# New Design Series

PROFESSIONAL CONFIDENTIALITY

FerroTec | FLH

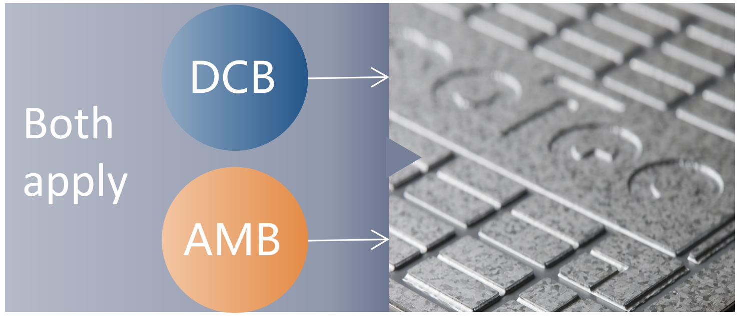
# PRODUCT INFORMATION

富乐华集团

[Ferrotec ● 荣誉出品]

# NEW DESIGN SERIES

FerroTec | FLH



Both apply

DCB

AMB

## 1 Design Properties

- ✓ Available for DCB and AMB Technology
- ✓ Available Cu thickness 0.25mm,0.3mm,0.4mm,0.5mm, 0.8mm
- ✓ Available material $Al_2O_3$,ZTA,AIN,Si3N4 thickness acc. to DCB & AMB design rules

### Direct Copper Bonding

| | 0.25mm | 0.30mm | 0.40mm |
|---|---|---|---|
| 0.25mm | HP<br>AIN<br>ZTA | ZTA | / |
| 0.32mm | HP<br>ZTA | HP<br>ZTA | ZTA |
| 0.38mm | ST<br>HP<br>AIN | ST<br>HP<br>AIN | / |
| 0.50mm | ST<br>AIN | ST<br>AIN | ST<br>AIN |
| 0.63mm | ST<br>AIN | ST<br>AIN | ST<br>AIN |
| 0.76mm | ST | ST | ST |
| 0.89mm | ST | ST | ST |
| 1.00mm | ST | ST | ST |

### Active Metal Brazing

| | 0.25mm | 0.30mm | 0.40mm | 0.50mm | 0.80mm |
|---|---|---|---|---|---|
| 0.25mm | Si3N4<br>AIN | Si3N4 | Si3N4 | Si3N4 | Si3N4 |
| 0.32mm | Si3N4 | Si3N4 | Si3N4 | Si3N4 | Si3N4 |
| 0.38mm | AIN | AIN | / | / | / |
| 0.63mm | AIN | AIN | AIN | AIN | / |
| 1.00mm | AIN | AIN | AIN | AIN | AIN |

DCB Material：
ST： $Al2O_3$-ST
HP： $Al2O_3$-HP
ALN： AIN Aluminium Nitride
ZTA： ZTA Alumina 9% ZrO2 Doped

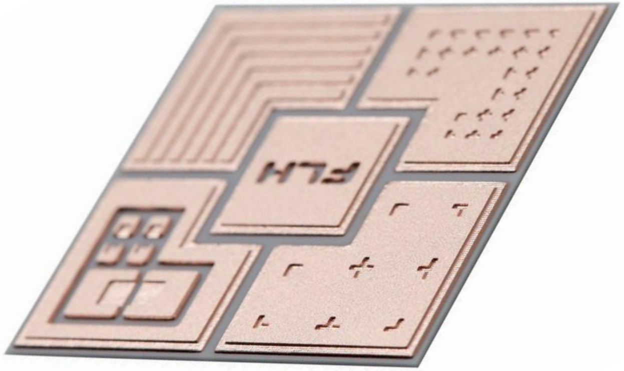
AMB Material：
ALN： AIN Aluminium Nitride
$Si_3N_4$： Si3N4 Silicon Nitride

🟩 COPPER THICKNESS

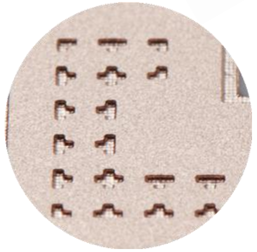
🟦 CERAMIC THICKNESS

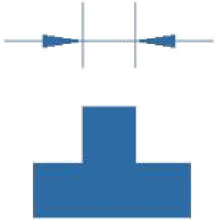
# WHAT CAN WE DO BY USING THE NEW DESIGN?

- Someway that we don't want the SMOBC (Solder mask over bare copper)



- Proposed Design Width from 0.3mm – 2mm (For bigger width on request)

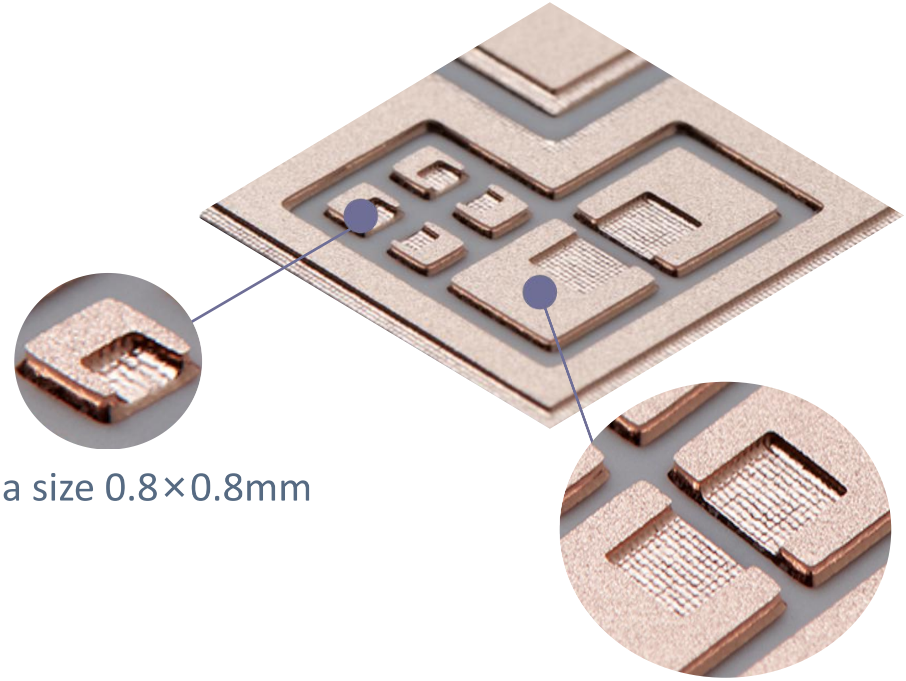



Proposed width 0.3-2.0mm

- Someway we want the parts to be fixed inside.

**Design Customized**

- Current design based on 0.3mm copper


Area size 0.8×0.8mm

Area size 2.0×1.8mm

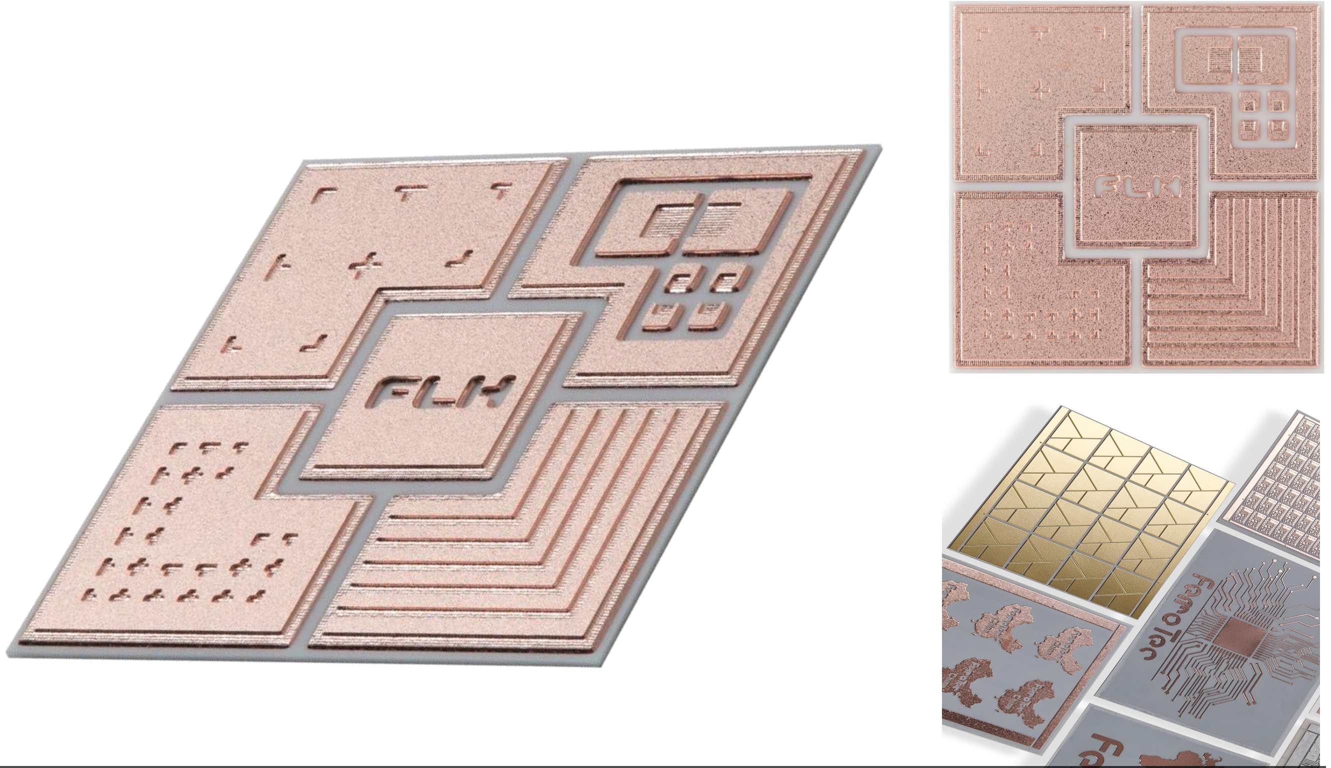
# WHAT CAN WE DO BY USING THE NEW DESIGN?

## PATTERNS OF DIFFERENT HEIGHTS

Someway that we want different altitude copper pattern at one side.

**Design Customized**

Current design based on 0.3mm copper， For different pattern design on request.



## APPLICABLE OCCASION

- Add ladder shaped design to the copper edge would increase the reliability effectively.
- Suitable for both DCB and AMB technology

## SPECIFICATION REFERENCE

1. Available Cu thickness 0.25mm,0.3mm,0.4mm,0.5mm,0.8mm
2. Available material $Al_2O_3$,ZTA,AIN,$Si_3N_4$ thickness acc. to DCB & AMB design rules

# RELIABILITY

## Cycling Condition

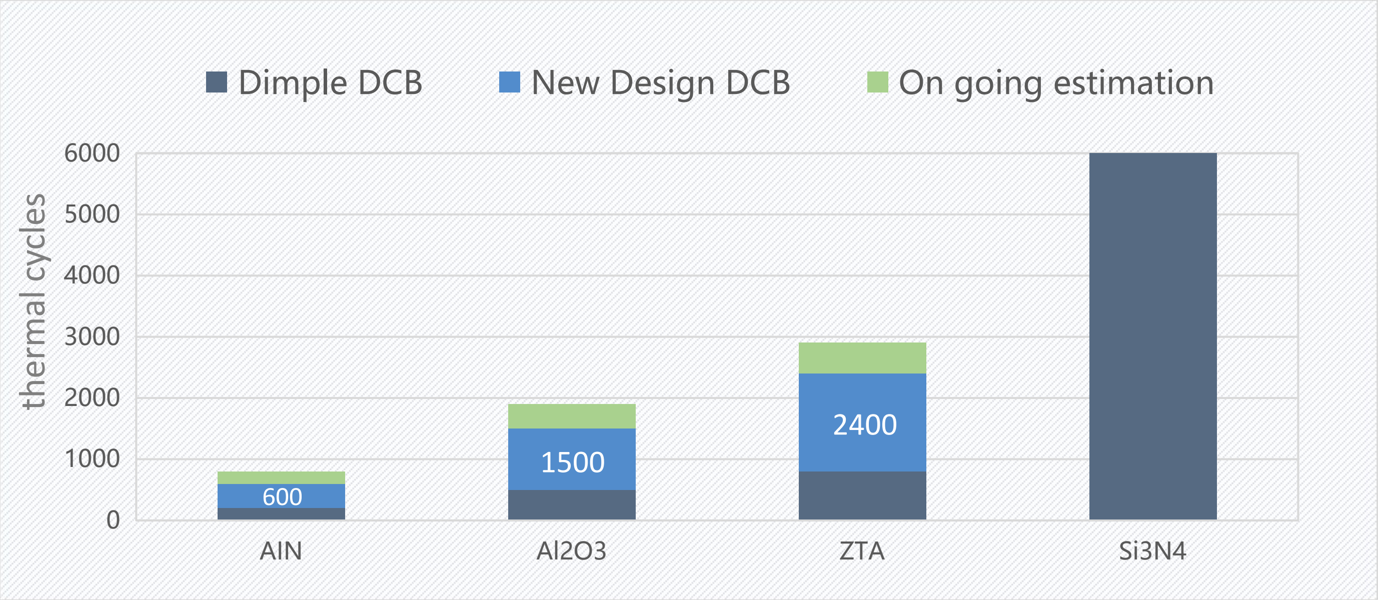
- -55℃ to 150 ℃
- 15min at each chamber , transfer time<30s

## Reference Layout

- FLH internal test layout
- 0.3mm copper top & bottom
- With ceramic of 0.32mm ZTA / $Si_3N_4$ 、0.38mm $Al_2O_3$ and 0.635mm AIN

## Partial test data

Note : Tests are based on FLH internal test layout； Different pattern layout may influence the result



With the ladder copper edge design shows an excellent performance advantage on lifetime test， Current lifetime shows close to 3 times better than with dimples, cycling test are still on going.

# THANKS FOR WATCHING!

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@ FLH reserves all right of interpretation.