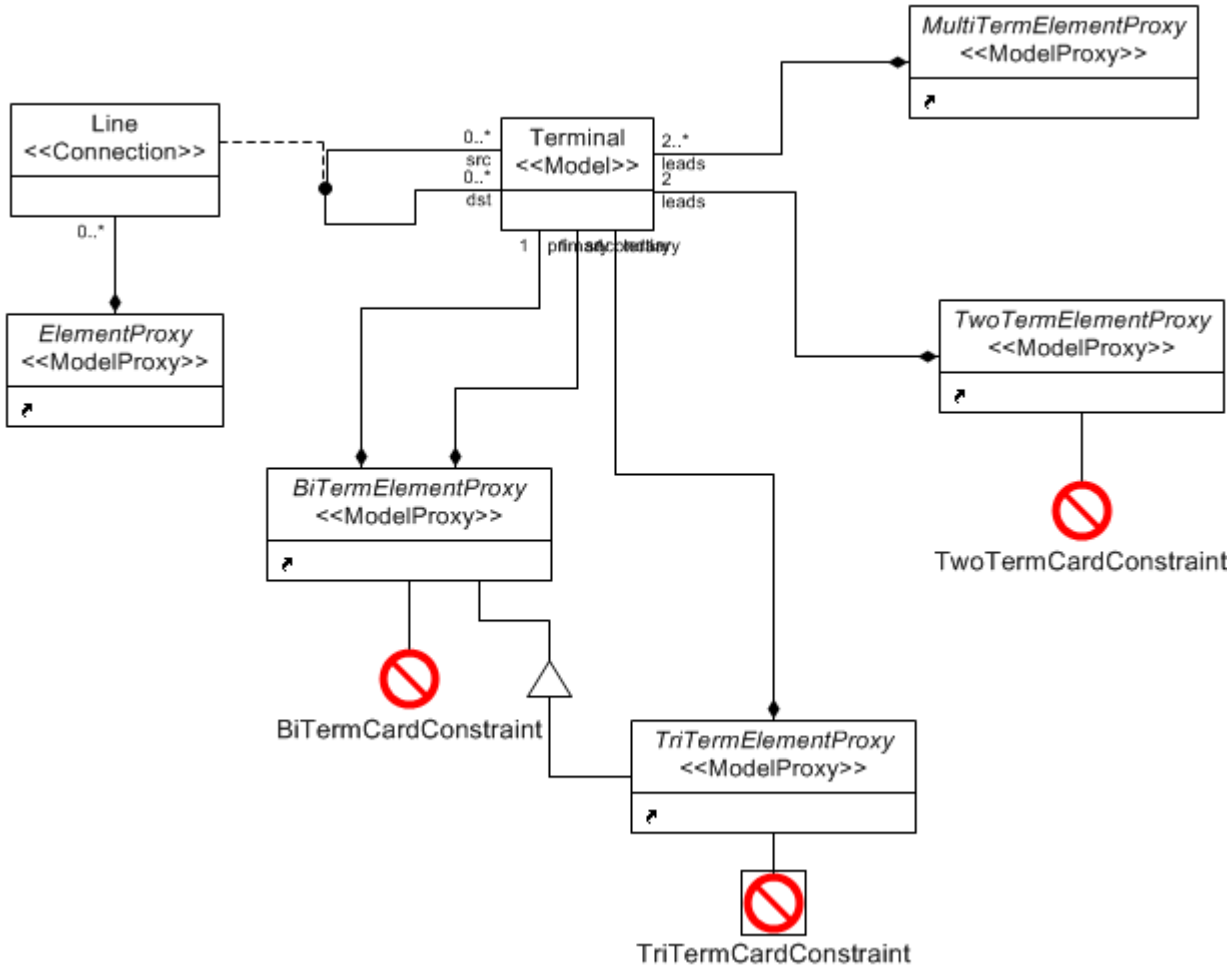
Assignment:

- Design and specify a small modeling language using MetaGME.
- Create a modeling environment in GME.

Domain:

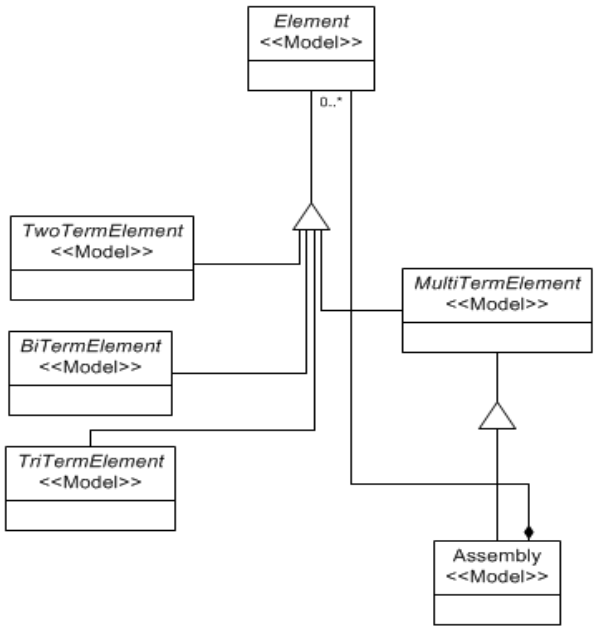
For the purposes of this project a passive electrical circuit consisting of simple passive electronic elements. Specifically passive elements do not generate power. Such a circuit consists of resistors, capacitors, inductors, some simple solid state elements and their assemblies. This modeling language will take as its target audience the ng-spice circuit simulator, http://ngspice.sourceforge.net/.
With ng-spice as the audience the modeling language will also allow for some active elements, namely voltage and current sources.



Elements contain and are connected to other elements through terminals. These elements expose bare their terminals as ports.

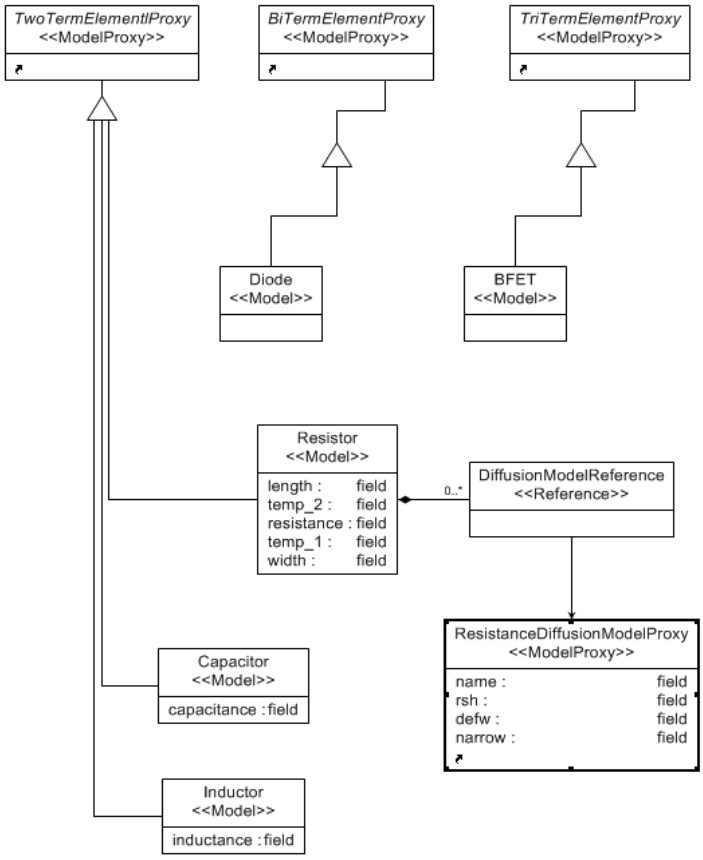
Fundamental elements have a fixed number of terminals. I noticed that the multiplicity constraints applied in the meta-model do not seem to be realized in the generated paradigm. If a constraint is to be

applied in the paradigm it must be written as an OCL constraint. It may be possible to write an OCL constraint which checks that the cardinality mentioned on the graph is verified. I implemented



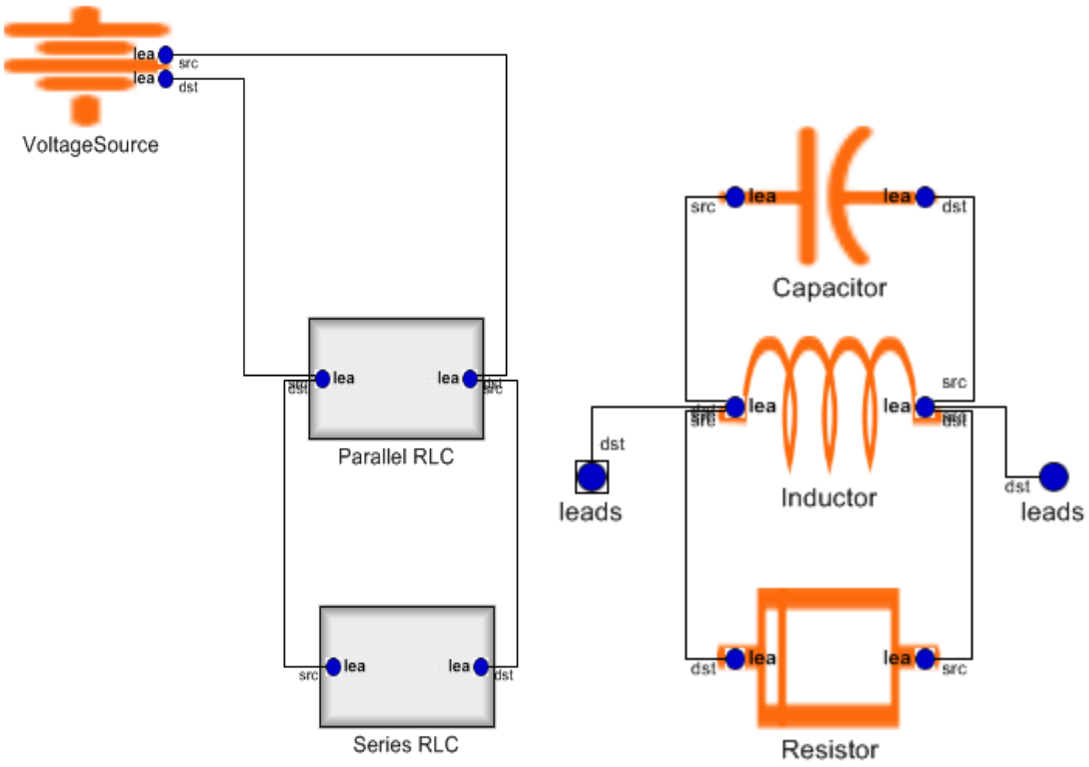
constraints which were redundant on the graph multiplicities.

The primary objects found in the "Root Folder" are of model type "Assembly". An assembly aggregates simpler elements.
Elements are differentiated by the number and type of terminals they contain.



In order to demonstrate the use of references I have implemented a simple ng-spice resistor diffusion model. These resistor models are then referenced by resistors as described in ng-spice.

The “Physics Model List” is the second element which may be included in the “Root Folder”.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