DECchip™ 21064 Microprocessor

Heat Sink Assembly Instructions

Heat Sink Assembly Process Description

Tools Required:

Vacuum pick-up tool
Manual nut/torque driver
    Available from Contact East
    Contact - Paul Shae (508) 682-2000
        Parts: TS30 torque driver
            1/4" hex bit
            3/8" socket with 1/4" hex drive
Nut placement tool (optional)
    Available from Advanced Torque Systems
    Contact - Warner Neibel (603) 472-2431
        Parts: T-1E10 1/4" drive 5/16" hex socket
            EX-250 1/4" drive hex 3" long

It is recommended that the heat sink be installed after the package has been assembled to the PWB. The process steps are as follows:

1. Attach a part label to the heatsink if desired. The user may want to transfer date codes or record other markings from the package so it can be viewed on the fully assembled module.
2. Place module on a holder.
3. Place Grafoil onto the package slug (using vacuum pick-up tool).
4. Place Heatsink on top of package slug.
5. Place aluminum nuts on the threaded posts using a nut placement tool.
6. Tighten nuts to the specified torque level of 15 inch-pounds (+/- 2 in-lbs) using a manual nut/torque driver.

Material Description

Grafoil - Flexible Grafite Foil Preform

- The Grafoil sheet is used to improve the thermal conductivity between the package and heat sink by replacing micro-air pockets with a less insulative material.
- During the heat sink assembly process, a Grafoil sheet is placed on the slug of the ceramic package.

Heatsink

- The heat sink material is 6061 aluminum T-6 and the heatsink finish requirement is clear anodization, hot water sealed, per MIL-A-8625C, Type II, Class I.

Nuts

- The nut material is 2011 T3 aluminum (this grade is critical). The nut style is hex machine screw, double-chambered, double-countersunk per ANSI B18.6.3. The thread size is 10-32, Class 2B.

Detailed Assembly Process Steps

Heat Sink Labeling:

- No specific labeling is recommended. Labeling before assembly of the heat sink to the package is recommended. The user may want to transfer date codes or record other markings from the package so it can be viewed on the fully assembled module.

Module Set-up:

- It is recommended that a fixture be used to hold the module in place during heat sink assembly to the package.

Grafoil Pick and Place:

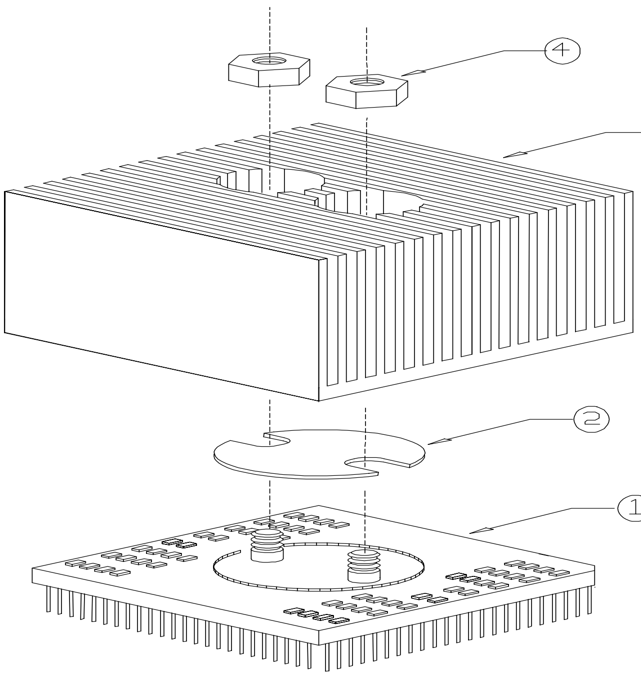
- Perform a visual inspection of the package slug to ensure it is free of contamination.
- Pick up the Grafoil at the center using a vacuum pick-up tool. (**Do not do this by hand.**)
- Place the Grafoil on the gold plated slug surface and align with the threaded studs.

Heat Sink Attachment:

- Align the heat sink holes to threaded studs on the ceramic package.
- Place the heat sink by lowering it onto the component (handle by the edges).
- Insert a nut into the placement tool and place on stud until the nut separates from the tool.
- Set calibrated torque driver to 15 in-lbs (+/- 2 in-lbs) (metric: 1.7 Newton-meters, +/- 0.2 N-m) and tighten.

Heat Sink Removal/Replacement

- If removal/replacement of the heat sink becomes necessary, remove Grafoil completely, clean slug and heat sink surface with Isopropyl alcohol, and replace with new Grafoil and nuts.



KEY:
1 = DECchip 21064
2 = Grafoil
3 = Heat Sink
4 = Aluminum Nuts

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Heatsink Performance

Heatsink dimensions: 2.69" x 2.69" x 1.35" h. (68.3 mm x 68.3mm x 34.2 mm h.)
Below is provided a reference of heat sink performance and maximum allowable ambient temperature. If you need to calculate maximum ambient temperature at other frequencies, please use the following formula:

$$T_a = 85 - [23 / (150 * f * \theta ja)]$$

where f is measured in MHz.

Air Velocity	THETA Junction-Ambient θja (max)	Maximum T_a (measured at package) @ 23W
50 lfpm	3.25 Deg C/Watt	10.0^{o}C
100 lfpm	2.50 Deg C/Watt	27.5^{o}C
200 lfpm	2.30 Deg C/Watt	32.0^{o}C
300 lfpm	2.00 Deg C/Watt	39.0^{o}C
400 lfpm	1.90 Deg C/Watt	41.0 ^{o}C
500 lfpm	1.80 Deg C/Watt	43.5 ^{o}C
600 lfpm	1.75 Deg C/Watt	44.5 ^{o}C
700 lfpm	1.70 Deg C/Watt	46.0 ^{o}C
800 lfpm	1.68 Deg C/Watt	46.5 ^{o}C
1000 lfpm	1.66 Deg C/Watt	47.0 ^{o}C

For more information about Alpha and the heat sinks contact our Hotline:
1-800-DEC-2717
1-800-DEC-2515 (Telecommunications Device for the Deaf --TDD)
1-508-568-6868 (local number)
1-508-568-6447 (FAX)

For more information on how to order Alpha, contact one of Digital's Sales Representatives. Call your local Digital sales office for details.

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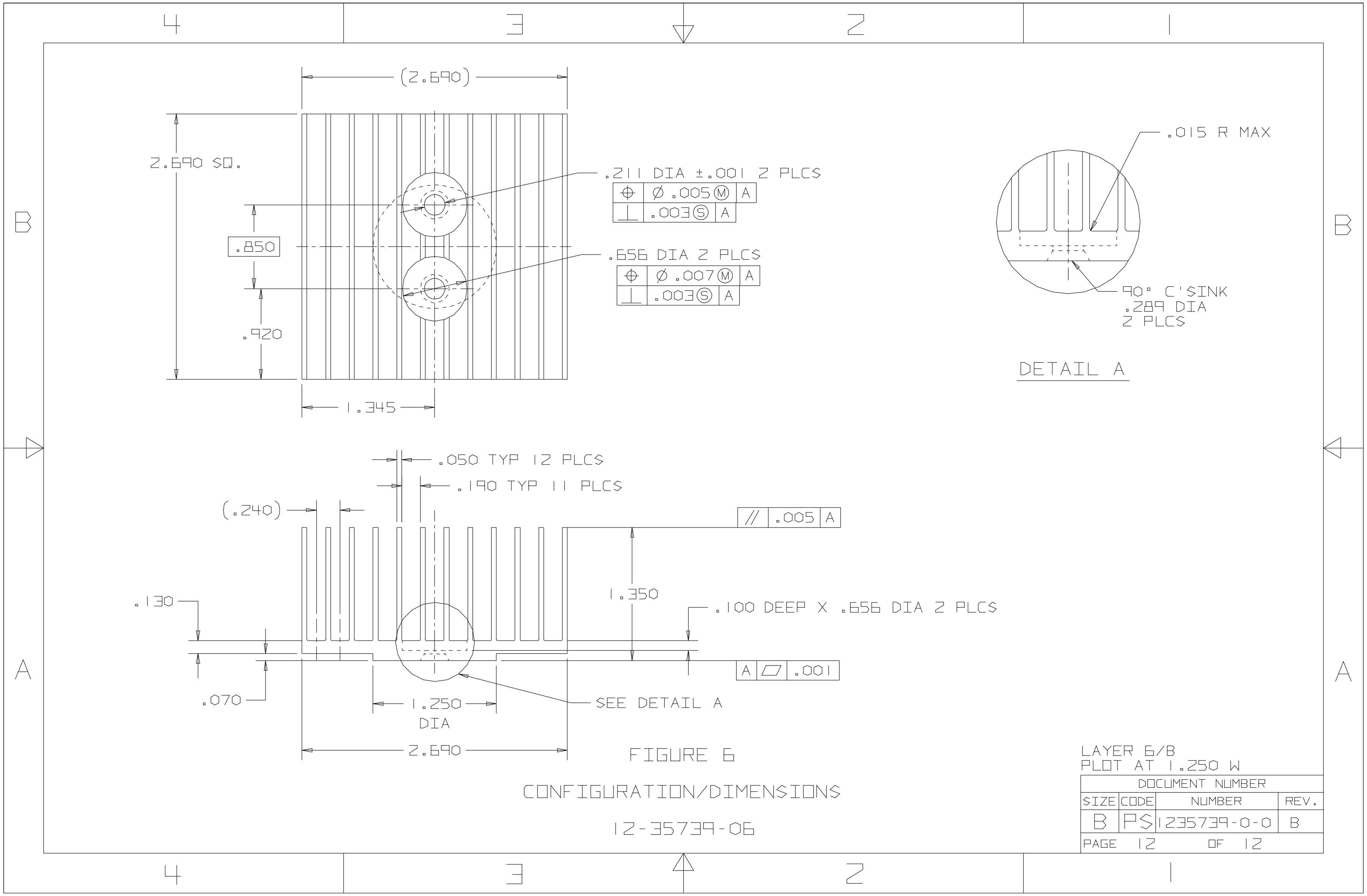

FIGURE 6

CONFIGURATION/DIMENSIONS

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