

2.3 Specification

2.3.1 Feature licences

Part of the MileGate functionality is subject to feature licences. For more information on feature licences please refer to [\[012\] Release Note “MileGate R5B”](#) and to [\[915\] Technical Bulletin “Feature Licences for MileGate”](#).SUAD3

2.3.2 Function and feature overview



Please note:

The SUAD3, SUAD4 units do not support PLS or TLS services in the current release. All occurrences of PLS or TLS service settings described in this document to not apply in the current release of the units although the description of the feature or the screendumps shown might indicate the availability of such services.

2.3.2.1 SUAD3 specific functions and features

Table 3: SUAD3 specific functions and features

Function	Rating or standard	ESW release
48 ADSL interfaces, supporting...		
- ADSL with non-overlapped spectrum	ITU-T G.992.1 (06/99), Asymmetric digital subscriber line (ADSL) transceivers, Annex A	r1
- ADSL2 with non-overlapped spectrum	ITU-T G.992.3 (01/05), Asymmetric digital subscriber line transceivers 2 (ADSL2), Annex A	r1
- ADSL2+ with non-overlapped spectrum	ITU-T G.992.5 (01/05), Asymmetric Digital Subscriber Line (ADSL) transceivers – Extended bandwidth ADSL2 (ADSL2+), Annex A	r1
Support of reach-extended ADSL2 (READSL2) for POTS lines	ITU-T G.992.3 Annex L	r1a
Support of ADSL2 extended upstream bandwidth for POTS lines	ITU-T G.992.3 Annex M	r1a
Support of ADSL2+ extended upstream bandwidth for POTS lines	ITU-T G.992.5 Annex M	r1a
Pair Bonding with free pair selection out of six 8-pair port groups	ITU-T G.998.1	r1a
Support of dying gasp	ITU-T G.991.2	r2a
Interworking with MileGate SUPC3/4 without CO splitter		r1a
PPPoA to PPPoE interworking		r1a

2.3.2.2 SUAD4 specific functions and features

Table 4: SUAD4 specific functions and features

Feature	Rating or standard	ESW release
48 ADSL interfaces, supporting...		

Table 4: SUAD4 specific functions and features (continued)

Feature	Rating or standard	ESW release
- ADSL with non-overlapped spectrum	ITU-T G.992.1 (06/99), Asymmetric digital subscriber line (ADSL) transceivers, Annex B	r1
- ADSL2 with non-overlapped spectrum	ITU-T G.992.3 (01/05), Asymmetric digital subscriber line transceivers 2 (ADSL2), Annex B	r1
- ADSL2+ with non-overlapped spectrum	ITU-T G.992.5 (01/05), Asymmetric Digital Subscriber Line (ADSL) transceivers – Extended bandwidth ADSL2 (ADSL2+), Annex B	r1

2.3.2.3 Functions and features common to SUAD3, SUAD4**Table 5: Functions and features common to SUAD3, SUAD4**

Function	Rating or standard	ESW release
Maximum number of units per subrack		
- in a MileGate 25x0	20	
- in a MileGate 23x0	7	
Support of ARPs within the NE (details see security features below)		r3a
Security features:	DSL Forum TR-101	
- Broadcast handling		r1a
- Prevention of L2 peer to peer (hair pin) forwarding		r1a
- Prevention of source MAC spoofing		r1a
- Prevention of source MAC flooding		r1a
- MAC address filtering		r1a
- MAC address aging (with DHCP)		r1a
- Multicast group address filtering		r1a
Enhanced security features:	DSL Forum TR-101, Migration to Ethernet Based DSL Aggregation, April 2006	r1a
- Broadcast filtering		
- Multicast filtering		
- MAC source filtering for Nto1 services		
- MAC destination filtering for Nto1 services		
- L2 packet filtering per logical interface		
- MAC forced forwarding		
- Support of DAI (Dynamic ARP Inspection)		
- IP spoofing prevention for nto1 services (DHCP)		
- IP flooding protection for nto1 services (DHCP)		
- Type specific slow protocol rate limiter		
- CoS based / per-VLAN rate limiting		
Enhanced DHCP logon options	DSL Forum TR-101	r1a
Enhanced PPPoE tag options	DSL Forum TR-101	r1a
Support of Single Ended Line Test (SELT)	ITU-T G.996.2 (05/09), Single-ended line testing for digital subscriber lines (DSL)	r1a
Detailed presentation of SELT results		r1b
Support of Double Ended Line Testing (DELT)	ITU-T G.996.2 (05/09)	r1a
Allows up to 960 ADSL2+ ports per MileGate 25x0 sub-rack		r1a
Interworking performance: packet rate of up to 700 k packets/s (up to 700 k packets/s per direction with unsymmetrical rates) at a packet size of 64 ... 1526 bytes		r1a

Table 5: Functions and features common to SUAD3, SUAD4 (continued)

Function	Rating or standard	ESW release
Handshaking procedures	ITU-T G.994.1 (05/03), Handshake procedures for digital subscriber line (DSL) transceivers	r1a
Support of L2 (low power) and L0 (Full On)	ITU-T G.992.3, ITU-T G.996.1 (02/01), Test procedures for digital subscriber line (DSL) transceivers	r1a
PSD (Power Spectral Density) shaping	ITU-T G.997.1	r1a
Downstream power back-off	ITU-T G.997.1	r1a
ADSL2 / ADSL2+ performance according to	DSL Forum WT-100, ADSL2 / ADSL2+ Performance Test Plan	r1a
Support of single latency mode (fast and interleaved with selectable latency)	ITU-T G.992.1, ITU-T G.992.3	r1a
Up to 7 VCCs per port	DSL Forum TR-101, ITU-T I.361 (02/99) B-ISDN ATM layer specification	r1a
PPPoE on ADSL lines	DSL Forum TR-101	r1a
IPoE on ADSL lines	DSL Forum TR-101	r1a
VLAN support	IEEE 802.1Q, Virtual Bridged Local Area Networks, 1998	r1a
Support of 1:1 VLAN mode, single and double tagged	DSL Forum TR-101	r1a
Support of N:1 single VLAN mode	DSL Forum TR-101	r1a
Support of N:1 double tagged services		r3a
VLAN tagging in upstream direction and VLAN filtering in downstream direction (frames from subscribers are not tagged or priority tagged, except for Transparent LAN services)	DSL Forum TR-101, IEEE 802.1D, Part 3: Media Access Control (MAC) Bridges, 1998	r1a
Support of VLAN QoS with Class of Service (CoS) handling: 8 CoS by four priority queues, with selectable scheduler per queue: - strict priority - weighted fair queuing (WFQ)	IEEE 802.1p, Traffic Class Expediting and Dynamic Multicast Filtering (in 802.1D-1998), DSL Forum TR-101	r1a
Interface (VCC) rate limiter (upstream, downstream)		r3a
IGMP snooping with IPoE, IGMP proxy with report message suppression	IETF RFC 2236, Internet Group Management Protocol, Version 2, November 1997; IETF RFC 3376, Internet Group Management Protocol, Version 3, October 2002	r1a
IGMP query padding		r3a
Multicast stream preview		r1c
Multicast pre-join and post-leave - pre-join intervals - post-leave intervals	1 ... 5 min 10 ... 180 sec	r1c
Multicast bandwidth allocation per port and per stream		r1c
Support of static multicast		r2a

Table 5: Functions and features common to SUAD3, SUAD4 (continued)

Function	Rating or standard	ESW release
Support of subscriber logon methods	nto1 service: - PPPoE - DHCP - None - PPPoE / DHCP combined (SUAD4) - PPPoE / DHCP combined (SUAD3) 1to1 service: - DHCP - PPPoE	r1a r1a r1a r1d r2a r3a r3c
DHCP relay option 82 for Nto1 services	IETF RFC 2131, IETF RFC 951, IETF RFC 3046, DHCP Relay Agent Information Option, January 2001	r1a
DHCP option 82 for 1to1 services		r3a
PPPoE intermediate agent	DSL Forum TR-101, IETF RFC 2516, A Method for Transmitting PPP Over Ethernet (PPPoE), February 1999	r1a
Configurable filtering per unit for - broadcast packets in 1:1 and N:1 services - multicast packets in 1:1 and N:1 services		r2a r2a
Fault Management	ITU-T X.733	r1a
Support of SNMP Alarm-MIB (RFC 3877), Entity-MIB (RFC 4133)	RFC 3877 RFC 4133	r4a
Operation in a MileGate 25x0 or 23x0 subrack		r1a
Power supply range	refer to [201] System Description "MileGate R5B"	
Maximum current consumption (all ADSL lines activated with maximum output power), $V_{bat} = -48\text{ V}$	1.15 A	
Maximum total power requirement from battery, $V_{bat} = \text{nominal voltage}$	54 W	
Basic power consumption (all ports disabled), $V_{bat} = \text{nominal voltage}$	23.5 W	
Maximum power dissipation on unit, $V_{bat} = \text{nominal voltage}$	47 W	
Mechanical parameters - Construction practice	19 inches	
- Dimensions: Height of the unit (1 HU = 44.45 mm) Width of the unit (1 TE = 5.08 mm) Size of the PCB (H x D)	6 HU 4 TE (1 slot) 233 mm x 220 mm	
- Weight of the unit	490 g	
Reliability - Calculated MTTF at 35 °C (MIL-HDBK-217F)	43 years	
Emission	refer to [201] System Description "MileGate R5B"	
Immunity	refer to [201] System Description "MileGate R5B"	
Safety	refer to [201] System Description "MileGate R5B"	

Table 5: Functions and features common to SUAD3, SUAD4 (continued)

Function	Rating or standard	ESW release
Ambient conditions	refer to [201] System Description “MileGate R5B”	

For additional information and functional contents or limitations, refer to [\[012\] Release Note “MileGate R5B”](#), and to the ESW release note of the unit software.

2.3.3 ADSL line interface characteristics

2.3.3.1 Transmission medium

Minimum requirements	Twisted copper pair no loading coils no open wires
Bridged taps	
- Maximum number	2
- Maximum length	500 m

2.3.3.2 Transmission parameters

Number of ADSL interfaces	48
Line rates	
- Downstream range	32 ... 26'000 kbit/s
- Upstream range	32 ... 1'536 kbit/s
- with Annex M	32 ... 3'520 kbit/s
Line code	DMT (ITU-T G.992.1, 992.3, 992.5)
Reach extended ADSL2	ITU-T G.992.3 (Annex L)
One way transfer delay	
- Channel type «Interleaved»	Configurable maximum, current value from status
- Channel type «Fast»	According to ADSL / ADSL2 / ADSL2+ standards
Output power	
- Maximum output power	20.4 dBm

2.3.3.3 Transmission performance

ADSL according to	DSL Forum TR 067 ETSI TS 101 388
ADSL2 and ADSL2+ according to	DSL Forum TR-100

The following diagrams show the rate & reach behaviour of the SUAD3 and SUAD4 ports in the case of 0.4 mm cable and white noise (-140 dBm/Hz) applied to ATU-R and ATU-C.

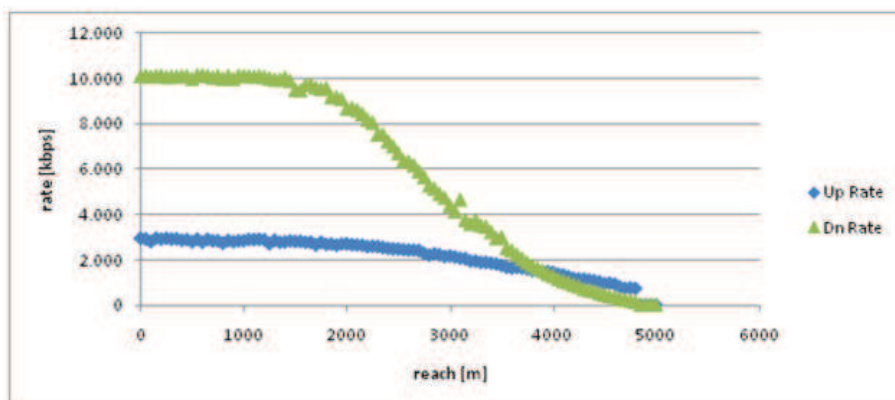


Figure 1: SUAD3 ADSL2 rate&reach with white noise (-140 dBm/Hz), interleaved channel (Annex M)

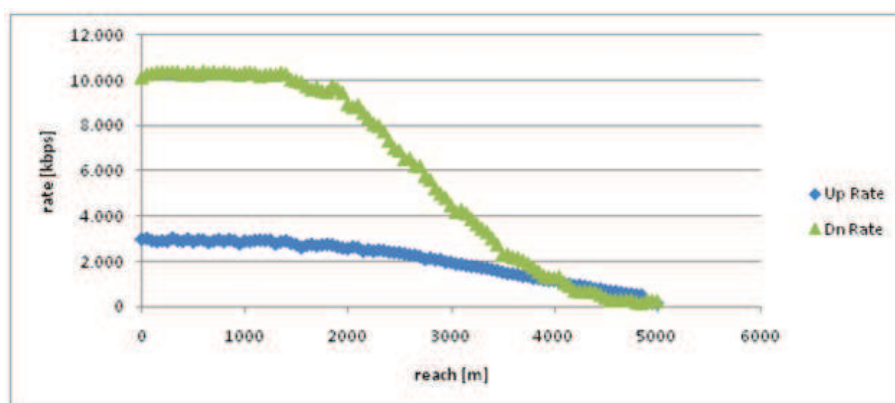


Figure 2: SUAD3 ADSL2 rate&reach with white noise (-140 dBm/Hz), fast channel (Annex M)

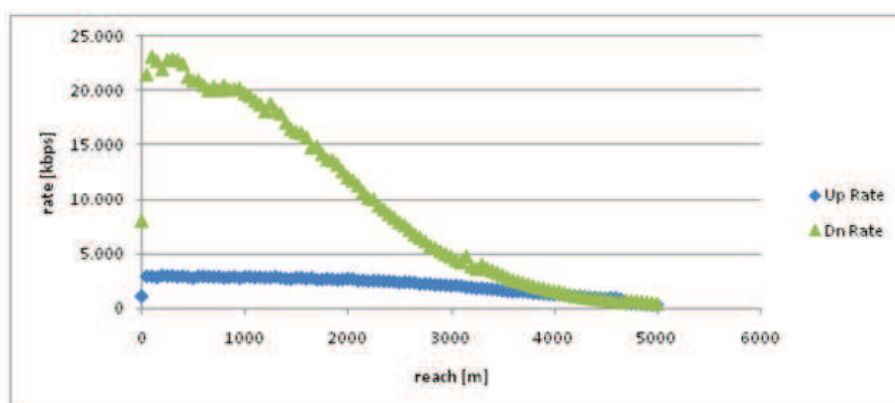


Figure 3: SUAD3 ADSL2+ rate&reach with white noise (-140 dBm/Hz), interleaved channel (Annex M)

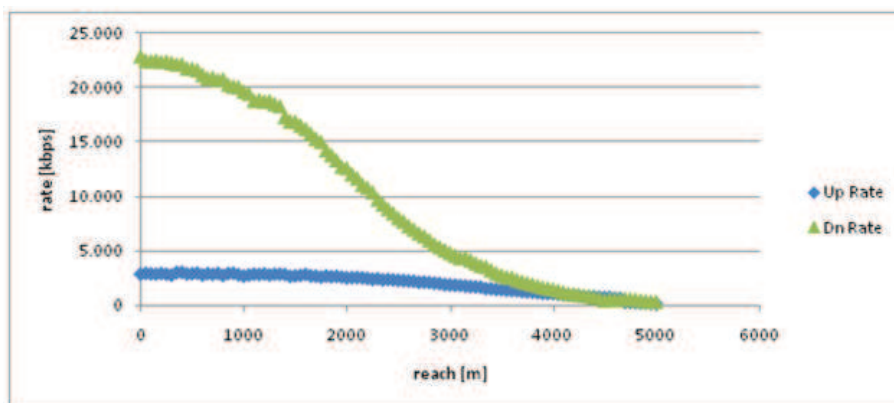


Figure 4: SUAD3 ADSL2+ rate&reach with white noise (-140 dBm/Hz), fast channel (Annex M)

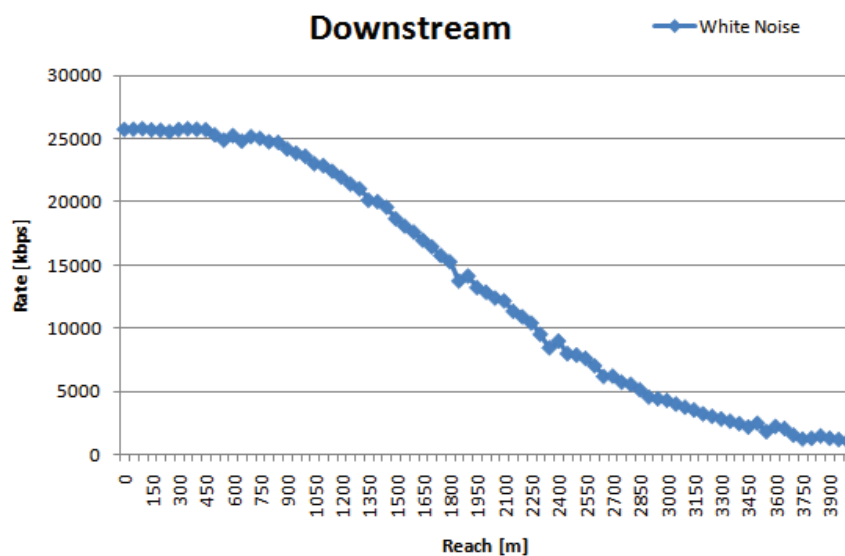


Figure 5: SUAD4 ADSL2+ downstream rate&reach with white noise (-140 dBm/Hz), interleaved channel (Annex B)

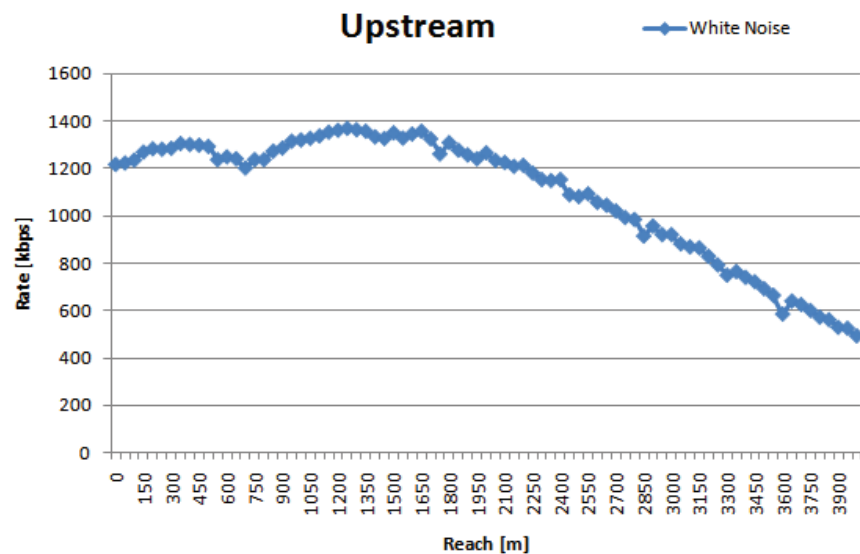


Figure 6: SUAD4 ADSL2+ upstream rate&reach with white noise (-140 dBm/Hz), interleaved channel (Annex B)

2.3.3.4 Power Spectral Density (PSD)

The following four diagrams show the PSDs of the ADSL2 and the ADSL2+ transmission signals on the SUAD3 and SUAD4 unit. Please note that the PSD requirements are identical for ADSL and ADSL2. Accordingly, the measurement results of ADSL2 and ADSL2+ are presented here only.

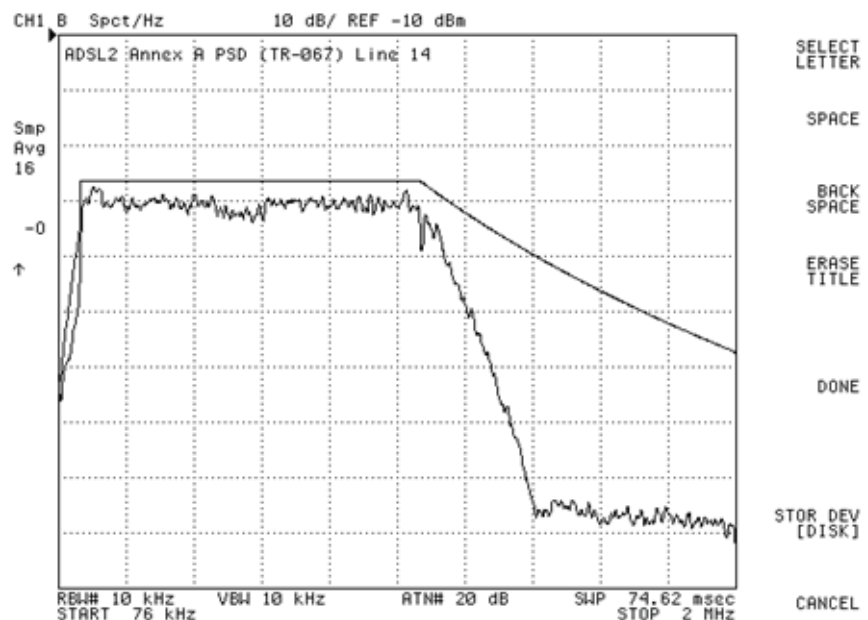


Figure 7: SUAD3 ADSL2 Power Spectral Density for non-overlapped spectrum operation (Annex A)

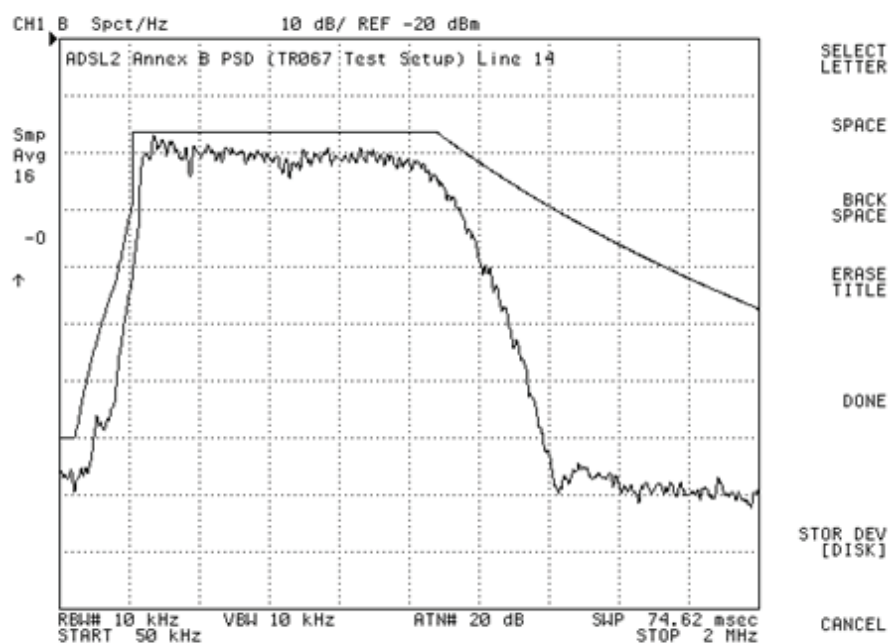


Figure 8: SUAD4 ADSL2 Power Spectral Density for non-overlapped spectrum operation (Annex B)

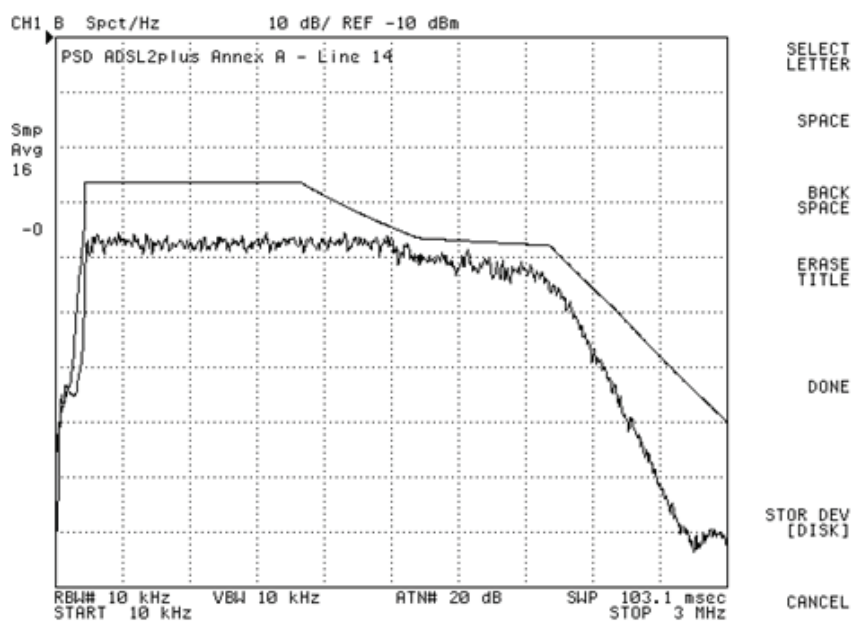


Figure 9: SUAD3 ADSL2+ Power Spectral Density for non-overlapped spectrum operation (Annex A)

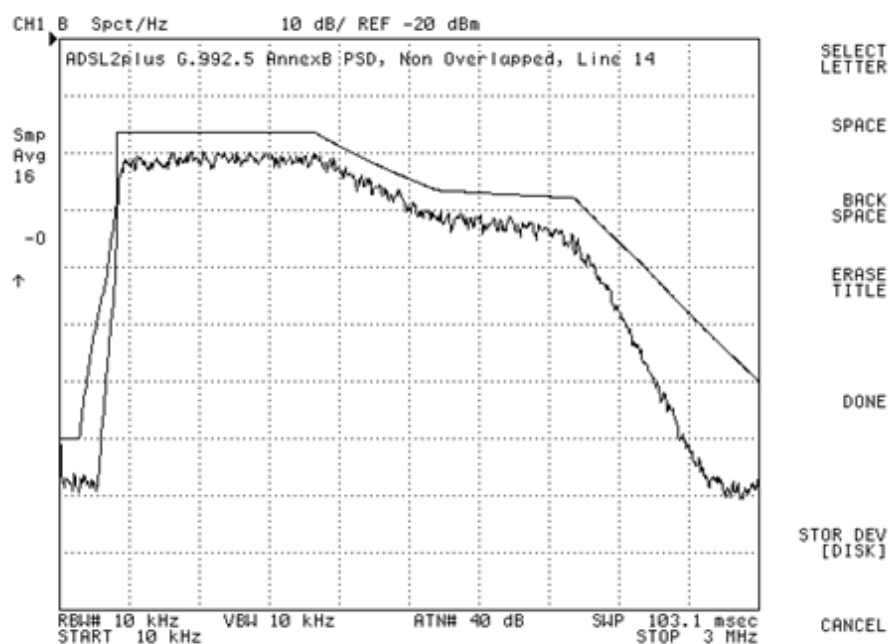


Figure 10: SUAD4 ADSL2+ Power Spectral Density for non-overlapped spectrum operation (Annex B)

The SUAD3 ADSL2+ power spectral density for non-overlapped spectrum operation with Annex M is the same as for Annex B with SUAD4.