Universal Element

The U element is a universal element for extending the number of elements that SPICE can handle. The element is determined by the model type. In some cases model parameters indicate further refinement.

Since the SPICE U element is used to specify many different kinds of physical elements there is no common form for it. Each physical element is distinguished by the type of the model it refers to. The format and description of each element is given in the model description as indicated in the following table. The index is used in this manual to uniquely identify the various elements.

Model Type

Model	Index	Description
STRUC	STRUC	Geometric coupled, lossy planar transmission line SUPERSPICE only.
U	U311	Geometric coupled planar transmission line (up to 5 lines) Identifying Model Parameters: `LEVEL=3 EVEL=1 PVEL=1` HSPICE only.
U	U312	Geometric coaxial cable Identifying Model Parameters: `LEVEL=3 EVEL=1 PVEL=2` HSPICE only.
U	32	General transmission line (up to 5 lines) defined by precomputed parameters. Identifying Model Parameters: `LEVEL=3 EVEL=2` HSPICE only.
U	U34	General transmission line (up to 5 lines) defined by measurements. Identifying Model Parameters: `LEVEL=3 EVEL=3` HSPICE only.
U	U4	Digital output element Identifying Model Parameter: `LEVEL=4` HSPICE only.
U	U5	Digital input element Identifying Model Parameter: `LEVEL=5` HSPICE only.

Model	Index	Description
UDLY	UDLY	Delay Line PSPICE only.
UEFF	UEFF	Edge-Triggered Flip-Flop PSPICE only.
UGATE	UGATE	Standard Gate Model Form PSPICE only.
UGFF	UGFF	Gated Flip-Flop PSPICE only.
UIO	UIO	IO Model PSPICE only.
URC	URC	Lossy RC transmission line SPICE3 only.
USUHD	USUHD	Setup and Hold Checker PSPICE only.
UTGATE	UTGATE	Tri-State Gate PSPICE only.
UWDTH	UWDTH	Pulse-Width Checker PSPICE only.

Note

1. One of the problems with SPICE is that the first letter of an element's name is used to determine the type of an element. One consequence of this is that there can only be 26 elements — one for each letter of the alphabet. SPICE2G6The original version of SPICE from which all subsequent versions of SPICE have been developed had less than 26 elements and so this was not a problem. With the addition of new element types several of the originally unised letters were used and a universal element, the U element, introduced to handle even more. The U element is used to represent many different type of elements such as lossy transmission lines and digital devices. All of the U elements refer to models and the model name, and sometimes model parameters, used to indicate the actual element referred to.

2. There is no equivalent element in *f*REEDA™.