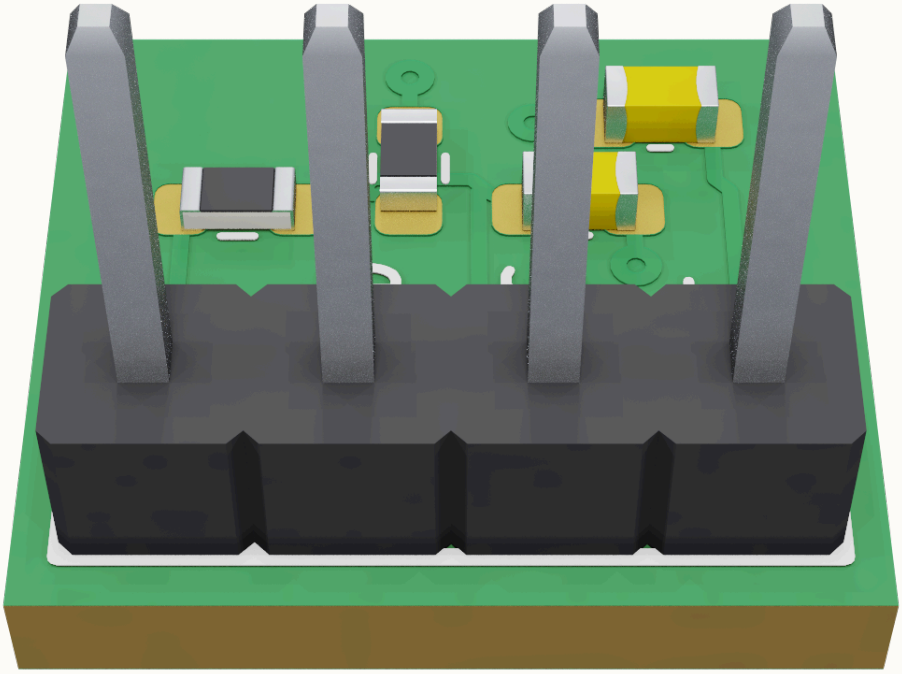
14 Off Board World

14-OFF-BOARD-WORLD - rev A - 2026-10-17 - ENGINEERING RELEASE



Assembly view

Key specifications

Interfaces	harness
Outline	11.41 x 10.00 mm
PCB	2 copper layers, 1.60 mm finished thickness
Fitted parts	5

Operating window

VIN supply voltage	**12 V**
Ambient operating temperature	**0 to 70 °C**

See Electrical limits for the conditions behind these values, required external loads and contact limits.

Connector overview

CONNECTOR	USE	SIGNALS
J1	harness	VIN, GND, SNS, BAT

Electrical limits

Operating conditions and limits for the assembled board

Recommended operating conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
VIN supply voltage	VIN	Required input supply voltage	12	—	12	V
External load impedance	R(J1.2-J1.3)	Between J1.2 and J1.3	46990	—	1001000	ohm
Ambient operating temperature	TA	Ambient operating range	0	—	70	°C

Electrical characteristics

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
VIN supply current	IIN	[1, 2, 3, 4]	1.136	—	1.271	mA
Power consumption	P	[5, 4]	—	—	15.27	mW
J1.2 to J1.3 mean-square current	I^2_J1	RMS current squared [6]	—	—	0.000000007761	A^2

How to use these limits

[1] Constant current during settled DC operation, drawn by the board itself.

[2] **Contacts:** What an attachment draws through a connector contact adds to this, up to that contact's limit.

[3] **Tolerances:** Calculated across the listed supply ranges and modeled component tolerances.

[4] **External loads:** The current and power limits require J1.2 to J1.3: 46990 ohm min, 1001000 ohm max.

[5] Worst-case input power the board itself draws across all supply rails.

[6] **Heating:** Mean-square current is RMS current squared, in A^2. Use it for cycle-averaged resistive heating under the declared steady-waveform model; startup and fault currents need separate limits.

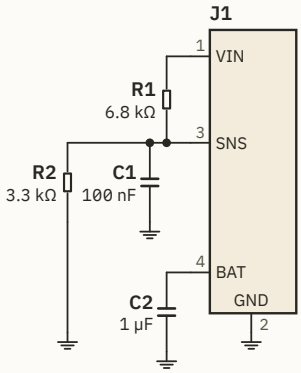
Use only the conditions printed with each value. Component absolute maximum ratings do not automatically apply to the assembled board.

Schematic

Header 14-OFF-BOARD-WORLD

KEY RAIL IN OUT BIDIR PASSIVE 5·p2 BLOCK 5, PAGE 2

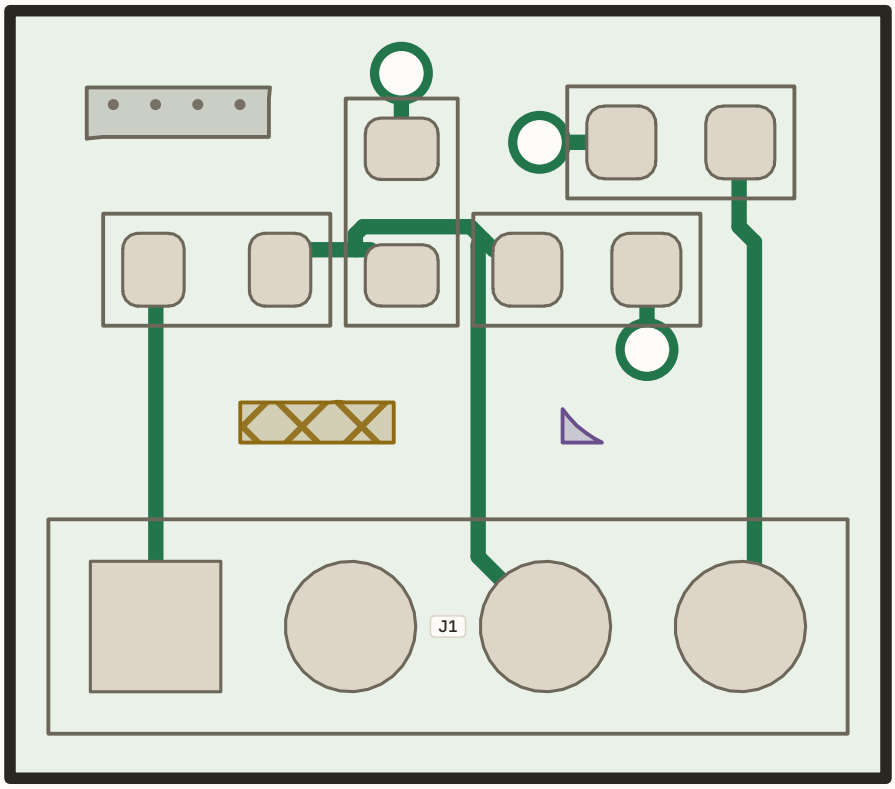
1 Header



Board layout

Copper on both layers, and the board area that no part or track uses

KEY — TOP COPPER — BOTTOM COPPER PAD VIA



TOP VIEW · BOTTOM COPPER SEEN THROUGH · 11 X 10 MM · LARGE PARTS NAMED

Unused area

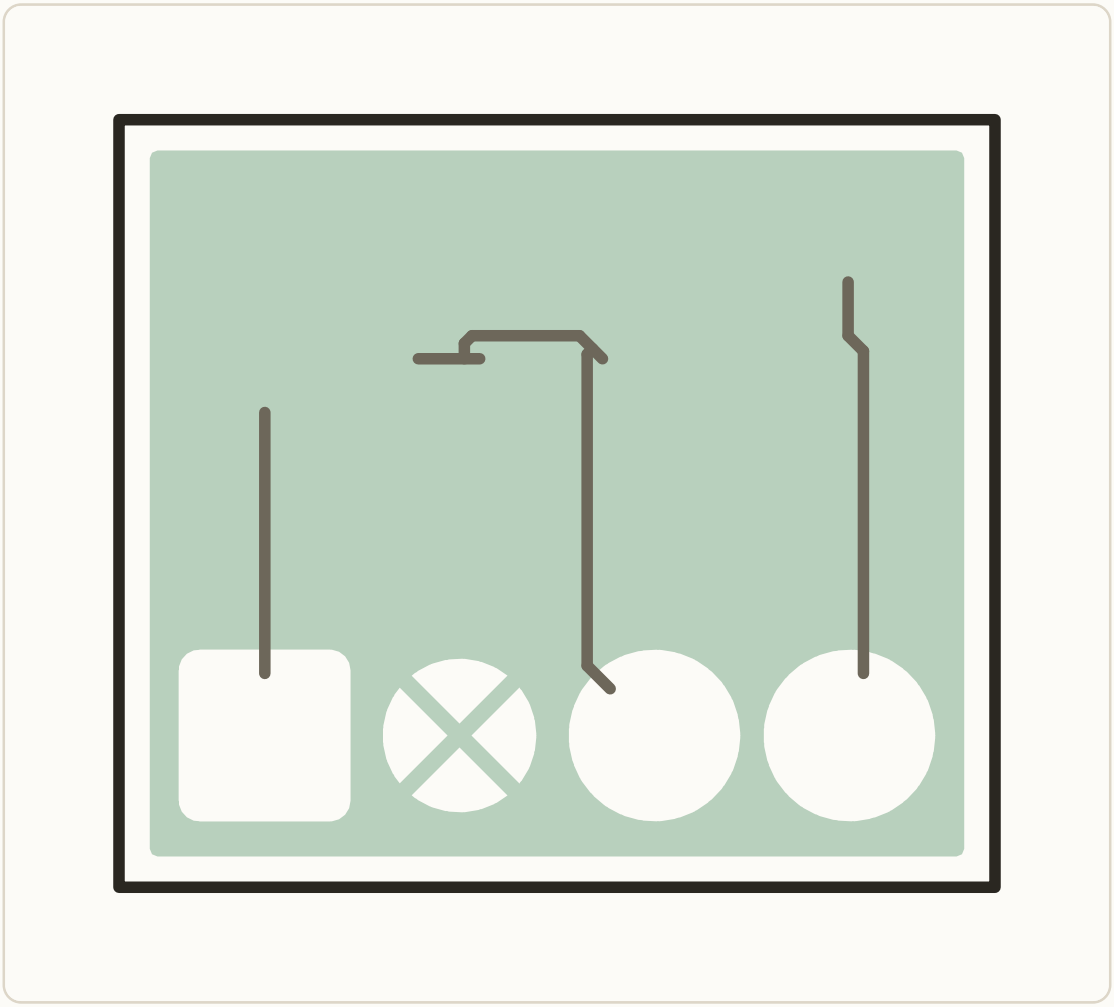
PATTERN	CAUSE	BOUNDED BY	AREA	OF BOARD
	Part gap	between parts	1.0 mm²	0.9 %
	Routing corridor	between tracks	0.1 mm²	0.1 %
	Edge margin	between parts and the outline	1.5 mm²	1.3 %
	Total	at least 1 mm from everything	2.7 mm²	2.3 %

Unused area is board surface at least 1 mm from every part, track and the board edge. A part gap is the only kind a tighter placement can reclaim.

Ground plane

Ground on B.Cu under the routes on F.Cu

KEY GROUND PLANE OPENING ROUTE ON F.CU



TOP VIEW · B.CU UNDER F.CU

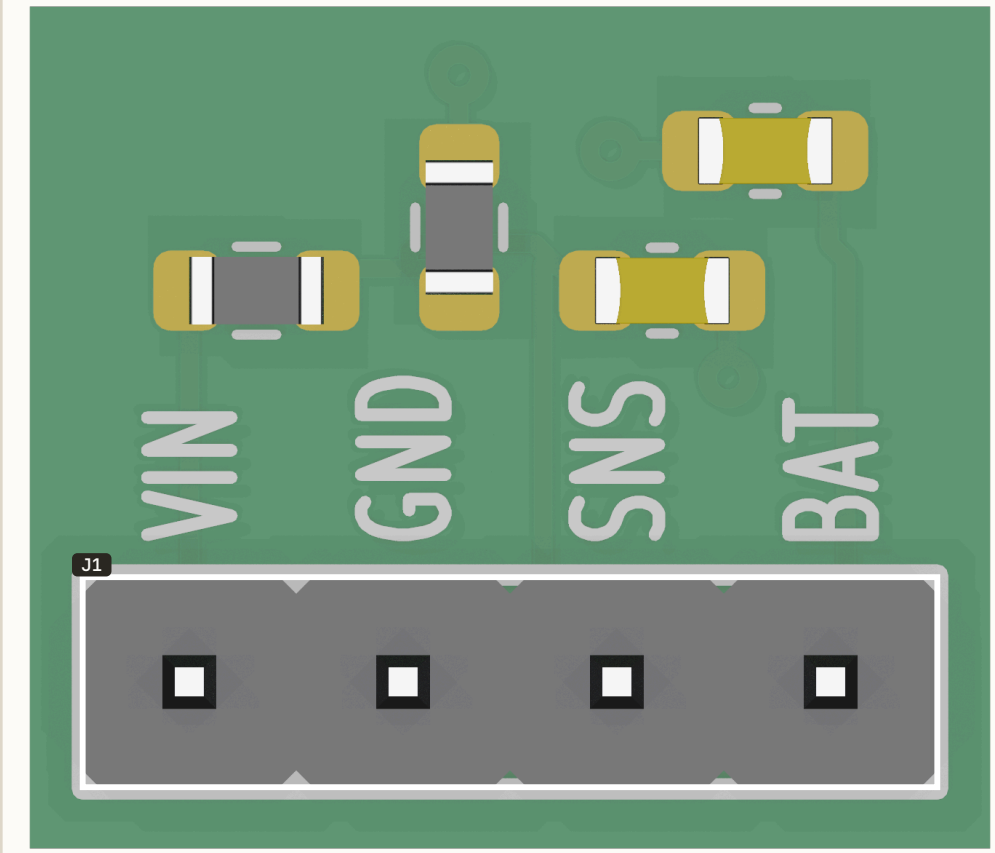
Return path

Ground plane	B.Cu, 72 % of the board
Routes on F.Cu	16 mm; no return detour of 1 mm or more

Openings in the plane add under 1 mm to the return path of a route on F.Cu above them; no route on F.Cu crosses a gap that adds more.

Board connections

Connector and test point locations viewed from the top of the assembled board



TOP VIEW - CONNECTORS AND TEST POINTS MARKED - NOT TO SCALE

Pin schedules and mating-face views are on the following pages.

Connector pinout

Pin numbers are shown as viewed into the mating face

SIGNAL CLASS SIGNAL GROUND

J1 - harness



TOP MATING FACE VIEW

PIN	SIGNAL	DESCRIPTION
1	VIN	VIN signal
2	GND	Ground reference
3	SNS	SNS signal
4	BAT	BAT signal

Components on this board

Component identities and supplier codes

IDENTIFICATION VIEWS ARE NOT TO SCALE



C2691448
harness
J1 · QTY 1 · LCSC C2691448

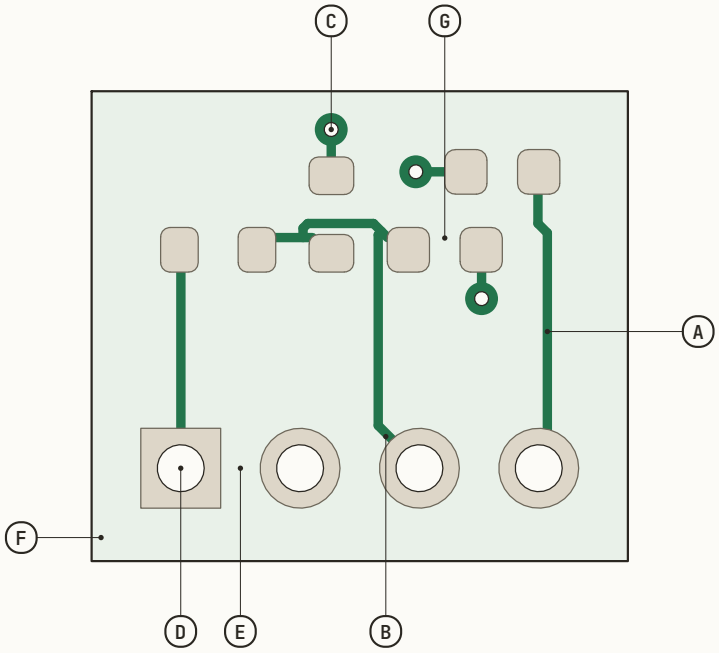
Passives

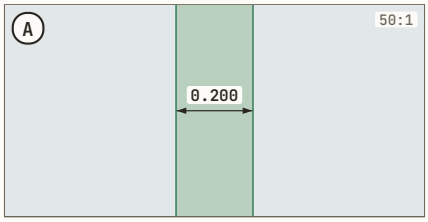
REFERENCE	VALUE / ROLE	QTY	PART
C1	SNS filter	1	C14663
C2	BAT bulk	1	C15849
R2	sense low	1	C22978
R1	sense high	1	C2907055

Manufacturability

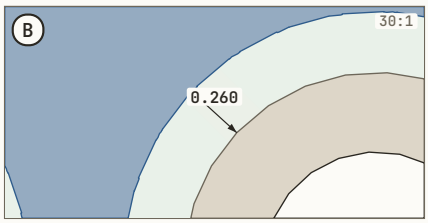
The smallest feature this board asks a fab to make, rule by rule

KEY — TOP COPPER — BOTTOM COPPER — PAD — MASK OPENING

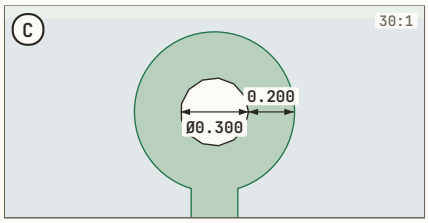




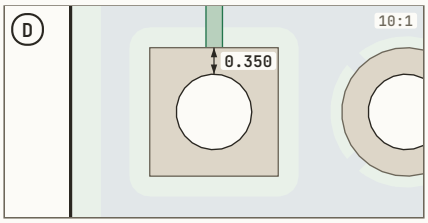
TRACK WIDTH
All 16 track segments
Required minimum 0.200; at minimum



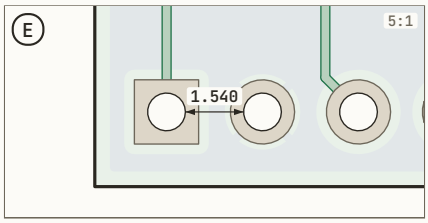
COPPER TO COPPER, OUTER
Every outer gap between nets
Required minimum 0.1524; 0.108 above



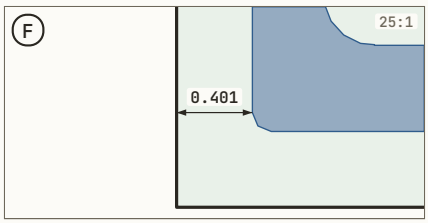
FINISHED DRILL · VIA RING
All 7 holes; all 3 vias
Finished drill minimum 0.300; at minimum.
Via ring minimum 0.200; at minimum



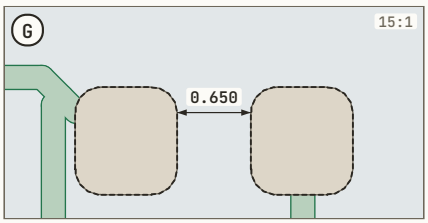
PTH RING
All 4 plated leads
Required minimum 0.300; 0.050 above



HOLE TO HOLE
All 7 holes, wall to wall
Required minimum 0.300; 1.240 above



COPPER TO EDGE
All copper, pours included
Required minimum 0.381; 0.020 above



MASK WEB
All 12 top mask openings
Required minimum 0.1016; 0.548 above

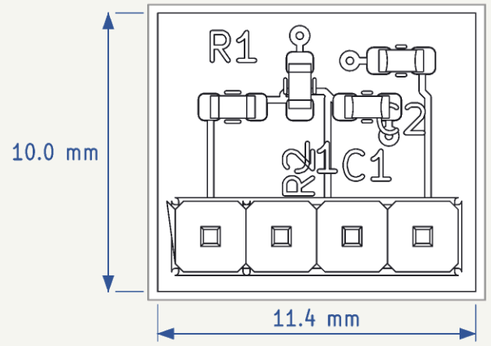
COMPATIBLE FABS

JLCPCB [1] · PCBWay [2] · OSH Park [3] · AISLER [4]

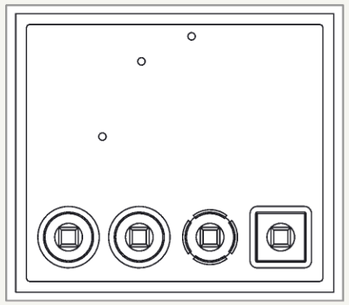
Detail minima use the strictest checked profile. Compatibility means the checked dimensional rules pass.

LAYERS	THICKNESS	ASPECT RATIO	HOLES	DRILL SIZES
2	1.6 mm	5.3 : 1	3 via, 4 PTH	2, Ø0.300–1.000

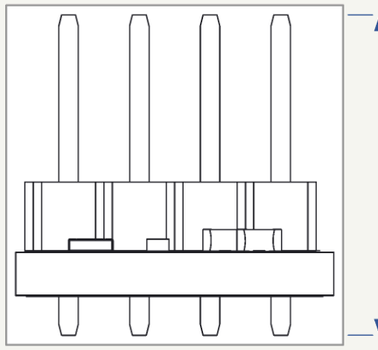
All values in mm. [1] read 2026-08-08 [2] read 2026-08-08 [3] read 2026-08-13 [4] read 2026-08-08



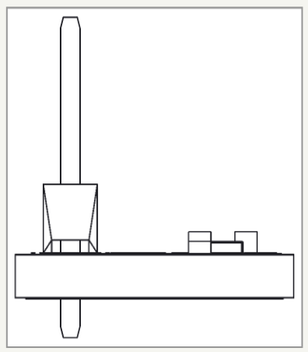
TOP VIEW



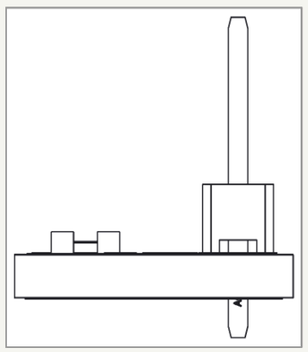
BOTTOM VIEW



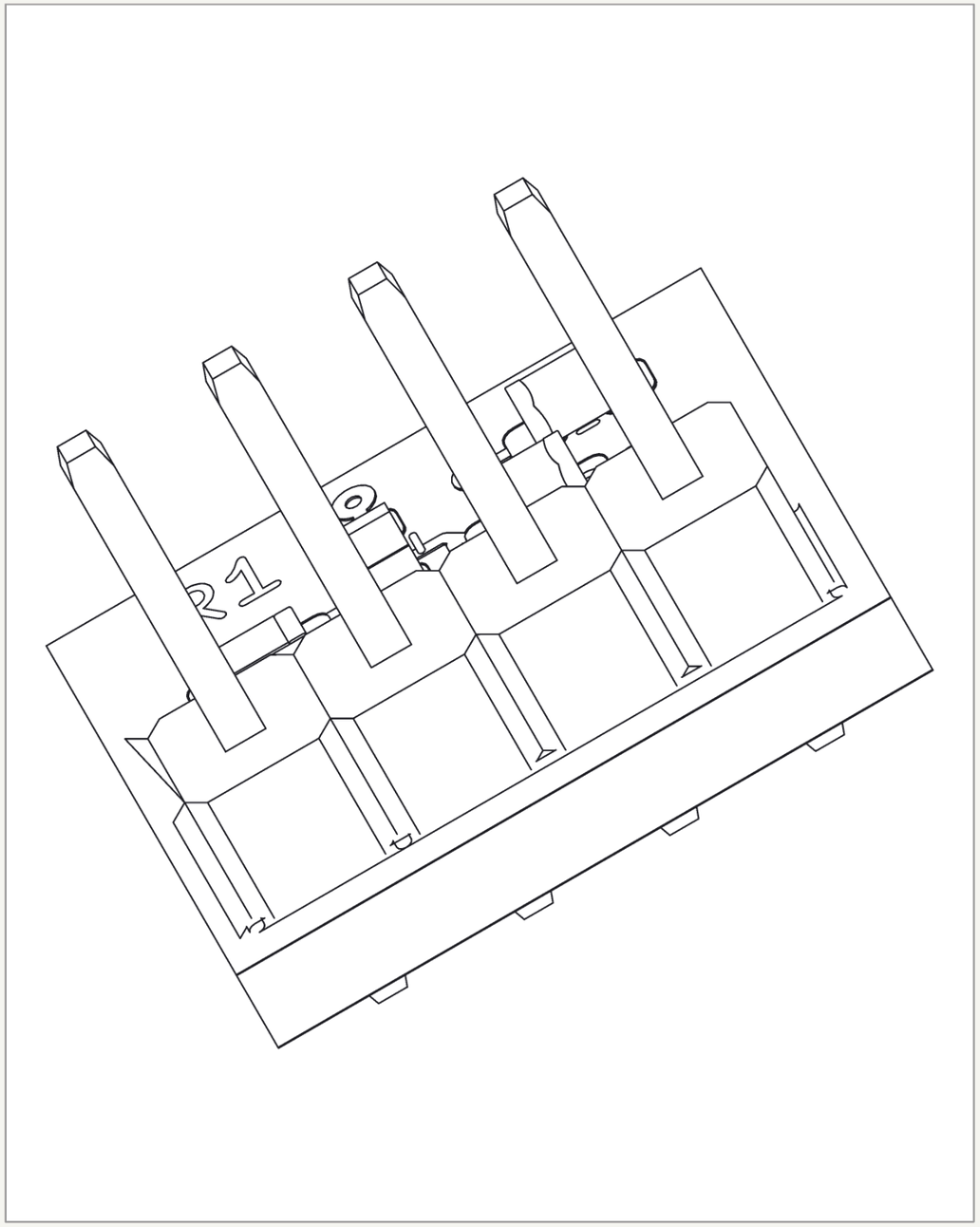
FRONT VIEW (Y)



LEFT VIEW (X)



RIGHT VIEW (X)



ISOMETRIC – NTS

TITLE 14 Off Board World assembly	DWG NO. 14-OFF-BOARD-WORLD
REV A	DATE 2026-10-17
OVERALL 11.4 x 10.0 x 11.5 mm	MATERIAL FR-4, 1.60 mm
PROJECTION REFERENCE VIEWS	SCALE NTS
UNITS mm	SHEET 1 OF 1