

Power Supply Symbol Cheat Sheet

IEC 60617 · ANSI/IEEE 315 · IEC 60417

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1 Independent Sources and Batteries

DC SUPPLY IEC 60617 · IEEE 315 A fixed DC potential.	AC SUPPLY IEC 60617 · IEEE 315 A sinusoidal source with RMS voltage and frequency.	CONSTANT CURRENT ANSI/IEEE 315 The arrow is the reference direction.
CONSTANT VOLTAGE ANSI/IEEE 315 Holds voltage fixed. Ideal internal resistance is zero.	SINGLE-CELL BATTERY ANSI/IEEE 315 Long thin bar positive, short thick bar negative.	MULTI-CELL BATTERY ANSI/IEEE 315 Cells in series. Voltage is the sum of the cells.

Colour key: ■ Voltage sources ■ Current sources and batteries ■ Circuit common ■ Chassis

2 Dependent (Controlled) Sources — the Diamond Family

VCVS $V_{out} = A \times V_{control}$ Voltage controlled voltage source. A is dimensionless. Models an op-amp.	VCCS $I_{out} = g \times V_{control}$ Voltage controlled current source. g in siemens. Models a MOSFET.	CCVS $V_{out} = r \times I_{control}$ Current controlled voltage source. r in ohms. Models a sense amplifier.	CCCS $I_{out} = B \times I_{control}$ Current controlled current source. B dimensionless. Models a BJT.
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The controlling quantity must be named elsewhere on the sheet. A diamond with no named control is an incomplete symbol. The diamond is a universal drafting convention rather than a numbered IEC 60617 entry, so do not cite a clause number for it.

3 Returns, Rails, and Equipment Marks

EARTH GROUND IEC 60417-5017 Connects to earth, or a structure serving that role.	CHASSIS GROUND IEC 60417-5020 Connects to the frame. Not automatically at earth potential.	SIGNAL GROUND IEEE 315 clause 3.9.3 The circuit's own 0V return. Label goes inside the triangle.	SUPPLY RAIL EDA library convention Connects by net name, not by a drawn wire.
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Mark	Meaning	Where it belongs
==	Direct current IEC 60417-5031	Rating plates, panels, silkscreen. Not a schematic symbol, and never in a netlist
~	Alternating current IEC 60417-5032	Rating plates, panels, silkscreen. IEC 60417 marks equipment; IEC 60617 draws diagrams

4 IEC 60617 vs ANSI/IEEE 315

Symbol	IEC 60617	ANSI/IEEE 315	Verdict
DC source	Circle with polarity marks	Circle with polarity marks	Same
AC source	Circle with one sine wave	Circle with one sine wave	Same
Battery	Long and short bar pairs	Long and short bar pairs	Same
Current source	Circle with a direction arrow	Circle with a direction arrow	Same
Earth ground	Three shrinking bars	Three shrinking bars, clause 3.9.1	Same glyph
Circuit common	Not in the equipment-marking set	Downward triangle, clause 3.9.3	IEEE only
Resistor (context)	Plain rectangle	Zigzag line	Different

5 Three Mistakes That Reach Fabrication



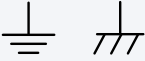
Dependent source drawn as a circle

It reads as an independent supply and the simulation settles on the wrong operating point.



Battery bars drawn equal

The polarity becomes ambiguous, and a reversed cell holder on the board follows.



Earth and chassis on one net

No DRC catches it. It shows up as a ground loop on the EMC scan instead.

Read the sheet in this order: outline first (circle, diamond, or bars), then the contents (polarity marks, arrow, or sine wave), then the label. Companion to **Power Supply Symbols: DC, AC, Ground, and Dependent Sources Explained** · jlcpcb.com