Battery life performance ratings of the Acer Aspire Timeline 4810T notebook system

Executive summary

Acer commissioned Principled Technologies (PT) to run BAPCo's MobileMark 2007 Productivity 2007 battery life benchmark test on the Acer Aspire Timeline 4810T notebook system in its out-of-the-box (OOB) configuration.

The goal of the testing was to gauge the battery life that buyers would experience. Acer specified and provided the test system. PT set up the system and executed all tests.

We measured system battery life using BAPCo's MobileMark 2007 Productivity 2007 test. MobileMark 2007 Productivity 2007 is an industry-standard benchmark that provides a battery life rating and a performance rating based on common office scenarios. In our tests, we focus solely on the battery life rating. MobileMark 2007

> **KEY FINDING**
>
> The Acer Aspire Timeline 4810T 14.0" notebook system, with a weight of just over 4 pounds and retail price of $699, produced a battery life score of 8 hours 54 minutes on the MobileMark 2007 Productivity 2007 test with its standard 6-cell battery. (See Figure 1.)

Productivity 2007 includes applications and workloads specific to notebook systems, such as office activities like file and document management, data processing, and rich content creation. This module provides a score for battery life of the tested applications.

As Figure 1 shows, with a standard 5,800 mAh, 6-cell battery, the Acer Aspire Timeline 4810T produced a battery life score of 8 hours 54 minutes.

The Workload section details the specific applications the MobileMark 2007 Productivity 2007 test uses, the Test results section shows the test results in more detail, and the Test methodology section explains how we ran the tests. Appendix A details the system configurations.

As Figure 2 shows, the battery with which the notebook produced these scores is standard size; the notebook case fully contains the battery.

Acer Aspire Timeline 4810T runs 8 hours 54 minutes on a single battery charge.

Source: Principled Technologies report, Battery life performance ratings of the Acer Aspire Timeline 4810T notebook system

Figure 1: MobileMark 2007 Productivity 2007 battery life score for the Acer Aspire Timeline 4810T notebook system.

Almost 9 hours of computing on a standard-sized battery

Source: Principled Technologies report, Battery life performance ratings of the Acer Aspire Timeline 4810T notebook system

Figure 2: Alternate view of the Acer Aspire Timeline 4810T notebook system. The notebook case fully contains the battery.

Workload

Our goal was to see how long the Acer Aspire Timeline 4810T notebook battery would last running BAPCo's MobileMark 2007 Productivity 2007 battery life benchmark test. MobileMark 2007 is an industry-standard benchmark BAPCo created to measure system battery life and performance.

MobileMark 2007 Productivity 2007 consists of the following applications and corresponding tasks: Microsoft Project 2003 (project management), Microsoft Excel 2003 (calculation sheets), Microsoft Outlook 2003 (emails, calendars, scheduler), Microsoft PowerPoint 2003 (slide presentations), Microsoft Word 2003 (formatted text documents), WinZip Computing and WinZip Pro 10.0 (compressed archives), Adobe Photoshop CS2 (manipulated and compressed images), Adobe Illustrator CS2 (manipulated images), and Adobe Flash 8 (vector graphics, animation).

MobileMark 2007 measures system battery life in minutes. MobileMark 2007 records system battery life at the start of the Productivity 2007 benchmark, and repeats the benchmark workload until the system battery life is depleted, or until the notebook system powers down due to low battery life. At the 7 percent battery life setting, MobileMark 2007 records a timestamp once per minute. At the end of the benchmark, it compares the beginning timestamp to the final (last recorded) timestamp. MobileMark 2007 derives its system battery life rating as the number of minutes between the start and end timestamps.

We followed the run rules that MobileMark 2007 specifies here: http://www.bapco.com/support/mobilemark2007/Manual/rules.html.

Test results

Figure 3 presents the MobileMark 2007 Productivity 2007 median battery life rating for the Acer Aspire Timeline 4810T notebook system. We conducted one conditioning run followed by three Official MobileMark 2007 Productivity 2007 runs. (Complete test results appear in Appendix B.)

Because screen brightness can affect the amount of energy a system consumes, we check the brightness of every system we test and adjust it when necessary. We set the levels of brightness to match as closely as possible and to meet MobileMark's required minimum brightness of 60 nits. We tested the system at 77 nits.

	Acer Aspire Timeline 4810T (77 nits)
MobileMark 2007 Productivity 2007	
Battery life score (hours:minutes)	8:54

Figure 3: MobileMark 2007 Productivity 2007 scores for the Acer Aspire Timeline 4810T notebook system we tested.

Test methodology

This section details the methodologies we followed in testing the system.

Initial setup

When the system arrived, we unpacked it and set it up. We went through the following process with Windows Vista Home Premium the first time we booted it:

1. At the Set up Windows screen, select United States, English and U.S. keyboard, and click Next.
2. At the Microsoft and Manufacturer End User License Agreements, select Yes, I accept them, and click Next.
3. Enter a user name.
4. Leave the password blank, and click Next.
5. Name the computer with its model, and click Next.
6. At the Help protect Windows automatically screen, click Ask me later (because our goal is to test the PC as it came directly out of the box).
7. At the Review your time and date settings, select Eastern Time, and click Next.
8. At the Thank you screen, click Start.
9. At the MyWinLocker Initialization dialog, click Start.
10. Type confirm a master password Password1, and click Next.
11. Click Ok to exit MyWinLocker.
12. At the registration screen, select No, from the reseller question, and click Next.
13. Fill out the registration information, uncheck the box for services and updates, and click Next.
14. Select Personal use and Place of Purchase, and click Register.

Capturing an image of the hard drive

We used Symantec's Ghost product to capture an exact image of the hard disk. We followed this process to capture the image:

1. Restart the computer.
2. Insert a bootable network CD.
3. At the Current Configuration dialog screen, press the Escape key to accept the automatic network options.
4. At the DOS command prompt, use the net use command to map a network drive to the dedicated Ghost image server: type `net use z: \\ghostserver\ghost` and press Enter.
5. Type `z:` to change to the mapped drive.
6. Type `ghost` and press Enter.
7. At the Symantec Ghost screen, click OK.
8. Select Local→Disk→To Image.
9. Click OK.
10. Select the Primary disk, and click OK.
11. Click Save.
12. At the Compress Image dialog, select Fast.
13. At the Proceed dialog, select Yes.
14. When the ghost image is complete, click OK, and exit Ghost.
15. Reboot the computer.

MobileMark 2007

Antivirus software conflicts

MobileMark 2007 is not compatible with any virus-scanning software, so we uninstalled any such software that is present on the notebook PCs before we installed the benchmark.

Pre-installed software conflicts

MobileMark 2007 installs the following applications, which its test scripts employ:

- Adobe Photoshop 6.0.1
- InterVideo WinDVD 6.0
- Macromedia Flash 5.0

- Microsoft Excel 2002
- Microsoft Outlook 2002
- Microsoft PowerPoint 2002
- Microsoft Word 2002
- Netscape Communicator 6.01
- Network Associates McAfee VirusScan 5.13
- WinZip Computing WinZip 8.0

If any of these applications are already on the system under test, they could cause problems with the benchmark due to software conflicts. To avoid any such issues, before we installed the benchmark, we uninstalled all conflicting pre-installed software applications, including different versions of any of the programs MobileMark uses.

Displaying brightness and power settings

Because the brightness of a notebook's display affects its battery life, BAPCo requires that, before you test with MobileMark 2007, you make sure the brightness of the notebook's monitor is greater than or equal to 60 nits on a completely white screen while the notebook is unplugged and running on battery power. The measurement follows the standards from the Video Electronics Standards Association (www.vesa.org/Standards/summary/2001_6a.htm).

We complied with this standard for all the tests we ran by setting the notebook PC's brightness as close to 60 nits as we could without going below that brightness level. We used the following procedure, which assumes we began with the notebook plugged into the power supply, to meet this requirement before we started each test:

1. To create a completely blank, white screen, open Microsoft Paint by clicking Start→All Programs→Accessories→Paint.
2. Open the Attributes by pressing Ctrl+E.
3. Enter dimensions that are larger than the current screen resolution. For example, if the screen resolution is 1280 x 800, type `1600` for Width and `1200` for Height.
4. Click OK.
5. Press Ctrl+F to view the bitmap image and render the screen totally white.
6. Wait 45 minutes to allow the screen to warm.
7. Unplug the notebook from the power supply, and measure the display's brightness using a luminance meter in the center of the screen. (We use the Gossen Mavolux5032C.)
8. If the reading is below or significantly greater than 60 nits, use the notebook's keyboard screen-brightness-adjustment keys to bring the display as close to 60 nits as possible, then retest.
9. Allow the notebook to run on battery power for 10 minutes, re-measure the display, and adjust the brightness up or down as necessary.
10. Verify that the notebook saved the brightness setting by plugging in the system, unplugging it, and taking another reading. If the notebook did not save this setting, use its power-management application(s) to set the brightness appropriately, and save that setting.

MobileMark 2007 Auto-configuration Tool

This tool supports three levels of configuration:

1. Only make changes that are REQUIRED in order for the benchmark to run.
2. Additionally, make changes that are RECOMMENDED for repeatable results.
3. Additionally, make changes that help ensure best results.

We choose Level 3 in the Auto-configuration tool unless the client specifically asks us to choose a different level or to manually set the power options.

The MobileMark Auto-configuration tool makes the following configuration changes at each of the three levels:

Level 1—Required
- Creates and activates a new power scheme that it names MobileMark 2007.
- Disables hibernate, standby, and display standby.

- Sets hard drive timeout and CPU power management.
- See the following POWER SCHEMES section for details on this scheme.
- Disables Screen Saver.
- Disables Windows Update.
- Disables Desktop Cleanup Wizard.
- Disables User Account Control (UAC).
- Disables Sidebar.

Level 2—Recommended
- Completes Level 1 steps.
- Disables Windows Security Center warning messages.
- Disables Windows Firewall.
- Disables incoming Remote Desktop connections.
- Disables Windows Error Reporting to Microsoft.
- Prevents the Welcome Center from running at startup.

Level 3—Best scores
- Completes Level 1 and Level 2.
- Disables Windows Defender.

Power schemes
The MobileMark Auto-configuration tool creates a MobileMark 2007 power scheme which makes the following power option changes:

a . Additional settings:
- Require a password on wakeup: No

b . Hard disk:
- Turn off hard disk after: 3 minutes

c . Wireless Adapter Settings:
- Power Saving Mode: Maximum Power Saving

d . Sleep:
- Sleep after: Never

e . USB settings
- USB selective suspend setting: Enabled

f . Power buttons and lid:
- Lid close action: Do nothing
- Power button action: Shut down
- Sleep button action: Sleep
- Start menu power button: Shut down

g . PCI Express:
- Link State Power Management: Maximum power savings

h . Processor power management:
- Minimum processor state: 5%
- Maximum processor state: 100%

i . Search and Indexing:
- Power Savings Mode: Power Saver

j . Display:
- Turn off display after: Never
- Adaptive display: Off (Extends the time that Windows waits to turn off the display)
- Display brightness: 100% (We then adjust the brightness % to be no less than 60 nits)

k . Multimedia settings:
- When sharing media: Prevent idling to sleep

l . Battery:
- Critical battery action: Shut down (on battery), Do nothing (plugged in)

- Low battery level: 0%
- Critical battery level: 0%
- Low battery notification: Off
- Low battery action: Do nothing

Installing MobileMark 2007
1. Reset the notebook to the base image using Symantec's Ghost product.
2. Turn off the wireless network adapter by using the external toggle switch.
3. Insert the MobileMark 2007 Install DVD in the notebook PC's DVD drive.
4. At the Welcome screen, click Next.
5. Accept the license agreement, and click Next.
6. At the Ready to Install the Program screen, click Install.
7. Run the BAPCo Auto-configuration tool, v.1.3.2, to set the power options:
    a. Insert the Auto-configuration tool in the notebook PC's DVD drive.
    b. Double-click BAPCo_AutoConfig.exe.
    c. Type M to choose MobileMark 2007.
    d. Type 3 to choose the changes that produce the best possible scores.
8. Adjust the screen brightness to no less than 60 nits:
    a. Click the Windows start button, and type power options in the Windows Start Search box.
    b. Click Change plan settings.
    c. Click Change advanced power settings.
    d. Expand the Display option, and change the Display brightness on battery and plugged in, to the correct percentage that produces no less than 60 nits.
9. Disable automatic disk defragmentation:
    a. Click the Windows start button, and type disk defragmenter in the Windows Start Search box.
    b. Uncheck the box next to Run on a schedule.
10. Disable System Protection:
    a. Click the Windows start button, and type System in the Windows Start Search box.
    b. Click System Protection.
    c. Uncheck all disks that are protected, and click Apply.
11. Disable Windows Desktop Search indexing:
    a. Click the Windows start button, and type Indexing Options in the Windows Start Search box.
    b. Click Modify.
    c. Click Show all locations.
    d. Under Summary of selected locations, highlight each Included Location listed, which will automatically take you to the indexed location.
    e. Under Change selected locations, uncheck the boxes next to each indexed location.
12. Defragment the hard drive(s):
    a. Click the Windows start button, and type disk defragmenter in the Windows Start Search box.
    b. Click Defragment now.

Conditioning the battery
1. Plug the AC power adapter into the notebook PC, and completely charge the battery.
2. Install MobileMark 2007 v1.05, following the steps we outlined in the Installing MobileMark 2007 section earlier in this section.
3. Double-click the MobileMark 2007 icon on the desktop.
4. Highlight the Productivity 2007 item in the left panel.
5. Type System Conditioning as the name for this test in the Project Name field at the top-right panel, and click Next Step.
6. If MobileMark lists no problems or warnings, click Next Step. If it does list any problems or warnings, close MobileMark 2007, and correct the problem(s) before proceeding.
7. Unplug the AC power adapter. The Productivity 2007 test begins immediately.
8. The test is complete when the notebook PC has fully depleted its battery and is no longer operational when running on battery power.
9. Plug the AC power adapter into the notebook PC, and completely charge the battery.

Measuring battery life
We performed the following steps to run the MobileMark Productivity 2007 benchmark:
1. Double-click the MobileMark 2007 icon on the desktop.
2. Select the Productivity 2007 test by highlighting it in the left panel.
3. Enter a name for this test in the Project Name field in the top right panel, and click Next Step.
4. If MobileMark lists no problems or warnings, click Next. If it does list any problems or warnings, close MobileMark 2007, and correct the problem(s) before proceeding.
5. Unplug the AC power adapter. The test begins immediately.
6. The Productivity 2007 test is complete when the notebook PC has fully depleted its battery and is no longer operational when running on battery power.

We executed the Productivity 2007 test three times on the system and took the median battery life run as the representative score for that test.

Getting the MobileMark 2007 results
After each MobileMark test completed, we plugged the AC power adapter into the notebook PC and turned on the system. MobileMark 2007 started automatically after the system booted, analyzed the test scores, and opened the Test Results Viewer with the results from the last test.

To submit these results to BAPCo, we saved the test results directory. To do so, we performed the following steps:
1. Browse to the C:\ Program Files\BAPCo\MobileMark 2007\results directory:
    a. Select My Computer.
    b. Select Local Disk (C:).
    c. Select the Program Files directory.
    d. Select the BAPCo directory.
    e. Select the MobileMark2007 directory.
    f. Select the results directory. (Note: The name of the directory for the Productivity 2007 results is the name you gave the test in Step 3 of the MobileMark Productivity 2007 process.)

Appendix A – Test system configuration information

Figure 4 provides detailed configuration information about the Acer Aspire Timeline 4810T notebook system.

System	Acer Aspire Timeline 4810T Intel Core 2 Solo SU3500 1.4GHz
General	
Processor and OS kernel: (physical, core, logical)/(UP, MP)	1P1C1L/UP
Number of physical processors	1
Single/dual-core processors	Single
System power management policy	MobileMark 2007
Processor power-saving option	Enhanced Intel SpeedStep Technology
System dimensions (length x width x height)	13.32" x 9.45" x 0.94" (front)/1.14" (back)
System weight	4 lbs. 6 oz.
CPU	
Vendor	Intel
Name	Core 2 Solo
Model number	SU3500
Stepping	R0
Socket type and number of pins	Socket P (478)
Core frequency (GHz)	1.4
Front-side bus frequency (MHz)	800
L1 cache	32 KB + 32 KB
L2 cache	3 MB
Platform	
Vendor	Acer
Motherboard model number	Aspire 4810T
Motherboard chipset	Intel GS45
Motherboard revision number	07
System serial number	91901082920
Bios name and version	Insyde V1.10 (04/29/2009)
BIOS settings	Default
Memory module(s)	
Vendor and model number	Elpida
Type	PC3-8500
Speed (MHz)	1,066
Speed running in the system (MHz)	800
Timing/latency (tCL-tRCD-tRP-tRASmin)	6-6-6-15

System	Acer Aspire Timeline 4810T Intel Core 2 Solo SU3500 1.4GHz
Size (MB)	4096
Number of memory module(s)	2
Chip organization (single-sided, double-sided)	Double-sided
Channel (single/dual)	Dual
Hard disk	
Vendor and model number	Western Digital WD3200BEVT-22ZCTO
Size (GB)	320
Buffer size (MB)	8
RPM	5,400
Type	SATA 3.0 Gb/s
Controller	Intel 82801IM (ICH9-M)
Controller driver	Intel 8.8.0.1009 (02/11/2009)
Operating system	
Name	Microsoft Windows Vista Home Premium x64
Build number	6001
Service pack	Service Pack 1
File system	NTFS
Kernel	ACPI x64-Based PC
Language	English
Microsoft DirectX version	10
Graphics	
Vendor and model number	Mobile Intel GMA 4500MHD
Type	Integrated
Chipset	Mobile Intel 4 Series Express Chipset
BIOS version	1736.0
Total available graphics memory (MB)	1,759
Dedicated video memory (MB)	64
System video memory (MB)	64
Shared system memory (MB)	1,631
Resolution	1,366 x 768 x 32 bit
Driver	Intel 7.15.10.1666 (02/26/2009)
Sound card/subsystem	
Vendor and model number	Realtek High Definition Audio, Intel High Definition Audio HDMI
Driver	Realtek 6.0.1.5830 (04/10/2009), Intel 6.10.0.2067 (09/22/2008)
Ethernet	
Vendor and model number	Atheros AR8131 PCI-E Gigabit
Driver	Atheros 1.0.0.10 (02/22/2009)
Wireless	
Vendor and model number	Intel WiFi Link 5100 AGN
Driver	Intel 12.1.2.1 (09/25/2008)

System	Acer Aspire Timeline 4810T Intel Core 2 Solo SU3500 1.4GHz
Optical drive(s)	
Vendor and model number	TSSTcorp TS-U633A
Type	DVD-RW
USB ports	
Number	3
Type	USB 2.0
Other	Media card reader
IEEE 1394 ports	
Number	0
Monitor	
LCD type	LED-backlit TFT LCD
Screen size (inches)	14.0
Refresh rate (Hz)	60
Battery	
Type	Acer AS09D56 Lithium-ion
Size (length x width x height)	10.75" x 2" x .75"
Rated capacity	5,800mAh/10.8V (63Wh)
Weight (ounces)	11 oz.

Figure 4: Detailed system information for the Acer Aspire Timeline 4810T notebook system.

Appendix B – Complete test results

Figure 5 presents the complete MobileMark 2007 Productivity 2007 test results for the Acer Aspire Timeline 4810T notebook system. We conducted one conditioning run followed by three Official MobileMark 2007 Productivity 2007 runs.

	Acer Aspire Timeline 4810T (77 nits)
MobileMark 2007 Productivity 2007	
MobileMark 2007 - Productivity 2007 - Performance Qualification score - Run 1	115
MobileMark 2007 - Productivity 2007 - Performance Qualification score - Run 2	115
MobileMark 2007 - Productivity 2007 - Performance Qualification score - Run 3	114
MobileMark 2007 - Productivity 2007 - Battery Life score (minutes) - Run 1	540
MobileMark 2007 - Productivity 2007 - Battery Life score (minutes) - Run 2	525
MobileMark 2007 - Productivity 2007 - Battery Life score (minutes) - Run 3	534

Figure 5: MobileMark 2007 Productivity 2007 scores for Acer Aspire Timeline 4810T notebook system we tested.

About Principled Technologies

We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help you assess how it will fare against its competition, its performance, whether it's ready to go to market, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.