MT7628DAN Core Module

Oolite V3.5_Module _SPEC_EN

Specification Version V1.0.2

Author： James

June 12, 2018

Revision	Date	Contents of Revision Change	Remark
1.0.0	2018-03-28	First release	James
1.0.1	2018-03-28	Update pictures	James
1.0.2	2018-03-28	Add Pins Map	James

INTRODUCTION

Oolite V3.5 is powerful, reliable,easy to use and with extremely small size(23.7mm x 23.7mm x 2.7mm).Low power consumption so can use on IOT device.

MT7628DAN with 580/575 MHz MIPS 24KEc with 64 KB I-Cache and 32 KB D-Cache. WiFi: 2T2R 2.4 GHz With 300Mbps 802.11 b/g/n. MCM 64 Mbytes DDR2 KGD(Build in MT7628DAN Chipset) .16MB SPI NOR Flash ROM(8MB/16MB/32MB/64MB optional).

The MT7628DAN router-on-a-chip includes an 802.11n MAC and baseband, a 2.4 GHz radio and FEM, a 575/580 MHz MIPS® 24K™ CPU core, a 5-port 10/100 fast ethernet switch. The MT7628DAN includes everything needed to build an AP router from a single chip. The embedded high performance CPU can process advanced applications effortlessly, such as routing, security and VoIP. The MT7628DAN also includes a selection of interfaces to support a variety of applications, such as a USB port for accessing external storage.
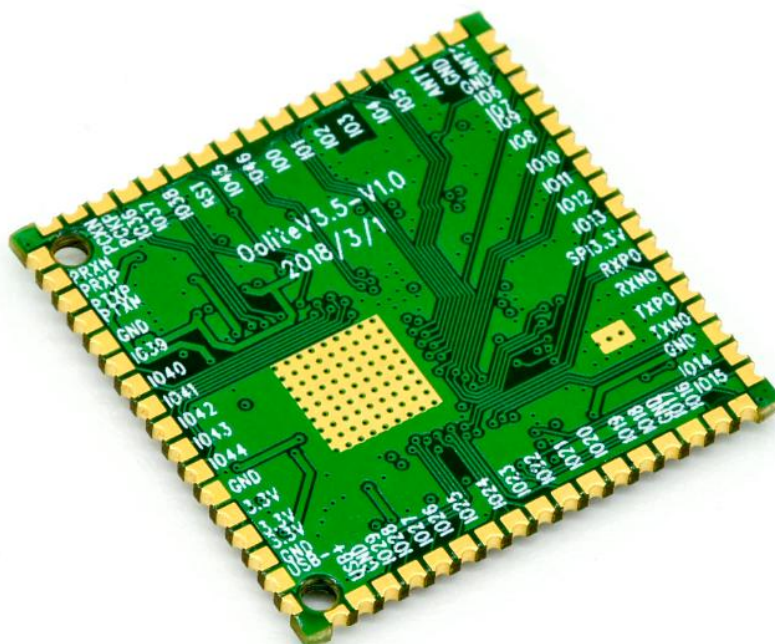
GainStrong Industry Co.,Ltd.   http://www.gainstrong.cn
Tell:+86-755-81720165   support@gainstrong.cn

FEATURES:

- **CPU:** MT7628DAN with 580/575 MHz MIPS 24KEc

- **RAM:** MCM 64 Mbytes DDR2 KGD(Build in MT7628DAN Chipset)

- **Flash:** 16MBytes SPI NOR Flash ROM(8MB/16MB/32MB/64MB optional)

- **WiFi:** 2T2R 2.4 GHz With 300Mbps 802.11 b/g/n

- **GPIO:** 37(total and share with), High-speed UART for console support

- **USB:** 1 x USB 2.0 master interface, support USB hub extension

- **Ethernet Port :** 5-port 10/100 FE PHY in Gateway Mode

- **Ethernet Port :** 1-port 10/100 FE PHY in IOT Mode

- **Mini-Pcie:** 1×Mini-PCIE interface

- **Antenna:** 2 × IPEX external antenna(default) or use the stamp hole pins interface

- **UART(Debug):** serial debugging interface has lead out.

- **Power supply voltage**: 3.3V

- **Size:** 23.7mm x 23.7mm x 2.7mm (without shield)

FUNCTIONAL BLOCK DIAGRAM(MT7628DAN)
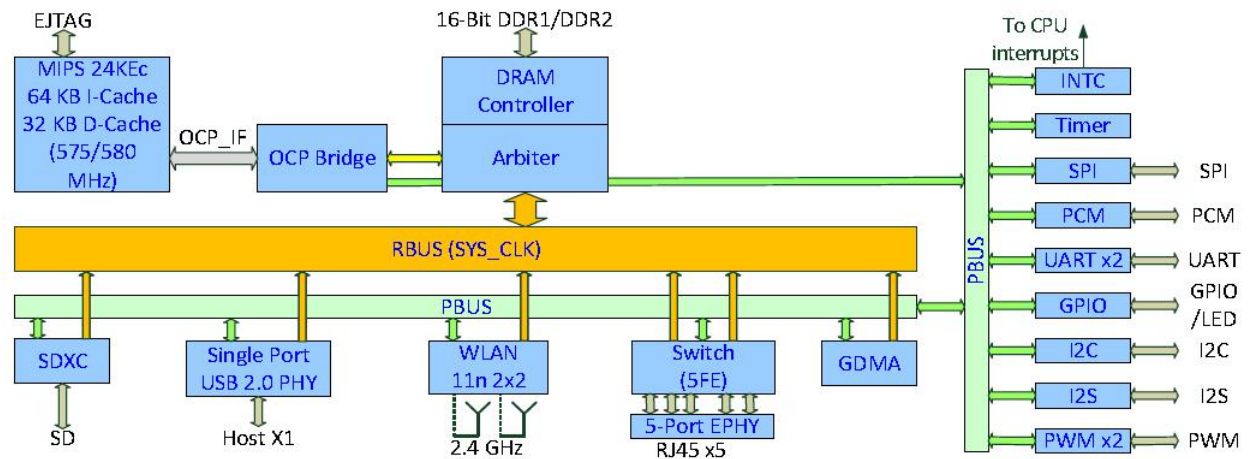
Features	MT7628DAN
CPU	MIPS24KEc (575/580 MHz)
Total DMIPs	580 x 1.6 DMIPs
I-Cache, D-Cache	64 KB, 32 KB
L2 Cache	n/a
Memory	
DDR2	512 Gb, 193 MHz, MCM
SPI Flash	3B addr mode (max 128Mbit) 4B addr mode (max 512Mbit)
SD	SD-XC (class 10)
RF	2T2R 802.11n 2.4 GHz
PCIe	1
USB 2.0	1
Switch	5p FE SW
I2S	1
PCM	1
I2C	1
UART	2 (Lite)
JTAG	1
Package	DR-QFN156- 12 mm x 12 mm

PICTURES

GainStrong Industry Co.,Ltd.   http://www.gainstrong.cn
Tell:+86-755-81720165   support@gainstrong.cn

RF PERFORMANCE

RF0 Test Report				
802.11 g 54Mbps	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) <10% PER
2412	-31.49	18.20	2.91	-75
2437	-31.23	18.35	2.87	-75
2462	-31.54	18.17	2.74	-75
802.11n HT20 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) <10% PER
2412	-33.34	18.46	2.74	-70
2437	-33.28	18.31	2.89	-70
2462	-33.33	18.34	2.83	-70
802.11 n HT40 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) <10% PER
2422	-33.28	17.73	2.97	-65
2442	-33.44	17.66	2.74	-65
2462	-33.60	17.63	2.88	-65

RF1 Test Report				
802.11 g 54Mbps	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) <10% PER
2412	-30.11	19.20	2.73	-75
2437	-30.35	19.17	2.73	-75
2462	-30.14	18.77	2.82	-75
802.11 n HT20 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) <10% PER
2412	-32.30	18.90	2.76	-70
2437	-31.43	18.87	2.91	-70
2462	-31.22	18.65	2.67	-70
802.11 n HT40 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) <10% PER
2422	-32.55	18.30	2.87	-65
2442	-32.71	18.35	2.98	-65
2462	-32.62	18.15	3.09	-65

MECHANICAL
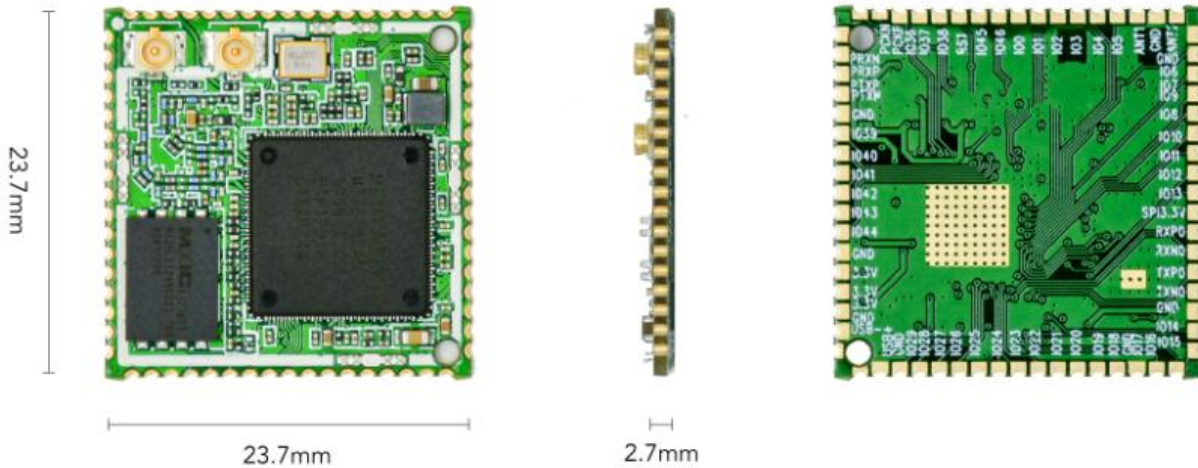
Length	Width	Height (without shield)
23.7mm	23.7mm	2.7mm
(Tolerance:±0.2mm)	(Tolerance:±0.2mm)	(Tolerance:±0.2mm)
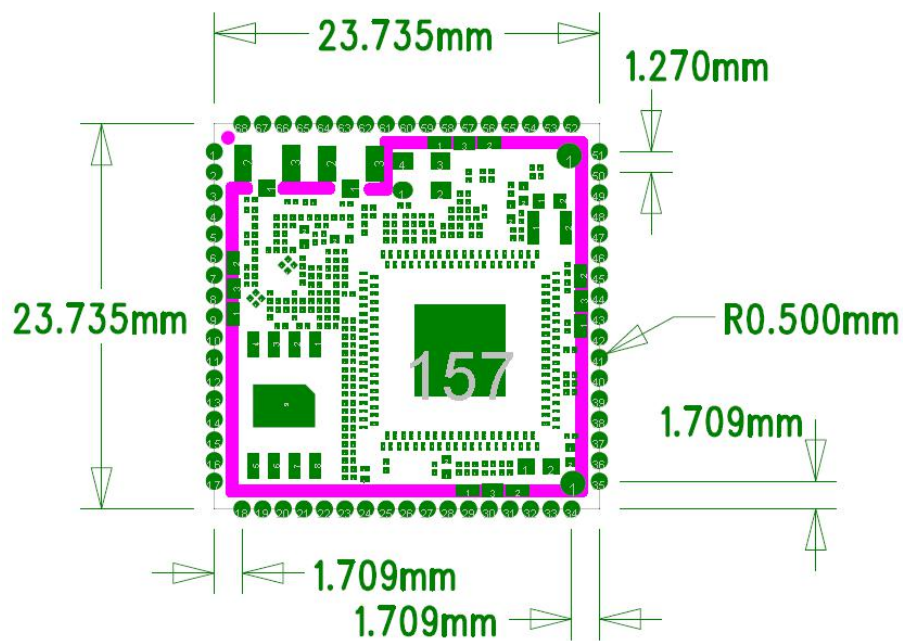
PIN DEFINITION

Pin	Name	Type	Description
1	GND	-	Exposed ground pad
2	SPI_CS1	O,IPD	SPI chip select1/GPIO#6
3	SPI_CLK	O,IPD	SPI clock/GPIO#7
4	SPI_MISO	I/O	SPI Master input/Slave output GPIO#9
5	SPI_MOSI	I/O,IPD	SPI Master output/Slave input GPIO#8
6	SPI_CS0	O	SPI chip select0/GPIO#10
7	GPIO#11	I/O,IPD	GPIO#11
8	UART_TXD0	O,IPD	UART0 Lite TXD/GPIO#12
9	UART_RXD0	I	UART0 Lite RXD/GPIO#13
10	3.3V	-	Supply voltage for digital blocks
11	MDI_RP_P0	A	10/100 PHY Port #0 RXN
12	MDI_RN_P0	A	10/100 PHY Port #0 RXP
13	MDI_TP_P0	A	10/100 PHY Port #0 TXN
14	MDI_TN_P0	A	10/100 PHY Port #0 TXP
15	GND	-	Exposed ground pad
16	MDI_TP_P1	A	SD-XC/eMMC/GPIO#14
17	MDI_TN_P1	A	SD-XC/eMMC/GPIO#15

Note:

- IPD : Internal pull-down
- IPU : Internal pull-up
- I : Input
- O : Output
- IO : Bi-directional

Pin	Name	Type	Description
18	MDI_RP_P1	A	SD-XC/eMMC/GPIO#16
19	MDI_RN_P1	A	SD-XC/eMMC/GPIO#17
20	GND	-	Exposed ground pad
21	MDI_RP_P2	A	SD-XC/eMMC/GPIO#18
22	MDI_RN_P2	A	SD-XC/eMMC/GPIO#19
23	MDI_TP_P2	A	SD-XC/eMMC/GPIO#20
24	MDI_TN_P2	A	SD-XC/eMMC/GPIO#21
25	MDI_TP_P3	A	SD-XC/eMMC/GPIO#22
26	MDI_TN_P3	A	SD-XC/eMMC/GPIO#23
27	MDI_RP_P3	A	SD-XC/eMMC/GPIO#24
28	MDI_RN_P3	A	SD-XC/eMMC/GPIO#25
29	MDI_RP_P4	A	SD-XC/eMMC/GPIO#26
30	MDI_RN_P4	A	SD-XC/eMMC/GPIO#27
31	MDI_TP_P4	A	SD-XC/eMMC/GPIO#28
32	MDI_TN_P4	A	SD-XC/eMMC/GPIO#29
33	GND	-	Exposed ground pad
34	USP_DP	I/O	USB port0 data pin Data+

Pin	Name	Type	Description
35	USB_DN	I/O	USB port0 data pin Data-
36	GND	-	Exposed ground pad
37	3.3V	-	Supply voltage for digital blocks
38	3.3V	-	Supply voltage for digital blocks
39	3.3V	-	Supply voltage for digital blocks
40	GND	-	Exposed ground pad
41	WLED_N	O	WLAN Activity LED/GPIO#44
42	EPHY_LED0_N_JTDO	I/O	Port#0 activity LED/GPIO#43/JTAG_TDO
43	EPHY_LED1_N_JTDI	I/O	Port#1 activity LED/GPIO#42/JTAG_TDI
44	EPHY_LED2_N_JTMS	I/O	Port#2 activity LED/GPIO#41/JTAG_TMS
45	EPHY_LED3_N_JTCLK	I/O	Port#3 activity LED/GPIO#40/JTAG_CLK
46	EPHY_LED4_N_JTRST_N	I/O	Port#4 activity LED//GPIO#39/JTAG_TRST_N
47	GND	-	Exposed ground pads
48	PCIE_TXN0	I/O	PCIe0 differential transmit TX -
49	PCIE_TXP0	I/O	PCIe0 differential transmit TX +
50	PCIE_RXP0	I/O	PCIe0 differential transmit RX +
51	PCIE_RXN0	I/O	PCIe0 differential transmit TX -

Pin	Name	Type	Description
52	PCIE_CKN0	O	External reference clock output (negative)
53	PCIE_CKP0	O	External reference clock output (positive)
54	PERST_N	O,IPD	PCIe device reset/GPIO#36
55	REF_CLK0	O,IPD	Reference Clock Ouptut/GPIO#37
56	WDT_RST_N	O	Watchdog Reset/GPIO#38/SW Reset
57	PORST_N	O,IPU	CPURST_N/Power on reset/HW Reset
58	UART_TXD1	O,IPU	UART1 Lite TXD/GPIO#45
59	UART_RXD1	I	UART1 Lite RXD/GPIO#46
60	I2S_SDI	O	I2S data input/GPIO#0
61	I2S_SDO	I/O,IPD	I2S data output/GPIO#1
62	I2S_WS	O	I2S word select/GPIO#2
63	I2S_CLK	I/O	I2S clock/GPIO#3
64	I2C_CLK	I/O	I2C clock/GPIO#4
65	I2S_SD	I/O	I2C Data/GPIO#5
66	WiFi ANT1	A	WiFi ANT1
67	GND	-	Exposed ground pad
68	WiFi ANT1	A	WiFi ANT2

ENVIRONAMENT

Power Supply	3.3V (2.97V-3.63V)
Operating Temperature	-20℃ ~ 55℃
Operating Humidity	<60% non-condensing
Storage Temperature	0℃ ~ 50℃
Storage Humidity	Storage Humidity: <90% non-condensing in sealed

REFLOW PROFILE GUIDELINE
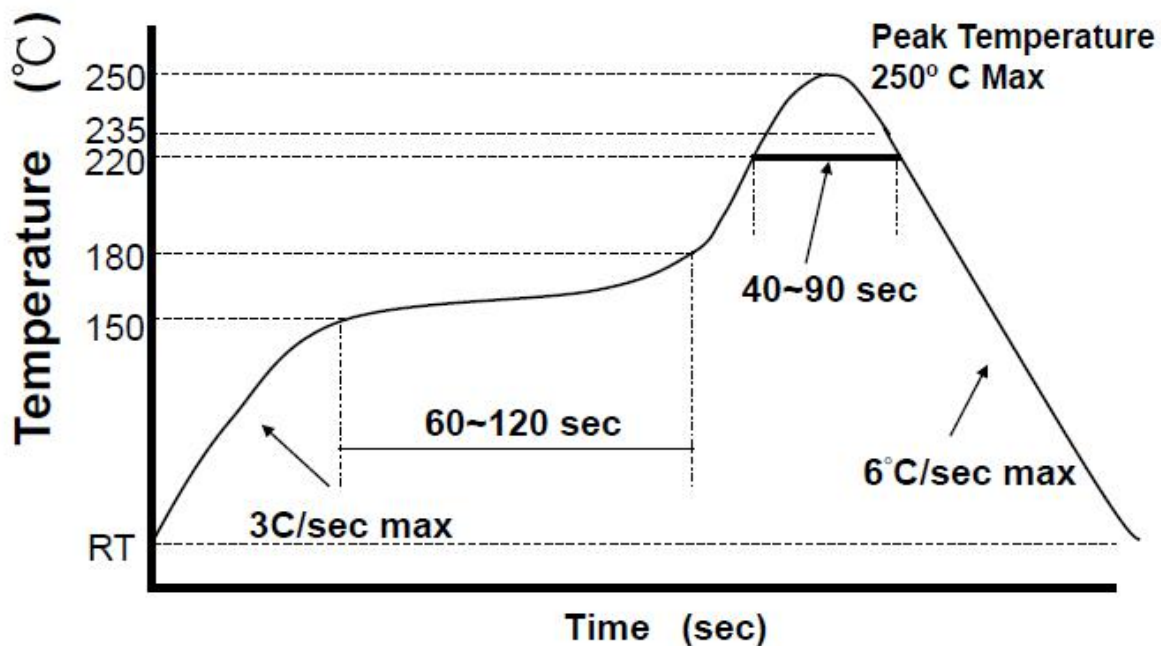
Notes:

1. Reflow profile guideline is designed for SnAgCulead-free solder paste.

2. Reflow temperature is defined at the solder ball of package/or the lead of package.

3. MTK would recommend customer following the solder paste vendor's guideline to design a profile appropriate your line and products.

4. Appropriate N2 atmosphere is recommended since it would widen the process window and mitigate the risk for having solder open issues.