

Demarc Technology Group, LLC
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FCC ID NO: QGK-DT-100

FCC Notice

Demarc Technology Group, LLC wireless equipment described herein complies with FCC radiation exposure limits set forth for an uncontrolled environment when installed as directed. The equipment should be installed and operated as fix-mounted system such that the main lobe(s) of these antennas are located a minimum of 8 feet between the antenna and all persons during normal operation.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Federal Communications Commission (FCC) Statement

This Equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

FCC Output Power Restrictions

The FCC does not require licensing to implement this device. However, the FCC has established restrictions regarding maximum output power and the adjustments required when employing directional gain antennas. These restrictions are detailed in FCC Part 15.247 (b)(1), (b)(3)(i), and (3)(iii). It is the responsibility of the individuals designing and implementing the radio system to assure compliance with these and any other pertinent FCC Rules and Regulations.

FCC RF Radiation Exposure Statement:

The DT-ZM-100mW-WC is designed for 2.4 GHz @ 100mW. This level of RF energy are below the Maximum Permissible Exposure (MPE) levels specified in FCC OET 65:97-01. This is only approved with the antenna gains as listed in this document with the maximum antenna gain of 15.7dBi. A separation distance of 25 cm between the antenna and humans must be maintained.

The following precautions must be taken during installation of this equipment:

- The installed antenna must not be located in a manner that allows exposure of the general population to the direct beam path of the antenna at a distance less than 25cm. Installation on towers, masts, or rooftops not accessible to the general population is recommended; or
- Mount the antenna in a manner that prevents any personnel from entering the area within 25 cm from the front of the antenna.
- During antenna installation, be sure that power to the DT-ZM-100mW-WC equipment is turned *off* in order to prevent any energy presence on the coaxial connector.
- During installation and alignment of the antenna, do not stand in front of the antenna assembly.
- During installation and alignment of the antenna, do not handle or touch the front of the antenna.

These simple precautions must be taken to prevent personnel from exposure to RF energy in excess of specified MPE levels.



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Feedline Loss

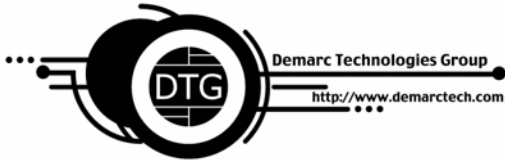
Feedline loss is a function of feedline type and length. Feedline loss per 100 feet for several types of coax at 2.4Ghz is detailed in the table below. The RF loss applies to BBP/RFC interconnection, and the RF loss applies to RFC/antenna interconnection.

RF Loss per 100 feet at 2.4GHz

Cable	dB Loss/100 feet
LMR-100	40 dB
LMR-195	19 dB
LMR-200	16.9 dB
LMR-240	12.9 dB
LMR-300	10.4 dB
LMR-400	6.8 dB
LMR-500	5.48 dB
LMR-600	4.42 dB
LMR-900	2.98 dB
LMR-1200	2.26 dB
LMR-1700	1.71 dB

TRANSMITTER POWER

The FCC specifies the maximum transmitter power that may be used for antennae of a given gain. FCC rules Part 15, Subpart 247 allow for a maximum power of 1 watt into antennae of a gain less than or equal to 6 dBi. For every 1 dB of gain over 6 dBi, the transmitter must be reduced by 1 dB.



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Authorized Antennas and Antenna Gain

Best performance will result from the use of high gain antennas. DT-ZM-100mW-WC is intended to be coupled with an antenna that is directional and provides signal gain as the FCC provides no recourse in this band in the event of nearby interference, so a highly directional antenna reduces the likelihood of interference in the antenna pattern.

A unique style (reverse MMCX) connector is provided on the DT-ZM-100mW-WC to prevent the use of non-approved antennas.

The following table is a list of Demarc antenna models that are approved to be used with this device: All antennas are the same type antenna. Only the panel design is changed between the different models. The Omni directional antennas do not have panels installed.

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
180° Sector Panel Base Station Antennas (Vertical)			
SPDG11H	2400-2483	3.5	180/70
SPDG12H	2400-2483	6	180/40
SPDG13H	2400-2483	7.5	180/24
SPDG14H	2400-2483	8	180/20
SPDG16H	2400-2483	9.5	180/14
SPDG18H	2400-2483	10.5	180/10
SPDG112H	2400-2483	11.5	180/8

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
180° Sector Panel Base Station Antennas (Vertical) with F/B<-22dB			
SPDG14H22	2400-2483	9.1	180/20
SPDG16H22	2400-2483	10.6	180/14
SPDG18H22	2400-2483	11.6	180/10
SPDG112H22	2400-2483	12.6	180/8

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
120 degree Sector Panel Antennas with -30dB F/B Ratio (Vertical)			
SPDG11T2	2400-2483	7.1	120/60
SPDG14T2	2400-2483	11	120/20
SPDG16T2	2400-2483	12.2	120/14
SPDG18T2	2400-2483	13	120/10
SPDG112T2	2400-2483	14	120/8

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
120° Sector Panel Base Station Antennas (Vertical)			
SPDG11T	2400-2483	7	120/60
SPDG12T	2400-2483	9	120/40
SPDG13T	2400-2483	10	120/24
SPDG14T	2400-2483	11	120/19
SPDG16T	2400-2483	12.2	120/12
SPDG18T	2400-2483	13	120/10
SPDG112T	2400-2483	14	120/8

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
90° Sector Panel Base Station Antennas (Vertical)			
SPDG11F	2400-2483	7.5	90/60
SPDG12F	2400-2483	9.5	90/38
SPDG13F	2400-2483	11	90/22
SPDG14F	2400-2483	12	90/20
SPDG16F	2400-2483	13	90/12
SPDG18F	2400-2483	14	90/10
SPDG112F	2400-2483	15	90/8

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
90° Sector Panel Base Station Antennas (Vertical)			
SPDG14F2	2400-2483	12.5	90/20
SPDG16F2	2400-2483	13.5	90/12
SPDG18F2	2400-2483	14.5	90/10
SPDG112F2	2400-2483	15.5	90/8

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
Omni Directional Base Station Antennas (Vertical)			
SPDG11O	2400-2483	2	360/90
SPDG12O	2400-2483	4.5	360/55
SPDG13O	2400-2483	5.5	360/30
SPDG14O	2400-2483	6.5	360/24
SPDG16O	2400-2483	8	360/18

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
Omni Directional Base Station Antennas (Vertical) (Panel)			
SPDG12OP	2400-2483	4.5	360/55
SPDG13OP	2400-2483	5.5	360/30
SPDG14OP	2400-2483	6.5	360/24
SPDG16OP	2400-2483	8	360/18

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
CPE Directional Panel Antennas (Vertical)			
SPLG11	2400-2483	10	60/65
SPFPG9	2400-2483	9.6	55/65
SPLG22	2400-2483	14	33/33
SPFPG13	2400-2483	13	20/65
SPFPG15	2400-2483	15	20/33

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
CPE Low Sidelobe Directional Panel Antennas (Vertical)			
SPFPG12	2400-2483	12.5	22/65
SPPGL13	2400-2483	13	22/65
SPFPG14	2400-2483	14.5	22/33
SPPGL15	2400-2483	15	22/33

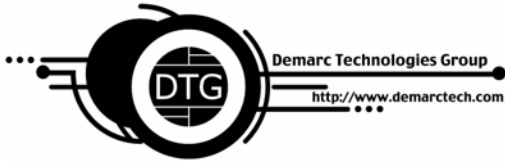
Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
Range Extender Omni Directional Antennas for 2.4GHz (Vertical)			
SPDGRE4	2400-2483	4.5	360/55
SPDGRE5	2400-2483	5.5	360/30

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
60° Sector Panel Base Station Antennas (Horizontal)			
SPFPGH9S	2400-2483	9.6	60/55
SPFPGH12S	2400-2483	12.5	60/22
SPFPGH14S	2400-2483	14	60/18

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
120° Sector Panel Base Station Antennas (Horizontal)			
SPHSG2T	2400-2483	9	120/40
SPHSG4T	2400-2483	13.5	120/12

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
180° Sector Panel Base Station Antennas (Horizontal)			
SPHSG2H	2400-2483	9	180/33
SPHSG4H	2400-2483	11.5	180/14
SPFPGH14H	2400-2483	14	180/18

Model No.	Frequency Mhz	Gain dBi	HB/VB Degree
CPE Directional Panel Antennas (Horizontal)			
SPFPGH9S	2400-2483	9.8	60/55



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60° Sector Panel Base Station Antennas (Vertical)			
SPLG11F	2400-2483	9.3	60/65
SPLG11	2400-2483	10	60/65
SPLG12	2400-2483	12	60/33
SPDG24	2400-2483	14	60/14
SPDG14S	2400-2483	14.5	60/12

45° Sector Panel Base Station Antennas (Vertical)			
SPDG15E	2400-2483	15.7	45/12

SPFPGH13	2400-2483	13.2	18/65
SPFPGH14	2400-2483	14.2	33/33
SPFPGH15	2400-2483	15	30/20

Omni Directional Base Station Antennas (Horizontal)			
SPHSG10	2400-2483	3.2	360/45
SPHSG20	2400-2483	5.5	360/30
SPHSG40	2400-2483	7.5	360/18
SPHSG60	2400-2483	8.5	360/12