





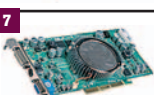





Top 10 Graphics cards

			Graphics cards	Graphics processor	Graphics architecture	DVI	Ramdac		Maximum resolution @75Hz	Video-out	Dual screen support	Manufacturing process	Software and extras
				Installed RAM	Memory interface	8X AGP	Memory bandwidth (gigabytes per second)			Video-in		DirectX 9.0 support	
				Core/memory clock									
PC ADVISOR BEST BUY	1	 <b>Sapphire Radeon 9800 Atlantis Pro</b> 0870 138 3554 www.sapphiretech.com Last month 2	• £220 inc VAT • 1-year warranty • First review Sep 03	ATI Radeon 9800 Pro	256bit	yes	400MHz	2,048x1,536	yes	yes	0.15 micron	Sapphire Redline Overclocking Utility, Soldier of Fortune II	
				128MB DDR		yes	21.8GBps		no		yes		
				380MHz/340MHz									
PC ADVISOR RECOMMENDED	2	 <b>Leadtek WinFast A380 Ultra TDH MyVivo</b> 0870 443 0880 www.leadtek.co.uk Last month 1	• £288 inc VAT • 1-year warranty • First review Feb 04	nVidia GeForce FX 5950 Ultra	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	WinFox II, WinFast PVR, Ulead VideoStudio 7.0 SE, Gun Metal, Ulead DVD MovieFactory 2.0 SE	
				256MB DDR	yes	30.4GBps	yes		yes				
				475MHz/475MHz									
PC ADVISOR RECOMMENDED	3	 <b>Gigabyte GV-N595U256V</b> 0870 443 0399 www.gigabyte.com.tw New	• £295 inc VAT • 3-year warranty • First review Spr 04	nVidia GeForce FX 5950 Ultra	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	Power Director 2.55 Me, Tomb Raider AOD	
				256MB DDR	yes	30.4GBps	no		yes				
				475MHz/475MHz									
PC ADVISOR RECOMMENDED	4	 <b>Sapphire Radeon 9800 XT Atlantis</b> 0870 138 3554 www.sapphiretech.com Last month 3	• £345 inc VAT • 2-year warranty • First review Feb 04	ATI Radeon 9800 XT	256bit	yes	400MHz	2,048x1,536	yes	yes	0.15 micron	Half-Life 2, Tomb Raider AOD	
				256MB DDR	yes	23.4GBps	no		yes				
				412MHz/365MHz									
	5	 <b>Gigabyte GV-N59X128D</b> 0870 443 0399 www.gigabyte.com.tw New	• £150 inc VAT • 3-year warranty • First review Apr 04	nVidia GeForce FX 5900 XT	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	Tomb Raider AOD	
				128MB DDR	yes	22.4GBps	no		yes				
				390MHz/350MHz									
	6	 <b>Hercules 3D Prophet 9800 XT Classic</b> 0870 443 0880 www.hercules.com New	• £350 inc VAT • 3-year warranty • First review Apr 04	ATI Radeon 9800 XT	256bit	yes	400MHz	2,048x1,536	yes	yes	0.15 micron	Half-Life 2	
				256MB DDR	yes	23.4GBps	no		yes				
				412MHz/365MHz									
	7	 <b>Leadtek WinFast A350 XT TDH</b> 0870 443 0880 www.leadtek.co.uk New	• £155 inc VAT • 2-year warranty • First review Apr 04	nVidia GeForce FX 5900 XT	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	WinFox II, Gun Metal	
				128MB DDR	yes	22.4GBps	no		yes				
				390MHz/350MHz									
	8	 <b>Sapphire Radeon 9600 XT Atlantis</b> 0870 138 3554 www.sapphiretech.com New	• £120 inc VAT • 2-year warranty • First review Apr 04	ATI Radeon 9600 XT	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	Sapphire Redline Overclocking Utility, Half-Life 2, Tomb Raider AOD	
				128MB DDR	128bit	yes	9.6GBps		no		yes		
				500MHz/300MHz									
	9	 <b>Asus Radeon 9600 XT</b> 0870 443 0880 www.asus.com.tw Last month 5	• £135 inc VAT • 3-year warranty • First review Feb 04	ATI Radeon 9600 XT	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	Asus Digital VCR, Asus VideoSecurity, Asus GameFace, Power Director Pro, Photo Express	
				128MB DDR	128bit	yes	9.6GBps		yes		yes		
				500MHz/300MHz									
	10	 <b>MSI FX5700 Ultra-TD128</b> 0870 755 4747 www.msi.com.tw New	• £150 inc VAT • 2-year warranty • First review Apr 04	nVidia GeForce FX 5700 Ultra	256bit	yes	400MHz	2,048x1,536	yes	yes	0.13 micron	WinDVD Creator, MSI Media Center, VirtualDrive, games bundle	
				128MB DDR-II	128bit	yes	14.4GBps		no		yes		
				475MHz/450MHz									



facilities. Add to that the competitive frame rates and price - this card is more than £60 cheaper than the Hercules 3D Prophet 9800 XT Classic - and you have a superb product. It's debatable whether this card will remain as polished on DirectX 9.0 titles, but by the time we really know the answer there are bound to be chips available that can get more out of DirectX 9.0 than either the 5950 Ultra or Radeon 9800 XT. In the meantime, this produces great results on existing games titles.



3 NEW Gigabyte GV-N595U256V

PC ADVISOR RECOMMENDED While the early signs suggest that the 5950 Ultra might not be as good as the 9800 XT for DirectX 9.0, it produces great results on most current games.

Without anti-aliasing, the Gigabyte lagged behind the 9800 XT cards on Halo and Code Creatures, and proved marginally inferior on Tomb Raider. In most games, though, the 5950 Ultra was the equal of the Radeon 9800 XT. It scored around 2-3fps (frames per second) more in Unreal Tournament 2003, 5-8fps more in X2, and won easily in the Quake III and Final Fantasy tests. Only Pro Evolution Soccer 3 resulted in a draw, suggesting that the 5950 Ultra really is a good performer for its price.

This card has the same chip as the Leadtek WinFast A380. But while both are close on performance, the Leadtek



The Sapphire Radeon 9800 Atlantis Pro boasts a competitive turn of speed at an affordable price

1 Sapphire Radeon 9800 Atlantis Pro

PC ADVISOR BEST BUY When we first looked at it six months ago, we weren't overawed by this Radeon 9800 Pro card. The technology was too expensive and not far enough ahead of the competition to be an essential purchase.

However, the 9800 Pro's turn of speed has remained competitive, while its price has dropped. The Sapphire can now be bought for just £220 - probably even less by the time you read this.

But if you are a serious gamer and you want the latest graphics technology available, is there a compromise involved in choosing this card?

Well, in many ways the 9800 Pro is almost identical to Sapphire's 9800 XT - both cards are manufactured using the same 0.15-micron process and both have a 256bit memory interface, for example.

This 9800 Pro has only 128MB of memory - there are versions boasting 256MB but this marginal improvement doesn't justify the price increase - and the clock speeds are inferior.

However, for all the hype, these aren't dramatic improvements, and our tests suggest that the only gamers who would notice a big difference would be those who played all their games at a resolution of 1,600x1,200 and with maximum settings for anti-aliasing and anisotropic filtering.

For standard titles, the Pro keeps within a few frames of the 9800 XT and GeForce FX 5950 Ultra chips. Indeed, the latter even fell behind the 9800 Pro on our DirectX 9.0 titles.

And bearing in mind the debate about which graphics card will make a better job of future titles, the safest move is to buy the card that has a bargain price - the 9800 Pro.

It'll give you excellent frame rates on existing titles, and by the time games programmers have really got to grips with DirectX 9.0, there'll be newer and more powerful graphics chips available that really can show the new games in their best light.

2 Leadtek WinFast A380 Ultra TDH MyVivo

PC ADVISOR RECOMMENDED Leadtek's superb WinFast A380 has slipped off the top of the chart this month, but there are still plenty of good reasons for buying it.

For a start, the nVidia GeForce FX 5950 Ultra is an excellent chip that achieves the highest clock speeds yet. Combined with 256MB of DDR RAM and 256bit memory bus, it's capable of handling almost anything you throw at it.

Features are good, from the Intellisample HCT anti-aliasing to the 128bit colour and UltraShadow



takes a small lead on price. The WinFast also has extra video-in facilities - allowing you to capture images from camcorders and other digital devices - and the excellent MyVivo software gives you great television and video utilities.

If the Leadtek isn't available, this Gigabyte card produces similar performance at a slightly higher price.



**4** **Sapphire Radeon 9800 XT**  
**PC ADVISOR RECOMMENDED** The question of DirectX 9.0 performance continues to hang over the graphics card market like a thick fog. Are the ATI Radeons going to be the only chips in town once the majority of games are created using version 9.0 of Microsoft's DirectX programming language? Well, even our most in-depth test process was unable to answer this, and results will remain inconclusive until far more DirectX 9.0 games are available.

With just anisotropic filtering activated, only Halo produced a decisive victory for the Radeon 9800 XT, generating 5-8fps more - a significant increase since the highest frame rate was less than 50fps. With 6x anti-aliasing turned on as well, the Radeon was also superior in Aquamark 3. However, once you start tweaking the graphics quality to this extent, the frame rates look less and less playable, which suggests that, in reality, none of today's chips is ideally suited to DirectX 9.0.

Given the high price tag of the 9800 XT, we feel your best bet is to buy the 9800 Pro for good performance on existing games and wait for a year to see which chip really does have the firepower to put DirectX 9.0 through its paces.

**5** **NEW** **Gigabyte GV-N59X128D**  
We reckon the £220 Sapphire Radeon 9800 Atlantis Pro is the ideal purchase for those who don't want to spend big bucks on a graphics card. But if this price tag still seems a bit extortionate, a more affordable alternative will be

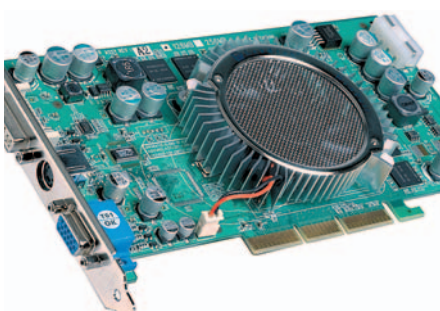


a card built around nVidia's GeForce FX 5900 XT chip. The drop in performance will be steeper than if you opt for the 9800 Pro, but these cards still have more than enough clout to offer strong frame rates in many of today's games. And with price tags around the £150 mark, they're excellent value for money. The Gigabyte GV-N59X128D is a good case in point. Compared to the MSI FX5700 Ultra, this card is around 27-29fps faster on Unreal Tournament 2003 and about 4-7fps faster on games such as Halo and Aquamark 3. You can add several frames when comparing with the Radeon 9600 cards. Indeed, on an OpenGL title such as Quake III, the Gigabyte was over 40fps faster at lower resolutions. The fastest card in the sub-£160 category, the GV-N59X128D offers even more speed than the Leadtek version of the 5900 XT. An excellent choice for those on a budget.



**6** **NEW** **Hercules 3D Prophet 9800 XT Classic**  
Built around the ATI Radeon 9800 XT chip, the Hercules 3D Prophet 9800 XT offers high performance - at a price. It costs £120 more than the Radeon 9800 Pro although, in reality, most of the differences in speed are fairly marginal. This isn't particularly surprising, since the 9800 XT chip is really only a slightly revamped 9800 Pro. Both chips are manufactured using the larger (and less efficient) 0.15-micron process, and the clock speeds on the 9800 XT are only just

increased - 412MHz and 365MHz rather than the 9800 Pro's 380MHz and 340MHz. In most of our games tests, the 9800 Pro was rarely more than a few frames per second slower than the XT, making the higher end card worse value for money. However, cards such as the 9800 XT Classic are likely to improve with age. The 9800 Pro ought to disappear from the market shortly, and although those built around the 9800 XT chip haven't fallen in price much since their release, this seems sure to change in the coming months. Add to this the smooth games performance and you have a card that might make far more sense come summer.

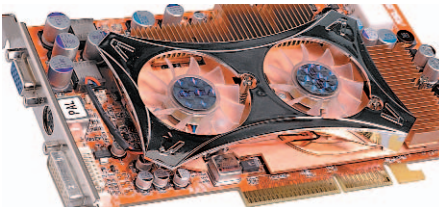


**7** **NEW** **Leadtek WinFast A350 XT TDH**  
Essentially a cut-down version of the 5900 Ultra and 5950 Ultra chips, the GeForce FX 5900 XT has more than enough hardware to beat its budget-priced rivals. It's made using the same efficient 0.13-micron process as the 5950 Ultra, resulting in smaller chips that generate less heat and can therefore run at higher clock speeds. At first glance, the 5900 XT's figures aren't impressive - the 390MHz core and 350MHz memory clock speeds are among the lowest in the chart. But it's the 256bit memory bus that makes the difference. The 5900 XT's high memory bandwidth means that it has plenty of space in which to juggle graphics data. This contrasts with other sub-£160 chips, where frequent memory bottlenecks mean they are only able to work at full-speed in short bursts. These clock speeds are still too low to allow the 5900 XT to compete with the top chips, and even the 9800 Pro is likely to give you between 20 and 30 percent more performance on games titles. As a cheap alternative, though, a 5900 XT card such as this Leadtek offers significantly more performance than other cards in its price range.



**8** **NEW** **Sapphire Radeon 9600 XT Atlantis**  
Saving money without compromising too much on performance is a far from easy task in the graphics card market. Whether you feel that the Sapphire Radeon 9600 XT Atlantis goes a little too far will depend on whether you value speed more than price. At £120, this is comfortably the cheapest card in the chart but it's also the slowest. There's also a question mark over whether it is good enough to run the latest games. On balance the answer is probably yes, although you won't want to run anything at a resolution higher than 1,280x1,024. Even then, if you're to play DirectX 9.0 games at good frame rates, (35fps and above) you'll need to cut the filtering and detail levels. If you do like playing games then we would recommend paying and upgrading to at least the GeForce FX 5900 XT cards.

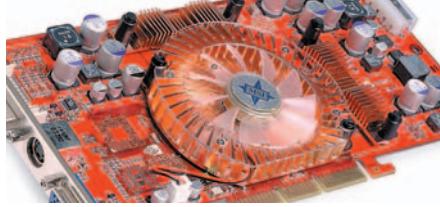
**9** **Asus Radeon 9600 XT**  
The second of two cards carrying the Radeon 9600 XT chip, Asus' version is dragged down by its more expensive price tag. When it's just £15 less than the 5900 XT cards, the shortcomings of the chip become even more significant.



That the 9600 XT has inferior frame rates may not be obvious from its specs. The chip is manufactured on the 0.13-micron process, so it's capable of running at high clock speeds and its core speed is higher than the 9800 XT's. However, this fact is wasted on the 128bit memory bus. And the bandwidth of 9.6GBps means that the 9600 XT can't perform many functions at once, so it struggles to keep up with all of the graphics information. If you want serious games performance, especially on DirectX 9.0 titles, the GeForce FX 5900 XT is the better choice.

And should the 9600 XT offer enough, the Sapphire version offers greater value.

**10** **NEW** **MSI FX5700 Ultra-TD128**  
The nVidia GeForce FX 5700 Ultra is a chip that's gaining plenty of publicity. For the life of us, though, we can't see why. On the face of it, it seems like a good buy. Its trump card is the DDR-II memory. This is so sophisticated that not even the flagship 5950 Ultra chips use it, resulting in a memory clock speed high enough to beat even the Radeon 9800 XT.



However, while this looks good on paper, the 128bit memory bus and four pixel pipes restrict performance. It is slightly superior to the Radeon 9600 XT in most current games titles, but its frame rates are 10-15 percent slower than those of the 5900 XT cards. And because this MSI costs the same as them, you'd be well advised to steer clear.

## Buying advice

- **Graphics chip** The graphics chip is the engine that powers the card and is probably the component that'll make or break your graphics card. The ATI Radeon 9800 XT and nVidia GeForce FX 5950 Ultra chips are the top performers, although the ATI Radeon 9800 Pro offers almost the same speed as either chip, and for significantly less money. Expect to pay between £215-350 for cards featuring these chips. The nVidia GeForce FX 5900 XT is a good mid-range chip. It isn't as fast as the more expensive chips, but still offers good performance for around £150. Other contenders at this level are the FX 5700 Ultra and the ATI Radeon 9600 Pro. Sub-£100 cards feature chips like the nVidia GeForce FX 5200. This is an extremely slow chip and, although its low £60 price tag is tempting, it's best left to those with little interest in playing games.

- **DirectX** Manufacturers are keen to support DirectX 9.0, the latest version of Microsoft's games programming interface. There are already a few titles available that utilise it but, come summertime, the market should be filling up. If you're focusing on DirectX 9.0 facilities then you shouldn't consider a sub-£100 card. In fact, for decent performance, an nVidia GeForce FX 5900 XT is the cheapest option. • **Memory** Whatever the price, specify no less than 128MB of DDR RAM. More cards are becoming available with 256MB of DDR RAM although, with a few exceptions, current games aren't sophisticated enough to take advantage of the extra 128MB. Many high-end cards will come with 256MB as standard. • **DVI** Although it's now hard to find a new graphics card without a DVI (digital visual interface) connector, make sure yours isn't an exception.

Most cards have a DVI socket in addition to standard RGB, so you can plug in a second monitor and effectively double the workspace in Windows. No mere gimmick, the ability to compare documents and web pages side-by-side is an excellent aid to productivity. • **Video-in** Some graphics cards have a Video-in connection that lets you capture video from camcorders and other digital devices. Video-in is quite unusual - don't confuse it with the far more common Video-out (or TV-out). • **Video/TV-out** You're almost certain to find Video-out (or TV-out) on most cards, so if you fancy hooking up your PC to the TV then you'll have everything you need. Bear in mind, though, that the resolution support offered by a TV is far less than even a basic monitor, so don't expect high-quality viewing.