

UNIVERSIDAD DEL VALLE DE GUATEMALA

ANALISIS DE CIRCUITOS Y FABRICACIÓN DE PCBS

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PROYECTO #3

FABRICACIÓN DE PLACA STELLARIS

Nombre del Fabricante: PCBWAY.

Reglas/Restricciones del fabricante:

PCB Manufacturing tolerances		
PCBWay provides you below with the required in-house tolerance guidelines to ensure quality manufacturing of your printed circuit boards. Adhering to these tolerances will allow for proper manufacturing of your PCBs. Within these parameters, there is enough variation to allow us to manufacture the board and then also for it to work properly in your application. If you have any questions or want to discuss unique requirements, please call contact your customer service.		
Items	Manufacturing Capabilities	Remarks
Number of Layers	1-10 layers	For orders above 10 layers, please contact our sales rep.
Material	FR-4,Aluminum	For Flex, Rigid-flex, Metal-based (Aluminum etc.), HDI, Halogen-free, High Tg, etc., please contact sales rep.
Maximum PCB Size(Dimension)	500x1100 mm	Any sizes beyond this dimension, please contact us.
Board Size Tolerance(Outline)	±0.2mm/±0.5mm	±0.2mm for CNC routing, and ±0.5mm for V-scoring.
Board Thickness	0.4-2.4mm	0.4, 0.6, 0.8, 1.0, 1.2, 1.6, 2.0, 2.4mm. Please contact us if your board exceeds these.
Board Thickness Tolerance(≥1.0mm)	±10%	Normally "+ Tolerance" will occur due to PCB processing steps such as electroless copper, solder mask and other types of finish on the surface.
Board Thickness Tolerance(<1.0mm)	±0.1mm	
Min Trace	0.1mm/4mil	Min manufacturable trace is 4mil(0.1mm), strongly suggest to design trace above 6mil(0.15mm) to save cost.
Min Spacing		Min manufacturable spacing is 4mil(0.1mm), strongly suggest to design spacing above 6mil(0.15mm) to save cost.
Outer Layer Copper Thickness	1oz/2oz/3oz(35µm/70µm/105µm)	Also known as copper weight. 35µm=1oz, 70µm=2oz, 105µm=3oz. Please contact us if you need copper weight greater than 3oz.
Inner Layer Copper Thickness	1oz/1.5oz(35µm/50µm)	Inner copper weight as per customer's request for 4 and 6 layers. Please contact us if you need copper weight greater than 1.5oz.
Drill Sizes (CNC)	0.2-6.3mm	Min drill size is 0.2mm, max drill is 6.3mm. Any holes greater than 6.3mm or smaller than 0.3mm will be subject to extra charges.
Min Width of Annular Ring	0.15mm(6mil)	For pads with vias in the middle, Min width for Annular Ring is 0.15mm(6mil).
Finished Hole Diameter (CNC)	0.2mm-6.2mm	The finished hole diameter will be smaller than size of drill bits because of copper plating in the hole barrels
Finished Hole Size Tolerance(CNC)	±0.08mm	For example, if the drill size is 0.6mm, the finished hole diameter ranges from 0.52mm to 0.68mm will be considered acceptable.
Solder Mask	LPI	Liquid Photo-Imageable is the mostly adopted. Thermosetting Ink is used in the inexpensive paper-based boards.
Minimum Character Width(Legend)	0.15mm	Characters of less than 0.15mm wide will be too narrow to be identifiable.
Minimum Character Height (Legend)	0.8mm	Characters of less than 0.8mm high will be too small to be recognizable.
Character Width to Height Ratio (Legend)	1:5	In PCB silkscreen legends processing, 1:5 is the most suitable ratio
Minimum Diameter of Plated Half Holes	0.6mm	Design Half-Holes greater than 0.6mm to ensure better connection between boards.
Surface Finishing	HASL with lead HASL lead free	The most popular three types of PCB surface finish. Please contact us for other finishes.

Height Ratio (Legend)		
Minimum Diameter of Plated Half Holes	0.6mm	Design Half-Holes greater than 0.6mm to ensure better connection between boards.
Surface Finishing	HASL with lead HASL lead free Immersion gold	The most popular three types of PCB surface finish. Please contact us for other finishes.
Solder Mask	Green ,Red, Yellow, Blue, White ,Black	No extra charge (Green, Red, Yellow, Blue)
Silkscreen	White, Black, None	No extra charge.
Panelization	V-scoring, Tab-routing, Tab-routing with Perforation (Stamp Holes)	Leave min clearance of 1.6mm between boards for break-routing. For V-score panelization, set the space between boards to be zero.
Others	Fly Probe Testing (Free) and A.O.I. testing(free), ISO 9001:2008 ,UL Certificate	No extra charge.

Para la fabricación de nuestra placa las reglas utilizadas fueron las siguientes:

- Clearance mínimo = 0.15mm
- Trace Width = 0.254mm
- Annular Ring mínimo = 0.15mm
- Hole size Mínimo = 0.25mm
- Hole size máximo = 6mm
- Hole To Hole Clearance = 0.254mm

Costos de fabricación:

Pricing And Build Time

PCB Price	Price Comparison Matrix	
Build Time	Qty	Total
✓ 10-11 days	10	\$ 385.20

Assembly Service Price

Per Piece	Qty	Total
✓ 13.3/pcs	10	\$ 132.83
○ 11.2/pcs	20	\$ 224.35
○ 6.9/pcs	50	\$ 345.59
○ 3.9/pcs	200	\$ 772.32

🗨️ Final price is subject to our review.

Shipping Cost: US \$26.79

🇺🇸 UNITED STATES OF AMERICA ▾

DHL 2-4 business days , wt : 0.613 kg

CHN Time Zone(GMT+8): 2021/11/30 10:24:58

Payment before 2021/11/30 18:00 (GMT+8 Only PCB)

📦 Shipment Date 2021/12/11 AM	📅 Delivery Date 2021/12/14
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PCB Cost: 🟢 US \$ 385.20


Assembly Service Cost: US \$ 132.83

Shipping: US \$ 26.79

Order discount: **US \$ -26.79**

Total: US \$ 518.03

Listado de componentes:

Component list				Bill of Materials for PCB Document [PCB_Stellaris.PcbDoc]				
Source Data From:				PCB_Stellaris.PcbDoc				
Project:				Stellaris.PrjPcb				
Variant:				None				
Report Date:				18:27				
Print Date:				29-Nov-21 8:47:40 PM				
								
#	LibRef	Manufacturer 1	Manufacturer Part Number 1	PartType	Description	Footprint	Column Name Error: PackageReference	Quantity
1	TMK105B7103KV-F			0.01uF	0402 0.01 uF 25 V ±10% X7R Automotive Multilayer Ceramic Capacitor	CAP 0402		7
2	EMK105B7104KV-F			0.1uF	0402 0.1 uF 10 V ±10% X7R Automotive Multilayer Ceramic Capacitor	CAP 0402		10
3	100R07X105KV4T, EMK105B7104KV-F			1.0uF	0402 1 uF 10 V ±10% X7R Automotive Multilayer Ceramic Capacitor	CAP 0402		5
4	C1005C0G1H240J			24pF	0402 24pF 50V, COG, 5%, 0402, Full Reel	CAP 0402		2
5	GRM1555C1H100J201D			10pF	Cap Ceramic 10pF 50V COG 5% SMD 0402 125°C Paper T/R	CAP 0402		4
6	18-038/RSGBHC1-S02/2T			18-038/RSGBHC1-S02/2T	LED Tri-Color Blue/Green/Red 475nm/531nm/631nm Chip LED 4-Pin SMD T/R	18-038/RSGBHC1-S02/2T		1
7	BAS70W-05-7-F			A1/A2	BA570W Series 70 V 70 mA Surface Mount Schottky Barrier Diode - SOT-323	BAS70W-05-7-F		1
8	LTST-C171GKT			GREEN	Green 0805 130° Min 5 mcd Typical 12 mcd Water Clear Lens SMT LED	LTST-C171GKT		1
9	Single Head			Single Head	Connector	CONNECTOR		16
10	961102-6404-AR			961102-6404-AR	Header, PinStrip, Copper Alloy; HighTempThermoplastic; 2Cnts; 2A; Str; 961Series	HEADER 2 PIN		1
11	SSW-110-23-S-D			SSW-110-23-S-D	Tiger Bury Socket Strip With Pcb Tails, 0.100" Pitch RoHS Compliant: Yes	H2-2X10		2
12	ZX62-B-5PA(11)			ZX62-B-5PA(11)	Conn Micro USB 2.0 Type B RCP 5 POS 0.65mm Solder RA SMD 5 Terminal 1 Port T/R	Micro USB 2.0 Type B		2
13	DTC114EET1G			NPN SC70	DTC114EET1G NPN Dgt Transistor; 100mA 50 V 10 kOhm Ratio Of 1; 3-Pin SOT-416	SOT130P220X90-3N		3
14	RC0402FR-07330RL, MCR01MRTF1004, RC0402FR-0710KL			RES	Res Thick Film 0402 330 Ohm 1%, 0.063W(1/16W) ±100ppm/C Rad SMD T/R; Res Thick Film 0402 1M Ohm 1%, 0.063W(1/16W) ±100ppm/C Rad SMD T/R; Res General Purpose Thick Film 0402 10K Ohm 1%, 1/16W ±100ppm/C Molded SMD Paper T/R	RES 0402		16
15	ERJ-3GEY0R00V			RES	ERJ Series 0603 0 Ohm 0.1 W Jumper Surface Mount Thick Film Chip Resistor	RES 0603		13
16	B3S-1000			B3S-1000	Switch Tactile N.O.; SPST Round Button Gull Wing 0.05A 24VDC 500000Cycles 1.57N SMD Bag	B3S-1000		3
17	JS202011SCQN			JS202011SCQN	C&K Components JS202011SCQN / Switch Slide DPDT 6VDC 0.3A SMT	JS202011SCQN		1
18	LMMF120H5QRFG			LMMF120H5QRFG	MCU 32-bit Stellaris ARM Cortex M4F RISC 256KB Flash 1.2V/3.3V 64-Pin LQFP Tray	LMMF120H5QRFG		2
19	TLV803MDBZR			TLV803	5-pin voltage supervisor (reset IC) with active-low and open-drain reset 3-SOT-23-40 to 125	TLV803MDBZR		1
20	TPS73633DRBT			Regulator	LDO Regulator Pos 3.3V 0.4A 8-Pin VSON EP T/R	TPS73633DRBT		1
21	AB26TRB-32.768KHz-T			32.768KHz	Crystal Cylindrical 32.768KHz, 12.5F, 20Ppm, 2 X 6 Formed Lead Smd RoHS Compliant: Yes	AB26TRB-32.768KHz-T		1
22	ABM3-16.000MHz-B2-T			16MHz	Crystal 16MHz ±20ppm (Tol) ±50ppm (Stability) 18pF FUND 40Ohm 2-Pin Mini-CSPM T/R	ABM3-16.000MHz-B2-T		2
Approved				Notes				
				95				

Costo final de Fabricación:

Suponiendo que se manden a hacer 10 placas e incluyendo el precio por ensamblaje y el envío el precio final sería de: \$518.03.

Sin embargo, si únicamente se desea realizar una placa sin pedir los servicios de envío y ensamblado, el precio unitario de esta placa sería de: \$38.52

Bibliografía:

- <https://www.pcbway.com/orderonline.aspx>
- https://www.pcbway.com/pcb_prototype/PCB_Manufacturing_tolerances.html

Otras empresas de fabricantes visitadas:

- <https://web.whatsapp.com/>
- <https://www.zxhpcb.com/>