

# **MR52**

Dual-band 802.11ac Wave 2 access point with separate radios dedicated to security, RF management, and Bluetooth



## High performance 802.11ac Wave 2 wireless

The Cisco Meraki MR52 is a cloud-managed 4x4:4 802.11ac Wave 2 access point with 160 MHz channels and MU-MIMO support. Designed for next-generation deployments in offices, schools, hospitals, shops, and hotels, the MR52 offers high performance, enterprise-grade security, and simple management.

The MR52 provides a maximum of 2.5 Gbps\* aggregate frame rate with concurrent 2.4 GHz and 5 GHz radios. A dedicated third radio provides real-time WIDS/WIPS with automated RF optimization, and a fourth integrated radio delivers Bluetooth Low Energy (BLE) scanning and Beaconing.

With the combination of cloud management, high perfomance hardware, multiple radios, and advanced software features, the MR52 makes an oustanding platform for the most demanding of uses - including high-density deployments and bandwidh or performanceintensive applications like voice and high-definition video.

## MR52 and Meraki cloud management: A powerful combo

Management of the MR52 is through the Meraki cloud, with an intuitive browser-based interface that enables rapid deployment without time-consuming training or costly certifications. Since the MR52 is self-configuring and managed over the web, it can be deployed at a remote location in a matter of minutes, even without on-site IT staff.

24x7 monitoring via the Meraki cloud delivers real-time alerts if the network encounters problems. Remote diagnostic tools enable imediate troubleshooting over the web so that distributed networks can be managed with a minimum of hassle.

The MR52's firmware is automatically kept up to date via the cloud. New features, bug fixes, and enhancements are delivered seamlessly over the web. This means no manual software updates to download or missing security patches to worry about.

### **Product Highlights**

- 4x4 160 MHz MU-MIMO 802.11ac Wave 2
- 2.5 Gbps dual-radio aggregate frame rate
- 24x7 real-time WIDS/WIPS and spectrum analytics via dedicated third radio
- Integrated Bluetooth Low Energy Beacon and scanning radio
- Enhanced transmit power and receive sensitivity

- Full-time WiFi location tracking via dedicated 3rd radio
- Integrated enterprise security and guest access
- Application-aware traffic shaping
- · Optimized for voice and video
- Self-configuring, plug-and-play deployment
- · Sleek, low-profile design blends into office environments

## Features

## Dual-radio aggregate frame rate of up to 2.5 Gbps\*

A 5 GHz 4x4:4 radio supporting 160 MHz channel widths and a 2.4 GHz 4x4:4 radio supporting 40 MHz channel widths offer a combined dual-radio aggregate frame rate of 2.5 Gbps\*, with up to 1,733 Mbps in the 5 GHz band thanks to 802.11ac Wave 2 and 800 Mbps in the 2.4 GHz band. Technologies like transmit beamforming and enhanced receive sensitivity allow the MR52 to support a higher client density than typical enterprise-class access points, resulting in fewer APs for a given deployment.

### Multi User Multiple Input Multiple Output (MU-MIMO)

With support for the 802.11ac Wave 2 standard, the MR52 offers MU-MIMO for more efficient transmission to multiple clients. Especially suited for enviroments with numerous mobile devices, MU-MIMO enables multiple clients to receive data simultanously. This increases the total network perfomance and the improves the end user experience.

## Link Aggregation

The two Ethernet uplinks on the MR52 can be configured for link aggregation, which relieve any existing uplink bottlenecks created by 802.11ac Wave 2.

## Bluetooth Low Energy Beacon and scanning radio

An integrated fourth radio for Bluetooth Low Energy (BLE) provides seamless deployment of BLE Beacon functionality and effortless visibility of BLE devices. The MR52 enables the next generation of location-aware applications while futureproofing your deployment, ensuring it's ready for any new customer engagement strategies.

## Automatic cloud-based RF optimization

The MR52's sophisticated and automated RF optimization means that there is no need for the dedicated hardware and RF expertise typically required to tune a wireless network. The RF data collected by the dedicated third radio is continuously fed back to the Meraki cloud. This data is then used to automatically tune the channel selection, transmit power, and client connection settings for optimal performance under even the most challenging RF conditions.

### Integrated enterprise security and guest access

The MR52 features integrated, easy-to-use security technologies to provide secure connectivity for employees and guests alike. Advanced security features such as AES hardware-based encryption and WPA2-Enterprise authentication with 802.1X and Active Directory integration provide wire-like security while still being easy to configure. One-click guest isolation provides secure, Internet-only access for visitors. PCI compliance reports check network settings against PCI requirements to simplify secure retail deployments.

## Third radio delivers 24x7 wireless security and RF analytics

The MR52's dedicated dual-band scanning and security radio continually assesses the environment, characterizing RF interference and containing wireless threats like rogue access points. There's no need to choose between wireless security, advanced RF analysis, and serving client data - a dedicated third radio means that all functions occur in real-time, without any impact to client traffic or AP throughput.

## Enterprise Mobility Management (EMM) & Mobile Device Management (MDM) integration

Meraki Systems Manager natively integrates with the MR52 to offer automatic, context-aware security. You can use Systems Manager's self-service enrollment to rapidly deploy MDM without installing additional equipment, and then dynamically tie firewall and traffic shaping policies to client posture.

## Application-aware traffic shaping

The MR52 includes an integrated layer 7 packet inspection, classification, and control engine, enabling you to set QoS policies based on traffic type. Prioritize your mission critical applications while setting limits on recreational traffic like peer-to-peer and video streaming. Policies can be implemented per network, per SSID, per usergroup, or per individual user for maximum flexibility and control.

### Voice and video optmizations

Industry standard QoS features are built in and easy to configure. Wireless Multi Media (WMM) access categories, 802.1p, and DSCP standards support all ensure important applications get priorotized correctly, not only on the MR52, but on other devices in your network. Unscheduled Automatic Power Save Delivery (U-APSD) ensures minimal battery drain on wireless VoIP phones.

## Self-configuring, self-maintaining, always up-to-date

When plugged in, the MR52 automatically connects to the Meraki cloud, downloads its configuration, and joins the appropriate network. If new firmware is required, this is retireved by the AP and updated automatically. This ensures the network is kept up-to-date with bug fixes, security updates, and new features.

### Advanced analytics

Drill down into the details of your network usage with highly granular traffic analytics. Extend your visibility into the physical world with journey tracking through location analytics. View vistor numbers, dwell time, repeat visit rates, and track trends. Fully customize your analysis with raw data available via simple APIs.

\* Refers to maximum over-the-air data frame rate capability of the radio chipset, and may exceed data rates allowed by IEEE 802.11ac-compliant operation.

## **Specifications**

#### Radios

2.4 GHz 802.11b/g/n client access radio

5 GHz 802.11a/n/ac client access radio

2.4 GHz & 5 GHz dual-band WIDS/WIPS, spectrum analysis, & location analytics radio 2.4 GHz Bluetooth Low Energy (BLE) radio with Beacon and BLE scanning support

Concurrent operation of all four radios

Supported frequency bands (country-specific restrictions apply): 2.412-2.484 GHz 5.150-5.250 GHz (UNII-1) 5.250-5.350 GHZ (UNII-2) 5.470-5.600, 5.660-5.725 GHz (UNII-2e) 5.725 -5.825 GHz (UNII-3)

#### Antenna

Integrated omni-directional antennas (5.5 dBi gain @ 2.4 GHz, 6.2 dBi gain @ 5 GHz) Individual antenna elements for each radio

#### 802.11ac Wave 2 and 802.11n Capabilities

4 x 4 multiple input, multiple output (MIMO) with four spatial streams

SU-MIMO and MU-MIMO support

Maximal ratio combining (MRC) & beamforming

20 and 40 MHz channels (802.11n); 20, 40, 80, and 160 MHz channels (802.11ac)

Up to 256-QAM on both 2.4 GHz & 5 GHz bands

Packet aggregation

#### Power

Power over Ethernet: 37 - 57 V (802.3at required; functionality-restricted 802.3af mode supported)

Alternative 12 V DC input

Power consumption: 21W max (802.3at)

Power over Ethernet injector and DC adapter sold separately

#### Interfaces

2x 10/100/1000 BASE-T Ethernet (RJ45)

1x DC power connector (5.5 mm x 2.5 mm, center positive)

#### Mounting

All standard mounting hardware included

Desktop, ceiling, and wall mount capable

Ceiling tile rail (9/16, 15/16 or 1 ½" flush or recessed rails), assorted cable junction boxes

Bubble level on mounting cradle for accurate horizontal wall mounting

#### **Physical Security**

Two security screw options (included)

Kensington lock hard point

Concealed mount plate with anti-tamper cable bay

#### Environment

Operating temperature: 32 °F to 104 °F (0 °C to 40 °C)

Humidity: 5 to 95% non-condensing

#### Physical Dimensions

10.56" x 6.38" x 1.58" (268.2 mm x 162.0 mm x 38.8 mm), not including deskmount feet or mount plate

Weight: 28.9 oz (820g)

#### Security

Integrated Layer 7 firewall with mobile device policy management

Real-time WIDS/WIPS with alerting and automatic rogue AP containment with Air Marshal

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VLAN tagging (802.1q) and tunneling with IPsec VPN

Flexible guest access with device isolation

PCI compliance reporting

WEP, WPA, WPA2-PSK, WPA2-Enterprise with 802.1X

EAP-TLS, EAP-TTLS, EAP-MSCHAPv2, EAP-SIM

TKIP and AES encryption

Enterprise Mobility Management (EMM) & Mobile Device Management (MDM) integration

Cisco ISE integration for Guest access and BYOD Posturing

#### Quality of Service

Advanced Power Save (U-APSD)

WMM Access Categories with DSCP and 802.1p support

Layer 7 application traffic identification and shaping

#### Mobility

PMK, OKC, & 802.11r for fast Layer 2 roaming

Distributed or centralized layer 3 roaming

#### Analytics

Embedded location analytics reporting and device tracking

Global L7 traffic analytics reporting per network, per device, & per application

#### Warranty

Lifetime hardware warranty with advanced replacement included

#### **Ordering Information**

MR52-HW: Meraki MR52 Cloud Managed 802.11ac AP

MA-PWR-30W-XX: Meraki AC Adapter for MR Series (XX = US/EU/UK/AU)

MA-INJ-4-XX: Meraki 802.3at Power over Ethernet Injector (XX = US/EU/UK/AU)

Note: Meraki access point license required.

## **Compliance & Standards**

IEEE Standards	
802.11b	
802.11g	
802.11a	
802.11n	
802.11ac	
802.11h	
802.11i	
802.11e	
802.11k	
802.11r	

Safety Approvals
UL 60950-1
CAN/CSA-C22.2 No. 60950-1
IEC 60950-1
EN 60950-1
UL 2043 (Plenum Rating)
Radio Approvals
FCC Part 15C, 15E
RSS-247 (Canada)
EN 300 328, EN 301 893 (Europe)
AS/NZS 4268 (Australia/NZ)
NOM-121 (Mexico)
NCC LP0002 (Taiwan)
For additional country-specific regulatory information,
please contact Meraki sales
EMI Approvals (Class B)

FCC Part 15B				
ICES-003 (Canada)				
EN 301 489-1-17, EN 55032, EN 55024 (Europe)				
CISPR 22 (Australia/NZ)				
VCCI (Japan)				
Exposure Approvals				
FCC Part 2				
RSS-102 (Canada)				

EN 50385, EN 62311, EN 62479 (Europe)

AS/NZS 2772 (Australia/NZ)









## **RF Performance Table**

Operating Band	Operating Mode	Data Rate	TX Power	RX Sensitivity
2.4 GHz	802.11b	1 Mb/s	19 dBm	-98 dBm
		2 Mb/s	19 dBm	-93 dBm
		5.5 Mb/s	19 dBm	-92 dBm
		11 Mb/s	19 dBm	-87 dBm
	802.11g	6 Mb/s	19 dBm	-92 dBm
		9 Mb/s	19 dBm	-91 dBm
2.4 GHz		12 Mb/s	18 dBm	-90 dBm
		18 Mb/s	18 dBm	-88 dBm
		24 Mb/s	18 dBm	-85 dBm
		36 Mb/s	18 dBm	-82 dBm
		48 Mb/s	17 dBm	-76 dBm
		54 Mb/s	17 dBm	-75 dBm
2.4 GHz	802.11n (HT20)	MCS0/8/16	19/22/23/27 dBm	-92/-95/-96/-98 dBm
		MCS1/9/17	18/21/22/24 dBm	-88/-91/-92/-94 dBm
		MCS2/10/18	18/21/22/24 dBm	-86/-89/-90/-92 dBm
		MCS3/11/19	17/20/21/23 dBm	-82/-85/-86/-88 dBm
		MCS4/12/20	17/20/21/23 dbm	-80/-83/-84/-86 dBm
		MCS5/13/21	16/19/20/25 dBm	-75/-78/-79/-81 dBm
		MCS6/14/22	15/18/19/21 dBm	-73/-76/-77/-79 dBm
		MCS7/15/23	15/18/19/21 dBm	-72/-75/-76/-78 dBm

## **RF Performance Table**

Operating Band	Operating Mode	Data Rate	TX Power	RX Sensitivity
5 GHz	802.11a	6 Mb/s	20 dBm	-91 dBm
		9 Mb/s	20 dBm	-90 dbm
		12 Mb/s	20 dBm	-89 dbm
		18 Mb/s	20 dBm	-87 dBm
		24 Mb/s	19 dBm	-80 dBm
		36 Mb/s	19 dBm	-77 dBm
		48 Mb/s	18 dBm	-75 dBm
		54 Mb/s	18 dBm	-74 dBm
	802.11n (HT20)	MCS0/8/16	20/23/24 dBm	-91/-94/-95 dBm
		MCS1/9/17	20/23/24 dBm	-88/-91/-92 dBm
		MCS2/10/18	20/23/24 dBm	-85/-88/-89 dBm
5 GHz		MCS3/11/19	20/23/24 dBm	-82/-85/-86 dBm
5 GHz		MCS4/12/20	19/22/23 dBm	-78/-81/-82 dBm
		MCS5/13/21	19/22/23 dBm	-74/-77/-78 dBm
		MCS6/14/22	18/21/22 dBm	-71/-74/-75 dBm
		MCS7/15/23	17/20/21 dBm	-72/-75/-76 dBm
5 GHz	802.11n (HT40)	MCS0/8/16	20/23/24 dBm	-88/-91/-92 dBm
		MCS1/9/17	20/23/24 dBm	-85/-88/-89 dBm
		MCS2/10/18	20/23/24 dBm	-83/-86/-87 dBm
		MCS3/11/19	20/23/24 dBm	-79/-82/-83 dBm
		MCS4/12/20	19/22/23 dBm	-76/-79/-80 dBm
		MCS5/13/21	19/22/23 dBm	-73/-76/-77 dBm
		MCS6/14/22	18/21/22 dBm	-72/-75/-76 dBm
		MCS7/15/23	17/20/21 dBm	-70/-73/-74 dBm

## **RF Performance Table**

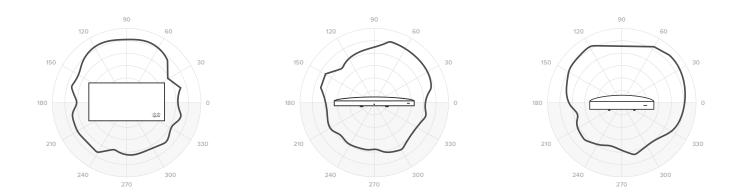
Series     MCS0/000     20023/226 dBm     99/94/98/97 dBm       Series     MCS0/010     20023/226 dBm     98/94/93/94 dBm       Series     39/92/102     20023/226 dBm     98/94/93/94 dBm       Series     20023/226 dBm     98/94/93/94 dBm     98/94/93/94 dBm       Series     20023/226 dBm     97/94/75/48 dBm       MCS56/666     102/2222 dBm     77/14/75/72 dBm       MCS66/666     102/2224 dBm     77/77/72 dBm       MCS70777     109/02/02 dBm     62/65/66-68 dBm       MCS70777     109/02/02 dBm     62/65/67-22 dBm       MCS90999     15/89/92/16Bm     62/65/67-22 dBm       MCS202210     200224/26 dBm     89/93/94 dBm       MCS20/000     15/89/92/16Bm     63/96/97/92 dBm       MCS20/001     200224/26 dBm     98/93/94 dBm       MCS20/002     200224/26 dBm     75/79/74 dBm       MCS20/001     109/02022 dBm     79/77/74 dBm       MCS20/001     109/02022 dBm     70/77/74 dBm       MCS20/001     200224/26 dBm     79/97/74 dBm       MCS20/002     200224/26 dBm     79/97/77 dBm </th <th>Operating Band</th> <th>Operating Mode</th> <th>Data Rate</th> <th>TX Power</th> <th>RX Sensitivity</th>	Operating Band	Operating Mode	Data Rate	TX Power	RX Sensitivity
5 GHz     30232426 dBm     30232426 dBm     3285 88.88 dBm       5 GHz     8021tic (VHT20)     MCS33373     91022222 dBm     328.98 88.88 dBm       MCS35955     91222222 dBm     74777380 0 dBm     74777380 0 dBm       MCS36956     9122222 dBm     74777380 0 dBm       MCS69696     9122222 dBm     74777380 0 dBm       MCS697077     17202123 dBm     664 670.75 dBm       MCS690900     20224742 dBm     86787737       MCS90900     2022424 dBm     86787737       MCS1011     2022242 dBm     8984974 dBm       MCS102222     20224242 dBm     8984974 dBm       MCS1011     2022242 dBm     779.767.76 dBm       MCS102222     2022424 dBm     779.767.77 dBm       MCS1011     1922222 dBm     779.777.77 dBm       MCS1022221     2022424 dBm     779.767.77 dBm       MCS1011     1922222 dBm     779.777.78 dBm       MCS1011     1922222 dBm     779.777.77 dBm       MCS1011     1922222 dBm     779.777.78 dBm       MCS1014     1922222 dBm     779.767.777       MCS1014			MCS0/0/0/0	20/23/24/26 dBm	-91/-94/-95/-97 dBm
FehrAccessionConstraintsConstraintsConstraintsConstraintsConstraints5 GHz802.1bc (VHT20)MCS36323CONSTRAINTSCONSTRAINTSCONSTRAINTSCONSTRAINTS6 GHz100.100100.100CONSTRAINTSCONSTRAINTSCONSTRAINTSCONSTRAINTS6 GHz100.100100.100CONSTRAINTSCONSTRAINTSCONSTRAINTSCONSTRAINTSCONSTRAINTS6 GHz100.100100.100CONSTRAINTSCONSTRAINTSCONSTRAINTS			MCS1/1/1/1	20/23/24/26 dBm	-88/-91/-92/-94 dBm
Beachair     Bacchair     MCS44444     99/22/32 6 dm     97/84/82/84 cdm       MCS56655     92/22/32 6 dm     74/77/78-00 dm     74/77/78-00 dm       MCS66666     19/22/22 dm     71/17/178-00 dm     71/174/78-77       MCS686666     19/22/22 dm     66/69-70/72 dm     66/69-70/72 dm       MCS90000     20/22/42 dm     66/69-70/72 dm     66/89-70/72 dm       MCS90000     20/22/42 dm     67/856666 dm     68/88-89/91 dm       MCS90000     20/22/42 dm     63/86.67/91 dm     66/89-70/72 dm       MCS90000     20/22/42 dm     63/86.67/91 dm     67/8568/86       MCS90000     20/22/42 dm     72/97/791 dm     72/97       MCS90000     20/22/42 dm     72/97/791 dm     72/97/791 dm       MCS90000     19/22/22 dm     72/97/791 dm     72/97/791 dm       MCS90000     19/22/22 dm     72/97/791 dm     72/97/791 dm       MCS90000     19/22/22 dm     72/97/791 dm     72/97/791 dm       MCS90000     20/22/42 dm     60/63/64/64 dm     72/97/791 dm       MCS90000     20/22/22 dm     73/97/791 dm     73/97/791 dm <td></td> <td></td> <td>MCS2/2/2/2</td> <td>20/23/24/26 dBm</td> <td>-85/-88/-89/-91 dBm</td>			MCS2/2/2/2	20/23/24/26 dBm	-85/-88/-89/-91 dBm
5 GHz     802.1bc (M120)     MCS5.656/5     91/22/23/2 GB     -74/77/84-80 dB       MCS5.0567/6     19/22/23/2 GB     -74/77/784-80 dB     -74/74/78-77 dBm       MCS5.057/77     17/702/22 dB     -74/74/78-76/78 dBm     -74/74/78-76/78 dBm       MCS8.08/80     15/19/22/24 dBm     -74/74/78-76/78 dBm       MCS8.09/90     15/19/92/1 dBm     462/65/66/67 dBm       MCS9.09/90     15/19/92/1 dBm     462/65/66/68 dBm       MCS9.01/01     20/22/47/6 dBm     -74/77/78/48/dBm       MCS9.01/21     20/22/47/6 dBm     -74/77/78/48/dBm       MCS9.01/21     20/22/47/6 dBm     -74/78/78/08/24 dBm       MCS9.01/21     20/22/22/25 dBm     -74/78/78/08/24 dBm       MCS9.01/21     19/22/23/25 dBm     -74/78/78/08/24 dBm       MCS9.01/21     19/22/23/25 dBm     -74/76/77/79/80/82 dBm       MCS9.01/21     19/22/23/25 dBm     -74/76/77/79/87/80/82 dBm       MCS9/01/21     19/22/22			MCS3/3/3/3	20/23/24/26 dBm	-82/-85/-86/-88 dBm
Select     MCSSR16/5     1922/2323 dBm     74/47/78/40 dBm       MCS66666     MCS66666     MS212/21/4 dBm     72/15/7 r6 mm       MCS870777     MT70202123 dBm     72/15/7 r6 r6 mm       MCS879919     15/819/21 dBm     66/64/70.72 dBm       MCS89919     15/819/21 dBm     66/24/70.72 dBm       MCS90100     20223/24 dBm     85/49/24.94 dBm       88/419/22.94 dBm     85/49/24.94 dBm     85/49/24.94 dBm       MCS90100     20223/24 dBm     85/49/24.94 dBm       MCS91011     20223/24.92 dBm     85/49/24.94 dBm       MCS91014     19/22/232 dBm     72/75/76/77.94 dBm       MCS91014     19/22/232 dBm     72/75/76/77.94 dBm       MCS91016     19/22/232 dBm     72/75/76/77.94 dBm       MCS91017     19/22/232 dBm     72/75/76/76 dBm       MCS91017     19/22/232 dBm     72/75/76/77.79 dBm       MCS91017     20223/24 dBm     73/76/77.79 dBm       MCS91019     19/21/22/24 dBm     63/64/67/69 dBm       MCS91019     20223/24/26 dBm     63/64/67/69 dBm       MCS91019     20223/24/26 dBm     63/64/67/69 dBm	5 GHz	802 11ac (V/HT20)	MCS4/4/4/4	19/22/23/25 dBm	-78/-81/-82/-84 dBm
Scher     MCS3/777     9720/2123 dbm     972/75/76/78 dbm       MCS8/8/8/8     16/19/20/22 dbm     6-66/49/70/72 dbm     6-66/49/70/72 dbm       MCS9/9/9/9     15/18/19/21 dbm     6-86/49/70/72 dbm     6-86/49/70/72 dbm       MCS9/9/9/9     15/18/19/21 dbm     6-86/49/70/72 dbm     6-86/49/70/72 dbm       MCS0/0/00     20/232/426 dbm     6-81/49/94 dbm     6-81/49/94 dbm       Scher     89/94/24/84 dbm     6-81/49/94 dbm     6-81/49/94 dbm       MCS3/3/33     20/23/24/26 dbm     6-81/49/94 dbm     77/79/80/82 dbm       Scher     89/94/24/84 bbm     77/79/80/82 dbm     77/79/80/82 dbm     77/79/80/82 dbm       MCS3/3/33     19/22/22/26 dbm     73/76/77/79 dbm     6-81/40/77     6-81/40/74/76 dbm       MCS56/66/6     18/22/22/24 dbm     77/75/76/78 dbm     6-81/40/74/76 dbm     6-81/40/74/76 dbm       MCS56/97/7     16/10/20/22 dbm     6-81/40/74/76 dbm     6-81/40/74/76 dbm     6-81/40/74/76 dbm       MCS59/99/9     16/18/10/21 dbm     6-81/40/74/76 dbm     6-81/40/74/76 dbm     6-81/40/74/76 dbm       MCS56/57/5     19/22/22/26 dbm     81/44/48/57 dbm     6-81/40/74/76 dbm </td <td>5 6112</td> <td rowspan="3">802.11dC (VH120)</td> <td>MCS5/5/5/5</td> <td>19/22/23/25 dBm</td> <td>-74/-77/-78/-80 dBm</td>	5 6112	802.11dC (VH120)	MCS5/5/5/5	19/22/23/25 dBm	-74/-77/-78/-80 dBm
Image: constraint of the second sec			MCS6/6/6/6	18/21/22/24 dBm	-71/-74/-75/-77 dBm
Shift			MCS7/7/7/7	17/20/21/23 dBm	-72/-75/-76/-78 dBm
Big     MCS0/00/0     20/23/24/26 dBm     -88/-91/-32/-34 dBm       SGHz     20/23/24/26 dBm     -68/-88/-90/-91 dBm       B02.71ac (VHT40)     MCS3/23/3     20/23/24/26 dBm     -76/-79/80/82 dBm       MCS3/23/3     20/23/24/26 dBm     -76/-79/80/82 dBm     -76/-79/80/82 dBm       MCS3/23/3     20/22/22 dBm     -76/-79/80/82 dBm     -76/-79/80/82 dBm       MCS4/4/4/44     19/22/23 dBm     -76/-79/80/82 dBm     -76/-79/80/82 dBm       MCS5/5/5/5     19/22/23 dBm     -73/-76/-77/-79 dBm     -73/-76/-77/-79 dBm       MCS8/8/8/8     19/22/23 dBm     -70/-73/-70/-78 dBm     -63/-66/-66       MCS8/9/9/9     15/16/19/20/23 dBm     -70/-73/-70/-78 dBm     -63/-66/-67/-69 dBm       MCS9/9/9/9     15/16/19/20/23 dBm     -70/-73/-76/-78 dBm     -70/-73/-76/-78 dBm       MCS9/9/9/9     15/16/19/20/23 dBm     -63/-64/-66/F6     -63/-64/-66       MCS9/9/9/9     15/16/19/20/23 dBm     -70/-73/-76/-78 dBm     -70/-73/-76/-78 dBm       MCS9/9/9/9     15/16/19/20/23 dBm     -70/-73/-76/-78 dBm     -70/-73/-79/-76/-78 dBm       MCS9/9/9/9     15/16/19/20/23 dBm     -70/-73/-76/-78 dBm     -70/-73/-76/-			MCS8/8/8/8	16/19/20/22 dBm	-66/-69/-70/-72 dBm
FGH2     8802.11ac (VHT40)     880.888.88     880.888.98     880.889.91 dBB       FGH2     FGH2     FGH2     8802.11ac (VHT80)     880.888.81     880.888.81     880.889.91 dBB       FGH2     FGH2     FGH2     890.21ac (VHT80)     880.888.81     800.828.81     880.838.81     880.838.81     880.838.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81     890.81.81			MCS9/9/9/9	15/18/19/21 dBm	-62/-65/-66/-68 dBm
5 GHz     80211cr (VHT40)     MCS2/22     20/22/24/26 dBm     6-8/3-68/-37/49 dBm       6 GHz     80211cr (VHT40)     MCS3/3/3     20/32/26 dBm     7-9/-82/-83/-85 dBm       6 GHz     80211cr (VHT40)     MCS3/3/3     20/22/22/25 dBm     7-9/-82/-83/-85 dBm       6 GHz     80211cr (VHT40)     MCS5/5/5/5     19/22/23/25 dBm     7-9/-70/-70/-70/-70       6 GHz     16/12/22/4 dBm     7-9/-73/-74/-76 dBm     7-6/-79/-80/-82 dBm     7-6/-79/-80/-82 dBm       6 GHz     16/12/22/24 dBm     7-7/-73/-74/-76 dBm     7-6/-79/-70/-74/-74 dBm     6-6/-66/-66/-69 dBm       7 GHz     16/19/2022 dBm     6-6/-66/-69/-69     6-8/-60/-69/-69     6-8/-60/-69/-69       802.11cr (VHT80)     MCS9/00/00     20/23/24/26 dBm     7-9/-82/-83/-88     6-8/-70/-70/-70/-70/-70/-70/-70/-70       802.11cr (VHT80)     MCS3/23/3     20/23/24/26 dBm     7-9/-82/-83/-86     7-9/-82/-83/-86       MCS9/05/5/5     19/22/23/25 dBm     7-79/-79/-79/-70/-70/-70     7-70/-70/-70/-70/-70/-70/-70     7-70/-70/-70/-70/-70/-70       802.11cr (VHT80)     MCS9/07/07     17/20/23/23 dBm     7-6/-79/-90/-23 dBm     6-6/-69/-70/-20/-23 dBm     6-6/-69/-70/-20/-23 dBm			MCS0/0/0/0	20/23/24/26 dBm	
5 GHz     20/23/24/24 dBm     -79/82/83/45 dBm       5 GHz     802.1te (VHT40)     MCS3/3/3     20/23/24/24 dBm     -76/79/80/82 dBm       MCS4/4/4/4     19/22/325 dBm     -76/79/80/82 dBm     -76/79/80/82 dBm       MCS6/6/6/6     18/21/22/4 dBm     -73/76/77/79 dBm       MCS6/6/6/6     18/21/22/4 dBm     -70/73/74/76 dBm       MCS6/6/6/6     18/21/22/4 dBm     -70/73/74/76 dBm       MCS7/777     170/70/23 dBm     -70/73/74/76 dBm       MCS8/8/8/8     15/8/9/21 dBm     -60/63/66/7/9 dBm       MCS9/9/99     15/8/9/21 dBm     -60/63/66/7/9 dBm       MCS9/0/00     20/23/24/26 dBm     -81/84/85/87 dBm       B02.1te (VHT80)     MCS3/3/33     20/23/24/26 dBm     -79/82/83/85 dBm       MCS9/7/77     170/20/23 dBm     -66/-69/79/80/82 dBm     -66/-69/79/80/82 dBm       MCS9/7/78     19/22/23/25 dBm     -66/-69/79/80/82 dBm     -66/-69/79/80/82 dBm       MCS9/7/78     16/19/20/22 dBm     -66/-69/79/80/82 dBm     -66/-69/79/80/82 dBm       MCS9/7/78     16/19/20/23 dBm     -59/62/63/65 dBm     -66/-69/70/20/23 dBm     -59/62/63/65 dBm       MCS9     <			MCS1/1/1/1	20/23/24/26 dBm	-85/-88/-89/-91 dBm
6Hz     6000000000000000000000000000000000000			MCS2/2/2/2	20/23/24/26 dBm	-83/-86/-87/-89 dBm
6 Hz     802.11ac (WHT40)     Miclionation     109.22.30.50 mm     73/76/77/79 dm       6 MCS5/6/5/5     19/22/2325 dm     73/76/77/79 dm     73/76/77/79 dm       6 MCS5/6/6/6     18/21/22/4 dm     73/76/77/79 dm       70/73/74/76 dB     63/66/6/69 dm     63/66/67/69 dm       6 MCS9/9/9     15/18/9/21 dB     60/63/64/66 dm       70/73/74/76 dB     60/63/64/66 dm     63/66/71/69 dB       70/73/74/76 dB     60/63/64/66 dB     63/66/67/69 dB       70/73/74/76 dB     60/63/64/66 dB     63/64/66 dB       70/73/74/76 dB     60/63/64/66 dB     63/64/66 dB       70/73/74/76 dB     63/64/66 dB     63/64/66 dB       70/73/74/77     17170/21/23 dBm     65/68/69/01       70/73/74/76 dB     70/73/74/76 dB     70/73/74/76 dB       802.11ac (WH780)     MCS10/101     20/23/24/26 dB     70/73/74/76/78 dB       802.11ac (WH780)     MCS51/71/7     19/22/23/25 dB     67/70/79/80/77/74 dB       802.11ac (WH780)     MCS51/71/7     19/22/23/25 dB     66/69/70/72/74 dB       802.11ac (WH780)     MCS51/71/7     19/22/23/25 dB     66/69/70/72/74 dB			MCS3/3/3/3	20/23/24/26 dBm	
Field     MCS5/5/5/5     19/22/23/25 dBm     7/3/17/47 dBm       MCS6/6/6     18/21/22/4 dBm     7/27/37/47/6 dBm       MCS7/77/7     17/20/21/23 dBm     7/07/37/47/6 dBm       MCS8/8/8/8     16/19/20/22 dBm     63/66/67/69 dBm       MCS8/8/8/8     15/19/20/22 dBm     63/66/67/69 dBm       MCS9/9/9     15/18/9/21 dBm     63/68/647/69 dBm       MCS8/8/8/8     15/19/20/22 dBm     85/88/89/91 dBm       MCS9/1/101     20/23/24/26 dBm     85/88/89/91 dBm       MCS9/2/22     20/23/24/26 dBm     65/68/69/61       MCS9/2/22     20/23/24/26 dBm     79/74/74/80 dBm       MCS9/2/22     20/23/24/26 dBm     79/74/74/80 dBm       MCS9/2/22     19/22/23/25 dBm     72/75/76/78 dBm       MCS9/2/3/4     19/22/23/25 dBm     72/75/76/78 dBm       MCS9/6/6/6     19/21/22/24 dBm     66/69/70/72 dBm       MCS9/9/9     15/18/9/21 dBm     66/69/70/72 dBm       MCS9/9/9/9     15/18/9/21 dBm     79/64/65/67 dBm       MCS9/9/9/9     15/18/9/21 dBm     79/64/65/67 dBm       MCS1     20 dBm     77/64/68       MCS1 <td>5.014</td> <td>000440/(1740)</td> <td>MCS4/4/4/4</td> <td>19/22/23/25 dBm</td> <td>-76/-79/-80/-82 dBm</td>	5.014	000440/(1740)	MCS4/4/4/4	19/22/23/25 dBm	-76/-79/-80/-82 dBm
5 GHz     163/12/21 dBm     -70/73/74/-76 dBm       MCS37/777     17/20/21/23 dBm     -63/66/-67/-69 dBm       MCS8/8/8/8     161/9/20/21 dBm     -60/63/-64/-66 dBm       MCS9/9/9/9     151/81/9/21 dBm     -60/63/-64/-66 dBm       MCS9/9/9/9     151/81/9/21 dBm     -85/-88/-89/-91 dBm       MCS1/1/11     20/23/24/26 dBm     -85/-88/-89/-91 dBm       5 GHz     20/23/24/26 dBm     -79/-82/-83/-85 dBm       802.11cr (VHT80)     MCS3/3/3/3     20/23/24/26 dBm     -76/-79/-80/-82 dBm       MCS5/5/5/5     19/22/23/25 dBm     -72/-75/-76/-78 dBm     -72/-75/-76/-78 dBm       MCS6/6/6/6     18/21/22/24 dBm     -66/-69/-70/-72 dBm     -66/-69/-70/-72 dBm       MCS9/9/9/9     16/19/20/22 dBm     66/-69/-70/-72 dBm     -65/-68/-69/-71 dBm       MCS9/9/9/9     16/19/20/22 dBm     65/-68/-69/-71 dBm     -66/-69/-70/-72 dBm       MCS9/9/9/9     16/19/20/22 dBm     65/-68/-69/-71 dBm     -65/-68/-69/-71 dBm       MCS9/9/9/9     16/19/20/22 dBm     65/-68/-69/-71 dBm     -65/-68/-69/-71 dBm       MCS9/9/9/9     16/19/9/21 dBm     -65/-68/-69/-71 dBm     -76/-68/-69/-71 dBm <td< td=""><td>5 GHZ</td><td>802.11ac (VH140)</td><td>MCS5/5/5/5</td><td>19/22/23/25 dBm</td><td>-73/-76/-77/-79 dBm</td></td<>	5 GHZ	802.11ac (VH140)	MCS5/5/5/5	19/22/23/25 dBm	-73/-76/-77/-79 dBm
Bit			MCS6/6/6/6	18/21/22/24 dBm	-72/-75/-76/-78 dBm
Index     Index     Index     Index     Index     Index       MCS9/9/9/9     15/18/19/21 dBm     -60/-63/-64/-66 dBm     -85/-83/-89/-91 dBm       MCS9/9/9/9     15/18/19/21 dBm     -85/-83/-89/-91 dBm     -85/-83/-89/-91 dBm       MCS1/1/1     20/23/24/26 dBm     -81/-84/-85/-87 dBm     -81/-84/-85/-87 dBm       FGH2     20/23/24/26 dBm     -72/-75/-80/-82 dBm     -72/-75/-76/-80 dBm     -72/-75/-76/-78 dBm       FGH2     802.11ac (VHT80)     MCS3/3/3     20/23/24/26 dBm     -72/-75/-76/-78 dBm       MCS5/5/5     19/22/23/25 dBm     -72/-75/-76/-78 dBm     -72/-75/-76/-78 dBm     -65/-69/-70/-72 dBm       MCS5/5/5     19/22/23/25 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm       MCS7/77/7     17/20/21/23 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm       MCS59/9/9/9     15/18/19/21 dBm     65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm       MCS59/9/9/9     15/18/-99/-10 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-72 dBm       MCS1     20 dBm     -65/-69/-70/-72 dBm     -65/-69/-70/-7			MCS7/7/7/7	17/20/21/23 dBm	
6 H2     7 H2 H3 H2 H3 H2     6 H2     7 H2 H3 H2 H3 H3 H2     8 H3 H4 H3 H3 H2 H3			MCS8/8/8/8	16/19/20/22 dBm	-63/-66/-67/-69 dBm
FGHz     20/23/24/26 dBm     6.94/4.85/.97 dBm       FGHz     20/23/24/26 dBm     7.97.82/83/58 dBm       B802.11ac (VHT80)     MCS3/3/31     2.02/23/24 GBm     7.07.75/7.67.80 dBm       MCS5/5/5     19/22/23/25 dBm     7.07.75/7.67.80 dBm     6.87.17/27/4 dBm       MCS5/5/5     19/22/23/25 dBm     6.66/9.701/72 dBm     6.87.17/27/4 dBm       MCS5/6/66     18/21/22/4 dBm     6.66/9.701/72 dBm     6.67.46/67/14 dBm       MCS7/77/7     MCS8/878     110/20/21/23 dBm     6.65/68/60/11 dBm       MCS7/77/7     MCS8/878     110/20/21/23 dBm     6.56/68/60/11 dBm       MCS7/77/7     MCS9/99/9     15/18/19/11 dBm     6.56/68/60/11 dBm       MCS1     2.00 dBm     7.82 dBm     6.67/68/01       MCS1     2.01 dBm     6.73 dBm     6.73 dBm       MCS1     2.01 dBm     7.73 dBm     7.73 dBm       MCS1     MCS1     10.40 dBm     6.69/67/11       MCS1     MCS1     10.40 dBm     6.69/67/11       MCS1     MCS1     10.40 dBm     6.61 dBm       MCS1     MCS3     19.40 Bm     6.61 d			MCS9/9/9/9	15/18/19/21 dBm	-60/-63/-64/-66 dBm
FGHz     20/23/24/26 dBm     -79/82/83/65 dBm       5 GHz     802.11ac (VHT80)     MCS3/3/3/3     20/23/24/26 dBm     -76/-79/80/82 dBm       MCS4/4/4     19/22/23/25 dBm     -72/-75/-76/78 dBm     -78/-78/-78 dBm     -78/-78/-78 dBm       MCS4/6/6/6     18/21/22/4 dBm     -66/-60/-71/2 dBm     -66/-60/-71/2 dBm     -66/-60/-71/2 dBm       MCS7/7/7/     18/21/22/4 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm       MCS7/7/7/     11/10/20/22 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm       MCS7/7/7/     11/10/20/22 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm       MCS7/7/7/     11/10/20/22 dBm     -65/-66/-71 dBm     -65/-66/-71 dBm     -65/-66/-61/Bm       MCS7/7/7/     11/10/20/22 dBm     -65/-66/-61/Bm     -65/-66/-61/Bm     -65/-66/-61/Bm       MCS9     MCS1     10/10/Bm     -62/-63/-61/Bm     -65/-66/-61/Bm       MCS1     MCS1     10/10/Bm     -76/-61/Bm     -76/-61/Bm       MCS1     MCS1     10/10/Bm     -76/-61/Bm     -76/-61/Bm       MCS1     MCS3     10/10/B		802.11ac (VHT80)	MCS0/0/0/0	20/23/24/26 dBm	-85/-88/-89/-91 dBm
Baberson     ACS3/3/3     20/23/24 GBm     -76/-79/-80/-82 dBm       Baberson     MCS3/3/3     19/22/23/25 dBm     -72/-75/-76/-78 dBm       MCS5/5/5/5     19/22/23/25 dBm     -66/-69/-70/-24 dBm     -66/-69/-70/-24 dBm       MCS6/6/6     18/21/22/4 dBm     -66/-69/-70/-24 dBm     -66/-69/-70/-24 dBm       MCS9/9/9     11/20/21/23 dBm     -65/-68/-69/-71 dBm     -66/-68/-67/-71 dBm       MCS9/9/9     15/18/19/21 dBm     -65/-68/-69/-71 dBm     -61/-68/-65/-67 dBm       MCS9/9/9     15/18/19/21 dBm     -65/-68/-69/-71 dBm     -61/-68/-65/-67 dBm       MCS9/9/9     15/18/19/21 dBm     -65/-68/-69/-71 dBm     -61/-68/-65/-67 dBm       MCS9     10/19/-10     10/10     -76/-68/-69/-71 dBm       MCS9     -61/-61/-10     -61/-61/-61/-61/-61/-61/-61/-61/-61/-61/			MCS1/1/1/1	20/23/24/26 dBm	-81/-84/-85/-87 dBm
5 GHz   802.11ac (VHT80)   MCS4/4/44 MCS5/5/5   19/22/325 dBm 19/22/325 dBm MCS5/5/5   72/75/76/78 dBm 6/6/71/72/4 dBm     MCS6/6/6   18/21/22/4 dBm   66/6/97/72     MCS6/6/6   18/21/22/4 dBm   65/68/97/1 dBm     MCS7/7/7   17/20/21/3 dBm   65/68/97/1 dBm     MCS9/9/9   15/81/92/1 dBm   65/68/99/1 dBm     MCS9/9/9   15/81/92/1 dBm   69/22/35 dBm     MCS9   910   15/81/92/1 dBm     MCS9   16/92/92   19/22/32 dBm     MCS9   16/92/92   19/22/32 dBm     MCS9   11/20/22 dBm   69/26/3-05     MCS9   10/20/22 dBm   69/26/3-05     MCS1   20 dBm   69/26/3-05     MCS2   19/26/3-05   69/26/3-05     MCS1   19/26/3-05   69/26/3-05     MCS2   19/26/3-05   69/26/3-05     MCS2   19/26/3-05   69/26/3-05     MCS2   19			MCS2/2/2/2	20/23/24/26 dBm	-79/-82/-83/-85 dBm
5 GHz802.11ac (VHT80)MCS5/5/5/519/2/23/25 dBm-68/71/72/74 dBmMCS5/6/6/618/21/22/4 dBm-66/-69/-70/25 dBm-66/-69/-70/25 dBmMCS5/7/7/717/20/21/23 dBm-65/-68/-69/-71 dBmMCS5/9/9/915/18/19/21 dBm-61/-64/-65/-67 dBmMCS9/9/9/915/18/19/21 dBm-59/-62/-63/-65 dBmMCS915/18/19/21 dBm-59/-62/-63/-65 dBmMCS120 dBm-82 dBmMCS219 dBm-73 dBmMCS319 dBm-65 dBmMCS519 dBm-65 dBmMCS519 dBm-65 dBmMCS618 dBm-65 dBmMCS618 dBm-63 dBmMCS617 dbm-63 dBmMCS6 <td< td=""><td></td><td>MCS3/3/3/3</td><td>20/23/24/26 dBm</td><td>-76/-79/-80/-82 dBm</td></td<>			MCS3/3/3/3	20/23/24/26 dBm	-76/-79/-80/-82 dBm
Financial     MCS5/5/5/5     19/22/23/25 dBm     -68/-71/-72/4 dBm       MCS6/6/6/6     18/21/22/24 dBm     -66/-69/-702 dBm     -66/-69/-702 dBm       MCS5/7/77     17/20/21/23 dBm     -65/-68/-69/-71 dBm     -65/-68/-69/-71 dBm       MCS9/9/9     15/18/19/21 dBm     -65/-68/-69/-71 dBm     -61/-64/-65/-67 dBm       MCS9/9/9     15/18/19/21 dBm     -69/-63/-65 dBm     -61/-64/-65/-67 dBm       MCS9/9/9     15/18/19/21 dBm     -59/-62/-63/-65 dBm     -61/-64/-65/-67 dBm       MCS9     90/99     15/18/19/21 dBm     -69/-63/-65 dBm       MCS1     20 dBm     -78 dBm       MCS2     19 dBm     -73 dBm       MCS3     19 dBm     -69/-69/-69/-69/-69/-69/-69/-69/-69/-69/	5 GHz		MCS4/4/4/4	19/22/23/25 dBm	-72/-75/-76/-78 dBm
MCS7/7/7 MCS8/8/817/20/21/23 dBm 16/19/20/22 dBm-65/-68/-69/-71 dBm -61/-64/-65/-7 dBm -59/-20-33 dBm -59/-20-33 dBm -59/-20-33 dBm -59/-20-33 dBm -59/-20-33 dBmNCS015/18/19/21 dBm-59/-20-33 dBm -59/-20-33 dBm -59/-20-33 dBm -59/-20-33 dBm -59/-20-33 dBmNCS020 dBm-82 dBm 	5 0112		MCS5/5/5/5	19/22/23/25 dBm	-68/-71/-72/-74 dBm
MCS8/8/8/816/19/20/20 dBm-6/h-6/h-G7 dBmMCS8/9/9/915/18/19/21 dBm-5/h-62/-63/-65 dBmNMCS020 dBm-82 dBmNMCS120 dBm-78 dBmMCS219 dBm-76 dBmSGHz19 dBm-73 dbm802.11ac (VHT80P80/VHT160)MCS319 dBmMCS619 dBm-65 dBmMCS618 dBm-63 dBmMCS618 dBm-63 dBmMCS717 dbm-63 dBm			MCS6/6/6/6	18/21/22/24 dBm	-66/-69/-70/-72 dBm
Image: style in the style in			MCS7/7/7/7	17/20/21/23 dBm	-65/-68/-69/-71 dBm
NMCS0     20 dBm     -82 dBm       MCS1     20 dBm     -78 dBm       MCS2     19 dBm     -76 dBm       5 GHz     19 dBm     -73 dbm       802.11ac (VHT80P80/VHT160)     MCS3     19 dBm     -69 dBm       MCS5     19 dBm     -65 dBm     -65 dBm       MCS6     18 dBm     -63 dBm       MCS7     17 dbm     -62 dBm			MCS8/8/8/8	16/19/20/22 dBm	-61/-64/-65/-67 dBm
NCS1     20 dBm     -78 dBm       MCS2     19 dBm     -76 dBm       SGHz     19 dBm     -73 dbm       NCS4     19 dBm     -69 dBm       MCS5     19 dBm     -69 dBm       MCS6     19 dBm     -63 dBm       MCS6     18 dBm     -63 dBm       MCS7     17 dbm     -62 dBm			MCS9/9/9/9	15/18/19/21 dBm	-59/-62/-63/-65 dBm
h     h	5 GHz	802.11ac (VHT80P80/VHT160)	MCS0	20 dBm	-82 dBm
5 GHz     MCS3     19 dBm     -73 dbm       5 GHz     802.11ac (VHT80P80/VHT160)     MCS4     19 dBm     -69 dBm       MCS5     19 dBm     -65 dBm     -63 dBm       MCS6     18 dBm     -63 dBm       MCS7     17 dbm     -62 dBm			MCS1	20 dBm	-78 dBm
SGHz     802.11ac (VHT80P80/VHT160)     MCS4     19 dBm     -69 dBm       MCS5     19 dBm     -65 dBm     -65 dBm       MCS6     18 dBm     -63 dBm       MCS7     17 dbm     -62 dBm			MCS2	19 dBm	-76 dBm
5 GHz     802.11ac (VHT80P80/VHT160)     MCS5     19 dBm     -65 dBm       MCS6     18 dBm     -63 dBm     -62 dBm			MCS3	19 dBm	-73 dbm
MCS5     19 dBm     -65 dBm       MCS6     18 dBm     -63 dBm       MCS7     17 dbm     -62 dBm			MCS4	19 dBm	-69 dBm
MCS7 17 dbm -62 dBm			MCS5	19 dBm	-65 dBm
			MCS6	18 dBm	-63 dBm
			MCS7	17 dbm	-62 dBm
MCS8 16 dBm -58 dBm			MCS8	16 dBm	-58 dBm
MCS9 15 dBm -56 dbm			MCS9	15 dBm	-56 dbm

## Signal Coverage Patterns

## Radiation Pattern for 2.4GHz Antennas



## **Radiation Pattern for 5GHz Antennas**



## **ThunderIT for the REMC SAVE Contract**

ThunderIT offers products and services for REMC SAVE contract customers at a discounted price in accordance to the REMC price list.

## **Overview for the REMC SAVE contract**

REMC SAVE provides large volume contracts for a variety of educational resources, including furniture, school and office supplies, software and digital services, and technology.

The program saves time and money by providing bids compliant with the Michigan Revised School Code that also provides local school districts with the authority to purchase using REMC contracts. The legislation that established REMCs (Michigan Compiled Laws Act 451 Section 380.671), and State Board of Education Rules, enables REMCs to bid on behalf of local school districts and also provide local school districts with the authority to purchase using REMC contracts. All items and vendors are awarded through a sealed bid process by the REMC SAVE Bid Project and approved by the REMC Association.

REMC SAVE is provided as a project of the REMC Association of Michigan for all Michigan schools. REMC SAVE provides large-volume contracts for a variety of educational resources. By using REMC SAVE contracts, Michigan schools have saved more than \$1 billion since 1990. Every dollar saved through REMC SAVE today is one more dollar to invest in instruction tomorrow.

**ThunderIT services the following REMC districts**; REMC 1, REMC 2N, REMC 2C, REMC 2S, REMC 3, REMC 4, REMC 5, REMC 6, REMC 7, REMC 8, REMC 9, REMC 10, REMC 11, REMC 12W, REMC 12E, REMC 13, REMC 14W, REMC 14E, REMC 15, REMC 16, REMC 17, REMC 18S, REMC 18N, REMC 19W, REMC 19E, REMC 20, REMC 21, REMC 22

**ThunderIT services the following REMC customers**; AKIVA HEBREW DAY SCHOOL, BIRNEY MIDDLE SCHOOL, BUSSEY CTR-EARLY CHILDHOOD DEV, DEVRY UNIVERSITY - SOUTHFIELD – CENTRAL, HAMILTON ACADEMY CENTRAL OFFICE, LEONHARD ELEMENTARY SCHOOL, MCINTYRE ELEMENTARY SCHOOL, OAKLAND INTERNATIONAL ACADEMY

Other REMC contract holders include: Inacomp Technical Services Group, Sentinel Technologies, Software Services Group, Insight Direct USA, Information Systems Intelligence, Netech, Secant Technologies, CDW Logistics Inc (CDWG)

## ThunderIT offers a variety of Solutions & Services to meet your every need

## **Digital Workplace**

Transform your digital workplace and empower employees to drive your business forward. We deliver flexible, tailored, end-to-end solutions to keep your workforce engaged and productive. With an innovative approach centered around exceptional user experiences.

## **Smart Spaces**

We provide smart workspace solutions to help you deliver consistent network performance and give guests, employees and students an uninterrupted experience.

## **Secure Network Solutions**

Our security solutions help protect your network and critical data from cybersecurity threats

## Safe Environments

We believe that employee, student, and customer safety is paramount in any environment. That's why our solutions provide a cloud based platform to help you intuitively manage and monitor physical locations to ensure a safe experience for everyone.

## **Next Generation WiFi**

Power new and improved user experiences with our managed wifi solutions, offering faster speeds for enhanced application experience and more capacity for high density indoor and outdoor environments.

## **Remote Work Solutions**

With our remote work solutions, working away from the office is no big deal. Give employees a secure, optimized connection to your entire network from anywhere.

## **Hybrid Workforce**

We provide a seamless hybrid workforce solution that embraces change and operational scale. Give your employees and customers unrivaled experiences with a cloud platform that unifies best-in-class technologies.

## Free Network Evaluation & Demo

ThunderIT offers a FREE Network Evaluation and/or product Demo to help ensure you are well informed and confident when choosing the right Cisco Meraki solution for your needs. During our call we'll architect a custom built Cisco Meraki solution for your business or environment.

## **Migration & Deployment**

ThunderIT offers Migration and Deployment Services for your Cisco Meraki solution. Our experienced team of IT Professionals can configure, deploy and support your products to meet your needs. Our custom solutions ensure maximum efficiency and provide a clear path for your business going forward.

## **Managed Security**

ThunderIT offers the best and most cost-effective solution to lower your risk in a heightened threat environment. Our team of certified Cisco engineers are ready to ensure that your network is secure, and your firewall is optimally configured to defend your business.

## Mobile device management (MDM) Services

Our Mobile Device Management (MDM) solution unifies management of thousands of endpoint devices in a secure cloud platform, driving your organization's mobility initiatives, while maintaining an environment of agility and security.

## Support & Monitoring

ThunderIT offers network support and monitoring services that are designed to fit the needs of every customer.

## FAQs for the REMC SAVE Contract

**Q: Does REMC SAVE meet the legal requirement for competitive bidding?** A: The legislation that established REMCs (Michigan Compiled Laws Act 451 Section 380.671), and State Board of Education Rules, enables REMCs to bid on behalf of local school districts and also provide local school districts with the authority to purchase using REMC contracts. All items are competitively bid by REMC SAVE and awarded by the REMC Association.

**Q: Who can Use REMC SAVE contracts?** A: The following agencies are eligible to purchase using REMC SAVE contracts: PreK-12 Public, Charter (PSA) and Non-Public Schools, Community Colleges, Universities and Colleges, Public Libraries, Museums, State, County, and Local Government Agencies, Educational Non-profit Organizations and Health Care Facilities. Personal purchases at awarded bid pricing are at the discretion of the vendors.

**Q: What is REMC SAVE?** A: REMC SAVE is a free service of the REMC Association for all Michigan schools. There are 3 staff of REMC SAVE, and they conduct all of the bids and maintain vendor contracts. You can ask your local REMC Center questions. Find your local REMC Center by scrolling down the REMC SAVE home screen to view the map for your region or look up by zip code.

**Q: How do I provide feedback?** A: Your local REMC SAVE contact will always listen to any feedback you wish to provide. If you have feedback about the product, scroll down the home screen at remcsave.org and click 'View All Vendors' and you can complete a vendor evaluation form.

**Q:** What if my company wishes to become an awarded vendor? A: Go to vendorcenter.remcbids.org and create an account by clicking Login or Register in the upper right corner. Follow the directions! The only requirement is that you need five Michigan K12 school references. Customers can send their vendor recommendations to their local REMC contact or email remcsave@remc.org

**Q: How are the vendors and products selected?** A: Products and Vendors are awarded through a competitive bid process. REMC SAVE staff analyzes all bids and make recommendations to the REMC SAVE Advisory Committee for award. Once the REMC SAVE Advisory Committee votes on the award recommendations, they are then voted on by the REMC Association Board of Directors for final award.

**Q: Where do I send my order or contact an awarded vendor?** To contact vendors, navigate to the vendor listing by scrolling down the home screen and click 'view all vendors,' or navigate to https://www.remcsave.org/vendors. Click on the vendor name to find their contact information.

**Q: What do I need to include on my purchase order?** Please make sure your purchase order is itemized and includes the REMC item number, the model number/name, the reseller product number (if available), the quantity of each item to be purchased, and the unit price. A quote may be attached, but the purchase order should still be itemized. Sometimes the item numbers for the warranties, accessories, and upgrades are located on the spec sheet, linked from the awarded item page – be sure to include on the Purchase Order.