High Power Microwave-Systems

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Abstract

With the increase of electronic systems in control, communication, command and security systems the sensitivity of these devices increases with respect to electromagnetic interference pulses. Electromagnetic interference of high field intensities can be generated by ultra-wide band high power microwaves.

Therefore the concept of developing and using high power microwave–systems (HPM) as a complementary weaponry is getting more and more important. HPM-systems are constituents of the growing family of less-lethal-weapons / non-lethal-weapons (LLW / NLW) as they do not effect on human beings with deadly force.

Especially peacebringing and peacekeeping international forces are depending on LLW/NLW-weaponry in order to fulfil their order according to the rules of engagement.

Of special interest in military and civilian application are ultra-wide band high power microwave systems with a frequency spectrum of 100 MHz up to several GHz (ultra-wide band high power microwaves) and a transmission power of several 100 MW.

A variety of military-operational and law enforcement / civilian scenarios are pointing the way to the different technical requirements of ultra-wide band high power microwave systems in respect of energy supply, frequency spectrum, transmission power, repetition rate, mass, and volume as well as production costs.

This overview paper presents the various HPM-UWB source technologies with their prognosticated output data, which at present are being researched and developed at Rheinmetall. As a result of this output data the range of possible application in military as well as law enforcement / civilian use in supporting internal security are being deduced and assessed. In conclusion a variety of Rheinmetall concepts of HPM-UWB-Systems are being presented, which in the short or medium term could come into use in various application ranges with different UWB-source and antenna technologies.

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