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## Technical Informations:

The MT7688AN IoT Routerboard is optimized for creating IoT Networks and Sub Networks. The MT7688 is based on Open Source Linux distribution LEDE / OpenWRT. Based on LEDE Firmware the MT7688 IoT Routerboard supports free configuration on LEDE Packages, also individual created packages.

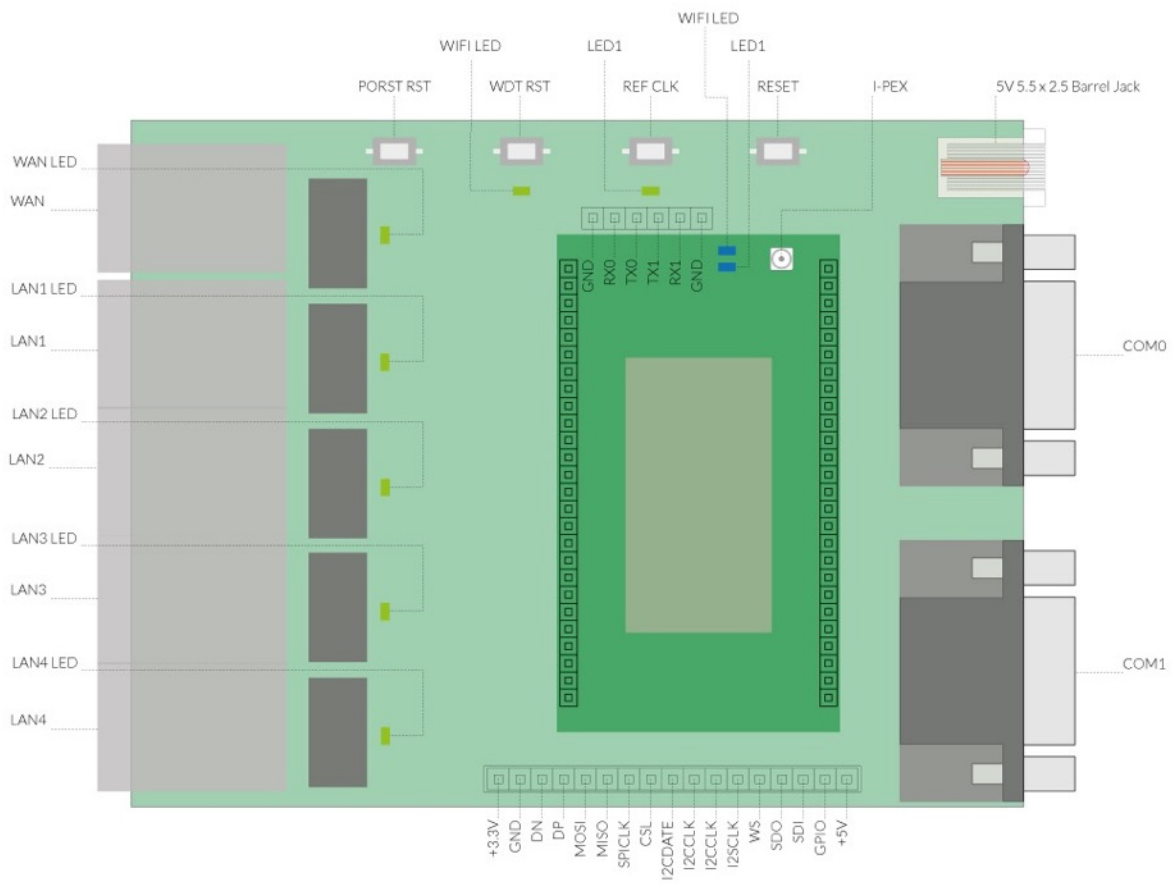
## Features:

- ✓ High data processing ability, MCU frequency 580MHz
- ✓ 150M Mbps
- ✓ Support 802.11b/g/n mode
- ✓ 20/40 channel bandwidth
- ✓ Support 802.11v
- ✓ Support AP,STA and AP,STA mixed
- ✓ 5 10/100M adaptive com port
- ✓ 1 USB2.0 host interface
- ✓ Multiple interfaces SPI/SD-XC/eMMC
- ✓ Rich peripheral interfaces
  - SPI
  - I2C
  - I2S
  - PCM
  - UART
  - JTAG
  - GPIO
- ✓ 2 RS232 Interface
- ✓ Widely used in IOT
- ✓ Inbuilt powerful PMU
- ✓ Support 16 Multiple BSSID
- ✓ Support multiple encryption
  - WEP64/128
  - TKIP
  - AES
  - WPA
  - WPA2
  - WAPI
- ✓ Support QoS, WMM, WMM-PS

## Dimensions:

length	103 mm
width	80 mm
height	18 mm
weight	90 gr.

## Overview:



## Specification overview table:

Description	Parameter
Main Chip	MT7688
I-Cache	64KB
D-Cache	32KB
Kernel	MIPS24KEc
Main Frequency	580MHz
RAM	64 MB
Flash	8MB or 32 MB
RF	1T1R 802.11n 2.4GHz
USB2.0	1 (4 Pins)
UART	2 DB9 Interface
Antenna	I-PEX connector
WAN Port	1
LAN Port	4
Status LED	2 LED1 Power Indicator 2 WIFI Status LED 1 WAN Status LED 4 LAN Status LED

## Technical Specifications:

### VOLTAGE RANGE

Voltage	Value
Input Voltage	5V
Output Voltage	5V / 3.3V
I/O Voltage	3.3V (Typ)

### 802.11B 11M

802.11b Transmit	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Tx Power Level	DQPSK dBm		18	22
Frequency	Tolerance		-15	0
Spectral Mask	11 Mhz. to 22 MHz. dBr			40
	> 22 MHz. dBr			53
Modulation	Accuracy all data rate %			15

802.11b Receiver	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Min. Input	11Mbps PER<8% dBm	-91.5	-89.5	-87.5

### 802.11G 54M

802.11g Transmit	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Tx Power Level	OFDM dBm		15	17
Frequency	Tolerance		-15	0
Modulation	Accuracy all data rate %			-31

802.11g Receiver	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Min. Input	54 Mbps PER<10% dBm		-78	-76

### 802.11N MCS7 (HT20)

802.11g Transmit	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Tx Power Level	OFDM dBm		15	17
Frequency	Tolerance		-15	0
Modulation	Accuracy all data rate %			-31

802.11g Receiver	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Min. Input	MCS7 PER<10% dBm		-76.5	-74.5

802.11N\_MCS7 (HT40)

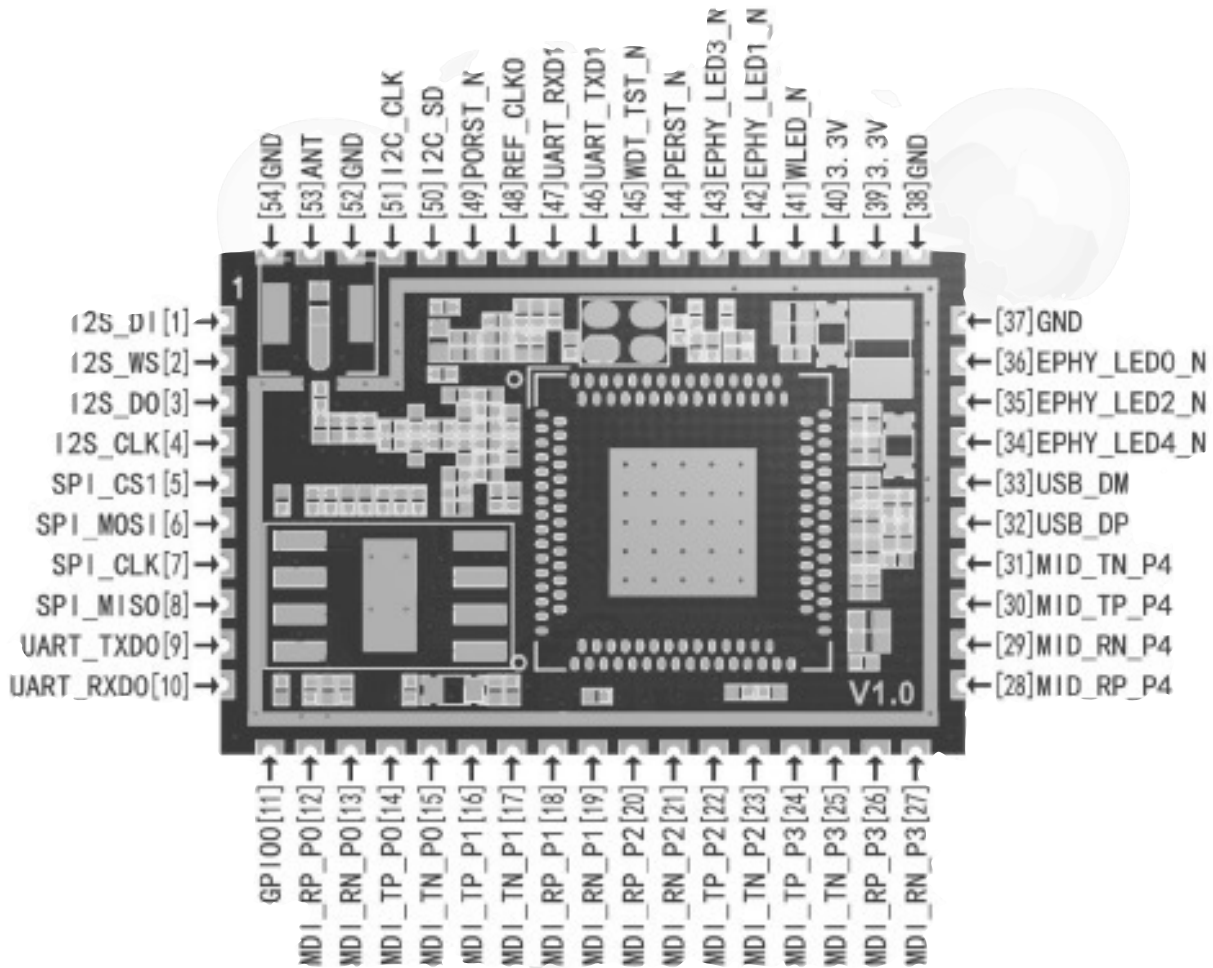
802.11g Transmit	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Tx Power Level	OFDM dBm		15	17
Frequency	Tolerance		-15	0
Modulation	Accuracy all data rate %			-31

802.11g Receiver	Parameter	Min.	Typ.	Max.
Frequency Range	Channel		1	13
Min. Input	MCS7 PER<10% dBm		-76.5	-74.5



## MT7688 Module Pinout:

### Default Module Pinout:



## MT7688 Module Pin GPIO Table:

Default Module Pinout:

Pin	Function1	Function2	Function3	Function4	GPIO	Notes
1	I2S_DI	PCMDRX	-	-	0	
2	I2S_WS	PCMCLK	-	-	2	
3	I2S_DO	PCMDTX	-	-	1	
4	I2S_CLK	PCMFS	-	-	3	
5	SPI_CS1	-	-	REF_CLKO	6	
6	SPI_MOSI	-	-	-	8	
7	SPI_CLK	-	-	-	7	
8	SPI_MISO	-	-	-	9	
9	UART_TXD0	-	-	-	12	serial interface as default
10	UART_RXD0	-	-	-	13	serial interface as default
11	GPIO0	-	REF_CLKO	PERST_N	11	drive current 4mA
12	MDI_RP_P0	-	-	-	24	
13	MDI_RN_P0	-	-	-	23	
14	MDI_TP_P0	-	-	-	22	
15	MDI_TN_P0	-	-	-	21	
16	MDI_RP_P1	SPIS_CS	-	PWM_CH0	14	
17	MDI_RN_P1	SPIS_CLK	-	PWM_CH1	15	
18	MDI_TP_P1	SPIS_MISO	-	UART_TXD2	16	
19	MDI_TN_P1	SPIS_MOSI	-	UART_RXD2	17	
20	MDI_RP_P2	-	eMMC_D7	PWM_CH0	18	
21	MDI_RN_P2	-	eMMC_D6	PWM_CH1	19	
22	MDI_TP_P2	UART_TXD2	eMMC_D5	PWM_CH2	20	
23	MDI_TN_P2	UART_RXD2	eMMC_D4	PWM_CH3	21	
24	MDI_RP_P3	SD_WP	eMMC_WP	-	22	
25	MDI_RN_P3	SD_CD	eMMC_CD	-	23	
26	MDI_TP_P3	SD_D1	eMMC_D1	-	24	
27	MDI_TN_P3	SD_D0	eMMC_D0	-	25	

Pin	Function1	Function2	Function3	Function4	GPIO	Notes
28	MDI_RP_P4	SD_CLK	eMMC_CLK	-	26	
29	MDI_RN_P4	SD_CMD	eMMC_CMD	-	28	
30	MDI_TP_P4	SD_D3	eMMC_D3	-	29	
31	MDI_TN_P4	SD_D2	eMMC_D2	-	27	
32	USB_DP	-	-	-		default
33	USB_DM	-	-	-		default
34	EPHY_LED4_N	JTAG_RST_N	-	-	30	com 4 status LED
35	EPHY_LED2	JTAG_TMS	-	-	32	com 2 status LED
36	EPHY_LED0	JTAG_TDO	-	-	34	com 0 status LED
37	GND					suggested external power supply current > 500mA
38	GND					
39	3.3V					
40	3.3V					
41	WLED_N	-	-	-	35	WIFI status LED
42	EPHY_LED1	JTAG_TDI	-	-	33	com 1 status LED
43	EPHY_LED3	JTAG_CLK	-	-	31	com 3 status LED
44	PORST_N	-	-	-		WIFI Reset
45	WDT_RST_N	-	-	-	37	Watchdog timeout reset
46	UART_TXD1	-	-	PWM_CH0	45	default is serial port
47	UART_RXD1	-	-	PWM_CH1	46	default is serial port
48	REF_CLK0	-	-	-	38	Reference Clock output
49	PERST_N	-	-	-	36	PCIe device reset
50	I2C_SD	-	-	-	5	
51	I2C_CLK	-	-	-	4	
52	GND					
53	ANT					default not connected
54	GND					

# MT7688 IoT Routerboard Firmware:

## Preinstalled Firmware Packages

The MT7688 IoT Routerboard LEDE / OpenWRT Firmware includes packages as follow:

Package name	Version
badblocks.....	1.43.3-2
base-files.....	171-r2919-d1daf3f
block-mount.....	2016-12-04-84b530a7-1
busybox.....	1.25.1-2
debugfs.....	1.43.3-2
dnsmasq.....	2.76-6
dropbear.....	2016.74-1
dumpe2fs.....	1.43.3-2
e2freefrag.....	1.43.3-2
e2fsprogs.....	1.43.3-2
fdisk.....	2.28-1
filefrag.....	1.43.3-2
findfs.....	2.28-1
firewall.....	2016-11-29-13698aaf-1
fstools.....	2016-12-04-84b530a7-1
fwtool.....	1
gdisk.....	1.0.1-1
hostapd-common.....	2016-12-19-ad02e79d-1
ip6tables.....	1.4.21-2
iptables.....	1.4.21-2
iw.....	4.9-1
iwinfo.....	2016-09-21-fd9e17be-1
jshn.....	2016-11-29-77a62937-1
jsonfilter.....	2016-07-02-dea067ad-1
kernel.....	4.4.40-1-7e09d1491d83..2eb
kmod-cfg80211.....	4.4.40+2016-10-08-1
kmod-crypto-crc32c.....	4.4.40-1
kmod-crypto-hash.....	4.4.40-1
kmod-dnsresolver.....	4.4.40-1

<b>Package name</b>	<b>Version</b>
kmod-EEPROM-93cx6 .....	4.4.40-1
kmod-fs-exportfs.....	4.4.40-1
kmod-fs-ext4 .....	4.4.40-1
kmod-fs-hfs.....	4.4.40-1
kmod-fs-hfsplus .....	4.4.40-1
kmod-fs-msdos.....	4.4.40-1
kmod-fs-nfs.....	4.4.40-1
kmod-fs-nfs-common.....	4.4.40-1
kmod-fs-reiserfs .....	4.4.40-1
kmod-fs-vfat .....	4.4.40-1
kmod-fs-xfs.....	4.4.40-1
kmod-gpio-button-hotplug.....	4.4.40-2
kmod-i2c-core .....	4.4.40-1
kmod-ip6tables.....	4.4.40-1
kmod-IPIP.....	4.4.40-1
kmod-ipt-contrack.....	4.4.40-1
kmod-ipt-core.....	4.4.40-1
kmod-ipt-nat.....	4.4.40-1
kmod-iptunnel.....	4.4.40-1
kmod-iptunnel4.....	4.4.40-1
kmod-LEDs-gpio.....	4.4.40-1
kmod-ledtrig-netdev.....	4.4.40-1
kmod-lib-crc-ccitt.....	4.4.40-1
kmod-lib-crc-itu-t.....	4.4.40-1
kmod-lib-crc16.....	4.4.40-1
kmod-lib-crc32c.....	4.4.40-1
kmod-lib-crc7.....	4.4.40-1
kmod-lib80211.....	4.4.40+2016-10-08-1
kmod-mac80211.....	4.4.40+2016-10-08-1
kmod-mmc.....	4.4.40-1
kmod-mmc-spi.....	4.4.40-1
kmod-mt76.....	4.4.40+2016-12-15-7ce..c-1
kmod-nf-contrack.....	4.4.40-1
kmod-nf-contrack6.....	4.4.40-1
kmod-nf-ipt .....	4.4.40-1
kmod-nf-ipt6.....	4.4.40-1

Package name	Version
kmod-nf-nat.....	4.4.40-1
kmod-nls-base.....	4.4.40-1
kmod-nls-cp437.....	4.4.40-1kmod-nls-iso8859-1 4.4.40-1
kmod-nls-utf8.....	4.4.40-1
kmod-ppp.....	4.4.40-1
kmod-pppoe.....	4.4.40-1
kmod-pppox.....	4.4.40-1
kmod-scsi-core.....	4.4.40-1
kmod-slhc.....	4.4.40-1
kmod-usb-core.....	4.4.40-1
kmod-usb-storage.....	4.4.40-1
kmod-usb-storage-extras.....	4.4.40-1
kmod-usb2.....	4.4.40-1
lede-keyring.....	2016-04-30-5c7857ee-1
libblkid.....	2.28-1
libblobmsg-json.....	2016-11-29-77a62937-1
libc.....	1.1.15-1
libexpat.....	2.2.0-1
libext2fs.....	1.43.3-2
libfdisk.....	2.28-1
libgcc.....	5.4.0-1
libip4tc.....	1.4.21-2
libip6tc.....	1.4.21-2
libiwinfo.....	2016-09-21-fd9e17be-1
libiwinfo-lua.....	2016-09-21-fd9e17be-1
libjson-c.....	0.12.1-1
libjson-script.....	2016-11-29-77a62937-1
liblua.....	5.1.5-1
libmount.....	2.28-1
libnl-tiny.....	0.1-5
libopenssl.....	1.0.2j-1
libpopt.....	1.16-1
libpthread.....	1.1.15-1
librt.....	1.1.15-1
libsmartcols.....	2.28-1

<b>Package name</b>	<b>Version</b>
libstdcpp.....	5.4.0-1
libubox.....	2016-11-29-77a62937-1
libubus.....	2016-10-12-312448a5-1
libubus-lua.....	2016-10-12-312448a5-1
libuci.....	2016-07-04-e1bf4356-1
libuci-lua.....	2016-07-04-e1bf4356-1
libuclient.....	2016-12-09-52d955fd-1
libusb-1.0.....	1.0.21-1
libuuid.....	2.28-1
libxtables.....	1.4.21-2
lua.....	5.1.5-1
lua-openssl.....	0.6.0-1
lua-rs232.....	1.0.3-1
lua-xavante.....	2.3.0-1
luac.....	5.1.5-1
luaexpat.....	1.3.0-1
luafilesystem.....	1.6.2-1
luai2c.....	1.0.0-3
luasec.....	0.6-1
luasocket.....	2014-08-21-af1e100281.a98
luasocket.....	3.0-rc1-20130909-3
luci.....	git-17.012.55177-6a7eaeab-1
luci-app-firewall.....	git-17.012.55177-6a7eaeab-1
luci-app-samba.....	git-17.012.55177-6a7eaeab-1
luci-app-uhttpd.....	1.0.0-1
luci-app-upnp.....	git-17.012.55177-6a7eaeab-1
luci-base.....	git-17.012.55177-6a7eaeab-1
luci-lib-ip.....	git-17.012.55177-6a7eaeab-1
luci-lib-json.....	git-17.012.55177-6a7eaeab-1
luci-lib-jsonc.....	git-17.012.55177-6a7eaeab-1
luci-lib-nixio.....	git-17.012.55177-6a7eaeab-1
luci-mod-admin-full.....	git-17.012.55177-6a7eaeab-1
luci-mod-rpc.....	git-17.012.55177-6a7eaeab-1
luci-proto-ipv6.....	git-17.012.55177-6a7eaeab-1
luci-proto-ppp.....	git-17.012.55177-6a7eaeab-1

<b>Package name</b>	<b>Version</b>
luci-theme-bootstrap .....	git-17.012.55177-6a7eae1
miniupnpd .....	2.0.20161216-1
mount-utils .....	2.28-1
mttd .....	21netifd 2016-12-23-64a655d8-1
odhcp6c .....	2017-01-07-d420f493-1
odhcpd .....	2017-01-06-ef3c5632-1
opkg .....	2011-04-08-9c97d5ec-16
ppp .....	2.4.7-10
ppp-mod-pppoe .....	2.4.7-10
procd .....	2017-01-10-f7069032-1
rpcd .....	2016-12-03-0577cfc1-1
samba36-server .....	3.6.25-5
swconfig .....	11
ubox .....	2016-09-26-5649c028-1
ubus .....	2016-10-12-312448a5-1
ubusd .....	2016-10-12-312448a5-1
uci .....	2016-07-04-e1bf4356-1
uclient-fetch .....	2016-12-09-52d955fd-1
uhttpd .....	2016-10-25-1628fa4b-1
uhttpd-mod-lua .....	2016-10-25-1628fa4b-1
uhttpd-mod-ubus .....	2016-10-25-1628fa4b-1
usbutils .....	007-6
usign .....	2015-07-04-ef641914-1
vsftpd .....	3.0.3-1
wpad-mini .....	2016-12-19-ad02e79d-1

Packages can be added and removed over Luci Web Interface also over SSH OPKG.



## IoT Routerboard default Configuration:

The MT7608 IoT Router Board is reachable over Luci Webinterface within the following Configuration Parameters.

Description	Parameter
IP Address	192.168.1.1
Connection Type	LAN (by default wireless lan is disabled)
Host IP Address	192.168.1.10 to 192.168.1.99
Subnet Mask	255.255.255.0
Gateway	192.168.1.1
DNS	192.168.1.1

After connecting MT7688 IoT Routerboard and network configuration Luci Webinterface is reachable thru:

<http://192.168.1.1>

## IoT Routerboard Web Interface settings

After connecting thru browser Luci Web Interface appears default parameters set as follow:

Description	Parameter
Username	root
Password	no Password / none