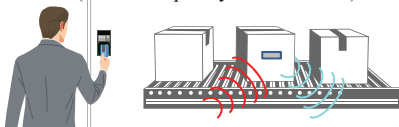


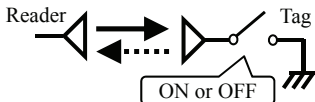
Introduction

RFID (Radio Frequency Identification)



Technology for identifying and managing people and goods using small wireless chip

Conventional load modulation

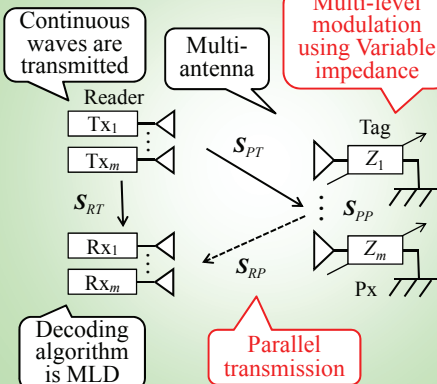


It can't attain high-speed data transmission

It can't meet demand for recent data rate

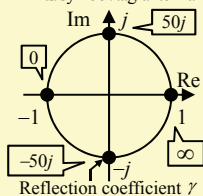
Passive MIMO Transmission

System model

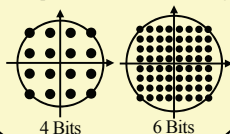


Determination of the termination impedance pattern of the tag

Transmission rate : 2 Bits/symbol/tag-antenna



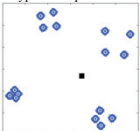
Examples of constellation at tag



Results

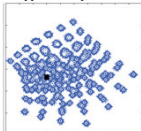
○ Ideal signal
+ Signal w/ noise
■ Carrier signal

4 types of impedance

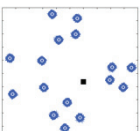


Received antenna 1

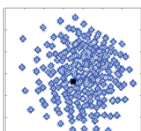
16 types of impedance



Received antenna 1



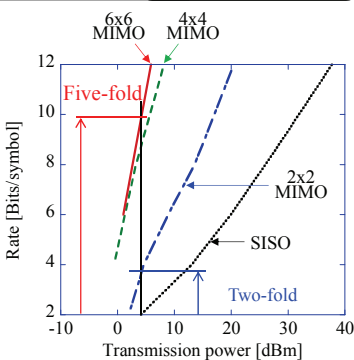
Received antenna 2



Received antenna 2

Constellation of received signal

The number of ideal received signal points are increased by proposed multi-level modulation method



Transmission power versus transmission rate
Transmission power yields BER= 10⁻² (noise power -100dBm)

The more the number of the antenna elements becomes, the larger the improvement becomes

Conclusion

Proposed method allows high-speed data transmission by increasing the number of antennas at the tag side.