

HDMI Explained

CABLE EDU

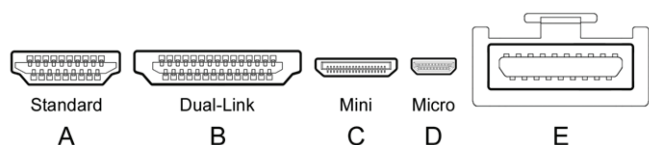


What is HDMI?

High-Definition Multimedia Interface (**HDMI**), is a standard for simultaneously transmitting digital video and audio from a source, such as a computer or TV cable box, to a computer monitor, TV or projector. Originally developed by a consortium of electronics manufacturers, it has been widely adopted with almost all televisions and computer monitors supporting the interface.

Ports and Connectors

Although most HDMI cables use the Type A (**Standard**) connector, Type C (**Mini**) and Type D (**Micro**) also exist for applications that call for a smaller form factor. Type B (**Dual Link**) was developed for very high resolution displays, but was never fully adopted. Type E is intended for automotive and industrial applications.



Active Optical vs. Active Chip vs. Passive HDMI Cables

A passive HDMI cable is a simple cable assembly with an HDMI connector at each end, and they have a limited range. Active cables on the other hand include a signal booster that enables video and audio to be transmitted over longer distances. Active cables sometimes require a power supply. Active optical cables are fiber optic cables with optoelectronic modules in the connector heads that convert electrical signals to light. This allows for much thinner cables and far greater cable lengths.

Display Stream Compression (DSC)

Beginning with HDMI 2.1 cables, DSC 1.2a is now supported. DSC is a visually lossless compression technique developed by the Video Electronics Standards Association (**VESA**) for use with displays to achieve larger resolutions at higher refresh rates. HDMI 2.1, for example, is only rated for resolutions up to **4K120Hz** and **8K60Hz**, but with DSC HDMI 2.1 cables can achieve resolutions up to **8K120Hz** and even **10K** with no loss in perceived visual quality.

HDMI Versions and Standards

SPECIFICATION	YEAR	VIDEO SUPPORT			AUDIO SUPPORT	
		MAX RESOLUTION	REFRESH RATE*	MAX DATA RATE		
HDMI 1.0	2002	1080P	@ 60Hz	3.96 Gbps	NO	8 Audio Ch.
HDMI 1.1 / 1.2	2005	1440P	@ 30Hz	3.96 Gbps	NO	DVD-Audio, One-Bit Audio
HDMI 1.3 / 1.4	2009	4K (2160P)	@ 60Hz	8.16 Gbps	NO	ARC, Dolby TrueHD, DTS-HD
HDMI 2.0	2013	5K (2880P)	@ 30Hz	14.4 Gbps	YES	HE-AAC, DRA, 32 Audio Ch.
HDMI 2.1	2017	8K (4320P)	@ 60Hz	42.6 Gbps	YES	eARC

*Higher resolutions and refresh rates are possible using Display Stream Compression (DSC)