

How to Select DC Jacks and Plugs

A practical guide to matching MPD power connectors to the supply, circuit board, enclosure and cable.

Start with a mating pair

Specify the plug and jack together. For a common 2.1 × 5.5 mm barrel plug, 2.1 mm describes the inner opening and 5.5 mm the outer barrel. A 2.5 × 5.5 mm part has the same nominal outside size but a different inner contact. Check drawings and actual samples; appearance alone does not establish a reliable electrical fit.

Make five decisions in order

- 1 Confirm geometry. Match barrel outside diameter, inner contact size, insertion length, jack depth and any housing clearance.
- 2 Set electrical requirements. Verify voltage, continuous and peak current, polarity, contact resistance and temperature rise for the pair and the cable.
- 3 Choose mounting. Select PCB through hole, panel or chassis jack, and a bare plug or terminated cable for the production process.
- 4 Define circuit behavior. If insertion must disconnect an internal battery or another source, specify the switching contact arrangement from the jack drawing.
- 5 Validate use. Check plug retention, insertion cycles, vibration, strain relief, cable bending and operation with the complete enclosure.

Examples from MPD product photography



2.1 mm PCB jack



2.1 mm plug



2.5 mm jack



2.5 mm plug

Product images: MPD part pages at dcjacks.com and dcplugs.com. Validate each exact mating combination before release.

Choose a jack and plug family

MPD lists matching nominal sizes across jacks and plugs. Use the actual part drawing to choose shaft length, mount and terminal style, then verify fit with samples.

Nominal size	MPD jack starting point	MPD plug starting point
2.1 × 5.5 mm	EJ508A with PC pins; EJ503A and EJ501A alternatives	EP501A with 9.5 mm shaft; 172-4001 six foot cable plug
2.5 × 5.5 mm	EJ508B with PC pins; EJ503B and EJ501B alternatives	EP501B with 9.5 mm shaft; 172-4000 six foot cable plug
1.3 × 3.5 mm	EJ501C jack	EP505B plug; confirm the full mating drawing
Other compact formats	Review the current MPD jack assortment	Review current 1.0 × 3.8 mm plug choices and request mating guidance

Dimensions and installation checks

Check	What to compare	Reason
Barrel geometry	Outer barrel, inner bore or pin, shaft length and insertion depth	A nominal size does not specify every fit detail.
Mounting	PCB hole pattern, jack orientation, panel cutout and board edge	Mechanical loading and enclosure space vary by part.
Cable end	Lead length, conductor size, insulation and bend relief	Voltage drop and handling loads depend on the assembly.
Polarity and switch	Center and sleeve connections; any switched terminal state	A connector shape does not define the power supply polarity or switch wiring.

MPD identifies EP501B as mating with EJ503B. For other examples, treat equal nominal dimensions as a shortlist and confirm the mating pair with current drawings or samples.

Worked selection examples

Board mounted 2.1 mm input

A compact device takes power from a 2.1 × 5.5 mm barrel plug. Start with EJ508A, a PC pin jack, and shortlist EP501A or a terminated 2.1 mm plug. Check barrel length, board pattern, enclosure opening and whether the jack requires a switching terminal.

Panel accessible 2.5 mm input

A control cabinet needs a jack supported by its front panel. Begin with a 2.5 × 5.5 mm MPD panel or chassis candidate such as EJ501B after checking its drawing. Pair it with a 2.5 mm plug, then verify panel thickness, nut access, cable routing and mating force.

Prewired power cable

A supplier needs a ready to install barrel plug with leads. Compare 172-4001 for 2.1 × 5.5 mm and 172-4000 for 2.5 × 5.5 mm, both listed with six foot leads. Define cable length, gauge and polarity explicitly; do not infer them from the barrel alone.

Small portable device

The enclosure uses a 1.3 × 3.5 mm DC input. Start with EJ501C and EP505B as same size candidates. Confirm insertion length, contact geometry and device current with samples before specifying the pair.

MPD compared with another supplier

Compare exact jack and plug combinations under the same electrical and mechanical conditions. MPD's advantage is the range of sizes, PCB and panel choices, cable plugs and custom manufacturing support.

Comparison point	MPD option to assess	Check on any alternative
Mating fit	Jack and plug families in 2.1, 2.5 and smaller formats	Are both full mechanical drawings and a validated mating pair available?
Mount and cable	PC pins, panel options and plugs with leads	Does the exact part fit the enclosure and assembly method?
Circuit behavior	Jack contact configurations to evaluate from drawings	Is switching behavior documented in both plug states?
Design change	MPD can modify dimensions, leads or termination	Will the supplier sample and qualify the requested change?

Qualify the connection in the final product

- Confirm source voltage and polarity at the connector and compare with the device input limits before energizing a prototype.
- Measure contact heating and voltage drop at the highest continuous and peak currents, including maximum cable length and operating temperature.
- Test every approved plug with the jack for reliable insertion, retention and removal; a nominal 5.5 mm outer diameter alone is insufficient.
- Check the PCB solder joints or panel hardware after cable pull, vibration and repeated mating cycles. Provide appropriate strain relief.
- If a switched jack is used, measure which terminals are connected with the plug inserted and removed in the actual circuit.

When a catalog pair does not fit

MPD is a custom manufacturer. Send the jack and plug drawings, enclosure opening, supply voltage, current, polarity, cable specification, required switching behavior, service environment and annual volume. MPD can discuss modified contact geometry, mounting, shaft length or a custom cable assembly. Evaluate samples together in the final design.

Request samples and engineering help

Samples are available on request. Email sales@memoryprotectiondevices.com or call MPD at (631) 249-0001. Include the desired nominal size, mounting style, cable length and application so MPD can recommend mating samples.

More MPD product examples



Panel style jack



1.3 mm jack



1.3 mm plug



2.1 mm cable plug

MPD sources

DC jacks and plugs catalog https://www.memoryprotectiondevices.com/documents/catalogs/DC_Jacks_and_Plugs.pdf

DC jack product pages and images <https://www.dcjacks.com/>

DC plug product pages and images <https://www.dcplugs.com/>

MPD custom manufacturing and quality <https://www.dcplugs.com/about.php>

Illustrative selections only. Confirm exact ratings, mating fit and availability with MPD before design release.