

# ePMP™ Force L Series

## QUICK LOOK:

- **High-performance subscriber modules for point-to-point and point-to-multipoint fixed wireless broadband applications**
- **Up to 400 Mbps capacity leveraging the proven ePMP platform on 802.11ac models (200 Mbps on 802.11n models)**
- **Compatible with all ePMP Access Points, including ePMP 3000 and ePMP 3000L**
- **3-year hardware warranty**



Service providers face ever-increasing demand for capacity in a limited amount of spectrum. The **ePMP Force L Series** of subscriber modules (SM) meets this demand offering high performance, scalability, low latency across both point-to-point and point-to-multipoint deployments while providing a rapid return on investment.

The Force L Series has a variety of options tailored to the range and capacity needs of the wireless service provider:

**The Force 300 L Series** delivers up to 400 Mbps and is based on 802.11ac Wave 2 Technology enabling MU-MIMO performance when used with the ePMP 3000 Access Point.

**Force 300-25L** features a high-gain 25 dBi integrated dish.

**Force 300-13L** features an integrated 13 dBi panel antenna.

**Force 130 L Series** delivers up to 200 Mbps and is based on 802.11n technology. **Force 130** features an integrated 13 dBi antenna and **Force 200L** has an integrated 25 dBi dish antenna.



### All Force L Series SMs feature the following:

- Proven ePMP air interface including the optimized ePTP interface for low latency point-to-point applications.
- Interoperability with ePMP 3000, 3000L, MicroPOP, 2000 and 1000 Access Points.
- Multiple levels of QoS (Quality of Service) for voice (VoIP), video (IPTV) and data applications.
- Security features meeting the requirements of enterprise, industrial, government and service provider users.
- Each SM comes with a Power over Ethernet (PoE) injector and pole mount hardware included.
- Management by Cambium Networks cnMaestro™ network management system for easy provisioning, monitoring and upgrades.
- Network planning with LINKPlanner and cnHeat.
- 3-year hardware warranty and support from Cambium Networks.
- An optional software license is available to convert the Force 300 CSML to an Access Point with maximum 12 subscribers modules and without GPS synchronization support.

## ePMP™ Force L Series

Spectrum					
	Force 130 5 GHz	Force 200L	Force 300-13L	Force 300-25L	Force 300-CSML
<b>Channel Width MHz</b>	5   10   20   40	5   10   20   40	20   40   80	20   40   80	20   40   80
<b>Proprietary Physical Layer</b>	2x2 MIMO/OFDM	2x2 MIMO/OFDM	2x2 MIMO/OFDM	2x2 MIMO/OFDM	2x2 MIMO/OFDM
<b>Channel Spacing</b>	Configurable in 5 MHz increments	Configurable in 5 MHz increments	Configurable in 5 MHz increments	Configurable in 5 MHz increments	Configurable in 5 MHz increments
<b>Frequency Range</b>	Wide Band Operation 4910–5970 MHz	Wide Band Operation 4910–5970 MHz	Wide Band Operation 4910–6200 MHz	Wide Band Operation 4910–6200 MHz	Wide Band Operation 4910–6200 MHz
Note: Allowable frequencies and bands are dictated by individual country regulations.					
<b>MAC Layer (Media Access Control)</b>	Cambium Proprietary	Cambium Proprietary	Cambium Proprietary	Cambium Proprietary	Cambium Proprietary
<b>Ethernet Interface</b>	10/100 BaseT	10/100 BaseT	10/100/1000 BaseT	10/100/1000 BaseT, Compatible with Cambium PoE & Standard PoE pinouts	10/100/1000 BaseT,
<b>Protocols Used</b>	IPv4, IPv6, UDP, TCP, IP, ICMP, SNMPv2c, HTTPs, STP, SSH	IPv4, IPv6, UDP, TCP, IP, ICMP, SNMPv2c, HTTPs, STP, SSH	IPv4, IPv6, UDP, TCP, IP, ICMP, SNMPv2c, HTTPs, STP, SSH	IPv4, IPv6, UDP, TCP, IP, ICMP, SNMPv2c, HTTPs, STP, SSH	IPv4, IPv6, UDP, TCP, IP, ICMP, SNMPv2c, HTTPs, STP, SSH
<b>Network Management</b>	IPv4/IPv6, HTTPs, SNMPv2c, SSH, Cambium Networks cnMaestro	IPv4/IPv6, HTTPs, SNMPv2c, SSH, Cambium Networks cnMaestro	IPv4/IPv6, HTTPs, SNMPv2c, SSH, Cambium Networks cnMaestro	IPv4/IPv6, HTTPs, SNMPv2c, SSH, Cambium Networks cnMaestro	IPv4/IPv6, HTTPs, SNMPv2c, SSH, Cambium Networks cnMaestro
<b>VLAN</b>	802.1Q with 802.1p priority	802.1Q with 802.1p priority	802.1Q with 802.1p priority	802.1Q with 802.1p priority	802.1Q with 802.1p priority

\*\* Tx power may be lower above 6135 MHz. Refer to user guide for specific values.

Performance					
	Force 130 5 GHz	Force 200L	Force 300-13L	Force 300-25L	Force 300-CSML
<b>ARQ</b>	Yes	Yes	Yes	Yes	Yes
<b>Nominal Receive Sensitivity (w/FEC) @20 MHz Channel</b>	MCS0 -88 dBm; MCS7 = -70 dBm	MCS0 -88 dBm; MCS7 = -70 dBm	MCS0 = -89 dBm; MCS9 = -62 dBm	MCS0 = -89 dBm; MCS9 = -62 dBm	MCS0 = -89 dBm; MCS9 = -62 dBm
<b>Nominal Receive Sensitivity (w/FEC) @40 MHz Channel</b>	MCS0 = -86 dBm; MCS7 = -68 dBm	MCS0 = -86 dBm; MCS7 = -68 dBm	MCS0 = -87 dBm; MCS9 = -61 dBm	MCS0 = -86 dBm; MCS9 = -60dBm	MCS0 = -86 dBm; MCS9 = -60dBm
<b>Nominal Receive Sensitivity (w/FEC) @80 MHz Channel</b>	n/a	n/a	MCS0 = -85 dBm; MCS9 = -59 dBm	MCS0 = -84 dBm to MCS9 = -57 dBm	MCS0 = -84 dBm to MCS9 = -57 dBm
<b>Modulation Levels (Adaptive)</b>	MCS0 (BPSK) to MCS7 (64QAM 5/6)	MCS0 (BPSK) to MCS7 (64QAM 5/6)	MCS0 (BPSK) to MCS9 (256 QAM 5/6)	MCS0 (BPSK) to MCS9 (256 QAM 5/6)	MCS0 (BPSK) to MCS9 (256 QAM 5/6)
<b>Transmit Power Range</b>	+3 to 28 dBm (combined, to regional EIRP limit) (1 dB interval)	+3 to 28 dBm (combined, to regional EIRP limit) (1 dB interval)	+3 to 27 dBm (combined, to regional EIRP limit) (1 dB interval)	+3 to +24 dBm (combined, to regional EIRP limit) (1 dB interval)	+3 to 27 dBm (combined, to regional EIRP limit) (1 dB interval)
<b>QoS (Quality of Service)</b>	Three level priority (Voice, High, Low) with packet classification by DSCP, COS, VLAN ID, IP & MAC Address, Broadcast, Multicast and Station Priority				

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Physical					
	Force 130 5 GHz	Force 200L	Force 300-13L	Force 300-25L	Force 300-CSML
<b>Surge Suppression*</b>	1 Joule Integrated	1 Joule Integrated	1 Joule Integrated	1 Joule Integrated	1 Joule Integrated
<b>Environmental</b>	IP55	IP55	IP55	IP55	IP55
<b>Temperature</b>	-30°C to 55°C (-22°F to 122°F)	-30°C to 55°C (-22°F to 122°F)	-30°C to 60°C (-22°F to 140°F)	-30°C to 60°C (-22°F to 140°F)	-30°C to 60°C (-22°F to 140°F)
<b>Weight</b>	0.35 kg (0.88 lbs)	1.6 kg (3.5 lbs)	0.35 kg (0.88 lbs)	1.6 kg (3.5 lbs)	0.49 kg (1.08 lbs)
<b>Wind Survival</b>	125 km/h (78 mph)	200 km/h (124 mph)	200 km/h (124 mph)	200 km/h (124 mph)	200 km/h (124 mph)
<b>Dimensions</b>	235 x 77 x 58 mm (9.25 x 3.03 x 2.28in)	TBD	235 x 77 x 58 mm (9.25 x 3.03 x 2.28in)	280 x 470 x 470 mm (11.0 x 18.5 x 18.5 in.)	29.1 x 14.5 x 8.3 cm (11.4 x 5.7 x 3.3 in)
<b>Pole Diameter Range</b>	3.8 - 6.4 cm (1.5 - 2.5 in)	2.5 - 7.5 cm (1.0 to 3.0 in)	3.8 - 6.4 cm (1.5 - 2.5 in)	2.5 - 7.5 cm (1.0 to 3.0 in)	2.5 - 7.5 cm (1.0 to 3.0 in)
<b>Power Consumption</b>	8 W Maximum, 5 W Typical	8 W Maximum, 5 W Typical	12 W Maximum, 9 W Typical	12 W Maximum, 9 W Typical	12 W Maximum, 9 W Typical
<b>Input Voltage</b>	24 V; uses standard passive PoE injectors at 24 V. Not compatible with 29 V supplies	30 V Passive PoE (14-30 V DC input)	30 V Passive PoE (14-30 V DC input)	30 V Passive PoE (14-30 V DC input)	30 V Passive PoE (14-30 V DC input)

\*Optional 30 V Surge Suppressor Available: Part # C000000L065A

Security					
	Force 130 5 GHz	Force 200L	Force 300-13L	Force 300-25L	Force 300-CSML
<b>Encryption</b>	128-bit AES (CCMP mode)	128-bit AES (CCMP mode)	128-bit AES (CCMP mode)	128-bit AES (CCMP mode)	128-bit AES (CCMP mode)

Certifications					
	Force 130 5 GHz	Force 200L	Force 300-13L	Force 300-25L	Force 300-CSML
<b>FCC</b>	Not Available in North America	Not Available in North America	Not Available in North America	Not Available in North America	Not Available in North America
<b>Industry Canada</b>	Not Available in North America	Not Available in North America	Not Available in North America	Not Available in North America	Not Available in North America
<b>CE</b>	DoC available on cambiumnetworks.com	DoC available on cambiumnetworks.com	DoC available on cambiumnetworks.com	DoC available on cambiumnetworks.com	DoC available on cambiumnetworks.com

## ePMP™ Force L Series

Antenna Specifications					
	Force 130 5 GHz	Force 200L	Force 300-13L	Force 300-25L	Force 300-CSML
<b>Frequency Range</b>	5.150 – 5.970 MHz	4.920 – 5.950 MHz	4.920 – 5.950 MHz	4.920– 6.400 MHz	N/A
<b>Antenna Type</b>	Flat Panel	Integrated Dish	Flat Panel	Integrated Dish	Connectorized 2 x RP-SMA
<b>Peak Gain</b>	14 dBi	25 dBi	13 dBi	25 dBi	N/A
<b>3 dB Beamwidth Azimuth</b>	45°	6° to 10°	45°	6° to 10°	N/A
<b>3 dB Beamwidth Elevation</b>	15°	6° to 10°	15°	6° to 10°	N/A
<b>Front-To-Back Isolation</b>	n/a	25 dB	n/a	25 dB	N/A
<b>Cross Polarization</b>	n/a	20 dB	n/a	20 dB	N/A



Force 130 5 GHz



Force 300-13L



Force 200L/300-25L

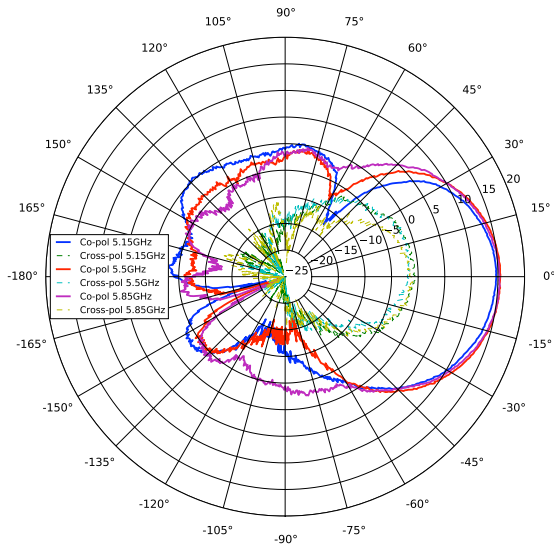


Force 300-CSML

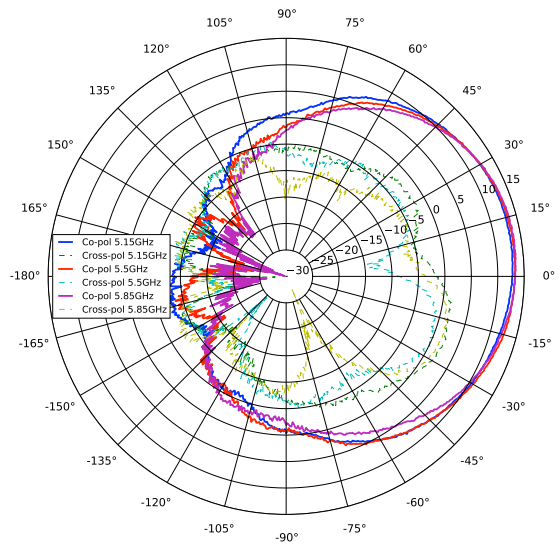
# ePMP™ Force L Series

## Force 130 Antenna Patterns

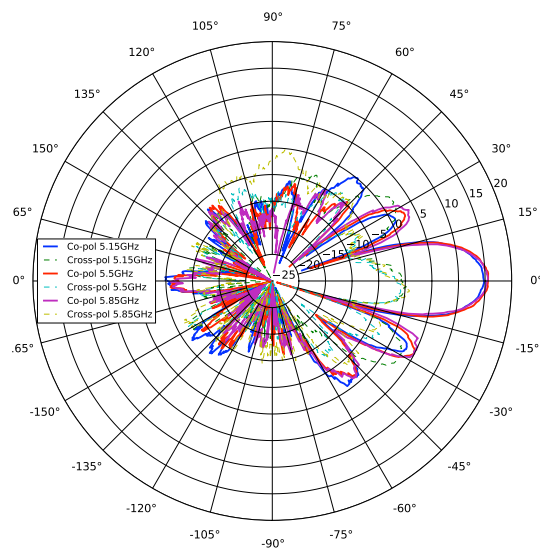
Azimuth, Horizontal



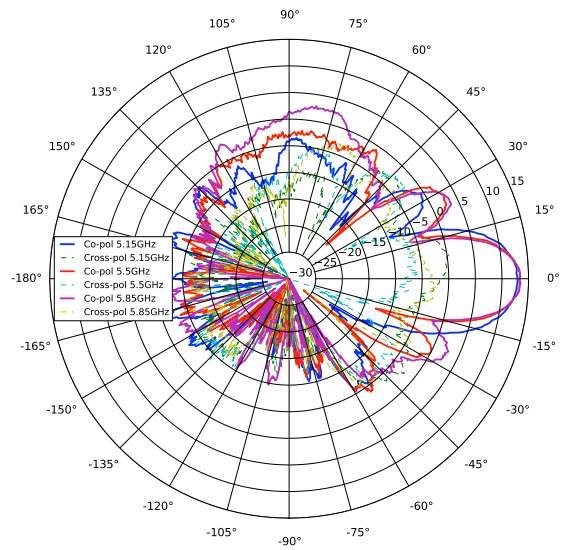
Azimuth, Vertical



Elevation, Horizontal



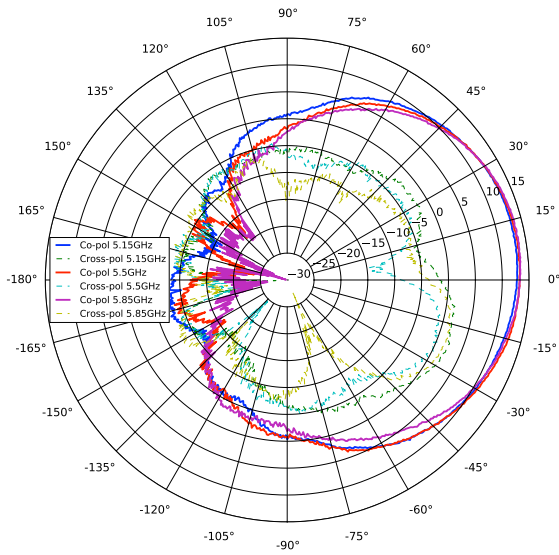
Elevation, Vertical



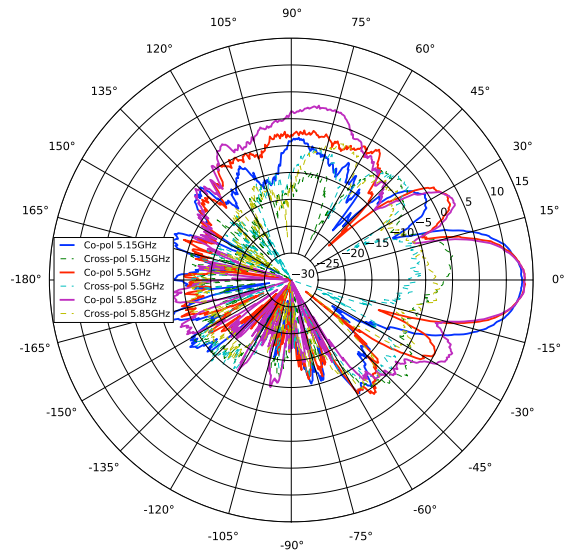
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## Force 300-13L Antenna Patterns

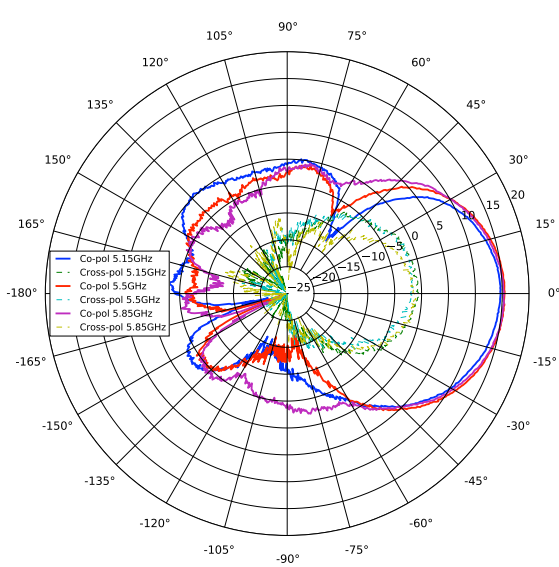
Azimuth, Horizontal



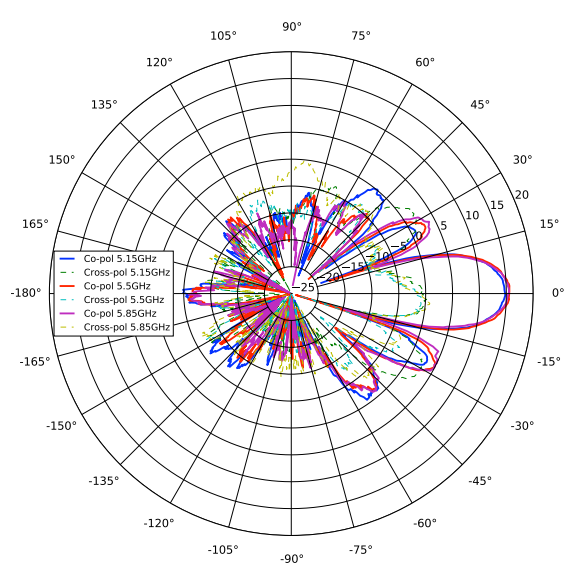
Azimuth, Vertical



Elevation, Horizontal



Elevation, Vertical



## ePMP™ Force L Series

### Force 130 5 GHz Ordering Information

<b>C050900C502A</b>	Force 130 5 GHz SM EU (EU cord)
<b>C050900C503A</b>	Force 130 5 GHz SM EU (UK cord)
<b>C050900C504A</b>	Force 130 5 GHz SM ROW (No cord)
<b>C050900C506A</b>	Force 130 5 GHz SM ROW (EU cord)
<b>C050900C507A</b>	Force 130 5 GHz SM ROW (UK cord)
<b>C050900C508A</b>	Force 130 5 GHz SM ROW (India cord)
<b>C050900C509A</b>	Force 130 5 GHz SM India (India cord)
<b>C050900C510A</b>	Force 130 5 GHz SM ROW (China cord)
<b>C050900C511A</b>	Force 130 5 GHz SM ROW (Brazil cord)
<b>C050900C512A</b>	Force 130 5 GHz SM ROW (Argentina cord)
<b>C050900C513A</b>	Force 130 5 GHz SM ROW (ANZ cord)
<b>C050900C514A</b>	Force 130 5 GHz SM ROW (South Africa cord)
<b>C050900C515A</b>	Force 130 5 GHz SM ROW (No PSU)

### Force 300-13L Ordering Information

<b>C050910C233A</b>	Force 300-13L SM EU (EU cord)
<b>C050910C331A</b>	Force 300-13L SM ROW (UK cord)
<b>C050910C333A</b>	Force 300-13L SM EU (UK cord)
<b>C050910C2431A</b>	Force 300-13L SM ROW (India cord)
<b>C050910C432A</b>	Force 300-13L SM India (India cord)
<b>C050910C531A</b>	Force 300-13L SM ROW (China cord)
<b>C050910C631A</b>	Force 300-13L SM ROW (Brazil cord)
<b>C050910C731A</b>	Force 300-13L SM ROW (Argentina cord)
<b>C050910C831A</b>	Force 300-13L SM ROW (ANZ cord)
<b>C050910C931A</b>	Force 300-13L SM ROW (South Africa cord)
<b>C050910CZ31A</b>	Force 300-13L SM ROW (No PSU)

### Force 200L 5 GHz Ordering Information

<b>C050900M091A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (no cord)
<b>C050900M191A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (US cord)
<b>C050900M291A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (EU cord)
<b>C050900M293A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (EU) (EU cord)
<b>C050900M391A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (UK cord)
<b>C050900M393A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (EU) (UK cord)
<b>C050900M491A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (India cord)
<b>C050900M492A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (India) (India Cord)
<b>C050900M591A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (China cord)
<b>C050900M691A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (Brazil cord)
<b>C050900M791A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (Argentina cord)
<b>C050900M891A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (ANZ cord)
<b>C050900M991A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (South Africa cord)
<b>C050900MZ91A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (ROW) (No PSU)
<b>C050900M294A</b>	ePMP 5 GHz Force 200L SM Bulk Packaging (Indonesia) (EU cord)



## ePMP™ Force L Series

### Force 300-25L Ordering Information

<b>C050910M171A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (US cord)
<b>C050910M271A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (EU cord)
<b>C050910M371A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (UK cord)
<b>C050910M971A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (South Africa cord)
<b>C050910MZ71A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (No PSU)
<b>C050910M273A</b>	5 GHz Force 300-25L SM Bulk Packaging (EU) (EU cord)
<b>C050910M373A</b>	5 GHz Force 300-25L SM Bulk Packaging (EU) (UK cord)
<b>C050910M071A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (no cord)
<b>C050910M471A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (India cord)
<b>C050910M472A</b>	5 GHz Force 300-25L SM Bulk Packaging (India) (India Cord)
<b>C050910M571A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (China cord)
<b>C050910M671A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (Brazil cord)
<b>C050910M771A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (Argentina cord)
<b>C050910M871A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (ANZ cord)
<b>C050910MZ71A</b>	5 GHz Force 300-25L SM Bulk Packaging (ROW) (No PSU)

### Force 300-CSML Ordering Information

<b>C050910C061A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (no cord)
<b>C050910C161A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (US cord)
<b>C050910C261A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (EU cord)
<b>C050910C261A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (EU cord)
<b>C050910C263A</b>	ePMP 5 GHz Force 300 CSML SM (EU) (EU cord)
<b>C050910C361A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (UK cord)
<b>C050910C363A</b>	ePMP 5 GHz Force 300 CSML SM (EU) (UK cord)
<b>C050910C461A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (India cord)
<b>C050910C462A</b>	ePMP 5 GHz Force 300 CSML SM (India) (India Cord)
<b>C050910C561A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (China cord)
<b>C050910C661A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (Brazil cord)
<b>C050910C761A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (Argentina cord)
<b>C050910C861A</b>	ePMP 5 GHz Force 300 CSML SM Bulk Packaging (ROW) (ANZ cord)
<b>C050910C961A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (South Africa cord)
<b>C050910CZ61A</b>	ePMP 5 GHz Force 300 CSML SM (ROW) (No PSU)
<b>C050900S005A</b>	License Key Force 300 CSML upgrade to AP – 12 SMs Maximum

### ABOUT CAMBIUM NETWORKS

Cambium Networks empowers millions of people with wireless connectivity worldwide. Its wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.