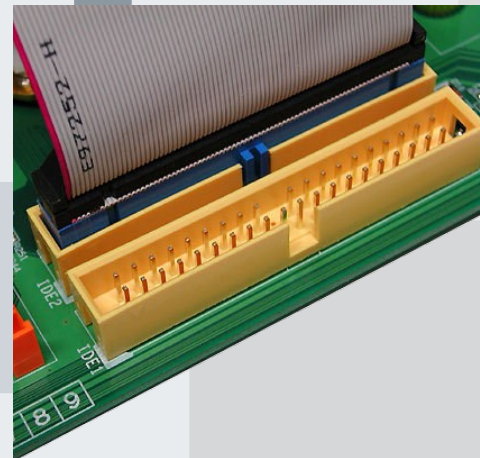
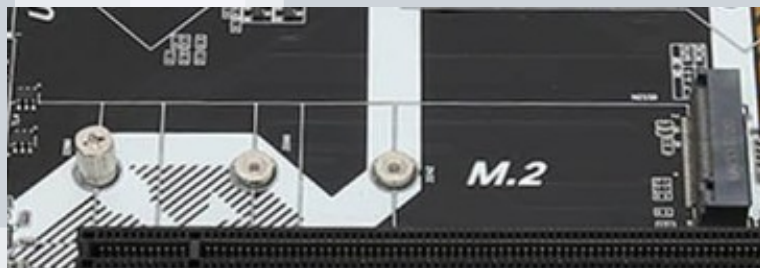
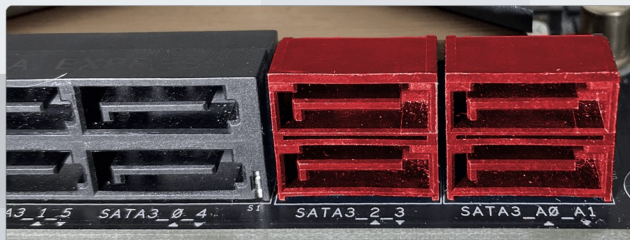
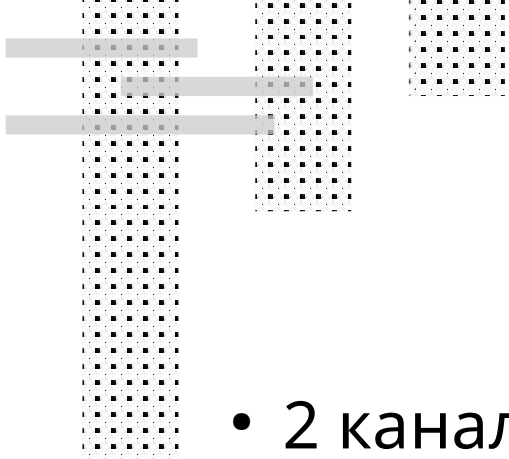




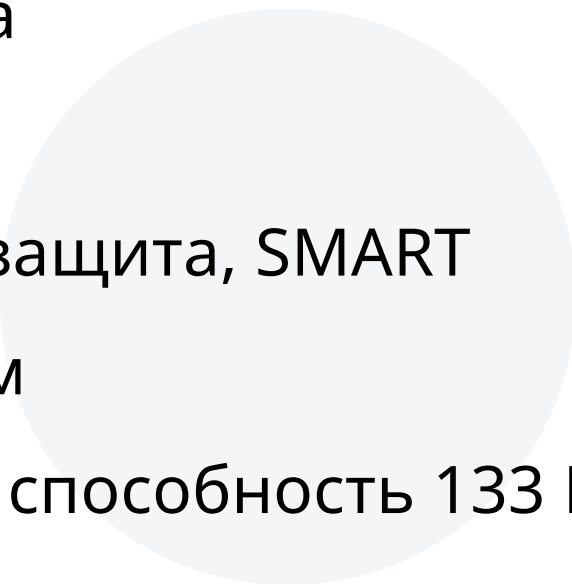
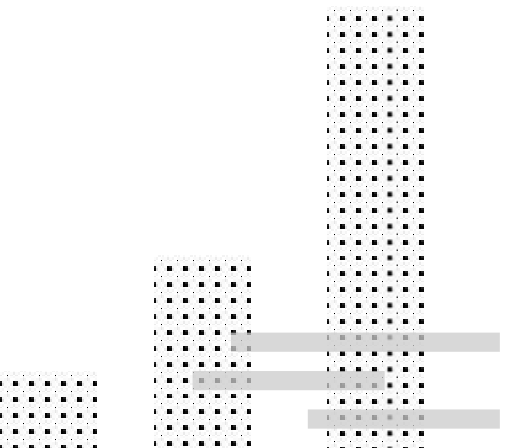
Интерфейсы подключения накопителей

Торгашин Р.Г.

14.11.24



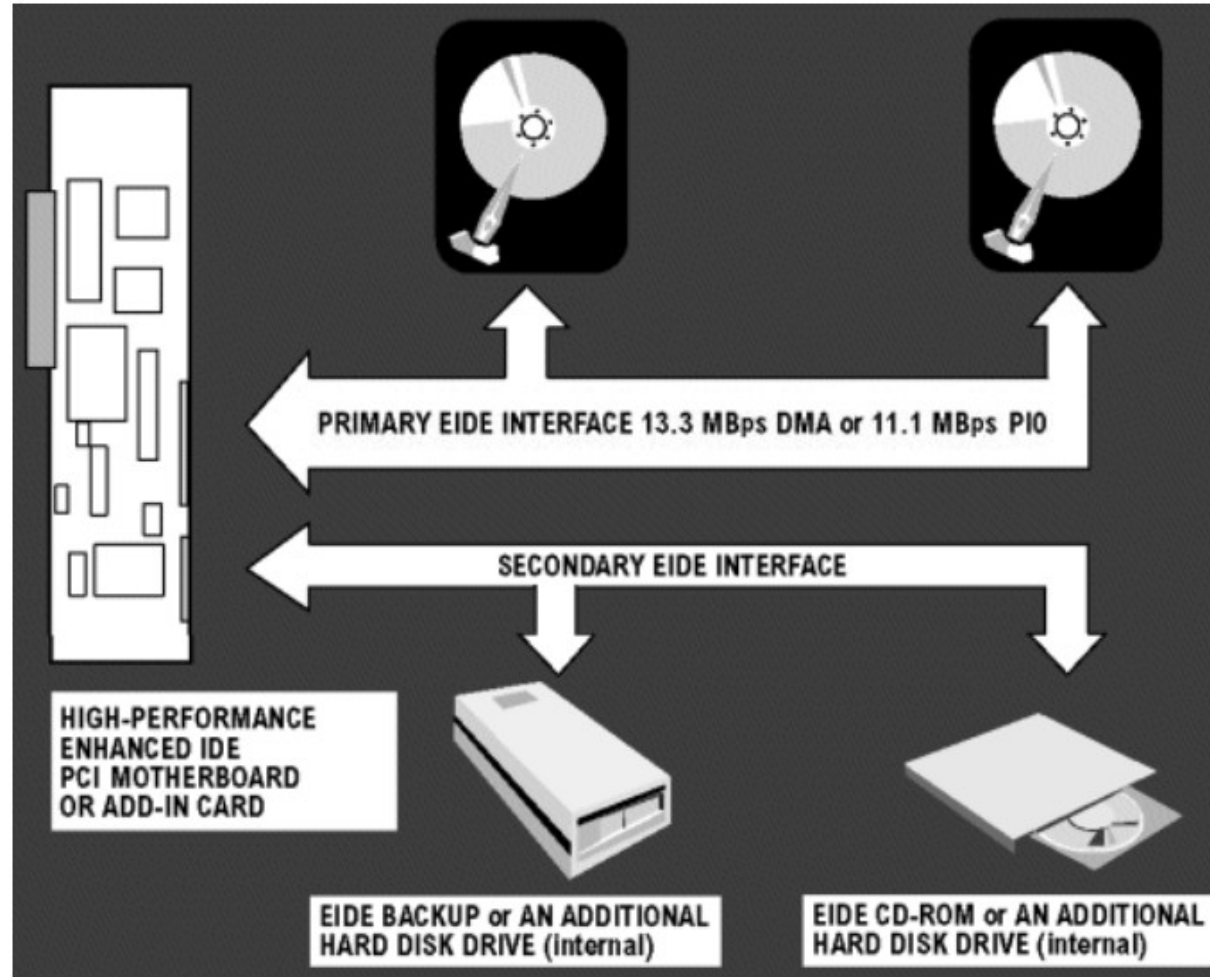
PATA (Parallel ATA, IDE)

- 2 канала
 - 4 устройства
 - DMA
 - Парольная защита, SMART
 - Кабель 46 см
 - Пропускная способность 133 Мб/с
- 
- 

PATA

(Parallel ATA, IDE)

Стандарт	Популярные названия	Режимы передачи (Mb/s)	Свойства
ATA/ATAPI-4	ATA-4, Ultra ATA/33	UltraDMA 2 (33)	40-wires
ATA/ATAPI-5	ATA-5, Ultra ATA/66	UltraDMA 4 (66.7)	80-wires
ATA/ATAPI-6	ATA-6, Ultra ATA/100	UDMA 5 (100)	80-wires
ATA/ATAPI-7	ATA-7, Ultra ATA/133	UDMA 6 (133) SATA/150	SATA 1.0

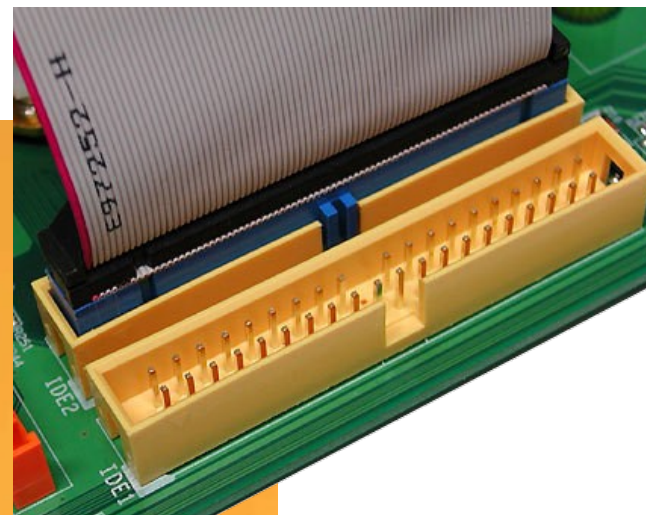
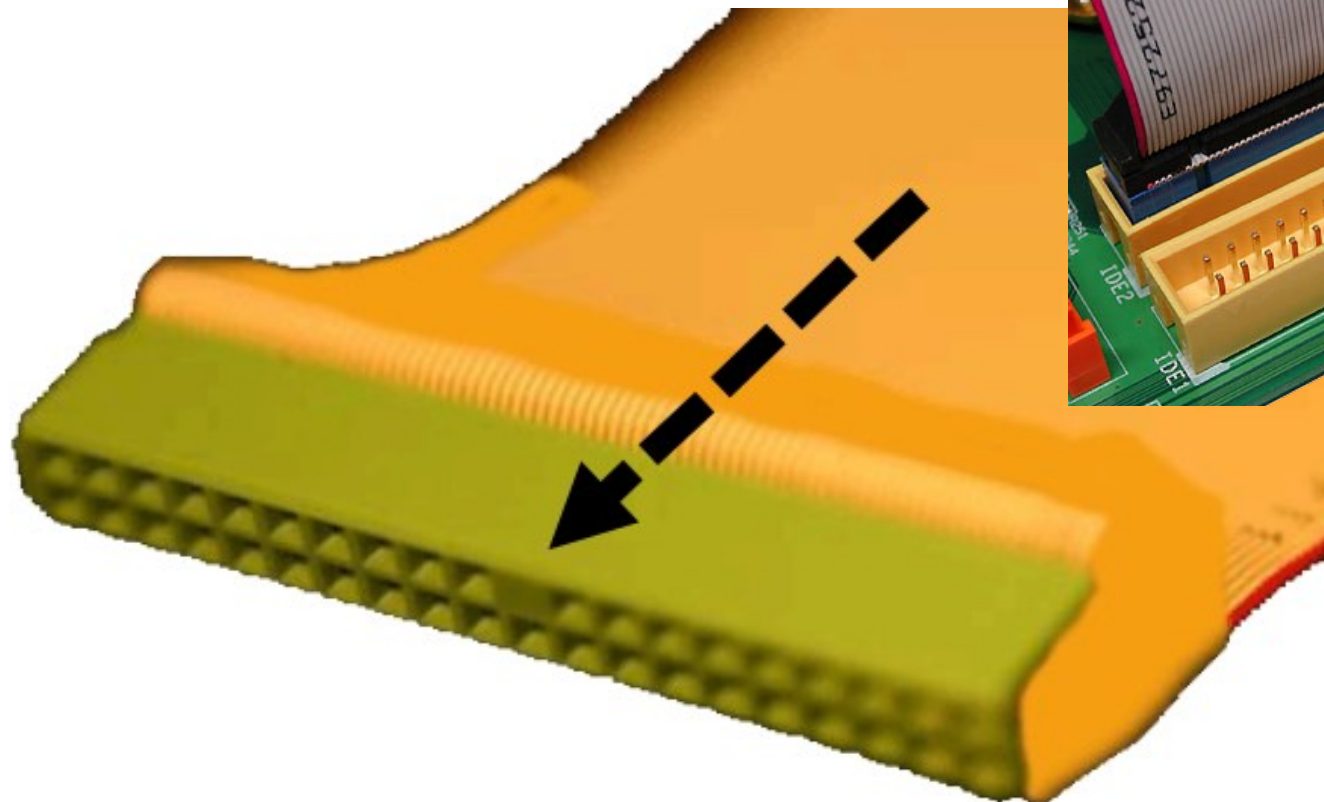


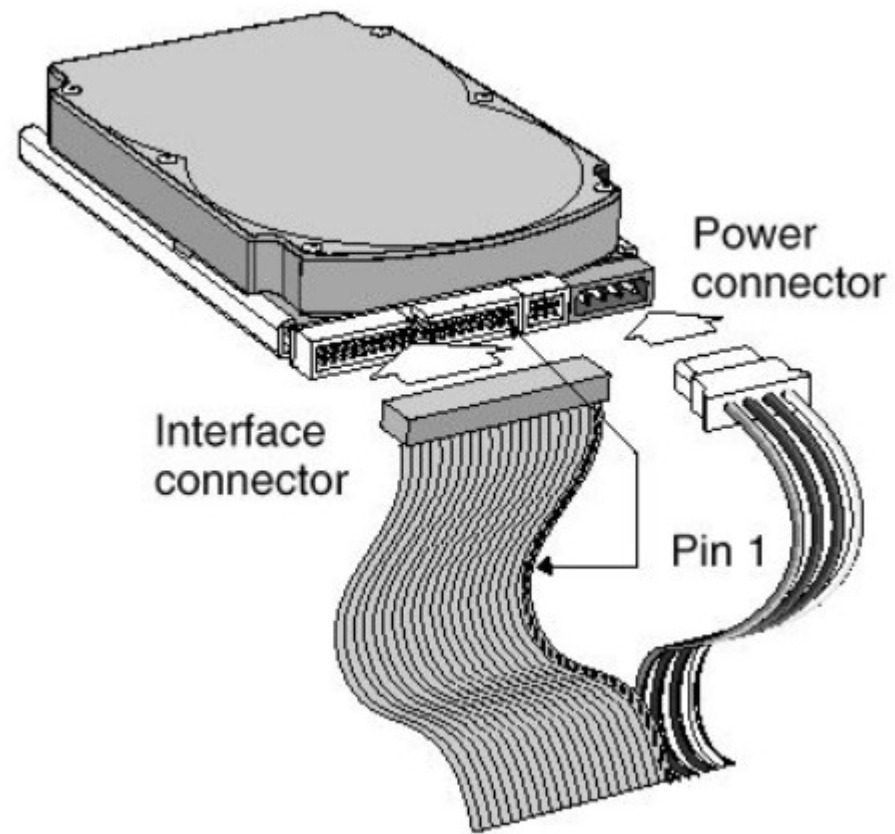


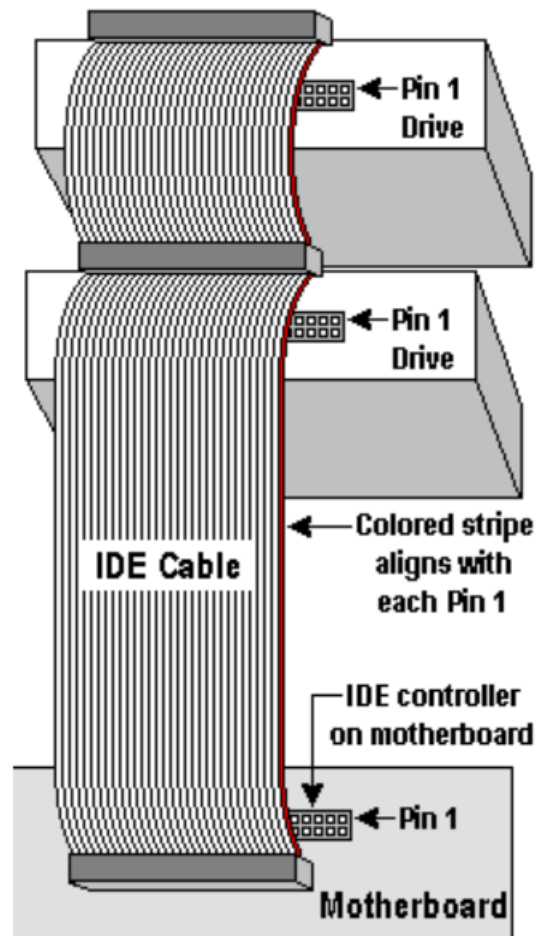
 **DEFINUM**

80 wire

40 wire



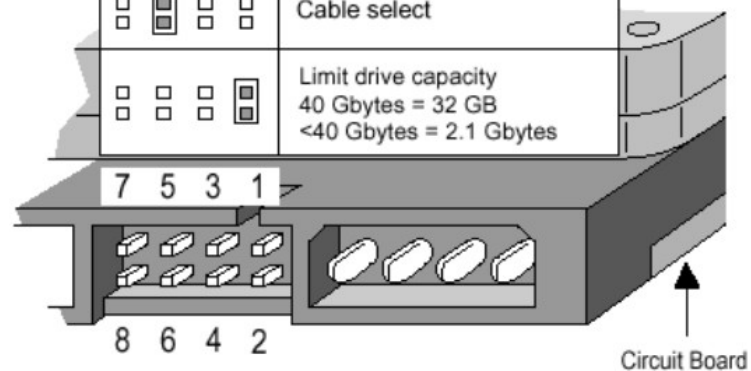


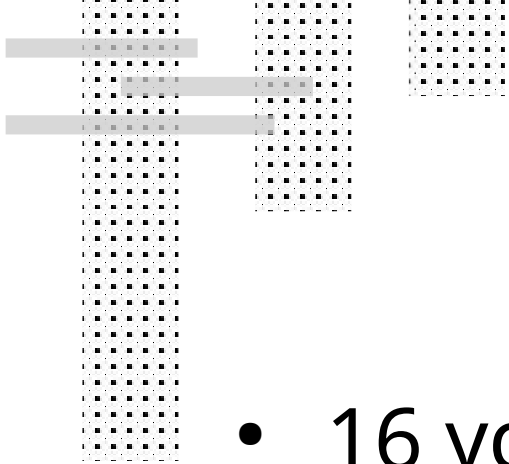




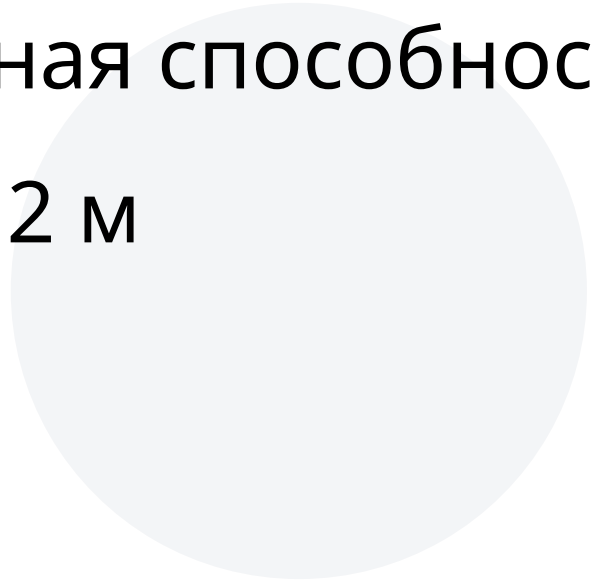
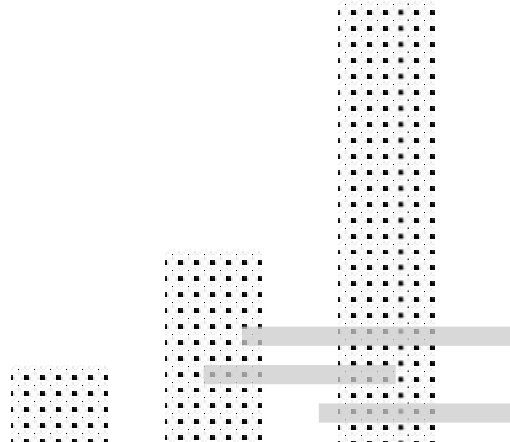
Options jumper block

☒ ☐ ☐ ☐	Master or single drive
☐ ☐ ☐ ☐	Drive is slave
☒ ☒ ☐ ☐	Master with non ATA-compatible slave
☐ ☒ ☐ ☐	Cable select
☐ ☐ ☐ ☒	Limit drive capacity 40 Gbytes = 32 GB <40 Gbytes = 2.1 Gbytes



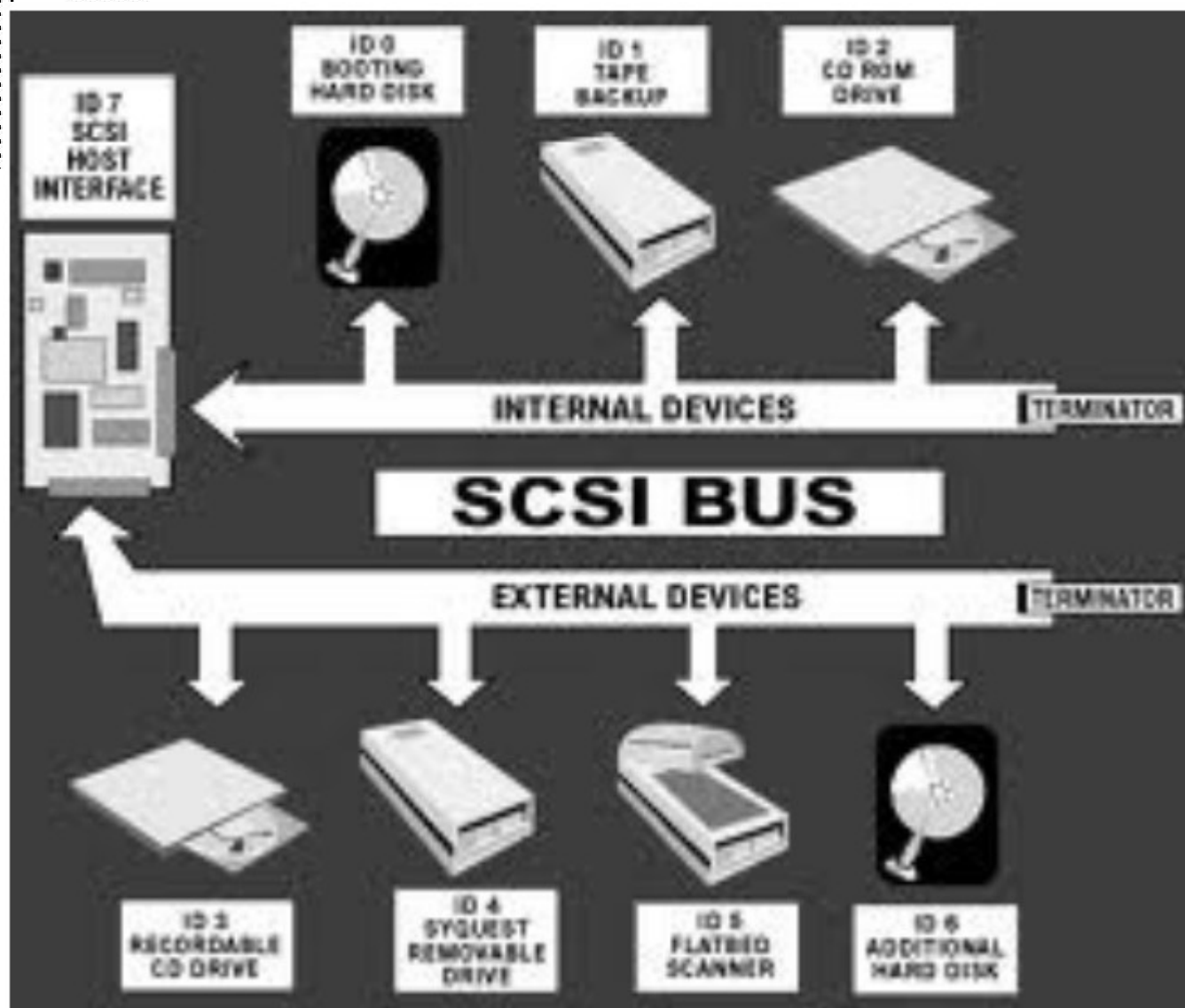


SCSI

- 16 устройств
 - Пропускная способность 640 Мб/с
 - Кабель 12 м
- 
- 

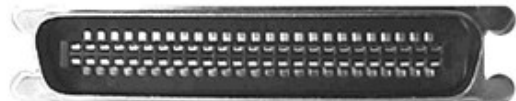
SCSI

Наименование	Разрядность шины	Частота шины	Пропускная способность	Максимальная длина кабеля	Максимальное количество устройств
SCSI	8 бит	5 МГц	5 МБайт/сек	6 м (25 м с HVD)	8
Fast SCSI	8 бит	10 МГц	10 МБайт/сек	3 м (25 м с HVD)	8
Wide SCSI	16 бит	10 МГц	20 МБайт/сек	3 м (25 м с HVD)	16
Ultra SCSI	8 бит	20 МГц	20 МБайт/сек	1,5—3 м (25 м с HVD)	4—8
Ultra Wide SCSI	16 бит	20 МГц	40 МБайт/сек	1,5—3 м (25 м с HVD)	4—16
Ultra2 SCSI	8 бит	40 МГц	40 МБайт/сек	12 м (25 м с HVD)	8
Ultra2 Wide SCSI	16 бит	40 МГц	80 МБайт/сек	12 м (25 м с HVD)	16
Ultra3 SCSI	16 бит	40 МГц DDR	160 МБайт/сек	12 м	16
Ultra-320 SCSI	16 бит	80 МГц DDR	320 МБайт/сек	12 м	16
Ultra-640 SCSI	16 бит	160 МГц DDR	640 МБайт/сек		16





DB25



CENTRONICS 50



IDC50 - SCSI 1



IDC50 - SCSI 1



HD50 - SCSI 2



HD68 - SCSI 3



HD68 - SCSI 3



VHDCI 68 - SCSI 4

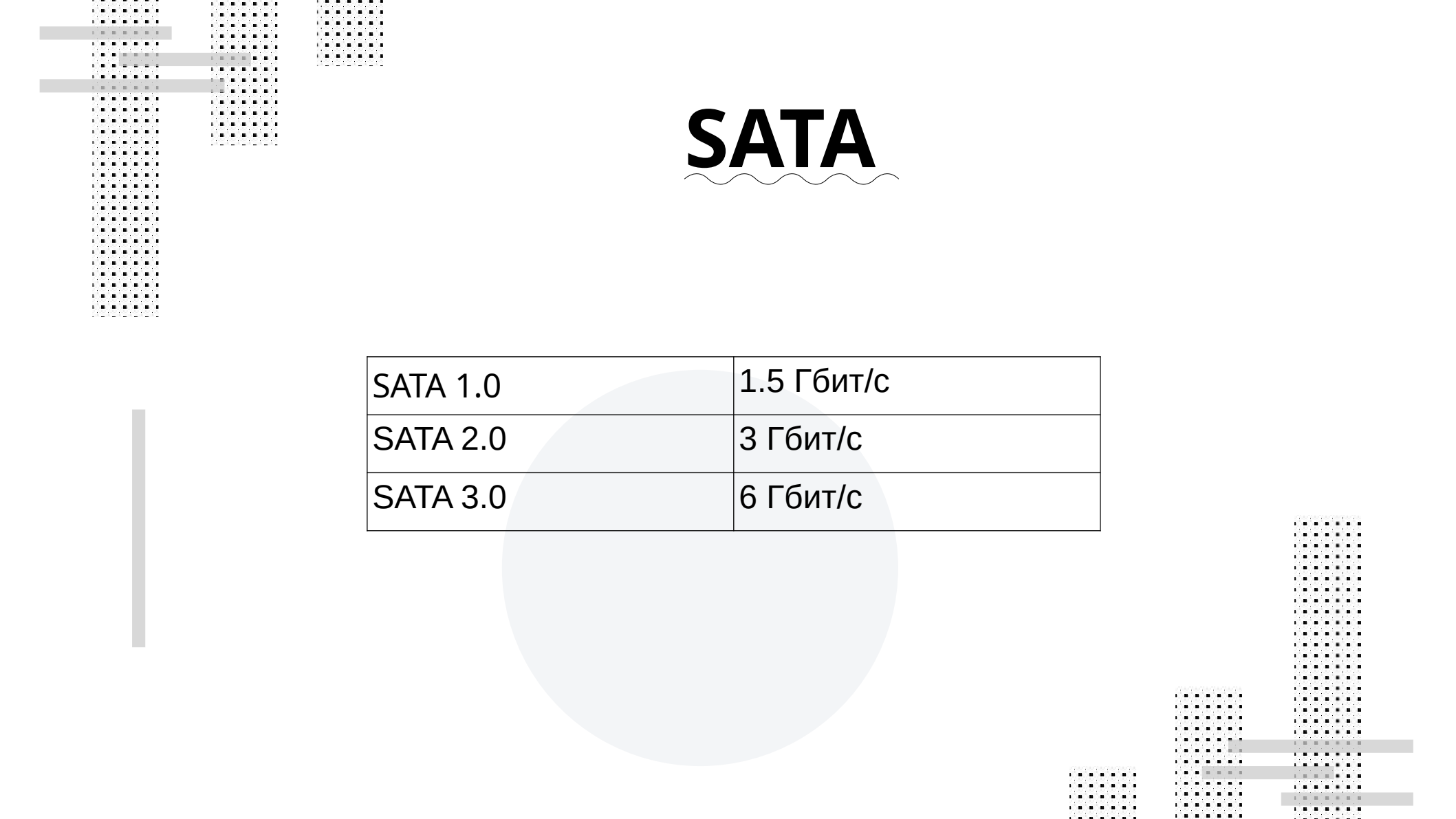


SCSI



SATA

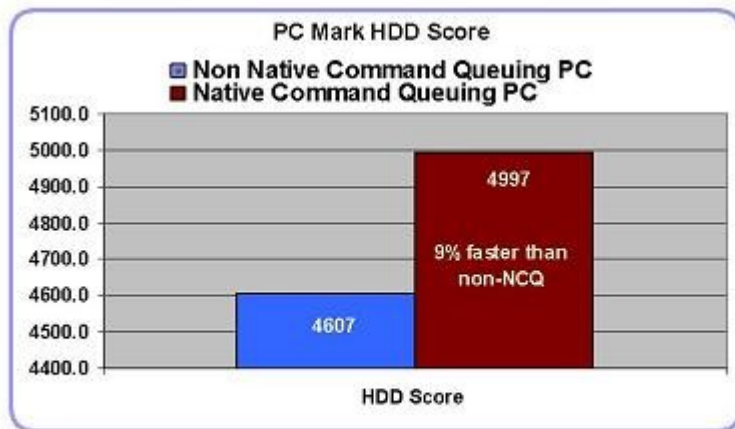
- Последовательная
- Пропускная способность до 6 Гб/с
- Кабель 1 м
- Устройств 1 на кабель (15 с мультиплексором)



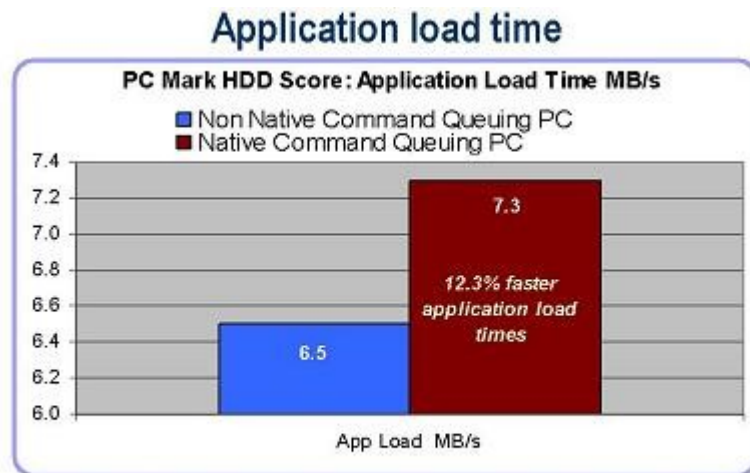
SATA

SATA 1.0	1.5 Гбит/с
SATA 2.0	3 Гбит/с
SATA 3.0	6 Гбит/с

NCQ



- NCQ gives you 9% faster performance in generic PC applications/environments over non-NCQ systems



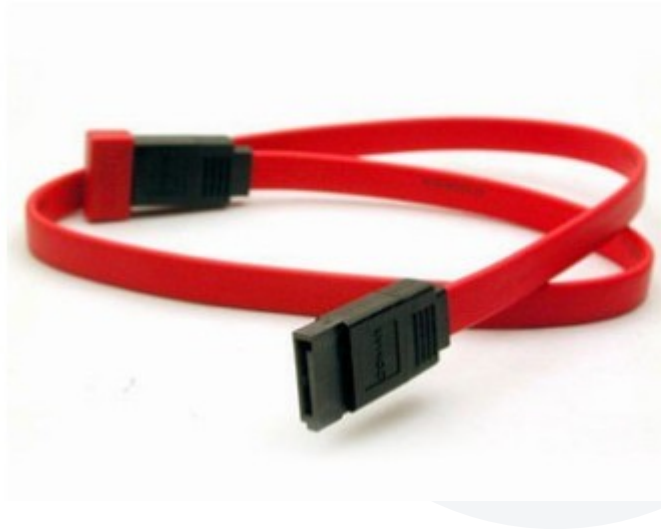
- NCQ gives you 12.3% faster performance in generic PC application load times over non-NCQ systems

RAID



SATA

Pin #	Function
1	Ground
2	A+ (Transmit)
3	A- (Transmit)
4	Ground
5	B- (Receive)
6	B+ (Receive)
7	Ground
—	Key

A close-up photograph of a SATA connector. The connector is black plastic with a red SATA-to-IDE adapter cable plugged into it. The word "SATA" is embossed on the black plastic housing of the connector.

SATA



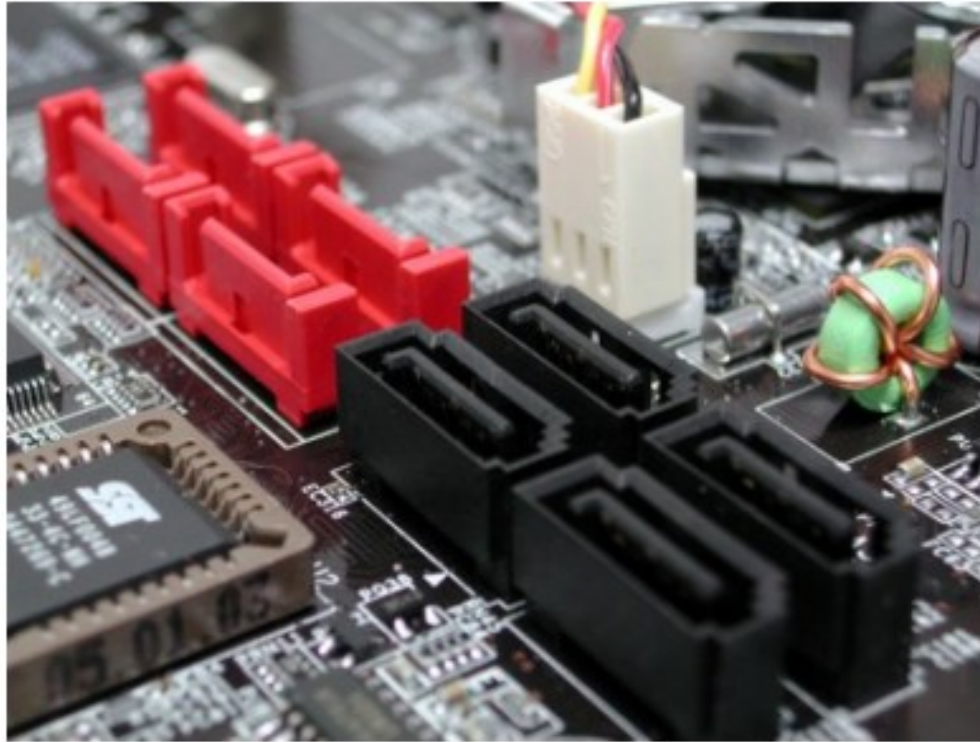
SATA



Pin #	Mating	Function
—	—	Key
1	3rd	3.3 V
2	3rd	
3	2nd	
4	1st	Ground
5	2nd	
6	2nd	
7	2nd	5 V
8	3rd	
9	3rd	
10	2nd	Ground
11	3rd	Staggered spinup/activity
12	1st	Ground
13	2nd	12 V
14	3rd	
15	3rd	



SATA



SATA



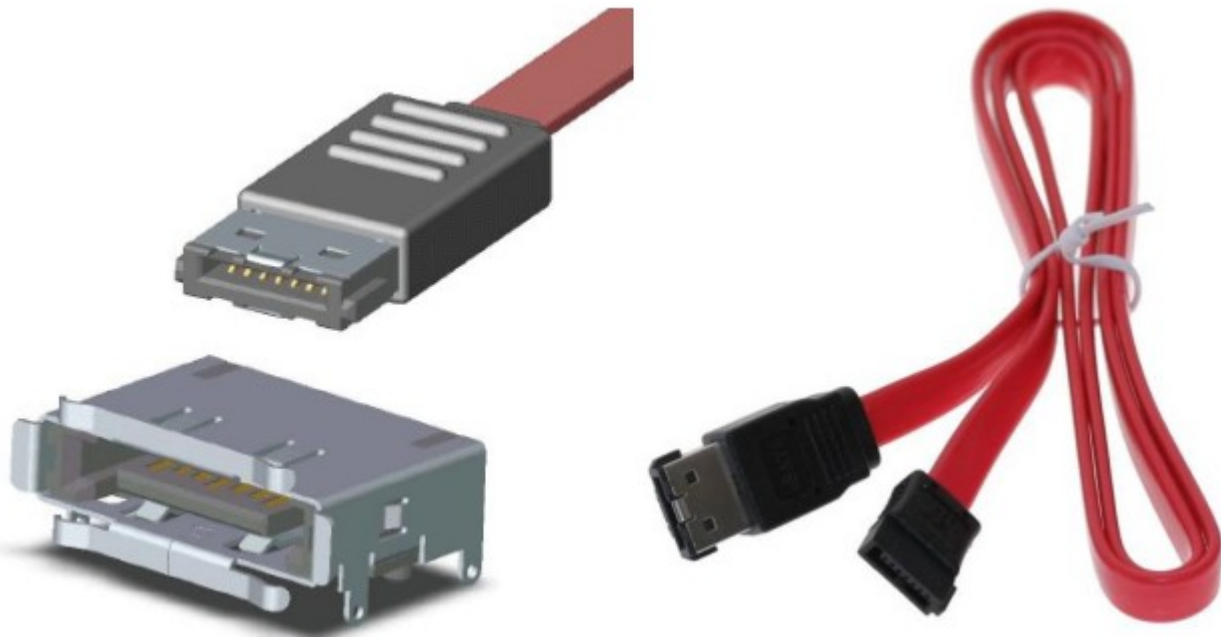
SATA



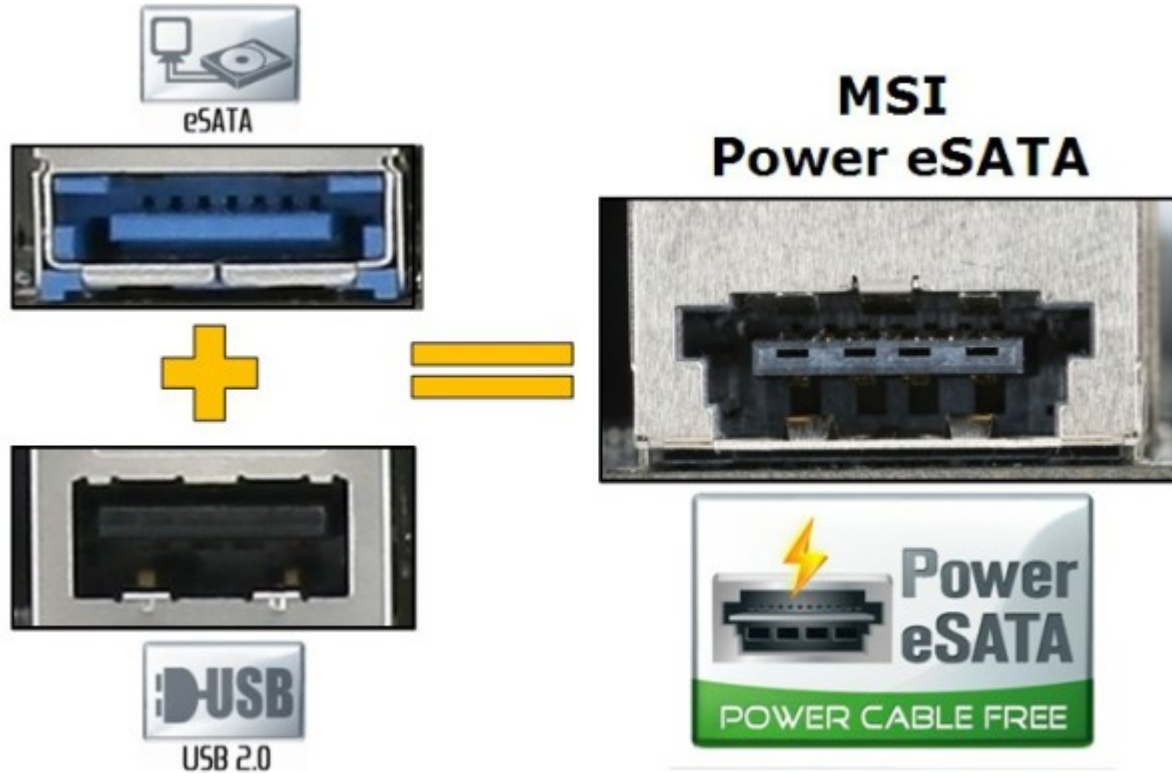
SATA



eSATA



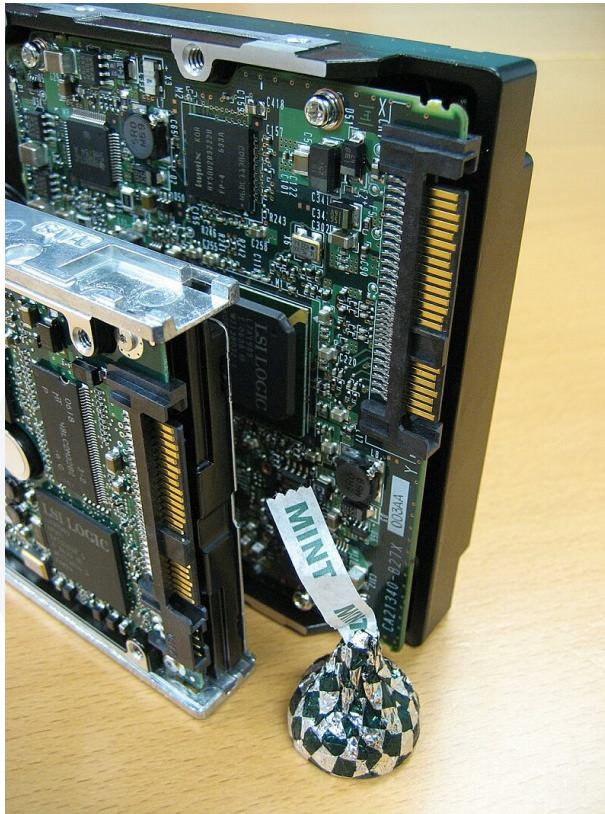
Power eSATA



SAS

- Последовательная
- Пропускная способность до 24 Гб/с
- Кабель 10м для пассивного медного, 25 м для активного медного, 100м оптика
- Устройств до 4

SAS



SAS



SFF-8482

1 линк



SFF-8484



SFF-8470



SFF-8087



SFF-8088



SFF-8644



SFF-8643

SAS



**HP DL360 Gen9 SFF Embedded SATA
Cable**

M.2



M.2 NVMe SSD



M.2 SATA SSDs



mSATA SSD

M.2

6 Kontakte wird



Socket "Socket" and "Socket" connector

5 Kontakte wird



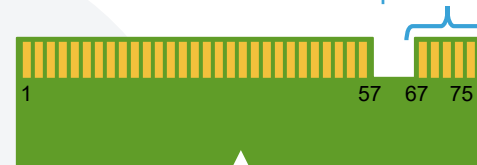
Socket "Socket" and "Socket" connector

6 Kontakte wird



Socket "Socket" and "Socket" connector

5 Kontakte wird



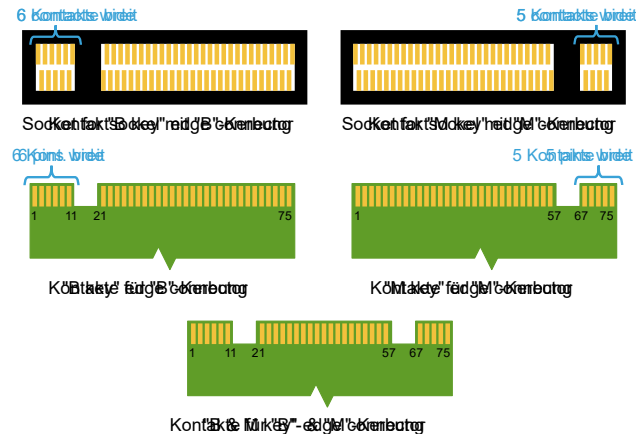
Socket "Socket" and "Socket" connector



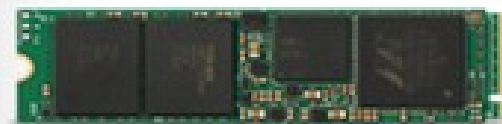
Socket "Socket" and "Socket" connector

M.2

Ключ	Разрезы	Интерфейсы
A	8-15	PCIe ×1, USB 2.0, I ² C and DP ×4
B	12-19	PCIe ×2, SATA, USB 2.0 и 3.0, Звук, PCM, IUM, SSIC и I ² C
E	24-31	PCIe ×1, USB 2.0, I ² C, SDIO, UART и PCM
F	28-35	«Future Memory Interface» (FMI)
G	39-46	«Generic» (не используется в спецификации M.2)
M	59-66	PCIe ×4 и SATA

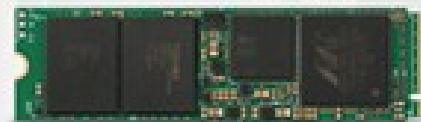


M.2



22110

22 MM x 110 MM



2280

22 MM x 80 MM



2260

22 MM x 60 MM



2242

22 MM x 42 MM



2230

22 MM x 30 MM

M.2

