

Femto Hexa-Band Digital Data Link

The Femto Digital Data Link is a miniature, high power, Hexa-Band wireless solution that delivers the throughput and range needed for complex data intensive applications. The fDDL1624 offers software selectable operation in six frequency bands between 1.6 and 2.5 GHz. The Femto DDL uses Maximal Ratio Combining (MRC), Maximal Likelihood (ML) decoding and Low-Density Parity Check (LDPC) to achieve robust RF performance. The fDDL1624 features secure and simultaneous Ethernet and Serial Data Communications.



Only 5.5 grams!

0.75" X 1.05" X 0.30"



New Dynamic Frequency Selection on OFDM overlay and Frequency Hopping provide robust interference and antijam immunity!

Up to 21 Mbps

Hexa-Band Frequency

Dual Ethernet, USB, Serial

DFS & Frequency Hopping

PTP | PMP | Relay | MESH

MANET MESH / Advanced MESH

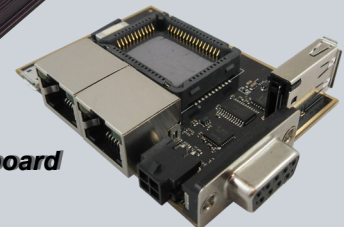
Real Time Spectrum Analyzer

Features

- Software Selectable 1.6, 1.8, 2.0, 2.2, 2.3 or 2.4 GHz Operation
- Maximal Ratio Combining (MRC), Maximal Likelihood (ML) decoding
- Low-Density Parity Check (LDPC)
- Up to 21 Mbps Iperf Throughput @ 8 MHz channel (-78 dB)
- Up to 2 Mbps IPerf Throughput @ 4 MHz channel (-100 dB)
- Serial Data/Console Communication Port
- Dual 10/100 Ethernet Ports (LAN/WAN) & Serial Ports
- Point-to-Point, Point-to-Multipoint & MANET MESH Networks
- Master, Remote, Relay & MESH Operating Modes
- Adjustable total transmit power (up to 1W)
- FIPS140-2 Compliant Pending
- NDAA Section 889 Compliant



Enclosed



Motherboard

Optimal Performance Specifications

Modulation	8MHZ Channel		4MHZ Channel		Total Tx Power +/- 1dB
	IPerf Throughput (Mbps)	Optimal MRC Sensitivity* (dB)	IPerf Throughput (Mbps)	Optimal MRC Sensitivity* (dB)	
Frequency Band: 1625 - 1725 MHz					
BPSK_1/2	3.1	-96.5	1.57	-100	30dBm
QPSK_1/2	6.0	-95	3.0	-98	30dBm
QPSK_3/4	8.4	-93	4.3	-96	30dBm
16QAM_1/2	10.7	-89	5.4	-92.5	30dBm
16QAM_3/4	14.8	-87	7.4	-90	30dBm
64QAM_2/3	18.1	-82	7.8	-85	30dBm
64QAM_3/4	19.0	-80.5	8.0	-83	30dBm
64QAM_5/6	21.0	-78	10.0	-80.5	30dBm
Frequency Band: 1780 - 1850 MHz					
BPSK_1/2	3.1	-96.5	1.57	-100	30dBm
QPSK_1/2	6.0	-95	3.0	-98	30dBm
QPSK_3/4	8.4	-93	4.3	-96	30dBm
16QAM_1/2	10.7	-89	5.4	-92.5	30dBm
16QAM_3/4	14.8	-87	7.4	-90	30dBm
64QAM_2/3	18.1	-82	7.8	-85	30dBm
64QAM_3/4	19.0	-80.5	8.0	-83	30dBm
64QAM_5/6	21.0	-78	10.0	-80.5	30dBm
Frequency Band: 2020 - 2110 MHz					
BPSK_1/2	3.1	-96.5	1.57	-100	30dBm
QPSK_1/2	6.0	-95	3.0	-98	30dBm
QPSK_3/4	8.4	-93	4.3	-96	30dBm
16QAM_1/2	10.7	-89	5.4	-92.5	30dBm
16QAM_3/4	14.8	-87	7.4	-90	30dBm
64QAM_2/3	18.1	-82	7.8	-85	28dBm
64QAM_3/4	19.0	-80.5	8.0	-83	28dBm
64QAM_5/6	21.0	-78	10.0	-80.5	27dBm
Frequency Band: 2200 - 2300 MHz					
BPSK_1/2	3.1	-96.5	1.57	-100	30dBm
QPSK_1/2	6.0	-95	3.0	-98	30dBm
QPSK_3/4	8.4	-93	4.3	-96	30dBm
16QAM_1/2	10.7	-89	5.4	-92.5	28dBm
16QAM_3/4	14.8	-87	7.4	-90	28dBm
64QAM_2/3	18.1	-82	7.8	-85	28dBm
64QAM_3/4	19.0	-80.5	8.0	-83	28dBm
64QAM_5/6	21.0	-78	10.0	-80.5	27dBm
Frequency Band: 2300 - 2390 MHz					
BPSK_1/2	3.1	-96.5	1.57	-100	30dBm
QPSK_1/2	6.0	-95	3.0	-98	30dBm
QPSK_3/4	8.4	-93	4.3	-96	30dBm
16QAM_1/2	10.7	-89	5.4	-92.5	28dBm
16QAM_3/4	14.8	-87	7.4	-90	28dBm
64QAM_2/3	18.1	-82	7.8	-85	28dBm
64QAM_3/4	19.0	-80.5	8.0	-83	28dBm
64QAM_5/6	21.0	-78	10.0	-80.5	27dBm
Frequency Band: 2400 - 2500 MHz					
BPSK_1/2	3.1	-96.5	1.57	-100	30dBm
QPSK_1/2	6.0	-95	3.0	-98	30dBm
QPSK_3/4	8.4	-93	4.3	-96	30dBm
16QAM_1/2	10.7	-89	5.4	-92.5	28dBm
16QAM_3/4	14.8	-87	7.4	-90	28dBm
64QAM_2/3	18.1	-82	7.8	-85	28dBm
64QAM_3/4	19.0	-80.5	8.0	-83	28dBm
64QAM_5/6	21.0	-78	10.0	-80.5	27dBm

*RX Sensitivity +/- 1.5 dB. Bands starting at 2280 MHz and higher, subtract 1.5~3 dB.

fDDL1624 Specifications



Frequency (Software Selectable)	1625 to 1725 MHz 1780 to 1850 MHz 2020 to 2110 MHz 2200 to 2300 MHz 2300 to 2390 MHz 2400 to 2500 MHz
Error Detection	32 bits of CRC, ARQ
Encryption (Requires Export Permit)	256-bit AES
Ports Serial Data/Console Ethernet USB	RS232 TTL level (300bps to 921kbps) Dual 10/100 IEEE802.3 (LAN/WAN) 2.0
Firewall	Port Forwarding, Access Control, IP/MAC List.
Operating Modes	Point-to-Point, Point-to-Multipoint, Repeater, MANET Mesh
Diagnostics	Remote Diagnostics, Ping, Traceroute, ARP table, DHCP active leases, IPPerf, RSSI
Management	Local Serial Port Console, Telnet, WebUI, SNMP, FTP Upgrade, TFTP, AT Command Interface
Rejection	Excellent strong signal interference & rejection characteristics
Input Voltage OEM Motherboard/Enclosed	Digital: 3.3V _{DC} RF = 5V _{DC} 9-30 V _{DC}
Connectors: OEM Motherboard/Enclosed	Antenna: UFL Data: 54 Pin SMT RJ-45 x2 (Ethernet) Female DB9 (Serial) USB Type A Micro-AB USB (Console) 4 PIN Interlock (Vin)
Environmental Temperature Humidity	-40°F to 185°F (-40°C to +85°C) 5-95%, non-condensing

Weight OEM Motherboard Enclosed	~ 5.5 grams ~ 43 grams ~ 165 grams
Dimensions OEM Motherboard Enclosed	~ 0.75" x 1.05" x 0.30" (19mm x 27mm x 7.5mm) ~ 2.0" x 3.0" x 0.75" (51mm x 76mm x 19mm) ~ 3.05" x 2.2" x 1.1" (77mm x 55mm x 28mm)
Approvals/Compliance	NDA Compliant FIPS140-2 Compliant Pending

Order Options

Model	Part Number	Description
fDDL1624	MHK185300	fDDL1624 FEMTO Hexa-Band OEM Digital Data Link
fDDL1624-DEV-KIT	MHK185325	fDDL1624 FEMTO Development Kit
fDDL1624-ENC	MHK185350	fDDL1624-ENC FEMTO Hexa-Band Enclosed Data Link
fDDL Motherboard	MHK105800	fDDL Motherboard
fDDL OEM Socket	MHS106040	fDDL OEM Socket
fDDL Socket Cover	MHS106050	fDDL Socket Cover

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Preliminary



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