

Near Field Magnetic Loop Sensor Antenna

Manufacture:
Validfill, LLC
6222 Tower Lane, Suite B7
Sarasota, FL 34240

Model Number:

RFID-v9.1 915 MHz

This antenna was designed primarily for use in RFID applications such as soft drink vending machines where a carefully controlled read/write staging area is needed, together with insensitivity to the presence of liquids. Far-Field radiation has been minimized to eliminate interaction with directly adjacent sensors and the presence of Tags not in the desired staging area.

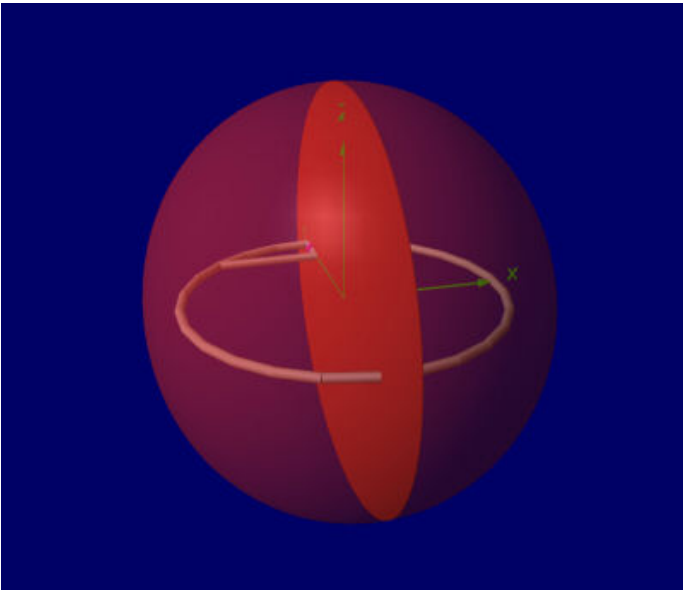
SPECIFICATIONS		
Nominal Impedance	50	Ohms
Center Frequency	915	MHz
Frequency Range of Operation	902 - 928	MHz
SWR Bandwidth (Min)	26	MHz
SWR (Max, 50 Ohm) ¹	2:1	
Read Range ²	4	Inches
Nominal Gain ³	-3.55 to 0.55	dbi
Maximum Input Power ⁴	500	mw

Notes
(1) SWR Typically 1.5:1
(2) RFID Tag centered over Antenna
(3) Depends on T-Attenuator option selected: 0 to -3dbi
(4) Typical Power needed for max read height is 50mw

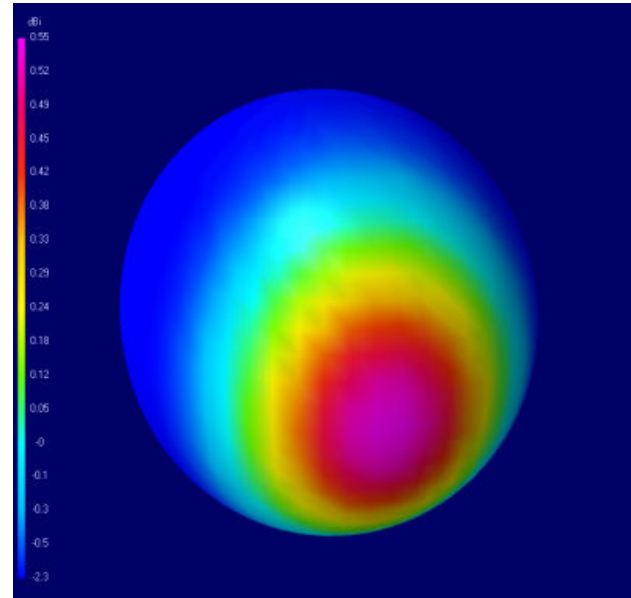
Because of the small size of this radiator compared to wavelength, its far field pattern is almost perfectly isotropic, producing a maximum gain in the pattern of 0.55db. This occurs on a line drawn from the center through the gap in the resonator in the plane of the antenna. The EIRP is therefore .55db maximum over the isotropic reference. The inclusion of the onboard T-Attenuator reduces the EIRP by 1db to 4db, depending on the configuration chosen.

Maximum average power in normal operation is less than 50mw (0.05W). Power output needed from the Reader is 100mw at a 50% duty cycle, and losses in the transmission line, connectors, and antenna dielectric actually reduce that by about 2db, to 32mw. Peak envelope power (PEP) would be 64mw. The power density in normal operation at 12 inches would be 27mw/m² (0.027W per square meter), or less than 18x10⁻⁶/in² (0.000018W per square inch). Again these levels would be reduced by 1db to 4db depending on the vales chosen for the T-Attenuator.

Shown below are two 3-dimensional plots of the far field pattern. The first shows the orientation of the antenna within a transparent field, and the second shows the color coded field strength with antenna orientation unchanged.



Antenna structure and far field pattern



Far field gain Violet = .55db

Mechanical Specifications RFID-v9.1		
Diameter	1.22 (31)	inches (mm)
Thickness (including connector)	0.55 (14)	inches (mm)
Weight	0.15 (4.25)	oz. (grams)
Termination	SMA	Female