



CC8800-F-U3

Product Specifications

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CC8800-F-U3 Introduction

Topvision CC8800-F-U3 is a high-performance and cost-effective cable network edge device, which is designed based on DOCSIS 3.1, and compatible with DOCSIS 3.0/ DOCSIS 2.0/ C-DOCSIS.



Product Features

- Compatible with DOCSIS 3.1/ 3.0/ 2.0/ C-DOCSIS, thus the existing investment is protected.
- Support DAA/ DCA access architecture, support operation and management through remote distributed controller.
- Support up to 1K CM.
- Support DOCSIS, PacketCable/ PCMM, EQAM and Optical receiver, which can satisfy applications including internet, VOIP, VoD and CATV application.
- Inner tube structure, which is easier to change module of CC8800-F-U3.
- More installation methods: supports field installation, corridor installation, wall-mounted and hanging-cable installation.

Performance and Specifications

CC8800-F-U3 Introduction

CC8800-F-U3 is mainly composed of DOCSIS module, power module and RF module.

- DOCSIS module: provide 10G SFP+ Interface, support GE/10GE/PON uplink.
- Support DOCSIS/EQAM function.
- RF module: provide optical receiver RF platform.
- Power module: Local power supply (AC110/ AC220V) or Cable-based power supply (AC60/ AC90V).
- (Optional) CWDM module.
- (Optional) Industrial grade SFP+ optical module.

Overall characteristic

Parameter	Specification
Dimension	436mm×243mm×185mm
Product form	Field-type
Weight	<20kg (rough weight)
Ingress protection rating	IP67
Surge protection level	6 kV in both common and differentiated modes for the AC power port
Operating temperature	-40~+55°C (startup on -25°C)
Operating humidity	5%-95% (non-condensing)
Power supply	Local power supply/cable-based power supply
Power consumption	115W
Overcurrent protection	
Continuous overcurrent	≥15A
Burst overcurrent	≥25A
Device grounding	PGND
Optical receiver module local test point	Support
LED indicators	Support
Optional status monitoring and control	Support
Electronic attenuator for each port	
Forward path	Provide individual level control for each port
Reverse path	Provide individual level control for each port
Number of ports	
Power supply port or AC only port	1
RF out port	4
Frequency division	42/ 54MHz, 65/ 87MHz, 85/ 108MHz, 204/ 258MHz
Output impedance	75ohm
Default RF port type	F type

DOCSIS Module

CC8800-F-U3 supports RMD or RPD mode. The different specifications of each mode are described below.

• CC8800-F-U3 RMD

RMD DOCSIS module provides 4 OFDM + 2 OFDMA, 10G SFP + interface, 1GE / 10GE / PON uplink, EQAM function, end-to-end QoS and unified network management.

The SFP + optical interface requires industrial grade optical modules.

Highlights

- ✧ Supports DAA/ DCA access architecture,
- ✧ Supports 4*OFDM and 2*OFDMA, US support 2 Service Group (SG), supports 10Gbps+ throughput per fiber node.
- ✧ Experienced in Remote CCAP solution, 10w+ fiber nodes deployed.

Specifications are subject to change without notice.

CC8800-F-U3 RMD DOCSIS module characteristic

Parameter	Specification	
Standard	DOCSIS 3.1 DOCSIS 3.0/ Euro-DOCSIS 3.0 DOCSIS 2.0/ Euro-DOCSIS 2.0 C-DOCSIS	
SNI ¹	1* GE 10GE PON SFP+ uplink interface 1* GE 10GE PON SFP+ daisy chain interface	
Management interface	1*GE RJ45 management interface 1*RJ45 console interface 1*RJ45 monitor Interface (transponder interface)	
CM Qty. supported		
DOCSIS 3.1 CMs	≤300	
DOCSIS 3.0 & 2.0CMs	≤1000	
Total CMs	≤1000	
MAC address	4K	
Working channel	DS	US
Channel frequency range		
DOCSIS 3.1	108/ 258~1218MHz	
DOCSIS 3.0		
European standard	87/ 108~1006MHz	
American standard	54~1002MHz	
Working channel		
DOCSIS 3.1	4 (OFDM)	
DOCSIS 3.0	96 (DOCSIS 32, BC EQAM 64)	
	<i>* 1*SG model, total upstream channels: 1 OFDMA + 8 DOCSIS.</i> <i>* 2*SG model, upstream channels: 1 OFDMA + 8 DOCSIS (each SG), total upstream channels: 2 OFDMA + 16 DOCSIS.</i>	
Channel width		
DOCSIS 3.1	24~192MHz	
DOCSIS 3.0	6/ 8MHz	
Communication protocol		
DOCSIS 3.1	/	
DOCSIS 3.0	/	
Modulation		
DOCSIS 3.1	OFDM (16/ 64/ 128/ 256/ 512/ 1024/ 2048/ 4096 QAM)	
DOCSIS 3.0	64/ 256/ 1024 QAM	
Configurable receiving level range	/	
Qty. of service flow	4K	
System function		
MTU	2000 Byte	
IPv6	Support IPv4 and IPv6 dual-stack	
DHCP	Support DHCP relay/ snooping Support DHCP bundle Support DHCP lease query Support insert CMTS capabilities and CM MAC	
DHCPv6	Support DHCPv6 relay/ snooping Support DHCPv6 bundle Support DHCPv6 lease query Support DHCPv6-PD Support according to Option 60 to identify equipment type Support insert Remote-ID, Interface-ID, CMTS capabilities and CM MAC	
VLAN&L2VPN	Support 802.1ad/ 802.1q/ subnet VLAN Support service flow-based VLAN addition or deletion Support VLAN addition according to device type Support the L2VPN Support VLAN conversion	

MAC domain management	Support MDD & MDF enable and disable Support MTC & MRC enable and disable Support UDC enable and disable Support upstream automatic frequency hopping Support piggyback, shared-secret, channel bonding
Multicast	Support multicast authentication Support IGMP V2/ V3 Snooping Support MLD V1/ V2
Load balance	Support RLBG/ GLBG
QoS	Support load balance priority Support static/ dynamic service flow Support service class Support best effort, UGS, UGS-AD, RTPS, NRTPS Support the DOCSIS 3.0 USCB scheduling Support PowerBoost
Packetcable	Support Packetcable 1.5/ 2.0 & PCMM Support DQoS
Management & Monitor	
CM management	Support CM status review Support CM steer Support CM blacklist Support CM dispersion degree Support remote query Support flaplist Support admission control
CPE management	Support CPE query and clear
Network management	Support SSH/telnet Support SNMP V1/ V2c/ V3 Support SYSLOG Support graphical standalone WEB management Support RMD Controller centralized management Support integrating to NMS
System diagnostic and monitor	Support system information acquisition and monitoring Support optical receiver information monitoring Support debug mode Support showtech Support ping, DOCSIS ping, tracert Support spectrum monitor
IPDR	Support IPDR/ SP over TCP Support DOCSIS IPDR Support based on the data IPDR/XDR encoding Support time interval/event-based/ adhoc data acquisition method
Security guarantee	Support AAA (TACACS+, RADIUS) Support RA guard Support ACL Support BPI+ Support EAE Support source verify Supports message speed Support prevent DoS attack Support blacklist, white list, the firewall
Software upgrade	Support CLI/ WEB GUI/ EMS(NM3000)/ RMDC upgrade Support remote upgrade, version reversion when upgrade failure
EQAM functions	
Channel frequency range	
European standard	87/ 108 ~ 1006MHz
American Standard	54 ~ 1002MHz
Channel width	8MHz/ 6MHz
Symbol rate	6.875/ 6.900/ 6.952Mband/ s, 5.057/ 5.361Mband/ s
Modulation mode	64/ 256QAM
Working channel	Maximum 32 NC QAM channels
Phase noise	

1KHz	<-75dBc/Hz
10KHz	<-85dBc/Hz
>100KHz	<-100dBc/Hz
Network delay jitter tolerance	1000ms
PCR jitter tolerance	≤500ns
Transmission technology	Support UDP/ IP/ GE transmission
Control protocol	Compatible with NGOD specification, D6/ R6 standard
Multiplexing capability	Support PMT PID, and other PSI/ SI multiplexing capabilities
TS multiplexing	Single frequency supports 32 programs, and each program can support 15 PIDs at the same time by default; Each frequency supports up to 480 PIDs, and 32 channels support up to 15360 PIDs.
Stream parameters	<ol style="list-style-type: none"> 1) Support the stream of a variety of signal source formats such as MPEG2, MPEG4, H.264, H.265, HEVC, AVS, DATA (including VBR and CBR formats) 2) In a single frequency, support unicast stream, multicast stream and DATA stream simultaneously 3) Each frequency support 4 business UDP port 4) the service port (UDP port) can be configured with PMT PID and service flow type information according to different frequencies 5) Support stream overflow protection 6) In data broadcasting service, support PID value offset in the transport stream (remapping)
Status monitoring	<p>Support real-time traffic statistics</p> <p>Support concurrent traffic statistics</p>
Regular ARP	Report EQAM business IP ARP packet every 2s
Network management	<ol style="list-style-type: none"> 1) Support web-based graphic management interface, HTTP/ HTTPS 2) Support SSH, telnet and R232 serial port management

Note:

1, Industrial-grade SFP+ module has to be used in DOCSIS module.

- **CC8800-F-U3 RPD**

RPD DOCSIS module provides 4 OFDM + 2 OFDMA, 10G SFP + interface, 1GE / 10GE uplink, EQAM function, 4 NDF, 4 NDR. RPD is a key component in DOCSIS Modular Headend Architecture version 2 (MHA v2). It works with a CCAP Core, and extends the PHY layer from the CCAP located at headend to the fiber node.

The SFP + optical interface requires industrial grade optical modules.

Highlights

- ✧ Supports DAA/ DCA access architecture, MHA v2. Compatible with third-party CCAP Core.
- ✧ Supports 4*OFDM and 2*OFDMA, US support 2 Service Group (SG), supports 10Gbps+ throughput per fiber node.
- ✧ Supports 10G Ethernet transport between the CCAP core and the RPD nodes.
- ✧ No limit on the number of CMs on the RPD side.
- ✧ Experienced in Remote CCAP solution, 10w+ fiber nodes deployed.

CC8800-F-U3 RPD DOCSIS module characteristic

Parameter	Specification	
Standard		
DOCSIS standard	DOCSIS 3.1 DOCSIS 3.0/ Euro-DOCSIS 3.0 DOCSIS 2.0/ Euro-DOCSIS 2.0 C-DOCSIS	
RPD standard	<ul style="list-style-type: none"> • CM-SP-R-PHY Remote PHY Specification • CM-SP-R-UEPI Remote Upstream External PHY Interface Specification • CM-SP-R-DEPI Remote Downstream External PHY Interface Specification • CM-SP-R-DTI Remote DOCSIS Timing Interface Specification • CM-SP-R-OOB Remote Out-of-Band Specification • CM-SP-R-OSSI Remote PHY OSS Interface Specification • CM-SP-GCP Generic Control Plane Specification • CM-SP-DRFI Downstream RF Interface Specification 	
SNI ¹	1* GE 10GE SFP+ uplink interface 1* GE 10GE SFP+ daisy chain interface	
Management interface	1*GE RJ45 management interface 1*RJ45 console interface 1*RJ45 monitor Interface (transponder interface)	
CM supported	DOCSIS 3.1/3.0/2.0 CM	
Working channel	DS	US
Channel frequency range		
DOCSIS 3.1	108/ 258~1218MHz	5~42/ 65/ 85/ 204MHz
DOCSIS 3.0		
European standard	87/ 108~1006MHz	5~65/ 85MHz
American standard	54~1002MHz	5~42MHz
Working channel		
DOCSIS 3.1	4 (OFDM, up to 6 OFDM)	2 (OFDMA)
DOCSIS 3.0	128 (SC-QAM)	16 (SC-QAM)
OOB	4 (NDF)	4 (NDR)
<i>* 1*SG model or 2*SG model, the total number of upstream channels are the same.</i>		
<i>*Up to 6 OFDM can be supported under full spectrum conditions.</i>		
Channel width		
DOCSIS 3.1	24~192MHz	6.4~96MHz
DOCSIS 3.0	6/ 8MHz	1.6/ 3.2/ 6.4MHz
Communication protocol		
DOCSIS 3.1	/	OFDMA
DOCSIS 3.0	/	ATDMA
Configurable receiving level range	/	-13 - +23dBm
System function		
IPv6	Support IPv4 and IPv6 dual-stack	
System diagnostic and monitor	Support system information acquisition and monitoring Support optical receiver information monitoring Support showtech Support ping, DOCSIS ping, tracert Support spectrum monitor	
Security guarantee	Support AAA (TACACS+, RADIUS) Support X509 certificate Support 802.1x Support MACSec Support IPSec	
L2TP	Support PSP FLOW Support DEPI and UEPI session	
Precise time synchronization	IEEE 1588v2	

RF Module

- 4 full amplifier RF output, support all electric function, support local adjustment and remote regulation, 1 CATV optical receiver, the maximum channel frequency range can be supported to 1.2GHz.

CC8800-F-U3 optical receiver module characteristic

Parameter	Specification	
Forward receiver (RX) module		
Wavelength	1290~1600nm	
Optical connector types	SC/ APC	
Number of optical receiver module	1	
Optical AGC options	-7~+2dBm	
Passband	47~1002MHz	
Flatness	±0.75dB	
Optical input test point (± 20 %)	1V/ mW	
RF section specifications¹		
Return loss	Forward	Reverse
	≥16dB (258MHz~550MHz)	≥16dB
	≥14dB (550MHz~1002/ 1218MHz)	
Internal RF test points (± 1 dB)	-20dB	-20dB
Port to port isolation	50dB	50dB
Maximum output level	112dBuV@1218MHz@18dB EQ	
Maximum QAM output level ²	45 dBmV@160 channels	
	46 dBmV@128 channels	
	49 dBmV@64channels	
	52 dBmV@32 channels	
	55 dBmV@16 channels	
	58 dBmV@8 channels	
	61 dBmV@4 channels	
64 dBmV@2 channels		
67 dBmV@1 channel		
Tilt range (±1.0 dB)	20dB	
Flatness ³	±0.75dB	±0.75dB
Level stability (-40~+55°C)	±1.5dB	
MER ⁴		
DOCSIS3.1	<ul style="list-style-type: none"> ● 108–600 MHz <ul style="list-style-type: none"> ≥48 dB (any single subcarrier) ≥ 50 dB (average over the complete OFDM channel) ● 600–1002 MHz <ul style="list-style-type: none"> ≥45 dB (any single subcarrier) ≥47 dB (average over the complete OFDM channel) ● 1002–1218 MHz <ul style="list-style-type: none"> ≥43 dB (any single subcarrier) ≥45 dB (average over the complete OFDM channel) 	
DOCSIS3.0	≥39dB (Equalizer off) ≥43dB (Equalizer on)	
99 PAL channels(CW)⁵		
CSO	>60dBc	
CTB	>65dBc	
C/N	>51dBc	
Accessories		
Fuses (15A)	4pcs	

Note:

- 1, All of RF section specifications are tested under default configuration.
- 2, Output level of each channel can be reduced based on the maximum output level.
- 3, The RF launch amplifier performance.
- 4, The values are obtained on RF OUT ports. Based on Cablelabs DOCSIS 3.1 test standard.

MER test conditions:

- a) The total frequency width 528 MHz, including 2*192 MHz (OFDM channel) + 24*6MHz (SC-QAM channel).
 - b) 528 MHz equal to 88 DOCSIS 3.0 channels (calculated using the U.S. standard 6M channel bandwidth).
- 5, Test conditions for C/ N, CTB and CSO

Specifications are subject to change without notice.

59 PAL-D analog signals (less than 550 MHz), 56 8MHz QAM signals (550-1218 MHz), and QAM signals are 6 dB lower than the analog signal carrier. 0dBm optical power input, 18dB equalization, 112dBuV@1218MHz output.

Power Module

Topvision CC8800-F-U3 supports local power supply and cable-based power supply. Different type of power supply plug can be suit for different power supply standard.

Power module characteristic

Parameter	Specification
Qty. of power module (whole device)	1pcs
Power supply	
Local power supply	AC110V/ AC220V, 90V~264V, 50/ 60Hz
Cable-based power supply	AC60V/ AC90V, 36V~110V, 50/ 60Hz
Max. output power	156W
Power efficiency	85%
Local power supply plug	
European standard plug	Type E (CEE 7/7 plug), Length 1000mm
American standard plug	Type B (NEMA 5-15 U.S. 3 pin), Length 1000mm
British standard plug	Type G (BS 1363 UK), Length 1000mm

(Optional) CWDM Component Specifications

Topvision CC8800 series R-CCAP support CWDM components.

CWDM multiplexes the optical signals of different wavelengths to a single optical fiber for transmission by using optical multiplexer. At the receiving end, the optical de-multiplexer is used to decompose the hybrid signal in the optical fiber into signal of different wavelengths, and is connected to corresponding receiving devices. CWDM is a low-cost WDM transmission technology.

The CWDM scheme supported by CC8800-F-U3 includes the following:

Data signal		CATV signal	
Data transmission protocol	Central wavelength	Modulation mode	Central wavelength
IEEE 802.3av 10G EPON (Asymmetrical)	1310nm/1577nm	Amplitude modulation	1550nm
IEEE 802.3av 10G EPON (Symmetric)	1270nm/1577nm	Amplitude modulation	1550nm
ITU-T G.987 XG-PON	1270nm/1577nm	Amplitude modulation	1550nm
EPON/GPON	1310nm/1490nm	Amplitude modulation	1550nm

CC8800-F-U3 CWDM components characteristic

Parameter	CWDM components 1 specification	CWDM components 2 specification
Support optical power	<300Mw (24.77dBm)	<300mW (24.77dBm)
COM interface	1260 ~ 1620nm	1260 ~ 1560nm
PASS interface	1523.5 ~ 1565nm	1540 ~ 1560nm
REF interface	1260 ~ 1510nm	1260 ~ 1360nm
	1571.5 ~ 1620nm	1480 ~ 1500nm
Insertion loss		
PASS interface	<0.8dB	<0.8dB
REF interface	<0.6dB	<0.6dB
Isolation		
PASS interface	>30dB	>30dB
REF interface	>15dB	>15dB

(Optional) Industrial-grade Optical Module

GE Industrial Optical Module

No.	1	2
Central Wavelength	TX: 1310nm	TX: 1550nm
	RX: 1550nm	RX: 1310nm
Package	SFP	SFP
Rate (Gbps)	1.25	1.25
Connector	BIDI LC/UPC	BIDI LC/UPC
Fiber type	Single mode	Single mode
Transmission distance	20km	20km
Launched power range (dBm)	-9~-3	-9~-3
Receive power range (dBm)	-23~-3	-23~-3

10GE Industrial Optical Module

No.	1	2
Central Wavelength	TX: 1270nm	TX: 1330nm
	RX: 1330nm	RX: 1270nm
Package	SFP+	SFP+
Rate (Gbps)	10	10
Connector	BIDI LC/UPC	BIDI LC/UPC
Fiber type	Single mode	Single mode
Transmission distance	20km	20km
Launched power range (dBm)	-3~3	-3~3
Receive power range (dBm)	-14.5~0.5	-14.5~0.5



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