

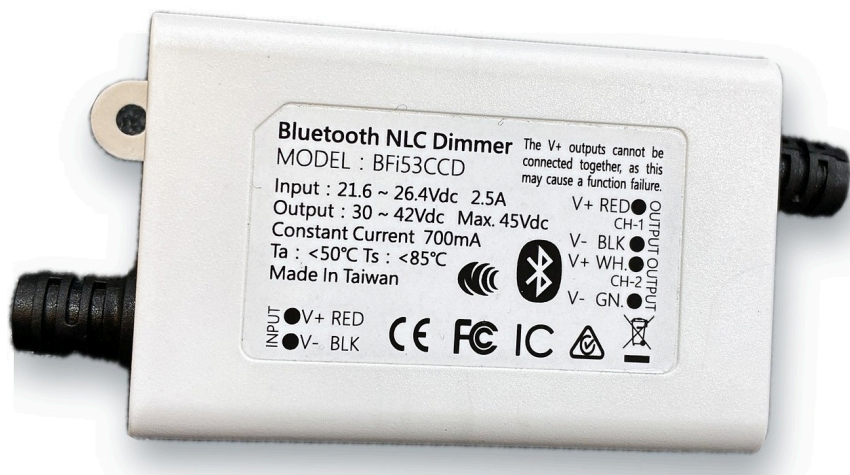
BFi53CCD

Product Specification

v1.6

Bluetooth NLC constant-current dimmer

A BANFi Semiconductor Co., Ltd. product · protocol stack and firmware by FLSEMI



BFi53CCD features

Features:

- 24 V DC input (21.6 – 26.4 V), 2.5 A
- 2 constant-current channels, 700 mA each
- Output voltage 30 – 42 V DC (max. 45 V), set by the LED string
- Default light source: 36 V COB, 25.2 W at 700 mA
- Flicker Index < 20 %, Percent Flicker < 2 %
- Over-voltage and over-current protection
- 78 × 40 × 30 mm housing, IP52
- BFi53MLG module (Nordic Semiconductor nRF5340 + RF front end)
- Bluetooth Mesh, TX +12 dBm, > 100 m line of sight
- Bluetooth NLC: Basic Scene Selector, Dimming Control, Energy Monitor, Time, Schedule, Light Control
- Battery-free 2- and 4-button switch support
- Energy-harvesting lux and occupancy sensor support
- Bluetooth Mesh DFU (OTA)
- Ta < 50 °C; Ts < 85 °C (case temperature point, per label)

Applications:

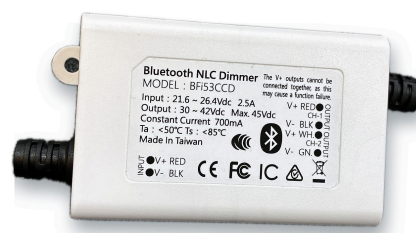
- Commercial NLC smart lighting
- COB downlights and track lights
- Boutique and retail display
- Hospitality and office
- Museum and gallery accent lighting

1 Product overview

The BFi53CCD is a dual-channel DC constant-current dimmer with an integrated Bluetooth Mesh radio and the Bluetooth NLC (Networked Lighting Control) profile. It drives COB and high-power LED fixtures at a stable 700 mA, with an output range of 30–42 V, with smooth, low-flicker dimming, and each channel is independently programmable.

The control side is the BFi53MLG module — a Nordic Semiconductor nRF5340 with an RF front end, QSPI flash and crystal — giving +12 dBm transmit power and more than 100 m line of sight per node. Every node repeats, and local control needs no gateway. NLC scene, dimming, time and schedule models and energy monitoring run in the device; firmware is updated over the mesh (Mesh DFU).

Its default light source is a 36 V COB module (25.2 W at 700 mA). Over-voltage and over-current protection, a Flicker Index below 20 % and an IP52 housing make it suitable for commercial fixtures, and it pairs with battery-free switches and energy-harvesting sensors.



BFi53CCD, dual-channel constant-current dimmer

1.1 Block diagram

The block diagram shows the functional structure of the device around the BFi53MLG radio module.

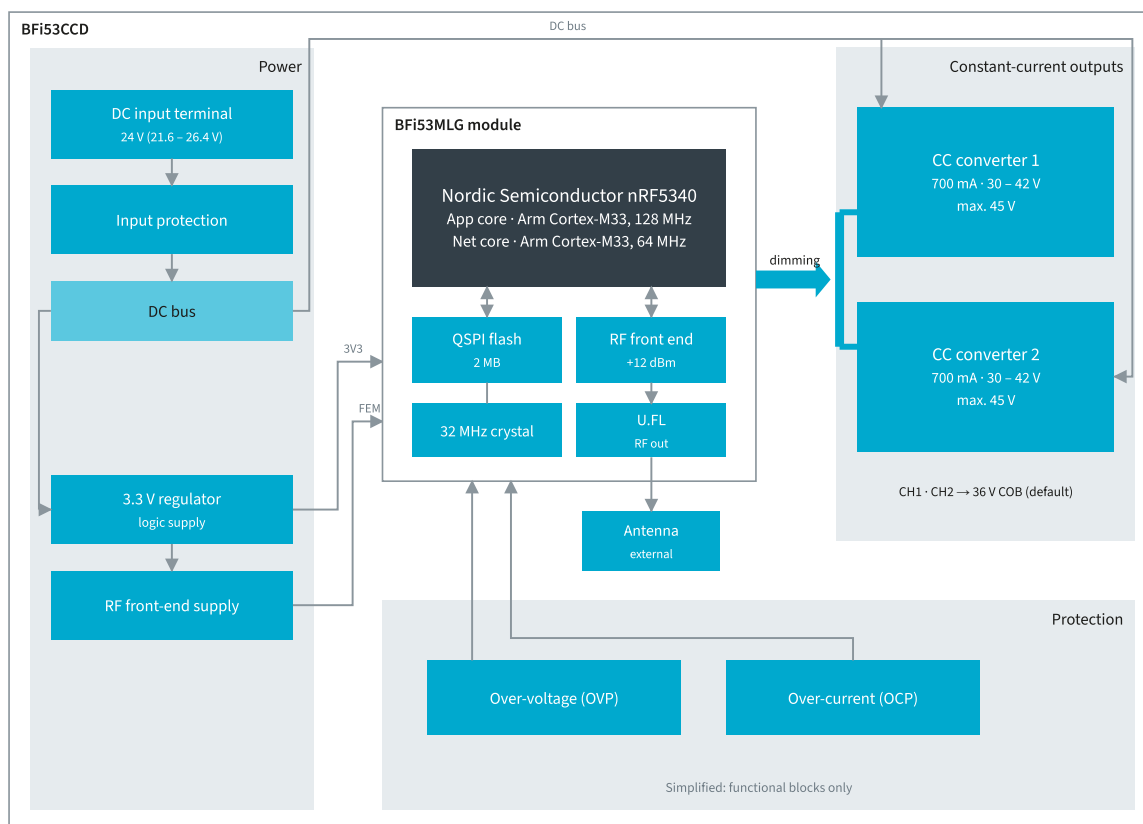


Figure 1: Simplified block diagram

2 Specifications

2.1 Recommended operating conditions

The operating conditions are the parameters the device can operate within.

Symbol	Parameter	Min.	Nom.	Max.	Units
V_{IN}	Supply voltage	21.6	24	26.4	V
I_{IN}	Input current			2.5	A
V_{OUT}	Output voltage (set by the LED string)	30		42	V
$V_{OUT,max}$	Maximum output voltage			45	V
I_{OUT}	Constant output current per channel		700		mA
P_{OUT}	Output power per channel, default 36 V COB		25.2		W
FI	Flicker Index			20	%
PF	Percent Flicker			2	%
T_A	Ambient temperature (non-condensing)			50	°C
T_S	Case temperature point (per label)			85	°C

Table 1: Recommended operating conditions

2.2 Output

Item	Description
Output	2 constant-current channels, 700 mA each, dual lightness (configurable)
Default light source	36 V COB module, 25.2 W at 700 mA, one per channel
Protection	Over-voltage (OVP) and over-current (OCP); low inrush current and ripple
Dimming	Smooth, low-flicker dimming; each channel independently programmable

Table 2: Output

2.3 Radio and control

Item	Description
Radio	BFi53MLG module: Nordic Semiconductor nRF5340 with RF front end, Bluetooth Mesh
TX power	+12 dBm
Range	> 100 m line of sight per node; every node repeats
Antenna	External antenna
Profile	Bluetooth NLC: Basic Scene Selector, Dimming Control, Energy Monitor, Time, Schedule, Light Control
Self-power	Battery-free 2- and 4-button switches; energy-harvesting lux and occupancy sensors
Firmware	Bluetooth Mesh DFU (maintenance and application)
Configuration	BANFi ONE iOS app

Table 3: Radio and control

2.4 Mechanical and certification

Item	Description
Dimensions	78 (L) × 40 (W) × 30 (H) mm
Ingress protection	IP52
Screw torque	0.4 N·m
Wire	0.5 – 1.5 mm ²
Certifications	NCC · CE · FCC · TELEC · RCM · Bluetooth qualified

Table 4: Mechanical and certification

3 Wiring

Each output is an independent 700 mA constant-current source: connect one COB or high-power LED module per channel, and do not parallel fixtures on one channel or tie the two channels together. The output voltage follows the LED string within 30–42 V DC (maximum 45 V); the default light source is a 36 V COB module. Observe DC polarity; screw torque 0.4 N·m.

3.1 Dual constant-current



Figure 2: Dual constant-current wiring

Diagrams are typical examples; confirm terminal markings against the unit. De-energise before wiring and observe local electrical codes.

4 Ordering information

Part number	Description
BFi53CCD	Bluetooth NLC constant-current dimmer, dual-channel 700 mA, COB and high-power LED; default light source 36 V COB

Table 5: Ordering information

Part numbers and quotation: BANFi Semiconductor Co., Ltd. · banfiww.com.

4.1 Revision history

Version	Date	Description
1.0	2026-09-29	First release in this format; replaces the July 2026 datasheet
1.1	2026-09-29	Values aligned with the product label: output 30–42 V (max. 45 V), default 36 V COB, Ts below 85 °C (case)
1.2	2026-09-29	Block diagram redrawn from the schematic around the BFi53MLG module; Ts is the case temperature point
1.3	2026-09-29	Product ownership stated: BANFi Semiconductor Co., Ltd. owns the product; FLSEMI provides the protocol stack and firmware
1.4	2026-10-04	BANFi edition (Traditional Chinese and English) for BANFi customers: BANFi logo and document ID; enquiries to BANFi Semiconductor Co., Ltd. (banfiww.com)
1.5	2026-10-04	Notices: FLSEMI is named only as the provider of the protocol stack and firmware
1.6	2026-10-05	Nordic Semiconductor named in full throughout

Table 6: Revision history

4.2 Notices

Specifications are typical and subject to change without notice; confirm against the latest version before design-in.

Product ownership. The BFi53CCD is a product of BANFi Semiconductor Co., Ltd. (Taiwan), which owns the product and its hardware design. FL Semiconductor LLC (FLSEMI) is the solution provider for the communication protocol stack and the firmware — the software running in the chip.

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