My KiCad Guidelines Volume 1: Symbols

My KiCad Guidelines Volume 1: Symbols

Table of Contents

1   Introduction

This Guideline describes Symbols for Eeschema based on IEEE Standards (IEEE Std 315-1975, ANSI/IEEE Std 315A-1986) and IEC 60617.

The KiCad term "component" is replaced by the term "Symbol".

1.1   Scope

This Guideline covers Library Structure, naming conventions, Field, Pin and line dimensions and individual Symbol dimensions.

1.2   Motivation

The motivations for the guide are:

1) How to organise libraries.

2) Ensure that Symbol sizes are determined by pin number and not be larger than necessary.

3) Ensure text sizes are common to at least Symbols of the same type (Discrete, IC, Electromechanical).

4) Ensure Pin lengths are as short as possible.

5) Ensure Symbols of the same type are a uniform size and shape.

6) Keeping a record of how the Symbols were created.

1.3   Audience

The Guideline is intended to only offer ideas about Symbol creation.

2 Library Structure

2.1 Location (Windows)

The libraries are located outside of the "Program Files" directory. e.g C:\ApplicationFiles\KiCad\Libraries.

"Components" or "Symbols" are located in C:\ApplicationFiles\KiCad\Libraries\Symbol.

General documentation is located in C:\ApplicationFiles\KiCad\Libraries\Documents.

E.g:
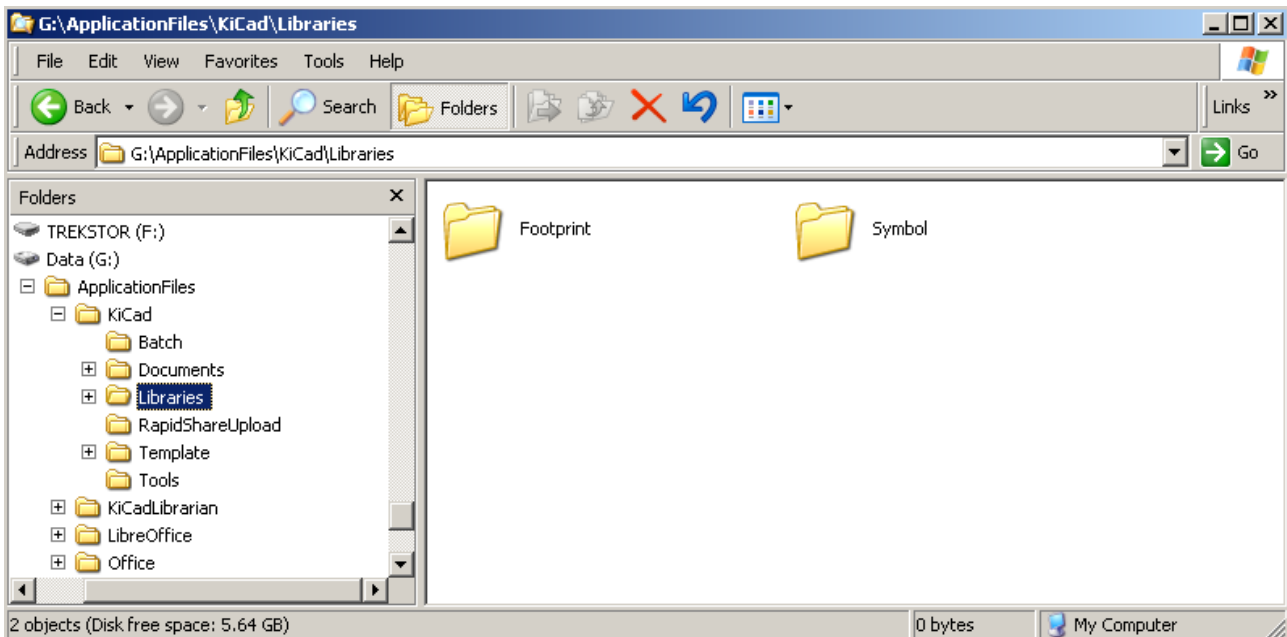
2.2 Location (Linux)

-

2.3 Eeschema Libraries

2.3.1 IEEE Std 315-1975 Symbol Library Naming Convention

Components or Symbols that can be designated according to IEEE Std 315-1975 (Clause 22) are contained in files located in folders using IEEE Std 315-1975 conventions, under C:\ApplicationFiles\KiCad\Libraries\Symbol\IEEE_315:

Folder Name [Class]	Description	Filename(s) [*.lib, *.dcm]	Group
A	Separable Assembly (incl. electronic divider, electronic function generator, electronic multiplier, facsimile set, field-polarization amplitude modulator, field-polarization rotator, general circuit element, gyroscope, integrator, positional servomechanism, sensor (transducer to electric power, separable assembly, separable subassembly, telephone set, telephone station, teleprinter, teletypewriter)	A-separableAssembly	CA/AF
AR	Amplifier Repeater	AR-amplifier AR-repeater	CA CA
AT	Attenuator Isolator Bolometer Capacitive Termination Inductive Termination Resistive Termination Pad	AT-attenuator AT-isolator AT-bolometer AT-capacitiveTermination AT-inductiveTermination AT-resistiveTermination AT-pad	FD SD FD FD FD FD FD
B	Blower Generator Motor Synchro	B-blower B-generator B-motor B-synchro	RM RM RM RM
BT	Battery, Cell Barrier Photocell, Blocking Layer Cell, Photovoltaic Transducer, Solar Cell	BT-battery BT-photovoltaic	FD FD
C	Non-Polarized Capacitor Polarized Capacitor Miscellaneous Capacitor (incl Capacitor Bushing, Variable Capacitor, Shielded Capacitor, Differential Capacitor, Phase Shifter Capacitor, Split-Stator Capacitor, Feed-Through Capacitor) Capacitor Network	C-capacitorNonPolarized C-capacitorPolarized C-capacitorMisc C-capacitorNetwork	FD FD FD FD
CB	Circuit Breaker Network Protector	CB-circuitBreaker CB-networkProtector	CP CP
CP	Connector Adapter Coupling Junction	CP-connectorAdapter CP-coupling CP-junction	CP HF HF
D	Diode (incl. Rectifier, Varactor, Small Signal, Photosensitive, Bi-directional, Zener, Schottky, PIN, Tunnel, Step Recovery)	D-diode	SD
DC	Directional Coupler	DC-directionalCoupler	HF
DL	Delay Function (incl. Delay Line, Slow Wave Structure)	DL-delayFunction	FD
DS	Alphanumeric Display Device LED General Light Source Visual Signalling Device (incl. Electrically Restored Drop, Annunciator, Manually Restored Drop, Lamp, Indicator)	DS-alphanumericDisplay DS-lightEmittingDiode DS-generalLightSource DS-visualSignallingDevice	LVSD LVSD LVSD LVSD
E	Aluminium Cell Antenna Armature Binding Post Cable Termination Carbon Block Circuit Terminal Conductivity Cell	E-aluminiumCell E-antenna E-armature E-bindingPost E-cableTermination E-carbonBlock E-circuitTerminal E-conductivityCell	CP FD RM TC CSCR CP TC ET

	Electrical Contact, Electrical Contact Brush	E-electricalContact	CSCR
	Electrical Shield	E-electricalShield	QS
	Electrolytic Cell	E-electrolyticCell	CP
	Ferrite Bead Rings	E-ferriteBeadRings	HF
	Film Element	E-filmElement	CP
	Gap	E-gap	CP
	Hall Element	E-hallElement	SD
	Igniter Gap	E-igniterGap	FD
	Insulator	E-insulator	-
	Lightning Arrester	E-lightningArrester	CP
	Magnetic Core	E-magneticCore	TIW
	Miscellaneous Electrical Part	E-miscellaneousElectricalPart	-
	Optical Shield	E-opticalShield	QS
	Permanent Magnet	E-permanentMagnet	FD
	Rotary Joint	E-rotaryJoint	HF
	Short Circuit	E-shortCircuit	TP
	Spark Gap	E-sparkGap	FD
	Splice	E-splice	TP
	Telephone Protector, Telephone Protector Block	E-telephoneProtector	CP
	Terminal	E-terminal	TC
	Valve Element	E-valveElement	-
	Vibrating Reed	E-vibratingReed	CSCR
EQ	Equalizer, Equalizing Network	EQ-equalizer	CA
F	Fuse, Fuse Cutout	F-fuse	CP
FL	Filter	FL-filter	HF/CA
G	Oscillator	G-oscillator	FD
	Electronic Chopper	G-electronicChopper	CA
	Ignition Magneto	G-ignitionMagneto	-
	Interrupter Vibrator	G-interrupterVibrator	CSCR
	Rotating Amplifier	G-rotatingAmplifier	RM
	Telephone Magneto	G-telephoneMagneto	RM
H	Hardware	H-hardware	-
HP	Hydraulic Part	HP-hydraulicPart	-
HR	Heater	HR-heater	ET
	Heating Lamp	HR-heatingLamp	-
	Heating Resistor	HR-heatingResistor	FD
	Infrared Lamp	HR-infraredLamp	LVSD
	Thermomechanical Transducer	HR-thermomechanicalTransducer	FD
HS	Handset, Operator's Handset	HS-handset	AD
HT	Earphone	HT-earphone	AD
	Electrical Headset	HT-electricalheadset	AD
	Receiver	HT-receiver	AD
	Telephone Receiver	HT-telephoneReceiver	AD
HY	Circulator	HY-circulator	HF
	Directionally Selective Transmission Device (incl. Hybrid Circuit Network, Hybrid Coil, Hybrid Junction)	HY-directionallySelectiveTransmissionDevice	HF
J	Stationary Receptacle (Jack) Generic Types	J-stationaryReceptacleGeneric	CSCR
	Stationary Receptacle (Jack) Unique	J-stationaryReceptacle	CSCR
	Waveguide Flange	J-waveguideFlange	CSCR
K	Contactor	K-contactor	CSCR
	Relay	K-relay	CSCR
L	Coil	L-coil	TIW
	Inductor	L-inductor	TIW
	Electrical Solenoid	L-electricalSolenoid	TIW
	Field Winding	L-fieldWinding	TIW
	Generator Field	L-generatorField	TIW
	Motor Field	L-motorField	RM
	Reactor	L-reactor	TIW
	Winding	L-winding	TIW
LS	Audible Signalling Device (incl. audible alarm, audible signalling device, buzzer, electric bell, electric horn, loudspeaker, loudspeaker-microphone, siren, telephone ringer, telephone sounder, underwater sound transducer)	LS-audibleSignallingDevice	AD
M	Readout Devices (incl. Clock, coulomb accumulator, elapsed time recorder, electric timer, electrical counter,	M-readoutDevice	RD

	electrochemical step-function device, instrument, message register, meter, meter-type level pressure gauge, oscillograph, oscilloscope, position indicator, thermometer)		
MG	Direct Current Machines (incl. Converter, dynamotor, inverter, motor-generator), Alternating Current Machines	MG-machine	**RM**
MK	Microphone (incl. Hydrophone, telephone transmitter)	MK-microphone	**AD**
MP	Mechanical Part (incl. Brake, Clutch, mechanical interlock, mechanical part, miscellaneous mechanical part)	MP-mechanicalPart	-
MT	Transducer (incl. Accelerometer, measuring transducer, mode transducer, motional pickup transducer, primary detector)	MT-transducer	**FD**
N	Equipment Subdivision	N/A	-
P	Movable Receptacle (Plug)	P-movableReceptacle	**CSCR**
PS	Power Supply Rectifier	PS-powerSupply PS-rectifier	**CA** **CA**
PU	Pickup (incl. Head, Sound Reproducer)	PU-pickup	**FD**
Q	Transistor Thyristor (incl. Semiconductor Controlled Rectifier, Semiconductor Controlled Switch)	Q-transistor Q-Thyristor	**SD** **SD**
R	Resistor Resistor Network Variable Resistor (incl. Rheostat, Potentiometer, Magnetoresistor)	R-resistor R-resistorNetwork R-resistorVaraible	**FD** **FD** **FD**
RE	Radio Receiver	RE-radioReceiver	**CA?**
RT	Thermistor (incl. Current Regulating Resistor, thermal resistor, temperature-sensing element, resistance lamp, Ballast Lamp, Ballast Tube)	RT-thermistor	**FD**
RV	Varistor	RV-varistor	**FD**
S	Switch (incl. Contactor, disconnecting device, electrical safety interlock, flasher (circuit interrupter), governor, speed regulator, telegraph key, Switch, telephone dial, thermal cutout, thermostat)	S-switch	**CSCR**
SQ	Not Used	N/A	-
SR	Not Used	N/A	-
T	Transformer (incl. Autotransformer, coaxial taper, linear coupler, telephone induction coil, telephone repeating coil, transformer, waveguide taper)	T-transformer	**TIW**
TB	Terminal Board (incl. connecting strip, terminal strip, test block)	TB-terminalBoard	**TC**
TC	Thermocouple Thermopile	TC-thermocouple TC-thermopile	**FD** **FD**
TP	Test Point (incl. In-Circuit Test Point)	TP-testPoint	**QS**
U	Inseparable Assembly Integrated Circuit Microcircuit Micromodule Exposed Pad Integrated Amplifier (incl. Operational, Comparator, Summing etc)	U-inseparableAssembly U-\<function\> U-microcircuit U-micromodule U-exposedPad U-integratedAmplifier	- - - - - **AF**
V	Electron Tube (incl. electron tube, Geiger-Muller counter tube, ionization chamber, klystron, magnetron, phototube, proportional counter tube, resonator tube, solion, thyratron, traveling-wave tube, voltage regulator)	V-electronTube	**ET/HF**
VR	Voltage Regulator	VR-voltageRegulator	**TIW/SD**
W	Transmission Path (incl. bus bar, cable, cable assembly, coaxial cable, conductor, distribution line, distribution path, Goubau line, strip-type transmission line, transmission line, transmission path, waveguide, wire, circuit return)	W-transmissionPath	**TP**
X	Fuse Holder Lamp Holder	X-fuseHolder X-lampHolder	- -

	Socket	X-socket	-
Y	Crystal (incl. magnetostriction oscillator, piezoelectric crystal unit, quartz crystal unit, tuning-fork resonator)	Y-crystal	FD
Z	Miscellaneous (incl. artificial line (other than delay line), balun, carrier-line trap, coupled tunable resonator, directional phase shifter, discontinuity, E-H tuner, general network, gyrator, mode suppressor, multistub tuner, phase shifter, phase-changing network, resonator (tuned cavity), slide-screw tuner)	Z-miscellaneous	HF/CA

Group	Description
AD	Acoustic Devices
AF	Analogue Functions
CA	Composite Assemblies
CP	Circuit Protectors
CSCR	Contacts, Switches, Contactors and Relays
ET	Electron Tubes and Related Devices
FD	Fundamental Devices
HF	High Frequency (VHF, UHF, SHF)
LVSD	Lamps and Visual Signalling Devices
QS	Qualifying Symbols
RD	Readout Device
RM	Rotating Machinery
SD	Semiconductor Devices
TC	Terminals and Connectors
TIW	Transformers, Inductors and Windings
TP	Transmission Devices

E.g:

Window title: **G:\ApplicationFiles\KiCad\Libraries\Symbol\IEEE_315**

Menu: File Edit View Favorites Tools Help

Toolbar: Back | Search | Folders | Links »

Address: G:\ApplicationFiles\KiCad\Libraries\Symbol\IEEE_315   Go

Folders panel:
- National Electrical Manufactur...
  - Electronic_symbol_files
  - Logic_symbols_files
- motes
- ariwen
- G:)
- plicationFiles
- KiCad
  - Batch
  - Libraries
    - Documents
      - DataTables
      - Guidelines
      - PTH
      - SMD
      - Tools
    - Equivalence
    - Footprint
    - Symbol
      - IEEE_315
      - Non-IEEE_315
      - Power
  - Template
- Office
- Projects
- VeeCAD
- l Panel
- d Documents
- nin's Documents
- k Places

Name ▲	Size	Type	Date Modified
A		File Folder	26/05/2013 21:30
AR		File Folder	26/05/2013 21:30
AT		File Folder	26/05/2013 21:30
B		File Folder	26/05/2013 21:30
BT		File Folder	02/06/2013 18:37
C		File Folder	26/05/2013 21:30
CB		File Folder	26/05/2013 21:30
CP		File Folder	26/05/2013 21:30
D		File Folder	02/06/2013 18:37
DC		File Folder	26/05/2013 21:30
DL		File Folder	29/05/2013 19:32
DS		File Folder	02/06/2013 18:37
E		File Folder	26/05/2013 21:30
EQ		File Folder	26/05/2013 21:30
F		File Folder	26/05/2013 21:30
FL		File Folder	26/05/2013 21:30
G		File Folder	26/05/2013 21:30
H		File Folder	26/05/2013 21:30
HP		File Folder	26/05/2013 21:30
HR		File Folder	26/05/2013 21:30
HS		File Folder	26/05/2013 21:30
HT		File Folder	26/05/2013 21:30
HY		File Folder	26/05/2013 21:30
J		File Folder	04/06/2013 20:44
K		File Folder	26/05/2013 21:30
L		File Folder	02/06/2013 18:37
LS		File Folder	26/05/2013 21:30
M		File Folder	02/06/2013 18:37
MG		File Folder	26/05/2013 21:30
MK		File Folder	26/05/2013 21:30
MP		File Folder	26/05/2013 21:30
P		File Folder	26/05/2013 21:30

Status bar: 51 objects (Disk free space: 8.21 GB)   0 bytes   My Computer

Note: Does not show all folders

2.3.2 Non-IEEE Std 315-1975 Symbol Library Naming Convention

Components or Symbols that cannot be designated according to IEEE Std 315-1975 are contained in files located in folders using other conventions, under C:\ApplicationFiles\KiCad\Libraries\Symbol\Non-IEEE_315:

Folder Name	Description	Filename(s) [*.lib, *.dcm]
-	-	-

2.3.3 "Power" Symbol Library Naming Convention

The special "power" symbols are contained in C:\ApplicationFiles\KiCad\Libraries\Symbol\Power:

Folder Name	Description	Filename(s) [*.lib, *.dcm]
-	Power Flags and Symbols	power

E.g:
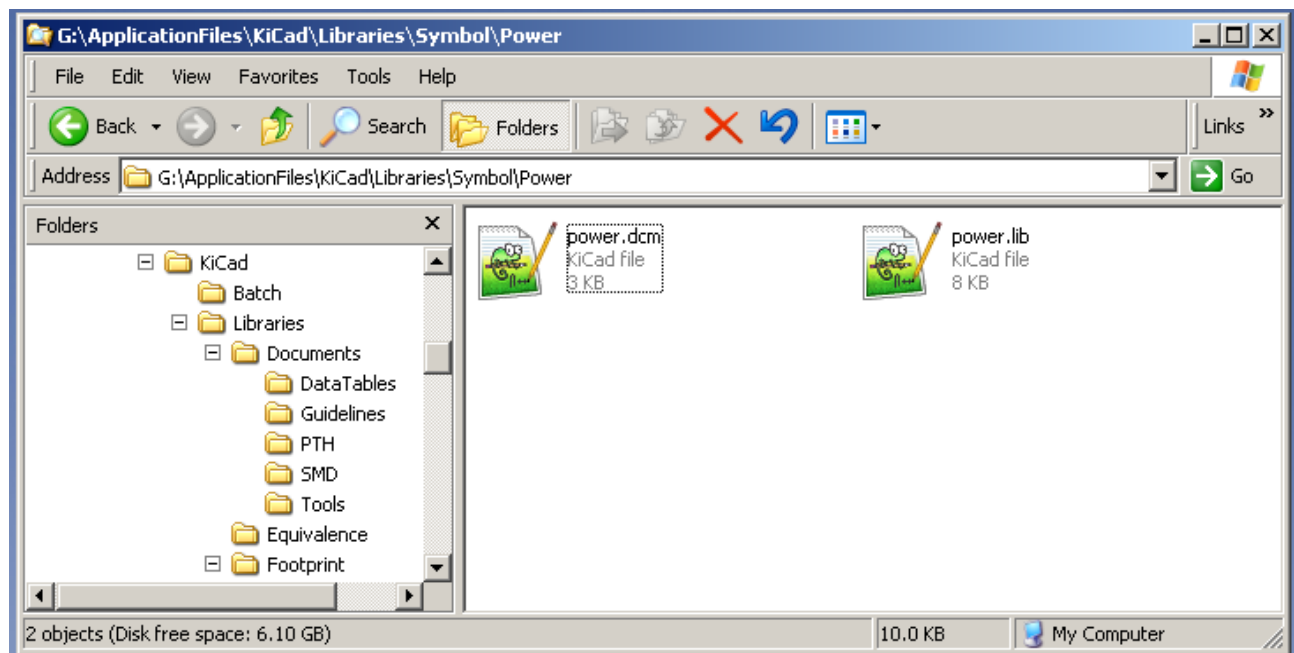
3 Eeschema Symbol (Component) Conventions

3.1 General

These dimensions apply to all Symbols unless stated otherwise.

3.2 Grid

Grid size of 50.0 mil is used. Pins **must** to fit to this grid.

3.2.1 Units

All dimensions/grids are inches. Where possible, Symbols are constructed using any available grid, but pins **must** snap to the 50.0 mil grid.

3.2.2 Documentation Links

-

3.2.3 Drawing Line Defaults

Line Width: 0.006" (0.1524mm)

3.2.4 Outline Dimensions

3.2.4.1 General

The outlines of the symbols are to be as small as is practicable. The general principle applied is that the shape should only be as large as the number of pins dictates, but must be large enough to clearly define the type of component. Dimensions for each type of Symbol is stated in the relevant chapter.

3.2.4.2 Digital Logic Gates

Digital Logic Gates are constructed from "elements". Each gate is constructed from an element and may be connected to one or more duplicated elements to form the desired Symbol (see 4.48.2 and 4.48.3).
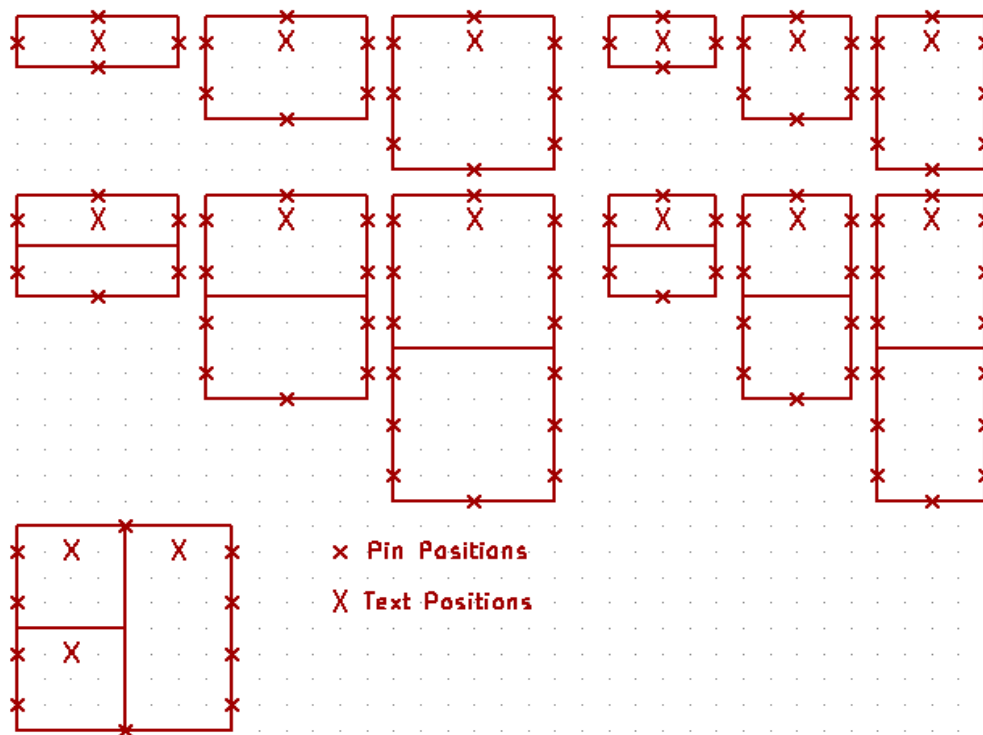
Top Row: Single Gate - Standard and Little Logic

Middle Row: Dual Gate - Standard and Little Logic

Bottom Row: Single Configurable Gate - Standard and Little Logic[1]

Note1: Standard Logic element width 0.30"

Note2: Little Logic element width 0.20"

Note3: Configurable Gate width 0.04"

Note4: Power Pins are top (+) and bottom (-) of element

Note5: Text (X) 0.04"

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1   If configuration is not possible to represent, then symbol is produced according to 3.2.4.3

3.2.4.3 Digital Logic

Digital Logic Symbols Symbols are formed as shown below (see 4.48.4):
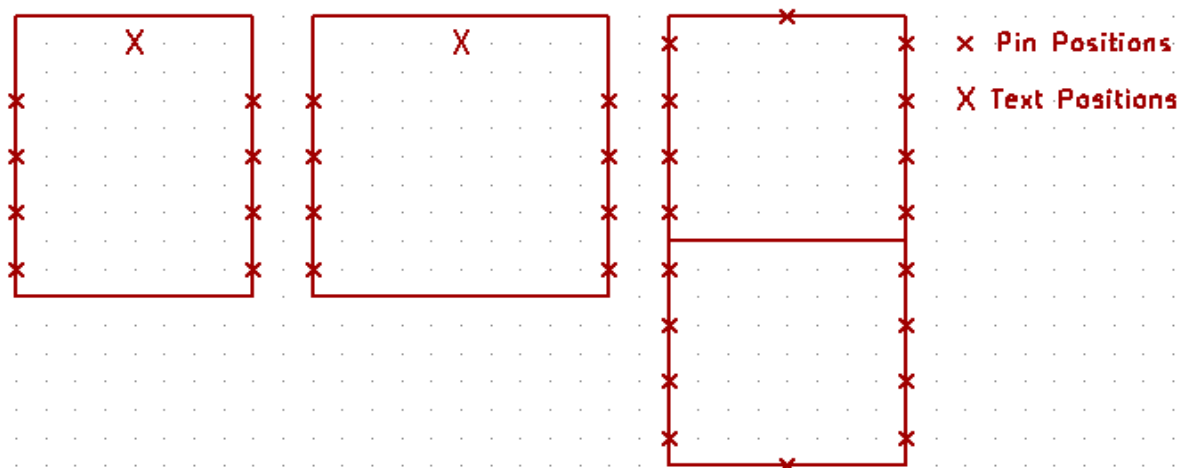
Left to Right: Single part standard width, Single part wide, Multi-part.

Note1: Standard Logic, Little Logic, body width 0.40"

Note2: Power Pins are top (+) and bottom (-) of element (Multi-part)

Note3: Power Pins are top right (+) and bottom left (-) of element (Single-part)

Note4: Text (X) 0.04"

3.2.4.4 Integrated Amplifiers

Integrated Amplifier Symbols are formed as shown below (see 4.48.5):
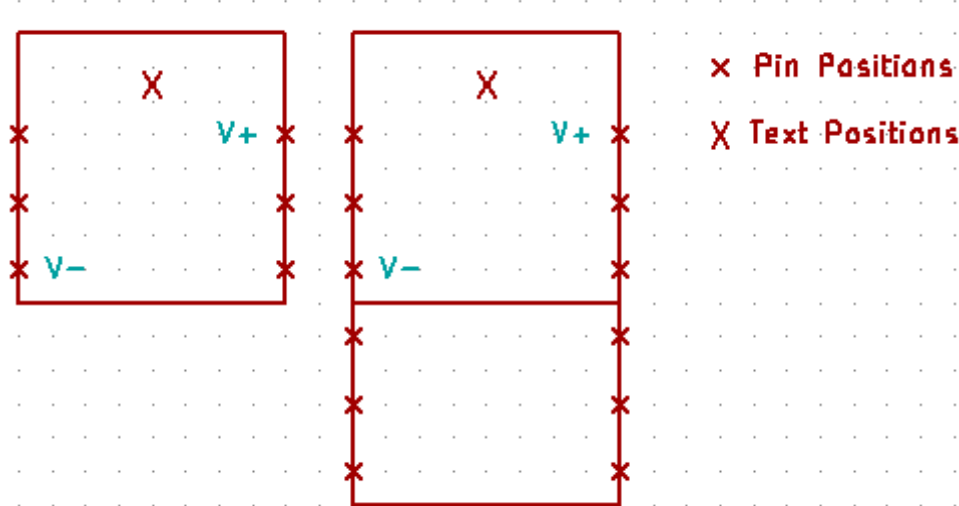
Left to Right: Single part, Multi-part.

Note1: Amplifier body width 0.40"

Note2: Power Pins are top right (+) and bottom left (-) of element (Single-part)

Note3: Power Pins are top right (+) and bottom left (-) of first element (Multi-part)

Note5: Text (X) 0.04"

3.2.5 Pins and Pin Dimensions

3.2.5.1 Component Power Pins

3.2.5.1.1 Non-Integrated Circuits

Power Pins by default are visible and the same size as the non-hidden pins of the component.

3.2.5.1.2 Integrated Circuits

Power Pins by default are visible and the same size as the non-hidden pins of the component.

In cases where an Integrated Circuit has multiple Ground or Vss pins (e.g. 7416240), invisible Power Pins are used as shown below:
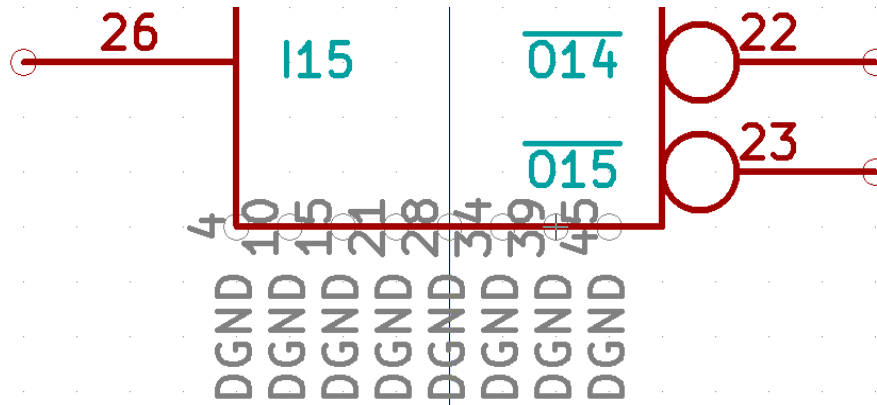
Note1: Invisible Power Pins are always 0.00" length.

Note2: There must be a corresponding Power Pin defined in the power library.

3.2.5.2 Pin Dimensions

Pins are as short as possible. When no pin name or pin number is displayed, the pin can be as short as 0.025" (only if the pin can snap to the 50.0 mil grid).

For Non-Integrated Circuits, pins where pin name or pin number is displayed should be long enough to accommodate any text. In this case the pin length would be approximately 0.10" (adding the appropriate amount to snap to the 50.0 mil grid)[2].

For Digital Integrated Circuits, Non-Hidden Pin sizes are always 0.10" length to not mask pin number when inverted style is used. For Analogue Integrated Circuits[3], Non-Hidden Pin sizes are 0.10".

---

2   Inverted Pin shapes are 0.10" to not obscure pin text
3   Analogue Integrated Circuits do not use Inverted pin style

3.2.5.2.1 Maximum Pin Dimensions, Discrete Components

Type	Pin Length	Name Text Size (max)	Number Text Size (max)	text_offset (mil)
Non-Hidden	0.00" - 0.20"	0.020"-0.025"	0.020"-0.025"	20 - 40
Hidden	N/A	N/A	N/A	N/A

3.2.5.2.2 Maximum Pin Dimensions, Electromechanical Components

Type	Pin Length	Name Text Size (max)	Number Text Size (max)	text_offset (mil)
Non-Hidden	0.00" - 0.20"	0.025"	0.025"	20 - 100
Hidden	N/A	N/A	N/A	N/A

3.2.5.2.3 Maximum Pin Dimensions, Digital Integrated Circuits

Type	Pin Length	Name Text Size (max)	Number Text Size (max)	text_offset (mil)[4]
Non-Hidden	0.10"	0.025"	0.025"	0 or 40
Hidden	0.00"	0.025"	0.025"	0 or 40

3.2.5.2.4 Maximum Pin Dimensions, Analogue Integrated Circuits

Type	Pin Length	Name Text Size (max)	Number Text Size (max)	text_offset (mil)[5]
Non-Hidden	0.10"	0.025"	0.025"	0 or 40
Hidden	0.00"	0.025"	0.025"	0 or 40

3.2.5.2.5 Maximum Pin Dimensions, Power

Type	Pin Length	Name Text Size (max)	Number Text Size (max)	text_offset (mil)
Hidden	0.00"	0.025"	0.025"	0

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4   Digital Integrated Circuits with no Pin Text have a text_offset of zero
5   Analogue Integrated Circuits with no Pin Text have a text_offset of zero

3.2.6   Fields Properties

Symbol Type	"Reference" (F0) Text Size	"Value" (F1) Text Size	"Unit" (F4) Text Size	Placement[6]
Discrete	0.04"	0.03"	0.03"	Reference: Outside Symbol Value/Unit: Outside Symbol[7]
Electromechanical	0.04"	0.03"	0.03"	Reference: Outside Symbol Value/Unit: Inside Symbol, where possible
Integrated Circuit	0.04"	0.04"	0.04"	Reference: Outside Symbol Value/Unit: Inside Symbol, where possible

3.2.6.1   Reference Field

The Reference Field is the Class Designator. e.g. D (Diode), Q (Transistor, Thyristor)

3.2.6.2   Value Field

- **Standard** – When a component has a standardised shape and pin designation. The Value Field is updated with the Manufacturer's Part Number during Schematic Capture (e.g. Diodes, Transistors etc.).

    - Example: Value = Rectifier

- **Standard Logic** – When a component has a standardised shape and pin designation. The Value Field may be updated with the Logic Family during Schematic Capture.

    - Example: Value = 7411245

- **Manufacturer's Part Number** – When a Component is unique (e.g. Microcontrollers, Operational Amplifiers etc.).

    - Example: Value = LM318

- **Component Type** – When a group of Components can share the same electrical values (e.g. Miscellaneous Capacitors, Inductors, Thermistors, Resistor Networks etc.) or when a Symbol is unique and has multiple Values (e.g. Resistance, Capacitance etc.). Usually used together with the Unit field (3.2.6.3).

    - Example: Value = POLARIZED_CAPACITOR

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6   The Reference and Value should be as close as possible to the Symbol without obscuring it, taking into account annotation
7   Value should be inside Symbol for Fixed Resistors

3.2.6.3 Unit Field

This Field is a user-defined field and is used when the Value Field is used to indicate the Component Type. This is when the same Symbol can share multiple values. The additional Unit field allows the use of characters such as space.

e.g.
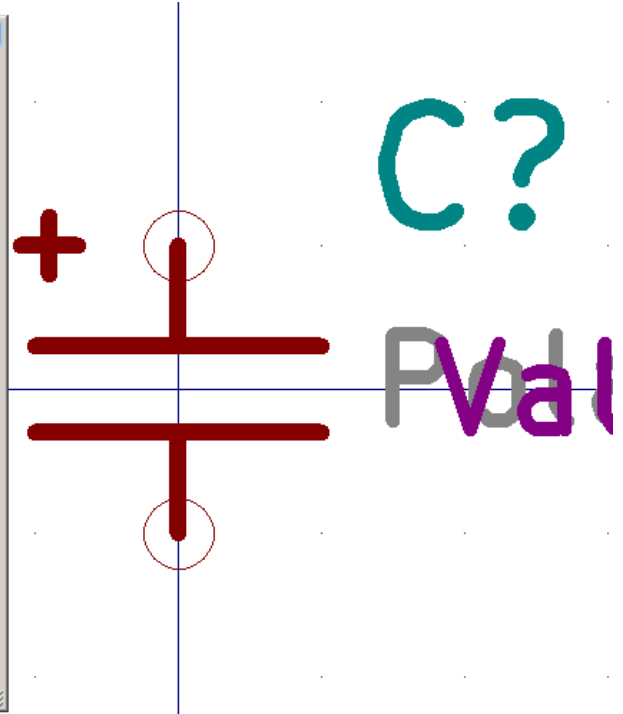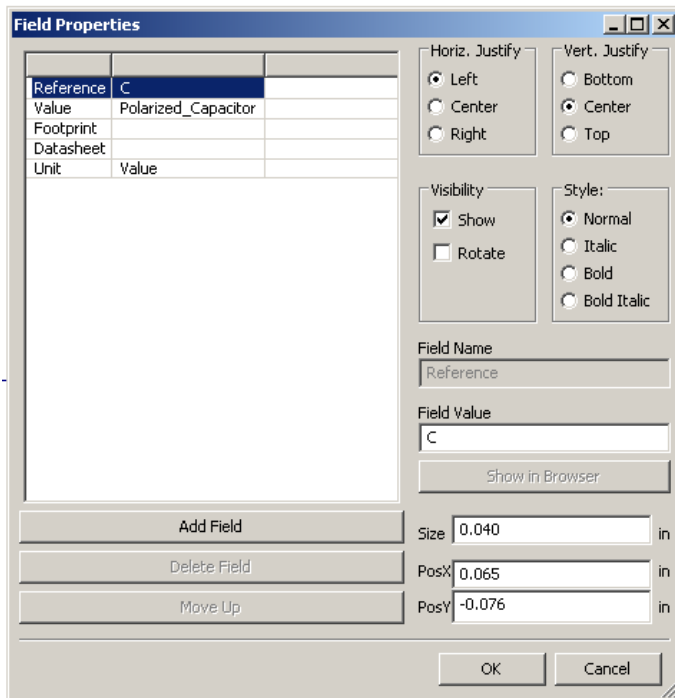
3.2.7 Footprint Filters

The Value Field of the Symbol determines if, or what type of Footprint Filter is used.

3.2.7.1 Standard

Symbols that can correspond to many different part numbers (Diodes, Transistors etc) have Wildcarded Footprint Filters defined. The Footprint is assigned using CvPcb.

- *Manufacturer's Part Number determines the Land Pattern.*
- *Land Pattern assigned manually via CvPcb.*

3.2.7.2 Standard Logic

Symbols that correspond to many different Logic Families have Wildcarded Footprint Filters defined. The Footprint is assigned using CvPcb.

- *Standard Logic Part Number determines the Land Pattern.*
- *Land Pattern assigned manually via CvPcb.*

3.2.7.3 Manufacturer's Part Number

Symbols that have a unique 1:1 relationship with a Land Pattern have a dedicated Non-Wildcarded Footprint Filter defined. The Footprint is assigned using CvPcb.

- *Manufacturer's Part Number determines the Land Pattern.*
- *Land Pattern assigned manually via CvPcb.*

3.2.7.4 Component Type

Wildcarded Footprint Filters are defined. The Footprint is assigned using CvPcb.

- *Component Type determines the Land Pattern.*
- *Land Pattern assigned manually via CvPcb.*

e.g. for the "Fixed Resistor" Symbol, the following Footprint Filter is specified:

```
$FPLIST
 RESAD0*8
 RESAD1*
 RESAD2*
 RESAD3*
 RESAD4*
 RESAD5*
 RESAD6*
 RESAD7*
 RESAD8*
 RESAD9*
 RESAR*
 RESADV*
 RESC*
 RESM0*9
 RESM1*
 RESM2*
 RESM3*
 RESM4*
 RESM5*
 RESM6*
 RESM7*
 RESM8*
 RESM9*
 RESMELF*
$ENDFPLIST
```

---

8   RESAD0*...RESAD9* are used to differentiate RESAD from RESADV
9   RESM0*...RESM9* are used to differentiate RESM from RESMELF

3.2.8   Value Field, Unit Field and Footprint Filtering

The following examples show how the Value, Unit and Footprint Filter fields are used to determine the correct Land Pattern.
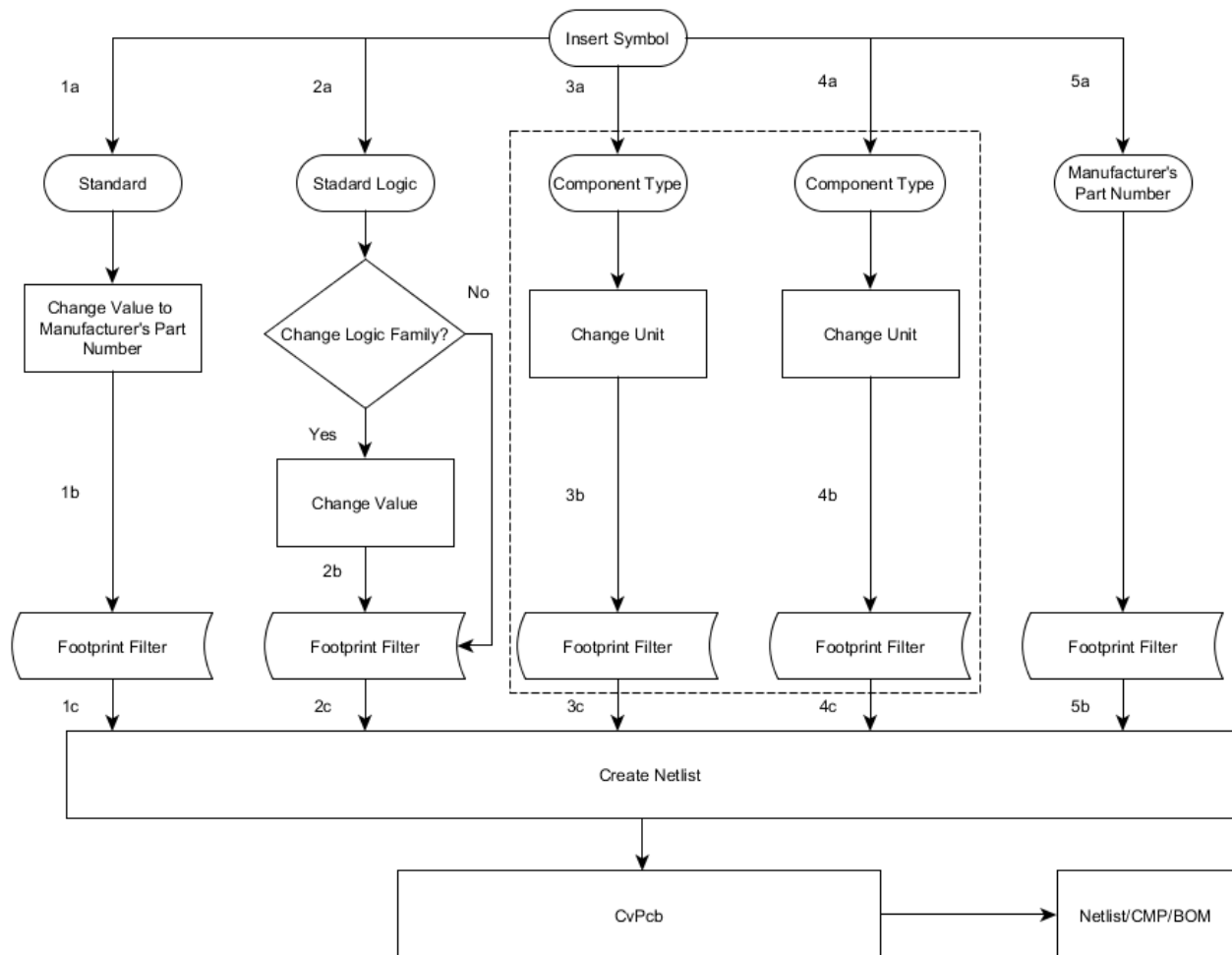
Inserting the following Symbols into a schematic:

1a   Value = Rectifier (Generic Rectifier Diode)

2a   Value = 7400 (Quad NAND Gate)

3a   Value = Non_Polarized_Capacitor, Unit = "Unit"

4a   Value = DIL01-13 (Resistor Network), Unit = "Unit"

5a   Value = LM358 (OpAmp)

After modification of relevant Value, Unit fields:

1b   Value = 1N4001

2b   Value = 74HCT00

3b   Value = Non_Polarized_Capacitor, Unit = 0.01 uF

4b   Value = DIL01-13, Unit = 100 k

Data used by CvPcb to assign Land Pattern[10]:

1c   Value = 1N4001, Footprint Filter = DIOAD*

2c   Value = 74HCT00, Footprint Filter = SOIC* DIP*

3c   Value = Non_Polarized_Capacitor, Unit = 0.01 uF, Footprint Filter = CAPC*

4c   Value = DIL01-13, Unit = 100 k, Footprint Filter = DIP*, SOIC*

5b   Value = LM358, Footprint Filter = DIP*

---

10 The Land Pattern for 1N4001 is found from an Equivalence File

3.2.9 Footprint Filters with VeeCAD

VeeCAD OrcadPCB2 netlist format requires that the Symbols' Footprint Field is populated when generating the Netlist. The following process is used:

1) Create "dummy" VeeCAD Land Patterns. The names contain the suffix "V". These Land Patterns consist of just the Land Pattern name. The dummy Land Pattern name matches an equivalent VeeCAD Land Pattern name.

2) The dummy Land Patterns are assigned as Footprint Filter(s) according to 3.2.7.

3) Annotate and create a Netlist in KiCad format.

4) Assign Land Patterns with CvPcb.

5) Save the footprint link file (*.cmp).

6) From Eeschema, import the created *.cmp file – The valid VeeCAD Land Patterns will be assigned.

7) Create a Netlist in OrcadPCB2 format and import into VeeCAD.

3.2.10 Pin Numbering

Pin numbering is numeric by default. Symbols that are composed of columns and rows, such as BGA etc. use alphanumeric numbering.

Pin numbering follows the conventions below:

- 2-terminal Diodes – Cathode: Pin No. 1, Anode: Pin No. 2
- 3-terminal Diodes – One Symbol per pin configuration (e.g. CCA, AAC). Note1
- 3-terminal Transistors – One Symbol per pin configuration (e.g. BCE, BEC, GSD, GDS). Note1
- 2-terminal Thyristors – Cathode: Pin No. 1, Anode: Pin No. 2
- >2-terminal Thyristors – One Symbol per pin configuration (e.g. CAG). Note1
- 2-terminal Passive Components – No preference
- >2-terminal Passive Components (not Transformers) – Main Body: Pin No. 1 & Pin No. 2, Other: Pin No. 3 onwards. Note2
- Transformers – Primary: Pin No. 1 & 2, Secondary: Pin No. 3 & 4, Other: Pin No. 3 onwards. Note2
- All others – According to data sheet

Note1: To handle components that may have multiple pin configurations such as 3-terminal Diodes, Transistors etc. multiple schematic symbols are used to represent the pin configurations, as opposed to multiple Land Patterns of the same type with various pin configurations.

Note2: To be confirmed

3.2.11 Alias

Aliases are always used when two or more Symbols of the same type share the same pin number and designation. Any special handling of the Alias field is specified under the relevant Symbol in Chapters 4 & 6.

4 Symbol Library Files using IEEE Std 315-1975 Conventions

4.1 General

4.1.1 Reference Designators

Symbols are given a Reference designator (Class) using the conventions laid out in IEEE Std 315-1975 (Clause 22). Symbols belonging to a common Class are arranged in library files using the following convention:

<class>-<description>.dcm

<class>-<description>.lib

These files are stored under the appropriate folder (see 2.3.1)

4.1.1.1 Example

All Diode Symbols are contained in the library files D-diode.lib, D-diode.dcm under
..\ApplicationFiles\KiCad\Libraries\Symbol\IEEE_315\D\

4.1.2 Symbol Shapes

Symbol Shapes are intended to conform to IEC 60617 and/or IEEE Std 315-1975/ ANSI/IEEE Std 315A-1986.

4.2   Class Designation A

4.2.1   A-separableAssembly

File contents: electronic divider, electronic function generator, electronic multiplier, facsimile set, field-polarization amplitude modulator, field-polarization rotator, general circuit element, gyroscope, integrator, positional servomechanism, sensor (transducer to electric power), separable assembly, separable sub assembly, telephone set, telephone station, teleprinter, teletypewriter

-

4.3   Class Designation AR

4.3.1   AR-amplifier

File contents: Amplifier

-

4.4   AR-repeater

File contents: Repeater

-

4.5   Class Designation AT

4.5.1   AT-attenuator

File contents: Attenuator

-

4.5.2 AT-isolator

File contents: Isolator (Opto, Magnetic)

Reference: AT

Value: <Manufacturer's Part Number>

4.5.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.30"	No
Hidden	N/A	N/A	

4.5.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.5.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.5.2.4 Footprint Filter

Yes

4.5.2.5 Alias

Any equivalent device

4.5.2.6 Equivalence File

No

4.5.2.7 Symbol Naming Convention

-

4.5.2.8 Example[11]
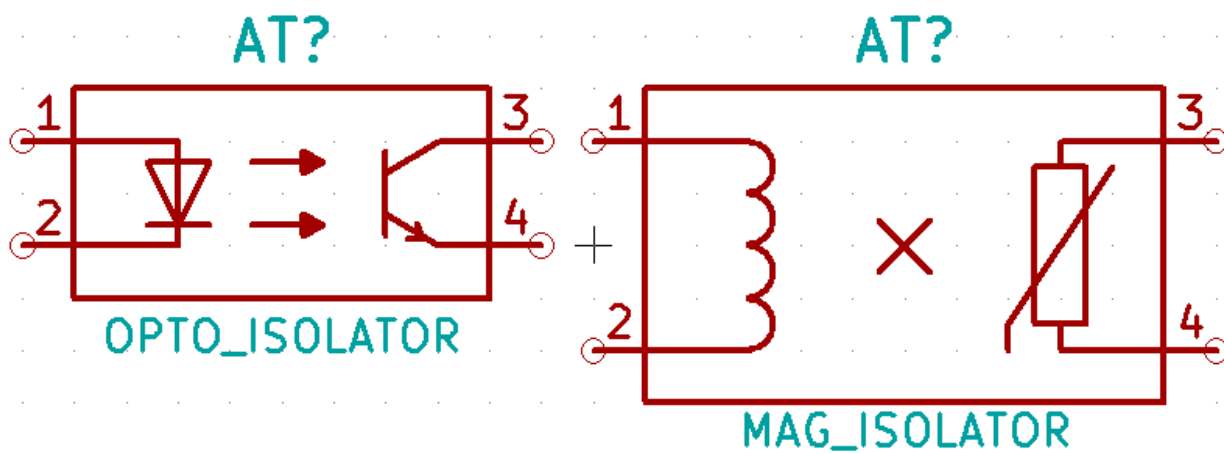
Note1: Pins 0.05" length

Note2: Opto-Isolator Diode and Transistor parts have smaller dimensions than the discrete versions

Note3: Magnetic Isolator Inductive and resistive parts have same dimensions as the discrete versions

---

11 Example(s) used do not represent actual component(s) but are used as template(s)

4.5.3 AT-bolometer

File contents: Bolometer

-

4.5.4 AT-capacitiveTermination

File contents: Capacitive Termination

-

4.5.5 AT-inductiveTermination

File contents: Inductive Termination

-

4.5.6 AT-resistiveTermination

File contents: Resistive Termination

-

4.5.7 AT-pad

File contents: Pad

-

4.6   Class Designation B

4.6.1   B-blower

File contents: Blower

-

4.6.2   B-motor

File contents: Motor

-

4.6.3   B-generator

File contents: Generator

-

4.6.4   B-synchro

File contents: Synchro

-

4.7   Class Designation BT

4.7.1   BT-battery

File contents: Battery, Cell

Reference: BT

Value: <Manufacturer's Part Number>

Unit: <Voltage Value>

4.7.1.1   Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	No
Hidden	0.03"	0.03"	

4.7.1.2   Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Left	Centre	Normal	Yes

4.7.1.3   Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	N/A	N/A
Output	N/A	N/A
Power	Power output	Line

4.7.1.4   Footprint Filter

Yes

4.7.1.5   Alias

Any Equivalent Device

4.7.1.6   Equivalence File

No

4.7.1.7   Symbol Naming Convention

-

4.7.1.8 Example[12]
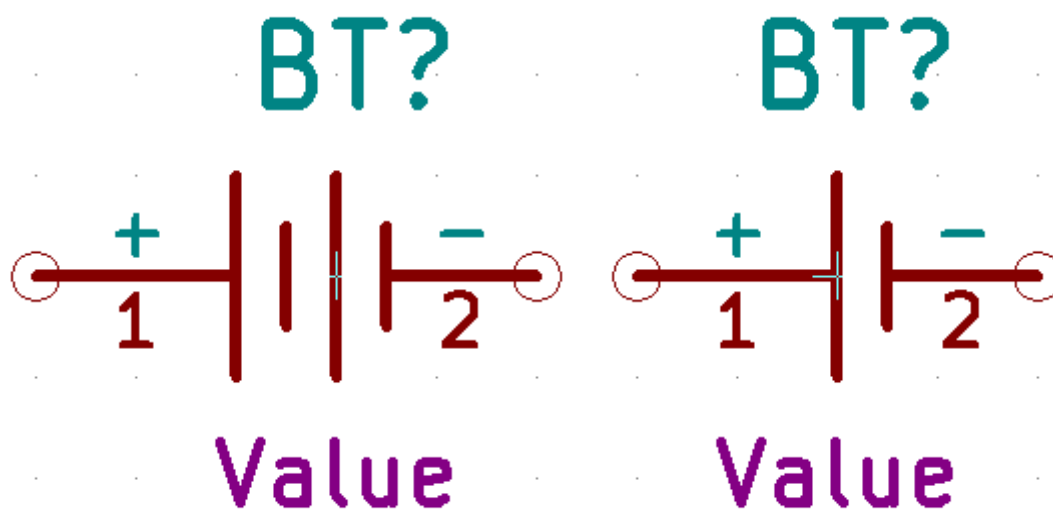
Note1: Pin 1 Length 0.10"

Note2: Pin 2 Length 0.075"

Note3: Cell spacing 0.025"

Note4: Short vertical 0.05", Long vertical 0.10"

---

12 Example(s) used do not represent actual component(s) but are used as template(s)

4.7.2 BT-photovoltaic

File contents: Barrier Photocell, Blocking Layer Cell, Photovoltaic Transducer, Solar Cell

Reference: BT

Value: <Manufacturer's Part Number>

Unit: <Voltage Value>

4.7.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	No
Hidden	0.03"	0.03"	

4.7.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Left	Centre	Normal	Yes

4.7.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	N/A	N/A
Output	N/A	N/A
Power	Power output	Line

4.7.2.4 Footprint Filter

Yes

4.7.2.5 Alias

Any Equivalent Device

4.7.2.6 Equivalence File

No

4.7.2.7 Symbol Naming Convention

-

4.7.2.8 Example[13]
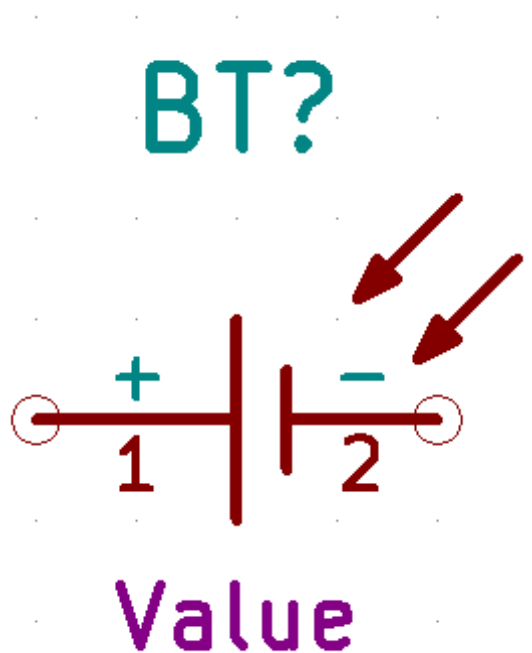
Note1: Pin 1 Length 0.10"

Note2: Pin 2 Length 0.075"

Note3: Cell spacing 0.025"

Note4: Short vertical 0.05", Long vertical 0.10"

---

13 Example(s) used do not represent actual component(s) but are used as template(s)

4.8　Class Designation C

4.8.1　C-capacitorNonPolarized

File Contents:　　Non-polarized Capacitor

Reference:　　　C

Value:　　　　　<Component Type> e.g. Non_Polarized_Capacitor

Unit:　　　　　<Capacitance Value>

4.8.1.1　Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.8.1.2　Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	No
Unit	0.03"	Left	Centre	Normal	Yes

4.8.1.3　Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.8.1.4　Footprint Filter

Yes

4.8.1.5　Alias

No

4.8.1.6　Equivalence File

No

4.8.1.7　Symbol Naming Convention

-

4.8.1.8 Example

C?

Value Polarized_Capacitor

Note1: Pins 0.035" length

Note2: Plates 0.10" Length

Note3: Space between plates 0.03"

4.8.2 C-capacitorPolarized

File Contents: Polarized Capacitor

Reference: C

Value: <Component Type> e.g. Polarized_Capacitor

Unit: <Capacitance Value>

4.8.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.8.2.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	No
Unit	0.03"	Left	Centre	Normal	Yes

4.8.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.8.2.4 Footprint Filter

Yes

4.8.2.5 Alias

No

4.8.2.6 Equivalence File

No

4.8.2.7 Symbol Naming Convention

-

4.8.2.8 Example

Note1: "+" 0.02" x 0.02"

Note2: Capacitor Body shapes and Pins are same dimensions as for Non-Polarized Capacitor (4.8.1)

4.8.3   C-capacitorMisc

File Contents: Capacitor Bushing, Variable Capacitor, Shielded Capacitor, Differential Capacitor, Phase Shifter Capacitor, Split-Stator Capacitor, Feed-Through Capacitor

File Contents: Miscellaneous Capacitor

Reference: C

Value: <Component Type> e.g. CADJ (Capacitor, Adjustable)

Unit: <Capacitance Value (Range)>

4.8.3.1   Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.8.3.2   Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	No
Unit	0.03"	Left	Centre	Normal	Yes

4.8.3.3   Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.8.3.4   Footprint Filter

Yes

4.8.3.5   Alias

Any Equivalent Device

4.8.3.6   Equivalence File

No

4.8.3.7   Symbol Naming Convention

-

4.8.3.8 Example
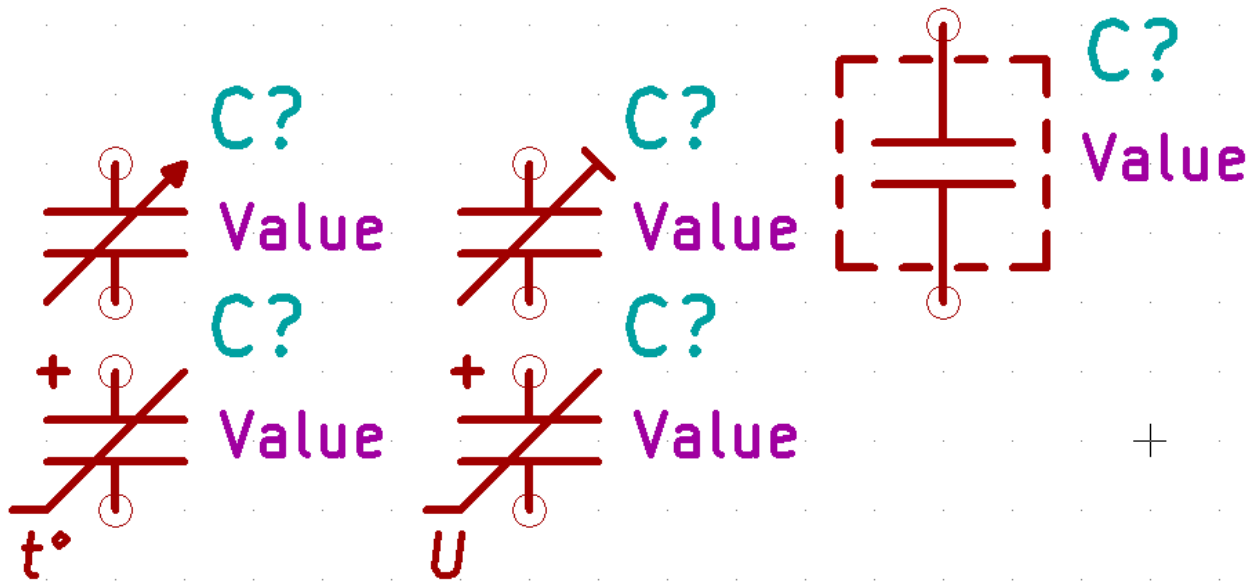
Top Row: CADJ, CPA, CSH

Bottom Row: TDPC, VDPC

Note1: Capacitor Body shapes and Pins are same dimensions as for Non-Polarized Capacitor (4.8.1) except Shielded Capacitor where Pin length is 0.085".

Note2: Text "t°" and "U" 0.03"

Note3: Value Field is hidden

Acronym	Description
CADJ	Capacitor, Adjustable
CPA	Capacitor, Preset Adjustment
CSH	Capacitor SHielded
TDPC	Temperature Dependant Polarized Capacitor
VDPC	Voltage Dependant Polarized Capacitor

4.8.4   C-capacitorNetwork

File Contents: Capacitor Networks

-

-

4.9   Class Designation CB

4.9.1   CB-circuitBreaker

File Contents: Circuit Breaker

Reference: CB

Value: <Component Type>

4.9.1.1   Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.03"	N/A
Hidden	N/A	N/A	

4.9.1.2   Fields Properties (DIP)

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.9.1.3   Fields Properties (Other)

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No

4.9.1.4   Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.9.1.5   Footprint Filter (Any)

Yes

4.9.1.6   Alias (Any)

No

4.9.1.7   Equivalence File (Any)

No

4.9.1.8   Symbol Naming Convention (DIP)

-

4.9.1.9 Example
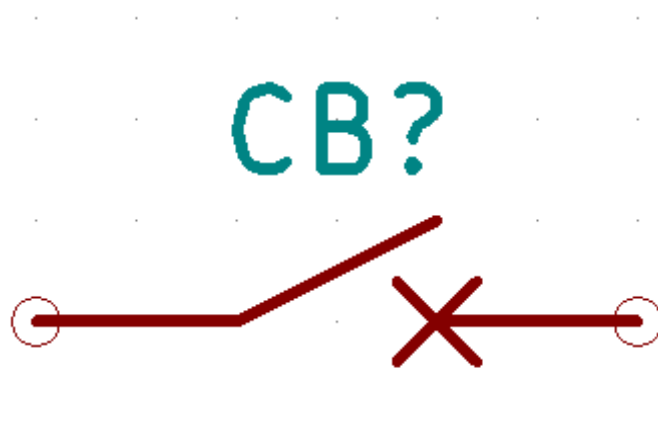
Note1: Pins 0.10"

4.9.2 CB-networkProtector

File Contents: Network Protector

-

4.10 Class Designation CP

4.10.1 CP-connectorAdapter

File Contents: Connector Adapter

-

4.10.2 CP-coupling

File Contents: Coupling

-

4.10.3 CP-junction

File Contents: Junction

-

4.11 Class Designation D

4.11.1 D-diode

File Contents: Rectifier, Varactor, Small Signal, Photosensitive, Bidirectional, Zener, Schottky, PIN, Tunnel, Step Recovery etc.

Reference: D

Value: <Standard>

4.11.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.20"[14]	N/A	No
Hidden	N/A	N/A	

4.11.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.11.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.11.1.4 Footprint Filter

No

4.11.1.5 Alias

No

4.11.1.6 Equivalence File

No

---

14 Pin Names are only shown for Symbols with more than two pins

4.11.1.7 Symbol Naming Convention

Description	Type	Pin Config	Pin Config
Bidirectional Diode	BIDIR	(AC)-(AC)	12
Breakdown Diode	BRKD	AA	12
Common Anode	COMA	ACC	123
Common Cathode	COMC	AAC	123
Constant Current	CONC	CA	12
Common Anode Schottky	COMACS	AC-(AC)	123
Common Cathode Schottky	COMCS	AAC	123
Photodiode	PHOTO	CA	12
PIN Diode	PIN	CA	12
Rectifier Diode	RECT	CA	12
Schottky Diode	SCTT	CA	12
Shockley Diode	SHCK	CA	12
Switching Diode	SWCH	CA	12
Tunnel Diode	TUNN	CA	12
Varactor	VARA	CA	12
Zener Diode	ZEN	CA	12

4.11.1.8 Example
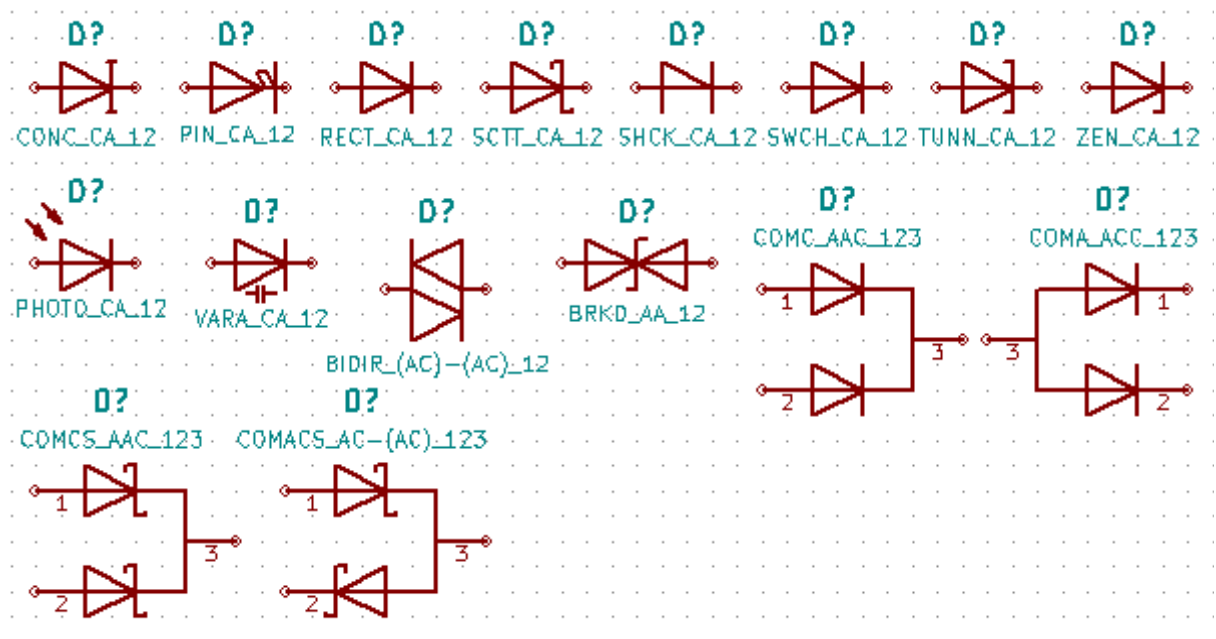
Note1: Pins 0.05" length (single diode)

Note2: Pins 0.10" length (Pins with pin number)

Note3: Diode Body 0.10" x 0.10"

4.12 Class Designation DC

4.12.1 DC-directionalCoupler

File Contents: Directional Coupler

-

4.13 Class Designation DL

4.13.1 DL-delayFunction

File Contents: Delay Line, Slow Wave Structure

-

4.14 Class Designation DS

4.14.1 DS-alphanumericDisplay

File Contents: Seven-segment Display etc.

Reference: DS

Value: <Manufacturer's Part Number>

4.14.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.30"	0.30"	Yes
Hidden	0.30"	0.30"	N/A

4.14.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.04"	Centre	Centre	Normal	Yes

4.14.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input	Line
Output	Output	Line
Power	Power input	Line

4.14.1.4 Footprint Filter

Yes

4.14.1.5 Alias

Any Equivalent Device

4.14.1.6 Equivalence File

No

4.14.1.7 Symbol Naming Convention

-

4.14.1.8 Body Outline Dimensions

Body Height	Body Width[15]	Pin Size[16]	Pin Space
(n) * 0.10"	0.40"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A component with 7 * Inputs, 3 * Outputs:

Left side = 7 * Inputs = 7 pins

Right side = 3 * Outputs = 3 pins

Therefore, n = 7

4.14.1.9 Example
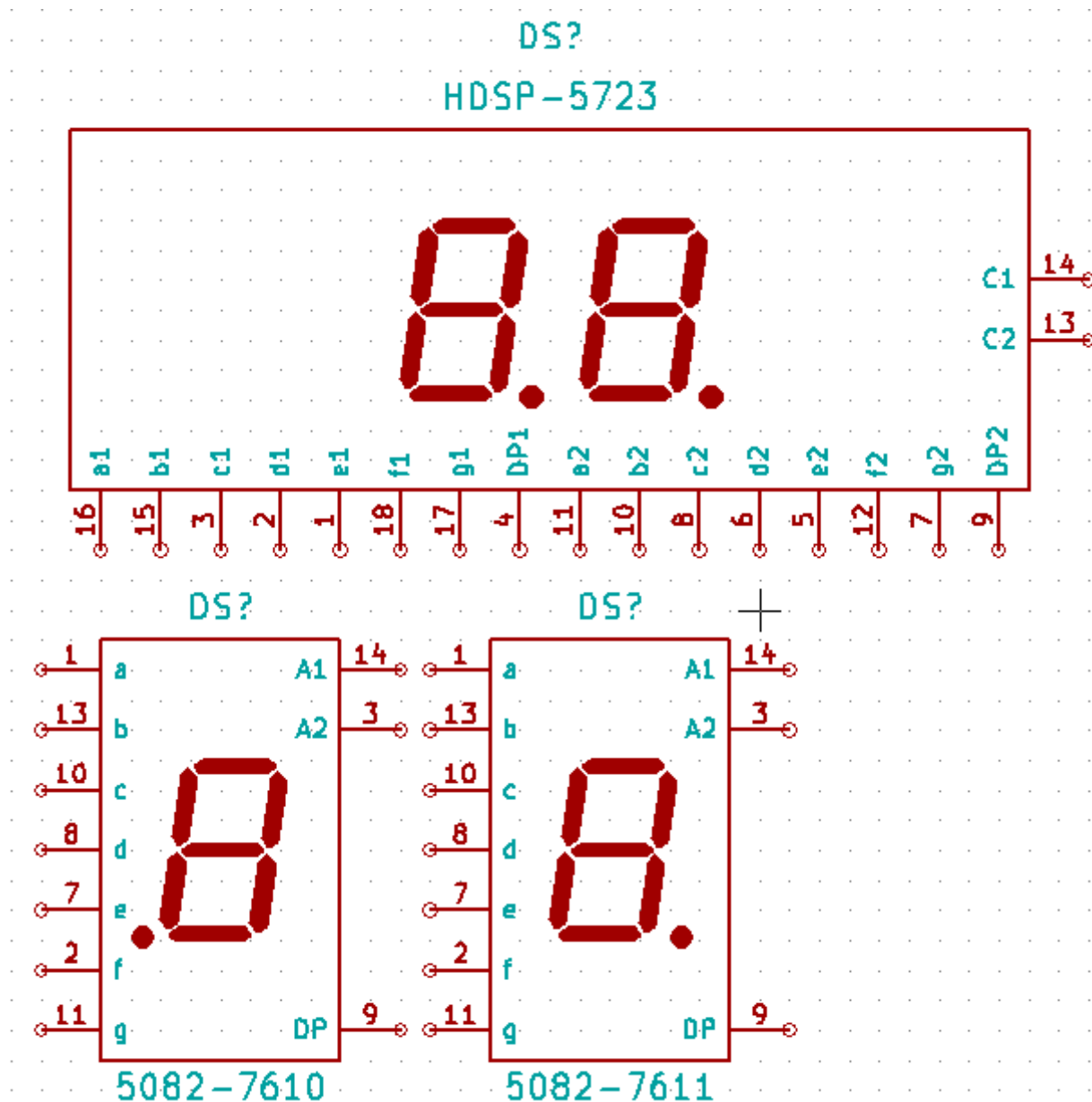
Note1: Pins 0.10" length

---

15 The width is 0.50" if pin text is too close for two opposing pins
16 Hidden Power Pins are 0.00" in length

4.14.2 DS-lightEmittingDiode

File Contents: LED

Reference: DS

Value: <Manufacturer's Part Number>

4.14.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.20"	N/A	No
Hidden	N/A	N/A	

4.14.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes
Colour	0.03"	Centre	Centre	Normal	Yes

4.14.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.14.2.4 Footprint Filter

Yes

4.14.2.5 Alias

Any Equivalent Device

4.14.2.6 Equivalence File

No

4.14.2.7 Symbol Naming Convention

-

4.14.2.8 Example
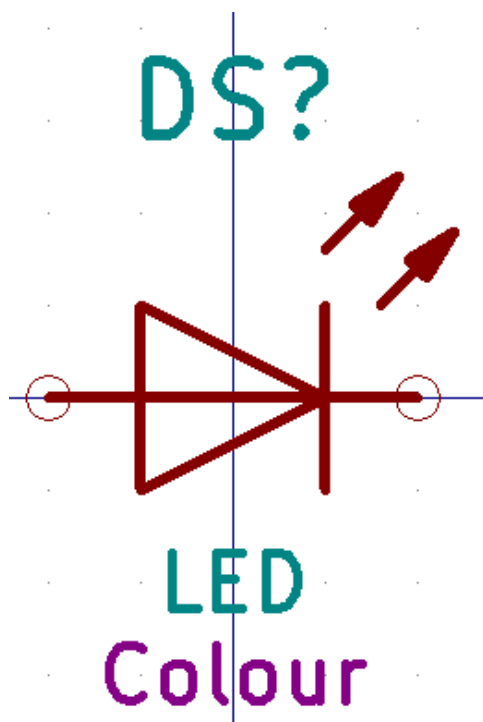
Note1: Pins 0.05" length

Note2: Diode dimensions according to 4.11.1.

4.14.3 DS-generalLightSource

File Contents: General Light Source

-

4.14.4 DS-visualSignallingDevice

File Contents: Electrically Restored Drop, Annunciator, Manually Restored Drop, Lamp, Indicator

-

4.15 Class Designation E

4.15.1 E-aluminiumCell

File Contents: Aluminium Cell

-

4.15.2 E-antenna

File Contents: Antenna

-

4.15.3 E-armature

File Contents: Armature

-

4.15.4 E-bindingPost

File Contents: Binding Post

-

4.15.5 E-cableTermination

File Contents: Cable Termination

-

4.15.6 E-carbonBlock

File Contents: Carbon Block

-

4.15.7 E-circuitTerminal

File Contents: Circuit Terminal

-

4.15.8 E-conductivityCell

File Contents: Conductivity Cell

-

4.15.9 E-electricalContact

File Contents: Electrical Contact

-

4.15.10   E-electricalShield

File Contents: Electrical Shield

-

4.15.11　E-electrolyticCell

File Contents:　Electrolytic Cell

-

4.15.12　E-ferriteBeadRings

File Contents:　Ferrite Bead Rings

-

4.15.13　E-filmElement

File Contents:　Film Element

-

4.15.14　E-gap

File Contents:　Gap

-

4.15.15　E-hallElement

File Contents:　Hall Element

-

4.15.16　E-igniterGap

File Contents:　Igniter Gap

-

4.15.17　E-insulator

File Contents:　Insulator

-

4.15.18　E-lightningArrester

File Contents:　Lightning Arrester

-

4.15.19　E-magneticCore

File Contents:　Magnetic Core

-

4.15.20　E-miscellaneousElectricalPart

File Contents:　Miscellaneous Electrical Part

-

4.15.21　E-opticalShield

File Contents:　Optical Shield

-

4.15.22   E-permanentMagnet

File Contents: Permanent Magnet

-

4.15.23   E-rotaryJoint

File Contents: Rotary Joint

-

4.15.24   E-shortCircuit

File Contents: Short Circuit

-

4.15.25   E-sparkGap

File Contents: Spark Gap

-

4.15.26   E-splice

File Contents: Splice

-

4.15.27   E-telephoneProtector

File Contents: Telephone Protector

-

4.15.28   E-terminal

File Contents: Terminal

-

4.15.29   E-valveElement

File Contents: Valve Element

-

4.15.30   E-vibratingReed

File Contents: Vibrating Reed

-

4.16 Class Designation EQ

4.16.1 EQ-equalizer

File Contents: Equalizer, Equalizing Network

-

4.17 Class Designation F

4.17.1 F-fuse

File Contents: Fuse, Fuse Cutout

Reference: F

Value: <Manufacturer's Part Number>

4.17.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.17.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.17.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.17.1.4 Footprint Filter

Yes

4.17.1.5 Alias

Any Equivalent Device

4.17.1.6 Equivalence File

No

4.17.1.7 Symbol Naming Convention

-

4.17.1.8 Example
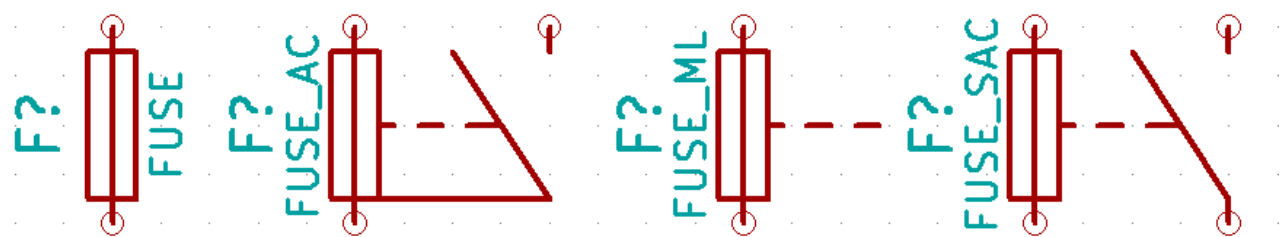
Left to Right: Fuse, Fuse with Alarm Contact, Fuse with Mechanical Linkage, Fuse with Separate Alarm Circuit

Note1: Resistor Body shapes and Pins are same dimensions as for Fixed Resistor (4.39.1)

4.18 Class Designation FL

4.18.1 FL-filter

File Contents: Filter

Reference: FL

Value: <Manufacturer's Part Number>

4.18.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.03"	Yes
Hidden	0.03"	N/A	

4.18.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.18.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	Power input	Line

4.18.1.4 Footprint Filter

Yes

4.18.1.5 Alias

Any Equivalent Device

4.18.1.6 Equivalence File

No

4.18.1.7 Symbol Naming Convention

-

4.18.1.8 Example
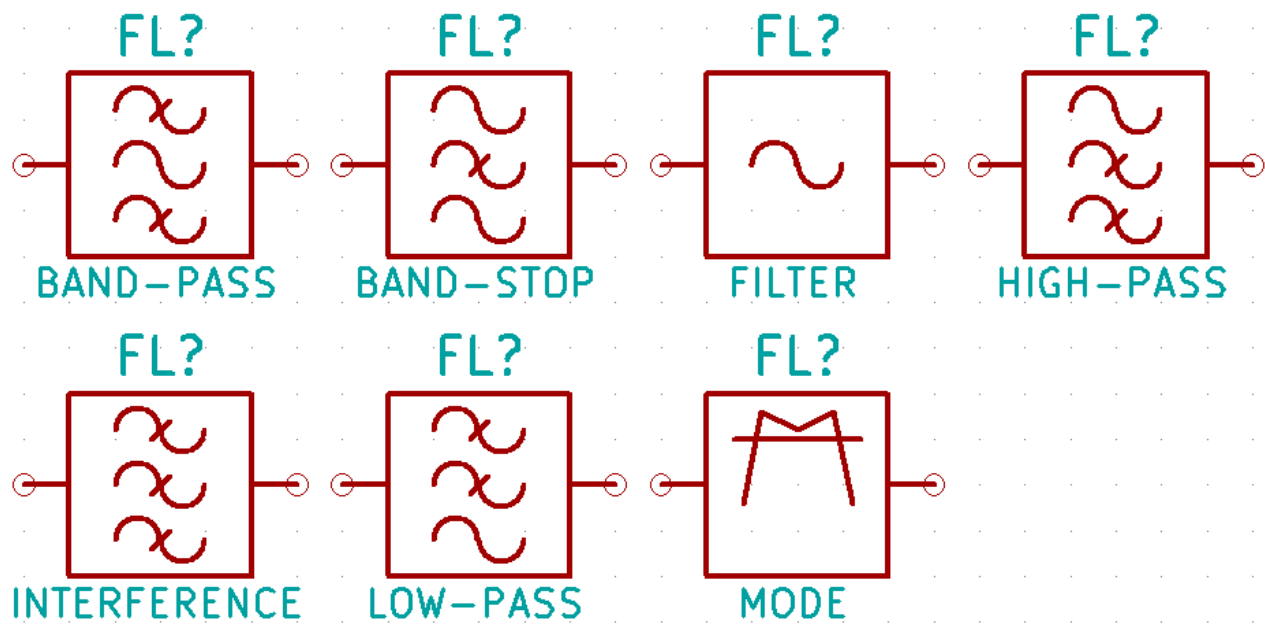
Note1: Each Filter has a hidden Power Pin "AGND".

4.19 Class Designation G

4.19.1 G-oscillator

File Contents: Oscillator, See also Integrated Circuits (4.48.6)

-

4.19.2 G-electronicChopper

File Contents: Electronic Chopper

-

4.19.3 G-ignitionMagneto

File Contents: Ignition Magneto

-

4.19.4 G-interrupterVibrator

File Contents: Interruptor Vibrator

-

4.19.5 G-rotatingAmplifier

File Contents: Rotating Amplifier

-

4.19.6 G-telephoneMagneto

File Contents: Telephone Magneto

-

4.20 Class Designation H

4.20.1 H-hardware

File Contents: Hardware

-

4.21 Class Designation HP

4.21.1 HP-hydraulicPart

File Contents: Hydraulic Part

-

4.22 Class Designation HR

4.22.1 HR-heater

File Contents: Heater

-

4.22.2 HR-heatingLamp

File Contents: Heating Lamp

-

4.22.3 HR-heatingResistor

File Contents: Heating Resistor

-

4.22.4 HR-infraredLamp

File Contents: Infrared Lamp

-

4.22.5 HR-thermomechanicalTransducer

File Contents: Thermomechanical Transducer

-

4.23 Class Designation HS

4.23.1 HS-handset

File Contents: Handset, Operator's Handset

-

4.24 Class Designation HT

4.24.1 HT-earphone

File Contents: Earphone

-

4.24.2 HT-electricalheadset

File Contents: Electrical Headset

-

4.24.3 HT-receiver

File Contents: Receiver

-

4.24.4 HT-telephoneReceiver

File Contents: Telephone Receiver

-

4.25 Class Designation HY

4.25.1 HY-circulator

File Contents: Circulator

-

4.25.2 HY-directionalCoupler

File Contents: Directional Coupler

-

4.25.3 HY-directionallySelectiveTransmissionDevice

File Contents: Directionally Selective Transmission Device

-

4.26 Class Designation J

4.26.1 J-stationaryReceptacleGeneric

File Contents: Header, Jack, Connectors (Generic Types)

Reference: J

Value: <Component Type> e.g. HEADER_F_1X10

Unit: <Any Value>

4.26.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.02"	0.02"	Yes
Hidden	N/A	N/A	

text_offset is 100 mil.

4.26.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.26.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.26.1.4 Footprint Filter

Yes

4.26.1.5 Alias

Any Equivalent Device

4.26.1.6 Equivalence File

No

4.26.1.7 Symbol Naming Convention

-

4.26.1.8 Example 1 (Generic Headers)

J1

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

HEADER_F_1X10

J2

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

HEADER_M_1X10

J3A

A1
A2
A3
A4
A5
A6
A7
A8
A9
A10

HEADER_F_2X10

J3B

B1
B2
B3
B4
B5
B6
B7
B8
B9
B10

HEADER_F_2X10

J4A

A1
A2
A3
A4

HEADER_M_2X4

J4B

B1
B2
B3
B4

HEADER_M_2X4
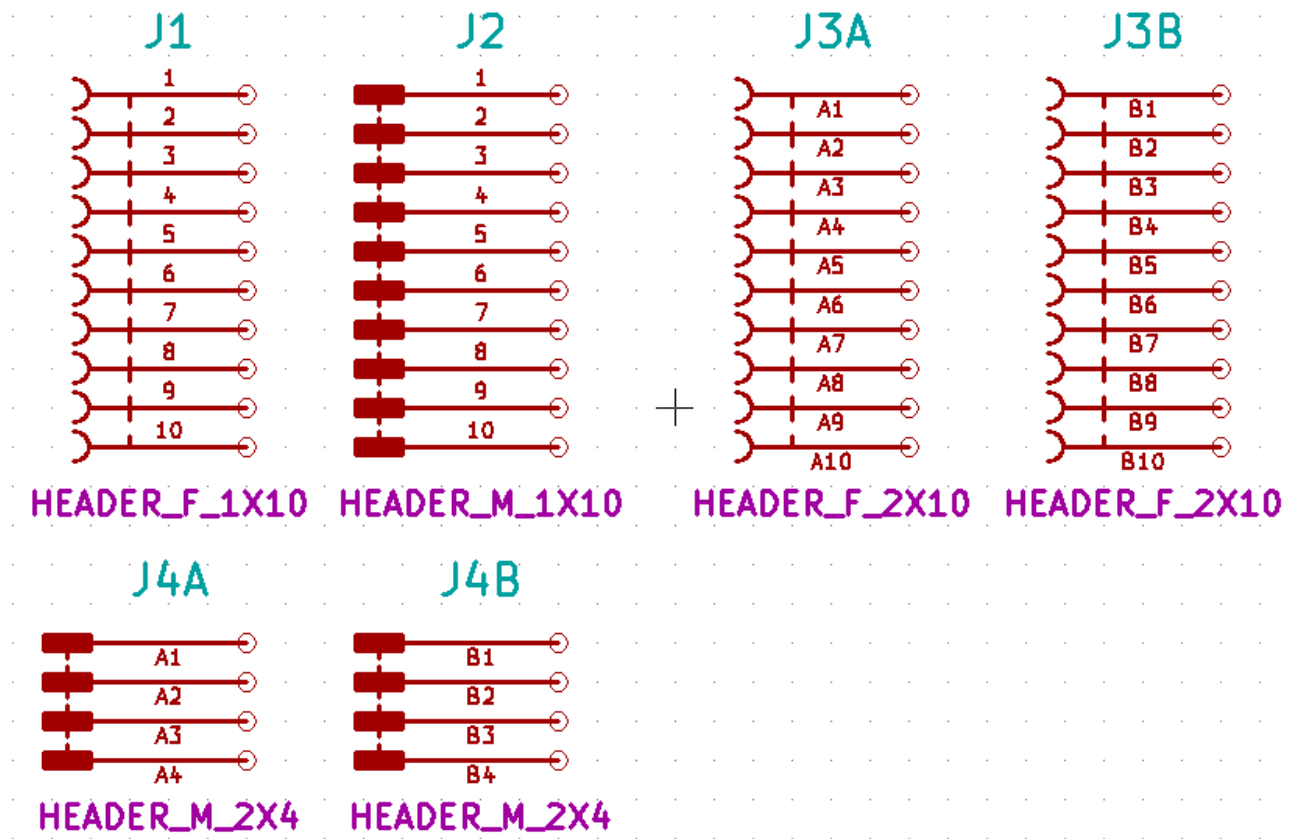
Note1: Pins 0.20" length

Note2: Pin space 0.05"

Note3: Single row headers are a single part with numeric pin numbering

Note4: Multi-row headers are multi-part components (one part represents one row)[17]

Note5: Female receptacle 0.04" diameter

Note6: Male receptacle 0.07" length, 0.02" width

---

17 J3A, J3B and J4A, J4B represent 2 row headers implemented as a multi-part component

4.26.1.9 Example 2 (Standard Connectors)
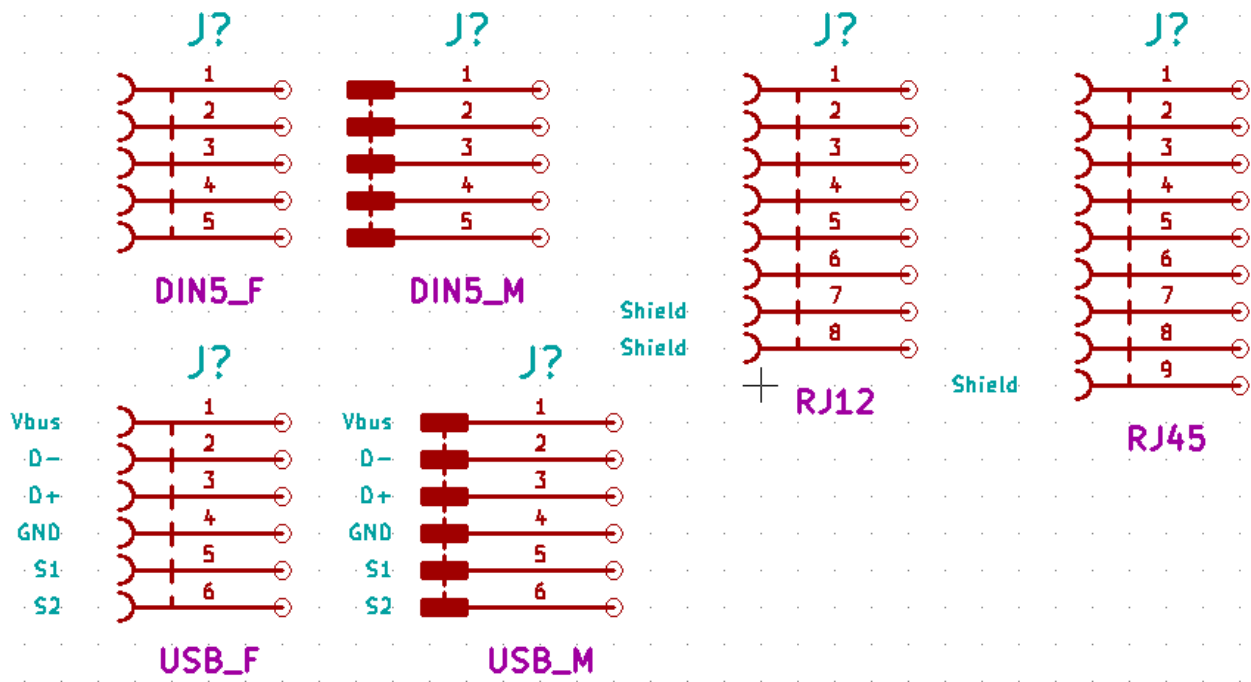
Note1: Pins 0.20" length

Note2: Pin space 0.05"

Note3: Female receptacle 0.04" diameter

Note4: Male receptacle 0.07" length, 0.02" width

Note5: Pins with specific function have Pin Name assigned (text_offset 100 mil)

4.26.2 J-stationaryReceptacle

File Contents: Header, Jack, Connectors (Unique)

Reference: J

Value: <Manufacturer's Part Number>

4.26.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.02"	No
Hidden	N/A	N/A	

4.26.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.26.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.26.2.4 Footprint Filter

Yes

4.26.2.5 Alias

Any Equivalent Device

4.26.2.6 Equivalence File

No

4.26.2.7 Symbol Naming Convention

-

4.26.2.8 Example

-

4.26.3 J-waveguideFlange

File Contents: Waveguide Flange

-

4.27 Class Designation K

4.27.1 K-contactor

File Contents: Contactor

-

4.27.2 K-relay

File Contents: Relay

Reference: K

Value: <Manufacturer's Part Number>

4.27.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.02"	0.02"	Yes
Hidden	N/A	N/A	

4.27.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.27.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.27.2.4 Footprint Filter

Yes

4.27.2.5 Alias

Any Equivalent Device

4.27.2.6 Equivalence File

No

4.27.2.7 Symbol Naming Convention

-

4.27.2.8 Example
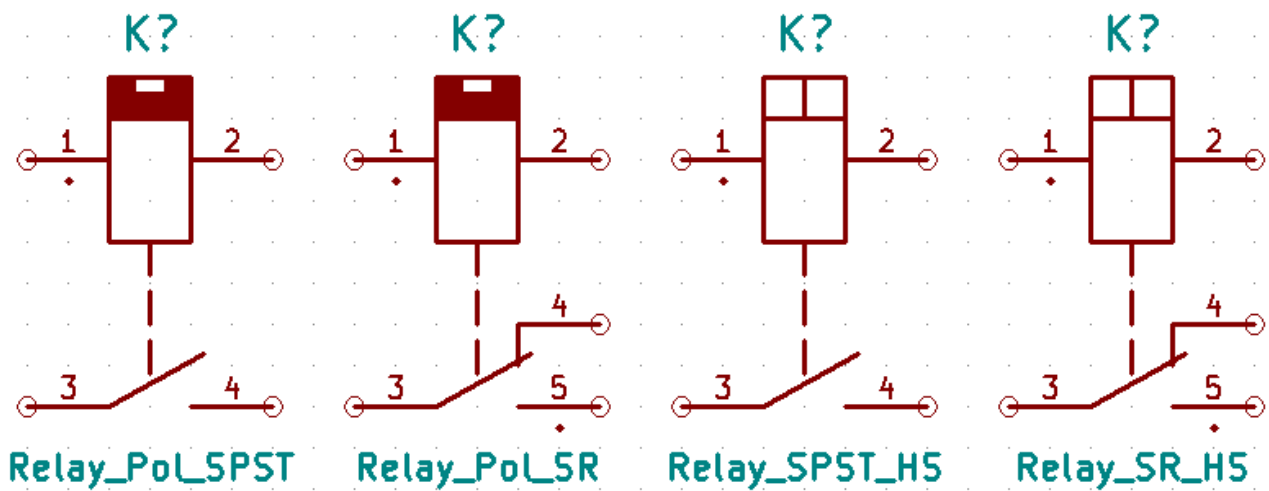
Left to right: Polarized SPST, Polarized Self-restoring, High-speed SPST, High-speed Self-restoring

Note1: Pins 0.10" length

4.28 Class Designation L

4.28.1 L-coil

File Contents: Coil

-

4.28.2 L-inductor

File Contents: Inductor

Reference: L

Value: <Component Type> e.g. IND_ADJ (Inductor, Adjustable)

Unit: <Inductance Value>

4.28.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.30"	N/A
Hidden	N/A	N/A	

4.28.2.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.28.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.28.2.4 Footprint Filter

Yes

4.28.2.5 Alias

Any Equivalent Device

4.28.2.6 Equivalence File

No

4.28.2.7 Symbol Naming Convention

-

4.28.2.8 Example[18]
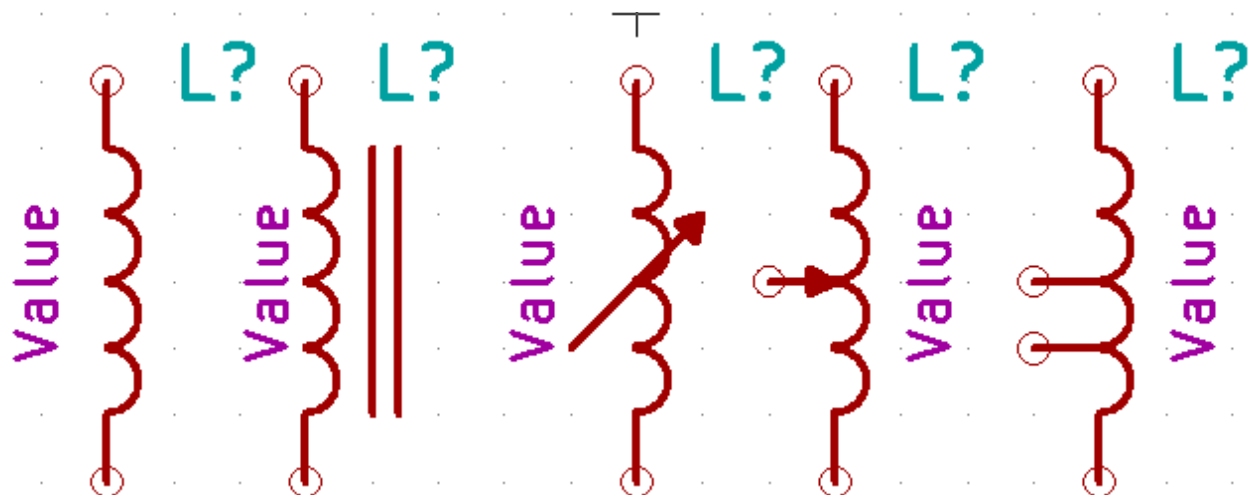
Left to Right: Inductor, Inductor with Magnetic Core, Continuously Adjustable Inductor, Adjustable Inductor, Tapped Inductor

Note1: Pins 0.050" length

Note2: Humps 0.050" diameter

Note3: Value Field is hidden

---

18 Pin numbering is not confirmed

4.28.3 L-electricalSolenoid

File Contents: Electrical Solenoid

-

4.28.4 L-fieldWinding

File Contents: Field Winding

-

4.28.5 L-generatorField

File Contents: Generator Field

-

4.28.6 L-lampBallast

File Contents: Lamp Ballast

-

4.28.7 L-motorField

File Contents: Motor Field

-

4.28.8 L-reactor

File Contents: Reactor

-

4.28.9 L-winding

File Contents: Winding

-

4.29 Class Designation LS

4.29.1 LS-audibleSignallingDevice

File Contents: audible alarm, audible signalling device, buzzer, electric bell, electric horn, loudspeaker, loudspeaker-microphone, siren, telephone ringer, telephone sounder, underwater sound transducer

-

4.30 Class Designation M

4.30.1 M-readoutDevice

File Contents: Clock, coulomb accumulator, elapsed time recorder, electric timer, electrical counter, electrochemical step-function device, instrument, message register, meter, meter-type level pressure gauge, oscillograph, oscilloscope, position indicator, thermometer

Reference: M

Value: <Manufacturer's Part Number>

4.30.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	No
Hidden	N/A	N/A	

4.30.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No

4.30.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.30.1.4 Footprint Filter

Yes

4.30.1.5 Alias

Any Equivalent Device

4.30.1.6 Equivalence File

No

4.30.1.7 Symbol Naming Convention

-

4.30.1.8 Example[19]

Row 1: M? A | M? AH | M? VU | M? CMA | M? CMC | M? CMV | M? C | M? DBM

Row 2: M? DB | M? DTR | M? DM | M? Hz | M? ↑ | M? GD | M? I | M? INT

Row 3: M? UA | M? MA | M? NM | M? OHM | M? OP | M? | M? PH | M? PI

Row 4: M? PF | M? RF | M? RD | M? REC | M? NaCl | M? OSCG | M? | M? n

Row 5: M? TLM | M? tª | M? THC | M? TT | M? VarH | M? Var | M? VA | M? V

Row 6: M? VI | M? WH | M? W
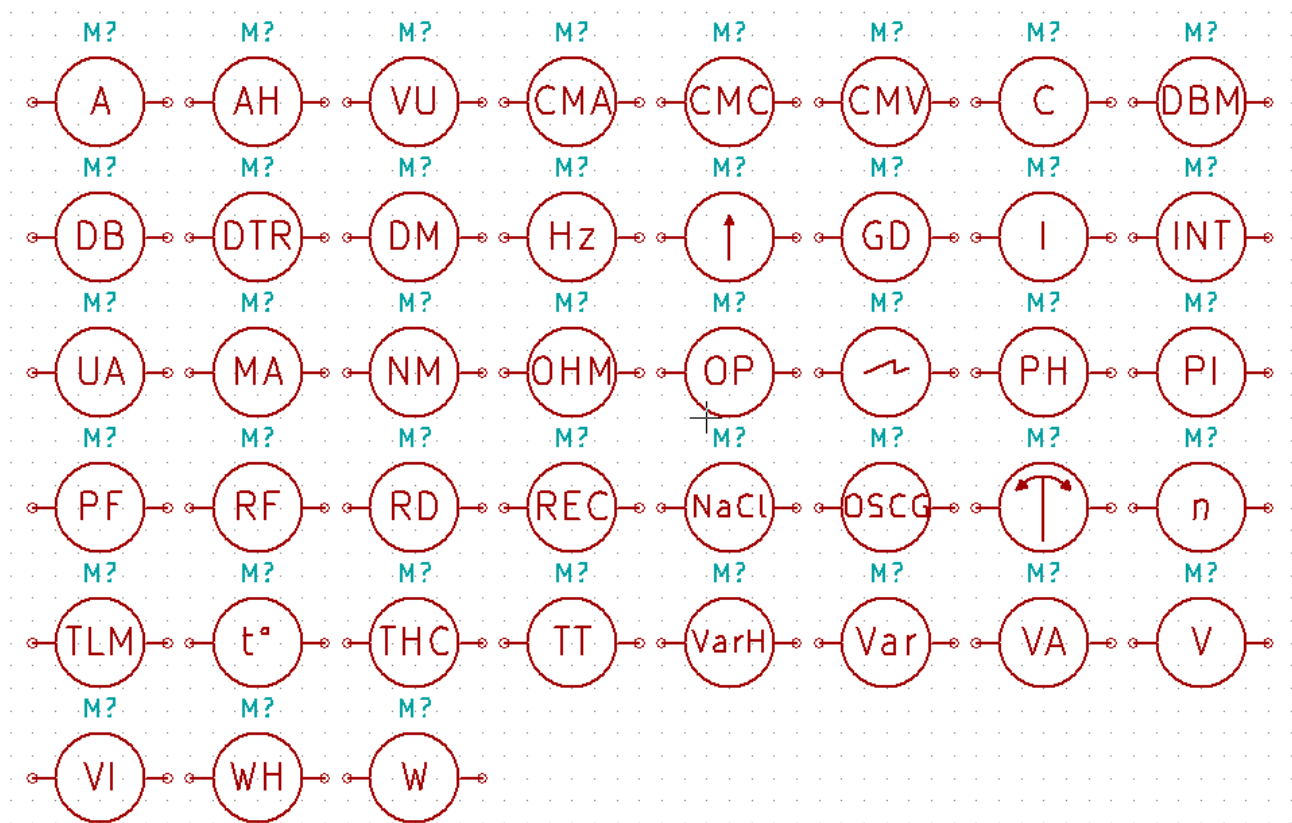
Note1: Pins 0.05" length

Note2: Text 0.06" length (3-Digit), Text 0.05" length (4-Digit)

Note3: Circle 0.20" diameter

---

19 Example(s) used do not represent actual component(s) but are used as template(s)

4.31 Class Designation MG

4.31.1 MG-machine

File Contents: Converter, dynamotor, inverter, motor-generator, Alternating Current Machines

-

4.32 Class Designation MK

4.32.1 MK-microphone

File Contents: Microphone, Hydrophone, telephone transmitter

-

4.33 Class Designation MP

4.33.1 MP-mechanicalPart

File Contents: Brake, Clutch, mechanical interlock, mechanical part, miscellaneous mechanical part

-

4.34 Class Designation MT

4.34.1 MT-transducer

File Contents: Accelerometer, measuring transducer, mode transducer, motional pickup transducer, primary detector)

-

4.35 Class Designation P

4.35.1 P-movableReceptacle

File Contents: Movable Receptacle

-

4.36 Class Designation PS

4.36.1 PS-powerSupply

File Contents: Power Supply

-

4.36.2 PS-rectifier

File Contents: Rectifier

Reference: PS

Value: <Manufacturer's Part Number>

4.36.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	No
Hidden	N/A	N/A	

4.36.2.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.36.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.36.2.4 Footprint Filter

Yes

4.36.2.5 Alias

Any Equivalent Device

4.36.2.6 Equivalence File

No

4.36.2.7 Symbol Naming Convention

-

4.36.2.8 Example[20]
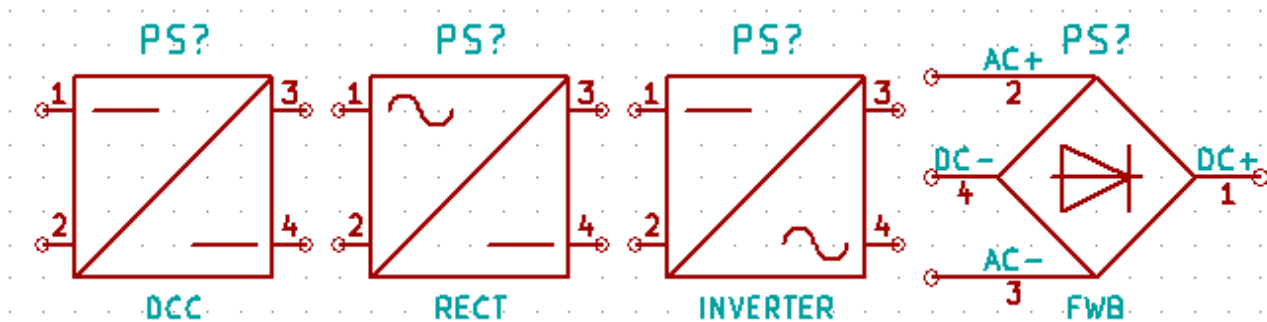
Left to Right: DC/DC Converter, Rectifier, Inverter, Full-Wave Bridge Rectifier

Note1: Pins 0.05" length (FWB 0.25" and 0.10")

Note2: Body Outline 0.30" x 0.30" (FWB 0.30" diagonal)

Note3: Symbols deviate from IEEE Std 315-1975 as they show 2 * inputs and 2 * outputs

---

20 Example(s) used do not represent actual component(s) but are used as template(s)

4.37 Class Designation PU

4.37.1 PU-pickup

File Contents: Head, Sound Reproducer

-

4.38 Class Designation Q

4.38.1 Q-transistor

File Contents: All Transistor types

Reference: Q

Value: <Standard>

4.38.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.20"	N/A	No
Hidden	N/A	N/A	

4.38.1.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	Yes

4.38.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.38.1.4 Footprint Filter

No

4.38.1.5 Alias

No

4.38.1.6 Equivalence File

No

4.38.1.7 Symbol Naming Convention

Description	Type	Junction Type	Pin Config	Pin Config
Darlington, NPN	DARL	NPN	BCE	123
Insulated Gate BiPolar, NPN	IGBT	NPN	GCE	123
Insulated Gate BiPolar, PNP	IGBT	PNP	GCE	123
Insulated Gate BiPolar, N-Channel	IGBT	N-Channel	GCE	123
Insulated Gate BiPolar, P-Channel	IGBT	P-Channel	GCE	123
Junction Field Effect, N-Channel	JFET	N-Channel	GSD	123
Junction Field Effect, P-Channel	JFET	P-Channel	GSD	123
Insulated Gate Field-Effect, N-Channel Depletion	MOS	N-Channel	GSD	123
Insulated Gate Field-Effect, N-Channel Enhancement	MOS	N-Channel	GSD	123
Insulated Gate Field-Effect, P-Channel Depletion	MOS	P-Channel	GSD	123
Insulated Gate Field-Effect, P-Channel Enhancement	MOS	P-Channel	GSD	123
BiPolar, NPN	BIPOL	NPN	BCE	123
BiPolar, PNP	BIPOL	PNP	BCE	123
BiPolar, NPN, Dual Emitter	BIPOL	NPN	BC2E	1234
BiPolar, PNP, Dual Emitter	BIPOL	PNP	BC2E	1234
Photo-Transistor, BiPolar, NPN	PHOTO	NPN	BCE	123
Photo-Transistor, BiPolar, PNP	PHOTO	PNP	BCE	123

4.38.1.8 Example
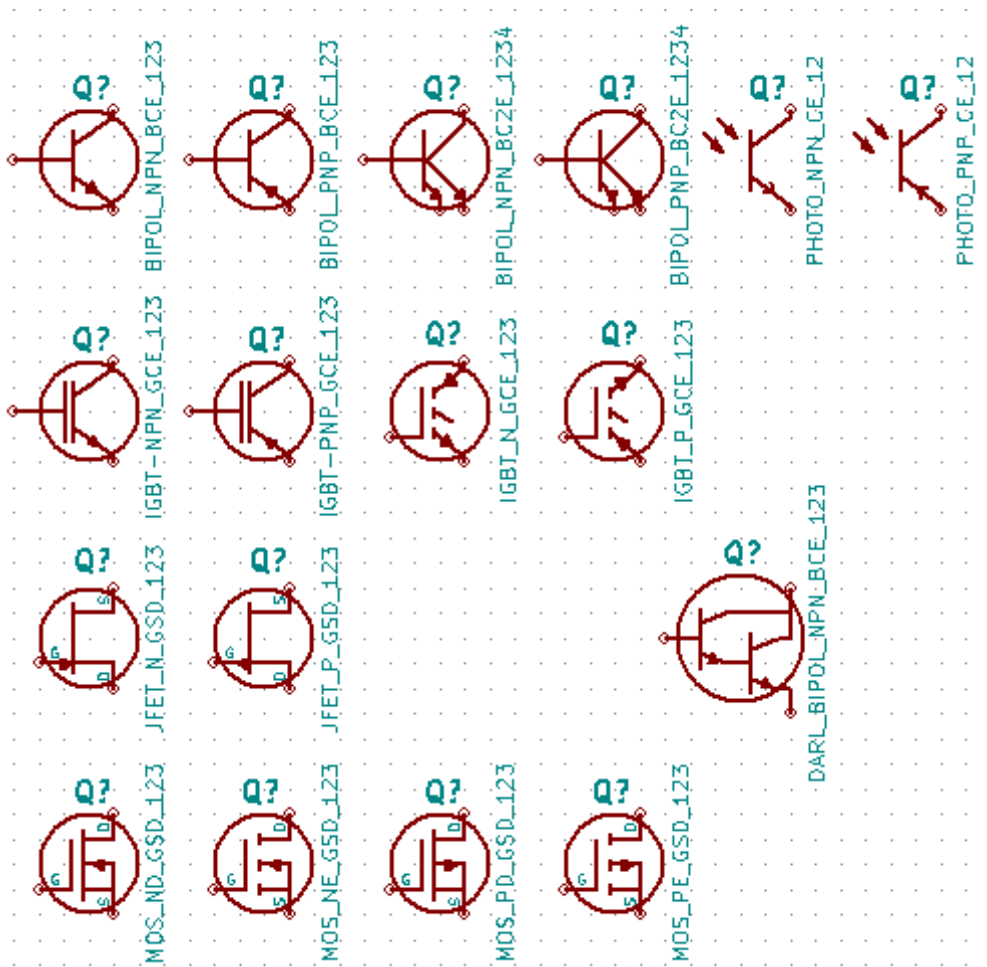
Note1: Envelope 0.20" (All except Darlington)

Note2: Envelope 0.30" (Darlington)

4.38.2 Q-Thyristor

File Contents: Thyristor, Semiconductor Controlled Rectifier, Semiconductor Controlled Switch

Reference: Q

Value: <Standard>

4.38.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.20"[21]	N/A	No
Hidden	N/A	N/A	

4.38.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.38.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.38.2.4 Footprint Filter

No

4.38.2.5 Alias

No

4.38.2.6 Equivalence File

No

---

21 Pin Names are only shown for Symbols with more than two pins

4.38.2.7 Symbol Naming Convention

Description	Type	Pin Config	Pin Config
Anode Gate Thyristor	AGT	CAG	123
Anode Gate Turn-Off Thyristor	AGTO	CAG	123
Reverse Blocking Anode Gate Thyristor	RBAGT	CAG	123
Reverse Conducting Anode Gate Thyristor	RCAGT	CAG	123
Cathode Gate Thyristor	CGT	CAG	123
Cathode Gate Turn-Off Thyristor	CGTO	CAG	123
Reverse Blocking Cathode Gate Thyristor	RBCGT	CAG	123
Reverse Conducting Cathode Gate Thyristor	RCCGT	CAG	123
Reverse Blocking Diode Thyristor	RBDT	CA	12
Reverse Conducting Diode Thyristor	RCDT	CA	12
Silicon Controlled Switch	SCS	CAGG	1234
TRIAC	TRIAC	MMG	123
DIAC	DIAC	MM	12

4.38.2.8 Example
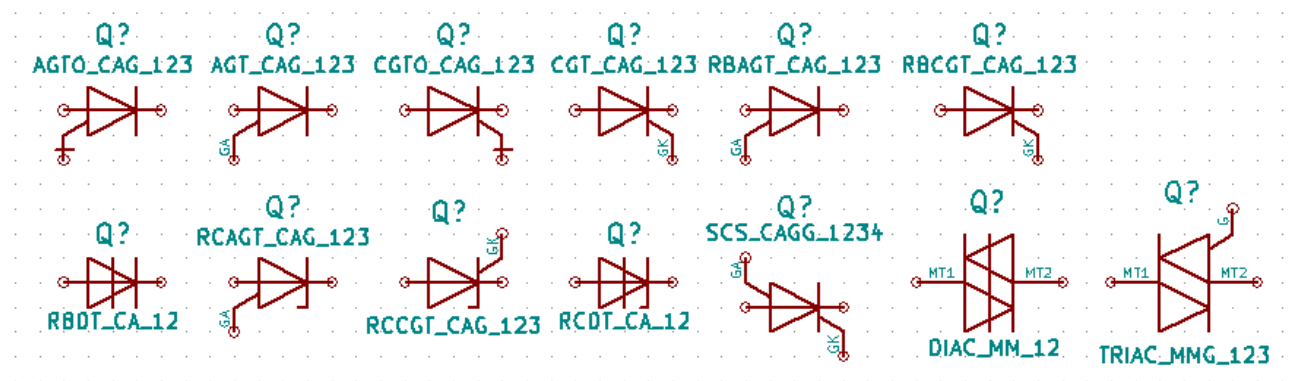
Note1: Thyristor Body shapes and Pins are same dimensions as for Diode (4.11.1)

Note2: DIAC and TRIAC Pins (MT1, MT2) 0.10" length

4.39 Class Designation R

4.39.1 R-resistor

File Contents: Single Fixed Value Resistors

Reference: R

Value: <Component Type> e.g. Fixed_Resistor

Unit: <Resistance Value>

4.39.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.39.1.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04”	Centre	Centre	Normal	Yes
Value	0.03”	Centre	Centre	Normal	No
Unit	0.03”	Centre	Centre	Normal	Yes

4.39.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.39.1.4 Footprint Filter

Yes

4.39.1.5 Alias

No

4.39.1.6 Equivalence File

No

4.39.1.7 Symbol Naming Convention

-

4.39.1.8 Example
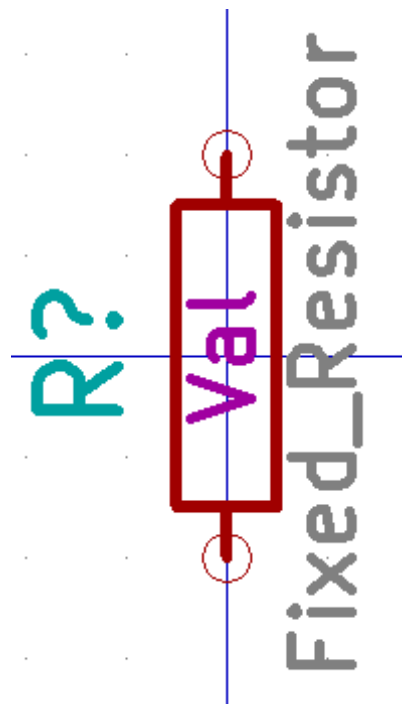
Note1: Pins 0.025" length

Note2: Component Width 0.05"

Note3: Component Length 0.150"

4.39.2 R-resistorNetwork

File Contents: Fixed Value Resistor Networks (Single in-line, Dual in-line)

Reference: R

Value: <Component Type> (Configuration e.g. DIL01-13, SIL01-13)

Unit: <Resistance Value>

These components are defined as Multi-part.

4.39.2.1 Pin Text Dimensions (01-Schematic[22])

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	No
Hidden	N/A	N/A	

4.39.2.2 Pin Text Dimensions (03-Schematic[23])

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.03"	N/A
Hidden	N/A	N/A	

4.39.2.3 Fields Properties (01, 03 Schematic)

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.39.2.4 Pin Electrical Type and Graphic Style (01, 03 Schematic)

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.39.2.5 Footprint Filter (01, 03 Schematic)

Yes

4.39.2.6 Alias (01, 03 Schematic)

Any Equivalent Device

4.39.2.7 Equivalence File (01, 03 Schematic)

No

---

22 All Resistors share a common pin
23 Individual Resistors

4.39.2.8 Symbol Naming Convention

Description	Type	Package	Schematic	No. Components	No.Pins
Resistor Network, Dual Inline	RN	DIL	BUS/ISOL	Rnn	Qnn
Resistor Network, Single Inline	RN	SIL	BUS/ISOL	Rnn	Qnn

e.g. RN_DIL_BUS_R13-Q14, RN_DIL_ISOL_R2-Q4, RN_SIL_BUS_R4-Q5, RN_SIL_ISOL_R6-Q12

4.39.2.9 Example
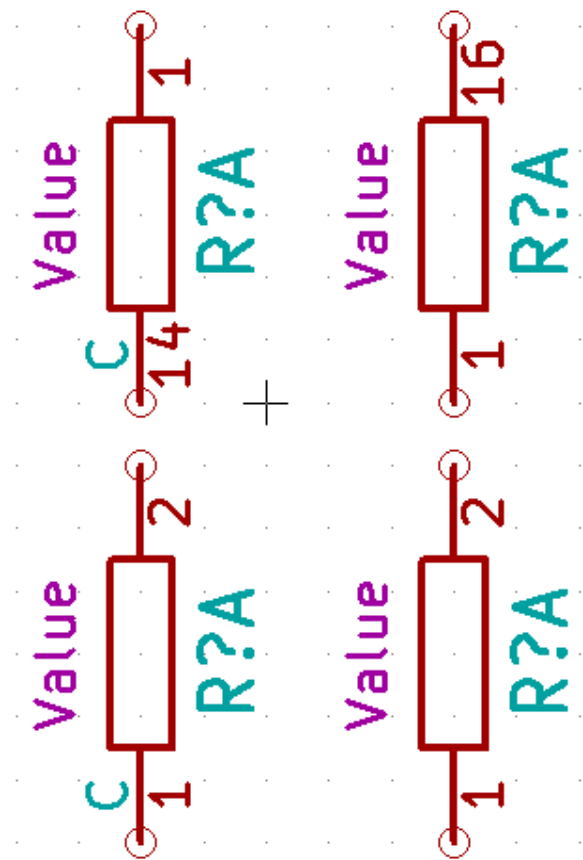
Top Row: DIL03, DIL01

Bottom Row: SIL03, SIL01

Note1: Resistor Body shapes are same dimensions as for Fixed Resistor (4.39.1)

Note2: Pins 0.075" length

Note3: Pin Name "C" denotes "Common" pin for 03 types

Note4: Value Field is hidden

4.39.3 R-resistorVaraible

File Contents: Rheostat, Potentiometer, Magnetoresistor

Reference: R

Value: \<Component Type\> e.g. Potentiometer

Unit: \<Resistance Value (Range)\>

4.39.3.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.39.3.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.39.3.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.39.3.4 Footprint Filter

Yes

4.39.3.5 Alias

Any Equivalent Device

4.39.3.6 Equivalence File

No

4.39.3.7 Symbol Naming Convention

-

4.39.3.8 Example[24]
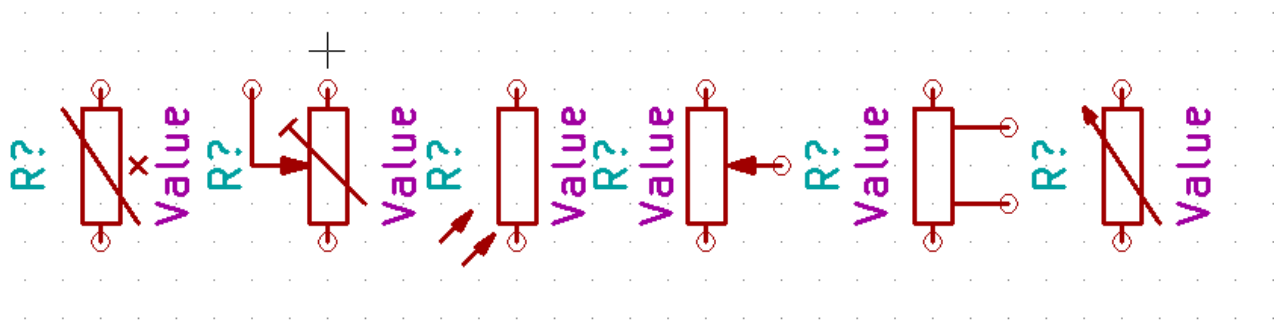
Left to Right: Magnetoresistor, Preset Adjustable Resistor, Photoresistor, Tapped Resistor, Rheostat

Note1: Resistor Body shapes and Pins are same dimensions as for Fixed Resistor (4.39.1)

Note2: Value Field is hidden

---

24 Pin numbering is not confirmed

4.40 Class Designation RE

4.40.1 RE-radioReceiver

File Contents: Radio Receiver

-

4.41 Class Designation RT

4.41.1 RT-thermistor

File Contents: Thermistor Current Regulating Resistor, thermal resistor, temperature-sensing element, resistance lamp, Ballast Lamp, Ballast Tube

Reference: RT

Value: <Component Type> e.g. Thermistor

Unit: <Resistance Value (Range)>

4.41.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.41.1.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.41.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.41.1.4 Footprint Filter

Yes

4.41.1.5 Alias

No

4.41.1.6 Equivalence File

No

4.41.1.7 Symbol Naming Convention

-

4.41.1.8 Example
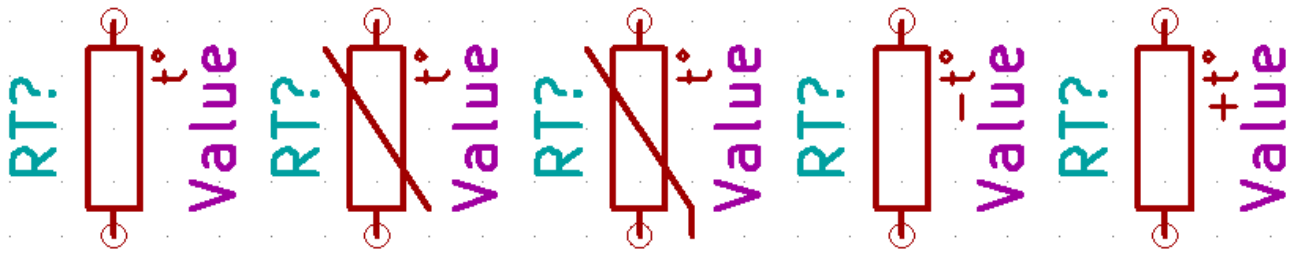
Left to Right: Thermistor, Linear Thermistor, Non-Linear Thermistor, Thermistor (Negative Temperature Coefficient), Thermistor (Positive Temperature Coefficient)

Note1: Resistor Body shapes and Pins are same dimensions as for Fixed Resistor (4.39.1)

Note2: Text "t°" 0.03"

4.42 Class Designation RV

4.42.1 RV-varistor

File Contents: Varistor

Reference: RV

Value: <Component Type> e.g. Varistor

Unit: <Resistance Value (Range)>

4.42.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.42.1.2 Fields Properties

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.42.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.42.1.4 Footprint Filter

Yes

4.42.1.5 Alias

No

4.42.1.6 Equivalence File

No

4.42.1.7 Symbol Naming Convention

-

4.42.1.8 Example
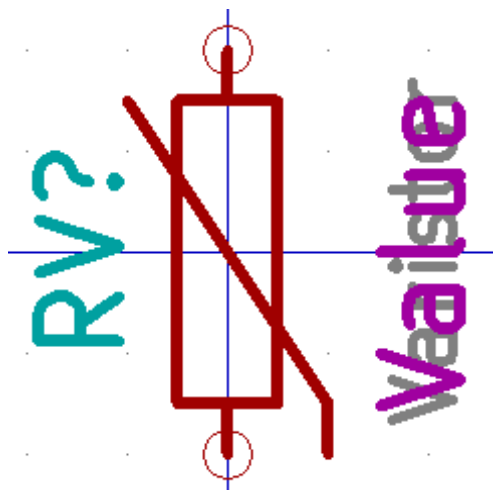
Note1: Resistor Body shapes and Pins are same dimensions as for Fixed Resistor (4.39.1)

4.43 Class Designation S

4.43.1 S-switch

File Contents: Contactor, disconnecting device, electrical safety interlock, flasher (circuit interrupter), governor, speed regulator, telegraph key, Switch, telephone dial, thermal cutout, thermostat), DIP Switch

Reference: S

Value: <Component Type> e.g. SPDM (Single-Pole, Double-Make)

4.43.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.03"	N/A
Hidden	N/A	N/A	

4.43.1.2 Fields Properties (DIP)

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.43.1.3 Fields Properties (Other)

Field Name	Size	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No

4.43.1.4 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.43.1.5 Footprint Filter (Any)

Yes

4.43.1.6 Alias (Any)

No

4.43.1.7 Equivalence File (Any)

No

4.43.1.8 Symbol Naming Convention (DIP)

Description	Type	Package	Switch Type/No. Components	No.Pins
Resistor Network, Dual Inline	SW	DIL	SPSTnn	Qnn

e.g. SW_DIP_SPST8_Q16

4.43.1.9 Example[25]
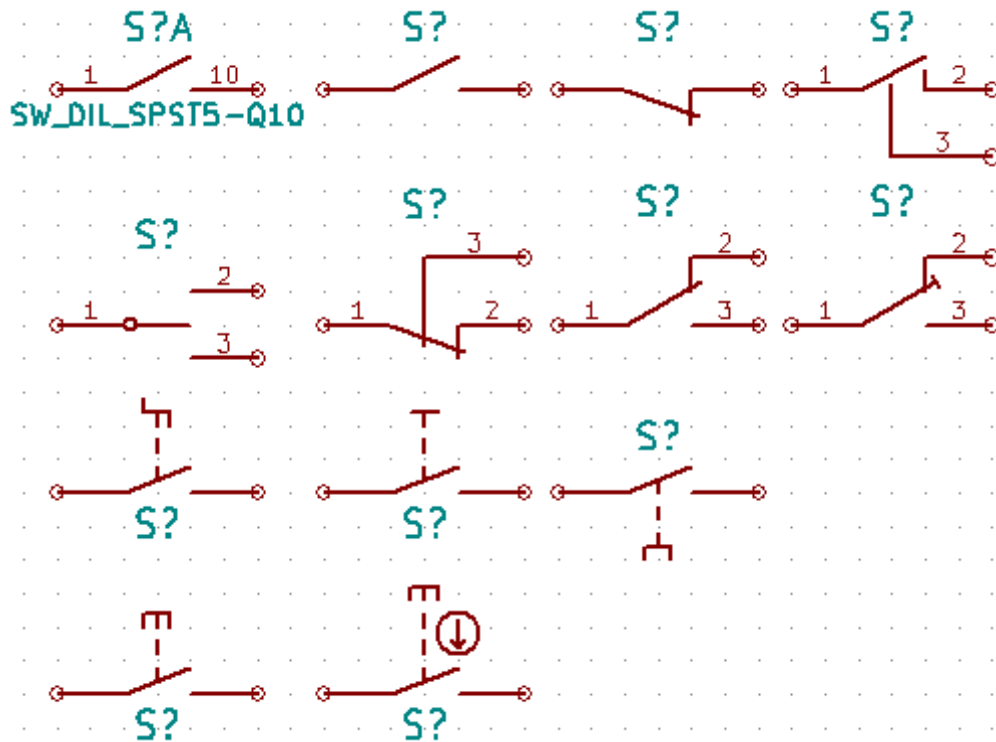
Row1: DIP Switch (Multipart), SPST Make Contact, SPST Break Contact, SP Dual Make

Row2: SPDT Change Over, SP Dual Break, SPDT Break Before Make, SPDT Make Before Break

Row3: Turn Switch, Manual Switch, Pull Switch

Row4: Push-button, Push-button Positive Action

Note1: Pins 0.10" and 0.15" length

Note2: Value Fields are not visible on non-DIL Switches

Note3: 2-Terminal switches have hidden pin numbers

---

25 Pin numbering is not confirmed

4.44 Class Designation T

4.44.1 T-transformer

File Contents: Autotransformer, coaxial taper, linear coupler, telephone induction coil, telephone repeating coil, transformer, waveguide taper

Reference: T

Value: <Manufacturer's Part Number>

4.44.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	0.03"	N/A
Hidden	N/A	N/A	

4.44.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.44.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.44.1.4 Footprint Filter

Yes

4.44.1.5 Alias

Any Equivalent Device

4.44.1.6 Equivalence File

No

4.44.1.7 Symbol Naming Convention

-

4.44.1.8 Example[26]
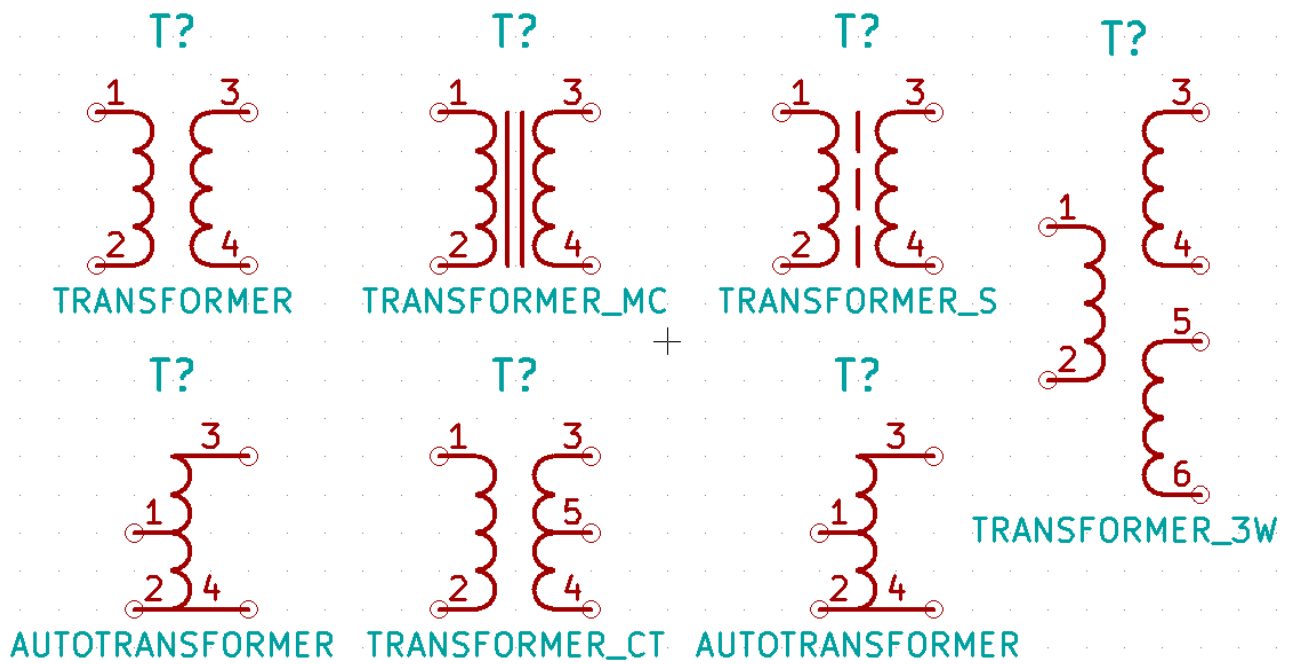
Note1: Pins 0.05" length (Pin 3 & 4 0.10" length on Autotransformer)

Note2: Winding gap 0.05"

---

26 Pin numbering is not confirmed

4.45 Class Designation TB

4.45.1 TB-terminalBoard

File Contents: connecting strip, terminal board, terminal strip, test block

-

4.46 Class Designation TC

4.46.1 TC-thermocouple

File Contents: Thermocouple

-

4.46.2 TC-thermopile

File Contents: Thermopile

-

4.47 Class Designation TP

4.47.1 TP-testPoint

File Contents: Test Point, In-Circuit Test Point

Reference: TP

Value: Test_Point

4.47.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.47.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No

4.47.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.47.1.4 Footprint Filter

N/A

4.47.1.5 Alias

N/A

4.47.1.6 Equivalence File

N/A

4.47.1.7 Symbol Naming Convention

-

4.47.1.8 Example
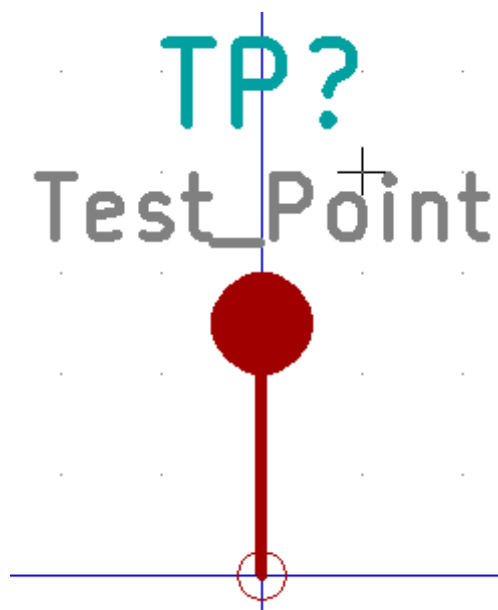
Note1: Pins 0.10" length

Note2: Circle 0.05" diameter

4.48 Class Designation U

4.48.1 U-inseparableAssembly

File Contents: Inseparable Assembly

-

4.48.2 U-standardLogicGate

File Contents: Standard Digital Logic Gates, except Little Logic

Reference: U

Value: <Standard Logic>

Where possible, these symbols have been constructed according to ANSI/IEEE Std 91-1984 & ANSI/IEEE Std 91a-1991.

4.48.2.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03”	0.03”	No
Hidden	0.03”	0.03”	

4.48.2.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04”	Left	Centre	Normal	Yes
Value	0.03”	Left	Centre	Normal	Yes

4.48.2.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.2.4 Footprint Filter

Yes

4.48.2.5 Alias

Symbols are named independently of Logic Family. The device "7400" represents the device in all Logic Families - "74ALS00", "74AC00", "74HCT00" etc. The Logic Family can be added to the Symbol Value during schematic capture. A separate case is the CD4K family. In this case the equivalent "74" series device(s) are added to the "Alias" field e.g:

```
#
# CD4049
#
DEF CD4049 U 0 35 Y Y 1 F N
F0 "U" 0 1200 40 H V C CNN
F1 "CD4049" 0 0 40 V V C CNN
ALIAS 744049
DRAW
...
```

4.48.2.6 Equivalence File

No

4.48.2.7 Symbol Naming Convention

-

4.48.2.8 Devices with multiple packages

Symbols representing DIL (DIP, SOIC, SOP etc.) packages have no suffix as these are considered the "default" package.

Symbols represented in multiple packages but with the same pin configurations do not use a suffix (e.g. SOIC could have the same pin configuration as SOT or SON for the same device).

Symbols representing the same symbol, but with different pin configurations in other packages have suffixes according to the table below:

Package	Suffix	Comment
DIL (DIP, SOIC, SOP, SOT etc.)	-	Default
DIL, DFN, BGA, SON, QFN, QFP, LCC, PLCC, SOT	-	When Pin configurations are identical
DFN	-DN	When DFN pin configuration differs
SON	-SN	When SON pin configuration differs
BGA	-BG	When BGA pin configuration differs
QFN	-QN	When QFN pin configuration differs
QFP	-QP	When QFP pin configuration differs
LCC	-LC	When LCC pin configuration differs
PLCC	-PC	When PLCC pin configuration differs
SOT	-ST	When SOT configuration differs

Note1: All Symbols use use the Element Dimensions and shapes described below, regardless of package.

Note2: The suffix is used to differentiate when symbols use multiple packages.

Note3: When a suffix is used, the Footprint Filter is populated with a non-wildcarded footprint.

Note4: If two Symbols exist of the same component with the same package type but with different numbers of pins/pin configuration then "_<n>P" is added to the suffix. e.g 741G14-BG_4P, 741G14-BG_5P where <n> is the number of pins.

4.48.2.9 Element Dimensions

Each element of the Symbol is dimensioned as follows:

Element Height	Element Width	Pin Size	Pin Space
(n) * 0.10"	0.30"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A NOR element with 2 * Inputs and 1 * Output:

Left side = 2 * Inputs

Right side = 1 * Output = 1 pin

Therefore, n = 2

Note: All Symbols are constructed as a single unit (see example).

4.48.2.10   Example
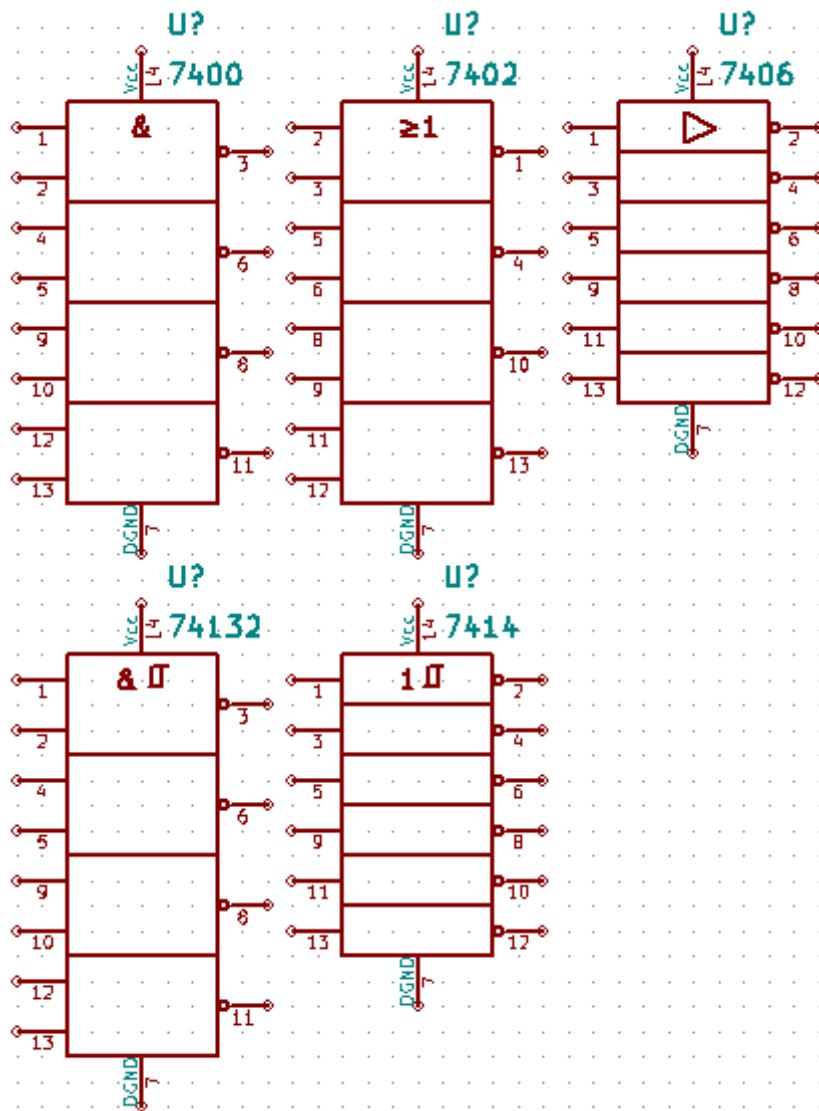
Digital Logic Gates use symbols constructed according to ANSI/IEEE Std 91-1984 & ANSI/IEEE Std 91a-1991.

Top Row: Quad 2-input NAND, Quad 2-input NOR, Hex Inverting Buffer

Bottom Row: Dual 4-input NAND with Schmitt-Trigger inputs, Hex Inverter with Schmitt-Trigger inputs

4.48.3 U-littleLogicGate

File Contents: Little Logic Gates

Reference: U

Value: <Standard Logic>

Where possible, these symbols have been constructed according to ANSI/IEEE Std 91-1984 & ANSI/IEEE Std 91a-1991.

4.48.3.1 Pin Text Dimensions, Non-Configurable Gates

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	No
Hidden	0.03"	0.03"	

4.48.3.2 Pin Text Dimensions, Configurable Gates

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

4.48.3.3 Fields Properties (All)

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	Yes

4.48.3.4 Pin Electrical Type and Graphic Style (All)

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.3.5 Footprint Filter

Yes

4.48.3.6 Alias

See 4.48.2.5

4.48.3.7 Equivalence File

No

4.48.3.8 Symbol Naming Convention

-

4.48.3.9 Devices with multiple packages

See 4.48.2.8

4.48.3.10   Element Dimensions, Non-Configurable Gates

Each element of the Symbol is dimensioned as follows:

Element Height	Element Width	Pin Size	Pin Space
(n) * 0.10"	0.20"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A NOR element with 2 * Inputs and 1 * Output:

Left side = 2 * Inputs

Right side = 1 * Output = 1 pin

Therefore, n = 2

Note: All Symbols are constructed as a single unit (see example).

4.48.3.11   Element Dimensions, Configurable Gates

These Symbols are constructed using the same principles as U-standardLogic & U-littleLogic. See (4.48.4)

4.48.3.12   Example
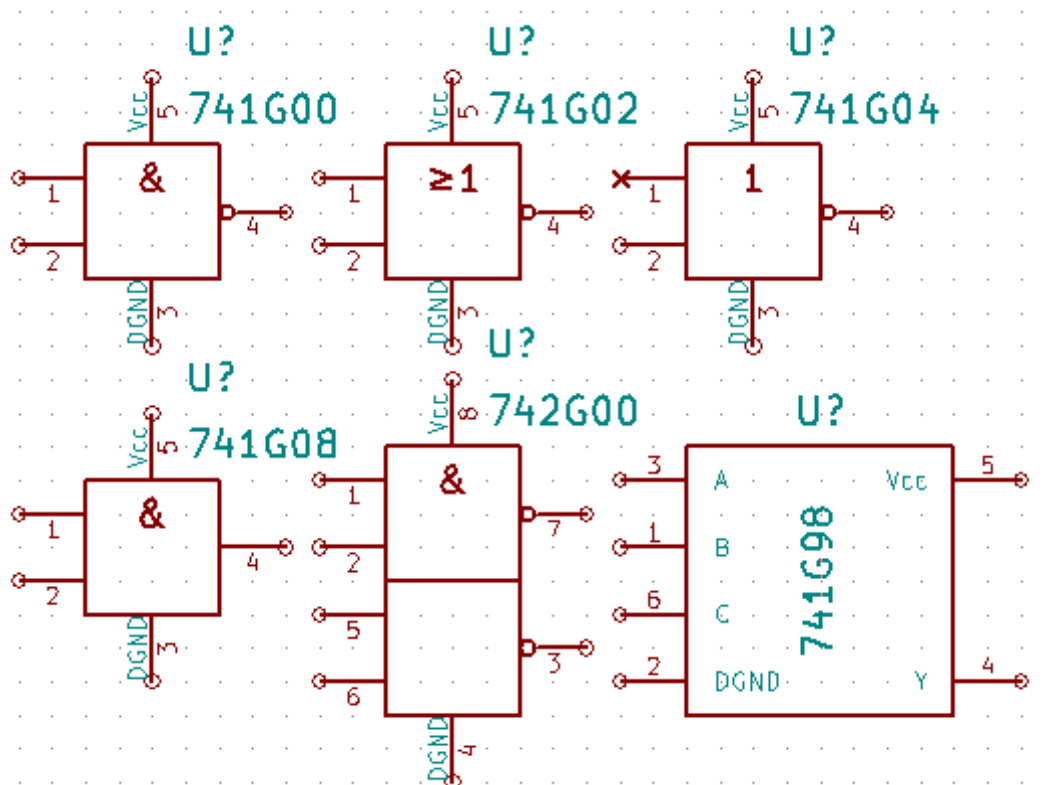
Digital Logic Gates use symbols constructed according to ANSI/IEEE Std 91-1984 & ANSI/IEEE Std 91a-1991.

Example shows single and dual Logic Gates and Configurable Gate (741G98)

4.48.4 U-standardLogic & U-littleLogic

File Contents: Digital Logic (except Logic Gates)

Reference: U

Value: <Standard Logic>

Where possible, these symbols have been constructed according to ANSI/IEEE Std 91-1984 & ANSI/IEEE Std 91a-1991.

4.48.4.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

4.48.4.2 Fields Properties, Single Part Components

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.48.4.3 Fields Properties, Multi Part Components

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	Yes

Note: "Multi-Part" Components are constructed as a single unit (see example)

4.48.4.4 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.4.5 Footprint Filter

Yes

4.48.4.6 Alias

See 4.48.2.5

4.48.4.7 Equivalence File

No

4.48.4.8 Symbol Naming Convention

-

4.48.4.9 Devices with multiple packages

See 4.48.2.8

4.48.4.10 Body Outline Dimensions, Single Part Components

Body Height	Body Width[27]	Pin Size[28]	Pin Space
(n) * 0.10" [+ 0.10"][29]	0.40"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A component with 8 * Inputs, 8 * Outputs, 3 * "Control", Vcc and GND:

Left side = 8 * Inputs + 3 * "Control" + GND = 12 pins

Right side = 8 * Outputs + Vcc = 9 pins

Therefore, n = 12

4.48.4.11 Element Dimensions, Multi-Part Components

Each element of the Symbol is dimensioned as follows:

Element Height	Element Width	Pin Size	Pin Space
(n) * 0.10"	0.40"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A NOR element with 2 * Inputs and 1 * Output:

Left side = 2 * Inputs

Right side = 1 * Output = 1 pin

Therefore, n = 2

Note: All Multi-Part Symbols are constructed as a single unit (see example).

---

27 The Element width is increased if pin text is too close for two opposing pins
28 Hidden Power Pins are 0.00" in length
29 An optional 0.10" is added to the top of the top of the body if a qualifying symbol is used

4.48.4.12 Example
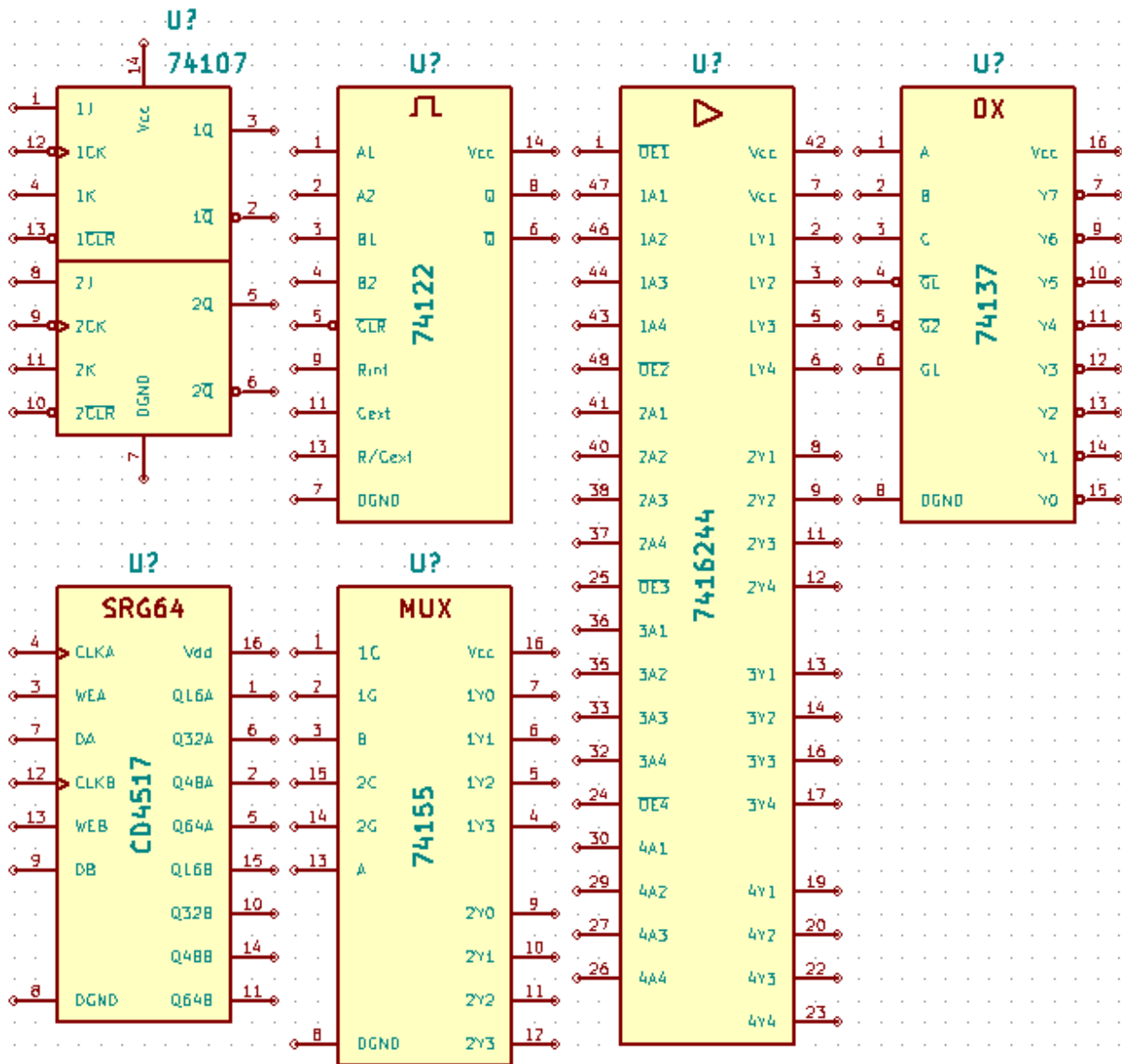
4.48.5 U-integratedAmplifier

File Contents: OpAmps, Comparators etc.

Reference: U

Value: <Manufacturer's Part Number>

4.48.5.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	N/A	N/A	

4.48.5.2 , Single Part Components

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	Yes

4.48.5.3 Fields Properties, Multi Part Components

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.03"	Left	Centre	Normal	Yes

Note: "Multi-Part" Components are constructed as a single unit (see example)

4.48.5.4 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, NC	Line
Output	Output	Line
Power	Power input	Line

4.48.5.5 Footprint Filter

Yes

4.48.5.6 Alias

Any Equivalent Device

4.48.5.7 Equivalence File

No

4.48.5.8 Symbol Naming Convention

-

4.48.5.9 Devices with multiple packages

See 4.48.2.8

4.48.5.10   Body Outline Dimensions

Body Height	Body Width	Pin Size	Pin Space
((n) * 0.10") + 0.10"[30]	0.40"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A component with 4 * Inputs, 2 * Outputs, V+ and V-:

Left side = 4 * Inputs + V- = 5 pins

Right side = 2 * Outputs + V+ = 3 pins

Therefore, n = 5

Note: All Multi-Part Symbols are constructed as a single unit.

---

30 A space of 0.10" without Pins is reserved at the top of the Body Outline to allow for Function Text

4.48.5.11 Example[31]
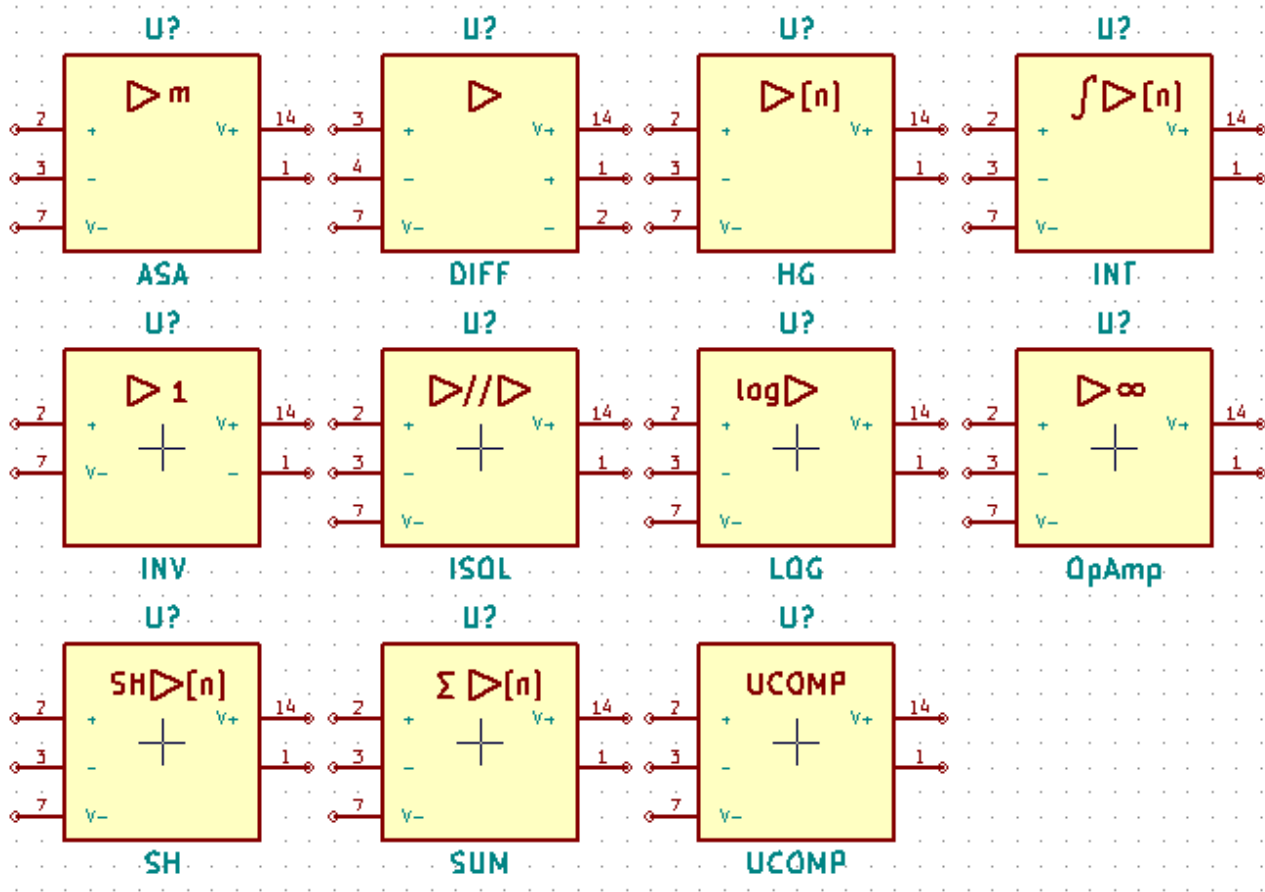
Note1: Text (Function Text) 0.04" except "∫" (0.07"), "∞" (0.08")

Note2: Amplification Symbol (Triangle) 0.06" x 0.06"

Acronym	Description	Symbol
ASA	Amplifier With Selectable Amplification	<triangle> m
DIFF	Differential Amplifier	<triangle>
HG	High Gain Amplifier	<triangle> [n]
LOG	Logarithmic Amplifier	log <triangle>
OPAMP	Operational Amplifier	<triangle>∞
SUM	Summing Amplifier	∑ <triangle> [n]
SH	Sample-and-Hold	SH <triangle> [n]
UCOMP	Voltage Comparator	*COMP
INV	Inverting Amplifier	<triangle> 1
INT	Integrating Amplifier (Integrator)	∫ <triangle> [n]
ISOL	Isolating Amplifier	<triangle> // <triangle>

---

31 Example(s) used do not represent actual component(s) but are used as template(s)

4.48.6 U-<function>

File Contents: Integrated Circuits

Reference: U

Value: <Manufacturer's Part Number>

4.48.6.1 File Naming Convention

Files containing Integrated Circuits are named according to function:

U-<function>

e.g. U-dataConverters, U-digitalPowerSupervision, U-microcontrollers etc.

4.48.6.2 Devices with multiple packages

Symbols representing DIL (DIP, SOIC, SOP etc.) packages have no suffix as these are considered the "default" package.

Symbols represented in multiple packages but with the same pin configurations do not use a suffix (e.g. SOIC could have the same pin configuration as SOT or SON for the same device).

Symbols representing the same symbol, but with different pin configurations in other packages have suffixes according to the table below:

Package	Suffix	Comment
DIL (DIP, SOIC, SOP, SOT etc.)	-	Default
DIL, DFN, BGA, SON, QFN, QFP, LCC, PLCC, SOT	-	When Pin configurations are identical
DFN	-DN	When DFN pin configuration differs
SON	-SN	When SON pin configuration differs
BGA	-BG	When BGA pin configuration differs
QFN	-QN	When QFN pin configuration differs
QFP	-QP	When QFP pin configuration differs
LCC	-LC	When LCC pin configuration differs
PLCC	-PC	When PLCC pin configuration differs
SOT	-ST	When SOT configuration differs

Note1: Symbols use use the Element Dimensions and shapes described in chapters 4.48.6.3 to 4.48.6.15.

Note2: The suffix is used to differentiate when symbols use multiple packages.

4.48.6.3 Integrated Circuits, DIL Packages

These Symbols use simple rectangle/square shapes. Where possible, input pins and "control" pins are located on the left, output pins located on the right. Generally, Vss or Gnd pins are located at the bottom left or bottom, Vcc or Vdd pins at the top right or top. The use of hidden Power Pins is described in 3.2.5.1.

DIL Symbols are implemented using templates created from http://kicad.rohrbacher.net/quicklib.php. See References.

4.48.6.3.1 Body Outline Dimensions

Body Length	Body Width[32]	Pin Size[33]	Pin Space
(n) * 0.10"	0.40"	0.10"	0.10"

Where n is the side with the greater number of pins.

e.g. A component with 8 * Inputs, 8 * Outputs, 3 * "Control", and Vcc and GND:

Left side = 8 * Inputs + 3 * "Control" + GND = 12 pins

Right side = 8 * Outputs + Vcc = 9 pins

Therefore, n = 12

4.48.6.3.2 Pin Dimensions

- Non-Hidden Pin size is always 0.10" to not mask pin number when inverted style is used.

- Minimum space between pins is 0.10". An exception to this is when many Hidden Power Pins are arranged along the base of the Symbol. In this case the pin spacing can be 0.05". e.g:

4.48.6.3.3 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

---

32 The width is 0.50" if pin text is too close for two opposing pins
33 Hidden Power Pins are 0.00" in length

4.48.6.3.4 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.04"	Centre	Centre	Normal	Yes

4.48.6.3.5 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.6.3.6 Footprint Filter

Yes

4.48.6.3.7 Alias

Any Equivalent Device

4.48.6.4 Equivalence File

No

4.48.6.5 Symbol Naming Convention

-

4.48.6.5.1 Example

-

4.48.6.6 Integrated Circuits, BGA Packages

These Symbols are implemented using templates created from http://kicad.rohrbacher.net/quicklib.php. See References.

4.48.6.6.1 Pin Dimensions

- Non-Hidden Pin size is always 0.10" to not mask pin number when inverted style is used.

- Minimum space between pins is 0.10"

4.48.6.6.2 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

4.48.6.6.3 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.04"	Centre	Centre	Normal	Yes

4.48.6.6.4 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.6.6.5 Footprint Filter

Yes

4.48.6.6.6 Alias

Any Equivalent Device

4.48.6.7 Equivalence File

No

4.48.6.8 Symbol Naming Convention

-

4.48.6.8.1 Example[34]
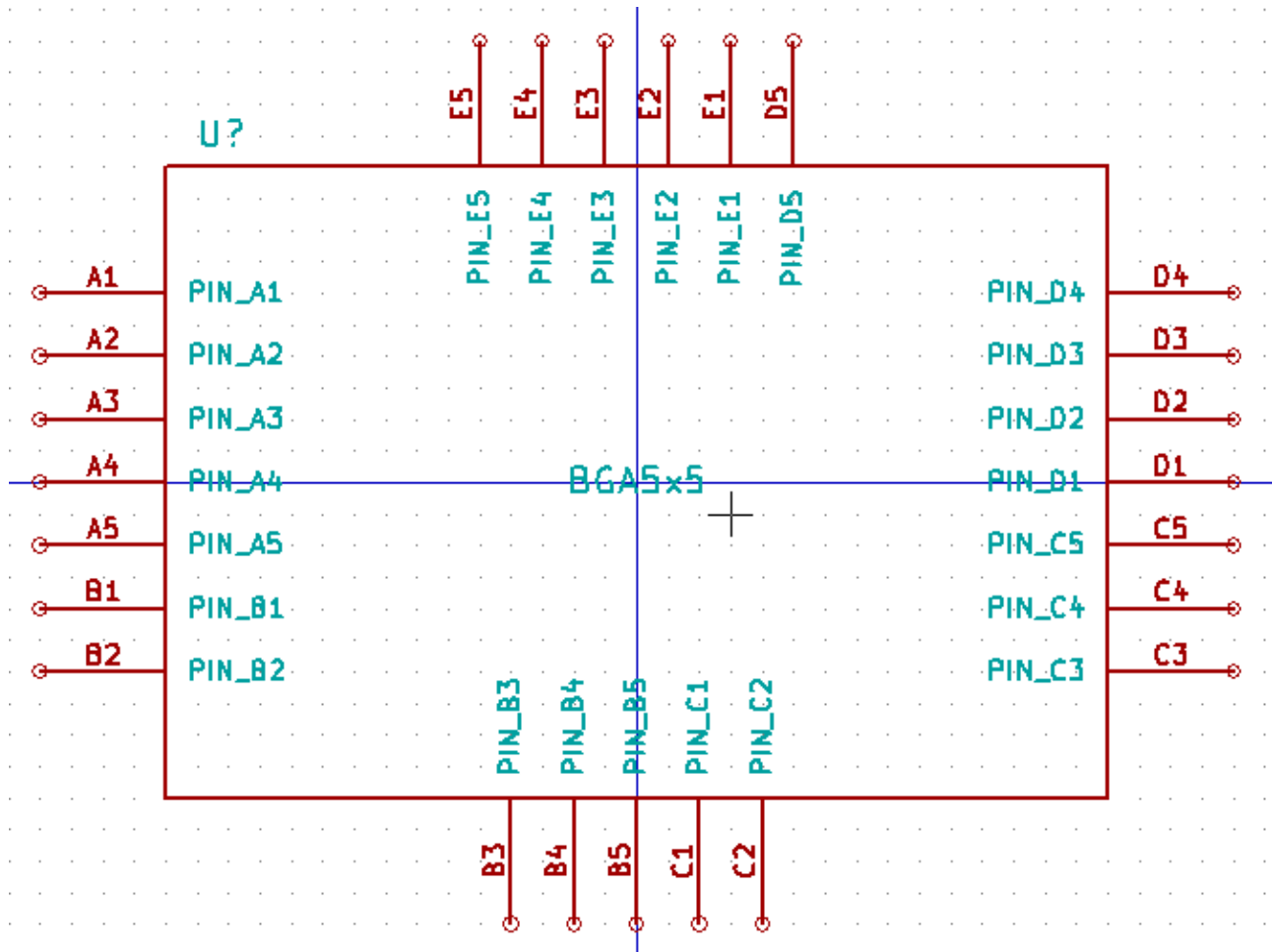
Note1: Pins 0.10" length

Note2: Pin space 0.10"

---

34 Example(s) used do not represent actual component(s) but are used as template(s)

4.48.6.9 Integrated Circuits, PLCC Packages

These Symbols are implemented using templates created from http://kicad.rohrbacher.net/quicklib.php. See References.

4.48.6.9.1 Pin Dimensions

- Non-Hidden Pin size is always 0.10" to not mask pin number when inverted style is used.

- Minimum space between pins is 0.10"

4.48.6.9.2 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

4.48.6.9.3 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.04"	Centre	Centre	Normal	Yes

4.48.6.9.4 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.6.9.5 Footprint Filter

Yes

4.48.6.9.6 Alias

Any Equivalent Device

4.48.6.10 Equivalence File

No

4.48.6.11 Symbol Naming Convention

-

4.48.6.11.1 Example[35]
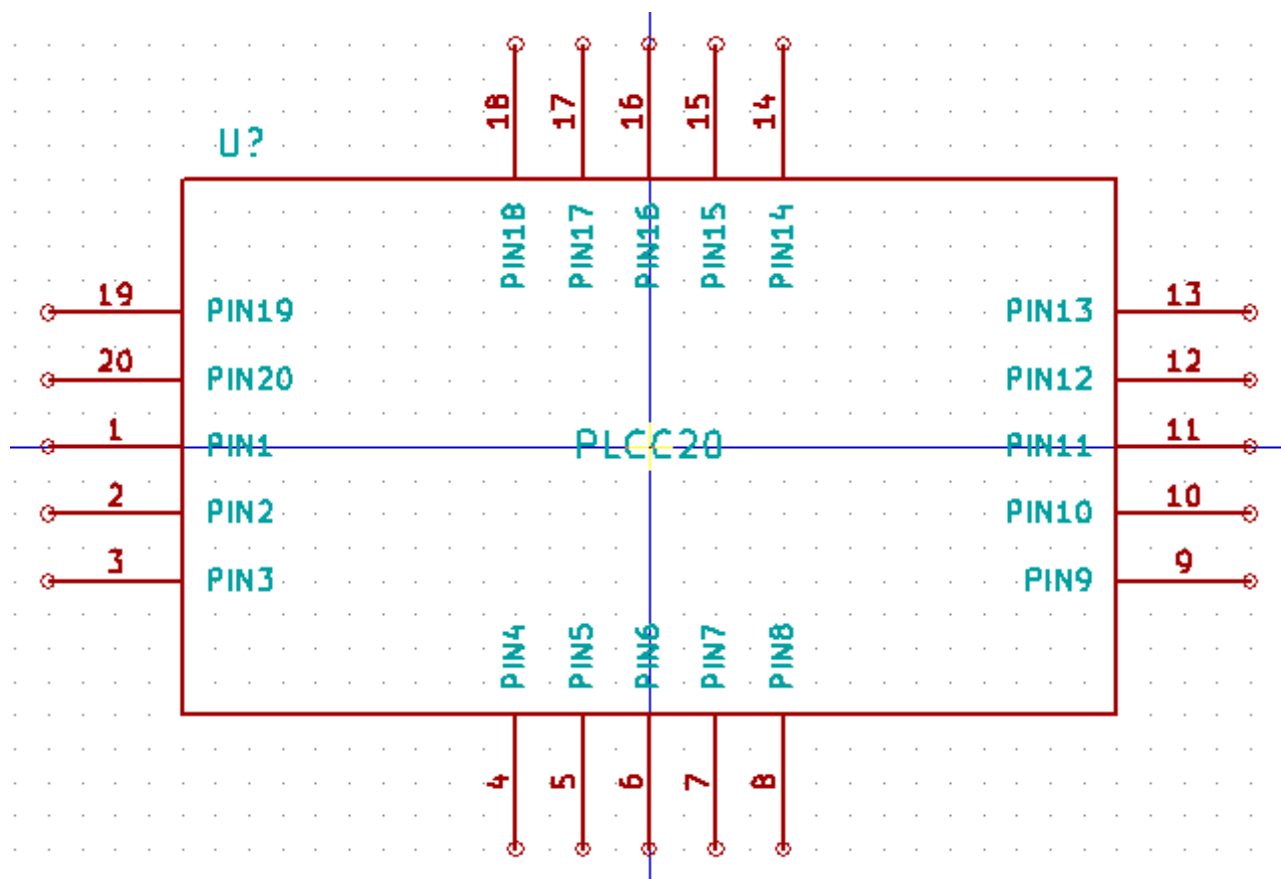
Note1: Pins 0.10" length

Note2: Pin space 0.10"

35 Example(s) used do not represent actual component(s) but are used as template(s)

4.48.6.12   Integrated Circuits, QFN & QFP Packages

These Symbols are implemented using templates created from http://kicad.rohrbacher.net/quicklib.php. See References.

4.48.6.12.1   Pin Dimensions

- Non-Hidden Pin size is always 0.10" to not mask pin number when inverted style is used.
- Minimum space between pins is 0.10"

4.48.6.12.2   Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

4.48.6.12.3   Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Left	Centre	Normal	Yes
Value	0.04"	Centre	Centre	Normal	Yes

4.48.6.12.4   Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.6.12.5   Footprint Filter

Yes

4.48.6.12.6   Alias

Any Equivalent Device

4.48.6.13   Equivalence File

No

4.48.6.14   Symbol Naming Convention

-

4.48.6.14.1   *Example*[36]
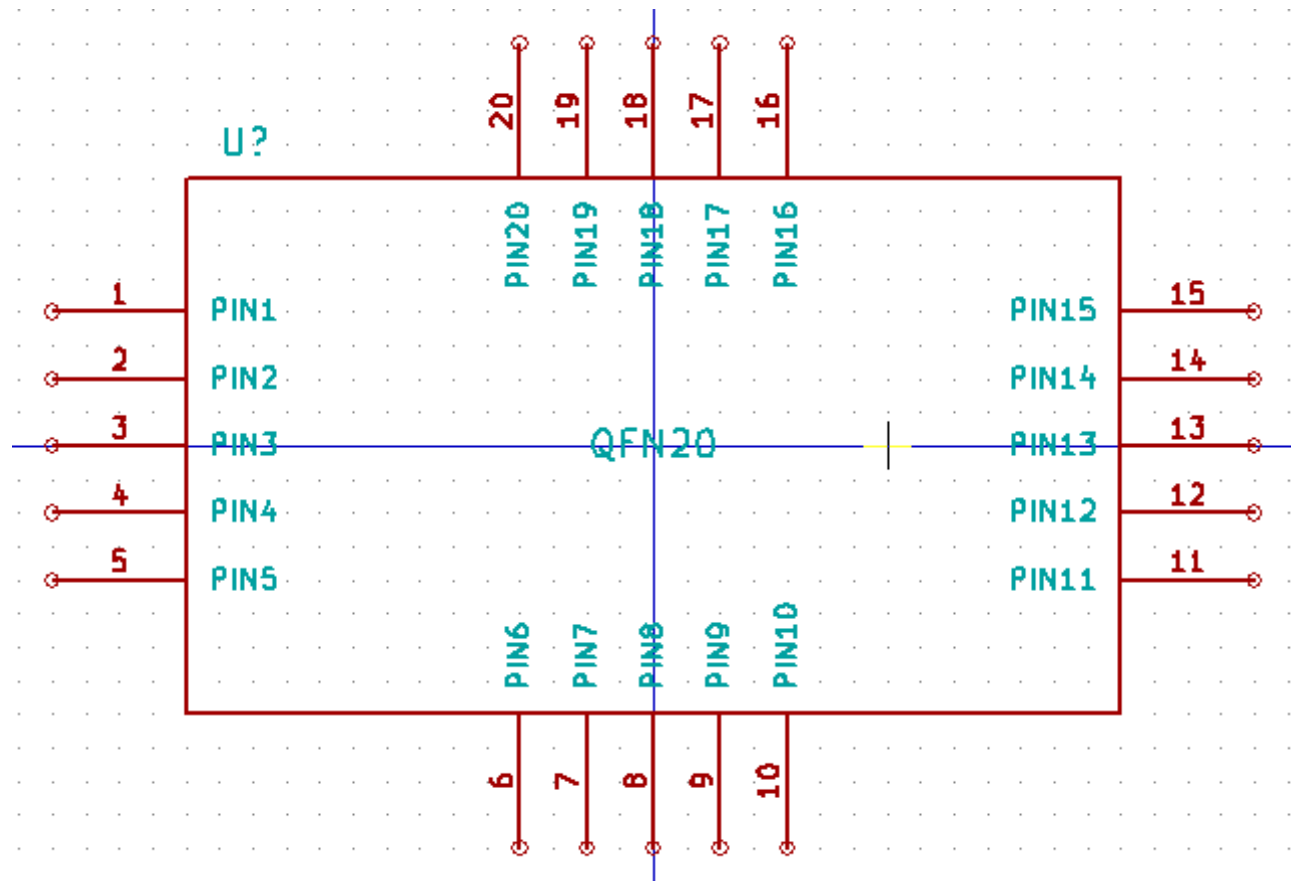
Note1: Pins 0.10" length

Note2: Pin space 0.10"

36 Example(s) used do not represent actual component(s) but are used as template(s)

4.48.6.15 Integrated Circuits, SOT Packages

These Symbols are implemented using templates created from http://kicad.rohrbacher.net/quicklib.php. See References.

4.48.6.15.1 Pin Dimensions

- Non-Hidden Pin size is always 0.10" to not mask pin number when inverted style is used.
- Minimum space between pins is 0.10"

4.48.6.15.2 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	0.03"	0.03"	Yes
Hidden	0.03"	0.03"	

4.48.6.15.3 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.04"	Centre	Centre	Normal	Yes

4.48.6.15.4 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Input, Bidirectional, NC	Any
Output	Output, Bidirectional, NC, Tristate, Open Collector, Open Emitter	Any
Power	Power input	Line

4.48.6.15.5 Footprint Filter

Yes

4.48.6.15.6 Alias

Any Equivalent Device

4.48.6.16 Equivalence File

No

4.48.6.17 Symbol Naming Convention

-

4.48.6.17.1   Example[37]
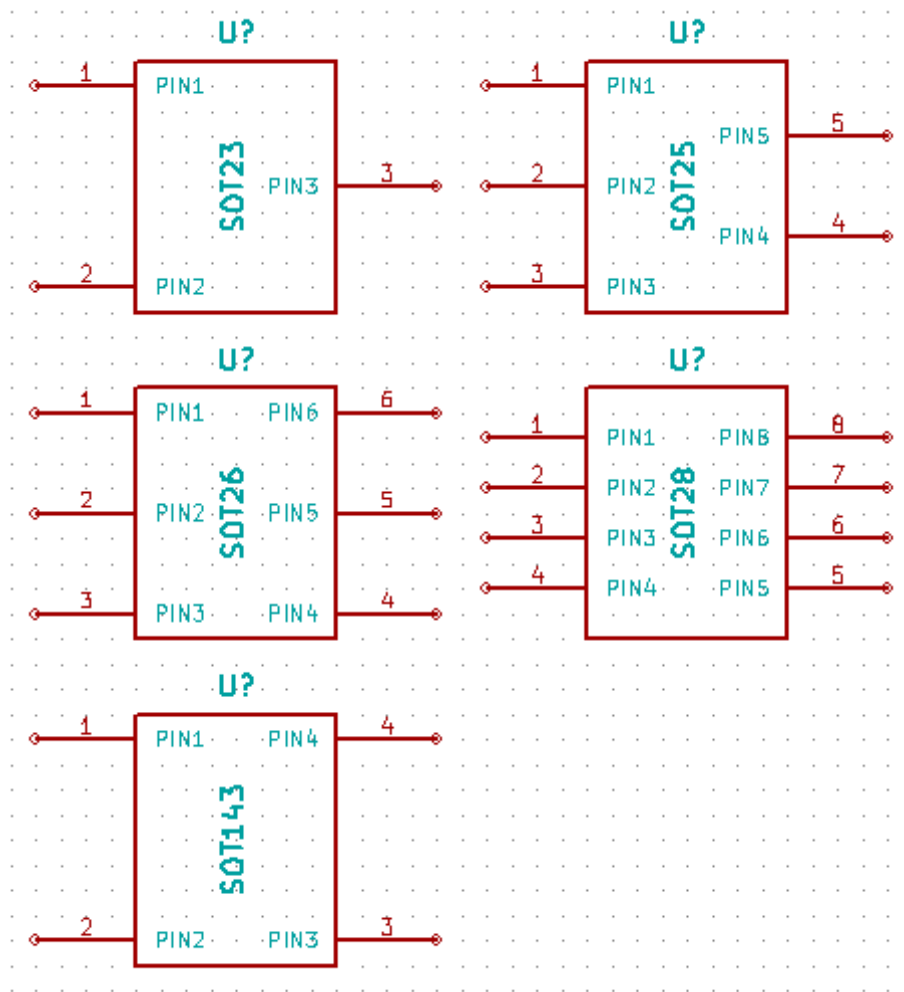
Note1: Pins 0.10" length

Note2: Pin space 0.10", 0.20", 0.40"

Note3: Shape size: 0.5" x 0.4"

---

37 Example(s) used do not represent actual component(s) but are used as template(s)

4.48.7 U-microcircuit

File Contents: Microcircuit

-

4.48.8 U-micromodule

File Contents: Micromodule

-

4.48.9 U-exposedPad

File Contents: Exposed Pad

-

4.49 Class Designation V

4.49.1 V-electronTube

File Contents: electron tube, Geiger-Muller counter tube, ionization chamber, klystron, magnetron, phototube, proportional counter tube, resonator tube, solion, thyratron, traveling-wave tube, voltage regulator

-

4.50 Class Designation VR

4.50.1 VR-voltageRegulator

File Contents: Voltage Regulator

-

4.51 Class Designation W

4.51.1 W-transmissionPath

File Contents: bus bar, cable, cable assembly, coaxial cable, conductor, distribution line, distribution path, Goubau line, strip-type transmission line, transmission line, transmission path, waveguide, wire, circuit return

-

4.52 Class Designation X

4.52.1 X-fuseHolder

File Contents: Fuse Holder

-

4.52.2 X-lampHolder

File Contents: Lamp Holder

-

4.52.3 X-socket

File Contents: Socket

-

4.53 Class Designation Y

4.53.1 Y-crystal

File Contents: magnetostriction oscillator, piezoelectric crystal unit, quartz crystal unit, tuning-fork resonator

Reference: Y

Value: <Component Type> e.g. Crystal

Unit: <Frequency Value>

4.53.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	N/A
Hidden	N/A	N/A	

4.53.1.2 Fields Properties

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.04"	Centre	Centre	Normal	Yes
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

4.53.1.3 Pin Electrical Type and Graphic Style

Pin Function	Electrical Type	Graphic Style
Input	Passive	Line
Output	Passive	Line
Power	N/A	N/A

4.53.1.4 Footprint Filter

Yes

4.53.1.5 Alias

No

4.53.1.6 Equivalence File

No

4.53.1.7 Symbol Naming Convention

-

4.53.1.8 Example
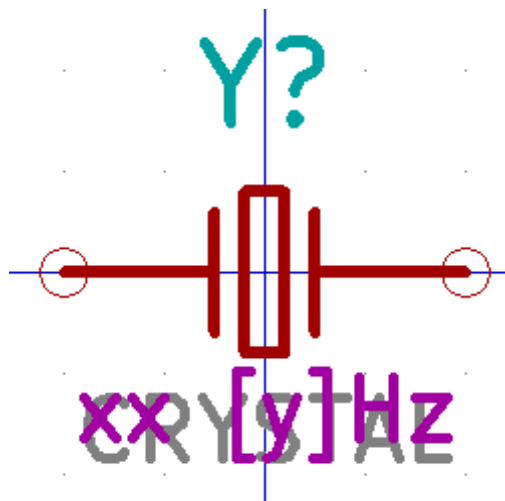
Note1: Pins 0.075" length

Note2: Rectangle 0.08" x 0.02"

Note3: Verticals 0.06"

Note4: Space 0.015"

4.54 Class Designation Z

4.54.1 Z-miscellaneous

File Contents: artificial line (other than delay line), balun, carrier-line trap, coupled tunable resonator, directional phase shifter, discontinuity, E-H tuner, general network, gyrator, mode suppressor, multistub tuner, phase shifter, phase-changing network, resonator (tuned cavity), slide-screw tuner

-

5 Power Symbol Library Files

5.1.1 power

File Contents: Positive, Negative, Ground (Earth) Power Pins, Power Flag

Reference: #PWR, #FLG

Value: <Component Type>

Unit[38]:   <Voltage Level>

5.1.1.1 Pin Text Dimensions

Type	Name Text Size	Number Text Size	Pin Name Inside
Non-Hidden	N/A	N/A	No
Hidden	0.20"	N/A	

5.1.1.2 Fields Properties (Positive/Negative Supply)

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.02"	Centre	Centre	Normal	No
Value	0.03"	Centre	Centre	Normal	No
Unit	0.03"	Centre	Centre	Normal	Yes

5.1.1.3 Fields Properties (Circuit Return, Flag)

Field Name	Size (max)	Justify (Horiz)	Justify (Vert)	Style	Show
Reference	0.02"	Centre	Centre	Normal	No
Value	0.03"	Centre	Centre	Normal	Yes

5.1.1.4 Pin Electrical Type and Graphic Style (Positive/Negative Supply, Circuit Return)

Pin Function	Electrical Type	Graphic Style
Power	Power input	Line

5.1.1.5 Pin Electrical Type and Graphic Style (Flag)

Pin Function	Electrical Type	Graphic Style
Power	Power output	Line

5.1.1.6 Footprint Filter

No

5.1.1.7 Alias

No

5.1.1.8 Equivalence File

No

---

38 Only Positive or Negative Supply

5.1.1.9 Symbol Naming Convention

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5.1.1.9.1 Example
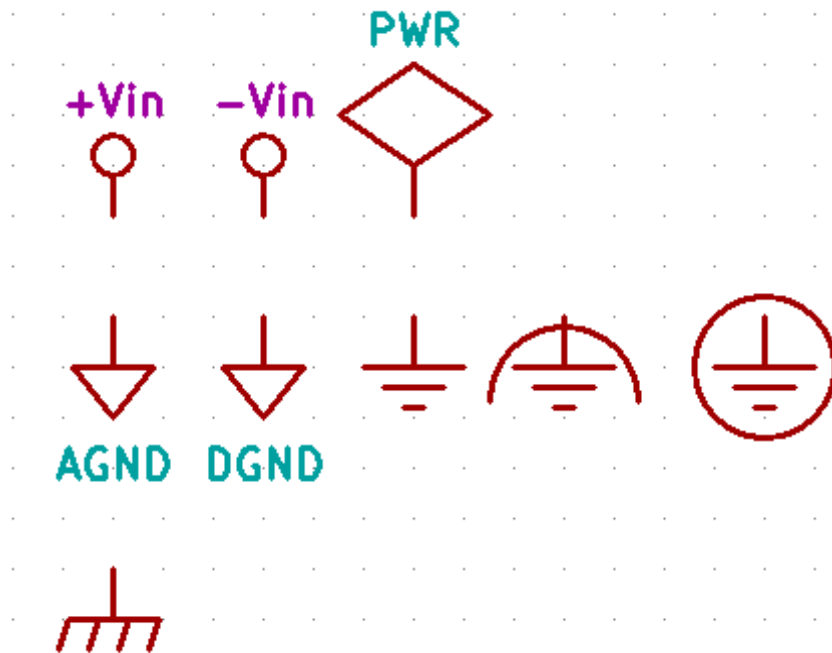
Top Row: Positive Power Input, Negative Power Input, Power Flag

Middle Row: Analogue Ground, Digital Ground, Low-Noise Ground, Protective Ground

Bottom Row: Chassis Ground

Note1: Pin size 0.00"

6   Symbol Library Files using Non-IEEE Std 315-1975 Conventions

–

7   Acronyms and Abbreviations

A	Anode (Diode, Thyristor)
B	Base (Transistor)
C	Cathode (Diode, Thyristor)
C	Collector (Transistor)
D	Drain (Transistor)
E	Emitter (Transistor)
G	Gate (Transistor, Thyristor)
GND	Ground
mil	Thousandth of an Inch
mm	millimeter(s)
MT	Main Terminal
S	Source (Transistor)
Vcc	Voltage Collector
Vdd	Voltage Drain
Vee	Voltage Emitter
Vss	Voltage Source

8 References

8.1 Documents

Title: The CAD Library

Author: Tom Hausherr

Link: http://www.frontdoor.biz/HowToPCB/HowToPCB-extra/CADlib.pdf

Title: IEEE 315-1975

Author: IEEE

Link: http://www.metalwebnews.com/manuals/electric-symbols.pdf

8.2 Tools

Title: Quick KICAD Library Component Builder

Author: C. Rohrbacher

Link: http://kicad.rohrbacher.net/quicklib.php

9   Appendix A

9.1   Sample kicad.pro file

```
update=20/11/2008-19:07:03
version=1
last_client=eeschema
[general]
version=1
RootSch=
BoardNm=
[cvpcb]
version=1
NetITyp=0
NetIExt=.net
PkgIExt=.pkg
NetDir=
LibDir=G:/ApplicationFiles/KiCad/Libraries/Equivalence
NetType=0
[cvpcb/libraries]
EquName1=D-DIAC
EquName2=D-PIN
EquName3=D-protectionDiodesAndArrays
EquName4=D-diodesRectifier
EquName5=D-diodesSchottky
EquName6=D-SCR
EquName7=D-SIDAC
EquName8=D-diodesSmallSignalSwitching
EquName9=D-thyristorSurgeProtectionDevices
EquName10=D-TRIAC
EquName11=D-diodesTuning
EquName12=D-diodesZener
EquName13=Q-transistorsBiPolar
EquName14=Q-transistorsDarlington
EquName15=Q-transistorsIGBT
EquName16=Q-transistorsJFET
EquName17=Q-transistorsMOSFET
EquName18=Q-transistorsPhoto
EquName19=Q-transistorsPowerMOSFETS
EquName20=Q-transistorsRF
[pcbnew]
version=1
LastNetListRead=
UseCmpFile=1
PadDrill=0.6
PadSizeH=1
PadSizeV=1
PcbTextSizeV=1.5
PcbTextSizeH=1.5
PcbTextThickness=0.3
ModuleTextSizeV=1.5
ModuleTextSizeH=1.5
ModuleTextSizeThickness=0.15
SolderMaskClearance=0
SolderMaskMinWidth=0
DrawSegmentWidth=0.2
BoardOutlineThickness=0.15
ModuleOutlineThickness=0.15
[pcbnew/libraries]
LibDir=G:/ApplicationFiles/KiCad/Libraries/Footprint
[eeschema]
version=1
LibDir=G:/ApplicationFiles/KiCad/Libraries/Symbol
NetFmt=1
HPGLSpd=20
HPGLDm=15
HPGLNum=1
offX_A4=0
offY_A4=0
offX_A3=0
offY_A3=0
offX_A2=0
offY_A2=0
offX_A1=0
```

```
offY_A1=0
offX_A0=0
offY_A0=0
offX_A=0
offY_A=0
offX_B=0
offY_B=0
offX_C=0
offY_C=0
offX_D=0
offY_D=0
offX_E=0
offY_E=0
RptD_X=0
RptD_Y=100
RptLab=1
SimCmd=
UseNetN=0
LabSize=30
[eeschema/libraries]
#
# LibName1 | Power
#
LibName1=Power/power
#
# LibName2...LibName99 | Non-Integrated Circuit according to IEEE 315-1975
#
LibName2=IEEE_315/A/A-separateAssembly
LibName3=IEEE_315/AR/AR-amplifier
LibName4=IEEE_315/AR/AR-repeater
LibName5=IEEE_315/AT/AT-attenuator
LibName6=IEEE_315/AT/AT-bolometer
LibName7=IEEE_315/AT/AT-capacitiveTermination
LibName8=IEEE_315/AT/AT-inductiveTermination
LibName9=IEEE_315/AT/AT-isolator
LibName10=IEEE_315/AT/AT-pad
LibName11=IEEE_315/AT/AT-resistiveTermination
LibName12=IEEE_315/B/B-blower
LibName13=IEEE_315/B/B-motor
LibName14=IEEE_315/B/B-synchro
LibName15=IEEE_315/BT/BT-battery
LibName16=IEEE_315/BT/BT-photovoltaic
LibName17=IEEE_315/C/C-capacitorNetwork
LibName18=IEEE_315/C/C-capacitorNonPolarized
LibName19=IEEE_315/C/C-capacitorMisc
LibName20=IEEE_315/C/C-capacitorPolarized
LibName21=IEEE_315/CB/CB-circuitBreaker
LibName22=IEEE_315/CB/CB-networkProtector
LibName23=IEEE_315/CP/CP-connectorAdapter
LibName24=IEEE_315/CP/CP-coupling
LibName25=IEEE_315/CP/CP-junction
LibName26=IEEE_315/D/D-diode
LibName27=IEEE_315/DC/DC-directionalCoupler
LibName28=IEEE_315/DL/DL-delayFunction
LibName29=IEEE_315/DS/DS-alphanumericDisplay
LibName30=IEEE_315/DS/DS-generalLightSource
LibName31=IEEE_315/DS/DS-lightEmittingDiode
LibName32=IEEE_315/DS/DS-visualSignallingDevice
LibName33=IEEE_315/E/E-aluminiumCell
LibName34=IEEE_315/E/E-antenna
LibName35=IEEE_315/E/E-armature
LibName36=IEEE_315/E/E-bindingPost
LibName37=IEEE_315/E/E-cableTermination
LibName38=IEEE_315/E/E-carbonBlock
LibName39=IEEE_315/E/E-circuitTerminal
LibName40=IEEE_315/E/E-conductivityCell
LibName41=IEEE_315/E/E-electricalContact
LibName42=IEEE_315/E/E-electricalShield
LibName43=IEEE_315/E/E-electrolyticCell
LibName44=IEEE_315/E/E-ferriteBeadRings
LibName45=IEEE_315/E/E-filmElement
LibName46=IEEE_315/E/E-gap
LibName47=IEEE_315/E/E-hallElement
LibName48=IEEE_315/E/E-igniterGap
LibName49=IEEE_315/E/E-insulator
LibName50=IEEE_315/E/E-lightningArrester
```

```
LibName51=IEEE_315/E/E-magneticCore
LibName52=IEEE_315/E/E-miscellaneousElectricalPart
LibName53=IEEE_315/E/E-opticalShield
LibName54=IEEE_315/E/E-permanentMagnet
LibName55=IEEE_315/E/E-rotaryJoint
LibName56=IEEE_315/E/E-shortCircuit
LibName57=IEEE_315/E/E-sparkGap
LibName58=IEEE_315/E/E-splice
LibName59=IEEE_315/E/E-telephoneProtector
LibName60=IEEE_315/E/E-terminal
LibName61=IEEE_315/E/E-valveElement
LibName62=IEEE_315/E/E-vibratingReed
LibName63=IEEE_315/EQ/EQ-equalizer
LibName64=IEEE_315/F/F-fuse
LibName65=IEEE_315/FL/FL-filter
LibName66=IEEE_315/G/G-electronicChopper
LibName67=IEEE_315/G/G-generator
LibName68=IEEE_315/G/G-ignitionMagneto
LibName69=IEEE_315/G/G-interrupterVibrator
LibName70=IEEE_315/G/G-oscillator
LibName71=IEEE_315/G/G-rotatingAmplifier
LibName72=IEEE_315/G/G-telephoneMagneto
LibName73=IEEE_315/H/H-hardware
LibName74=IEEE_315/HP/HP-hydraulicPart
LibName75=IEEE_315/HR/HR-heater
LibName76=IEEE_315/HR/HR-heatingLamp
LibName77=IEEE_315/HR/HR-heatingResistor
LibName78=IEEE_315/HR/HR-infraredLamp
LibName79=IEEE_315/HR/HR-thermomechanicalTransducer
LibName80=IEEE_315/HS/HS-handset
LibName81=IEEE_315/HT/HT-earphone
LibName82=IEEE_315/HT/HT-electricalheadset
LibName83=IEEE_315/HT/HT-receiver
LibName84=IEEE_315/HT/HT-telephoneReceiver
LibName85=IEEE_315/HY/HY-circulator
LibName86=IEEE_315/HY/HY-directionallySelectiveTransmissionDevice
LibName87=IEEE_315/HY/HY-hybridCircuitNetwork
LibName88=IEEE_315/HY/HY-hybridCoil
LibName89=IEEE_315/HY/HY-hybridJunction
LibName90=IEEE_315/J/J-stationaryReceptacleGeneric
LibName91=IEEE_315/J/J-stationaryReceptacle
LibName92=IEEE_315/J/J-waveguideFlange
LibName93=IEEE_315/K/K-contactor
LibName94=IEEE_315/K/K-relay
LibName95=IEEE_315/L/L-coil
LibName96=IEEE_315/L/L-electricalSolenoid
LibName97=IEEE_315/L/L-fieldWinding
LibName98=IEEE_315/L/L-generatorField
LibName99=IEEE_315/L/L-inductor
LibName100=IEEE_315/L/L-lampBallast
LibName101=IEEE_315/L/L-motorField
LibName102=IEEE_315/L/L-reactor
LibName103=IEEE_315/L/L-winding
LibName104=IEEE_315/LS/LS-audibleSignallingDevice
LibName105=IEEE_315/M/M-readoutDevice
LibName106=IEEE_315/MG/MG-directCurrentMachine
LibName107=IEEE_315/MK/MK-microphone
LibName108=IEEE_315/MP/MP-mechanicalPart
LibName109=IEEE_315/P/P-movableReceptacle
LibName110=IEEE_315/PS/PS-powerSupply
LibName111=IEEE_315/PS/PS-rectifier
LibName112=IEEE_315/PU/PU-pickup
LibName113=IEEE_315/Q/Q-thyristor
LibName114=IEEE_315/Q/Q-Transistor
LibName115=IEEE_315/R/R-resistor
LibName116=IEEE_315/R/R-resistorNetwork
LibName117=IEEE_315/R/R-resistorVariable
LibName118=IEEE_315/RE/RE-radioReceiver
LibName119=IEEE_315/RT/RT-thermistor
LibName120=IEEE_315/RV/RV-varistor
LibName121=IEEE_315/S/S-switch
LibName122=IEEE_315/T/T-transformer
LibName123=IEEE_315/TB/TB-terminalBoard
LibName124=IEEE_315/TC/TC-thermocouple
LibName125=IEEE_315/TC/TC-thermopile
LibName126=IEEE_315/TP/TP-testPoint
```

```
LibName127=IEEE_315/V/V-electronTube
LibName128=IEEE_315/VR/VR-voltageCurrentReference
LibName129=IEEE_315/VR/VR-voltageRegulator
LibName130=IEEE_315/W/W-transmissionPath
LibName131=IEEE_315/X/X-fuseHolder
LibName132=IEEE_315/X/X-lampHolder
LibName133=IEEE_315/X/X-socket
LibName134=IEEE_315/Y/Y-crystal
LibName135=IEEE_315/Z/Z-miscellaneous
LibName136=Non-IEEE_315/Reserved/Reserved
LibName137=Non-IEEE_315/Reserved/Reserved
LibName138=Non-IEEE_315/Reserved/Reserved
LibName139=Non-IEEE_315/Reserved/Reserved
LibName140=Non-IEEE_315/Reserved/Reserved
LibName141=Non-IEEE_315/Reserved/Reserved
LibName142=Non-IEEE_315/Reserved/Reserved
LibName143=Non-IEEE_315/Reserved/Reserved
LibName144=Non-IEEE_315/Reserved/Reserved
LibName145=Non-IEEE_315/Reserved/Reserved
LibName146=Non-IEEE_315/Reserved/Reserved
LibName147=Non-IEEE_315/Reserved/Reserved
LibName148=Non-IEEE_315/Reserved/Reserved
LibName149=Non-IEEE_315/Reserved/Reserved
#
# LibName150...LibName199 | Integrated Circuit according to IEEE 315-1975
#
LibName150=IEEE_315/U/U-standardLogic
LibName151=IEEE_315/U/U-standardLogicGate
LibName152=IEEE_315/U/U-littleLogic
LibName153=IEEE_315/U/U-littleLogicGate
LibName154=IEEE_315/U/U-microcontroller
LibName155=IEEE_315/U/U-digitalPowerControl
LibName156=IEEE_315/U/U-exposedPad
LibName157=IEEE_315/U/U-digitalPotentiometer
LibName158=IEEE_315/U/U-interface
LibName159=IEEE_315/U/U-dataConverter
LibName160=IEEE_315/U/U-digitalPowerSupervision
LibName161=IEEE_315/U/U-digitalSignalProcessor
LibName162=IEEE_315/U/U-integratedSwitch
LibName163=IEEE_315/U/U-microprocessor
LibName164=IEEE_315/U/U-sensorsSensorControl
LibName165=IEEE_315/U/U-microcircuit
LibName166=IEEE_315/U/U-micromodule
LibName167=IEEE_315/U/U-integratedAmplifier
LibName168=IEEE_315/U/U-realTimeClock
LibName169=IEEE_315/U/U-timer
LibName170=Non-IEEE_315/Reserved/Reserved
LibName171=Non-IEEE_315/Reserved/Reserved
LibName172=Non-IEEE_315/Reserved/Reserved
LibName173=Non-IEEE_315/Reserved/Reserved
LibName174=Non-IEEE_315/Reserved/Reserved
LibName175=Non-IEEE_315/Reserved/Reserved
LibName176=Non-IEEE_315/Reserved/Reserved
LibName177=Non-IEEE_315/Reserved/Reserved
LibName178=Non-IEEE_315/Reserved/Reserved
LibName179=Non-IEEE_315/Reserved/Reserved
LibName180=Non-IEEE_315/Reserved/Reserved
LibName181=Non-IEEE_315/Reserved/Reserved
LibName182=Non-IEEE_315/Reserved/Reserved
LibName183=Non-IEEE_315/Reserved/Reserved
LibName184=Non-IEEE_315/Reserved/Reserved
LibName185=Non-IEEE_315/Reserved/Reserved
LibName186=Non-IEEE_315/Reserved/Reserved
LibName187=Non-IEEE_315/Reserved/Reserved
LibName188=Non-IEEE_315/Reserved/Reserved
LibName189=Non-IEEE_315/Reserved/Reserved
LibName190=Non-IEEE_315/Reserved/Reserved
LibName191=Non-IEEE_315/Reserved/Reserved
LibName192=Non-IEEE_315/Reserved/Reserved
LibName193=Non-IEEE_315/Reserved/Reserved
LibName194=Non-IEEE_315/Reserved/Reserved
LibName195=Non-IEEE_315/Reserved/Reserved
LibName196=Non-IEEE_315/Reserved/Reserved
LibName197=Non-IEEE_315/Reserved/Reserved
LibName198=Non-IEEE_315/Reserved/Reserved
LibName199=Non-IEEE_315/Reserved/Reserved
```

```
#
# LibName200...LibName229 | Non-IEEE 315-1975
#
LibName200=Non-IEEE_315/Graphics/graphics
LibName201=Non-IEEE_315/Reserved/Reserved
LibName202=Non-IEEE_315/Reserved/Reserved
LibName203=Non-IEEE_315/Reserved/Reserved
LibName204=Non-IEEE_315/Reserved/Reserved
LibName205=Non-IEEE_315/Reserved/Reserved
LibName206=Non-IEEE_315/Reserved/Reserved
LibName207=Non-IEEE_315/Reserved/Reserved
LibName208=Non-IEEE_315/Reserved/Reserved
LibName209=Non-IEEE_315/Reserved/Reserved
LibName210=Non-IEEE_315/Reserved/Reserved
LibName211=Non-IEEE_315

/Reserved/Reserved
LibName212=Non-IEEE_315/Reserved/Reserved
LibName213=Non-IEEE_315/Reserved/Reserved
LibName214=Non-IEEE_315/Reserved/Reserved
LibName215=Non-IEEE_315/Reserved/Reserved
LibName216=Non-IEEE_315/Reserved/Reserved
LibName217=Non-IEEE_315/Reserved/Reserved
LibName218=Non-IEEE_315/Reserved/Reserved
LibName219=Non-IEEE_315/Reserved/Reserved
LibName220=Non-IEEE_315/Reserved/Reserved
LibName221=Non-IEEE_315/Reserved/Reserved
LibName222=Non-IEEE_315/Reserved/Reserved
LibName223=Non-IEEE_315/Reserved/Reserved
LibName224=Non-IEEE_315/Reserved/Reserved
LibName225=Non-IEEE_315/Reserved/Reserved
LibName226=Non-IEEE_315/Reserved/Reserved
LibName227=Non-IEEE_315/Reserved/Reserved
LibName228=Non-IEEE_315/Reserved/Reserved
LibName229=Non-IEEE_315/Reserved/Reserved
```

9.2 Sample fp-lib-table file

```
(fp_lib_table
# Standard Through-Hole footprints according to IPC-7251
 (lib (name IPC-7251_CAPAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPAD-capacitorsNonPolarizedAxialDiameter.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_CAPADV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPADV-capacitorsNonPolarizedAxialDiameterVertical.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Axial Diameter Vertical Mount"))
 (lib (name IPC-7251_CAPAR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPAR-capacitorsNonPolarizedAxialRectangular.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Axial Rectangular Horizontal Mount"))
 (lib (name IPC-7251_CAPARV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPARV-capacitorsNonPolarizedAxialRectangularVertical.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Axial Rectangular Vertical Mount"))
 (lib (name IPC-7251_CAPRB)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPRB-capacitorsNonPolarizedRadialDiscButton.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Radial Disc Button"))
 (lib (name IPC-7251_CAPRD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPRD-capacitorsNonPolarizedRadialDiameter.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Radial Diameter"))
 (lib (name IPC-7251_CAPRR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPRR-capacitorsNonPolarizedRadialRectangular.mod)(options "")(descr "IPC-7251 Capacitors, Non-Polarized Radial Rectangular"))
 (lib (name IPC-7251_CAPPAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPPAD-capacitorsPolarizedAxialDiameter.mod)(options "")(descr "IPC-7251 Capacitors, Polarized Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_CAPPADV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPPADV-capacitorsPolarizedAxialDiameterVertical.mod)(options "")(descr "IPC-7251 Capacitors, Polarized Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_CAPPARV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPPARV-capacitorsPolarizedAxialRectangularVertical.mod)(options "")(descr "IPC-7251 Capacitors, Polarized Axial Rectangular Vertical Mount"))
 (lib (name IPC-7251_CAPPRD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPPRD-capacitorsPolarizedRadialDiameter.mod)(options "")(descr "IPC-7251 Capacitors, Polarized Radial Diameter"))
 (lib (name IPC-7251_CAPPRR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\CAPx\CAPPRR-capacitorsPolarizedRadialRectangular.mod)(options "")(descr "IPC-7251 Capacitors, Polarized Rectangular Diameter"))
 (lib (name IPC-7251_DIOAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\DIOx\DIOAD-diodesAxialDiameter.mod)(options "")(descr "IPC-7251 Diodes, Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_DIOADV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\DIOx\DIOADV-diodesAxialDiameterVertical.mod)(options "")(descr "IPC-7251 Diodes, Axial Diameter Vertical Mount"))
 (lib (name IPC-7251_DIOAR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\DIOx\DIOAR-diodesAxialRectangular.mod)(options "")(descr "IPC-7251 Diodes, Axial Rectangular Horizontal Mount"))
 (lib (name IPC-7251_DIOARV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\DIOx\DIOARV-diodesAxialRectangularVertical.mod)(options "")(descr "IPC-7251 Diodes, Axial Rectangular Vertical Mount"))
 (lib (name IPC-7251_DIP)(type Legacy)(uri ${KISYSMOD}\IPC-7251\DIP\DIP-dualInLinePackages.mod)(options "")(descr "IPC-7251 Dual-In-Line Packages (JEDEC Standard)"))
 (lib (name IPC-7251_DIPS)(type Legacy)(uri ${KISYSMOD}\IPC-7251\DIPS\DIPS-dualInLineSockets.mod)(options "")(descr "IPC-7251 Dual-In-Line Sockets"))
 (lib (name IPC-7251_FUSAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\FUSx\FUSAD-fusesAxialDiameter.mod)(options "")(descr "IPC-7251 Fuses, Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_FUSAR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\FUSx\FUSAR-fusesAxialRectangular.mod)(options "")(descr "IPC-7251 Fuses, Axial Rectangular Horizontal Mount"))
 (lib (name IPC-7251_FUSADV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\FUSx\FUSADV-fusesAxialDiameterVertical.mod)(options "")(descr "IPC-7251 Fuses, Axial Diameter Vertical Mount"))
 (lib (name IPC-7251_FUSARV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\FUSx\FUSARV-fusesAxialRectangularVertical.mod)(options "")(descr "IPC-7251 Fuses, Axial Rectangular Vertical Mount"))
 (lib (name IPC-7251_FUSRD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\FUSx\FUSRD-fusesRadialDiameter.mod)(options "")(descr "IPC-7251 Fuses, Radial Diameter"))
 (lib (name IPC-7251_FUSRR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\FUSx\FUSRR-fusesRadialRectangular.mod)(options "")(descr "IPC-7251 Fuses, Radial Rectangular"))
 (lib (name IPC-7251_HDRV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\HDRx\HDRV-headerVertical.mod)(options "")(descr "IPC-7251 Header, Vertical"))
 (lib (name IPC-7251_HDRRA)(type Legacy)(uri ${KISYSMOD}\IPC-7251\HDRx\HDRRA-headerRightAngle.mod)(options "")(descr "IPC-7251 Header, Right Angle"))
 (lib (name IPC-7251_INDAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\INDx\INDAD-inductorsAxialDiameter.mod)(options "")(descr "IPC-7251 Inductors, Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_INDADV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\INDx\INDADV-inductorsAxialDiameterVertical.mod)(options "")(descr "IPC-7251 Inductors, Axial Diameter Vertical Mount"))
 (lib (name IPC-7251_INDAR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\INDx\INDAR-inductorsAxialRectangular.mod)(options "")(descr "IPC-7251 Inductors, Axial Rectangular Horizontal Mount"))
 (lib (name IPC-7251_INDARV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\INDx\INDARV-inductorsAxialRectangularVertical.mod)(options "")(descr "IPC-7251 Inductors, Axial Rectangular Vertical Mount"))
 (lib (name IPC-7251_INDRD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\INDx\INDRD-inductorsRadialDiameter.mod)(options "")(descr "IPC-7251 Inductors, Radial Diameter"))
 (lib (name IPC-7251_INDRR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\INDx\INDRR-inductorsRadialRectangular.mod)(options "")(descr "IPC-7251 Inductors, Radial Rectangular"))
 (lib (name IPC-7251_JUMP)(type Legacy)(uri ${KISYSMOD}\IPC-7251\JUMP\JUMP-jumpersWire.mod)(options "")(descr "IPC-7251 Jumpers"))
 (lib (name IPC-7251_LEDRD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\LEDx\LEDRD-lightEmittingDiodesRadialDiameter.mod)(options "")(descr "IPC-7251 Light-Emitting Diodes, Radial Diameter"))
 (lib (name IPC-7251_LEDRR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\LEDx\LEDRR-lightEmittingDiodesRadialRectangular.mod)(options "")(descr "IPC-7251 Light-Emitting Diodes, Radial Rectangular"))
 (lib (name IPC-7251_MTGNP)(type Legacy)(uri ${KISYSMOD}\IPC-7251\MTGx\MTGNP-mountingHoleNonPlated.mod)(options "")(descr "IPC-7251 Mounting Hole, Non-Plated"))
 (lib (name IPC-7251_MTGP)(type Legacy)(uri ${KISYSMOD}\IPC-7251\MTGx\MTGP-mountingHolePlated.mod)(options "")(descr "IPC-7251 Mounting Hole, Plated"))
 (lib (name IPC-7251_OSC)(type Legacy)(uri ${KISYSMOD}\IPC-7251\OSC\OSC-oscillators.mod)(options "")(descr "IPC-7251 Oscillators"))
 (lib (name IPC-7251_PGA)(type Legacy)(uri ${KISYSMOD}\IPC-7251\PGA\PGA-pinGridArray.mod)(options "")(descr "IPC-7251 Pin Grid Arrays"))
 (lib (name IPC-7251_RESAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\RESx\RESAD-resistorsAxialDiameter.mod)(options "")(descr "IPC-7251 Resistors, Axial Diameter Horizontal Mount"))
 (lib (name IPC-7251_RESADV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\RESx\RESADV-resistorsAxialDiameterVertical.mod)(options "")(descr "IPC-7251 Resistors, Axial Diameter Vertical Mount"))
 (lib (name IPC-7251_RESAR)(type Legacy)(uri ${KISYSMOD}\IPC-7251\RESx\RESAR-resistorsAxialRectangular.mod)(options "")(descr "IPC-7251 Resistors, Axial Rectangular Horizontal Mount"))
 (lib (name IPC-7251_RESARV)(type Legacy)(uri ${KISYSMOD}\IPC-7251\RESx\RESARV-resistorsAxialRectangularVertical.mod)(options "")(descr "IPC-7251 Resistors, Axial Rectangular Vertical Mount"))
 (lib (name IPC-7251_SIP)(type Legacy)(uri ${KISYSMOD}\IPC-7251\SIP\SIP-resistorNetworks.mod)(options "")(descr "IPC-7251 Resistor Networks"))
 (lib (name IPC-7251_TPCW)(type Legacy)(uri ${KISYSMOD}\IPC-7251\TPx\TPCW-testPointsRound.mod)(options "")(descr "IPC-7251 Test Point, Round/Rectangular"))
 (lib (name IPC-7251_TPRW)(type Legacy)(uri ${KISYSMOD}\IPC-7251\TPx\TPRW-testPointsSquare.mod)(options "")(descr "IPC-7251 Test Point, Square"))
 (lib (name IPC-7251_TO)(type Legacy)(uri ${KISYSMOD}\IPC-7251\TO\TO-transistorOutlines.mod)(options "")(descr "IPC-7251 Transistor Outlines"))
 (lib (name IPC-7251_PAD)(type Legacy)(uri ${KISYSMOD}\IPC-7251\WIRE\PAD-wire.mod)(options "")(descr "IPC-7251 Wire"))
# Non-Standard IPC-7251 Through-Hole footprints
 (lib (name PTH_AMP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\AMP\AMP-amplifiers.mod)(options "")(descr "Non-IPC-7251 Amplifiers"))
 (lib (name PTH_BAT)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\BAT\BAT-batteries.mod)(options "")(descr "Non-IPC-7251 Batteries"))
 (lib (name PTH_CONN)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\CONN\CONN-connectors.mod)(options "")(descr "Non-IPC-7251 Connectors"))
 (lib (name PTH_CONV)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\CONV\CONV-converters.mod)(options "")(descr "Non-IPC-7251 Converters"))
 (lib (name PTH_DIOB)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\DIOB\DIOB-bridgeRectifiers.mod)(options "")(descr "Non-IPC-7251 Bridge Rectifiers"))
 (lib (name PTH_EXPP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\EXPP\EXPP-exposedPad.mod)(options "")(descr "Non-IPC-7251 Exposed Pad (Thermal Pad)"))
 (lib (name PTH_FB)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\FB\FB-ferriteBeads.mod)(options "")(descr "Non-IPC-7251 Ferrite Beads"))
 (lib (name PTH_FIL)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\FILx\FIL-filters.mod)(options "")(descr "Non-IPC-7251 Filters"))
 (lib (name PTH_FUSE)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\FUSx\FUSE-fuses.mod)(options "")(descr "Non-IPC-7251 Fuses"))
 (lib (name PTH_FUSER)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\FUSx\FUSER-fusesResettable.mod)(options "")(descr "Non-IPC-7251 Fuses, Resettable"))
 (lib (name PTH_HSINK)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\HSINK\HSINK-heatSinks.mod)(options "")(descr "Non-IPC-7251 Heat Sinks"))
 (lib (name PTH_LCD)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\LCD\LCD-liquidCrystalDisplay.mod)(options "")(descr "Non-IPC-7251 Liquid Crystal Display"))
 (lib (name PTH_LED)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\LEDx\LED-lightEmittingDiodes.mod)(options "")(descr "Non-IPC-7251 Light Emitting Diodes, LED"))
 (lib (name PTH_LED7S)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\LEDx\LED7S-7SegmentDisplays.mod)(options "")(descr "Non-IPC-7251 Seven-segment Displays"))
 (lib (name PTH_MIC)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\MIC\MIC-microphones.mod)(options "")(descr "Non-IPC-7251 Microphones"))
 (lib (name PTH_MOV)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\MOV\MOV-mov.mod)(options "")(descr "Non-IPC-7251 MOV"))
 (lib (name PTH_OPTO)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\OPTO\OPTO-optoIsolators.mod)(options "")(descr "Non-IPC-7251 Opto Isolators"))
 (lib (name PTH_PAD)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\PAD\PAD-pad.mod)(options "")(descr "Non-IPC-7251 PAD"))
 (lib (name PTH_PHODET)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\PHODET\PHODET-photoDetectors.mod)(options "")(descr "Non-IPC-7251 Photo Detectors"))
 (lib (name PTH_REG)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\REG\REG-regulators.mod)(options "")(descr "Non-IPC-7251 Regulators"))
 (lib (name PTH_RELAY)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\RELAY\RELAY-relays.mod)(options "")(descr "Non-IPC-7251 Relays"))
 (lib (name PTH_SHIELD)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\SHIELD\SHIELD.mod)(options "")(descr "Non-IPC-7251 Shield"))
 (lib (name PTH_SPKR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\SPKR\SPKR-speakers.mod)(options "")(descr "Non-IPC-7251 Speakers"))
 (lib (name PTH_STIF)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\STIF\STIF-stiffness.mod)(options "")(descr "Non-IPC-7251 Stiffeners"))
 (lib (name PTH_SW)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\SW\SW-switches.mod)(options "")(descr "Non-IPC-7251 Switches"))
 (lib (name PTH_THERM)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\THERM\THERM-thermistors.mod)(options "")(descr "Non-IPC-7251 Thermistors"))
 (lib (name PTH_TRANS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\TRANS\TRANS-transistorOutlinesCustom.mod)(options "")(descr "Non-IPC-7251 Transistor Outlines, Custom"))
 (lib (name PTH_TRIM)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\TRIM\TRIM-trimmerPotentiometers.mod)(options "")(descr "Non-IPC-7251 Trimmers & Potentiometers"))
 (lib (name PTH_TUNER)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\TUNER\TUNER-tuners.mod)(options "")(descr "Non-IPC-7251 Tuners"))
 (lib (name PTH_TVS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\TVSx\TVS-transientVoltageSuppressors.mod)(options "")(descr "Non-IPC-7251 Transient Voltage Suppressors"))
 (lib (name PTH_TVSP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\TVSx\TVSP-transientVoltageSuppressorsPolarized.mod)(options "")(descr "Non-IPC-7251 Transient Voltage Suppressors, Polarized"))
 (lib (name PTH_VAR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\VAR\VAR-varistors.mod)(options "")(descr "Non-IPC-7251 Varistors"))
 (lib (name PTH_VCO)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\VCO\VCO-voltageControlledOscillator.mod)(options "")(descr "Non-IPC-7251 Voltage Controlled Oscillator"))
 (lib (name PTH_XDCR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\XDCR\XDCR-transducersIRDA.mod)(options "")(descr "Non-IPC-7251 Transducers (IRDAs)"))
 (lib (name PTH_XFMR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\XFMR\XFMR-transformers.mod)(options "")(descr "Non-IPC-7251 Transformers"))
 (lib (name PTH_XTAL)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7251\XTAL\XTAL-crystalOscillator.mod)(options "")(descr "Non-IPC-7251 Crystals"))
# Standard Surface-Mount footprints according to IPC-7351
 (lib (name IPC-7351_BGAC30P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA30P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.30 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC35P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA35P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.35 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC40P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA40P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.40 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC50P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA50P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.50 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC65P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA65P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.65 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC75P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA75P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.75 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC80P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA80P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.80 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC100P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA100P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 1.00 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC127P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA127P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 1.27 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAC150P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA150P-ballGridArrayNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 1.50 mm Pitch, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGAN30P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA30P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.30 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN35P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA35P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.35 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN40P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA40P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.40 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN50P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA50P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.50 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN65P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA65P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.65 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN75P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA75P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.75 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN80P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA80P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 0.80 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN100P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA100P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 1.00 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN127P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA127P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 1.27 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGAN150P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGA150P-ballGridArraySolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays, 1.50 mm Pitch, Solder Mask Defined"))
 (lib (name IPC-7351_BGACS)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGAS-ballGridArrayStaggeredNonSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays with Staggered Pins, Non Solder Mask Defined"))
 (lib (name IPC-7351_BGANS)(type Legacy)(uri ${KISYSMOD}\IPC-7351\BGAx\BGAS-ballGridArrayStaggeredSolderMaskDefined.mod)(options "")(descr "IPC-7351 Ball Grid Arrays with Staggered Pins, Solder Mask Defined"))
 (lib (name IPC-7351_CAPAE)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPAE-capacitorsAluminiumElectrolytic.mod)(options "")(descr "IPC-7351 Capacitors, Aluminium Electrolytic"))
 (lib (name IPC-7351_CAPCAF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPCAF-capacitorsChipArrayFlat.mod)(options "")(descr "IPC-7351 Capacitors, Chip Array, 2-Side, 4-Side, Flat"))
 (lib (name IPC-7351_CAPCAV)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPCAV-capacitorsChipArrayConcave.mod)(options "")(descr "IPC-7351 Capacitors, Chip Array, 2-Side, 4-Side, Concave"))
 (lib (name IPC-7351_CAPC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPC-capacitorsChipNonPolarized.mod)(options "")(descr "IPC-7351 Capacitors, Chip, Non-Polarized"))
 (lib (name IPC-7351_CAPCP)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPCP-capacitorsChipPolarized.mod)(options "")(descr "IPC-7351 Capacitors, Chip, Polarized"))
 (lib (name IPC-7351_CAPCWR)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPCWR-capacitorsChipWireRectangular.mod)(options "")(descr "IPC-7351 Capacitors, Chip, Wire Rectangle"))
 (lib (name IPC-7351_CAPM)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPM-capacitorsMouldedNonPolarized.mod)(options "")(descr "IPC-7351 Capacitors, Moulded, Non-Polarized"))
 (lib (name IPC-7351_CAPMP)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CAPx\CAPMP-capacitorsMouldedPolarized.mod)(options "")(descr "IPC-7351 Capacitors, Moulded, Polarized"))
 (lib (name IPC-7351_CFP127P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CFP\CFP127P-ceramicFlatPackage.mod)(options "")(descr "IPC-7351 Ceramic Flat Packages"))
 (lib (name IPC-7351_CGA)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CGA\CGA-columnGridArray.mod)(options "")(descr "IPC-7351 Column Grid Array"))
 (lib (name IPC-7351_CQFP)(type Legacy)(uri ${KISYSMOD}\IPC-7351\CQFP\CQFP-ceramicQuadFlatPackages.mod)(options "")(descr "IPC-7351 Ceramic Quad Flat Packages"))
 (lib (name IPC-7351_DFN)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DFN\DFN-dualFlatNoLead.mod)(options "")(descr "IPC-7351 Dual Flat No-lead"))
 (lib (name IPC-7351_DIOC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DIOx\DIOC-diodesChip.mod)(options "")(descr "IPC-7351 Diodes, Chip"))
 (lib (name IPC-7351_DIOM)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DIOx\DIOM-diodesMoulded.mod)(options "")(descr "IPC-7351 Diodes, Moulded"))
 (lib (name IPC-7351_DIOMELF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DIOx\DIOMELF-diodesMELF.mod)(options "")(descr "IPC-7351 Diodes, MELF"))
 (lib (name IPC-7351_DIOSC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DIOx\DIOSC-diodesConcave2Pin.mod)(options "")(descr "IPC-7351 Diodes, Side Concave, 2 Pin"))
 (lib (name IPC-7351_DIOCAF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DIOx\DIOCAF-diodesChipArrayFlat.mod)(options "")(descr "IPC-7351 Diodes, Chip Array, 2-Side, 4-Side, Flat"))
 (lib (name IPC-7351_DIOCAV)(type Legacy)(uri ${KISYSMOD}\IPC-7351\DIOx\DIOCAV-diodesChipArrayConcave.mod)(options "")(descr "IPC-7351 Diodes, Chip Array, 2-Side, 4-Side, Concave"))
 (lib (name IPC-7351_FUSM)(type Legacy)(uri ${KISYSMOD}\IPC-7351\FUSM\FUSM-fusesMoulded.mod)(options "")(descr "IPC-7351 Fuses, Moulded"))
 (lib (name IPC-7351_INDCAF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\INDx\INDCAF-inductorsChipArrayFlat.mod)(options "")(descr "IPC-7351 Inductors, Chip Array, 2-Side, 4-Side, Flat"))
 (lib (name IPC-7351_INDCAV)(type Legacy)(uri ${KISYSMOD}\IPC-7351\INDx\INDCAV-inductorsChipArrayConcave.mod)(options "")(descr "IPC-7351 Inductors, Chip Array, 2-Side, 4-Side, Concave"))
 (lib (name IPC-7351_INDC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\INDx\INDC-inductorsChip.mod)(options "")(descr "IPC-7351 Inductors, Chip"))
 (lib (name IPC-7351_INDM)(type Legacy)(uri ${KISYSMOD}\IPC-7351\INDx\INDM-inductorsMoulded.mod)(options "")(descr "IPC-7351 Inductors, Moulded"))
 (lib (name IPC-7351_INDP)(type Legacy)(uri ${KISYSMOD}\IPC-7351\INDx\INDP-inductorsPrecisionWireWound.mod)(options "")(descr "IPC-7351 Inductors, Precision Wire Wound"))
 (lib (name IPC-7351_LCC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LCCx\LCC-quadLeadlessCeramicChipCarriers.mod)(options "")(descr "IPC-7351 Quad Leadless Ceramic Chip Carriers"))
 (lib (name IPC-7351_LCCS)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LCCx\LCCS-quadLeadlessCeramicChipCarriersSide.mod)(options "")(descr "IPC-7351 Quad Leadless Ceramic Chip Carriers (Pin 1 on Side)"))
 (lib (name IPC-7351_LEDC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LEDx\LEDC-lightEmittingDiodeChip.mod)(options "")(descr "IPC-7351 LED, Chip"))
 (lib (name IPC-7351_LEDM)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LEDx\LEDM-lightEmittingDiodeMoulded.mod)(options "")(descr "IPC-7351 LED, Moulded"))
 (lib (name IPC-7351_LEDSC2)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LEDx\LEDSC-lightEmittingDiodeConcave2Pin.mod)(options "")(descr "IPC-7351 LED, Side Concave, 2 Pin"))
 (lib (name IPC-7351_LEDSC4)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LEDx\LEDSC-lightEmittingDiodeConcave4Pin.mod)(options "")(descr "IPC-7351 LED, Side Concave, 4 Pin"))
 (lib (name IPC-7351_LGA)(type Legacy)(uri ${KISYSMOD}\IPC-7351\LGA\LGA-landGridArray.mod)(options "")(descr "IPC-7351 Land Grid Array"))
 (lib (name IPC-7351_OSCCC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\OSCx\OSCCC-oscillatorsCornerConcave.mod)(options "")(descr "IPC-7351 Oscillators, Corner Concave"))
 (lib (name IPC-7351_OSCJ)(type Legacy)(uri ${KISYSMOD}\IPC-7351\OSCx\OSCJ-oscillatorsJLead.mod)(options "")(descr "IPC-7351 Oscillators, J-Lead"))
 (lib (name IPC-7351_OSCL)(type Legacy)(uri ${KISYSMOD}\IPC-7351\OSCx\OSCL-oscillatorsLBendLead.mod)(options "")(descr "IPC-7351 Oscillators, L-Bend Lead"))
 (lib (name IPC-7351_OSCSC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\OSCx\OSCSC-oscillatorsSideConcave.mod)(options "")(descr "IPC-7351 Oscillators, Side Concave"))
 (lib (name IPC-7351_PLCC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PLCCx\PLCC-plasticLeadedChipCarriers.mod)(options "")(descr "IPC-7351 Plastic Leaded Chip Carriers"))
 (lib (name IPC-7351_PLCCS)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PLCCx\PLCCS-plasticLeadedChipCarrierSocketsSquare.mod)(options "")(descr "IPC-7351 Plastic Leaded Chip Carrier Sockets Square"))
 (lib (name IPC-7351_PQFN40P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PQFN\PQFN40P-pullBackQuadFlatNoLead.mod)(options "")(descr "IPC-7351 Pull-back Quad Flat No-lead, 0.40 mm Pitch"))
 (lib (name IPC-7351_PQFN50P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PQFN\PQFN50P-pullBackQuadFlatNoLead.mod)(options "")(descr "IPC-7351 Pull-back Quad Flat No-lead, 0.50 mm Pitch"))
 (lib (name IPC-7351_PQFN65P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PQFN\PQFN65P-pullBackQuadFlatNoLead.mod)(options "")(descr "IPC-7351 Pull-back Quad Flat No-lead, 0.65 mm Pitch"))
 (lib (name IPC-7351_PQFN80P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PQFN\PQFN80P-pullBackQuadFlatNoLead.mod)(options "")(descr "IPC-7351 Pull-back Quad Flat No-lead, 0.80 mm Pitch"))
 (lib (name IPC-7351_PSON)(type Legacy)(uri ${KISYSMOD}\IPC-7351\PSON\PSON-pullBackSmallOutlineNoLead.mod)(options "")(descr "IPC-7351 Pull-back Small Outline No-lead"))
 (lib (name IPC-7351_QFN35P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN35P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.35 mm Pitch"))
 (lib (name IPC-7351_QFN40P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN40P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.40 mm Pitch"))
 (lib (name IPC-7351_QFN50P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN50P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.50 mm Pitch"))
 (lib (name IPC-7351_QFN55P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN55P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.55 mm Pitch"))
 (lib (name IPC-7351_QFN65P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN65P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.65 mm Pitch"))
 (lib (name IPC-7351_QFN70P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN70P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.70 mm Pitch"))
 (lib (name IPC-7351_QFN80P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN80P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.80 mm Pitch"))
 (lib (name IPC-7351_QFN90P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFN\QFN90P-quadFlatNoLeadPackages.mod)(options "")(descr "IPC-7351 Quad Flat No-lead, 0.90 mm Pitch"))
 (lib (name IPC-7351_QFP30P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP30P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 0.30 mm Pitch"))
 (lib (name IPC-7351_QFP40P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP40P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 0.40 mm Pitch"))
 (lib (name IPC-7351_QFP50P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP50P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 0.50 mm Pitch"))
 (lib (name IPC-7351_QFP635P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP635P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 0.635 mm Pitch"))
 (lib (name IPC-7351_QFP65P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP65P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 0.65 mm Pitch"))
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  (lib (name IPC-7351_QFP80P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP80P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 0.80 mm Pitch"))
  (lib (name IPC-7351_QFP100P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\QFP\QFP100P-quadFlatPackages.mod)(options "")(descr "IPC-7351 Quad Flat Packages, 1.00 mm Pitch"))
  (lib (name IPC-7351_RESCAF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESCAF-resistorsChipArrayFlat.mod)(options "")(descr "IPC-7351 Resistors, Chip Array, 2-Side, 4-Side, Flat"))
  (lib (name IPC-7351_RESCAV)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESCAV-resistorsChipArrayConcave.mod)(options "")(descr "IPC-7351 Resistors, Chip Array, 2-Side, 4-Side, Concave"))
  (lib (name IPC-7351_RESCAXE)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESCAXE-resistorsChipArrayConvexE.mod)(options "")(descr "IPC-7351 Resistors, Chip Array, Convex, E-Version (Even Pin Size)"))
  (lib (name IPC-7351_RESCAXS)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESCAXS-resistorsChipArrayConvexS.mod)(options "")(descr "IPC-7351 Resistors, Chip Array, Convex, S-Version (Side Pins Differ)"))
  (lib (name IPC-7351_RESC)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESC-resistorsChip.mod)(options "")(descr "IPC-7351 Resistors, Chip"))
  (lib (name IPC-7351_RESMELF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESMELF-resistorsMELF.mod)(options "")(descr "IPC-7351 Resistors, MELF"))
  (lib (name IPC-7351_RESM)(type Legacy)(uri ${KISYSMOD}\IPC-7351\RESx\RESM-resistorsMoulded.mod)(options "")(descr "IPC-7351 Resistors, Moulded"))
  (lib (name IPC-7351_SOD)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOD\SOD-JEDEC.mod)(options "")(descr "IPC-7351 Small Outline Diodes"))
  (lib (name IPC-7351_SOIC127P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOIC127P\SOIC127P-smallOutlineIntegratedCircuit.mod)(options "")(descr "IPC-7351 Small Outline Integrated Circuit, (50 mil Pitch SOIC)"))
  (lib (name IPC-7351_SOIC25xP)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOIC25xP\SOIC25xP-smallOutlineIntegratedCircuit.mod)(options "")(descr "IPC-7351 Small Outline Integrated Circuit, (100 mil Pitch SOIC)"))
  (lib (name IPC-7351_SODFL)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SODFL\SODFL-smallOutlineDiodesFlatLead.mod)(options "")(descr "IPC-7351 Small Outline Diodes, Flat Lead"))
  (lib (name IPC-7351_SOJ)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOJ\SOJ-smallOutlineJleaded.mod)(options "")(descr "IPC-7351 Small Outline IC, J-Leaded"))
  (lib (name IPC-7351_SON)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SON\SON-smallOutlineNoLead.mod)(options "")(descr "IPC-7351 Small Outline No-lead"))
  (lib (name IPC-7351_SOP30P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP30P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.30 mm Pitch"))
  (lib (name IPC-7351_SOP40P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP40P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.40 mm Pitch"))
  (lib (name IPC-7351_SOP50P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP50P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.50 mm Pitch"))
  (lib (name IPC-7351_SOP55P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP55P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.55 mm Pitch"))
  (lib (name IPC-7351_SOP635P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP635P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.635 mm Pitch"))
  (lib (name IPC-7351_SOP65P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP65P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.65 mm Pitch"))
  (lib (name IPC-7351_SOP80P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP80P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 0.80 mm Pitch"))
  (lib (name IPC-7351_SOP100P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP100P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 1.00 mm Pitch"))
  (lib (name IPC-7351_SOP147P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP147P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 1.47 mm Pitch"))
  (lib (name IPC-7351_SOP192P)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOP\SOP192P-smallOutlinePackage.mod)(options "")(descr "IPC-7351 Small Outline Packages, 1.92 mm Pitch"))
  (lib (name IPC-7351_SOT23)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT23-JEDEC.mod)(options "")(descr "IPC-7351 SOT23 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT223)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT223-JEDEC.mod)(options "")(descr "IPC-7351 SOT223 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT143)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT143-JEDEC.mod)(options "")(descr "IPC-7351 SOT143 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT343)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT343-JEDEC.mod)(options "")(descr "IPC-7351 SOT343 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT26)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT26-JEDEC.mod)(options "")(descr "IPC-7351 SOT26 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT323)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT323-JEDEC.mod)(options "")(descr "IPC-7351 SOT323 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT363)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT363-JEDEC.mod)(options "")(descr "IPC-7351 SOT363 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOT404)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOT\SOT404-JEDEC.mod)(options "")(descr "IPC-7351 SOT404 (JEDEC Standard Packages)"))
  (lib (name IPC-7351_SOTFL)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOTFL\SOTFL-smallOutlineTransistorsFlatLead.mod)(options "")(descr "IPC-7351 Small Outline Transistors, Flat Lead"))
  (lib (name IPC-7351_SOCAF)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOx\SOCAF-integratedCircuitsChipArrayFlat.mod)(options "")(descr "IPC-7351 Integrated Circuit, Chip Array, 2-Side, Flat"))
  (lib (name IPC-7351_SOCAV)(type Legacy)(uri ${KISYSMOD}\IPC-7351\SOx\SOCAV-integratedCircuitsChipArrayConcave.mod)(options "")(descr "IPC-7351 Integrated Circuit, Chip Array, 2-Side, Concave"))
  (lib (name IPC-7351_TO)(type Legacy)(uri ${KISYSMOD}\IPC-7351\TO\TO-genericDPAK.mod)(options "")(descr "IPC-7351 TO (Generic DPAK)"))
  (lib (name IPC-7351_XTAL)(type Legacy)(uri ${KISYSMOD}\IPC-7351\XTAL\XTAL-crystalOscillator.mod)(options "")(descr "IPC-7351 Crystal Oscillaror (2 leads)"))
# Non-Standard IPC-7351 Surface-Mount footprints
  (lib (name SMD_AMP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\AMP\AMP-amplifiers.mod)(options "")(descr "Non-IPC-7351 Amplifiers"))
  (lib (name SMD_BAT)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\BAT\BAT-batteries.mod)(options "")(descr "Non-IPC-7351 Batteries"))
  (lib (name SMD_BQFPC)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\BQFPx\BQFPC-bumberQuadFlatPackageCenter.mod)(options "")(descr "Non-IPC-7351 Quad Flat Packages with Bumper Corners, 1 Centre"))
  (lib (name SMD_BQFPS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\BQFPx\BQFPS-bumberQuadFlatPackageSide.mod)(options "")(descr "Non-IPC-7351 Quad Flat Packages with Bumper Corners, Pin 1 Side"))
  (lib (name SMD_CAPCAF)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\CAPx\CAPCAF-capacitorsChipArrayFlat.mod)(options "")(descr "Non-IPC-7351 Capacitors, Chip, Array, Flat (Pins on 2 sides)"))
  (lib (name SMD_CAP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\CAPx\CAP-capacitorsMiscellaneous.mod)(options "")(descr "Non-IPC-7351 Capacitors, Miscellaneous"))
  (lib (name SMD_CAPCAV)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\CAPx\CAPCAV-capacitorsChipArrayConcave.mod)(options "")(descr "Non-IPC-7351 Capacitors, Chip, Array, Concave (Pins on 2 or 4 sides)"))
  (lib (name SMD_CAPV)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\CAPx\CAPV-capacitorsVariable.mod)(options "")(descr "Non-IPC-7351 Capacitors, Variable"))
  (lib (name SMD_DIO)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\DIO\DIO-diodesMiscellaneous.mod)(options "")(descr "Non-IPC-7351 Diodes, Miscellaneous"))
  (lib (name SMD_DIOB)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\DIOB\DIOB-diodesBridgeRectifiers.mod)(options "")(descr "Non-IPC-7351 Diodes, Bridge Rectifiers"))
  (lib (name SMD_FB)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\FB\FB-ferriteBeads.mod)(options "")(descr "Non-IPC-7351 Ferrite Beads"))
  (lib (name SMD_FID)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\FID\FID-fiducials.mod)(options "")(descr "Non-IPC-7351 Fiducials"))
  (lib (name SMD_FIL)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\FIL\FIL-filters.mod)(options "")(descr "Non-IPC-7351 Filters"))
  (lib (name SMD_FUSE)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\FUSx\FUSE-fuses.mod)(options "")(descr "Non-IPC-7351 Fuses"))
  (lib (name SMD_FUSER)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\FUSx\FUSER-fusesResettable.mod)(options "")(descr "Non-IPC-7351 Fuses, Resettable"))
  (lib (name SMD_INDCAF)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\INDx\INDCAF-inductorsChipArrayFlat.mod)(options "")(descr "Non-IPC-7351 Inductors, Chip, Array, Flat (Pins on 2 sides)"))
  (lib (name SMD_INDCAV)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\INDx\INDCAV-inductorsChipArrayConcave.mod)(options "")(descr "Non-IPC-7351 Inductors, Chip, Array, Concave (Pins on 2 or 4 sides)"))
  (lib (name SMD_IND)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\INDx\IND-inductorsMiscellaneous.mod)(options "")(descr "Non-IPC-7351 Inductors, Miscellaneous"))
  (lib (name SMD_KEYPAD)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\KEYPAD\KEYPAD.mod)(options "")(descr "Non-IPC-7351 Keypad"))
  (lib (name SMD_LCD)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\LCD\LCD-liquidCrystalDisplay.mod)(options "")(descr "Non-IPC-7351 Liquid Crystal Display"))
  (lib (name SMD_LED)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\LED\LED-lightEmittingDiodes.mod)(options "")(descr "Non-IPC-7351 Light Emitting Diodes, LED"))
  (lib (name SMD_MIC)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\MIC\MIC-microphones.mod)(options "")(descr "Non-IPC-7351 Microphones"))
  (lib (name SMD_OPTO)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\OPTO\OPTO-optoIsolators.mod)(options "")(descr "Non-IPC-7351 Opto Isolators"))
  (lib (name SMD_OSC)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\OSC\OSC-oscillators.mod)(options "")(descr "Non-IPC-7351 Oscillators"))
  (lib (name SMD_RELAY)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\RELAY\RELAY-relays.mod)(options "")(descr "Non-IPC-7351 Relays"))
  (lib (name SMD_RESCAF)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\RESx\RESCAF-resistorsChipArrayFlat.mod)(options "")(descr "Non-IPC-7351 Resistors, Chip, Array, Flat (Pins on 2 sides)"))
  (lib (name SMD_RESCAV)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\RESx\RESCAV-resistorsChipArrayConcave.mod)(options "")(descr "Non-IPC-7351 Resistors, Chip, Array, Concave (Pins on 2 or 4 sides)"))
  (lib (name SMD_RESCAXE)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\RESx\RESCAXE-resistorsChipArrayConvexTypeE.mod)(options "")(descr "Non-IPC-7351 Resistors, Chip, Array, Convex Type E (Pins on 2 sides)"))
  (lib (name SMD_RESCAXS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\RESx\RESCAXS-resistorsChipArrayConvexTypeS.mod)(options "")(descr "Non-IPC-7351 Resistors, Chip, Array, Convex Type S (Pins on 2 sides)"))
  (lib (name SMD_SPKR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\SPKR\SPKR-speakers.mod)(options "")(descr "Non-IPC-7351 Speakers"))
  (lib (name SMD_SW)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\SW\SW-switches.mod)(options "")(descr "Non-IPC-7351 Switches"))
  (lib (name SMD_THERM)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\THERM\THERM-thermistors.mod)(options "")(descr "Non-IPC-7351 Thermistors"))
  (lib (name SMD_TP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TPx\TP-testPointsRound.mod)(options "")(descr "Non-IPC-7351 Test Points, Round"))
  (lib (name SMD_TPS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TPx\TPS-testPointsSquare.mod)(options "")(descr "Non-IPC-7351 Test Points, Rectangle, Square"))
  (lib (name SMD_TRANS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TRANS\TRANS-transistorOutlinesCustom.mod)(options "")(descr "Non-IPC-7351 Transistor Outlines, Custom"))
  (lib (name SMD_TRIM)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TRIM\TRIM-trimmersPotentiometers.mod)(options "")(descr "Non-IPC-7351 Trimmers & Potentiometers"))
  (lib (name SMD_TUNERs)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TUNER\TUNER-tuners.mod)(options "")(descr "Non-IPC-7351 Tuners"))
  (lib (name SMD_TVS)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TVSx\TVS-transientVoltageSuppressors.mod)(options "")(descr "Non-IPC-7351 Transient Voltage Suppressors"))
  (lib (name SMD_TVSP)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\TVSx\TVSP-transientVoltageSuppressorsPolarized.mod)(options "")(descr "Non-IPC-7351 Transient Voltage Suppressors, Polarized"))
  (lib (name SMD_VAR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\VAR\VAR-varistors.mod)(options "")(descr "Non-IPC-7351 Varistors"))
  (lib (name SMD_VCOr)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\VCO\VCO-voltageControlledOscillator.mod)(options "")(descr "Non-IPC-7351 Voltage Controlled Oscillators"))
  (lib (name SMD_VREG)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\VREG\VREG-voltageRegulatorsCustom.mod)(options "")(descr "Non-IPC-7351 Voltage Regulators, Custom"))
  (lib (name SMD_XCVR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\XCVR\XCVR-transceivers.mod)(options "")(descr "Non-IPC-7351 Transceivers"))
  (lib (name SMD_XDCR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\XDCR\XDCR-transducersIRDA.mod)(options "")(descr "Non-IPC-7351 Transducers (IRDAs)"))
  (lib (name SMD_XFMR)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\XFMR\XFMR-transformers.mod)(options "")(descr "Non-IPC-7351 Transformers"))
  (lib (name SMD_XTAL)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\XTAL\XTAL-crystalOscillator.mod)(options "")(descr "Non-IPC-7351 Crystals"))
  (lib (name SMD_CONN)(type Legacy)(uri ${KISYSMOD}\Nonstandard-IPC-7351\CONN\CONN-connectors.mod)(options "")(descr "Non-IPC-7351 Connectors"))
)
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10 Appendix B

10.1 Properties Summary

Filename(s) [*.lib, *.dcm]	Value	Unit	Alias	Equivalence	Footprint Filter
A-separableAssembly	???	???	???	???	???
AR-amplifier	???	???	???	???	???
AR-repeater	???	???	???	???	???
AT-attenuator	???	???	???	???	???
AT-isolator	MPN	-	Yes	No	NWC
AT-bolometer	???	???	???	???	???
AT-capacitiveTermination	???	???	???	???	???
AT-inductiveTermination	???	???	???	???	???
AT-resistiveTermination	???	???	???	???	???
AT-pad	???	???	???	???	???
B-blower	???	???	???	???	???
B-generator	???	???	???	???	???
B-motor	???	???	???	???	???
B-synchro	???	???	???	???	???
BT-battery	MPN	Value	Yes	No	NWC
BT-photovoltaic	MPN	Value	Yes	No	NWC
C-capacitorNonPolarized	CT	Value	No	No	WC
C-capacitorPolarized	CT	Value	No	No	WC
C-capacitorMisc	CT	Value	No	No	WC
C-capacitorNetwork	???	???	???	???	???
CB-circuitBreaker	CT	-	No	No	WC
CB-networkProtector	???	???	???	???	???
CP-connectorAdapter	???	???	???	???	???
CP-coupling	???	???	???	???	???
CP-junction	???	???	???	???	???
D-diode	STD	-	No	No	No
DC-directionalCoupler	???	???	???	???	???
DL-delayFunction	???	???	???	???	???
DS-alphanumericDisplay	MPN	-	Yes	No	NWC
DS-lightEmittingDiode	MPN	-	Yes	No	NWC
DS-generalLightSource	???	???	???	???	???
DS-visualSignallingDevice	???	???	???	???	???
E-aluminiumCell	???	???	???	???	???
E-antenna	???	???	???	???	???
E-armature	???	???	???	???	???
E-bindingPost	???	???	???	???	???
E-cableTermination	???	???	???	???	???
E-carbonBlock	???	???	???	???	???
E-circuitTerminal	???	???	???	???	???
E-conductivityCell	???	???	???	???	???
E-electricalContact	???	???	???	???	???
E-electricalShield	???	???	???	???	???
E-electrolyticCell	???	???	???	???	???
E-ferriteBeadRings	???	???	???	???	???
E-filmElement	???	???	???	???	???
E-gap	???	???	???	???	???
E-hallElement	???	???	???	???	???
E-igniterGap	???	???	???	???	???
E-insulator	???	???	???	???	???
E-lightningArrester	???	???	???	???	???
E-magneticCore	???	???	???	???	???
E-miscellaneousElectricalPart	???	???	???	???	???
E-opticalShield	???	???	???	???	???
E-permanentMagnet	???	???	???	???	???
E-rotaryJoint	???	???	???	???	???
E-shortCircuit	???	???	???	???	???
E-sparkGap	???	???	???	???	???
E-splice	???	???	???	???	???

E-telephoneProtector	???	???	???	???	???
E-terminal	???	???	???	???	???
E-valveElement	???	???	???	???	???
E-vibratingReed	???	???	???	???	???
EQ-equalizer	???	???	???	???	???
F-fuse	MPN	-	Yes	No	NWC
FL-filter	MPN	-	Yes	No	NWC
G-oscillator	???	???	???	???	???
G-electronicChopper	???	???	???	???	???
G-ignitionMagneto	???	???	???	???	???
G-interrupterVibrator	???	???	???	???	???
G-rotatingAmplifier	???	???	???	???	???
G-telephoneMagneto	???	???	???	???	???
H-hardware	???	???	???	???	???
HP-hydraulicPart	???	???	???	???	???
HR-heater	???	???	???	???	???
HR-heatingLamp	???	???	???	???	???
HR-heatingResistor	???	???	???	???	???
HR-infraredLamp	???	???	???	???	???
HR-thermomechanicalTransducer	???	???	???	???	???
HS-handset	???	???	???	???	???
HT-earphone	???	???	???	???	???
HT-electricalheadset	???	???	???	???	???
HT-receiver	???	???	???	???	???
HT-telephoneReceiver	???	???	???	???	???
HY-circulator	???	???	???	???	???
HY-directionallySelectiveTransmissionDevice	???	???	???	???	???
J-stationaryReceptacleGeneric	CT	Any	No	No	WC
J-stationaryReceptacle	MPN	-	Yes	No	NWC
J-waveguideFlange	???	???	???	???	???
K-contactor	???	???	???	???	???
K-relay	MPN	-	Yes	No	NWC
L-coil	???	???	???	???	???
L-inductor	CT	Value	No	No	WC
L-electricalSolenoid	???	???	???	???	???
L-fieldWinding	???	???	???	???	???
L-generatorField	???	???	???	???	???
L-motorField	???	???	???	???	???
L-reactor	???	???	???	???	???
L-winding	???	???	???	???	???
LS-audibleSignallingDevice	???	???	???	???	???
M-readoutDevice	MPN	-	Yes	No	NWC
MG-machine	???	???	???	???	???
MK-microphone	???	???	???	???	???
MP-mechanicalPart	???	???	???	???	???
MT-transducer	???	???	???	???	???
P-movableReceptacle	???	???	???	???	???
PS-powerSupply	???	???	???	???	???
PS-rectifier	MPN	-	Yes	No	NWC
PU-pickup	???	???	???	???	???
Q-transistor	STD	-	No	No	No
Q-Thyristor	STD	-	No	No	No
R-resistor	CT	Value	No	No	WC
R-resistorNetwork	CT	Value	No	No	WC
R-resistorVaraible	CT	Value	No	No	WC
RE-radioReceiver	???	???	???	???	???
RT-thermistor	CT	Value	No	No	WC
RV-varistor	CT	Value	No	No	WC

S-switch	CT	-	No	No	WC
T-transformer	MPN	-	Yes	No	NWC
TB-terminalBoard	???	???	???	???	???
TC-thermocouple TC-thermopile	??? ???	??? ???	??? ???	??? ???	??? ???
TP-testPoint	Test_Point	-	-	-	-
U-inseparableAssembly U-microcircuit U-micromodule U-digitalLogicGate U-digitalLogic U-integratedAmplifier U-<function> U-exposedPad	??? ??? ??? STDL STDL MPN MPN ???	??? ??? ??? - - - - ???	??? ??? ??? Yes Yes Yes Yes ???	??? ??? ??? No No No No ???	??? ??? ??? WC WC WC WC ???
V-electronTube	???	???	???	???	???
VR-voltageRegulator	???	???	???	???	???
W-transmissionPath	???	???	???	???	???
X-fuseHolder X-lampHolder X-socket	??? ??? ???	??? ??? ???	??? ??? ???	??? ??? ???	??? ??? ???
Y-crystal	CT	Value	No	No	WC
Z-miscellaneous	???	???	???	???	???

MPR: Manufacturer's Part Number WC: Wildcarded

CT: Component Type NWC: Non-Wildcarded

STD: Standard

STDL: Standard Logic