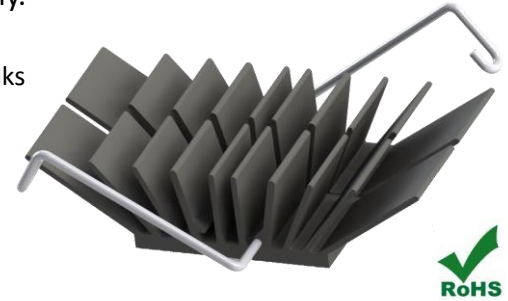


The Wakefield-Vette Wave Series Heat Sink Series are a superior choice for cooling BGA applications in which limited height/footprint while achieving maximum surface area. The Wave Series Heat Sinks include a unique clipping mechanism that allows for superior heat transfer while securing the heat sink to the BGA itself. The clipping mechanism allows for easy installation in high production assembly.

Features & Benefits

- Approximately 12% better thermal performance than traditional footprint heat sinks
- Height- A low profile design allows for more surface area in a height restricted application
- Clipping mechanism included with heat sink
- Surface Area- Fin array allows for more surface area for forced convection
- Easily customizable
- Easily compatible with major BGA device manufacturers components such as: Broadcom, Motorola, Freescale, TI, Intel, etc.



Material Specifications

- **Heat Sink:** Aluminum Alloy 6063-T5 with black anodized finish.
- **Spring Clip:** 304 Stainless Steel, 1.2mm [0.47"] DIA
- **RoHS Compliant**



| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-23-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 23 | 23 | 40 | 12.5 | 6055.1 | 10.5 | 6.76 |
| WAVE-23-165 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 23 | 23 | 46.5 | 16.5 | 7634.6 | 14.5 | 5.08 |
| WAVE-26-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 26 | 26 | 52.9 | 12 | 8305.2 | 10 | 5.21 |
| WAVE-29-127 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 29 | 29 | 61.4 | 12.7 | 11810.5 | 10.7 | 4.08 |
| WAVE-32-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 32 | 32 | 50.2 | 12 | 10957.5 | 10 | 4.64 |
| WAVE-34-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 34 | 34 | 70 | 21 | 21268.4 | 19 | 2.19 |
| WAVE-35-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 62 | 12 | 15180.8 | 10 | 3.83 |
| WAVE-35-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 63.3 | 12.5 | 15792.6 | 10.5 | 3.63 |
| WAVE-35-15 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 58.1 | 15 | 15612.7 | 13 | 3.15 |
| WAVE-35-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 74.6 | 21 | 21721.8 | 19 | 2.11 |
| WAVE-366-175 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 36.6 | 36.6 | 63.6 | 17.5 | 18637.8 | 15.5 | 2.55 |
| WAVE-40-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 66.9 | 12 | 17689.4 | 10 | 3.36 |
| WAVE-40-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 68.3 | 12.5 | 18410.1 | 10.5 | 3.16 |
| WAVE-425-117 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 42.5 | 42.5 | 67.4 | 11.7 | 21668.3 | 9.3 | 3.40 |
| WAVE-45-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 45 | 45 | 72 | 12 | 22303.7 | 10 | 2.96 |

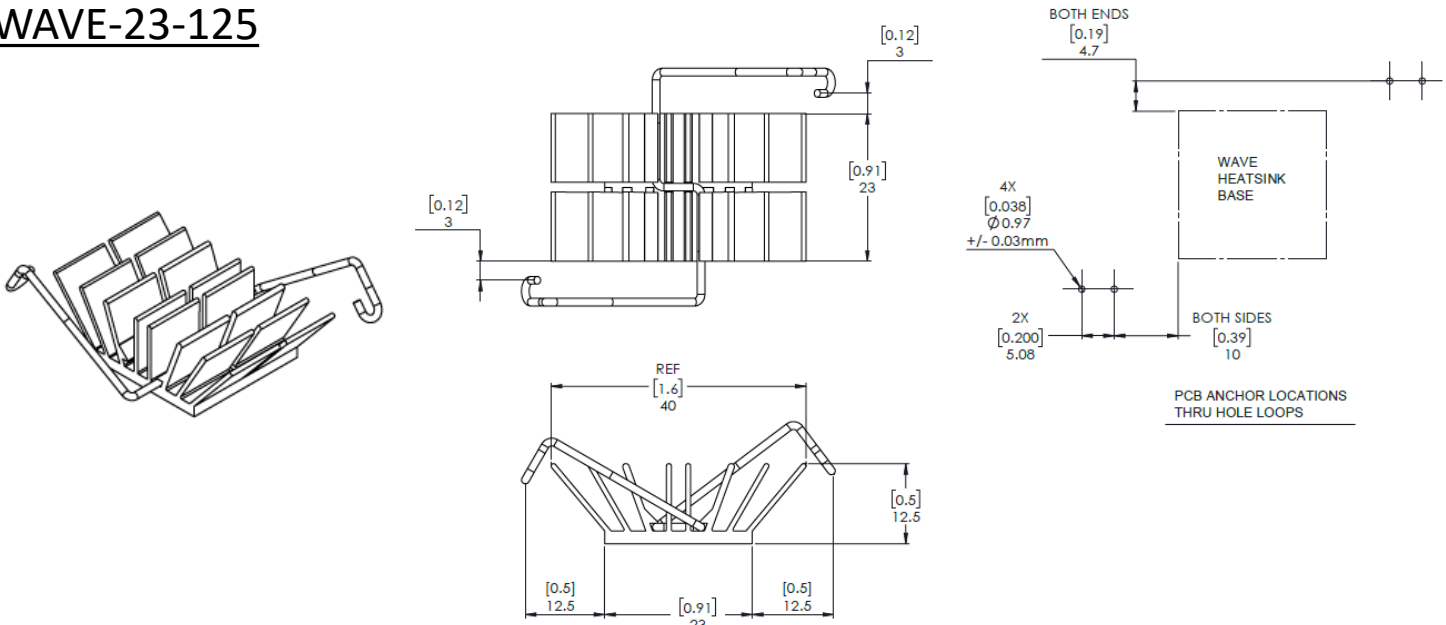


- WAVE-ANC1 ANCHOR, PCB, 10MM TALL
- WAVE-ANC2 ASSEMBLY , SOLDER ANCHOR

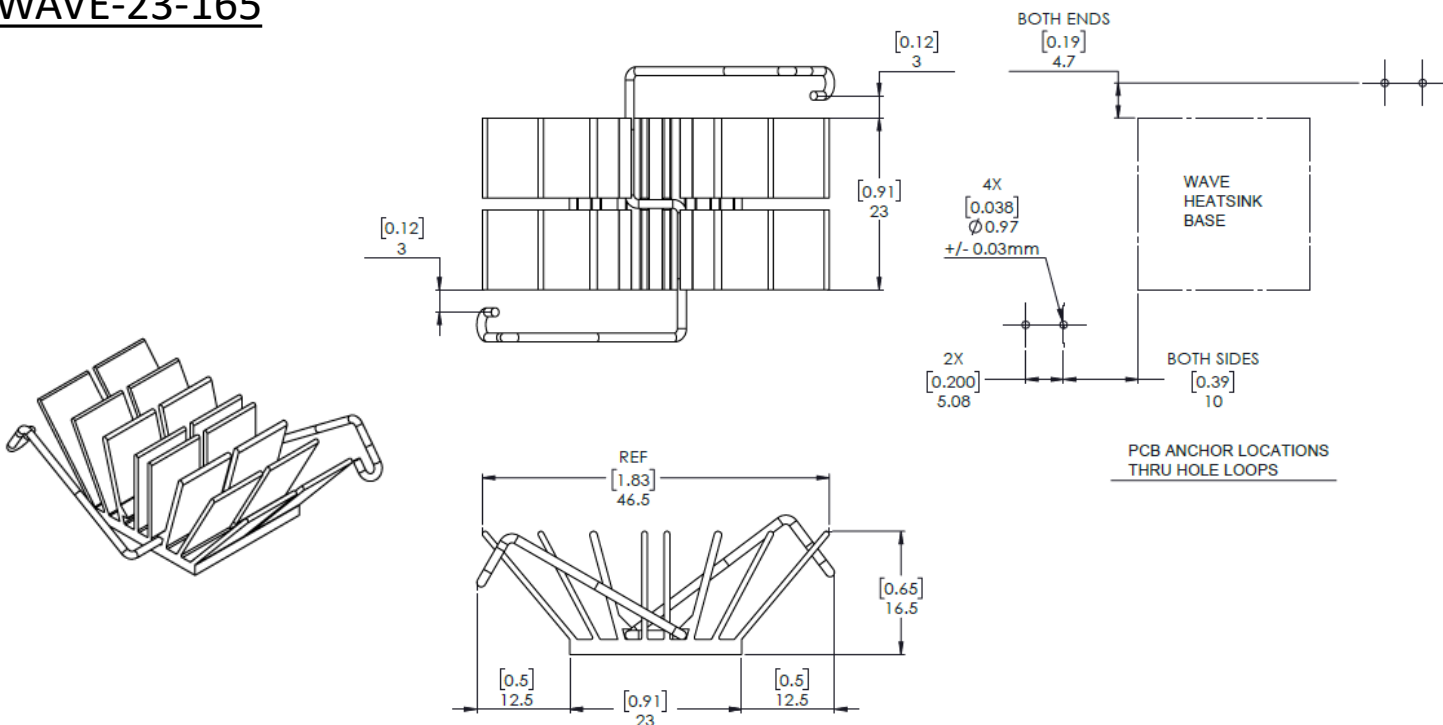
Wave 2x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-23-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 23 | 23 | 40 | 12.5 | 6055.1 | 10.5 | 6.76 |
| WAVE-23-165 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 23 | 23 | 46.5 | 16.5 | 7634.6 | 14.5 | 5.08 |
| WAVE-26-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 26 | 26 | 52.9 | 12 | 8305.2 | 10 | 5.21 |
| WAVE-29-127 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 29 | 29 | 61.4 | 12.7 | 11810.5 | 10.7 | 4.08 |

WAVE-23-125



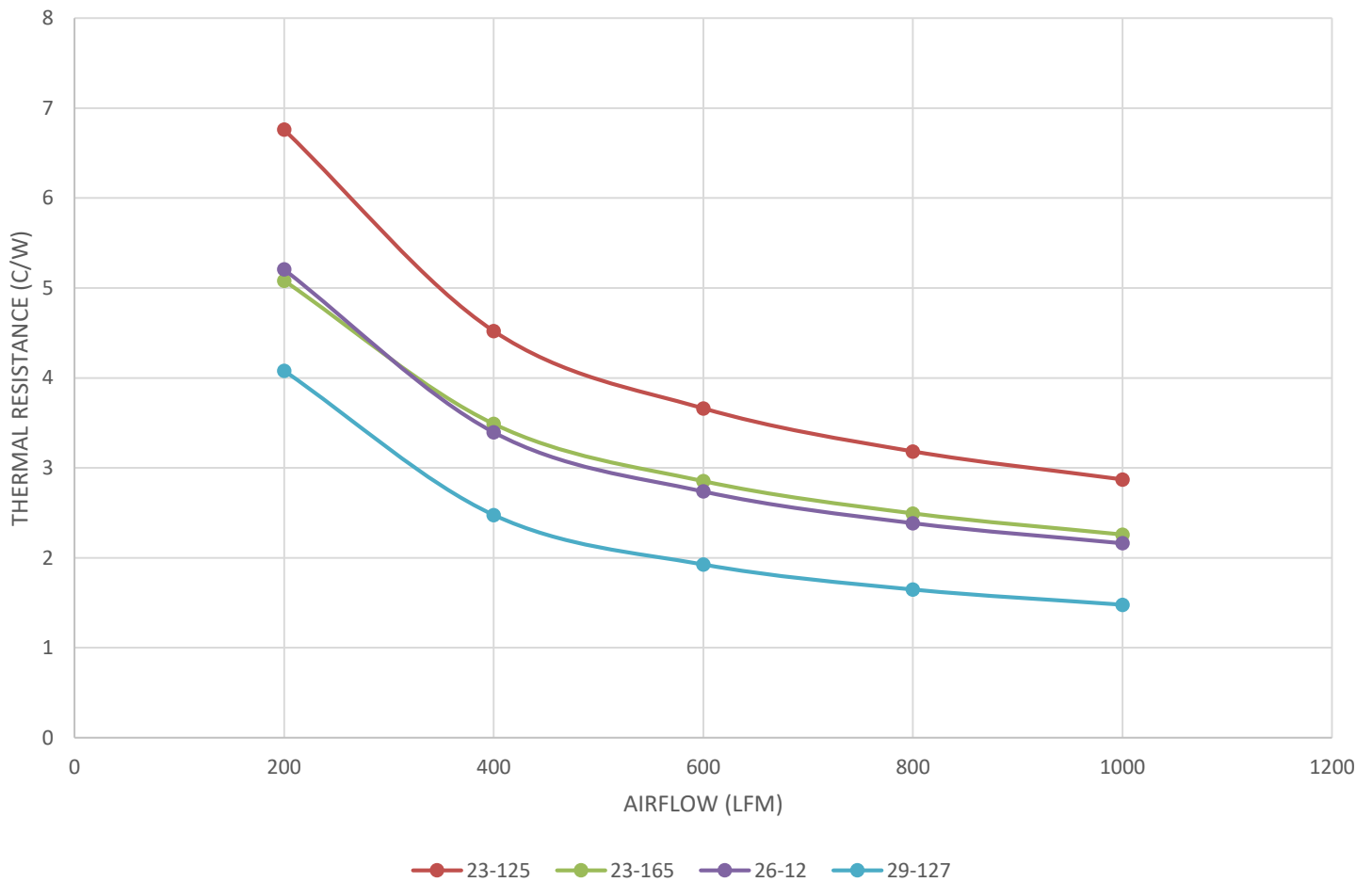
WAVE-23-165



Wave 2x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-23-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 23 | 23 | 40 | 12.5 | 6055.1 | 10.5 | 6.76 |
| WAVE-23-165 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 23 | 23 | 46.5 | 16.5 | 7634.6 | 14.5 | 5.08 |
| WAVE-26-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 26 | 26 | 52.9 | 12 | 8305.2 | 10 | 5.21 |
| WAVE-29-127 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 29 | 29 | 61.4 | 12.7 | 11810.5 | 10.7 | 4.08 |

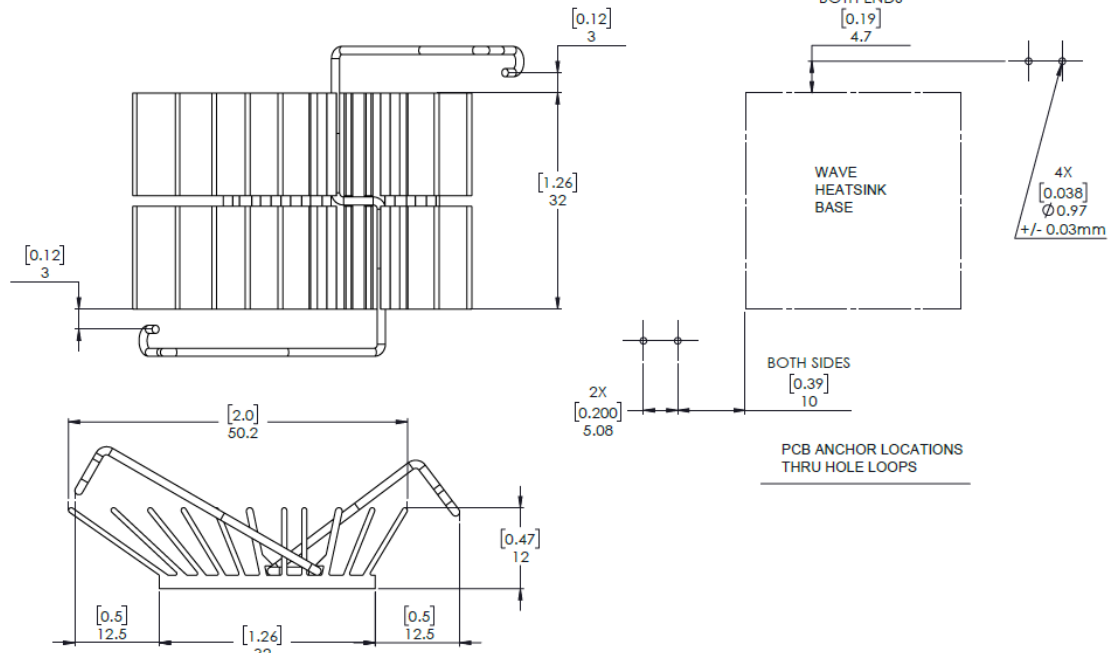
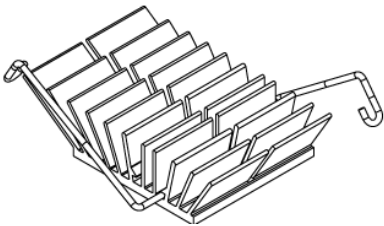
Wave 2X



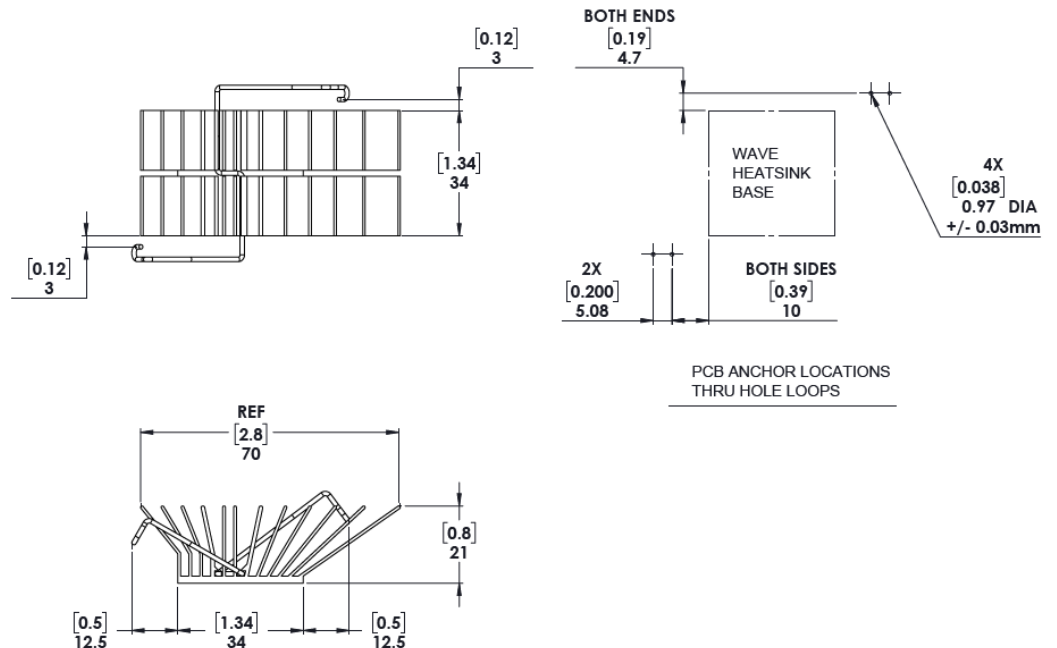
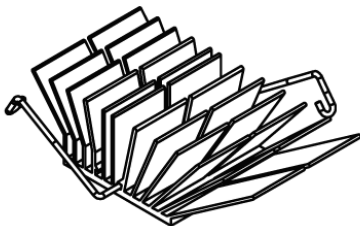
Wave 3x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-32-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 32 | 32 | 50.2 | 12 | 10957.5 | 10 | 4.64 |
| WAVE-34-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 34 | 34 | 70 | 21 | 21268.4 | 19 | 2.19 |
| WAVE-35-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 62 | 12 | 15180.8 | 10 | 3.83 |
| WAVE-35-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 63.3 | 12.5 | 15792.6 | 10.5 | 3.63 |
| WAVE-35-15 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 58.1 | 15 | 15612.7 | 13 | 3.15 |
| WAVE-35-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 74.6 | 21 | 21721.8 | 19 | 2.11 |
| WAVE-366-175 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 36.6 | 36.6 | 63.6 | 17.5 | 18637.8 | 15.5 | 2.55 |

WAVE-32-12



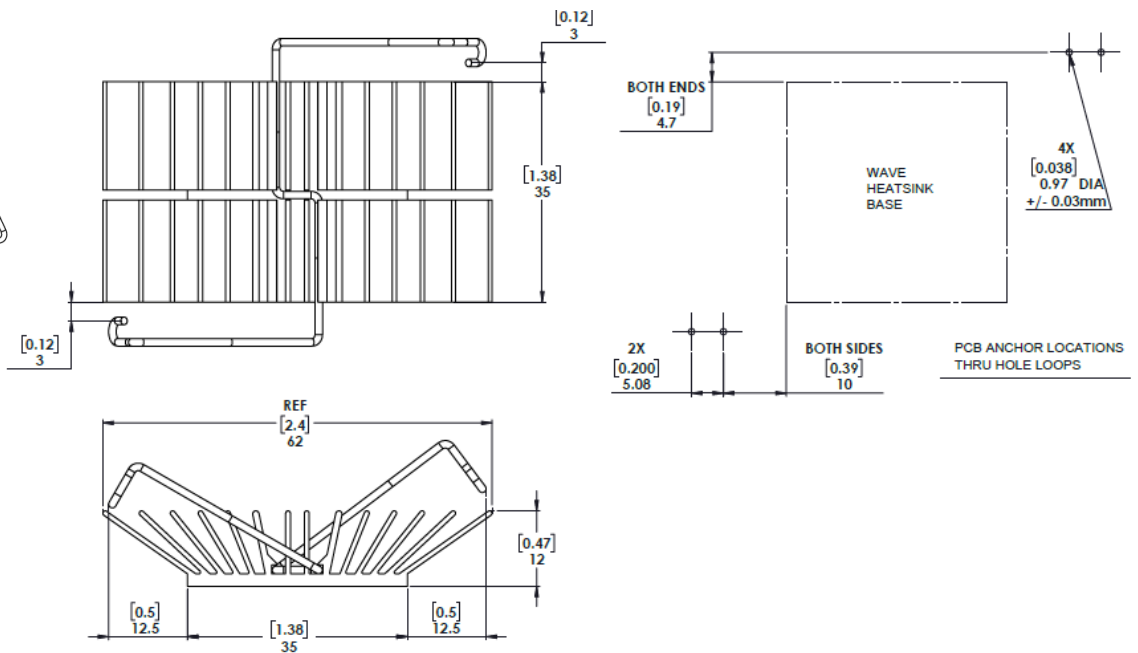
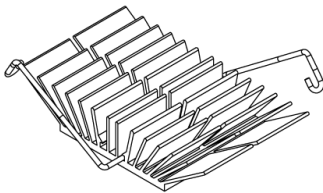
WAVE-34-21



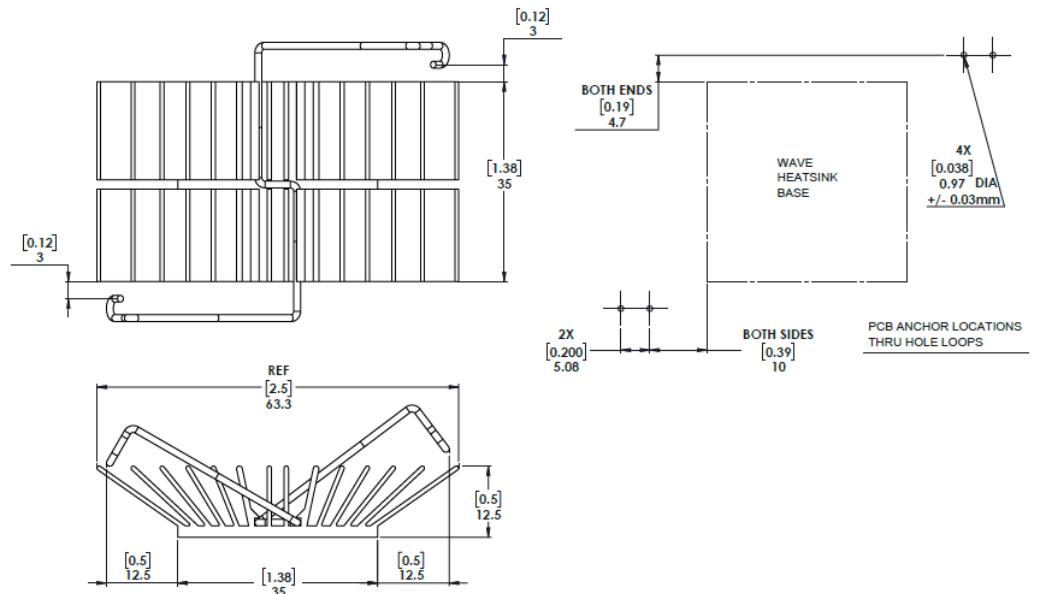
Wave 3x Series

| Wkv Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|------------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Fin Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-32-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 32 | 32 | 50.2 | 12 | 10957.5 | 10 | 4.64 |
| WAVE-34-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 34 | 34 | 70 | 21 | 21268.4 | 19 | 2.19 |
| WAVE-35-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 62 | 12 | 15180.8 | 10 | 3.83 |
| WAVE-35-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 63.3 | 12.5 | 15792.6 | 10.5 | 3.63 |
| WAVE-35-15 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 58.1 | 15 | 15612.7 | 13 | 3.15 |
| WAVE-35-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 74.6 | 21 | 21721.8 | 19 | 2.11 |
| WAVE-366-175 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 36.6 | 36.6 | 63.6 | 17.5 | 18637.8 | 15.5 | 2.55 |

WAVE-35-12



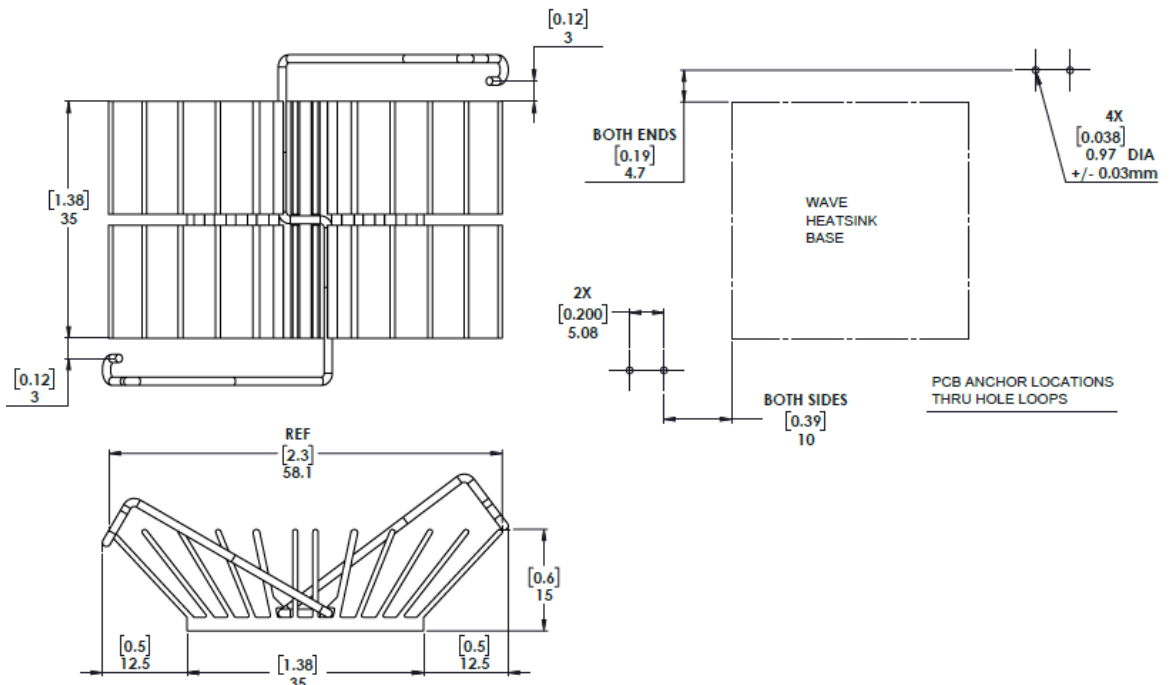
WAVE-35-125



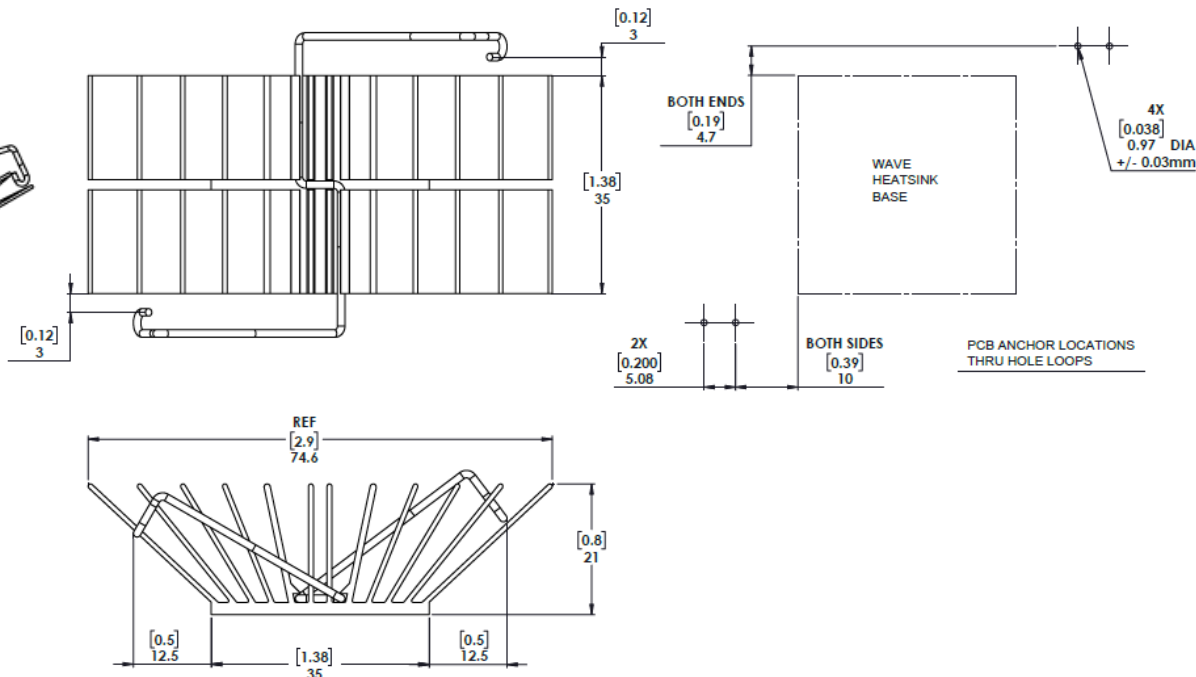
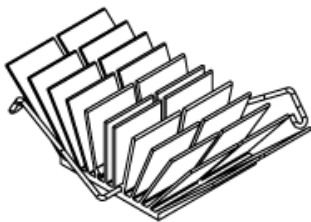
Wave 3x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-32-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 32 | 32 | 50.2 | 12 | 10957.5 | 10 | 4.64 |
| WAVE-34-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 34 | 34 | 70 | 21 | 21268.4 | 19 | 2.19 |
| WAVE-35-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 62 | 12 | 15180.8 | 10 | 3.83 |
| WAVE-35-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 63.3 | 12.5 | 15792.6 | 10.5 | 3.63 |
| WAVE-35-15 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 58.1 | 15 | 15612.7 | 13 | 3.15 |
| WAVE-35-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 74.6 | 21 | 21721.8 | 19 | 2.11 |
| WAVE-366-175 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 36.6 | 36.6 | 63.6 | 17.5 | 18637.8 | 15.5 | 2.55 |

WAVE-35-15



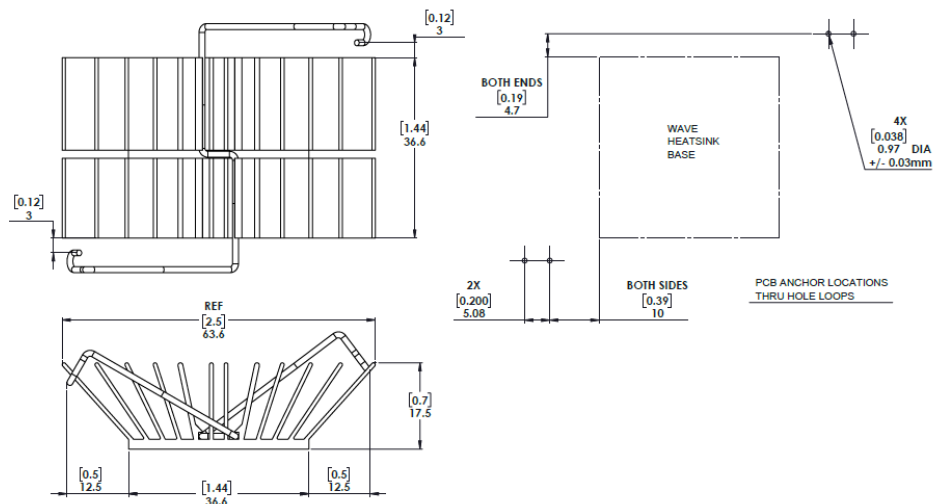
WAVE-35-21



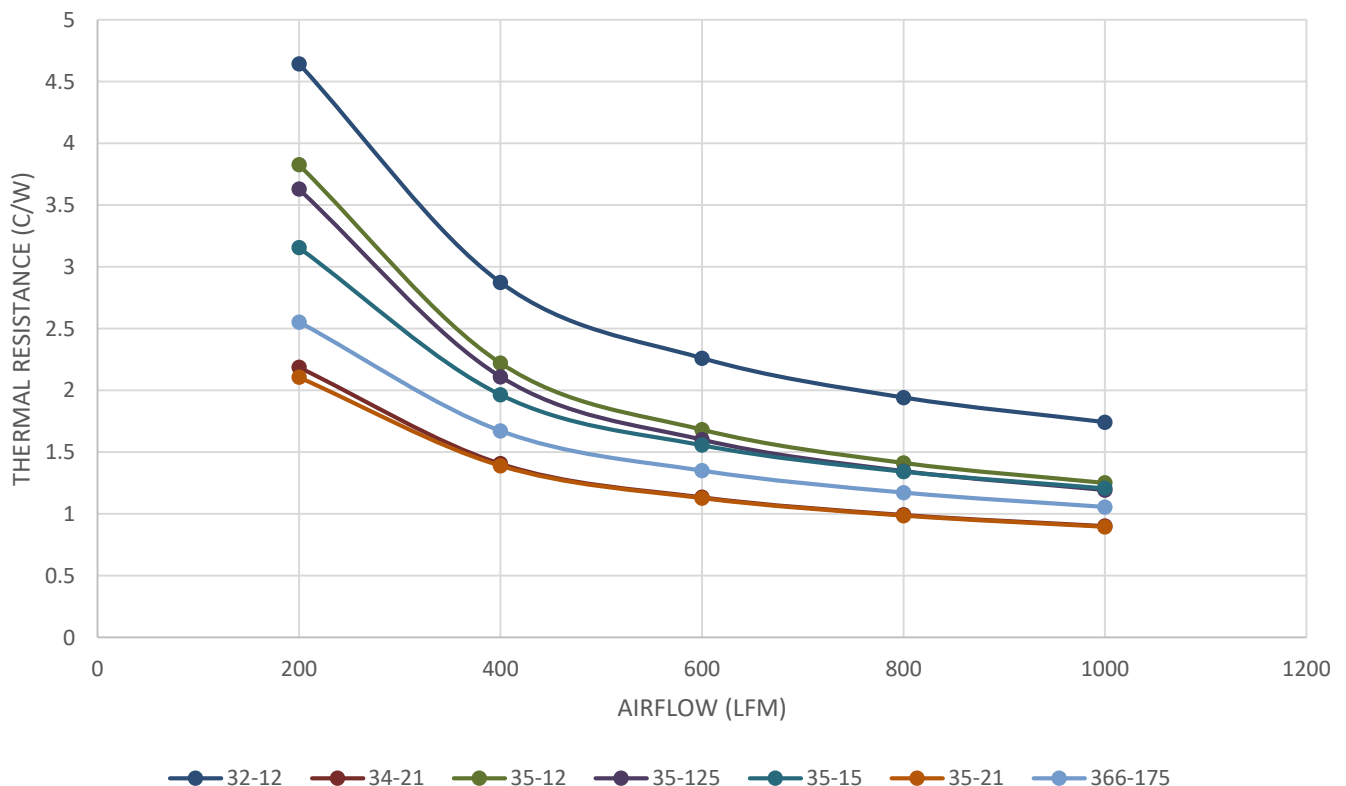
Wave 3x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-32-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 32 | 32 | 50.2 | 12 | 10957.5 | 10 | 4.64 |
| WAVE-34-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 34 | 34 | 70 | 21 | 21268.4 | 19 | 2.19 |
| WAVE-35-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 62 | 12 | 15180.8 | 10 | 3.83 |
| WAVE-35-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 63.3 | 12.5 | 15792.6 | 10.5 | 3.63 |
| WAVE-35-15 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 58.1 | 15 | 15612.7 | 13 | 3.15 |
| WAVE-35-21 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 35 | 35 | 74.6 | 21 | 21721.8 | 19 | 2.11 |
| WAVE-366-175 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 36.6 | 36.6 | 63.6 | 17.5 | 18637.8 | 15.5 | 2.55 |

WAVE-365-175



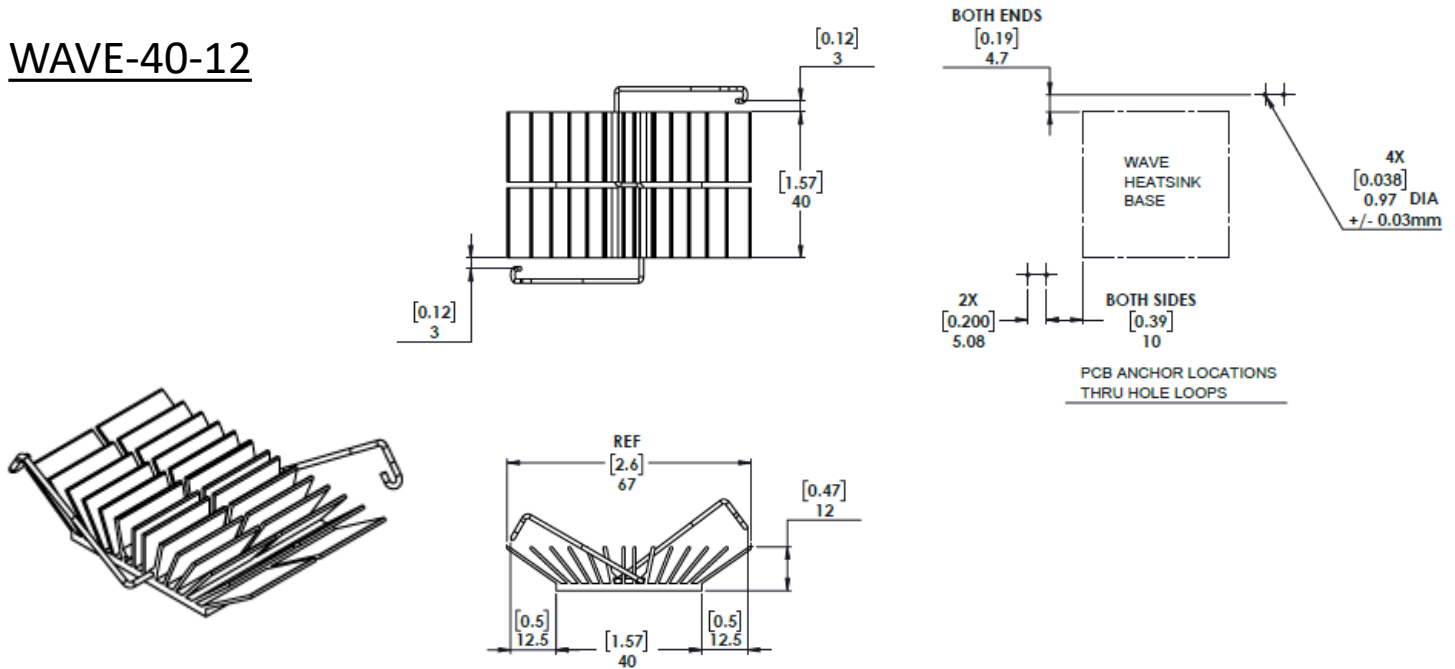
Wave 3X



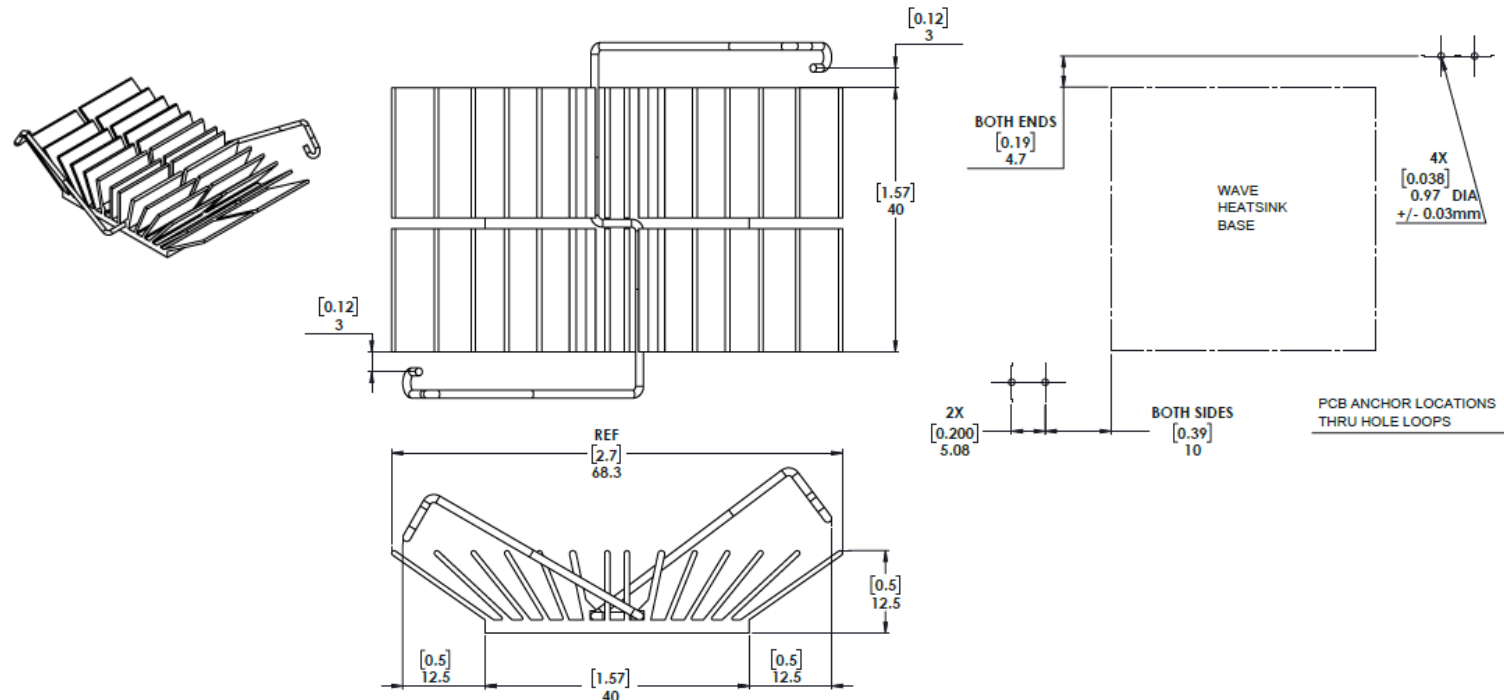
Wave 4x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | | |
| WAVE-40-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 66.9 | 12 | 17689.4 | 10 | 3.36 | |
| WAVE-40-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 68.3 | 12.5 | 18410.1 | 10.5 | 3.16 | |
| WAVE-425-117 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 42.5 | 42.5 | 67.4 | 11.7 | 21668.3 | 9.3 | 3.40 | |
| WAVE-45-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 45 | 45 | 72 | 12 | 22303.7 | 10 | 2.96 | |

WAVE-40-12



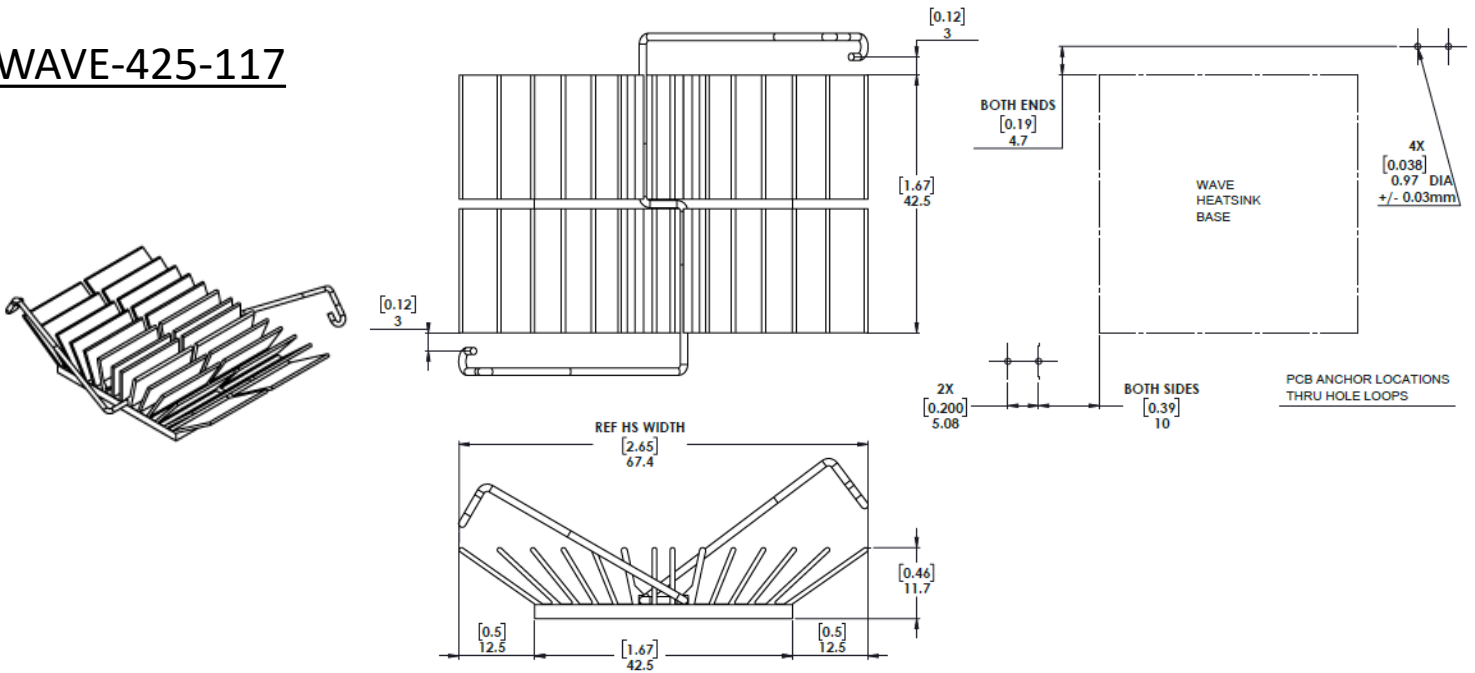
WAVE-40-125



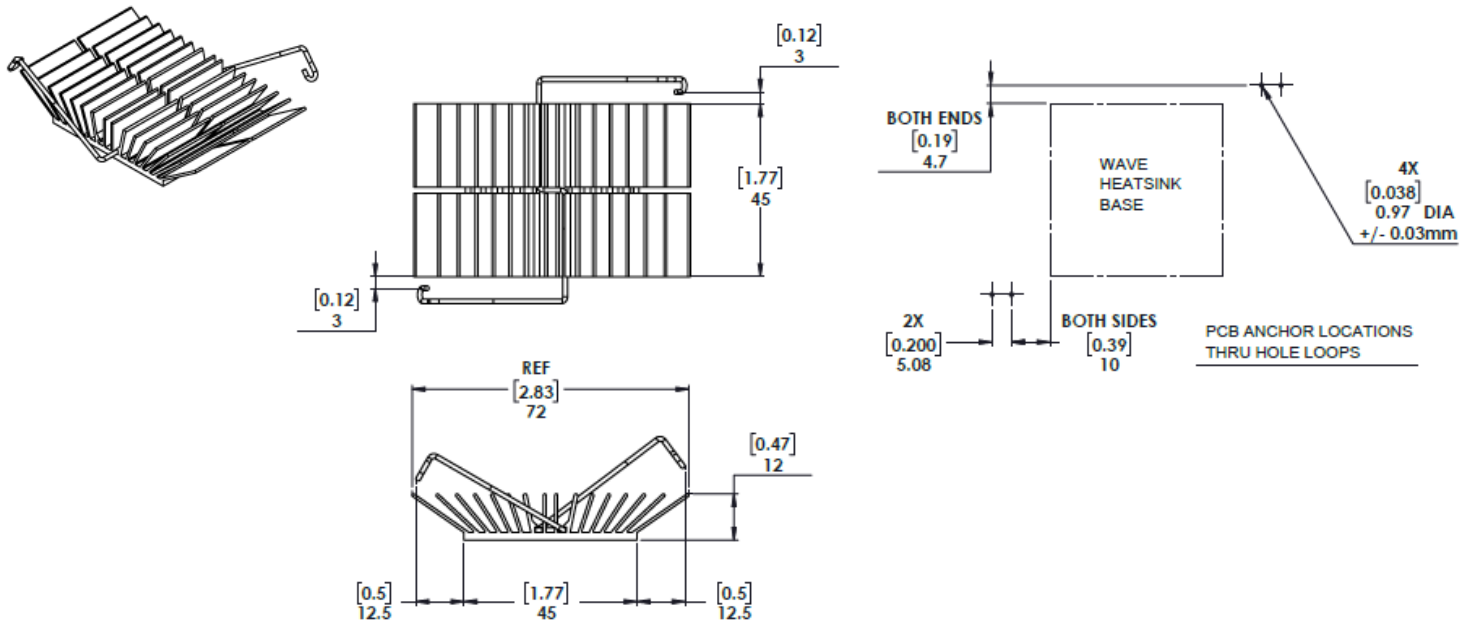
Wave 4x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | |
| WAVE-40-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 66.9 | 12 | 17689.4 | 10 | 3.36 |
| WAVE-40-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 68.3 | 12.5 | 18410.1 | 10.5 | 3.16 |
| WAVE-425-117 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 42.5 | 42.5 | 67.4 | 11.7 | 21668.3 | 9.3 | 3.40 |
| WAVE-45-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 45 | 45 | 72 | 12 | 22303.7 | 10 | 2.96 |

WAVE-425-117



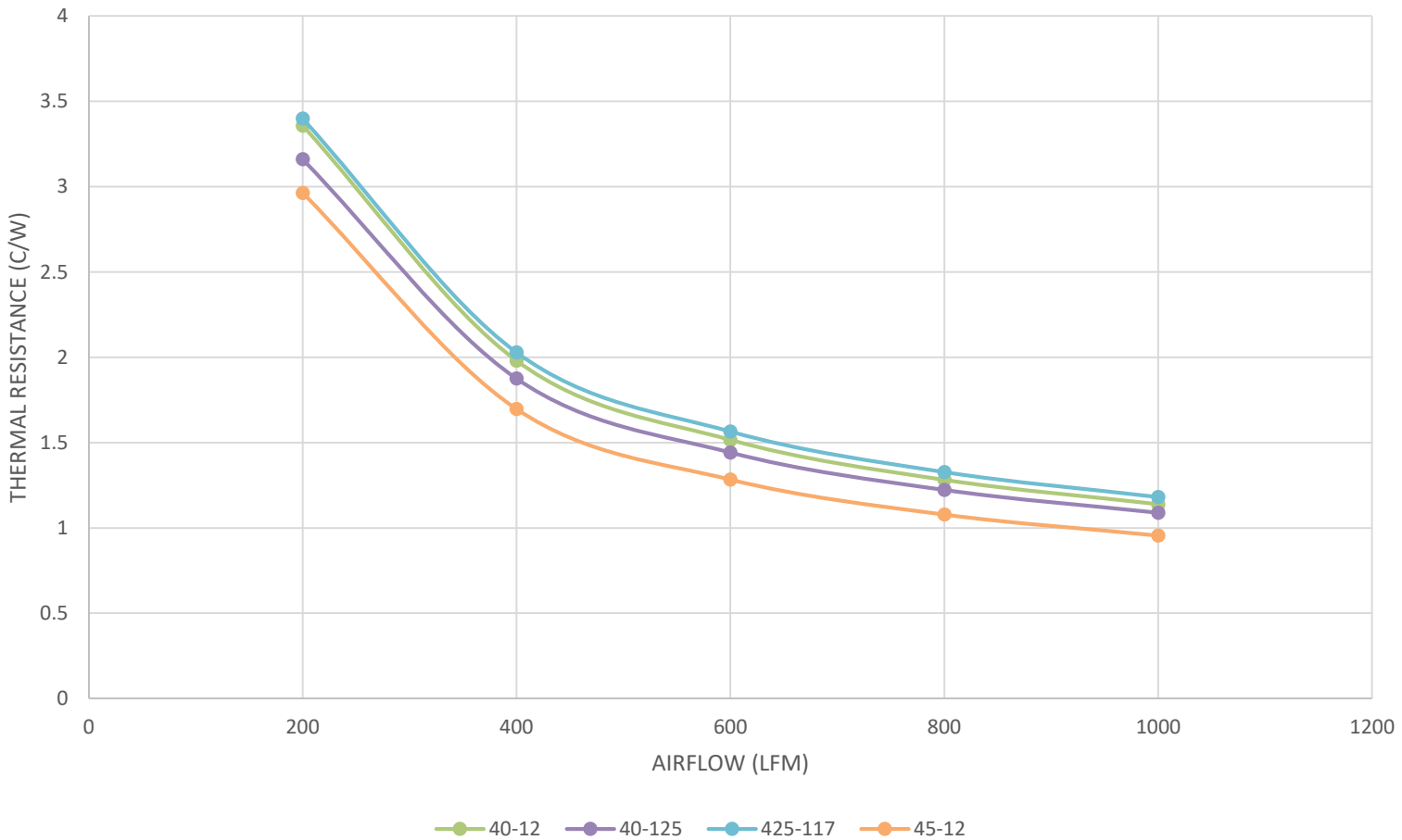
WAVE-45-12



Wave 4x Series

| WkV Part Number | Description | Attachment Method | Mechanical Dimensions (mm) | | | | | | | Thermal Resistance - Forced Conv. @ 200 LFM |
|-----------------|---|-------------------|----------------------------|-------|-----------|--------|----------------------|------------------------------|------|---|
| | | | Length | Width | Fin Width | Height | Surface Area (sq mm) | Height Off Base (Fin Height) | | |
| WAVE-40-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 66.9 | 12 | 17689.4 | 10 | 3.36 | |
| WAVE-40-125 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 40 | 40 | 68.3 | 12.5 | 18410.1 | 10.5 | 3.16 | |
| WAVE-425-117 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 42.5 | 42.5 | 67.4 | 11.7 | 21668.3 | 9.3 | 3.40 | |
| WAVE-45-12 | Wave Heat Sink BGA Chipset Aluminum Top Mount | Spring-Anchor | 45 | 45 | 72 | 12 | 22303.7 | 10 | 2.96 | |

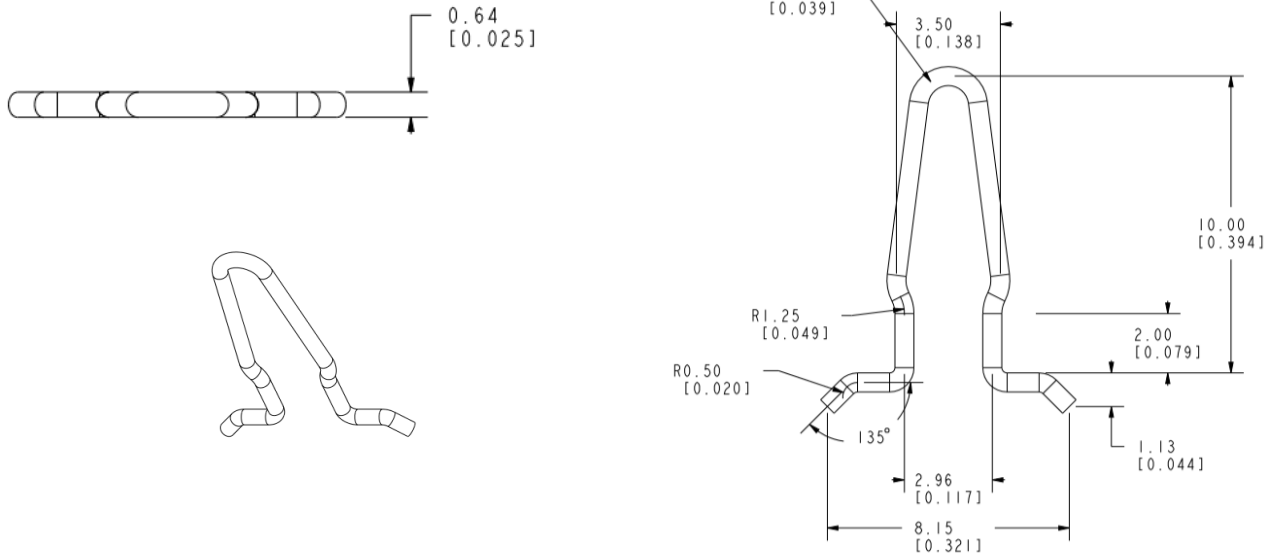
Wave 4X



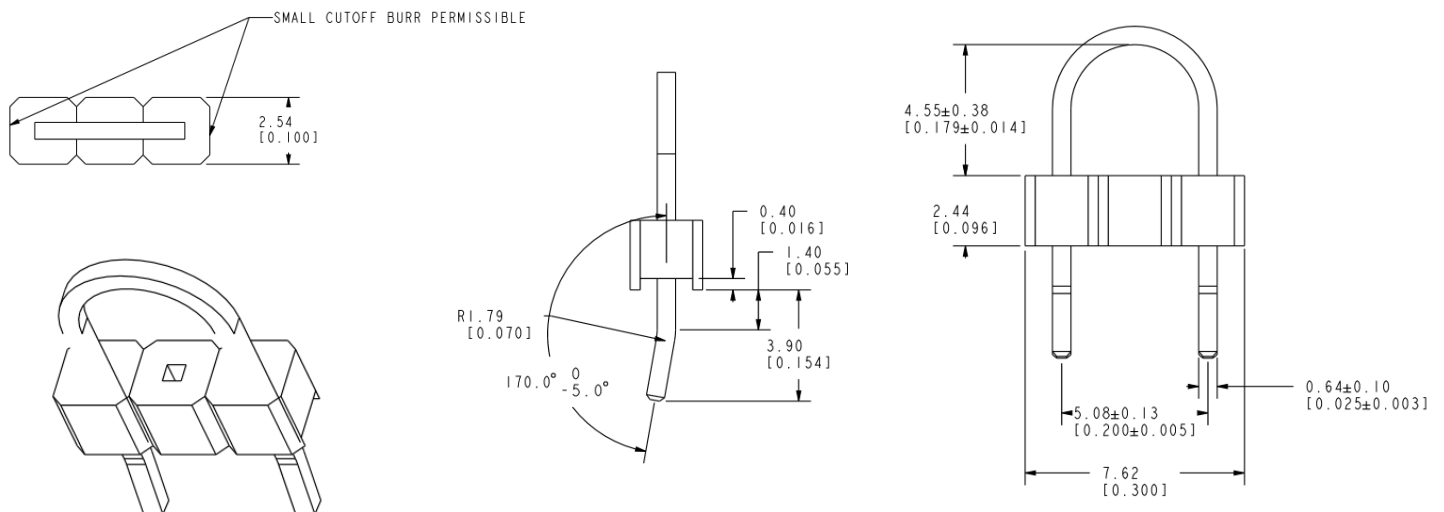
Wave Series Anchors

| | |
|-----------|-------------------------|
| WAVE-ANC1 | ANCHOR, PCB, 10MM TALL |
| WAVE-ANC2 | ASSEMBLY, SOLDER ANCHOR |

WAVE-ANC1



WAVE-ANC2



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».



JONHON

«**JONHON**» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А