

ANNEX-C: TECHNICAL SPECIFICATION SHEET

Technical Specifications Mini MSAG							
Bidder's Name							
Bidder's Quoted Brand & Model							
Manufacturing Country (Made & assembled in)							
Features	CCUB control board	CCUC control board	Marks	Bidder's Statement			
				FC	NC	Bidder's Quoted Feature	Reference in Data Sheets / Manual
GPON	ITU G.984-compliance	ITU G.984-compliance	M				
	8 T-CONTs	32 T-CONTs	M				
	128 GEM ports	1000 GEM ports	M				
Broadband	4K VLANs, supporting QinQ and stacking VLANs	4K VLANs, supporting QinQ and stacking VLANs	M				
	4K MAC addresses, supporting VMAC	4K MAC addresses, supporting VMAC	M				
	VLAN switching	VLAN switching	M				
	Conversion from PPPoA to PPPoE and from IPoA to IPoE	Conversion from PPPoA to PPPoE and from IPoA to IPoE	M				
	802.1p, supporting PQ and WRR flow control, and ACL	802.1p, supporting PQ and WRR flow control, and ACL	M				
Voice	SIP and H.248	SIP and H.248	M				
	ISDN BRA port	ISDN BRA port	M				
	POTS short-loop design	POTS short-loop design	M				
ADSL2+	Compliance with ITU-T G992.1 to G992.5, and T1.413	Compliance with ITU-T G992.1 to G992.5, and T1.413	M				
	ADSL2+ bonding (2-wire, 4-wire, 6-wire, or 8-wire)	ADSL2+ bonding (2-wire, 4-wire, 6-wire, or 8-wire)	M				
VDSL2	G993.2-compliance	G993.2-compliance	M				
	8a, 8b, 8c, 8d, 12a, 12b, 17a, and 30a profiles	8a, 8b, 8c, 8d, 12a, 12b, 17a, and 30a profiles	M				
	2-wire VDSL2 bonding	2-wire VDSL2 bonding	M				
SHDSL	G991.2-compliance	G991.2-compliance	M				
	G.SHDSL.Bis, supporting ATM and PTM	G.SHDSL.Bis, supporting ATM and PTM	M				
	EFM bonding (2-wire, 4-wire, 6-wire, or 8-wire)	EFM bonding (2-wire, 4-wire, 6-wire, or 8-wire)	M				
Multicast	IGMPv2 and IGMPv3	IGMPv2 and IGMPv3	M				
	IGMP proxy and IGMP snooping	IGMP proxy and IGMP snooping	M				
	A maximum of 1024 configurable multicast programs in the system A maximum of 256 multicast users A maximum of 16 concurrent multicast programs for each user	A maximum of 1024 configurable multicast programs in the system A maximum of 256 multicast users A maximum of 16 concurrent multicast programs for each user	M				
Security	PPPoE+ and DHCP option82	PPPoE+ and DHCP option82	M				

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	Static and dynamic MAC address binding	Static and dynamic MAC address binding	M				
	Anti-MAC and anti-IP spoofing; source MAC address and IP address filtering	Anti-MAC and anti-IP spoofing; source MAC address and IP address filtering	M				
	Anti-DoS attack and firewall	Anti-DoS attack and firewall	M				
Maintenance and management	SNMPv1, SNMPv2, and SNMPv3	SNMPv1, SNMPv2, and SNMPv3	M				
	Telnet and SSHv2	Telnet and SSHv2	M				
	Remote and batch pre-deployment	Remote and batch pre-deployment	M				
	Remote upgrade and monitoring	Remote upgrade and monitoring	M				
Network-side port	The MA5616 supports the following configurations: • 1*GPON + 1*GE • 2*GE	The MA5616 supports the following configurations: • 1*GPON + 1*GE • 2*GE	M				
Operating temperature	-40oC to 65oC; startup at -25oC	-40oC to 65oC; startup at -25oC	M				
Humidity	5% to 95% (non-condensing)	5% to 95% (non-condensing)	M				
Heat dissipation mode	Providing fans for heat dissipation. The rotating speed can be automatically adjusted.	Providing fans for heat dissipation. The rotating speed can be automatically adjusted.	M				
Power supply	AC: 220 V/110 V DC: -48 V	AC: 220 V/110 V DC: -48 V	M				
Backup power	Support for 48-V backup power Support for lead-acid batteries and LiFePO4 batteries	Support for 48-V backup power Support for lead-acid batteries and LiFePO4 batteries	M				

Technical Specifications Managed L2 Ethernet Switch							
Bidder's Name							
Bidder's Quoted Brand & Model							
Manufacturing Country (Made & assembled in)							
S.No	Title	Description	Marks	Bidder's Statement			
				FC	NC	Bidder's Quoted Feature	Reference in Data Sheets / Manual
1	Performance						
1.1	Switching Capacity (Duplex)	≥ 12.8 Gbps	M				
1.2	Forwarding Rate	≥ 9.6 Mpps	M				
1.3	VLAN ID Support	4096	M				
1.4	MAC Address Table	8k	M				
1.5	QoS queues	Supports SP+WRR queues	M				
2	Interfaces						
2.1	100/1000 * port	8 Ports (at least)	M				
2.2	1000/10000 base-X Optical 2 SFP	2 Ports (at least)	M				
3							
3.1	Interpretability	With all major vendor equipment	M				
4	Layer-2 Features						
4.1	Spanning Tree	STP-802.1D ,RSTP 802.1w,MSTP,802.1S	M				
4.2	LACP	Link Aggregation Control Protocol (802.3ad / 802.1AX)	M				
4.3	VLAN	Interface/Port-based VLAN, MAC-based VLAN, Q-in-Q (802.1ad), Private/MUX VLAN	M				
4.4	Multicasting	Multiple Registration Protocol (MRP) or Multicast VLAN Registration (MVR) or GARP VLAN Registration Protocol (GVRP)	M				
4.5		IGMP v1, v2, v3	M				
4.6		IGMP Snooping	M				
4.7	Ring protocol with ≤ 50ms recovery time	ITU-T G.8032 - Ethernet Ring Protection Switching (ERPS)	M				
5	Qos, ACL/Security						
5.1	QoS	CoS (Class-of-Service) / IEEE 802.1p priority marking	M				
5.2		Strict Priority (SP), Weighted Round Robin (WRR)	M				
5.3	Packet Filtering / Advanced ACL based on:	IPv4, VLAN ID, MAC Address	M				
5.4	L2 Security	ARP Guard (Anti-ARP Scan/Inspection or Anti-ARP Spoofing)	M				
5.5		BPDU Attack Protection	M				
5.6		DoS (Denial of Service) Attack Prevention (any type)	M				

5.7	DHCP	Client, Relay, Snooping	M				
6	Authentication / Accounting						
6.1	IEEE 802.1x	IEEE 802.1X Port or MAC-Based Authentication (Network Access Control)	M				
6.2	AAA	RADIUS	M				
6.3		TACACS (any variant)	M				
7	L3 Features						
7.1	Routing	Static route	M				
8	Management						
8.1	Management	Web-based GUI	M				
8.2		CLI based Console access	M				
8.3		SSH access	M				
8.4		SNTP/NTP Client	M				
8.5		SNMP v2c/v3 support	M				
8.6		Syslog (System Log)	M				
8.7	Operation, Administration & Management (OAM) Standards	ITU-T Y.1731	M				
9	Power						
9.1	Power Supply	AC 220V	M				
10	Environmental						
10.1	Operating Environment	0°C to +45°C	M				
10.2	Humidity non condensing	5% to 85%	M				
11	Serviceability-EOX						
11.1	EoS (End of Support) of the quoted model	At least 1 Years of EoS from OEM	M				

TECHNICAL SPECIFICATIONS ISM Band Digital Radio System							
Bidder's Name:							
Bidder's Quoted Brand / Model:							
Country of Manufacture:							
S. No	Feature / Description	Minimum Specification	Marks	Bidder Statement			Bidder Quoted Features
				FC	PC	NC	
1	Frequency Band	5 GHz ISM band; operating range 5150 – 5875 MHz (subject to local regulatory approval)	M				
2	Wireless Standard	IEEE 802.11a/n; 2x2 MIMO dual-chain (dual polarization)	M				
3	TX Output Power	Minimum 26 dBm (400 mW) maximum transmit power	M				
4	RX Sensitivity	Minimum –96 dBm at MCS0; minimum –74 dBm at MCS15	M				
5	Antenna Gain	Minimum 22 dBi integrated directional antenna (dish / grid / flat-panel); no external RF cable losses	M				
6	Channel Bandwidth	Selectable: 5 / 10 / 20 / 40 MHz	M				
7	TDMA Protocol	Supports TDMA-based protocol (e.g. airMAX, Nv2, or equivalent) for PtP/PtMP efficiency and hidden-node mitigation	M				
8	Throughput	Minimum 300 Mbps real TCP/IP throughput in PtP configuration	M				
9	Air Distance / Link Range	Minimum 20 km operating range in clear line-of-sight (LOS) conditions	M				
10	Ethernet Interface	Minimum 1 × 10/100 Mbps RJ45 port; Auto MDI/MDIX; passive PoE input (10 – 30 V DC); PoE injector included	M				
11	Power Consumption	Maximum 8W total; powered via passive PoE	M				
12	Management	Web-based HTTPS GUI; CLI via SSH; SNMP v2c/v3; real-time RSSI signal strength display; remote firmware upgrade	M				
13	Security	WPA2-AES encryption (IEEE 802.11i); MAC ACL; management access control	M				
14	Enclosure & Mounting	Outdoor UV-stabilized weatherproof housing (IP65 or equivalent); pole-mount bracket with ±15° tilt; grounding lug; wind survivability ≥ 120 km/h; operating temp –40°C to +70°C	M				

TECHNICAL SPECIFICATIONS UPS (700 / 800 VA) with 12V 50Ah Battery							
Bidder's Name							
Bidder's Quoted Brand / Model							
Country of Manufacture							
S.No	Feature / Description	Minimum Specification	Marks	Bidder Statement			Bidder Quoted Features
				FC	PC	NC	
1	UPS Type & Topology	Line-Interactive or Online Double Conversion; sine wave output mandatory	M				
2	Power Rating	Minimum 700 VA / 700 W (unity power factor or ≥ 0.9 pF); 800 VA / 800 W preferred	M				
3	Input Voltage & Frequency	AC input: 170 – 280 V (wide range); 50 Hz $\pm$ 5%; single phase	M				
4	Output	220 – 240 V AC $\pm$ 5%; pure sine wave; minimum 2 $\times$ IEC C13 or local output sockets	M				
5	Battery	External sealed lead-acid (SLA/VRLA) battery: 12V, 50Ah; deep-cycle; maintenance-free	M				
6	Backup Time	Minimum 15-20 mins at full load with 12V 50Ah battery	M				
7	Protection & Alarms	Overload, over-voltage, under-voltage, short circuit, over-temperature protection; audible alarms and LED indicators for mains, battery, fault status	M				
8	Certifications & Warranty	CE / IEC 62040 or equivalent national certification; RoHS compliant; minimum 1-year manufacturer warranty	M				