

ATM Module Technical Specifications

Physical Interfaces	SONET: STS-1, OC-1, OC-3, OC-12, OC-48, OC-192 SDH: STM-0/0e, STM-1/1e, STM-4, STM-16, STM-64 PDH: DS1, DS3, E1, E3	Protocol Generation	AAL0 cell generation, AAL1/AAL5 protocol gen.
Physical Layer PLCP Structure	SONET: VT1.5, VT2, VT6, Full SPE, STS-3c, STS-12c SDH: C-11, C-12, C-2, C-3, C-4, C-4-4c PDH (Direct/PLCP): DS1, DS3, E1, E3 (G.832, G.751)	Error Measurement	HEC correctable and uncorrectable error counts and rates, AAL5 CRC errors, AAL5 length errors; PRBS bit error measurement, loss of PRBS sync; AAL1 SN/SNP error, lost cells, misinserted cell counts and rates; PLCP framing errors, PLCP BIP, PLCP FEBE counts and rates, PLCP B1 CNT, PLCP Framing Error Cnt, cell overflow, BERT analysis
Adaptation Layers	AAL0, AAL1, AAL5	Error Injection	HEC-correctable and uncorrectable errors, HEC error rate from continuous to 10 ⁻⁹ , HEC error burst from 1 to 10 on consecutive cells; PLCP B1, PLCP FEBE, PLCP POI, PLCP Frame (A1A2), PLCP (POI)
Header and Interface Support	Control of all cell header bits; UNI (3.0, 3.1, 4.0) and NNI support	Error Measurement	HEC correctable and uncorrectable error counts and rates, AAL5 CRC errors, AAL5 length errors; PRBS bit error measurement, loss of PRBS sync; AAL1 SN/SNP error, lost cells, misinserted cell counts and rates; PLCP framing errors, PLCP BIP, PLCP FEBE counts and rates
Channel Capacity	<u>Transmit</u> : 240 channels (independent AAL, service class, and bandwidth on all VCCs) <u>Receive</u> : 256 channels (cell count, bandwidth, AAL5 PDU counts and errors on all channels)	Alarm Detection	Cell synchronization loss, F4 and F5 AIS OAM flow (end-to-end/segment), F4 and F5 RDI OAM flow (end-to-end/segment); PLCP yellow alarm (RAI)
Test Traffic Generation	<u>VCC Channel Count</u> : Transmit foreground and background test channels <u>Traffic Shaping</u> : Foreground traffic shaping: Constant Bit Rate (CBR), real time/non-real time Variable Bit Rate (rt VBR, nrt VBR), Unspecified Bit Rate (UBR), Available Bit Rate: ABR (for STS-12c or Ac-4-4c only); foreground transmit resolution; background traffic shaping <u>Cell Generation</u> : Foreground VCC payload: 2 ¹⁵ - 1 (cross cell PRBS) + INV, user-defined 32-bit pattern, full cell, 0.191 test cell, special OAM generation/test feature, and burst cell transmission; background VCC payload	Cell Payload Patterns	PRBS 2 ¹⁵ -1, all 1's, 10101010, user-defined pattern
Test Traffic Analysis	<u>VCC Channel Count</u> : Receive test channels: Bandwidth analysis, cell count/rate, CLP ratio, CLP indication, BERT analysis, 0.191 Rev0/Rev1 analysis, AAL1 analysis, AAL5 analysis <u>Cell Analysis / QOS</u> : Cell bandwidth analysis (count/rate) - 256 channels; correctable HEC errors; uncorrectable HEC errors; BERT analysis (count/rate); 0.191 analysis I.356 (CER, CMR, CLR, Cell Transfer Delay-CTD, SECB, MTBO, 2-point Cell Delay Variation-CDV); 1-point CDV; Cell misinsertion ratio for AAL1; cell inter-arrival analysis; real-time analysis channels (bandwidth, BERT, 0.191, AAL1, AAL5) and CLP monitoring	Error Injection	HEC-correctable and uncorrectable errors, HEC error rate from continuous to 10 ⁻⁹ , HEC error burst from 1 to 10 on consecutive cells; PRBS bit error rates from 10 ⁻² to 10 ⁻⁹ , PLCP framing errors, BIP, FEBE
Performance Analysis	CER, CLR, CMR, SECBR	Alarm Generation	Cell synchronization loss, F4 and F5 AIS OAM flow (end-to-end/segment), F4 and F5 RDI flow (end-to-end/segment), PLCP yellow alarm
Protocol Analysis	<u>AAL0</u> : Cell count and bandwidth utilization, bit error count, pattern sync errors <u>AAL1</u> : AAL1 SAR PDU header SNP errors, lost cells, misinserted cells for AAL1 VCCs; cell count and bandwidth utilization, bit error count, pattern sync errors; <u>AAL5</u> : CPCS analysis, VCC simultaneous analysis, CRC, PDU length errors <u>Network Impairment</u> : Cell error generation, cell loss, cell misinsertion, CDV, cell reordering, test traffic insertion, VPI/VCI remapping, CLP tagging, CI setting, padding errors	SVC Support	Calling SVCs, called SVCs, load test-call setup, load test-cyclic calls
		SVC Signalling Analysis	Channel set up time, channel tear down, SSCOP link status indication, Tx/Rx attempted calls, Tx/Rx connected calls, Tx/Rx rejected calls, Tx/Rx cleared calls, call reference value
		SVC Monitoring	Call statistics, UNI signalling, ATM layer, AAL-5, signaling filters, UNI signaling errors, SSCOP errors, port, errors/alerts
		OAM Support (Generate & Analyze)	I.610 OAM support: F4 AIS, F5 AIS, F4 RDI, F5 RDI, F4 loopback, F5 loopback, PM OAM support (generate PM OAM with test traffic, receive and analyze PM OAM, forward monitoring PM OAM, backward reporting PM OAM)
		Cell Capture Support	Capture buffer size, capture filter-based on VPI/VCI, sending of captured data after optional modifications by user
		No. of Test Channels	240 Tx, 256 Rx



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