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NEC

iPASOLINK EX
Advanced

SAFETY INFORMATION

NEC Corporation
7-1, Shiba 5-Chome, Minato-Ku, Tokyo 108-8001, Japan

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iPASOLINK EX Advanced
SAFETY INFORMATION

This equipment is not suitable for use in locations where children are likely to present.

Accessing to the equipment should be limited only by the SERVICE PERSONNEL or by USERS WHO ARE WELL TRAINED WITH ENOUGH SKILLS AND KNOWLEDGES REGARDING THESE RESTRICTIONS, PRECAUTIONS AND INSTALLATION SITES.

The Safety Information provides precautions and directions to install, operate and maintain the iPASOLINK EX Advanced (hereinafter iPASOLINK EX/A) safely. To prevent the equipment from being damaged or causing bodily harm, please familiarize yourself with the contents here in this document and in the instruction manuals before installing/operating the equipment.

Following indications are used for admonishment:

GENERAL

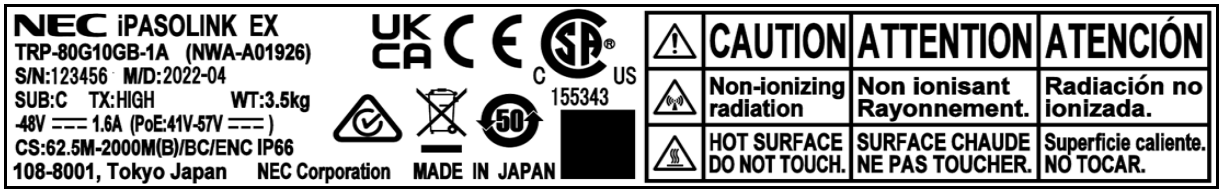
 **DANGER**	Indicates an imminently hazardous situation, which, if not avoided, ***will*** result in death or serious injuries.
 **WARNING**	Indicates an imminently hazardous situation, which, if not avoided, ***could*** result in serious injuries or physical damages.
 **CAUTION**	Indicates a potentially hazardous situation, which, if not avoided, ***may*** result in minor or moderate injuries or physical damages. It is also used to alert against inappropriate practices

This system should be installed, powered on, operated and maintained only by the appropriate service personnel who is/are skilled enough to be aware of hazards to which the personnel may be exposed during operation, and of measures to minimize the risks to the personnel or others.

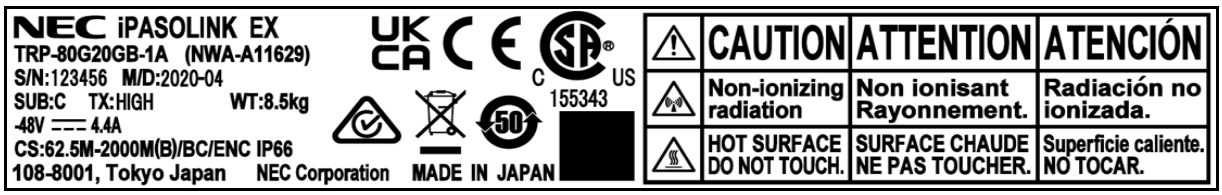
LABELS

Marks of Cautions and Warnings printed on the equipment are shown below. In case that these labels are out of sight due to the installed condition, please contact NEC:

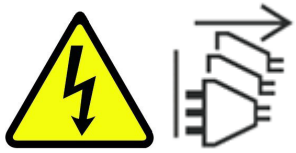
■ **EX/A**



■ **EX/A Dual**



CAUTION



Risk of Electric Shock. Do Not Touch.

The system uses a high voltage. Extra attention is required particularly in the WET CONDITION in the outdoor environment.

CAUTION

Hot Surface. Do Not Touch.

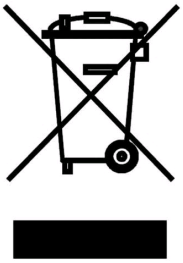
The surface of the equipment may be heated if it is in operation. Ensure not to touch the equipment while it is in operation.

CAUTION

Non-Ionizing Radiation

Keep body away from front of Antenna.

Caution that the non-ionizing radiation from the equipment may affect your health.



WEEE

Waste Electrical and Electronic Equipment — The electrical and electronic products with this mark are the subjects to follow WEEE. Disposal of NEC equipment or any part of NEC equipment with this mark should comply with regulations implemented by the local authorities or the agreement with NEC.

China RoHS

Equipment with this mark is subject to compliance with China RoHS in terms of the environmental protection applied to the electrical and electronic equipment.

Protective Earthing (Should Be Grounded)

Any device and equipment with this label should be connected to the ground using its Grounding Terminal.

Regulatory Compliance Mark (RCM)

Equipment with this mark is subject to compliance with EESS and ACMA arrangements in terms of the electrical safety applied to the electrical and electronic equipment.

In case that these labels are out of sight due to the installed condition, please contact NEC.

WARNING

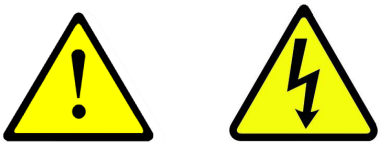
(1) Class A Product [TRP-80G20GB-1A]

WARNING

Operation of this equipment in a residential environment could cause radio interference.

CAUTION

(1) Risk of Electric Shock



CAUTION: ***Electric shock***
Do Not Touch.

(1) iPASOLINK EX/A is designated to use the –48 V DC power at the outdoor environment. Due to the risk of electric shock, particular attention should be paid in wet condition that decreases the electric resistance.

(2) AC Power Module is designated to convert the 100-200 V AC power to –48 V DC power at the outdoor environment. Due to the risk of electric shock, particular attention should be paid in wet condition that decreases the resistance.

(2) Microwave Radiation

CAUTION: ***Non-Ionizing Radiation***
Keep body away from front of Antenna.

Do not enter the area in front of the antenna while transmitter is activating. Power density of microwave or millimeter-wave is high along the antenna beam. For details, refer to the NOTICE and SAFETY GUIDELINE in this document.

(3) Class1/1M Laser Product

CAUTION: ***Laser Radiation***
Do Not View Directly.

In a system using optical modules, do not stare at the laser beams directly when using the optical instruments. or it may cause damages to eyes and skin.

(4) Lift with Care

CAUTION: ***Heavy weight***
Keep body parts away from risk of heavy weight.

Use Caution when Lifting: This equipment is heavier than you expect. Ensure not to hurt yourself or the equipment when lifting or transporting it.

(5) To Work in High Place

CAUTION: ***High Energy Hazard***
Do not drop anything and yourself

Take care not to drop the equipment, parts and/or tools when working in a high place. Even a small part could be a weapon (sometimes deadly), if it is fallen from the high place. Ensure to take adequate measures, such as restricting the area, to prevent an accident before starting the high-place work.

(6) Supply Safety Extra Low Voltage

CAUTION

Use the Safety Extra Low Voltage (SELV) to supply the –48 VDC power to the equipment.

(7) Protect from Lightning

CAUTION: *Surge Current*

Keep equipment away from surge current.

Place iPASOLINK EX/A within the area protected by lightning rod. To avoid surge current caused by lightning, from circulating within the equipment earth system, the equipment earth system should be connected to the ground of the lightning rod at the ground level.

(8) Do Not Touch Power Plug While in Service

CAUTION: *Electric Shock*

While the equipment is powered on, do not even attempt to disconnect/reconnect the power supply plug, or the equipment and DC-DC CONV may be damaged.

(9) Use Circuit Breaker

CAUTION

iPASOLINK EX/A requires a circuit breaker or shut-off function externally. The equipment does not provide a power on/off switch. Place the equipment and a power injector in position to shut the power of iPASOLINK EX/A off safely just in case of emergency.

(10) Using PoE [TRP-80G10GB-1A]

CAUTION

When iPASOLINK EX/A is powered via the PoE Terminal, ensure not to disconnect the LAN Cable while in service, or the equipment may be damaged.

CAUTION

iPASOLINK EX/A provides PoE (Power over Ethernet) Port, which can enable either –48 VDC Power Port or PoE Port but not both at a time. See NOTICE (POWER SUPPLY AND CIRCUIT BREAKER) also.

(11) Use STP Cable for LAN Connection

CAUTION

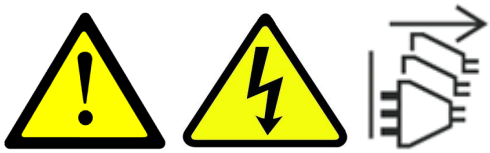
Use STP (Shielded Twisted Pair) cables for LAN connections. Using UTP (Unshielded Twisted Pair) cables may result in damage to the equipment, causing the failure. To enable the shielding effect for the radio equipment and devices to which these are connected, ground the equipment and connecting cables securely and properly.

(12) Do Not Use Cables Charged with Static Electricity

CAUTION

Do not use cables that are charged with static electricity. If the charged cables are used for connecting to the equipment, it may result in damage to the equipment. Make sure that the cables are not charged with static electricity before connecting them to the equipment.

(13) Quit Operation in Case of Emergency



CAUTION: *Shock Hazard*

In case of emergency, such as detecting unusual odor, burning smells, smokes, or strange sounds, quit operating the equipment immediately, and power it off. If the equipment keeps operating in such condition, the equipment may get damaged, generating an electric shock, which should not be fixed or repaired by customers.

(14) Do Not Disassemble

CAUTION: *Electric Shock*

Do not attempt to disassemble, modify, overhaul, or repair the equipment by yourself, or it may damage the equipment or may result in giving an electric shock.

NOTICE (PLACING EQUIPMENT)

1. *iPASOLINK EX/A generates non-ionizing radiation, and is designated for the outdoor use. Installing the equipment indoors may cause bodily harm nor inflict damage to objects, which needs to take the adequate measures, if occurs.*

2. *iPASOLINK EX/A should be installed as follows:*

   - *Confirm that the equipment is installed in the appropriate site. Do not install it on an unstable spot. Improper installation raises the temperature inside the equipment, which may damage the equipment.*
   - *Accessing to the equipment should be limited only by the SERVICE PERSONNEL or by USERS WHO ARE WELL TRAINED WITH ENOUGH SKILLS AND KNOWLEDGES REGARDING THESE RESTRICTIONS, PRECAUTIONS AND INSTALLATION SITES.*
   - *Accessing to the equipment should be protected using a tool, locks, keys, and/or other means of security, which should be managed by the authority who is responsible for the installed site.*
   - *The other end of the grounding cable connected to the ground terminal should be connected to the station earth point. For details, refer to the Installation Manual.*

3. *Precautions for Cables:*

   (a) POWER SUPPLY CABLES

   Use two-core double insulated cable of 5.86 to 10.00 mm in diameter.

   (b) DATA TRANSMISSION CABLES

   Use shielded cables for the data transmission cables.

   (c) GROUNDING

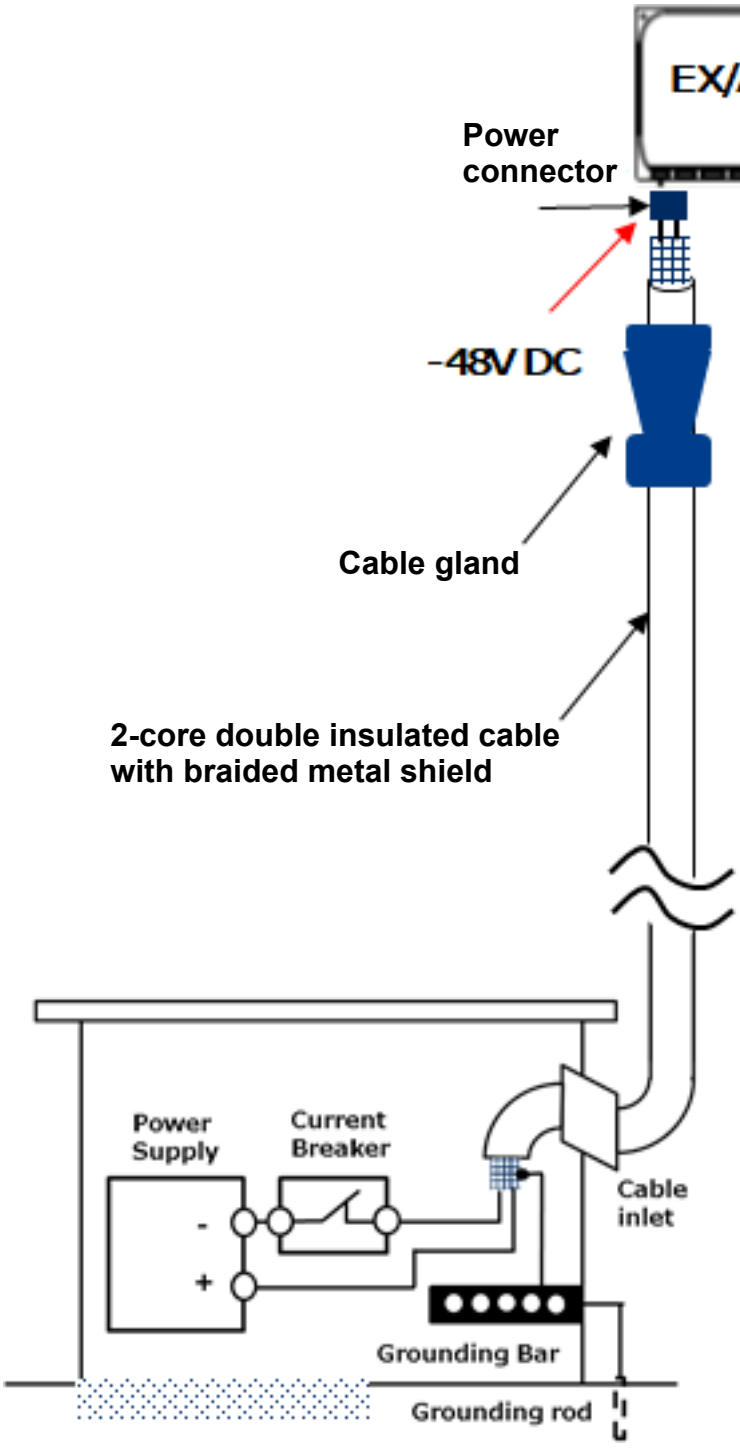
   Ground Terminal should be connected to the station earth point. For details, refer to the Grounding the Frame section in the ***Installation*** *manual.*

4. *Transmission quality degradation may temporarily occur due to the electromagnetic disturbances, such as lightning or ESD.*

NOTICE (POWER SUPPLY AND CIRCUIT BREAKER)

Since iPASOLINK EX/A itself does not have a power on/off switch, it requires a circuit breaker or shut-off function externally. See the followings for reference:

■ Typical Connection (to DC –48 V Port)

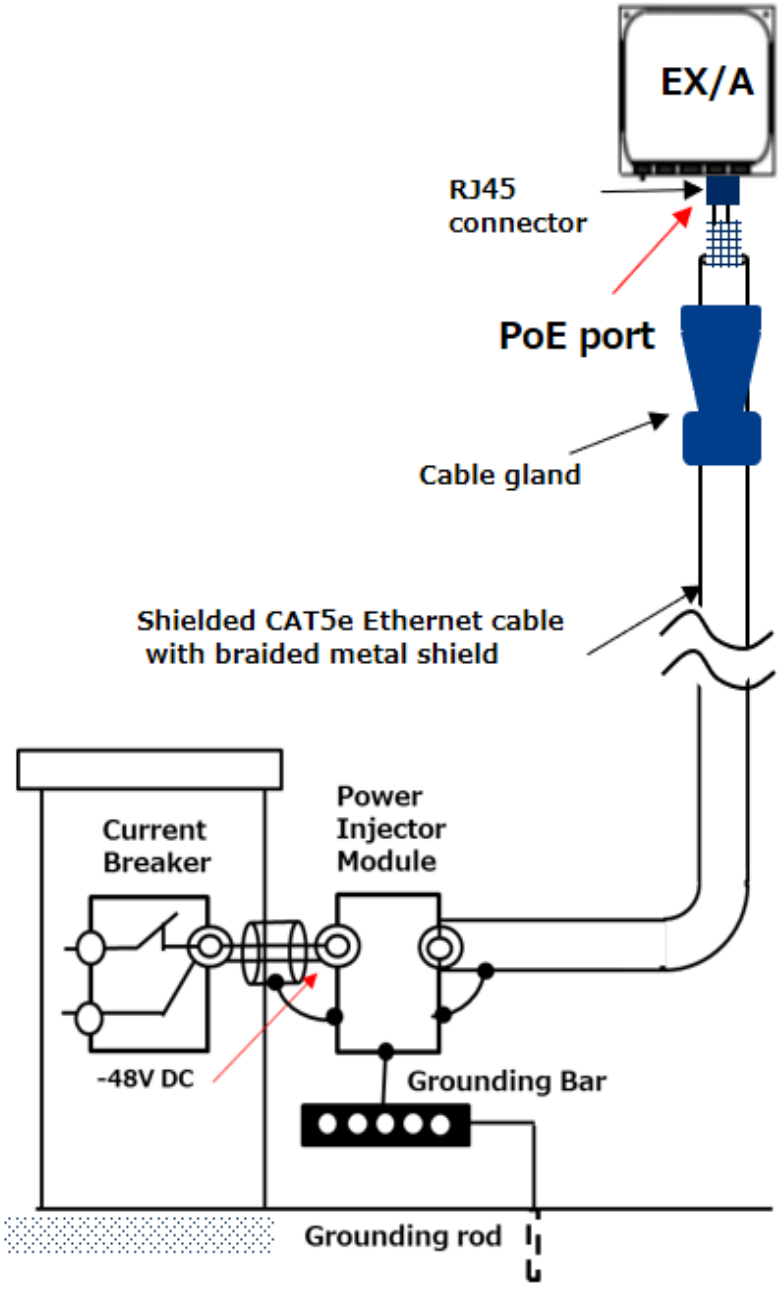


Points:

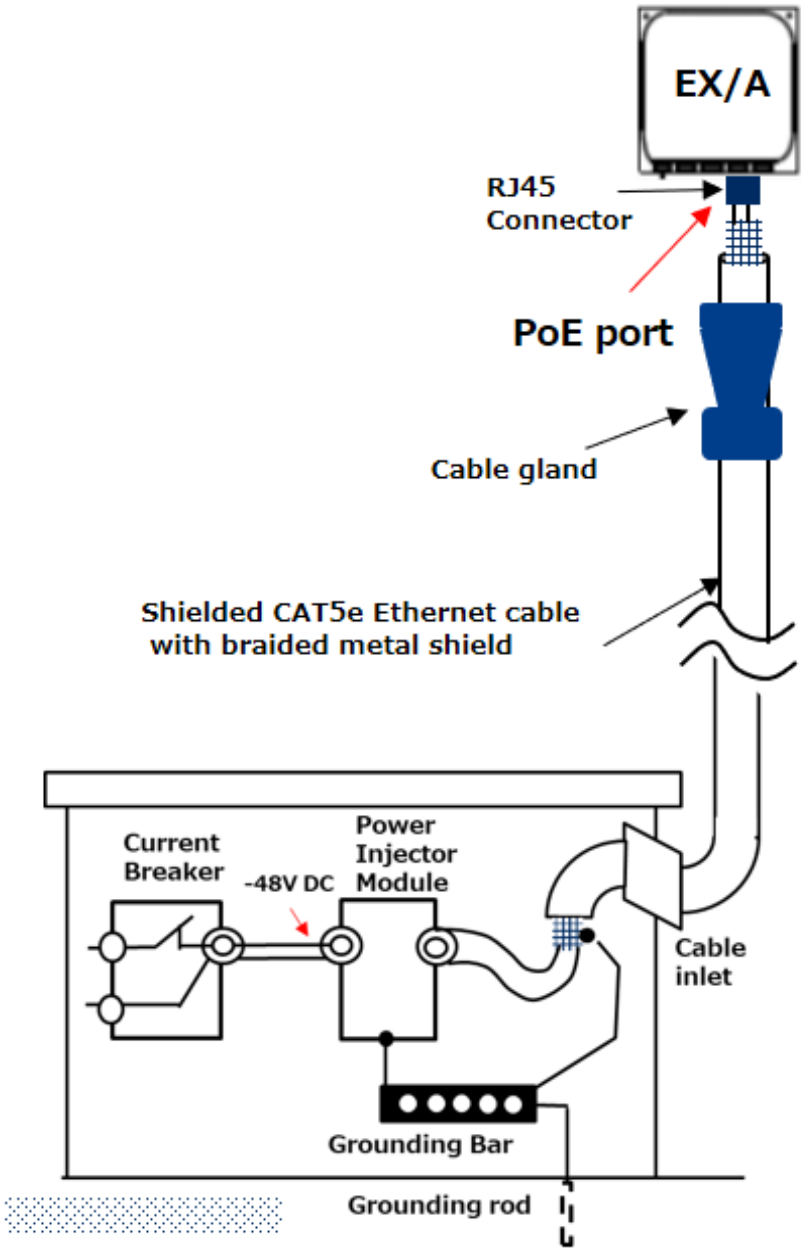
1. Use power cable with shield protection.
2. Connect shield conductor to common grounding bar at bottom of tower or cabinet.
3. The shield conductor should not connect to AOR FG (at top, near Equipment shield conductor should not be exposed or connected).

■ Using LAN (PoE) Port

Outdoor Power Injector Module (DC PSE Unit)



Indoor Power Injector Module (DC PSE Unit)



The cable should be shielded to keep operating in conformity with EMC standards.

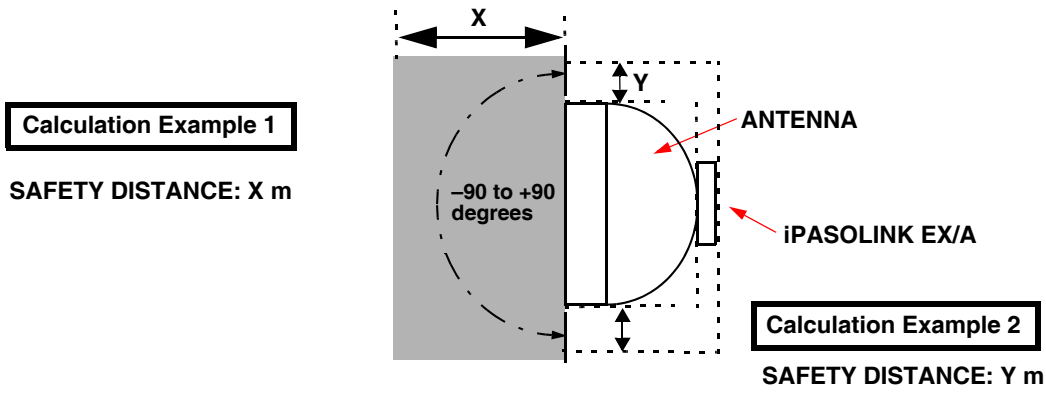
SAFETY GUIDELINE FOR USING HAZARDOUS MICROWAVE RADIATION

The radiation levels of Microwave and Millimeter-Wave that iPASOLINK series deal with are very low, and no health hazard has been reported for them so far. However, advanced countries that care much about health hazard have started regulating the radiation levels. For EU countries, it is specified by EN 62311 Annex A A.2. In order to follow the regulation, operators should not work near the antenna if its transmitter is activating. Especially, the radiation level of a specific area (**X** and **Y** shown in the illustration below) in front of antenna is high.

See the following illustration and **Calculation Examples 1 and 2**:

Power density in front of the antenna turns high along the antenna beam. Ensure not to allow yourself radiated by beams anytime.

Radiation Hazard Area



The power density and field strength level can be obtained by the following calculation formula:

$$\text{Power Density} : S = \frac{P}{4\pi R^2}\ (W/m^2) = \frac{10^{\left(\frac{P' + G - 30}{10}\right)}}{40\pi R^2}\ (mW/cm^2)$$

Where

P = Output Power (**W**),
P' = Output Power (**dBm**),
G = Antenna Gain (**dBi**),
(in condition of angle and range from antenna)
R = Distance between human being and antenna (**m**)

Safety distance should be calculated according to the conditions of installation site. Followings show the calculation examples:

■ Calculation Example 1 (Front Side of Antenna)

- iPASOLINK EX = +18 dBm
- Antenna Diameter = 0.6 m
- Antenna Gain = 52 dBi
- Distance = 9.0 m
- Output Power Density : S = 0.982 mW/cm^2 ≦ 1 mW/cm^2

*Limit: Output Power Density S = 10 (W/m^2) * = 1 (mW/cm^2)*

: **COUNCIL RECOMMENDATION (1999/519/EC) of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)*

■ Calculation Example 2 (Rear Side of Antenna)

- iPASOLINK EX = +18 dBm
- Antenna Diameter = 0.6 m
- Antenna Gain = –16 dBi
- Distance = 0.004 m = 4.0 mm
- Output Power Density : S = 0.788 mW/cm^2 ≦ 1 mW/cm^2

*Limit: Output Power Density S = 10 (W/m^2) * = 1 (mW/cm^2)*

: **COUNCIL RECOMMENDATION (1999/519/EC) of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)*

The safety distance that is obtained by the conditions above and is below the value defined by **COUNCIL RECOMMENDATION** (1999/519/EC) of 1 mW/cm^2 is:

- Front Side of Antenna (X) ≧ 9.0 m
- Rear Side of Antenna (Y) ≧ 0.004 m = 4.0 mm

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