

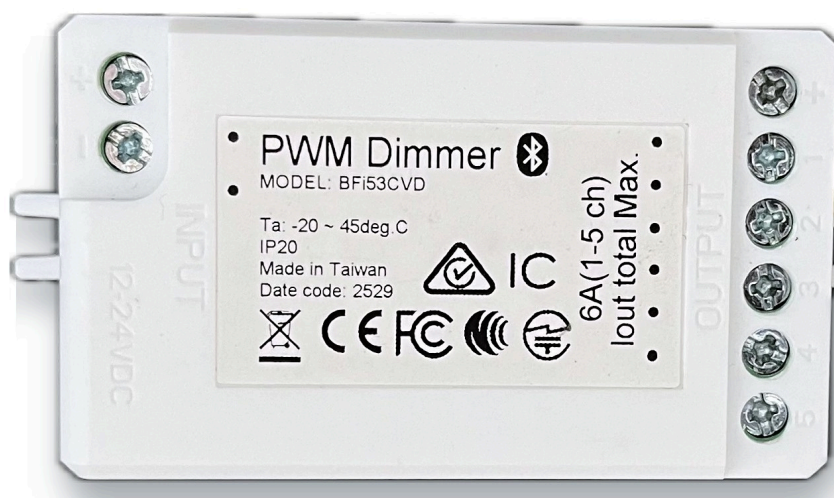
BFi53CVD

Product Specification

v1.6

Bluetooth NLC constant-voltage dimmer

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



BFi53CVD features

Features:

- 12 – 24 V DC input (Class 2 supply)
- 5-channel PWM constant-voltage output
- 6 A total across channels 1–5; 144 W at 24 V, 72 W at 12 V
- Output modes RGBCW, CCCCC, CWCWC and RGBCC
- Compact 72 × 30 × 19 mm housing, IP20
- Ambient temperature –20 to +45 °C
- BFi53MLG module (Nordic Semiconductor nRF5340 + RF front end)
- Bluetooth Mesh, TX +12 dBm, > 100 m line of sight
- Bluetooth NLC: Basic Lightness Controller, 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)

Applications:

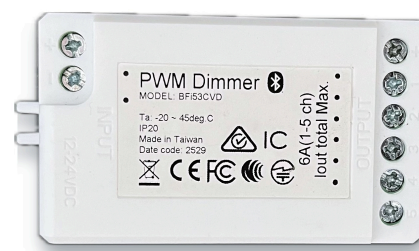
- Commercial and retail display lighting
- Tunable-white office and hospitality
- Human-centric lighting (HCL)
- Architectural cove and linear lighting
- Networked lighting control and energy management

1 Product overview

The BFi53CVD is a 12–24 V DC, 5-channel PWM constant-voltage dimmer with an integrated Bluetooth Mesh radio and the Bluetooth NLC (Networked Lighting Control) profile. It drives RGB, CCT and RGCCT LED strip and linear luminaires with smooth, flicker-free dimming and tunable white.

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, so coverage grows as nodes are added, and local control needs no gateway. NLC time and schedule models and energy monitoring run in the device itself; firmware is updated over the mesh (Mesh DFU).

As a low-voltage DC end-node it pairs with battery-free wall switches and energy-harvesting light and occupancy sensors, and it is provisioned and configured from the BANFi ONE iOS app.



BFi53CVD, enclosed dimmer with the antenna inside the housing

1.1 Block diagram

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

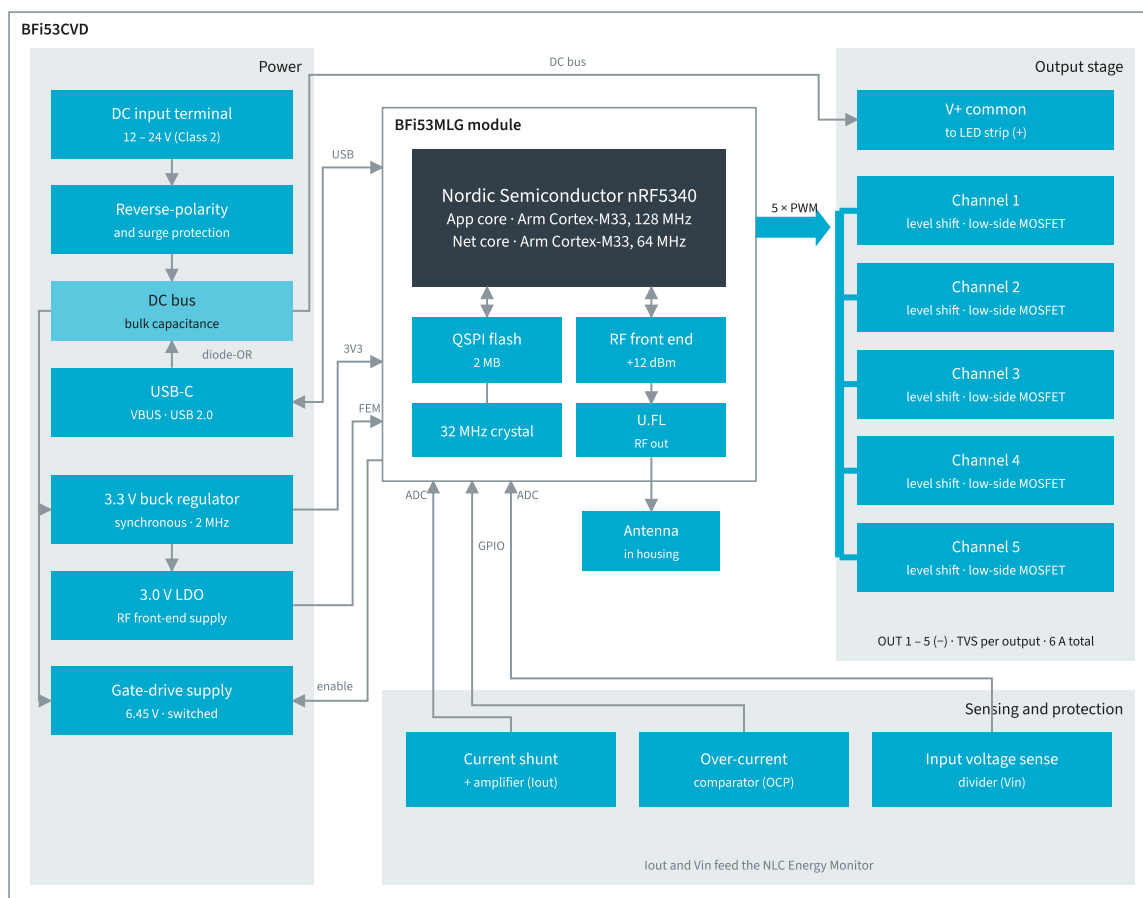


Figure 1: Simplified block diagram

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 (Class 2)	12	24	24	V
I_{OUT}	Output current, total across channels 1–5			6	A
P_{OUT}	Output power, 24 V supply			144	W
P_{OUT}	Output power, 12 V supply			72	W
T_A	Ambient temperature (non-condensing)	–20		+45	°C

Table 1: Recommended operating conditions

2.2 Output

Item	Description
Output	5-channel PWM, common anode (V+ common, channels 1–5 switch the return)
Output modes	RGBCW · CCCCC · CWCWC · RGBCC (set by mode setting)
Dimming	Smooth, flicker-free PWM dimming; tunable white

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-type antenna, factory-fitted inside the housing
Profile	Bluetooth NLC: Basic Lightness Controller, 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	72 (L) × 30 (W) × 19 (H) mm, with housing
Ingress protection	IP20
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

Common-anode wiring: the strip “+” goes to V+, and each colour or channel return goes to a numbered output (1–5). Observe DC polarity; keep the total across all channels at or below 6 A (144 W at 24 V, 72 W at 12 V). Control is wireless (Bluetooth Mesh).

3.1 Output modes

Mode	Channels used	Independent loops
RGB / RGBCW	up to 5: R · G · B · CW · WW	1 luminaire (5 channels)
Tunable white	4: warm + cool, × 2	up to 2 loops
Single colour	up to 5	up to 5 loops

Table 5: Output modes

3.2 RGBCW strip

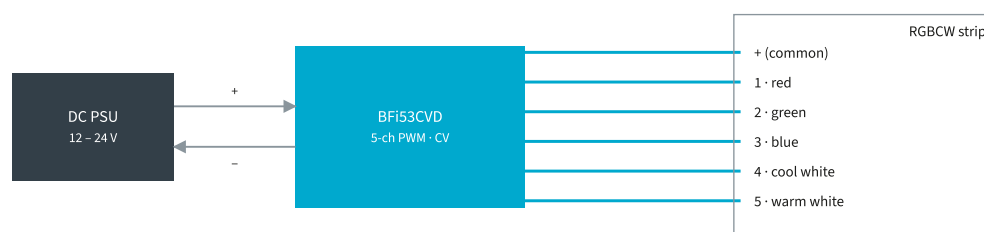


Figure 2: RGBCW strip wiring

3.3 Tunable white (CCT)

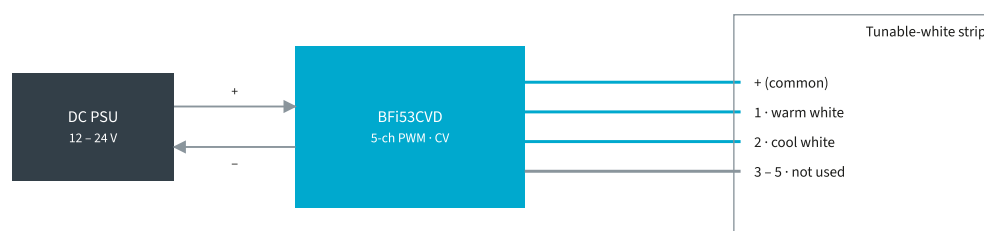


Figure 3: Tunable white (CCT) wiring

3.4 Single-colour circuits

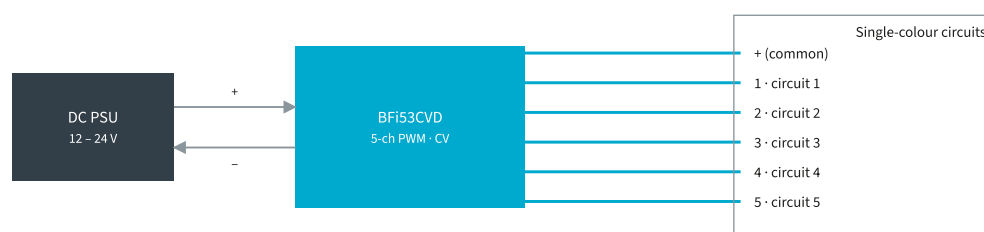


Figure 4: Single-colour circuits wiring

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
BFi53CVD	Bluetooth NLC constant-voltage dimmer, 5-channel PWM, RGB / CCT / RGB CCT, 12–24 V DC

Table 6: 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: 6 A total across channels, ambient –20 to +45 °C
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 7: 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 BFi53CVD 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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