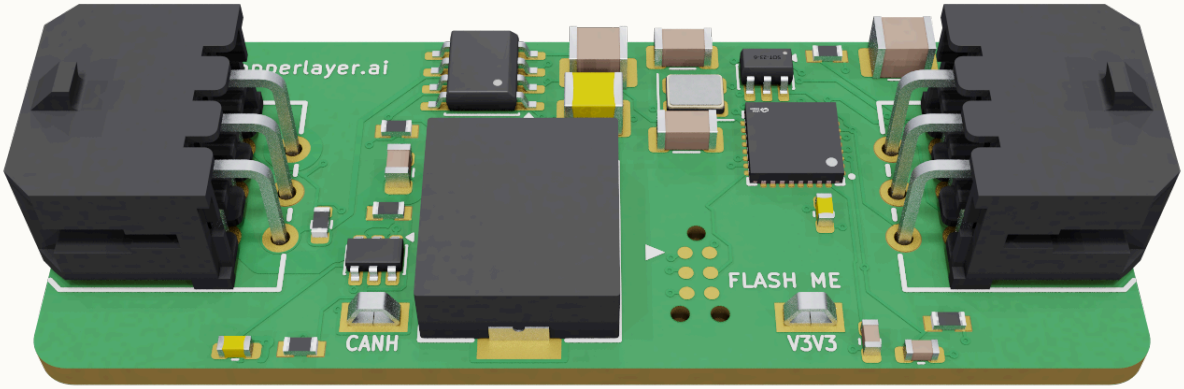
Molex CAN Node

MOLEX-CAN-NODE - rev A - 2026-10-21 - ENGINEERING RELEASE



Assembly view

Key specifications

Interfaces	12V CAN / I/O / SWD · PCB contacts
Outline	56.00 x 22.00 mm
PCB	4 copper layers, 1.60 mm finished thickness
Fitted parts	27

Operating window

V12 supply voltage	`12 V`
V3V3 supply voltage	`3.241 to 3.416 V`
Ambient operating temperature	`0 to 55 °C`

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

Connector overview

CONNECTOR	USE	SIGNALS
J1	12V CAN	V12, GND, CANH, CANL
J2	I/O	V3V3, GND, IO1, IO2, IO3, IO4
J3	SWD · PCB contacts	V3V3, SWDIO, NRST, SWCLK, GND

Electrical limits

Operating conditions and limits for the assembled board

Recommended operating conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
V12 supply voltage	V12	Required input supply voltage	12	–	12	V
V3V3 supply voltage	V3V3	Supply and component tolerances	3.241	–	3.416	V
External load impedance	R(J2.1-J2.2)	Between J2.1 and J2.2	6.599	–	1001000	ohm
External load impedance	R(J3.1-J3.5)	Between J3.1 and J3.5	99900	–	10010000	ohm
Ambient operating temperature	TA	Ambient operating range	0	–	55	°C

Electrical characteristics

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
V12 supply current	I12	RMS, settled operation [1, 2, 3, 4]	–	–	1.24	A
V3V3 supply current	I3V3	RMS, settled operation [1, 2, 4]	–	–	803.7	mA
Power consumption	P	[5, 2, 3]	–	–	8.445	W
J2.1 to J2.2 mean-square current	I²_J2	RMS current squared [6]	–	–	0.2678	A²
J3.1 to J3.5 mean-square current	I²_J3	RMS current squared [6]	–	–	0.000000001167	A²
L1.1 to L1.2 mean-square current	I²_L1	RMS current squared [6, 4]	–	–	0.64582881976975	A²

Interface constraints

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
J1 current per contact	I(J1)	Pins 1, 6 [7]	–	–	1	A
J1 current per contact	I(J1)	Pins 2, 5 [7]	–	–	1.4	A
J1 current per contact	I(J1)	Pins 3, 4 [7]	–	–	405.092	mA
J2 current per contact	I(J2)	Pin 1 [7]	–	–	518	mA
J2 current per contact	I(J2)	Pin 2 [7]	–	–	542	mA
J2 current per contact	I(J2)	Pins 3, 4, 5, 6 [7]	–	–	6	mA

How to use these limits

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

[2] **External loads:** The current and power limits require J2.1 to J2.2: 6.599 ohm min, 1001000 ohm max and J3.1 to J3.5: 99900 ohm min, 10010000 ohm max.

[3] **U1 efficiency model:** This bound uses an assumed ratio of output power to input power from the component model.

[4] **U1 switching frequency model:** This bound uses an assumed switching frequency, which determines the regulator's current ripple.

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

[6] **Heating:** Mean-square current is RMS current squared, in A². Use it for cycle-averaged resistive heating under the declared steady-waveform model; startup and fault currents need separate limits.

[7] **Contact current:** Each listed pin must not exceed this current. These are application design limits, not connector ratings or available output current.

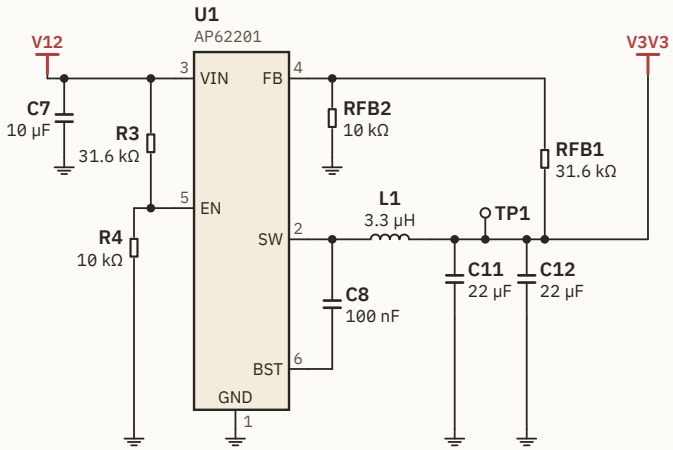
Use only the conditions printed with each value. Component absolute maximum ratings do not automatically apply to the assembled board.

Schematic

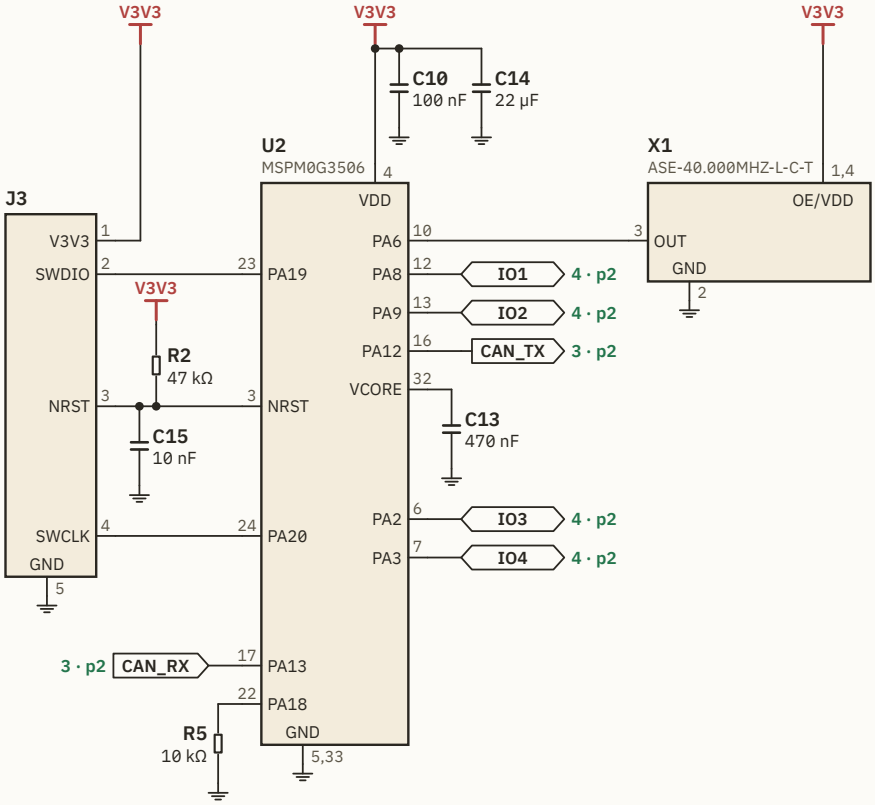
3.3 V buck and controller MOLEX-CAN-NODE

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

1 3.3 V buck AP62201

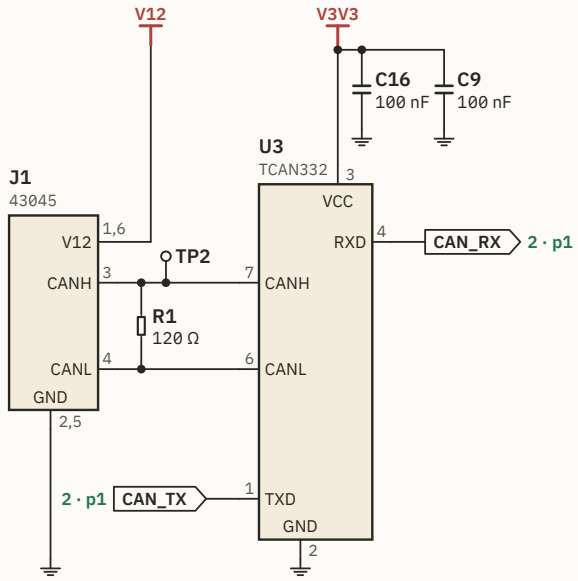


2 Controller MSPM0G3506

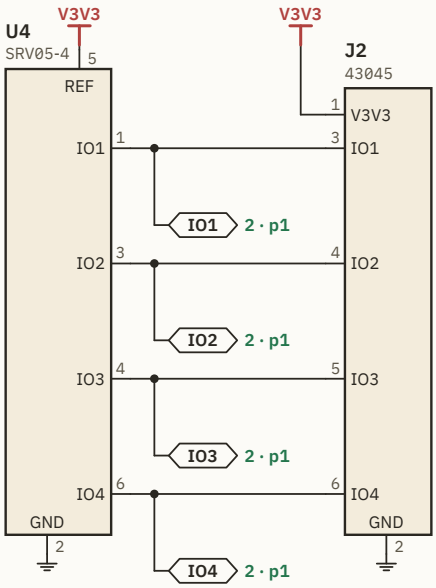


UNUSED PINS NOT SHOWN

3 Harness and CAN transceiver TCAN332



4 Harness and ESD protection SRV05-4

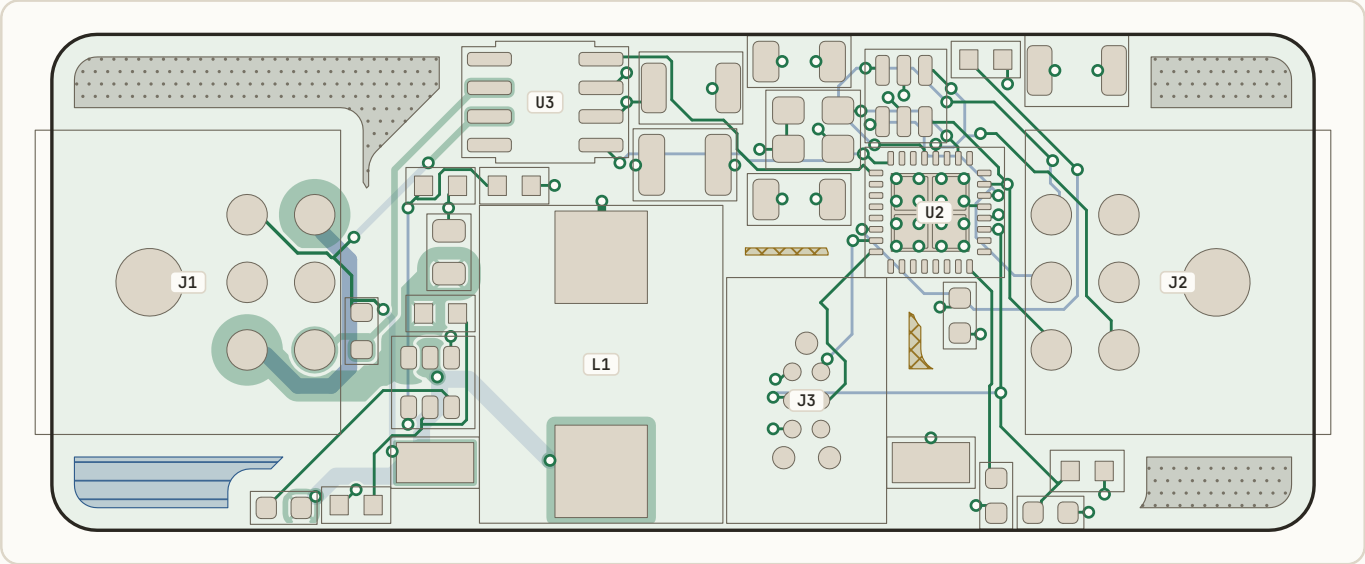


UNUSED PINS NOT SHOWN

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 · 56 X 22 MM · LARGE PARTS NAMED

Unused area

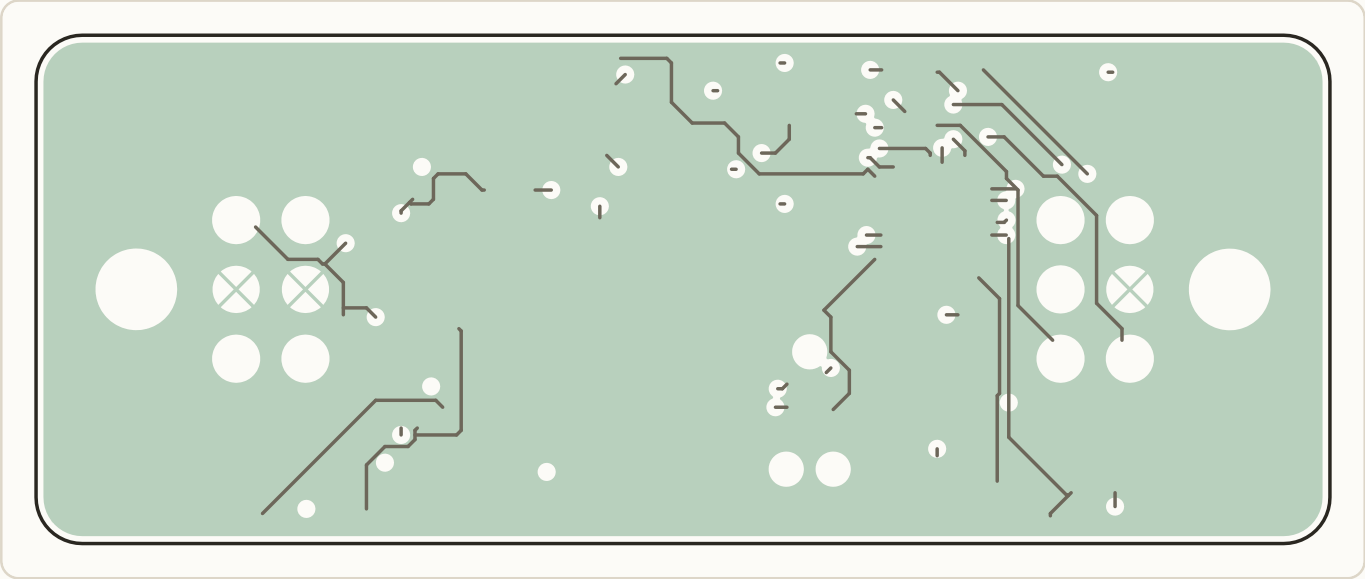
PATTERN	CAUSE	BOUNDED BY	AREA	OF BOARD
	Part gap	between parts	2.4 mm²	0.2 %
	Connector apron	beside a connector	16.5 mm²	1.3 %
	Edge margin	between parts and the outline	67.6 mm²	5.5 %
	Total	at least 1 mm from everything	86.5 mm²	7.0 %

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 In1.Cu under the routes on F.Cu

KEY GROUND PLANE OPENING ROUTE ON F.CU



TOP VIEW · IN1.CU UNDER F.CU

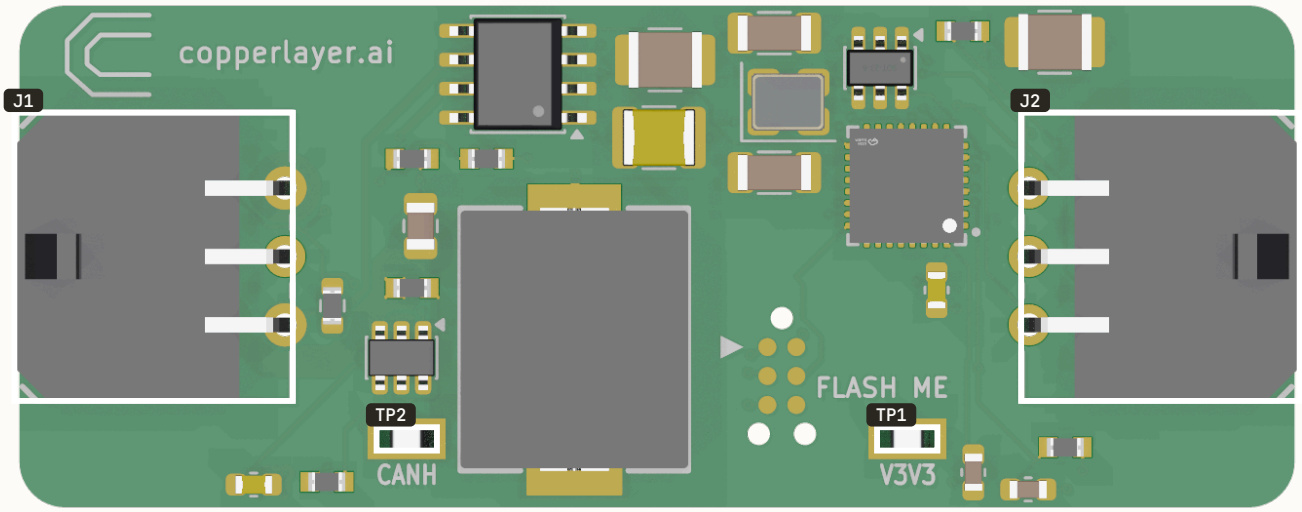
Return path

Ground plane	In1.Cu, 89 % of the board
Routes on F.Cu	139 mm; no return detour of 1 mm or more
Routes on B.Cu	97 mm, next to In2.Cu: V3V3 fill, 88 % of the board

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

Test point locations

STATION	SIGNAL	PINS	CONNECTED TO
TP1	V3V3	1	to C10, C11, C12, and 12 more
TP2	CANH	1	to J1, R1, U3

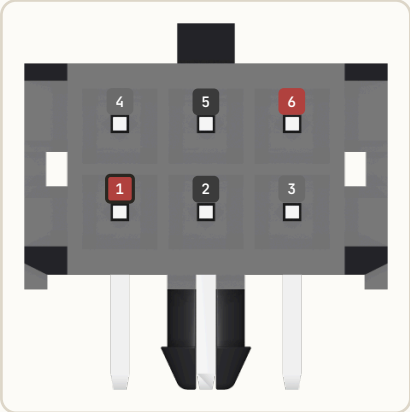
Pin schedules are on the following pages. Mating-face orientation is not published for every connector; confirm it against the connector manufacturer's drawing before wiring.

Connector pinout

Pin numbers follow the PCB footprint numbering; mating-face orientation is not fully published

SIGNAL CLASS POWER GROUND SIGNAL NO CONNECT

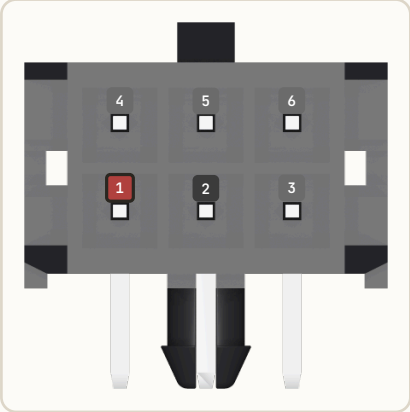
J1 - 12V CAN



MATING FACE VIEW

PIN	SIGNAL	DESCRIPTION
1	V12	12 V supply rail
2	GND	Ground reference
3	CANH	CANH signal
4	CANL	CANL signal
5	GND	Ground reference
6	V12	12 V supply rail

J2 - I/O



MATING FACE VIEW

PIN	SIGNAL	DESCRIPTION
1	V3V3	Supply rail
2	GND	Ground reference
3	IO1	IO1 signal
4	IO2	IO2 signal
5	IO3	IO3 signal
6	IO4	IO4 signal

J3 - SWD · PCB contacts

PIN	SIGNAL	DESCRIPTION
1	V3V3	Supply rail
2	SWDIO	SWDIO signal
3	NRST	NRST signal
4	SWCLK	SWCLK signal
5	GND	Ground reference
6	NC	No connection on the released board

Components on this board

Component identities and supplier codes

IDENTIFICATION VIEWS ARE NOT TO SCALE



C73651
TCAN332
U3 · QTY 1 · LCSC C73651



C85364
SRV05-4 I/O ESD
U4 · QTY 1 · LCSC C85364



C127367
12V CAN
J1 · QTY 1 · LCSC C127367



C127367
I/O
J2 · QTY 1 · LCSC C127367



C1670009
40MHz CAN reference
X1 · QTY 1 · LCSC C1670009



C2906768
TP
TP1, TP2 · QTY 2 · LCSC C2906768



C3194236
AP62201WU-7
U1 · QTY 1 · LCSC C3194236



C22427705
MSPM0G3506
U2 · QTY 1 · LCSC C22427705

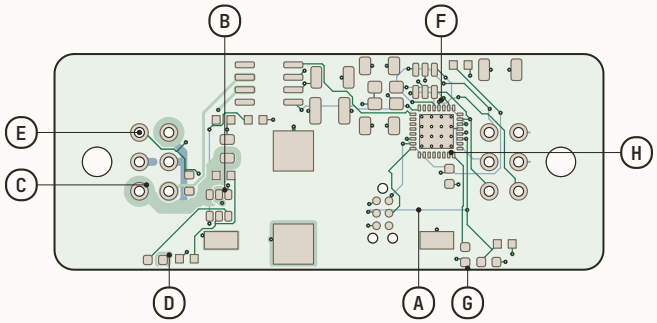
Passives

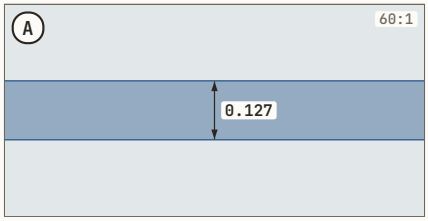
REFERENCE	VALUE / ROLE	QTY	PART
C8	100nF bootstrap	1	C14663
C16	100nF oscillator bypass	1	C14663
C15	10nF NRST	1	C72452
L1	FXL1040-3R3-M 3u3	1	C167229
C7	10uF low-ESR buck input	1	C329933
C13	470nF VCORE low-ESR	1	C361189
C11	22uF buck output A	1	C694521
C12	22uF buck output B	1	C694521
RFB1	3V3 feedback upper	1	C843870
R3	EN UVLO top	1	C843870
R1	120R CAN endpoint	1	C844736
RFB2	3V3 feedback lower	1	C844890
R4	EN UVLO bottom	1	C844890
R5	PA18 BSL invoke pull-down	1	C844890
R2	47k NRST pull-up	1	C2089026
C10, C9	100nF	2	C2891592
C14	22uF MSP VDD local low-ESR	1	C5159399

Manufacturability

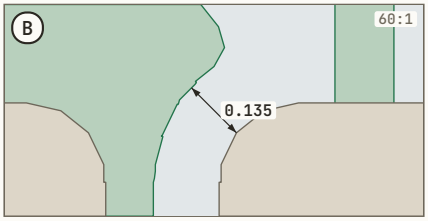
The smallest feature this board asks a fab to make, rule by rule

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

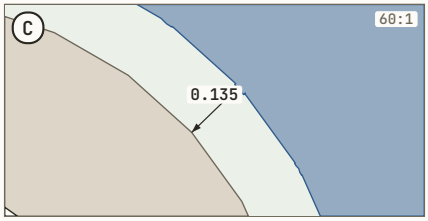




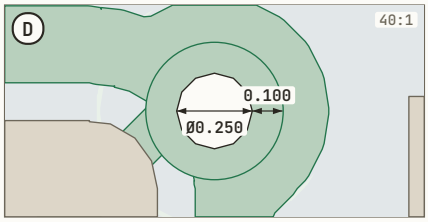
TRACK WIDTH
All 198 track segments
Required minimum 0.125; 0.002 above



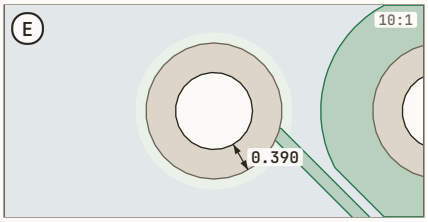
COPPER TO COPPER, OUTER
Every outer gap between nets
Required minimum 0.125; 0.010 above



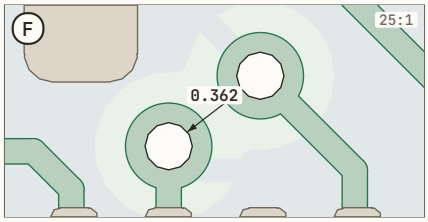
COPPER TO COPPER, INNER
Every inner gap between nets
Required minimum 0.125; 0.010 above



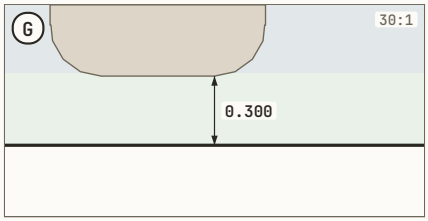
FINISHED DRILL · VIA RING
All 93 holes; all 76 vias
Finished drill minimum 0.250; at minimum. Via ring minimum 0.100; at minimum



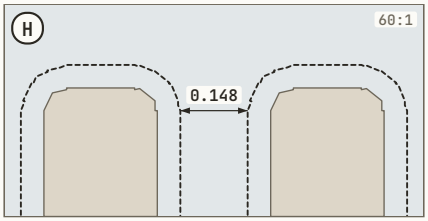
PTH RING
All 12 plated leads
Required minimum 0.300; 0.090 above



HOLE TO HOLE
All 93 holes, wall to wall
Required minimum 0.300; 0.062 above



COPPER TO EDGE
All copper, pours included
Required minimum 0.300; at minimum



MASK WEB
All 118 top mask openings
Required minimum 0.100; 0.048 above

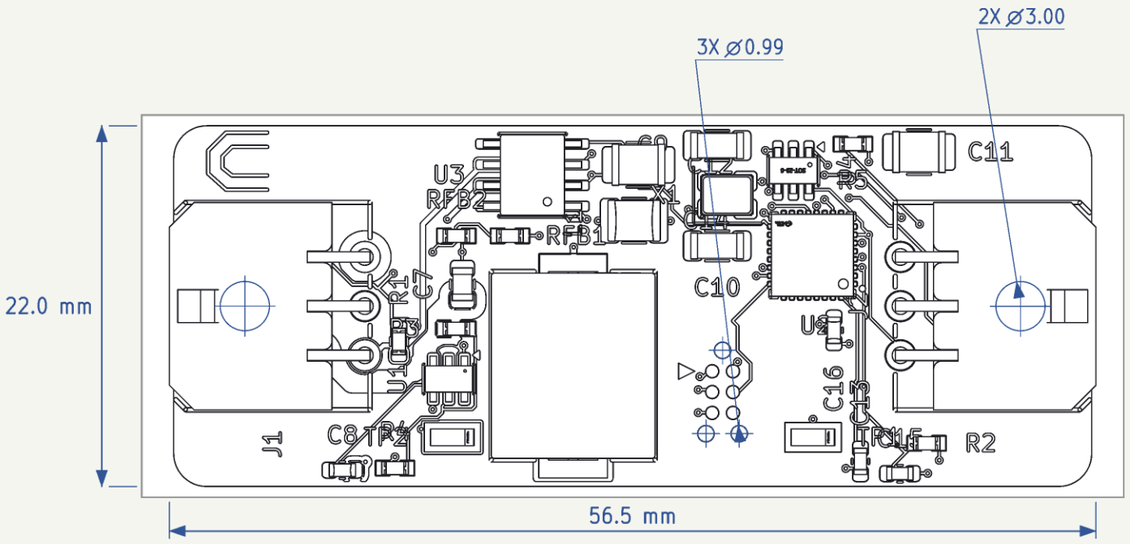
COMPATIBLE FABS — AISLER

aisler-4l-1p6mm-35um-enig@2025-07-07+00fe215f [1]

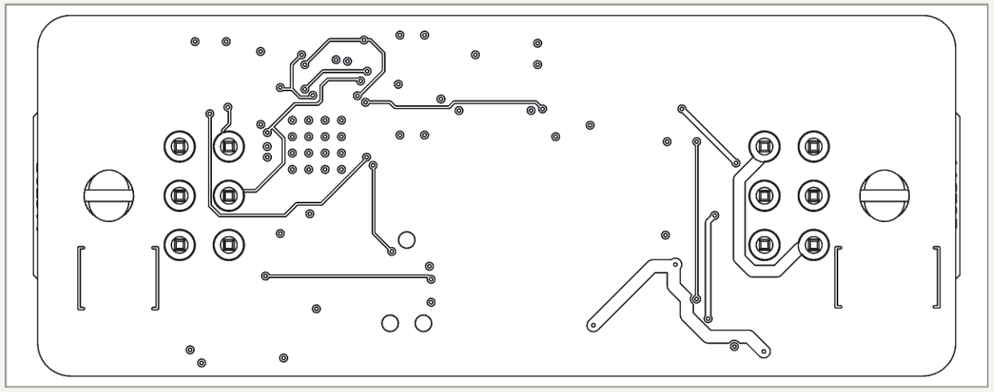
Detail minima use the fab profile this board was built for. Compatibility means the checked dimensional rules pass.

LAYERS	THICKNESS	ASPECT RATIO	HOLES	DRILL SIZES
4	1.6 mm	6.4 : 1	76 via, 12 PTH, 5 NPTH	4, Ø0.250–3.000

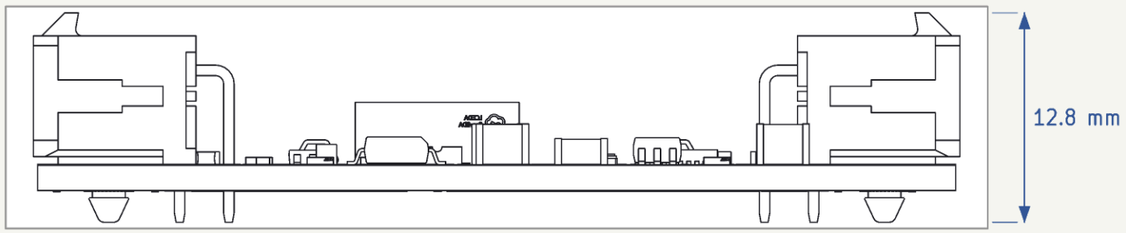
All values in mm. [1] read 2026-08-11



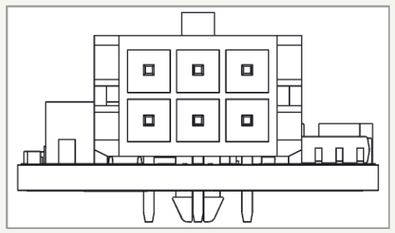
TOP VIEW



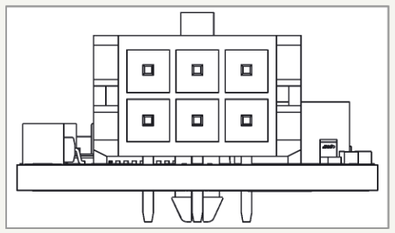
BOTTOM VIEW



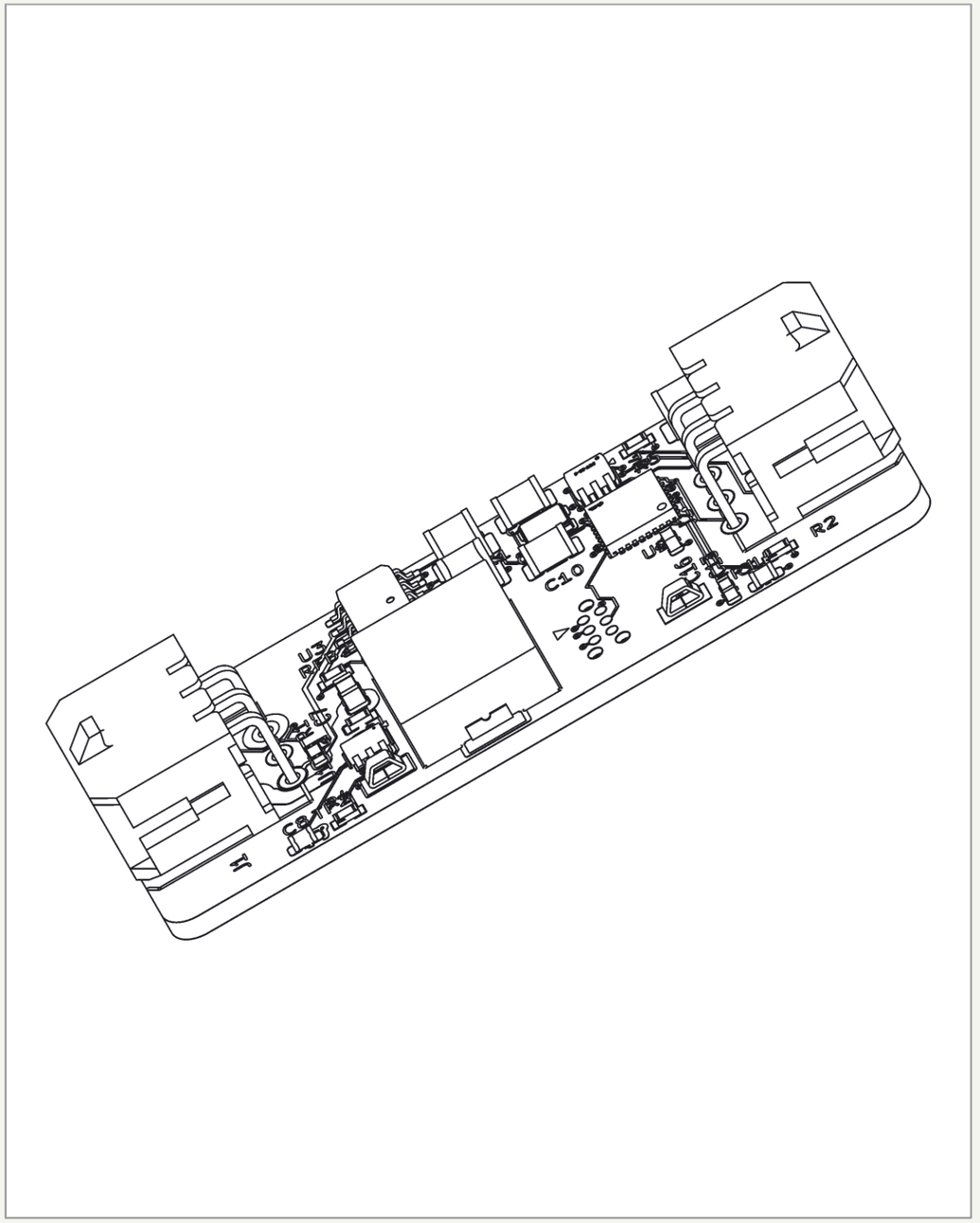
FRONT VIEW (Y)



LEFT VIEW (X)



RIGHT VIEW (X)



ISOMETRIC – NTS

TITLE Molex CAN Node assembly	DWG NO. MOLEX-CAN-NODE
REV A	DATE 2026-10-21
OVERALL 56.5 x 22.0 x 12.8 mm	MATERIAL FR-4, 1.60 mm
PROJECTION REFERENCE VIEWS	SCALE NTS
UNITS mm	SHEET 1 OF 1