

Secure Digital

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Speeds [[edit](#)]

There are different speeds of SD card available. The official unit of measurement is the **Speed Class Rating**; an older unit of measurement is the *x* rating.

Speed Class Rating [[edit](#)]

The **Speed Class Rating** is the official unit of speed measurement for SD Cards, defined by the SD Association. The Class number represents a multiple of 8 Mbit/s (1 MB/s), and it measures the minimum sustained write speeds for a card in a fragmented state.^[11]

The following are the ratings of some currently available cards:^[11]

- Class 0 - These cards do not specify performance, which includes all legacy cards prior to class specifications.
- Class 2 - Minimum of 2 MB/s performance. Lowest speed for SDHC cards.
- Class 4 - Minimum of 4 MB/s performance.
- Class 6 - Minimum of 6 MB/s performance.
- Class 10 - Minimum of 10 MB/s performance.

Even though the class ratings are defined by a governing body, like *x* speed ratings, class speed ratings are quoted by the manufacturers but unverified by any independent evaluation process. In applications that require sustained write throughput, such as video recording, the device may not perform satisfactorily if the SD card's class rating falls below a particular speed. For example, a *camcorder* that is designed to record to class 6 media may suffer dropouts or corrupted video on slower media.^[*citation needed*] On slower class cards, digital cameras may experience a lag of several seconds between photo-taking, whilst the camera writes the picture to the card.

Important differences between the Speed Class and the traditional CD-ROM drive speed measurement ("*x*" speed ratings) are that speed class:^[11]

- may be queried by the host device
- defines the *minimum* transfer speed.

Since the class rating is readable by devices, they can issue a warning to the user if the inserted card's reported rating falls below the application's minimum requirement.^[11] On 21 May 2009, **Panasonic** announced new *class 10* SDHC cards, claiming that this new class is "part of SD Card Specification Ver.3.0".^[12] Toshiba also announced cards based on the new 3.0 spec.^[13]

On 1 June 2010, Pretec announced the new Class 16 HD video grade SDXC 64GB card at Computex Taipei 2010.^[14]

x rating [[edit](#)]

The *x* rating is a unit of measurement equal to 1.2 Mbit/s. It is derived from the standard CD-ROM drive speed of 1.2 Mbit/s. Basic cards transfer data up to six times (6*x*) the data rate of the standard CD-ROM speed (7.2 Mbit/s vs 1.2 Mbit/s). The 2.0 specification defines speeds up to 200*x*, but unlike the class rating system, does not mandate that *x*-ratings measure the card's minimum sustained write-speed. So, typically, manufacturers provide *x*-ratings based on maximum read/write speeds. Furthermore, for most cards, the maximum *read* speed is typically faster than its maximum *write* speed, leading some manufacturers to use read-speed as the *x*-rating measurement. Other vendors, such as **Kingston**, use write-speed.^[15]

This table lists common ratings and minimum transfer rates.

Rating	Write Speed (Mbit/s)	Write Speed (MB/s)
6 <i>x</i>	7.2	
10 <i>x</i>	12.0	
13<i>x</i>	16.0	2
26<i>x</i>	32.0	4
32 <i>x</i>	38.4	5
40<i>x</i>	48.0	6
66<i>x</i>	80.0	10
100 <i>x</i>	120.0	15
133 <i>x</i>	160.0	20
150 <i>x</i>	180.0	22
200 <i>x</i>	240.0	30
266 <i>x</i>	320.0	40
300 <i>x</i>	360.0	45
400 <i>x</i>	480.0	60
600 <i>x</i>	720.0	90