



Test Report

**Memory ReadWrite Speed Test Report for Renesas
G2L A55 SOM**

**Rev1.0
2022-07-06**

Version History

Version	Modification instructions	Author	Date
V1.0	Initial document.	yuge	2022-07-06

1. Test Objective

The objective of the test is to evaluate the memory read/write speed, specifically the performance of DDR4, using the WTB-G2LS_V02 industrial control board launched by Weixin Technology (including the WTC-G2LS_V03 SOM).

2. Test Results

Test result for a single Micron 1GB DDR4 memory: 1050MB/s

Test result for a single Samsung 512MB DDR4 memory: 1060MB/s

3. Test Tools

Memory bandwidth test tool: mbw

Mbw is a memory bandwidth testing tool that can test memory copy speeds in three different methods: byte copy, block copy, and overall copy. The program source code is simple and easy to understand.

To obtain: git clone <http://github.com/raas/mbw>

After compiling it with the appropriate cross-compiler, copy it to the machine to run.

```
root@weathink:~# ./mbw -h
mbw memory benchmark v1.5, https://github.com/raas/mbw
Usage: mbw [options] array_size_in_MiB
Options:
    -n: number of runs per test (0 to run forever)
    -a: Don't display average
    -t0: memcpy test
    -t1: dumb (b[i]=a[i] style) test
```

-t2: memcpy test with fixed block size
 -b <size>: block size in bytes for -t2 (default: 262144)
 -q: quiet (print statistics only)

(will then use two arrays, watch out for swapping)

'Bandwidth' is amount of data copied over the time this operation took.

The default is to run all tests available.

root@weathink:~#

4、Test Process

4.1、Test for a Single Micron 1GB DDR4

Memory read/write speed test on a single Micron 1GB DDR4 module.

Command used:

```
./mbw -q -n 10 256
```

-n indicates the number of test runs

256 indicates the memory size tested, which is 256MB

```
root@weathink:~# ./mbw -q -n 10 256
0 Method: MEMCPY Elapsed: 0.24393 MiB: 256.00000 Copy: 1049.503 MiB/s
1 Method: MEMCPY Elapsed: 0.24377 MiB: 256.00000 Copy: 1050.192 MiB/s
2 Method: MEMCPY Elapsed: 0.24344 MiB: 256.00000 Copy: 1051.611 MiB/s
3 Method: MEMCPY Elapsed: 0.24431 MiB: 256.00000 Copy: 1047.866 MiB/s
4 Method: MEMCPY Elapsed: 0.24342 MiB: 256.00000 Copy: 1051.672 MiB/s
5 Method: MEMCPY Elapsed: 0.24441 MiB: 256.00000 Copy: 1047.437 MiB/s
6 Method: MEMCPY Elapsed: 0.24341 MiB: 256.00000 Copy: 1051.715 MiB/s
7 Method: MEMCPY Elapsed: 0.24389 MiB: 256.00000 Copy: 1049.641 MiB/s
8 Method: MEMCPY Elapsed: 0.24345 MiB: 256.00000 Copy: 1051.546 MiB/s
9 Method: MEMCPY Elapsed: 0.24344 MiB: 256.00000 Copy: 1051.572 MiB/s
AVG Method: MEMCPY Elapsed: 0.24375 MiB: 256.00000 Copy: 1050.273 MiB/s
0 Method: DUMB Elapsed: 0.58390 MiB: 256.00000 Copy: 438.455 MiB/s
1 Method: DUMB Elapsed: 0.58407 MiB: 256.00000 Copy: 438.302 MiB/s
2 Method: DUMB Elapsed: 0.58371 MiB: 256.00000 Copy: 438.575 MiB/s
3 Method: DUMB Elapsed: 0.58463 MiB: 256.00000 Copy: 437.887 MiB/s
4 Method: DUMB Elapsed: 0.58405 MiB: 256.00000 Copy: 438.316 MiB/s
5 Method: DUMB Elapsed: 0.58380 MiB: 256.00000 Copy: 438.505 MiB/s
6 Method: DUMB Elapsed: 0.58389 MiB: 256.00000 Copy: 438.439 MiB/s
7 Method: DUMB Elapsed: 0.58373 MiB: 256.00000 Copy: 438.560 MiB/s
8 Method: DUMB Elapsed: 0.58396 MiB: 256.00000 Copy: 438.385 MiB/s
9 Method: DUMB Elapsed: 0.58376 MiB: 256.00000 Copy: 438.539 MiB/s
AVG Method: DUMB Elapsed: 0.58395 MiB: 256.00000 Copy: 438.394 MiB/s
0 Method: MCBLOCK Elapsed: 0.25507 MiB: 256.00000 Copy: 1003.658 MiB/s
1 Method: MCBLOCK Elapsed: 0.25517 MiB: 256.00000 Copy: 1003.265 MiB/s
2 Method: MCBLOCK Elapsed: 0.25468 MiB: 256.00000 Copy: 1005.179 MiB/s
3 Method: MCBLOCK Elapsed: 0.25534 MiB: 256.00000 Copy: 1002.569 MiB/s
4 Method: MCBLOCK Elapsed: 0.25634 MiB: 256.00000 Copy: 998.666 MiB/s
5 Method: MCBLOCK Elapsed: 0.25542 MiB: 256.00000 Copy: 1002.279 MiB/s
6 Method: MCBLOCK Elapsed: 0.25474 MiB: 256.00000 Copy: 1004.954 MiB/s
7 Method: MCBLOCK Elapsed: 0.25477 MiB: 256.00000 Copy: 1004.820 MiB/s
8 Method: MCBLOCK Elapsed: 0.25463 MiB: 256.00000 Copy: 1005.369 MiB/s
9 Method: MCBLOCK Elapsed: 0.25511 MiB: 256.00000 Copy: 1003.497 MiB/s
AVG Method: MCBLOCK Elapsed: 0.25513 MiB: 256.00000 Copy: 1003.422 MiB/s
root@weathink:~#
```

4.2 Test for a Single Samsung 512MB DDR4

Memory read/write speed test on a single Samsung 512MB DDR4 module.

Command used:

```
./mbw -q -n 10 128
```

-n indicates the number of test runs

128 indicates the memory size tested, which is 128MB

```
root@weathink:/# ./mbw -q -n 10 128
0 Method: MEMCPY Elapsed: 0.12031 MiB: 128.00000 Copy: 1063.936 MiB/s
1 Method: MEMCPY Elapsed: 0.12043 MiB: 128.00000 Copy: 1062.867 MiB/s
2 Method: MEMCPY Elapsed: 0.12049 MiB: 128.00000 Copy: 1062.364 MiB/s
3 Method: MEMCPY Elapsed: 0.12032 MiB: 128.00000 Copy: 1063.803 MiB/s
4 Method: MEMCPY Elapsed: 0.12044 MiB: 128.00000 Copy: 1062.770 MiB/s
5 Method: MEMCPY Elapsed: 0.12042 MiB: 128.00000 Copy: 1062.946 MiB/s
6 Method: MEMCPY Elapsed: 0.12049 MiB: 128.00000 Copy: 1062.329 MiB/s
7 Method: MEMCPY Elapsed: 0.12072 MiB: 128.00000 Copy: 1060.305 MiB/s
8 Method: MEMCPY Elapsed: 0.12143 MiB: 128.00000 Copy: 1054.131 MiB/s
9 Method: MEMCPY Elapsed: 0.12140 MiB: 128.00000 Copy: 1054.400 MiB/s
AVG Method: MEMCPY Elapsed: 0.12064 MiB: 128.00000 Copy: 1060.974 MiB/s
0 Method: DUMB Elapsed: 0.29390 MiB: 128.00000 Copy: 435.530 MiB/s
1 Method: DUMB Elapsed: 0.29384 MiB: 128.00000 Copy: 435.605 MiB/s
2 Method: DUMB Elapsed: 0.29393 MiB: 128.00000 Copy: 435.476 MiB/s
3 Method: DUMB Elapsed: 0.29385 MiB: 128.00000 Copy: 435.598 MiB/s
4 Method: DUMB Elapsed: 0.29377 MiB: 128.00000 Copy: 435.714 MiB/s
5 Method: DUMB Elapsed: 0.29381 MiB: 128.00000 Copy: 435.648 MiB/s
6 Method: DUMB Elapsed: 0.29380 MiB: 128.00000 Copy: 435.663 MiB/s
7 Method: DUMB Elapsed: 0.29390 MiB: 128.00000 Copy: 435.524 MiB/s
8 Method: DUMB Elapsed: 0.29393 MiB: 128.00000 Copy: 435.472 MiB/s
9 Method: DUMB Elapsed: 0.29368 MiB: 128.00000 Copy: 435.841 MiB/s
AVG Method: DUMB Elapsed: 0.29384 MiB: 128.00000 Copy: 435.607 MiB/s
0 Method: MCBLOCK Elapsed: 0.12734 MiB: 128.00000 Copy: 1005.191 MiB/s
1 Method: MCBLOCK Elapsed: 0.12838 MiB: 128.00000 Copy: 997.071 MiB/s
2 Method: MCBLOCK Elapsed: 0.12709 MiB: 128.00000 Copy: 1007.160 MiB/s
3 Method: MCBLOCK Elapsed: 0.12717 MiB: 128.00000 Copy: 1006.535 MiB/s
4 Method: MCBLOCK Elapsed: 0.12675 MiB: 128.00000 Copy: 1009.854 MiB/s
5 Method: MCBLOCK Elapsed: 0.12702 MiB: 128.00000 Copy: 1007.747 MiB/s
6 Method: MCBLOCK Elapsed: 0.12703 MiB: 128.00000 Copy: 1007.620 MiB/s
7 Method: MCBLOCK Elapsed: 0.12698 MiB: 128.00000 Copy: 1008.041 MiB/s
8 Method: MCBLOCK Elapsed: 0.12690 MiB: 128.00000 Copy: 1008.684 MiB/s
9 Method: MCBLOCK Elapsed: 0.12691 MiB: 128.00000 Copy: 1008.621 MiB/s
AVG Method: MCBLOCK Elapsed: 0.12716 MiB: 128.00000 Copy: 1006.641 MiB/s
root@weathink:/#
```

Physical picture:

