WAKEFIELDTHERMAL

GAP PADS DATA SHEET

Wakefield Thermal's ulTIMiFlux line of thermal interface materials offer high performance, low cost, configurability and custom sizes for your thermal system needs. Thermal Interface Materials (TIM) are a secondary material installed between the heat sink and the device which are designed to improve the thermal transfer to the heat sink. Regardless of how flat or smooth the device and heat sink are, there will always be small air voids between the two surfaces. Since air is a not a great conductor of heat, a TIM replaces the air and fills the voids. There are many types of TIMs and each has its best case usages. Wakefield Thermal's line of thermal gap filling pads are intended to fill a large void between a device and the heat sink. A gap pad is a compressible material most commonly used when there are multiple devices to be contacted to the heat sink, but all the different device heights make it difficult to use a thin material. These materials come in a variety of thicknesses, conductivities, and durometers to meet a wide range of needs.

ulTIMiFlux™

Part Number Guide

Example: PLF-1-1-76X127-40

Series	PLF (Silicone Free) PLX (Silicone Based)
Thickness	1
Thml Conductivity	1
Size	76x127
Durometer	40

Wakefield Part Number	Thickness inch (mm)	Thermal Conductivity (W/mK)	Size (mm)	Color
PLF-1-1-76X127-40	0.039 (1.0)	1	76 X 127	White
PLF-1-1-210X310-40	0.039 (1.0)	1	210 X 310	White
PLX-1-1.5-76X127-40	0.039 (1.0)	1.5	76 X 127	White
PLX-1-1.5-210X310-40	0.039 (1.0)	1.5	210 X 310	White
PLX-1-2-76X127-80	0.039 (1.0)	2	76 X 127	Gray
PLX-1-2-210X310-80	0.039 (1.0)	2	210 X 310	Gray
PLX-1-3-76X127-30	0.039 (1.0)	3	76 X 127	Blue
PLX-1-3-210X310-30	0.039 (1.0)	3	210 X 310	Blue
PLF-1-3-76X127-70	0.039 (1.0)	3	76 X 127	Off White
PLF-1-3-210X310-70	0.039 (1.0)	3	210 X 310	Off White
PLX-1-5-76X127-40	0.039 (1.0)	5	76 X 127	Gray
PLX-1-5-210X310-40	0.039 (1.0)	5	210 X 310	Gray
PLX-1-6-76X127-48	0.039 (1.0)	6	76 X 127	Gray
PLX-1-6-210X310-48	0.039 (1.0)	6	210 X 310	Gray
PLX-1-7-76X127-68	0.039 (1.0)	7	76 X 127	Gray
PLX-1-7-210X310-68	0.039 (1.0)	7	210 X 310	Gray
PLX-1-8-76x127-40	0.039 (1.0)	8	76 X 127	Gray
PLX-1-8-210x310-40	0.039 (1.0)	8	210 X 310	Gray
PLF-1-8-76X127-70	0.039 (1.0)	8	76 X 127	Gray
PLF-1-8-210X310-70	0.039 (1.0)	8	210 X 310	Gray
PLX-1-10-76X127-55	0.039 (1.0)	10	76 X 127	Gray
PLX-1-10-210X310-55	0.039 (1.0)	10	210 X 310	Gray
PLX-1-12-76X127-58	0.039 (1.0)	12	76 X 127	Gray
PLX-1-12-210X310-58	0.039 (1.0)	12	210 X 310	Gray

PLF-1-1-76X127-40
PLF-1-1-210X310-40

WAKEFIELDTHERMAL

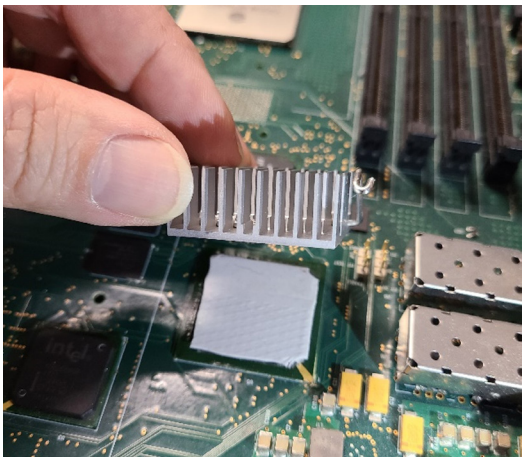
For Custom Sizes, **CONTACT WAKEFIELD**

TECHNICAL DATA SHEET

SILICONE FREE

Thermal pads are used for filling the voids between a heat source and heat sink, effectively excluding air from the contact interface. The products are ultra soft, naturally tacky and can be die-cut into various shapes.

Illustration Example



PLF-1-1-76X127-40 PLF-1-1-210X310-40		
Color	White	Visual
Alternative Thickness	0.25mm - 5mm	ASTM D374
Thermal Conductivity	1.0 W/mK	ASTM D5470
Specific Gravity	1.9g/cm^3	ASTM D792
Hardness (Shore OO)	40-80	ASTM D2240
Elongation	100%	ASTM D412
Tensile Strength	75psi	ASTM D412
Dielectric Breakdown Voltage	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	UL94
Volume Resistivity	10^{13}Ω.cm	ASTM D257
Operating Temperature	-40 - 130°C	——
Thermal Resistance (1mm,@40psi)	1.10°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	30%	——
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

ulTIMiFlux™

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
- Vehicle navigation equipment
- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

- Wide operating temperature range
- Excellent flame retardance
- Good electrical insulation performance
- Good flexibility and high compression ratio

The above data is information we consider to be reliable. The data provided is for reference only and no warranty is expressed or implied regarding the accuracy of this data. The properties given are typical values and are not intended for use in preparing specifications. This information is furnished upon the condition that the person receiving it shall make their own tests to determine the suitability for their particular application.

*Test fixtures using ASTM D5470. Recorded values include interface thermal resistance. These values are for reference only. The actual application performance is directly related to the applied surface roughness, flatness and pressure.

PLX-1-1.5-76X127-40
PLX-1-1.5-210X310-40

TECHNICAL DATA SHEET

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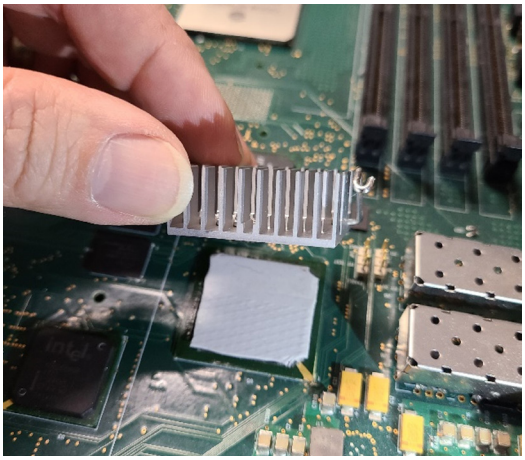
Illustration Example



ulTIMiFlux™

PLX-1-1.5-76X127-40 PLX-1-1.5-210X310-40		
Color	White	Visual
Alternative Thickness	0.15mm to 15.0mm	ASTM D374
Thermal Conductivity	1.5 W/mK	ASTM D5470
Specific Gravity	2.1g/cm³	ASTM D792
Hardness (Shore OO)	30 - 90	ASTM D2240
Elongation	50%	ASTM D412
Tensile Strength	40psi	ASTM D412
Electrical Strength	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	——
Volume Resistivity	10^{13}Ω.cm	ASTM D257
Operating Temperature	-50 - 200°C	——
Thermal Resistance (1mm,@40psi)	0.9°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	40%	——
Dielectric Constant MHz	5.5	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

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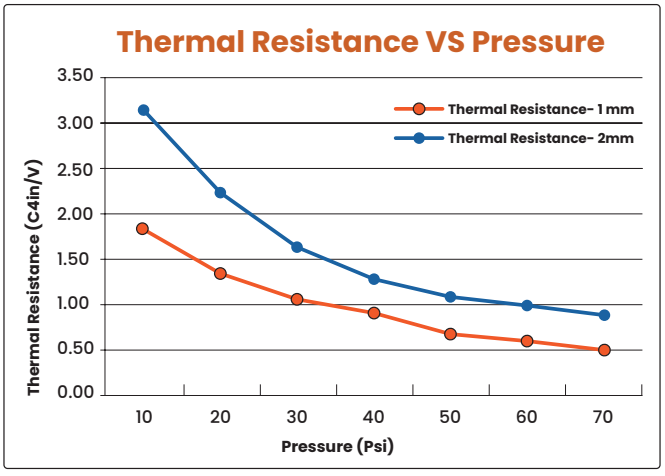

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*Test fixtures using ASTM D5470. Recorded values include interface thermal resistance. These values are for reference only. The actual application performance is directly related to the applied surface roughness, flatness and pressure.

PLX-1-2-76X127-80
PLX-1-2-210X310-80

TECHNICAL DATA SHEET

WAKEFIELDTHERMAL

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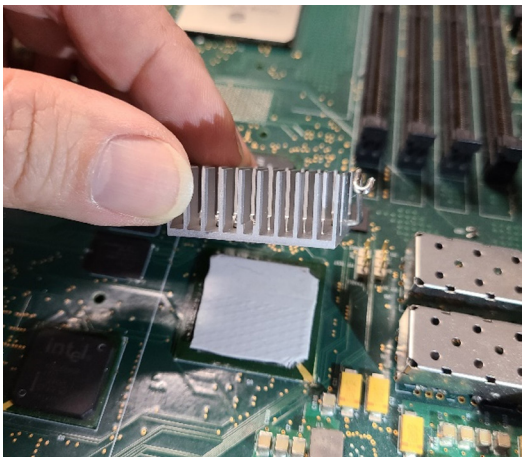
Illustration Example



ulTIMiFlux™

PLX-1-2-76X127-80 PLX-1-2-210X310-80		
Color	Gray	Visual
Alternative Thickness	0.15mm - 15.0mm	ASTM D374
Thermal Conductivity	2.0 W/m-k	ASTM D5470
Specific Gravity	2.3g/cm^3	ASTM D792
Hardness (Shore OO)	30-90	ASTM D2240
Elongation	50%	ASTM D412
Tensile Strength	40psi	ASTM D412
Electrical Strength	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	——
Volume Resistivity	10^{13}Ω.cm	ASTM D257
Operating Temperature	-50 - 200°C	——
Thermal Resistance (1mm,@40psi)	0.7°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	40%	——
Dielectric Constant MHz	6.0	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
- Vehicle navigation equipment
- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

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*Test fixtures using ASTM D5470. Recorded values include interface thermal resistance. These values are for reference only. The actual application performance is directly related to the applied surface roughness, flatness and pressure.

PLX-1-3-76X127-30
PLX-1-3-210X310-30

TECHNICAL DATA SHEET

WAKEFIELDTHERMAL

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CONTACT WAKEFIELD

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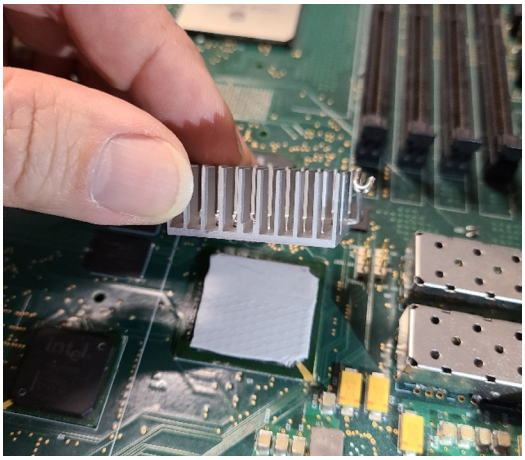
Illustration Example



ulTIMiFlux™

PLX-1-3-76X127-30 PLX-1-3-210X310-30		
Color	Blue	Visual
Alternative Thickness	0.3mm - 10mm	ASTM D374
Thermal Conductivity	3.0 W/m-K	ASTM D5470
Specific Gravity	2.9g/cm³	ASTM D792
Hardness (Shore OO)	30 - 90	ASTM D2240
Elongation	40%	ASTM D412
Tensile Strength	30psi	ASTM D412
Electrical Strength	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	——
Volume Resistivity	10^{13}Ω.cm	ASTM D257
Operating Temperature	-50 - 200°C	——
Thermal Resistance (1mm,@40psi)	0.45°*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	30%	——
Dielectric Constant 1MHz	7.5	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
REACH	PASS	EN14372

Alternative size pads available upon request

Applications

- Semiconductor heat sink
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- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

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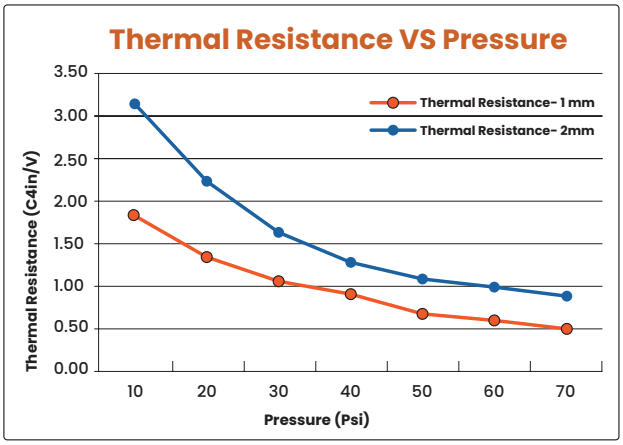

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PLF-1-3-76X127-70
PLF-1-3-210X310-70

TECHNICAL DATA SHEET

SILICONE FREE

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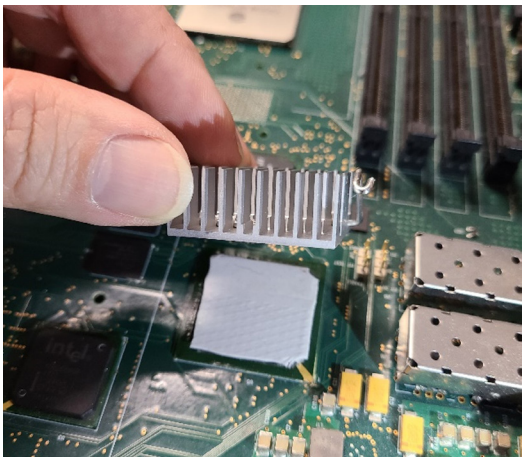

PLF-1-3-76X127-70 PLF-1-3-210X310-70		
Color	Off White	Visual
Alternative Thickness	0.25mm - 5.0mm	ASTM D374
Thermal Conductivity	3.0 W/mK	ASTM D5470
Specific Gravity	2.9g/cm^3	ASTM D792
Hardness (Shore OO)	40-80	ASTM D2240
Elongation	70%	ASTM D412
Tensile Strength	55psi	ASTM D412
Dielectric Breakdown Voltage	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	UL94
Volume Resistivity	$10^{13}\Omega$.cm	ASTM D257
Operating Temperature	-40 - 130°C	——
Thermal Resistance (1mm,@40psi)	0.6°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	30%	——
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

ulTIMiFlux™

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
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PLX-1-5-76X127-40
PLX-1-5-210X310-40

TECHNICAL DATA SHEET

WAKEFIELDTHERMAL

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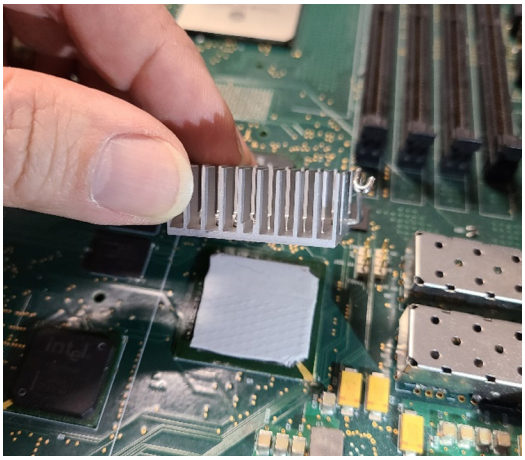
Illustration Example



ulTIMiFlux™

PLX-1-5-76X127-40 PLX-1-5-210X310-40		
Color	Gray	Visual
Alternative Thickness	0.5mm -5.0mm	ASTM D374
Thermal Conductivity	5.0 W/m-K	ASTM D5470
Specific Gravity	3.20g/cm^3	ASTM D470
Hardness (Shore OO)	40-90	ASTM D2240
Elongation	30%	ASTM D412
Tensile Strength	30psi	ASTM D412
Electrical Strength	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	——
Volume Resistivity	$10^{13}\Omega$.cm	ASTM D257
Operating Temperature	-50 - 200°C	——
Thermal Resistance (1mm,@40psi)	0.31°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	25%	——
Dielectric Constant MHz	9	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

Applications

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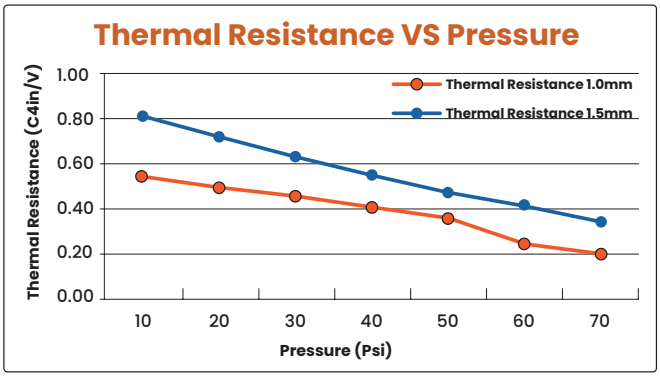

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PLX-1-6-76X127-48
PLX-1-6-210X310-48

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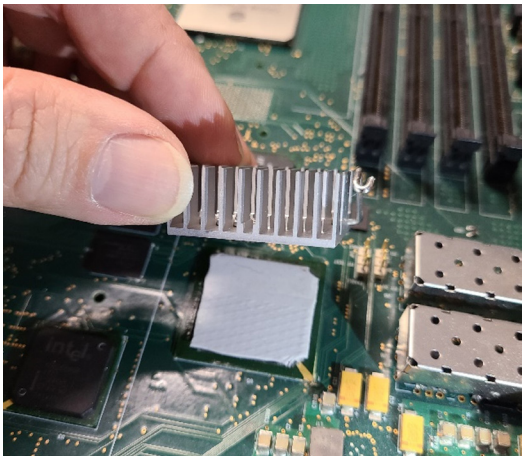
Illustration Example



ulTIMiFlux™

PLX-1-6-76X127-48 PLX-1-6-210X310-48		
Color	Gray	Visual
Alternative Thickness	0.5mm - 5.0mm	ASTM D374
Thermal Conductivity	6.0 W/m-K	ASTM D5470
Specific Gravity	3.30g/cm^3	ASTM D792
Hardness (Shore OO)	40-90	ASTM D2240
Elongation	30%	ASTM D412
Tensile Strength	30psi	ASTM D412
Dielectric Breakdown Voltage	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	UL94
Volume Resistivity	$10^{13}\Omega$.cm	ASTM D257
Operating Temperature	-50 - 200°C	——
Thermal Resistance (1mm,@40psi)	0.29°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	25%	——
Dielectric Constant MHz	9	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

Applications

- Semiconductor heat sink
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PLX-1-7-76X127-68
PLX-1-7-210X310-68

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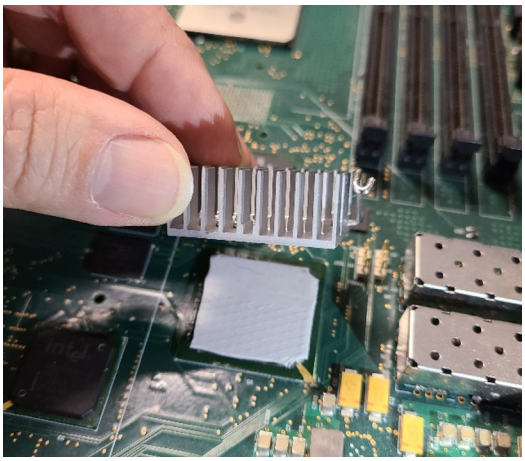

ulTIMiFlux™

PLX-1-7-76X127-68 PLX-1-7-210X310-68		
Color	Gray	Visual
Alternative Thickness	0.5mm - 5.0mm	ASTM D374
Thermal Conductivity	7.0 W/m.k	ASTM D5470
Specific Gravity	3.40g/cm^3	ASTM D792
Hardness (Shore OO)	40~80	ASTM D2240
Elongation	15%	ASTM D412
Tensile Strength	20psi	ASTM D412
Dielectric Breakdown Voltage	>6000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	UL94
Volume Resistivity	10^{13}Ω.cm	ASTM D257
Operating Temperature	-50-150°C	——
Thermal Resistance (1mm,@30psi)	0.29°C*in2/W	ASTM D5470
Compression Ratio (1mm,@30psi)	30%	——
Dielectric Constant@1MHz	10.0	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

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PLX-1-8-76X127-40
PLX-1-8-210X310-40

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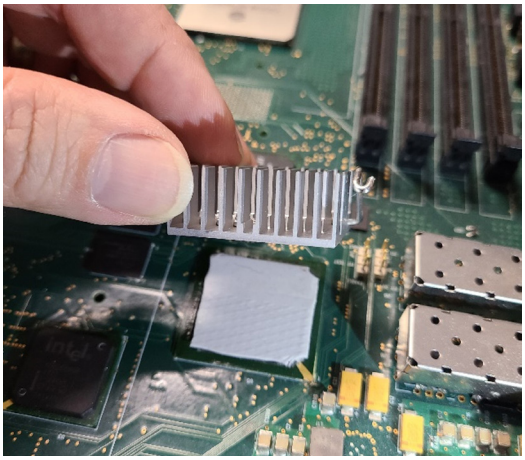
Illustration Example



ulTIMiFlux™

PLX-1-8-76x127-40 PLX-1-8-210x310-40		
Color	Gray	Visual
Alternative Thickness	0.5mm - 3.0mm	ASTM D374
Thermal Conductivity	8.0 W/m-K	ASTM D5470
Specific Gravity	3.40g/cm³	ASTM D792
Hardness (Shore OO)	40-80	ASTM D2240
Elongation	15%	ASTM D412
Tensile Strength	20psi	ASTM D412
Dielectric Breakdown Voltage	>6000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	UL94
Volume Resistivity	$10^{13}\Omega$.cm	ASTM D257
Operating Temperature	-50 - 200°C	——
Thermal Resistance (1mm,@40psi)	0.29°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	15%	——
Dielectric Constant 1MHz	5.5	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

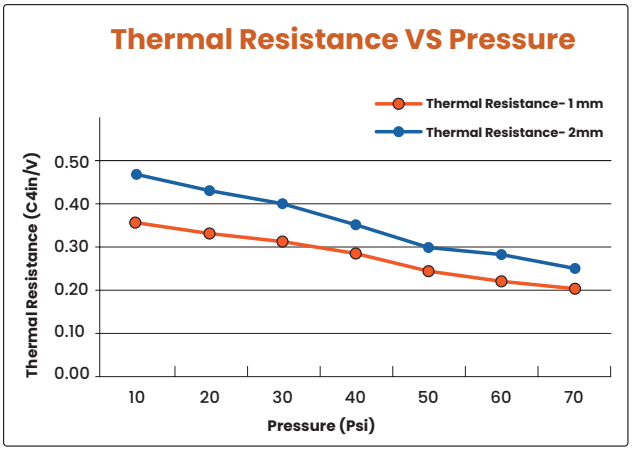
Alternative size pads available upon request

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
- Vehicle navigation equipment
- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

- Wide operating temperature range
- Excellent flame retardance
- Good electrical insulation performance
- Good flexibility and high compression ratio



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*Test fixtures using ASTM D5470. Recorded values include interface thermal resistance. These values are for reference only. The actual application performance is directly related to the applied surface roughness, flatness and pressure.

PLF-1-8-76X127-70
PLF-1-8-210X310-70

TECHNICAL DATA SHEET

SILICONE FREE

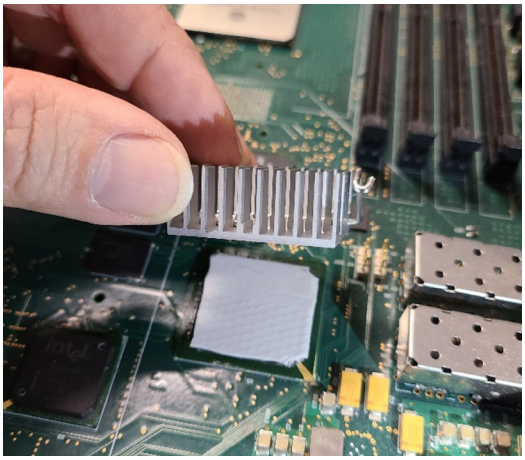
WAKEFIELDTHERMAL

For Custom Sizes,

CONTACT WAKEFIELD

Thermal pads are used for filling the voids between a heat source and heat sink, effectively excluding air from the contact interface. The products are ultra soft, naturally tacky and can be die-cut into various shapes.

Illustration Example



PLF-1-8-76X127-70 PLF-1-8-210X310-70		
Color	Gray	Visual
Alternative Thickness	0.5mm - 5.0mm	ASTM D374
Thermal Conductivity	8.0 W/m.k	ASTM D5470
Specific Gravity	3.4g/cm^3	ASTM D792
Hardness (Shore OO)	45-80	ASTM D2240
Elongation	30%	ASTM D412
Tensile Strength	30psi	ASTM D412
Dielectric Breakdown Voltage	>8000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	UL94
Volume Resistivity	$10^{13}\Omega$.cm	ASTM D257
Operating Temperature	-40-120°C	——
Thermal Resistance (1mm,@40psi)	0.10°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	20%	——
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

ulTIMiFlux™

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
- Vehicle navigation equipment
- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

- Wide operating temperature range
- Excellent flame retardance
- Good electrical insulation performance
- Good flexibility and high compression ratio

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*Test fixtures using ASTM D5470. Recorded values include interface thermal resistance. These values are for reference only. The actual application performance is directly related to the applied surface roughness, flatness and pressure.

PLX-1-10-76X127-55
PLX-1-10-210X310-55

TECHNICAL DATA SHEET

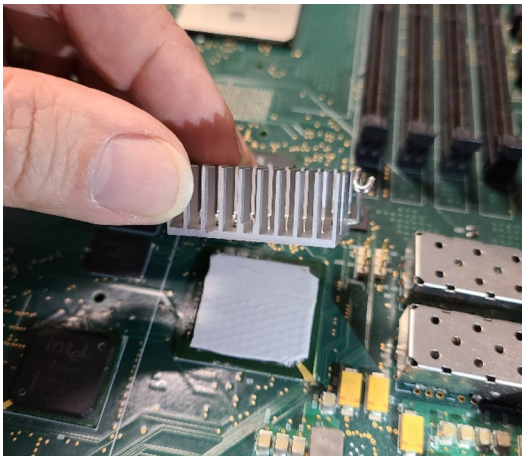
WAKEFIELDTHERMAL

For Custom Sizes,

CONTACT WAKEFIELD

Thermal pads are used for filling the voids between a heat source and heat sink, effectively excluding air from the contact interface. The products are ultra soft, naturally tacky and can be die-cut into various shapes.

Illustration Example



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PLX-1-10-76X127-55 PLX-1-10-210X310-55		
Color	Gray	Visual
Alternative Thickness	0.5mm - 5.0mm	ASTM D374
Thermal Conductivity	10.0 W/m-K	ASTM D5470
Specific Gravity	3.40g/cm^3	ASTM D792
Hardness (Shore OO)	40-80	ASTM D2240
Elongation	15%	ASTM D412
Tensile Strength	10psi	ASTM D412
Dielectric Breakdown Voltage	>6000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	——
Volume Resistivity	10^{12}Ω.cm	ASTM D257
Operating Temperature	-50 - 150°C	——
Thermal Resistance (1mm,@40psi)	0.12°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	30%	——
Dielectric Constant MHz	12	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

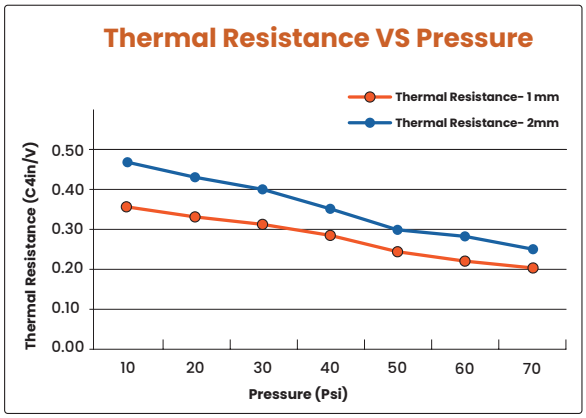
Alternative size pads available upon request

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
- Vehicle navigation equipment
- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

- Wide operating temperature range
- Excellent flame retardance
- Good electrical insulation performance
- Good flexibility and high compression ratio



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*Test fixtures using ASTM D5470. Recorded values include interface thermal resistance. These values are for reference only. The actual application performance is directly related to the applied surface roughness, flatness and pressure.

PLX-1-12-76X127-58
PLX-1-12-210X310-58

TECHNICAL DATA SHEET

WAKEFIELDTHERMAL

For Custom Sizes,

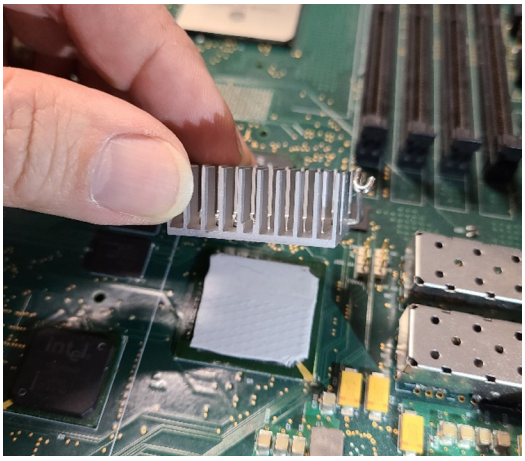
CONTACT WAKEFIELD

Thermal pads are used for filling the voids between a heat source and heat sink, effectively excluding air from the contact interface. The products are ultra soft, naturally tacky and can be die-cut into various shapes.

PLX-1-12-76X127-58 PLX-1-12-210X310-58		
Color	Gray	Visual
Alternative Thickness	0.8mm - 5.0mm	ASTM D374
Thermal Conductivity	12.0 W/m.k	ASTM D5470
Specific Gravity	3.40g/cm^3	ASTM D792
Hardness (Shore OO)	40-80	ASTM D2240
Elongation	15%	ASTM D412
Tensile Strength	10psi	ASTM D412
Dielectric Breakdown Voltage	>5000V/mm	ASTM D149
UL Flammability Rating	UL94 V-0	——
Volume Resistivity	10^{12}Ω.cm	ASTM D257
Operating Temperature	-50 - 120°C	——
Thermal Resistance (1mm,@40psi)	0.1°C*in2/W	ASTM D5470
Compression Ratio (1mm,@40psi)	≥15%	——
Dielectric Constant MHz	12.0	ASTM D150
RoHS	PASS	IEC 62321
Halogen	PASS	EN14582
Reach	PASS	EN14372

Alternative size pads available upon request

Illustration Example



ulTIMiFlux™

Applications

- Semiconductor heat sink
- Thermal imaging equipment
- Military electronic products
- Vehicle navigation equipment
- Communication & power equipment
- Graphics card, memory module
- LED lighting equipment
- HDTVs

Features and Benefits

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COOLVATION
Innovative Thermal Solutions
COOLED BY WAKEFIELD THERMAL

5 STEP
THERMAL ENGINEERING GUIDE
From Concept To Cooling

COOLVATION provides thermal management engineering services to improve products' thermal performance while applying cost effective solutions to eliminate unnecessary manufacturing costs. COOLVATION is a seamless resource extension for our customers' thermal & mechanical engineering teams from ideation to lab testing.

Customer Thermal Challenge
Physical limitations
Power constraints
Air flow/ fluid conditions
Environmental conditions
Component specifications
Define ideal state

01 STEP

Execution
Concept analysis
(CFD-ansys/ ice pack, fin optimizations software)
Solid model
Analysis & verification
Cost analysis

03 STEP

Global Manufacturing
Global manufacturing facilities
Global warehousing
Global labs to support future program

05 STEP

02 STEP

Collaboration
Review conditions
Statement of work to customer
Historical consideration along with cutting edge technologies to provide cost effective solution

04 STEP

Solution & Verification
Dedicated new product development center
Prototype
Physical thermal lab testing
Proven manufacturability

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