Distributed CCAP DOCSIS 3.1 Indoor Node

Product

DEV 6811   Distributed CCAP DOCSIS 3.1 Indoor Node

Features

▰ Compatible with DOCSIS 3.1 / 3.0 / 2.0 / EuroDOCSIS / C-DOCSIS

▰ Supports RMD Controller centralized Management

▰ Remote Operation and Management

▰ High Bandwidth: 10 Gigabit Level Access

▰ Supports PacketCable / PacketCable Multimedia (PCMM), and Multi-Service Applications including Internet, Video and interactive VOD Application

▰ End-to-End QoS Support

▰ Redundant Power Supply

THE ART OF ENGINEERING

Technical Data

DEV 6811   Distributed CCAP DOCSIS 3.1 Indoor Node

▰ Currently, the technical data describes the Option vD31 (Distributed CCAP DOCSIS 3.1 Indoor Node),
the differences to the technical data of Option vDE and of Option vD30 will be explained in a future version
of this spec sheet

Power Supply

Number of Power Supply Modules	1	(standard)
	2	(with Option PSM220V)
Supply Voltage	100…240 V AC	
Power Consumption	70 W	

General Specifications

Size	19"	(483 mm) Width,
	1.73"	(44 mm) Height (1 RU),
	11.81"	(300 mm) Depth
Weight	~5.5 kg	
Operating Temperature	-10…+55 °C (+14…+131 °F)	
Operating Humidity	10…95 % (non-condensing)	

Number of RF Ports

US Ports	4
DS Ports	1
Monitor Ports	1 (DS)

RF Specifications

Impedance, Connectors	75 Ohm, precision F (f)
Return Loss	≥13 dB
Monitor Port	-20±1 dB
Maximum QAM output level [1]	34 dBmV @ 160 channels
	37 dBmV @ 128 channels
	41 dBmV @ 64 channels
	45 dBmV @ 32 channels
	48 dBmV @ 16 channels
	52 dBmV @ 8 channels
	55 dBmV @ 4 channels
	59 dBmV @ 2 channels
	63 dBmV @ 1 channel

MER [2]

DOCSIS 3.1	▰	87…600 MHz
		≥48 dB (any single subcarrier)
		≥50 dB (average over a whole OFDM channel)
	▰	600…1002 MHz
		≥45 dB (any single subcarrier)
		≥47 dB (average over a whole OFDM channel)
	▰	1002…1218 MHz
		≥43 dB (any single subcarrier)
		≥45 dB (average over a whole OFDM channel)
DOCSIS 3.0	≥35 dB (equalizer off)	
	≥43 dB (equalizer on)	

Interface Specifications

Standards	DOCSIS 3.1
	DOCSIS / EuroDOCSIS 3.0
	DOCSIS / EuroDOCSIS 2.0
	C-DOCSIS
SNI (Service Node Interface)	1 * 10GE SFP+
Management Interface	1 * GE RJ-45 management interface
	1 * RJ-45 console interface

Technical Data (cont.)

Interface Specifications (cont.)

Number of Cable Modems	≤300	(DOCSIS 3.1 cable modems)
	≤1000	(DOCSIS 3.0 & DOCSIS 2.0 cable modems)
Communication Protocol	OFDMA	(DOCSIS 3.1)
	SCDMA / ATDMA	(DOCSIS 3.0)

Working Channels	**Downstream (DS)**	**Upstream (US)**
Channel Frequency Range		
DOCSIS 3.1	54/87/108/258…1218 MHz	5…42/65/85/204 MHz
DOCSIS 3.0	54/87/108…1003 MHz	5…42/65/85 MHz
Working Channels		
DOCSIS 3.1	6	2 * 2
DOCSIS 3.0	96 (64 DOCSIS + 32 NC)	2 * 12 (DOCSIS)
Channel Width		
DOCSIS 3.1	24…192 MHz	6.4…96 MHz
DOCSIS 3.0	6/8 MHz	1.6/3.2/6.4 MHz
Modulation		
DOCSIS 3.1	OFDM (16…4096 QAM)	OFDMA (BPSK, QPSK, 16…2048 QAM)
DOCSIS 3.0	64…1024 QAM	QPSK, 16…256 QAM
Reception Level Range (US)		
DOCSIS 3.1	N/A	-4…+10 dBmV @ 6.4 MHz
		-7…+10 dBmV @ 3.2 MHz
		-10…+10 dBmV @ 1.6 MHz
DOCSIS 3.0	N/A	-7…+23 dBmV @ 6.4 MHz
		-10…+20 dBmV @ 3.2 MHz
		-13…+17 dBmV @ 1.6 MHz

System Functions

IP Version Support	IPv4 and IPv6 dual-stack
DHCP Support	DHCP relay / snooping; DHCP bundle; DHCP lease query; According to Option 60 to identify equipment type; Insert Remote-ID, Interface-ID, CMTS capabilities, and CM MAC
DHCPv6 Support	DHCPv6 relay / snooping; DHCPv6 bundle; DHCPv6 lease query; DHCPv6-PD; According to Option 60 to identify equipment type; Insert Remote-ID, Interface-ID, CMTS capabilities, and CM MAC
VLAN & L2VPN Support	802.1ad / 802.1q; Service flow-based VLAN addition or deletion; VLAN addition according to device type; L2VPN; VLAN conversion
MAC Domain Management Support	MDD & MDF enable and disable; MTC & MRC enable and disable; UDC enable and disable; Upstream automatic frequency hopping; Piggyback, shared-secret, channel bonding
Multicast Support	Multicast authentication; Static multicast; IGMP V2 / V3 snooping; MLD V1 / V2
Load Balance Support	RLBG / GLBG; Load balance priority
QoS Support	Static / dynamic service flow; Service class; Best effort, UGS, UGS-AD, RTPS, NRTPS; DOCSIS 3.0 USCB scheduling; PowerBoost
PacketCable Support	PacketCable 1.5/2.0 & PCMM; DQoS

Management & Monitoring

Cable Modem (CM) Management Support	CM status review; CM steer; CM blacklist; Remote query; Flap list; Admission control
CPE Management Support	CPE query and clear
Network Management Support	SSH/Telnet; SNMP V1/V2/V3; SYSLOG; Graphical standalone WEB management; RMD Controller centralized management; NM3000 graphical EMS centralized management; NM3000 mobile APP management; NMS integration

Technical Data (cont.)

Management & Monitoring (cont.)

System Diagnostic and Monitoring Support	System information acquisition and monitoring; Optical receiver information monitoring; Show tech-support; Ping, DOCSIS ping, tracert; Spectrum monitor
IPDR Support	IPDR/SP over TCP; DOCSIS IPDR; IPDR/XDR encoding based on the data; Time interval/event-based/ad hoc data acquisition method
Security Guarantee Support	AAA (TACACS+, RADIUS); RA guard; ACL; BPI+; EAE; Source verify; DoS attack prevention; Blacklist, whitelist, firewall
Software Upgrade Support	CLI / WEB GUI / EMS (NM3000) / RMDC upgrade; Remote upgrade, version reversion when upgrade failure

EQAM Functions

Channel Frequency Range	54/87/108/258…1003 MHz
Channel Width	8/6 MHz
Symbol Rate	6.875/6.900/6.952 MBaud, 5.057/5.361 MBaud
Modulation Mode	64/256 QAM
Working Channel	Maximum 32 NC QAM channels
Phase Noise	<-75 dBc/Hz @ 1 kHz <-85 dBc/Hz @ 10 kHz <-100 dBc/Hz @ >100 kHz
Network Delay Jitter Tolerance	1000 ms
PCR Jitter Tolerance	≤500 ns
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	1) VOD service, single frequency supports 32 programs, with each program supporting 16 PIDs simultaneously by default 2) A single program can configure to transmit 50 PIDs 3) The whole device supports 256 UDP ports, and 4096 PIDs 4) Support DATA stream of a single frequency multiplexing with other frequency
Stream Parameters	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 supports 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 Support	Real-time traffic statistics; Concurrent traffic statistics
Regular ARP	Report EQAM business IP ARP packet every 2 seconds
Network Management Support	1) Web-based graphic management interface, HTTP/ HTTPS 2) SSH, Telnet and RS232 serial port management

Note 1: The channel width of each channel is 6 MHz; the output level of each channel can be reduced based on the maximum output level

Note 2: The values are obtained from the RF OUT ports. Based on CableLabs DOCSIS 3.1 test standard.
MER test conditions:
a) Total frequency width 528 MHz, including 2 *192 MHz (OFDM channel) + 24 * 6 MHz (SC-QAM channel)
b) 528 MHz equal to 88 DOCSIS 3.0 channels (calculated using the U.S. standard 6M channel bandwidth)

Order Information

Products	
DEV 6811	Distributed CCAP DOCSIS 3.1 Indoor Node
Options	
Option vDE	Distributed CCAP DE Indoor Node
Option vD30	Distributed CCAP DOCSIS 3.0 Indoor Node
Option vD31	Distributed CCAP DOCSIS 3.1 Indoor Node
Option vPDE	European Power Cable
Option vPGB	UK Power Cable
Option vPIT	Italian Power Cable
Option PSM220V	Power Supply Module 110/220 V AC
Option LD30-DS	DOCSIS 3.0 License 8*DS
Option LD30-US	DOCSIS 3.0 License 4*US
Option LD31-DS	DOCSIS 3.1 License 1*DS OFDM
Option LD31-US	DOCSIS 3.1 License 1*US OFDMA
Option SER	Serial Interface; RJ-45 - Sub-D 9 (f); 3.0 m

SFP Module Options	
Option SFP_GE1	SFP electrical Module GE; 1000M; 100 m
Option SFP_GE2	SFP optical Module GE; 1.25 Gbps; 850 nm; 550 m
Option SFP_GE3	SFP optical Module GE; 1.25 Gbps; Commercial Grade; 1310 nm; 20 km
Option SFP_10GE1	SFP+ optical Module 10GE; 10.3125 Gbps; 850 nm; 300 m
Option SFP_10GE2	SFP+ optical Module 10GE; 10.3125 Gbps; Commercial Grade; 1310 nm; 20 km
Option SFP_GE4	SFP optical Module GE; 1.25 Gbps; Industrial Grade; 1310 nm; 20 km
Option SFP_GEB1	SFP optical Module GE BIDI; 1.25 Gbps; Tx 1310 nm, Rx 1550 nm; 20 km
Option SFP_GEB2	SFP optical Module GE BIDI; 1.25 Gbps; Tx 1550 nm, Rx 1310 nm; 20 km
Option SFP_10GE3	SFP+ optical Module 10GE; 10.3125 Gbps; Industrial Grade; 1310 nm; 20 km
Option SFP_10GEB1	SFP+ optical Module 10GE BIDI; 10.3125 Gbps; Tx 1270 nm, Rx 1330 nm; 20 km
Option SFP_10GEB2	SFP+ optical Module 10GE BIDI; 10.3125 Gbps; Tx 1330 nm, Rx 1270 nm; 20 km

Configuration Example

1 *	DEV 6811		Distributed CCAP DOCSIS 3.1 Indoor Node
1 *		Option vD31	Distributed CCAP DOCSIS 3.1 Indoor Node
2 *		Option vPDE	European Power Cable
1 *		Option PSM220V	Power Supply Module 110/220 V AC
2 *		Option LD31-DS	DOCSIS 3.1 License 1*DS OFDM
2 *		Option LD31-US	DOCSIS 3.1 License 1*US OFDMA
2 *		Option SFP_10GE1	SFP+ optical Module 10GE; 10.3125 Gbps; 850 nm; 300 m

Contact

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