SPEC CPU®2026 Floating Point Rate Result

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Raspberry Pi

(Test Sponsor: Ampere Computing, Inc.)

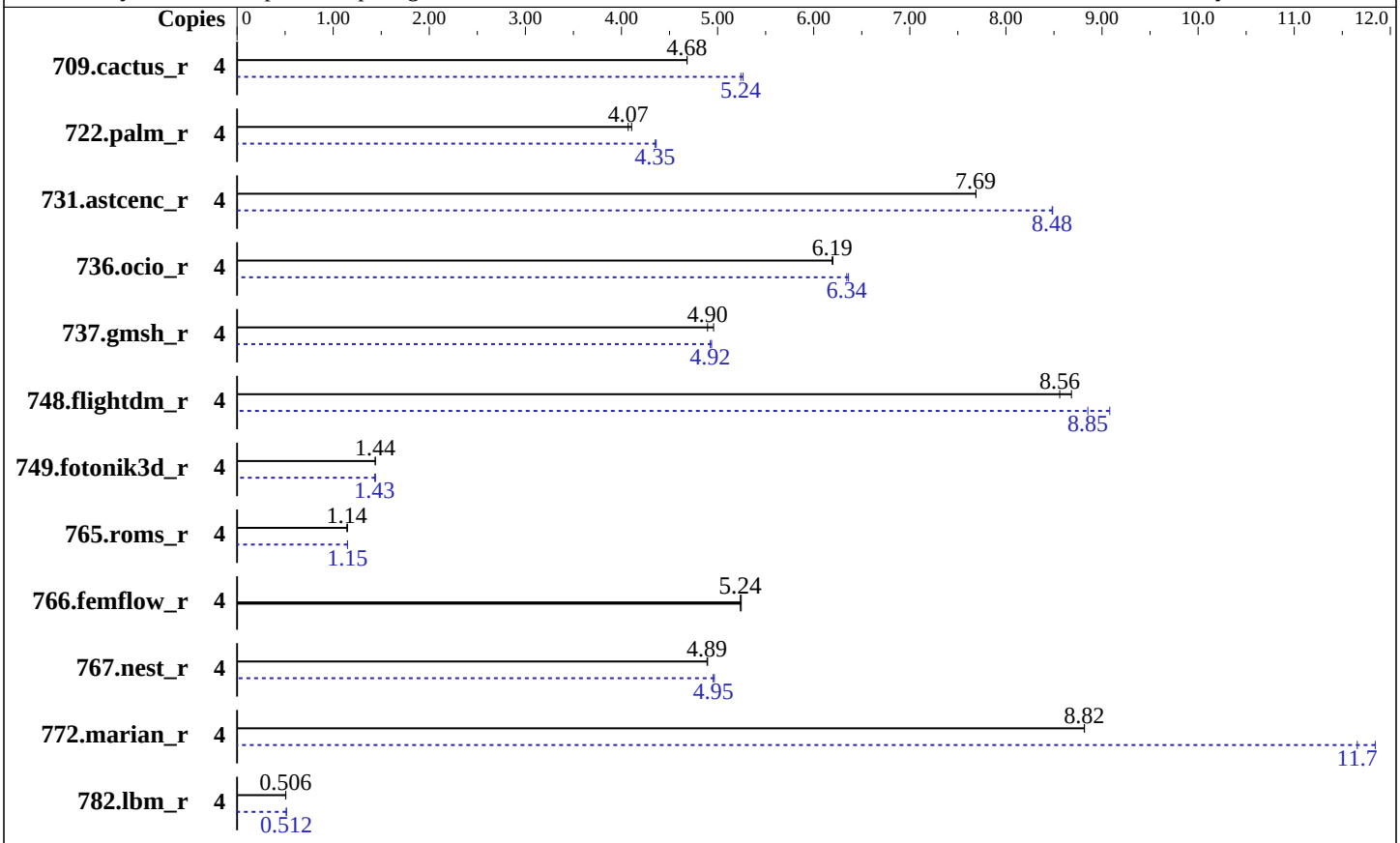
Raspberry Pi 5 Model B Rev 1.1 (16 GB)

SPECrate®2026_fp_base = 3.72

SPECrate®2026_fp_peak = 3.93

CPU2026 License: 6412
Test Sponsor: Ampere Computing, Inc.
Tested by: Ampere Computing, Inc.

Test Date: Feb-2026
Hardware Availability: Jan-2025
Software Availability: Nov-2025



Hardware

CPU Name:	Broadcom BCM2712
Max MHz:	2400
Nominal:	2400
Enabled:	4 cores, 1 chip
Orderable:	1 board
Cache L1:	64 KB I + 64 KB D on chip per core
L2:	2 MB I+D on chip per core 512 KB
L3:	2 MB I+D on chip per chip
Other:	None
Memory:	16 GB
Storage:	1 x 128 GB Samsung PRO Endurance MicroSD
Cooling:	Air
Other:	Adafruit Raspberry Pi 5 case (ID 6307; no fan); veakson Portable Desk Fan (UPC 669936718801)

Software

OS:	DietPi v9.19.2 (kernel 6.12.47+rpt-rpi-2712)
Compiler:	C/C++/Fortran: Version 14.2.0 of GCC, the GNU Compiler Collection (Debian 14.2.0-19)
Compiler Category:	Community
Firmware:	Version 57db150d released Nov-2025
File System:	ext4
System State:	Run level 3 (multi-user; no GUI)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other:	None
Power Management:	All settings left at default.

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
709.cactus_r	4	733	4.68	**733**	**4.68**			4	652	5.27	**655**	**5.24**		
722.palm_r	4	**1297**	**4.07**	1286	4.11			4	1211	4.36	**1214**	**4.35**		
731.astcenc_r	4	437	7.69	**437**	**7.69**			4	**396**	**8.48**	396	8.49		
736.ocio_r	4	565	6.20	**565**	**6.19**			4	550	6.36	**552**	**6.34**		
737.gmsh_r	4	370	4.96	**375**	**4.90**			4	372	4.94	**373**	**4.92**		
748.flightdm_r	4	330	8.68	**335**	**8.56**			4	315	9.08	**324**	**8.85**		
749.fotonik3d_r	4	3213	1.44	**3218**	**1.44**			4	**3227**	**1.43**	3211	1.44		
765.roms_r	4	**5516**	**1.14**	5480	1.15			4	**5483**	**1.15**	5478	1.15		
766.femflow_r	4	**1121**	**5.24**	1118	5.25			4	**1121**	**5.24**	1118	5.25		
767.nest_r	4	648	4.90	**649**	**4.89**			4	**640**	**4.95**	639	4.97		
772.marian_r	4	**716**	**8.82**	716	8.82			4	**542**	**11.7**	533	11.8		
782.lbm_r	4	**4532**	**0.506**	4516	0.508			4	4462	0.514	**4480**	**0.512**		

SPECrate®2026_fp_base = 3.72

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size limit
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/usr/lib64/:/usr/lib/:/lib64"
```

Platform Notes

```
System powered via USB-C from Apple 45W USB-C power supply.
HDMI display and keyboard were disconnected during the run.

Sysinfo program /spec/cpu2026-0.902.0/bin/sysinfo
Rev: 069f95da7e7f5d81b2ce48a82150e54f
running on ci-pi5 Sat Feb  7 22:42:49 2026

SUT (System Under Test) info as seen by some common utilities.

------------------------------------------------------------
Table of contents
------------------------------------------------------------
 1. uname -srvm
 2. w
```

(Continued on next page)

Platform Notes (Continued)

```
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 8. numactl warning
 9. /proc/meminfo
10. Systemd service manager version: systemd 257 (257.9-1~deb13u1)
11. Services, from systemctl list-unit-files
12. Linux kernel boot-time arguments, from /proc/cmdline
13. sysctl
14. OS release
15. Disk information
16. dmidecode warning
------------------------------------------------------------

------------------------------------------------------------
1. uname -srvm
  Linux 6.12.47+rpt-rpi-2712 #1 SMP PREEMPT Debian 1:6.12.47-1+rpt1 (2025-09-16) aarch64

------------------------------------------------------------
2. w
   22:42:49 up  8:04,  0 users,  load average: 2.15, 3.47, 3.82
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU  WHAT

------------------------------------------------------------
3. Username
  From environment variable $USER:  cloyce

------------------------------------------------------------
4. ulimit -a
  time(seconds)        unlimited
  file(blocks)         unlimited
  data(kbytes)         unlimited
  stack(kbytes)        unlimited
  coredump(blocks)     0
  memory(kbytes)       unlimited
  locked memory(kbytes) 8192
  process              64597
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
  rtprio               0

------------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init
```

(Continued on next page)

Platform Notes (Continued)

```
 tmux a
 zsh
 runcpu --reportable -c rpi-gcc fprate
runcpu --reportable --configfile rpi-gcc --nopower --runmode rate --tune base:peak --size refrate fprate
  --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2026.012/templogs/preenv.fprate.012.0.log --lognum 012.0
   --from_runcpu 2
 specperl $SPEC/bin/sysinfo -f
$SPEC = /spec/cpu2026-0.902.0

------------------------------------------------------------
6. /proc/cpuinfo
    CPU implementer : 0x41
    CPU architecture: 8
    CPU variant     : 0x4
    CPU part        : 0xd0b
    CPU revision    : 1
   Features        : fp asimd evtstrm aes pmull sha1 sha2 crc32 atomics fphp asimdhp cpuid asimdrdm lrcpc
                     dcpop asimddp
  WARNING: the number of "processors" from /proc/cpuinfo does not seem to match the number of hardware
   threads as reported by lscpu.   Please verify counts independently.

------------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.41:
  Architecture:                            aarch64
  CPU op-mode(s):                          32-bit, 64-bit
  Byte Order:                              Little Endian
  CPU(s):                                  4
  On-line CPU(s) list:                     0-3
  Vendor ID:                               ARM
  Model name:                              Cortex-A76
  Model:                                   1
  Thread(s) per core:                      1
  Core(s) per cluster:                     4
  Socket(s):                               -
  Cluster(s):                              1
  Stepping:                                r4p1
  CPU(s) scaling MHz:                      62%
  CPU max MHz:                             2400.0000
  CPU min MHz:                             1500.0000
  BogoMIPS:                                108.00
  Flags:                                   fp asimd evtstrm aes pmull sha1 sha2 crc32 atomics fphp asimdhp
                                           cpuid asimdrdm lrcpc dcpop asimddp
  L1d cache:                               256 KiB (4 instances)
  L1i cache:                               256 KiB (4 instances)
  L2 cache:                                2 MiB (4 instances)
```

(Continued on next page)

Platform Notes (Continued)

```
   L3 cache:                                2 MiB (1 instance)
   NUMA node(s):                            8
   NUMA node0 CPU(s):                       0-3
   NUMA node1 CPU(s):                       0-3
   NUMA node2 CPU(s):                       0-3
   NUMA node3 CPU(s):                       0-3
   NUMA node4 CPU(s):                       0-3
   NUMA node5 CPU(s):                       0-3
   NUMA node6 CPU(s):                       0-3
   NUMA node7 CPU(s):                       0-3
   Vulnerability Gather data sampling:      Not affected
   Vulnerability Indirect target selection: Not affected
   Vulnerability Itlb multihit:             Not affected
   Vulnerability L1tf:                      Not affected
   Vulnerability Mds:                       Not affected
   Vulnerability Meltdown:                  Not affected
   Vulnerability Mmio stale data:           Not affected
   Vulnerability Reg file data sampling:    Not affected
   Vulnerability Retbleed:                  Not affected
   Vulnerability Spec rstack overflow:      Not affected
   Vulnerability Spec store bypass:         Mitigation; Speculative Store Bypass disabled via prctl
   Vulnerability Spectre v1:                Mitigation; __user pointer sanitization
   Vulnerability Spectre v2:                Mitigation; CSV2, BHB
   Vulnerability Srbds:                     Not affected
   Vulnerability Tsa:                       Not affected
   Vulnerability Tsx async abort:           Not affected
   Vulnerability Vmscape:                   Not affected

From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL SETS PHY-LINE COHERENCY-SIZE
     L1d       64K     256K    4 Data            1  256                    64
     L1i       64K     256K    4 Instruction     1  256                    64
     L2       512K       2M    8 Unified         2 1024                    64
     L3         2M       2M   16 Unified         3 2048                    64

------------------------------------------------------------
8. numactl warning

Unable to get information from 'numactl --hardware'.  Please consider installing numactl.

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       16604176 kB

'who -r' did not return a run level

------------------------------------------------------------
```

(Continued on next page)

Platform Notes (Continued)

```
10. Systemd service manager version: systemd 257 (257.9-1~deb13u1)
  Default Target  Status
  graphical       running

------------------------------------------------------------
11. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          console-setup cron dietpi-kill_ssh dietpi-postboot dietpi-preboot dietpi-ramlog
                   fake-hwclock-load fake-hwclock-save getty@ keyboard-setup networking rpi-eeprom-update ssh
                   sshd-keygen systemd-pstore systemd-timesyncd
  enabled-runtime  systemd-fsck-root systemd-remount-fs
  disabled         console-getty debug-shell dietpi-cloudshell dietpi-firstboot dietpi-fs_partition_resize
                   dietpi-vpn dietpi-wifi-monitor e2scrub_reap ifupdown-wait-online rsync sysstat
                   systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-networkd
                   systemd-networkd-wait-online systemd-networkd-wait-online@ systemd-pcrlock-file-system
                   systemd-pcrlock-firmware-code systemd-pcrlock-firmware-config systemd-pcrlock-machine-id
                   systemd-pcrlock-make-policy systemd-pcrlock-secureboot-authority
                   systemd-pcrlock-secureboot-policy systemd-sysext systemd-time-wait-sync
                   systemd-udev-load-credentials wpa_supplicant wpa_supplicant-nl80211@ wpa_supplicant-wired@
                   wpa_supplicant@
  indirect         serial-getty@ sshd@
  masked           apt-daily apt-daily-upgrade cryptdisks cryptdisks-early fake-hwclock getty-static hwclock
                   serial-getty@ttyAMA0 serial-getty@ttyS0 sudo systemd-logind x11-common

------------------------------------------------------------
12. Linux kernel boot-time arguments, from /proc/cmdline
  reboot=w
  coherent_pool=1M
  8250.nr_uarts=1
  pci=pcie_bus_safe
  cgroup_disable=memory
  numa_policy=interleave
  nvme.max_host_mem_size_mb=0
  bcm2708_fb.fbwidth=1920
  bcm2708_fb.fbheight=1080
  bcm2708_fb.fbdepth=16
  bcm2708_fb.fbswap=1
  numa=fake=8
  system_heap.max_order=0
  iommu_dma_numa_policy=interleave
  smsc95xx.macaddr=88:A2:9E:03:6B:8B
  vc_mem.mem_base=0x3fc00000
  vc_mem.mem_size=0x40000000
  root=PARTUUID=b06e45c0-02
  rootfstype=ext4
  rootwait
  fsck.repair=yes
```

(Continued on next page)

Platform Notes (Continued)

```
   net.ifnames=0
   logo.nologo
   console=ttyAMA10,115200
   console=tty1

 ------------------------------------------------------------
 13. sysctl
   kernel.randomize_va_space           2
   vm.compaction_proactiveness        20
   vm.dirty_background_bytes           0
   vm.dirty_background_ratio          10
   vm.dirty_bytes                      0
   vm.dirty_expire_centisecs        3000
   vm.dirty_ratio                     20
   vm.dirty_writeback_centisecs      500
   vm.dirtytime_expire_seconds     43200
   vm.extfrag_threshold              500
   vm.min_unmapped_ratio               1
   vm.swappiness                       1
   vm.watermark_boost_factor       15000
   vm.watermark_scale_factor          10
   vm.zone_reclaim_mode                0

 ------------------------------------------------------------
 14. OS release
   From /etc/*-release /etc/*-version
   os-release Debian GNU/Linux 13 (trixie)

 ------------------------------------------------------------
 15. Disk information
 SPEC is set to: /spec/cpu2026-0.902.0
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/root      ext4  117G   22G   91G  20% /

 ------------------------------------------------------------
 16. dmidecode warning
   Could not find dmidecode

 BIOS: (could not find information)
```

Compiler Version Notes

```
==============================================================================
C       | 782.lbm_r(base, peak)
------------------------------------------------------------------------------
gcc (Debian 14.2.0-19) 14.2.0
```


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Compiler Version Notes (Continued)

```
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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------

==============================================================================
C++     | 731.astcenc_r(base, peak) 736.ocio_r(base, peak)
        | 748.flightdm_r(base, peak) 766.femflow_r(base, peak)
        | 767.nest_r(base, peak) 772.marian_r(base, peak)
------------------------------------------------------------------------------
g++ (Debian 14.2.0-19) 14.2.0
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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------

==============================================================================
C++, C  | 709.cactus_r(base pass 0, peak pass 0) 737.gmsh_r(base pass 0, peak
        | pass 0)
------------------------------------------------------------------------------
g++ (Debian 14.2.0-19) 14.2.0
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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------

==============================================================================
C++, C  | 709.cactus_r(base pass 0, peak pass 0) 737.gmsh_r(base pass 0, peak
        | pass 0)
------------------------------------------------------------------------------
gcc (Debian 14.2.0-19) 14.2.0
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------------------------------------------------------------------------------

==============================================================================
C++, C  | 709.cactus_r(base pass 0, peak pass 0) 737.gmsh_r(base pass 0, peak
        | pass 0)
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g++ (Debian 14.2.0-19) 14.2.0
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------------------------------------------------------------------------------

==============================================================================
```

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Compiler Version Notes (Continued)

```
C++, C  | 709.cactus_r(base pass 0, peak pass 0) 737.gmsh_r(base pass 0, peak
        | pass 0)
------------------------------------------------------------------------------
gcc (Debian 14.2.0-19) 14.2.0
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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------

==============================================================================
Fortran | 722.palm_r(base, peak) 749.fotonik3d_r(base, peak) 765.roms_r(base,
        | peak)
------------------------------------------------------------------------------
GNU Fortran (Debian 14.2.0-19) 14.2.0
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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
gcc

C++ benchmarks:
g++

Fortran benchmarks:
gfortran

Benchmarks using both C and C++:
g++ gcc

Base Portability Flags

709.cactus_r: -DSPEC_LP64
722.palm_r: -DSPEC_LP64
731.astcenc_r: -DSPEC_LP64
736.ocio_r: -DSPEC_LP64
737.gmsh_r: -DSPEC_LP64
748.flightdm_r: -DSPEC_LP64
749.fotonik3d_r: -DSPEC_LP64
765.roms_r: -DSPEC_LP64

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Base Portability Flags (Continued)

766.femflow_r: `-DSPEC_LP64`
767.nest_r: `-DSPEC_LP64`
772.marian_r: `-DSPEC_LP64`
782.lbm_r: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
`-mabi=lp64 -std=c18 -g -O3 -flto`

C++ benchmarks:
`-mabi=lp64 -std=c++17 -g -O3 -flto`

Fortran benchmarks:
`-mabi=lp64 -std=f2018 -g -O3 -flto -fallow-argument-mismatch`

Benchmarks using both C and C++:
`-mabi=lp64 -std=c++17 -std=c18 -g -O3 -flto`

Peak Compiler Invocation

C benchmarks:
`gcc`

C++ benchmarks:
`g++`

Fortran benchmarks:
`gfortran`

Benchmarks using both C and C++:
`g++ gcc`

Peak Portability Flags

709.cactus_r: `-DSPEC_LP64`
722.palm_r: `-DSPEC_LP64`
731.astcenc_r: `-DSPEC_LP64`
736.ocio_r: `-fno-finite-math-only(*) -DSPEC_LP64`

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Peak Portability Flags (Continued)

737.gmsh_r: `-fno-fast-math`(*) `-DSPEC_LP64`
748.flightdm_r: `-fno-fast-math`(*) `-DSPEC_LP64`
749.fotonik3d_r: `-DSPEC_LP64`
765.roms_r: `-DSPEC_LP64`
766.femflow_r: `-DSPEC_LP64`
767.nest_r: `-fno-finite-math-only`(*) `-DSPEC_LP64`
772.marian_r: `-DSPEC_LP64`
782.lbm_r: `-DSPEC_LP64`

(*) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:
`-mabi=lp64 -std=c18 -Ofast -mcpu=native -flto`

C++ benchmarks:

731.astcenc_r: `-mabi=lp64 -std=c++17 -Ofast -mcpu=native -flto`

736.ocio_r: `Same as 731.astcenc_r`

748.flightdm_r: `Same as 731.astcenc_r`

766.femflow_r: `basepeak = yes`

767.nest_r: `Same as 731.astcenc_r`

772.marian_r: `Same as 731.astcenc_r`

Fortran benchmarks:
`-mabi=lp64 -std=f2018 -Ofast -mcpu=native -flto`
`-fallow-argument-mismatch`

Benchmarks using both C and C++:
`-mabi=lp64 -std=c++17 -std=c18 -Ofast -mcpu=native -flto`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2026/results/flags/gcc-rev-A2.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2026/results/flags/gcc-rev-A2.xml`

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2026 v0.902.0 on 2026-02-08 01:42:48-0500.
Report generated on 2026-08-11 15:09:40 by CPU2026 PDF formatter (unknown).
Originally published on 2026-05-05.