**Huawei MA5603T OLT:**

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**MA5603T Overview:**

The MA5603T is a multi-service access device provided by Huawei Technologies Co., Ltd...

The MA5603T provides the integrated broadband and narrowband access and FTTx optical access services that feature high rate, high bandwidth, and high quality:

1. Supports broadband access services such as ADSL2+, VDSL2, and SHDSL, thereby enhancing the xDSL function.

2. Provides the STM-1 optical port through the AIUG board for subtending to the ATM DSLAM and converting the IPoA/PPPoA access into IPoE/PPPoE upstream transmission, thus implementing the ATM network consolidation function.

3. Provides the voice service solutions based on the Session Initiation Protocol (SIP), H.248, supports the POTS port, and implements the voice service, fax service, narrowband modem service, and various supplementary services.

4. Supports the GPON access service. The MA5603T can function as an optical line terminal (OLT) in the GPON system, working with the optical network terminal (ONT) or optical network unit (ONU).

**MA5603T Specifications:**

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| **Item** | **MA5603T** |
| Board configuration | 2 slots for control boards 6 slots for service boards 1 slot for the universal interface board 2 slots for upstream interface boards 2 slots for power interface boards. |
| Switching capacity of the backplane bus | 1.5 Tbit/s (H801MABO) 2 Tbit/s (H802MABO) |
| Supported control board and its switching capacity | SCUN: 480 Gbit/s in active/standby mode or 960 Gbit/s in load-sharing mode SCUH: 960 Gbit/s in active/standby mode or 1920 Gbit/s in load-sharing mode SCUB: 48 Gbit/s SCUF: 128 Gbit/s |
| System Layer 2 packet forwarding rate | SCUN: 480 Gbit/s in active/standby mode or 960 Gbit/s in load-sharing mode SCUH: 960 Gbit/s in active/standby mode or 1920 Gbit/s in load-sharing mode SCUB: 48 Gbit/s SCUF: 128 Gbit/s |
| Switching/Forwarding delay | Port forwarding delay: The 100 Mbit/s Ethernet port sends the 64-byte Ethernet packets at a delay shorter than 20 μs. |
| BER in full load | BER of a port when the port transmits data in full load < 10 e-7 |
| System reliability specifications | System: redundant configuration. System availability for the typical configuration: > 99.999% Mean time between failures (MTBF): about 45 years.  NOTE Due to different network environments and different boards used by devices, the above-mentioned MTBF (45 years) of the is only for reference. The average repair time for field replaceable units (FRUs) is about 2 hours. The preceding values are only for reference. For details, contact the related Huawei engineers. |
| Maximum number of ADSL2+ ports in a subrack | 384 |
| Maximum number of VDSL2 ports in a subrack | 384 |
| Maximum number of EFM SHDSL ports in a subrack | 192 |
| Maximum number of TDM SHDSL ports in a subrack | 96 |
| Maximum number of POTS ports in a subrack | 384 |
| Maximum number of ISDN BRA ports in a subrack | 192 |
| Maximum number of ISDN PRA ports in a subrack | 64 |
| Maximum number of GPON ports in a subrack | 96 |
| Maximum number of 10G GPON ports in a subrack | 48 |
| Maximum number of EPON ports in a subrack | 96 |
| Maximum number of 10G EPON ports in a subrack | 48 |
| Maximum number of P2P GE ports in a subrack | 288 |
| Maximum number of upstream ports (GE ports in the GIU slot) in a subrack | 8 |
| Maximum number of upstream ports (10GE ports in the GIU slot) in a subrack | 4 |
| Maximum number of upstream ports (PON ports in the GIU slot) in a subrack | 2 |
| Maximum number of extended subracks connected to a master subrack | 32 |
| Operating environment | **Operating temperature:** -40°C to +65°C Operating **humidity:**5% RH to 95% RH **Atmospheric pressure:** 61 kPa to106 kPa **Altitude:**≤ 4000 m |

**MA5603T Boards Descriptions:**

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| Board Type | Silk Screen | Full Name | Function |
| Control board | SCUB | Super Control Unit Board | -System control and management unit  -Local and remote maintenance  -Active/standby switchover  -GE channel to the service board  -Environmental monitoring parameters  -Four SFP GE ports for upstream transmission or cascading |
| SCUN | Super Control Unit Board | -System control and management unit  -Local and remote maintenance  -Active/standby switchover  -Load balancing(supported in V800R011C00 and later versions)  -GE or 10GE channel to the service board  -Environmental monitoring parameters  -Four SFP GE ports for upstream transmission or cascading |
| SCUL | Super Control Unit Board | -System control and management unit  -Local and remote maintenance  -Active/standby switchover  -GE or 10GE channel to the service board  -Environmental monitoring parameters |
| Service board | GPBC | 4-port GPON OLT Interface Board | -Four GPON ports  -Up to 64 ONTs for each GPON port |
| GPBD | 8-port GPON OLT Interface Board | -Eight GPON SFP ports (one-fiber bi-directional port)  -Up to 128 ONTs for each GPON port  -Class B+ and class C+ optical transceivers  -Querying the temperature and powering off the board in case of a high temperature |
| OPFA | FE P2P Optical Interface Board | -16-channels of FE optical signals  -Base station backhaul and transmission of the synchronous Ethernet clock signals |
| ASRB | 32-port Analog Subscriber Board | -32 channels of VoIP POTS access services  -Polarity reversal function on all the ports  -POTS metallic loop test (MELT)  -Must configuration with H806ASDA daughter board |
| ASPB | 64-port VOIP Subscriber Board | -64 channels of VoIP POTS access services  -Polarity reversal function on all the ports  -POTS metallic loop test (MELT)  -Must configuration with -H806ASDB daughter board  -Automatic power shutdown in case of a high temperature |
| DSRD | 32-port ISDN Digital Subscriber Board | -32 channels of ISDN access services  -The H802DSRD board uses the 2B1Q encoding mode  -Automatic power shutdown in case of a high temperature |
| ADLF | 32-port ADSL2+ over POTS Service Board | -32-channel ADSL2+ over POTS access service (working with a splitter)  -32-channel ADSL2+ access service  -Port protection  -SELT and DELT tests  -G.992.1 Annex A, G.992.3 Annex A/L/M (EU32-EU64), and G.992.5 Annex A/M (EU32-EU64)  -Automatic power shutdown in case of a high temperature (supported in V800R009C00 and later versions) |
| ADIF | 32-port ADSL2+ over ISDN Service Board | - 32-channel ADSL2+ over ISDN access service (working with a splitter)  - 32-channel ADSL2+ access service  - Port protection  - SELT and DELT tests  - G.992.1/3/5 Annex B, Annex J The differences between the ADLF board and the ADIF board are as follows:   - The ADLF board supports the ADSL2+ over POTS service, and the board can work with the SPLL/SPLF board.   - The ADIF board supports the ADSL2+ over ISDN service, and the board can work with the SPLH board. |
| ADPD | 64-port ADSL2+ over POTS Service Board | -64-channel ADSL2+ over POTS access service (working with a splitter)  - 64-channel ADSL2+ access service  - Port protection  - 2-wire bonding  - SELT and DELT tests  - G.992.1 Annex A, G.992.3 Annex A/L/M (EU32-EU64), and G.992.5 Annex A/M (EU32-EU64)  - G.INP re-transmission at the physical layer (V800R009C00 and later versions)  - Automatic power shutdown in case of a high temperature |
| ADQD | 64-port ADSL2+ over ISDN Service Board | -64-channel ADSL2+ over ISDN access service (working with a splitter)  - 64-channel ADSL2+ access service  - Port protection  - 2-wire bonding  - SELT and DELT tests  - G.992.1/3/5 Annex B  - Automatic power shutdown in case of a high temperature  The differences between the ADPD board and the ADQD board are as follows:  - The ADPD board supports the ADSL2+ over POTS service.  - The ADQD board supports the ADSL2+ over ISDN service. |
| ADKM | 64-port ADSL2+ Service Board | - 64 channels of ADSL2+ service  - Not supporting the ISDN service  - Port protection  - SELT, MELT and DELT tests  - G.992.1/3/5 Annex B, Annex J  - G.INP re-transmission at the physical layer (V800R011C00 and later versions)  - Automatic power shutdown in case of a high temperature |
| VDSA | 24-Port VDSL2 over POTS Service Board | -24-channel VDSL2 over POTS access service (working with a splitter)  - 24-channel VDSL2 access service  - Port protection  - SELT and DELT tests  - G.993.1, G.993.2  - G.992.1 Annex A, G.992.3 Annex A/L/M (EU32-EU64), and G.992.5 Annex A/M (EU32-EU64)  - 8b and 17a, and is compatible with 8a, 8c, 8d, 12a and 12b profiles  - Temperature query and  high-temperature  alarm  - Automatic power shutdown in case of a high temperature (supported in V800R009C00 and later versions) |
| VDTF | 24-port VDSL2 over ISDN Service Board | -24-channel VDSL2 over ISDN access service (working with a splitter)  - 24-channel VDSL2 access service  - Port protection  - SELT and DELT tests  - G.993.1/2  - G.992.1/3/5 Annex B, Annex J  - 8a, 8b, 8c, 8d, 12a, 12b, and 17a profiles  - Temperature query and  high-temperature alarm |
| VDRD | 24-Port VDSL2 over POTS Service Board | -24-channel VDSL2 over POTS  - Line protection  - VDSL2 30a profile  - Not requiring a built-in SPL, working with the SPL board  - Querying the temperature and powering off the board in case of a high temperature |
| VDMF | 48-port VDSL2 over POTS Service Board | -48-channel VDSL2 over POTS  -Line protection  - Querying the temperature and powering off the board in case of a high temperature  - VDSL2 17a/8b profile  - Not requiring a built-in SPL, working with the SPL board |
| VDNF | 48-port VDSL2 over ISDN Service Board | - 48-channel VDSL2 over ISDN  - Line protection  - Querying the temperature and powering off the board in case of a high temperature  - VDSL2 17a/8b profile  - Not requiring a built-in SPL,working with the SPL board |
| VDJM | 48-port VDSL2 Service Board | -48-channel VDSL2, VDSL2 17a/8b profile  - Line protection  - Querying the temperature and powering off the board in case of a high temperature  - Compatible with ADSL2+ Annex B and Annex J  - Can not be used with ISDN service  - MELT function |
| SHLB | 16-port SHDSL.bis Service Board | - SHDSL.bis feature in the ATM mode and the SDHSL service in the EFM mode  - M-pairs, EFM, and EFM bonding |
| SHLM | 16-port SHDSL.bis Service Board | - SHDSL.bis feature in the ATM mode and the SDHSL service in the EFM mode  - M-pairs, EFM, EFM bonding, and IMA bonding  - MELT function |
| EDTB | E1 Digital Trunk Board | - VoIP processing of the voice service  - High-level data link control (HDLC) signaling processing of the voice service |
| TOPA | TDM Traffic over PSN Board | - Native TDM function (when the NH1A/O2CE sub board is configured)  - CESoP function (when the EH1A/ CSSA sub board is configured)  - TDM signal upstream transmission through the E1 port (when the NH1A/EH1A subboard is configured)  - TDM signal upstream transmission through the STM-1 optical port (when the O2CE/CSSA subboard is configured) |
| CSPA | CESoP Service Process Board | - SAToP processing of 64 channels of E1 signals  - Active/standby switchover or load sharing of the control boards  - 8 kHz clock channel from the CSPA board to the backplane, which is used to transmit the clock signals recovered from the service to the control board  - Providing one 10GE attachment unit interface (XAUI) to each control board  - Querying the temperature and powering off the board in case of a high temperature |
| SPUA | Service Process Board | - Switching capacity of 40 G  - Eight GE ports and two 10GE ports on the front panel  - SFP interface  - Converging the ETH access services  - Enhanced L2 functions such as the S+C forwarding  - Supporting HQoS  - Querying the temperature and powering off the board in case of a high temperature |
| ETHB | Ethernet Service Access Board | - Ethernet upstream transmission  - Ethernet subtending  - Eight SFP GE optical transceiver or GE electrical ports  - Inter-board aggregation  - Load sharing and redundancy protection |
| AIUG | ATM Interface Unit Board | -Four ATM optical ports (STM-1)  - Upstream transmission over a common Ethernet  - ATM subtending upstream transmission (ATM PWE3) through a private line |
| SPUB | MPLS service Process Unit Board | - 10 Gbit/s MPLS switching capability  - Unidirectional 10 Gbit/s, bidirectional 5 Gbit/s when the control boards work in active/standby mode  - Bidirectional 10 Gbit/s when the control boards work in load sharing mode(V800R011C00 and later versions)  - Active/standby switchover of the control boards  - Load balancing of the control boards(V800R011C00 and later versions)  - Automatic power shutdown in case of a high temperature |
| SPL board | SPLF | 32-port ADSL over POTS Splitter Board | - Separating 32-channel POTS signals from ADSL2+ signals  - The SPLF board is applicable to the POTS line, and can work with the ADLF board. The port impedance of the SPLF board is the real impedance (600 ohms). |
| SPLH | 32-port ADSL over ISDN Splitter Board | - Separating 32-channel ISDN signals from ADSL2+ signals  - The SPLH board is applicable to the ISDN line, and can work with the ADIF board. The port impedance of the SPLH board is 2B1Q/4B3T. |
| SPLL | 32-port ADSL over POTS Splitter Board | -Separating 32-channel POTS signals from ADSL2+ signals  - The SPLL board is applicable to the POTS line, and can work with the ADLF board. The port impedance of the SPLF board is the complex impedance (ETSI TS 101 952 01 01 option A). |
| SPPF | 64-port ADSL over POTS Splitter Board | - Separating 64-channel POTS signals from ADSL2+ signals  - The SPPF board is applicable to the POTS line, and can work with the ADPD board. The port impedance of the SPPF board is the real impedance (600 ohms). |
| SPPH | 64-port ADSL over ISDN Splitter Board | - Separating 64-channel ISDN signals from ADSL2+ signals  - The SPPH board is applicable to the ISDN line, and can work with the ADQD board. The port impedance of the SPPH board is 2B1Q/4B3T. |
| SPPL | 64-port ADSL over POTS Splitter Board | - Separating 64-channel POTS signals from ADSL2+ signals  - The SPPL board is applicable to the POTS line, and can work with the ADPD board. The port impedance of the SPPL board is the complex impedance (ETSI TS 101 952 01 01 option A or ETSI TS 101 952 01 01 option B). |
| VSTL | 24-port VDSL2 over POTS Splitter Board | -Separating 24-channel VDSL2 signals from POTS signals  - The VSTL board is applicable to the POTS line, and can work with the VDSA board. The port impedance of the VSTL board is the complex impedance (ETSI TS 101 952 01 01 option A). |
| VSTH | 24-port VDSL2 over ISDN Splitter Board | - Separating 24-channel VDSL2 signals from ISDN  - The VSTH board is applicable to the ISDN line, and can work with the VDTF board. The port impedance of the VSTH board is 2B1Q/4B3T. |
| VSPHA | 64-port VDSL2 over ISDN Splitter Board | - Separating 64-channel VDSL2 signals from ISDN signals  - Supporting ISDN (2B1Q/4B3T) complex impedance. |
| VSNLA | 48-port VDSL2 over POTS Splitter Board | -Separating 48-channel VDSL2 signals from POTS signals  - Supports complex impedance (ETSI TS 101 952 01 01 option A) |
| VSNF | 48-port VDSL2 over POTS Splitter Board | - Separating 48-channel VDSL2 signals from POTS signals  - Real impedance (600 ohms) |
| Clock board | CITD | Combo Interface Transfer Board | -Seven inputs of alarm digital parameters and one output of digital controlling parameters  - External monitoring Ethernet port to transparently transmit monitored data  - When configured with the BITSB clock daughter board, the CITD board also provides the following functions:   – Two inputs of 2 Mbit/s or 2 MHz BITS clock signals  – Two inputs of 1 PPS+TOD time signals  – One output of 2 Mbit/s or 2 MHz clock signals  – Two outputs of 1PPS time signals(supported in V800R011C00 and later versions) |
| Upstream interface board | GICD | 4-port GE Optical Interface Card | - Upstream transmission or cascading  - Four SFP GE ports  - Intra-board aggregation and Inter-board aggregation |
| GICE | 4-port GE/FE Electrical Interface Card | - Upstream transmission or cascading  - Four GE electrical ports  - Intra-board aggregation and Interboard aggregation |
| GICF | 2-port GE Optical Interface Card | - Upstream transmission or cascading  - Two SFP GE ports  - Intra-board aggregation and Interboard aggregation |
| X1CA | 1-port 10GE XFP Optical Interface Unit Board | - Upstream transmission or cascading  - One 10GE optical port  - Intra-board aggregation and Interboard aggregation |
| X2CA | 2-port 10GE XFP Optical Interface Unit Board | - Upstream transmission or cascading  - Two 10GE optical ports  - Intra-board aggregation and Interboard aggregation |
| X2CS | 2-port 10GE Uplink Interface Card | - 2 10GE upstream ports  - 10GE synchronization Ethernet  - Intra-board aggregation and Interboard aggregation |
| Transfer board | SHET | SHDSL Extension board | converts signals between different connectors |
| Power interface board | PRTE | Connect Power Board | - One -48 V power input - Filtering and current-limiting for the power input port  - Under-voltage detection, detection of whether the input power exists, and fault detection  - Combined reporting of the protection alarm and board online signal  - ALARM indicator |

**MA5603T Features**:

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| Classification | Feature |
| Access features | GPON access ADSL/ADSL2/ADSL2+ access VDSL access SHDSL access ATM access |
| GPON access | GPON terminal management Continuous-mode ONU detection |
| MPLS | Basic MPLS functions  MPLS RSVP-TE  MPLS OAM  Graceful restart (GR) function of the LDP, RSVPTE, and PW |
| Broadband L2 features | MAC address management  VLAN attribute management  Service stream processing  L2 forwarding policy  Traffic classification  VLAN switching policy  \*Bridging |
| QoS | Priority processing  Traffic management  ACL policy  Congestion management  \*HQoS |
| Multicast | PIM-SSM  IGMP snooping  IGMP proxy  Multicast VLAN management  Multicast program management  Multicast user management  \*Multicast CAC |
| L2 tunnel emulation technology | \*TDM PWE3  ATM PWE3  \*ETH PWE3  \*Terminating the SAToP service and transmitting the service upstream through the STM-1/E1 port  Terminating the native TDM service and transmitting the service upstream through the E1/ STM-1 port |
| L3 features | VLAN L3 interface  ARP  ARP proxy  DHCP relay  DHCP Option60  Static routing  RIP dynamic routing  OSPF dynamic routing  DHCP proxy  ECMP  VRF |
| Voice services | VoIP  - SIP  - H.248  FoIP  MoIP |
| Security features | User security  System security  OAM security  Line security |
| Network protection features | MSTP  \*Smart link and monitor link  \*Inter-board aggregation  Ethernet link aggregation (through the LACP protocol)  BFD  \*STM-1 protection switching  \*Type-B dual-homing protection switching  Redundancy protection |
| OAM features | Remote operation and user management  Version and data management  Device abnormality management  \*Service overload control  ETH OAM |
| Clock features | \*IEEE 1588 V2 clock synchronization  BITS access clock synchronization  Synchronous Ethernet clock  System internal clock  Network time synchronization  Line recovered clock (E1/STM-1/SAToP) |
| Control board redundancy | Load-balancing mode  Active/Standby mode |
| System energy conservation | Energy conservation control  Energy consumption monitoring |