed by Future Electronics System Design Center to demonstrate current sensing designs. It implements four channels with current sensors controlled by two Infineon PSoC 4 (**CY8C4245**) microcontrollers to measure voltage, current and power. Channel 1 and 2 are isolated channels implemented with two Melexis integrated magnetic current sensors (**MLX91220**) controlled by Infineon PSoC 4 (**CY8C4245**) (marked as PSoC-A on block diagram) to measure DC current up to 25A / 60V via terminal block connections. Channel 3 is designed for current measurement up to 5A / 20V via an USB Type C port connection, using Vishay current sense resistor (WSL series) combined with Diodes Inc. current monitor (**ZXCT1086**) and Infineon PSoC 4 (**CY8C4245**) microcontroller (PSoC-B on block diagram). Channel 4 can measure up to 300mA / 5V via a USB Type A port connection using the same PSoC-B microcontroller as channel 3. The PSoC-A is also controlling the communication to PC through USB/UART bridge (**CY7C65213**). And the PSoC-B controls user interface with capacitive touch keypad user buttons and the WiseChip OLED display to show current, voltage and power measurement results.

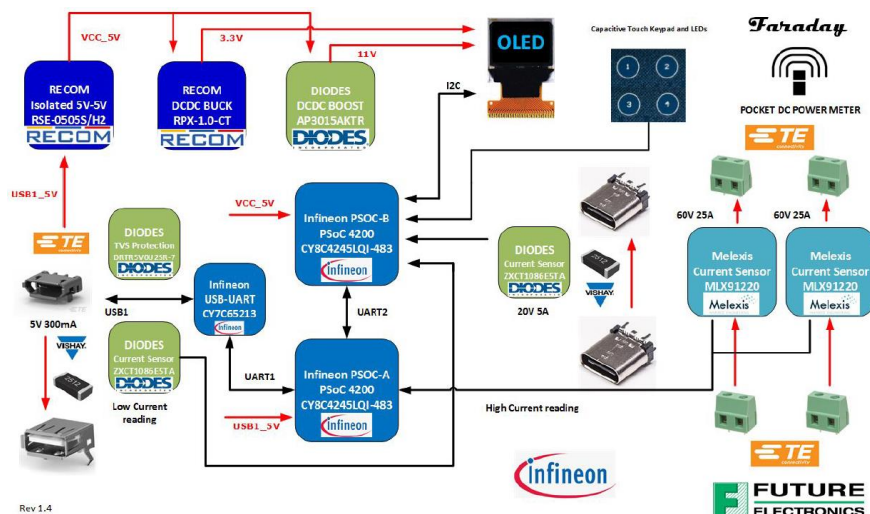


Ordering Part Number:  
FUT-FARADAY-1

## Features

- Programmable System-On-Chip
- Interface and Connectivity:
  - OLED Display
  - Capacitive Touch Keypad Control
  - USB Micro-B
- Multi-channel Current Sensing platform:
  - Two channels current sensing up to 25A / 60V via terminal block
  - One channel current sensing up to 5A / 20V via USB Type C receptacle
  - One Channel current sensing up to 300mA / 5V via USB Type A receptacle

## System Block Diagram



# Faraday Current Sense and Measurement Solution

## Key Components

Function	Part Number	Description	Manufacturer
Processor	CY8C4245LQI-483	Programmable System-on-Chip (PSoC®)	Infineon
Interface	CY7C65213-32LTXI	USB-UART LP Bridge Controller	Infineon
Sensor	MLX91220	100 kHz Integrated current sensor with high accuracy and common mode field rejection	Melexis
Power	ZXRE330ASA-7	Precision Micropower Shunt Voltage References	Diodes
Protection	DRTR5V0U2SR-7	2 Channel Low Capacitance Tvs Diode Array	Diodes
Power	AP3015AKTR-G1	Micro Power Step-Up Dc-Dc Converter	Diodes
Power	ZXCT1086E5TA	Precision High Voltage High-Side Current Monitors	Diodes
Power	RPX-1.0-CT	Buck Regulator Power Module with Integrated Shielded Inductor	RECOM
Power	RSE-0505S/H2	Isolated, Regulated and Short-Circuit Protected DC/DC Converter	RECOM
Display	UG-2832GSYBT04	OLED Display	WiseChip
Connector	2013499-1	USB 2.0 MicroB RA Top	TE
Connector	796740-2	1Row Side Entry Terminal Block	TE
Connector	292303-1	USB 2.0 Type A RA	TE
Connector	2129691-1	USB_C 3.1 RA Receptacle	TE
Resistor	WSL1206R0200FEA	Surface-Mount Power Metal Strip® Current Sense Resistors	Vishay

## Application Examples

Faraday demonstrates current measurement designs that can be used to measure current in a wide range of applications like:

- Motor drive and control
- Robotic
- Switch Mode Power Supply
- Server / Data Center
- Electric vehicle

