

MTFComm

Data Sheet: MTF Cellular Systems



Description	DownLink	UpLink
Tx Power	46dBm/Beam	33dBm
Bit Rate	100Mbps/User	5Mbps/User
# of Users	128 Users/Beam	128 Users/Beam
Tx Antenna Gain	27dBi	9dBi
Tx Antenna Type	16X16 AESA, 2 π lobe	2X2 PESA, 2 π lobe
Rx Antenna Gain	9dBi	27dBi
Rx Antenna Type	2X2 PESA, 2 π lobe	16X16 AESA, 2 π lobe
Obstructions	20dB	20dB
Range	8.4Km	8.4Km
Modulation	MTFM™	MTF™
Coding Gain	0dB	0dB
Tx/Rx H/W	Apart	Integrated
Carrier Frequency	3.5GHz	3.5GHz
BW	10MHz	10MHz
Sampling Type	RF	RF
ADC	Dual: 7GHz @ 4bit/sample	Dual: 7GHz @ 8bit/sample
PAPR	0dB	11dB
MAC	MTFMA™ with Dynamic Channel Allocation	
Multiple Access	Point-to-Multipoint	Multipoint-to-Point

MTFComm

Data Sheet: 5G Systems



Description	DownLink	UpLink
Tx Power	46dBm/Beam	33dBm
Bit Rate	100Mbps/User	5Mbps/User
# of Users	128 Users/Beam	128 Users/Beam
Tx Antenna Gain	27dBi	9dBi
Tx Antenna Type	16X16 AESA, 2π lobe	2X2 PESA, 2π lobe
Rx Antenna Gain	9dBi	27dBi
Rx Antenna Type	2X2 PESA, 2π lobe	16X16 AESA, 2π lobe
Obstructions	20dB	20dB
Range	1.4Km	320m
Modulation	OFDM with 16QAM	OFDM with 16QAM
Coding Gain	9dB	9dB
Tx/Rx H/W	Apart	Integrated
Carrier Frequency	26GHz	26GHz
BW	3.5GHz	3.5GHz
Sampling Type	IF	IF
ADC	Dual: 3.5GHz @ 12bit/sample	Dual: 3.5GHz @ 12bit/sample
PAPR	16dB	16dB
MAC	TDD	
Multiple Access	Point-to-Multipoint	Multipoint-to-Point

MTFComm

Comparison: MTF Systems Versus 5G Systems



For a fixed Tx power, bit rate, antenna gain and types, MTF systems offer 3 types of advantages compared to 5G:

1. The bandwidth is reduced from for 5G to for MTF Cellular systems.
2. The range is increased from for 5G to for MTF Cellular systems.
3. The complexity for 5G is substantially reduced for MTF Cellular systems as shown below:
 - a. The Up-Converters/Down-Converters are not required for MTF Cellular systems.
 - b. The Forward Error Correction (FEC) Encoders are not required for MTF Cellular systems.
 - c. The resolution of the ADC is smaller for MTF Cellular systems.
 - d. The PA in the cellular BS for MTF Cellular systems is selected to be highly efficient.

Assumptions:

1. For a cellular BS, Tx and Rx are separated such that Full Duplex communications is possible for both 5G systems and MTF Cellular systems, while for a cellular device, Tx and Rx are integrated.
2. The cellular device is designed to be in a non-LOS environment.
3. Each array element in both Tx and Rx antennas has a steradian lobe.