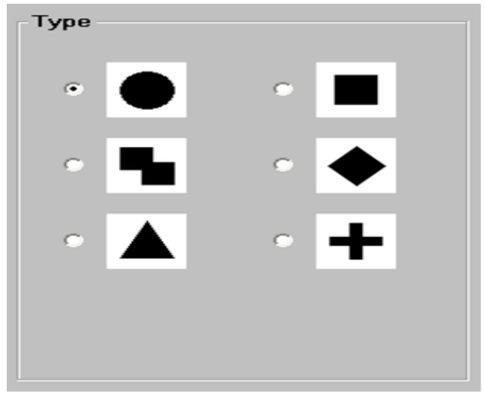
HFA
electrónica e telecomunicações

Production support documentation

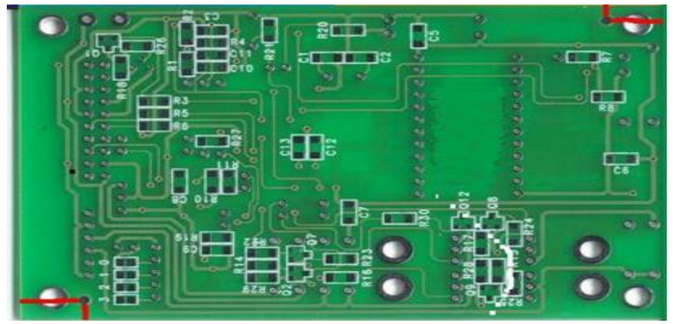
Pick & Place Programming (P&P)

- Component position on the PCB layout (C1, C2, R234)
- X & Y Coordenates , from the center of the component of the printed circuit board
- Components rotation on the board
- Designation and physical case of the components
- Point of origin tracking of the board`s coordenates
- Information on the measurement unit of x and y coordenates and whether they are in “mirror”
- Component information that are not assembled
- Files can be in xls, TXT format

- Fidutial between 0.5mm a 5.0mm, tinned, with the following formats:



- Fidutial should not be equidistant in x, y to the board`s edge.



- Printing with component`s reference on the board or on a document.
- PCB minimun thickness 0.5mm; maximum 4.0mm
- No placing of componentes on PCB`s edges . If so, we need a 0.5mm frame.
- Printed circuit boards should be at minimum 80mm*50mm (but for small boards it`s advisable to be in matrix)
- Maximum 460mm*460mm.

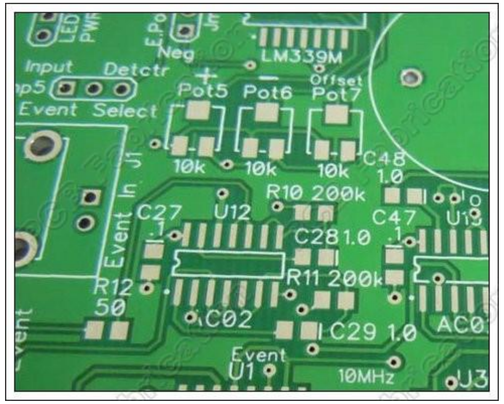
An exemple on how the files should appear

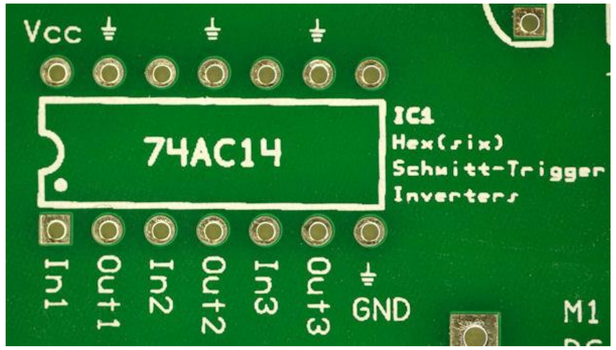
#< Xpos >	< Ypos >	< Ang >	< Ref >	< Value >
5.080,	69. 215,	180.00 ,	C1,	100NF_0805
3.492,	156.527,	0.00 ,	C6 ,	1NF_1206
3.492,	162.560,	180.00 ,	C7 ,	1UF_16V _size A
10. 160,	142.240,	270.00 ,	C10,	39PF_0805

Silkscreen

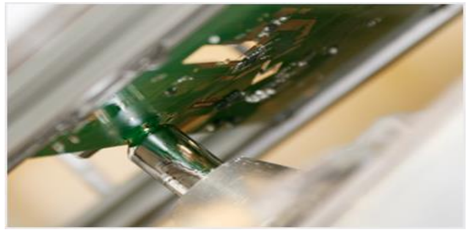
Silkscreen is a layer of ink traces used to identify components, test points, parts of the **PCB**, warning symbols, logos and marks etc. ...

A detailed **PCB silkscreen** is mandatory in order to locate and identify all the components position on the PCB.

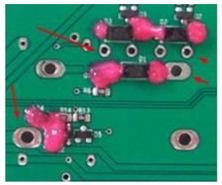




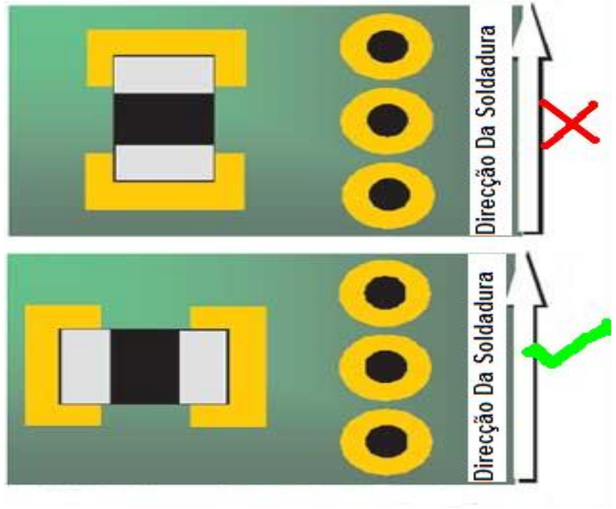
Selective Soldering



- it should have an aproximate 5mm distance area between the pin to be welded and SMD nearest components. If not, we will have a cost for protecting SMT components

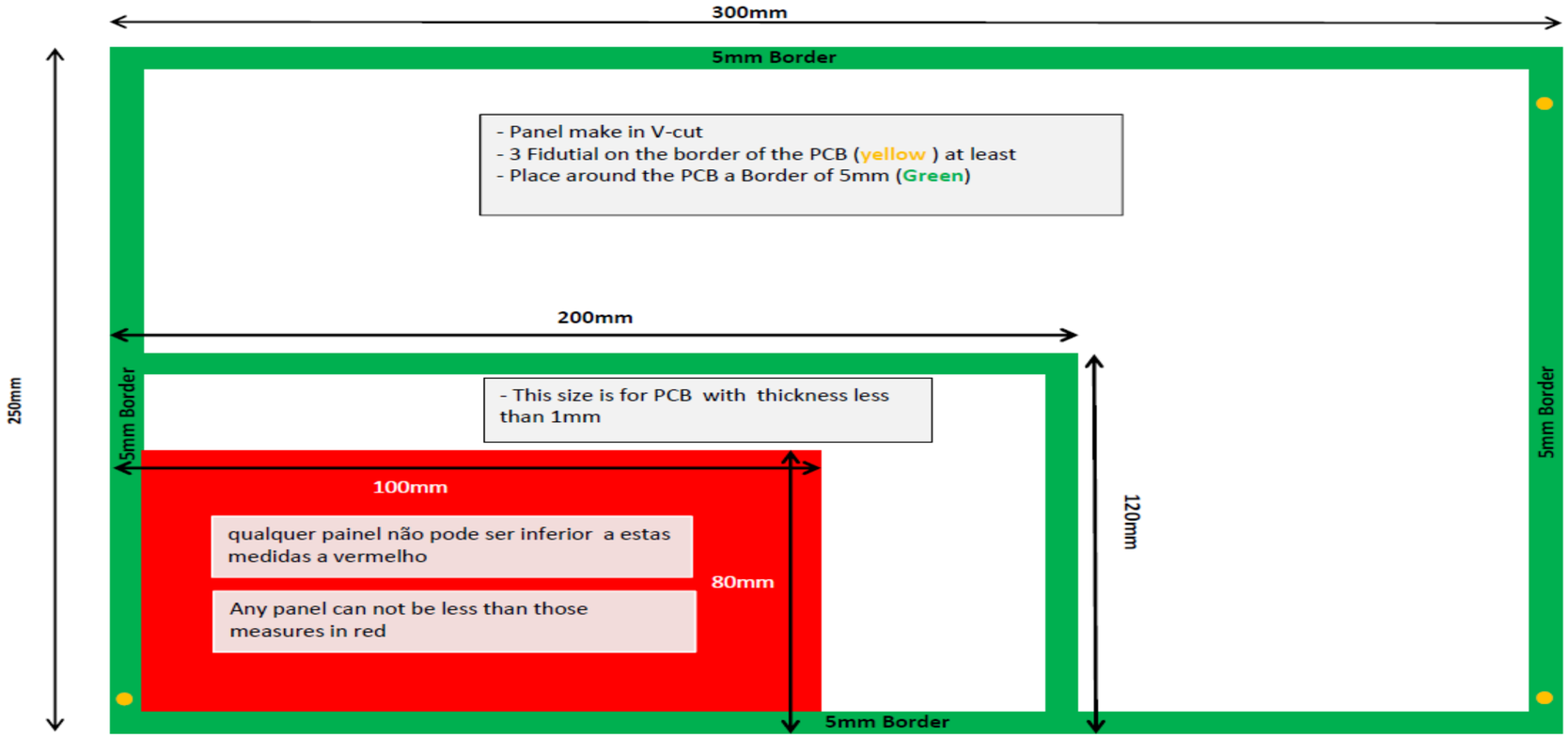


- When ther is no distance alternative we should consider at least the following situation:



This way we also prevent the SMD`s soldering to be affected and / or the component removed by selective soldering.

Standard for PCB panel



Stencil information / Types

LOW COST

Is used to print solder paste in prototypes or small qty of PCB.
Material stainless steel PHD (High Density)
Thickness: 130 y 150µm
Available sizes: 200 x 280 y 400 x 280 mm
Manufacturing system: laser cut
Accuracy: ± 4µm

In first order pin-registration

LASER-CUT INOX

Is recommended when PCB has no fine pitch and not components 0201 or smaller.
Material stainless steel PHD (High Density)
Thickness: 100, 110, 120, 130, 150, 160, 180, 200 y 250 µm
Manufacturing system: laser cut
Accuracy: ± 4µm

ELECTROFORMING

Is recommended when PCBs has fine pitch (0.65 mm or less), components 0201 or smaller, and the qty of PCBs higher 1000 pcs.
Material Nickel 100%
Thickness: All thickness are available
Manufacturing system: : electro depostion
Accuracy: ± 2µm

LASER-CUT NIQUEL

Is recommended when PCB has fine pitch (0.65 mm or less), components 0201 or smaller.
Material Nickel 100%
Thickness: 100, 125 y 150µm
Manufacturing system: Laser cut
Accuracy: ± 4µm

Stencil information / Types

ADDITIVE

Is used to print 2 or more different thickness of solder paste with the same stencil.
Nickel is added in selected zones where want increase the thickness of solder paste.
Material Stainless steel PHD (High Density) and Nickel
Thickness Stainless steel: 100, 110, 120, 130, 150, 180, 200 and 250 µm
Thickness Nickel: 100, 125 and 150µm
Manufacturing system: electro depostion + laser cut
Accuracy: ± 4µm
electro depostion accuracy: ± 4µm

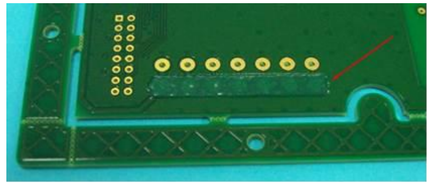
STEP-STENCIL

This type of stencils are used in two cases. First one is to print 2 or more different thickness of solder paste with the same stencil. Second one is used when we have a PCB with pelable ink, silver link, silver contact, etc.
Material Stainless steel PHD (High Density) and Nickel
Thickness Stainless steel: 100, 110, 120, 130, 150, 180, 200 and 250 µm
Thickness Nickel: 100, 125 and 150µm
Manufacturing system: Chemical etch + Laser cut
Accuracy: ± 4µm
Accuracy chemical etch: ± 5µm

Some tips…

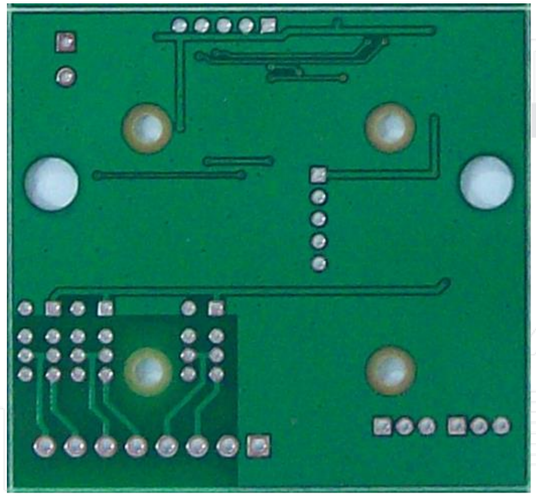
- Placing the SMD components only in one side saves money, time and one stencil;

- Heavy components should be on the TOP side of the board, not on the BOT
- Peelabel on the test points and vias to protect them during the wave soldering process



- Vias must be protected with solder mask to avoid shortcuts

- Fixation points always without coper



Some tips…

- To avoid damaged caused by the vibration of the cut, ultrasound and mechanical efforts distance from board edges, screw holes and connectors (Ensure an appropriate distance, for example, 10 mm or more.)

You can find more information of the following links:
https://www.murata.com/en-sg/products/emiconfun/capacitor/2012/08/28/en-20120828-p1

https://www.murata.com/en-sg/products/emiconfun/capacitor/2012/08/28/en-20120828-p2

https://www.murata.com/en-sg/products/emiconfun/capacitor/2012/08/28/en-20120828-p3

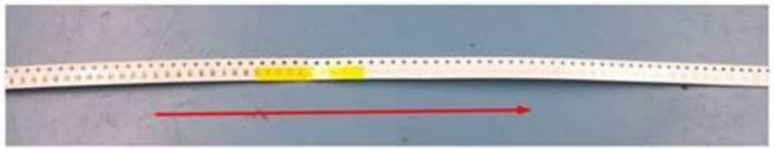
http://www.dfrsolutions.com/hubfs/Webinar%20Slides%20for%20YouTube/Avoiding-Pad-Cratering-and-Cracked-Capacitor-Webinar.pdf

Some tips…

RE-Reeling(cut tape, bobine without 15 to 20cm of tape without components)	
Qtd	Cost
Until 2 RE-Reeling	**0 €**
More than 3 RE-Reeling	**2.5€** for reeling

MP prima recebida em tiras ou em bobine mas com fita cortada rente:

HFA - Prepara MP com emenda da fita = 30Cm



Preparação da MP:

Emenda:

Bill Of Materials

Requirements:

Important items for building a Bill of Materials:	Reason:
If possible only one list in **EXCELL Format** **(Avoid PDF, TXT, other)**	Organization and easy management. Prevents errors, when consulting only one list. Example that generates delays: a list with total quantities and a second list with references (C1,C2,C3… one on each line); **We have to place everything together in only one list of material.**
List should contain name of project + version+ date+ alterations history	Organization and easy management
Should contain the **quantity** and the **total reference** of same part number on the same line.	If list has each reference (C1, C2,C3…) in each line, it gets too extensive. In HFA we have to pair the references to matching part numbers and place them in a cell (**can generate mistakes**) A lot of time used in optimizing the Bill of Materials
Should contain the **case/pitch** of the component	Advantage/expediting in procurement, prevents propositions with cases/pitches too big/too small. **Missing the case/pitch, we are forced to go the Gerber and measure (slowing the process).**
Should contain **Part number and Manufacturer** or **Description + features to fulfill**	It their is no part number, HFA follows specified features in the Bill of materials. If part number or description + features are missing, it can lead to
For **Application projects: Automotive, Military, Medical**,... Must pay attention to correct part number for the Application **(HFA only follows the part number/ features that are in the Bill of Materials)**	It their is not a correct part number fot the Application, we assume that the requirement is not necessary (it is not available in the market).
Material supplied by customer should have an internal code associated to the component or specific manufacturer part number.	Advantage in procurement, getting more competitive prices, in case of stock rupture, we have a solution. Prevents delays in material reception: whenever the received part number turns out to be different than the bill of materials used, we need to question the customer. Delays the entry of components in our warehouse. If client had them in the alternative´s list we wouldn´t need to question any more.
Should contain (if existent) assembly notes.	Important for production, in case their are special annotations.
Material supplied by customer should have an internal code associated to the component or specific manufacturer part number.	E.g.: 100nF 0603 X7R - has many part numbers and manufacturers. In HFA, a HFA code is assigned to each item, with the same features/ part numbers. When ever customer sends a different part number than the one before we create an HFA code, and may already have that item in stock, but with another description. If customer assigns it´s own internal code to the components, it prevents code replication in the equivalent/ alternative and needless email communication over the material
When choosing SMD part numbers, **Package Reels** part numbers should be preferred. **(For SMD components** avoid **Packaging: Tube/Bulk)**	SMD material for production should always arrive (if possible) in REEL = less mistakes, fewer losses, and faster assembly.

Bill Of Materials

Example:

Bill Materials xxxxxxxA Rev1.5 23-06-2016

Qty.	Designator/REF.	Description/Descrição	Package/Case	Partnumber ou Caracteristicas	Manuf./Fabricante	Alternative/ Alternativa	Note/notas	Se MP é do cliente =Código cliente ex:
1	B500	Lithium-Battery CR1/2AASLF 3V/950mAh	D15mm x 25mm	6127 201 301	Varta		e. g. Farnell: 463-310	
3	D10, D11, D12	TVS	SMA	SMAJ30CA-TR	ST MICROELECTRONICS		Não trocar por alternativo	I03458
1	D9	Schottky diodes	SOT23	BAT54S-7-F	Diodes Inc	BAT54S,215 NXP		I02644
4	C203, C204, C254, C256	330uF/50V/ZL	Radial RM5 D10x23	50ZL330M10X23	RUBYCON			
5	C213, C234, C705, C1007, C1010	Ceramic Capacitor	805	100pF 100V NP0 5%				
6	C200, C208, C233, C239, C244, C251	Ceramic Capacitor	603	10nF 50V X7R 10%				
5	C308, C403, C710, C905, C915	Ceramic Capacitor	603	10pF 100V NP0 5%				
2	IC601, IC602	1Gbit LPDDR-SDRAM hynix 1.8V 16Mx16 4banks 166MHz	BGA-60	H5MS1G62AFR-J3M	Hynix/ Memphis	H5MS1G62AFR-E3M		
1	IC202	Synchronous triple output Buck-Boost Controller	QFN-38	LTC3859IUHF#TRPBF	Linear Technology		Solder paste stencil design requires careful attention!	
0	IC1	IC	TSSOP14	LSF0204PW	Texas		Não assemblar	009-02-00795
10	IC2, IC3, IC4, IC5, IC6, IC7, IC8, IC9, IC10, IC15	IC	SOT23-5	LTC2054IS5#PBF	Linear			009-02-00798
1	IC12	IC	UDFN8	AT45DB161E-MHD-Y	Adesto			009-02-00799
5	R212, R410, R723, R912, R934	Resistor Thick film	603	12k 1% 100mW				
1	R221	Resistor Thick film	603	147k 1% 100mW				
4	R217, R223, R232, R303	Resistor Thick film	603	15k 1% 100mW				
0	R1	Resistor Thick Film	603	10K 1% 0.063W			Não assemblar	Y9003008
3	R6,R8,R9	Resistor Thick Film	603	1M5 1% 0.063W				Y9003064
1	R12	Resistor Thick Film	603	220R 1% 0.063W				Y9003044
1	PCB	PCB xxxxxx V1.0 - 2Layers FR4 1.6mm 35u Soldermask Blue 59.69x55.25mm						

History/Histórico:

Revision/ Revisão	Date/Data	Change	Designator/REF.	Partnumber ou Caracteristicas
Rev1.0	**20/06/2015**	**first creation/Bom inicial**		
Rev1.1	**26/05/2015**	**removed/Removido**	R1	10K 1% 0.063W
Rev1.2	**30/08/2015**	**removed/Removido**	IC1	LSF0204PW
Rev1.3	**22/01/2016**	**added/Adicionado**	R12	220R 1% 0.063W
Rev1.4	**01/03/2016**	**added/Adicionado**	IC202	LTC3859IUHF#TRPBF
Rev1.5	**22/03/2016**	**changed/Alterado**	D9	BAT54S-7-F

PCB Laser marking

DMC

PCB´s should have at least 6x6mm available
The space for marking should be free of:
* Pin test
* Holes
* Silkscreen
* Tracks

Marking COD128:

PCB´s should have at least 28x10mm available
The space for marking should be free of:
* Pin test
* Holes
* Silkscreen
* Tracks

Remarks:

- It is the Client`s responsability to send the Specific Requirements, otherwise HFA will not be liable for it`s enforcement.
- Component`s assembly is performed in compliance with the lists provided;
- If their is not specific requirement the packaging of the boards will be done in colective boxes, with ESD transportation bags;

- If client supplies components, these should be supplied in Pick & Place assembly suited containers (tape, reel, etc) and ensure a 15 to 20cm margin of extra componentes needed for production (only valid for SMD components).

Fale Connosco

Keep in touch

Ligue-nos / Call us

(+351) 234 612 680

(+351) 234 612 689

Escreva-nos / Write us

geral@hfa.pt

Visite-nos / Visit us

Estrada da Zona Industrial Nº 337, Oronhe

3750-404 Espinhel, Águeda

Portugal

ATEX - DIRECTIVA 94/9/CE

PME excelência 14

PME líder