

# BOYD

## CORPORATION



### THERMAL MANAGEMENT

# One Company, Many Solutions

Precision Components

Fabricated Solutions

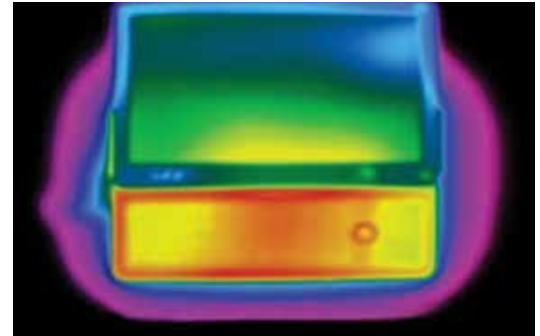
Global Presence

As electronics become an ever increasing part of our daily lives, so too OEMs' challenges associated with the advancing complexities and miniaturization of technologies they produce with attendant power consumption, heat and thermal management-related challenges.

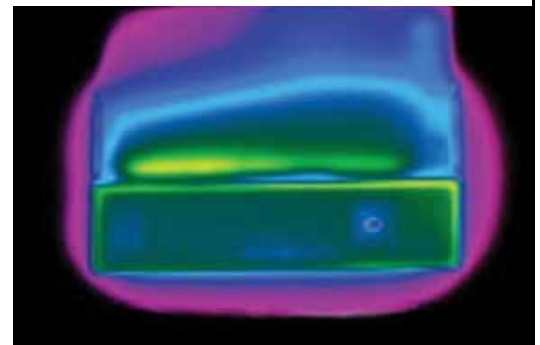
For more than a decade, Boyd has provided thermal management solutions for market segments and applications including:

- Automotive: ECU (Electronic Control Unit) featuring thermally conductive adhesives, heat spreaders and TIMs
- LED TV Displays: backlights cooled with graphite and power modules cooled with TIMs
- Mobile Computing: CPU, power amplifiers and displays featuring heat spreaders made of graphite, copper and aluminum
- Enterprise Electronics: CPU, chips and heat sinks featuring TIMs for heat transfer
- Lighting: thermally conductive adhesives and TIMs used in LED chips and heat sinks
- Hybrid or Electric Vehicles: TIMs for battery temperature management

Before **TRANSTHERM™**  
Thermal Management Products by **BOYD**  
CORPORATION



After **TRANSTHERM™**  
Thermal Management Products by **BOYD**  
CORPORATION



With a fully equipped and capable thermal analysis lab to support customer product evaluations, Boyd utilizes excellent analysis tools and market experience to provide an unmatched ability to assist its OEM customers, EMS partners and suppliers in designing solutions that solve thermal management challenges.



Boyd provides best-cost, engineered, specialty material-based energy management and sealing solutions through comprehensive technical materials and design expertise, world-class manufacturing quality, service reliability, and unparalleled supply chain management. Use Boyd's years of experience and engineering support in concert with your engineering / technical expertise to ensure your thermal challenges are solved in a cost effective, leading edge way.

# TRANSTHERM™

Thermal Management Products by **BOYD CORPORATION**

Properties	Units	Product Type: Silicone Thermal Pad				Test Method
		BOYD Part Number				
		BCTIM-210-1001	BCTIM-210-1002	BCTIM-210-1003	BCTIM-210-1004	
Color		Pink				Visual
Reinforce Layer		Fiberglass				
Surface Tack (0, 1 or 2 sided)		0	0	0	0	
Thermal Conductivity	W/m-K	1	1	1.5	1.5	ASTM D5470
Hardness	Shore OO (Shore A)	(80~90)	(80~90)	(80~90)	(80~90)	ASTM D2240
Thickness	mm	0.15	0.2	0.15	0.2	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	ASTM D257
Breakdown Voltage	KV/mm	10	10	10	10	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		General Thermal Pad, Reinforced, No Tackiness				

Properties	Units	Product Type: Silicone Thermal Pad				Test Method
		BOYD Part Number				
		BCTIM-210-1005	BCTIM-210-1006	BCTIM-210-1007	BCTIM-210-1008	
Color		Pink		Gray		Visual
Reinforce Layer		Fiberglass		PI film		
Surface Tack (0, 1 or 2 sided)		0	0	0	0	
Thermal Conductivity	W/m-K	2	2	1.3	1.3	ASTM D5470
Hardness	Shore OO (Shore A)	(80~90)	(80~90)	(80~90)	(80~90)	ASTM D2240
Thickness	mm	0.15	0.2	0.15	0.2	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	6	10	10	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		General Thermal Pad, Reinforced, No Tackiness				

Properties	Units	Product Type: Silicone Thermal Pad				Test Method
		BOYD Part Number				
		BCTIM-210-1009	BCTIM-210-1010	BCTIM-210-1011	BCTIM-210-1012	
Color		Pink				Visual
Reinforce Layer		Fiberglass			PI film	
Surface Tack (0, 1 or 2 sided)		0	0	0	0	
Thermal Conductivity	W/m-K	1.6	1.5	1.5	1	ASTM D5470
Hardness	Shore OO (Shore A)	(89)	(86)	(86)	(90)	ASTM D2240
Thickness	mm	0.23	0.19	0.23	0.15	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	6	6	6	ASTM D149
Continuous Usage Temperature	°C	-60~180	-60~180	-60~180	-60~180	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		General Thermal Pad, Reinforced, No Tackiness				

## TRANSTHERM™

Thermal Management Products by **BOYD CORPORATION**

Properties	Units	Product Type: Silicone Thermal Pad		Test Method
		BOYD Part Number		
		BCTIM-210-1013		
Color		Beige		Visual
Reinforce Layer		PI film		
Surface Tack (0, 1 or 2 sided)		0		
Thermal Conductivity	W/m-K	1.3		ASTM D5470
Hardness	Shore OO (Shore A)	(89)		ASTM D2240
Thickness	mm	0.15		ASTM D374
Volume Resistivity	$\Omega$ -cm	$10^{12}$		ASTM D257
Breakdown Voltage	KV/mm	6		ASTM D149
Continuous Usage Temperature	°C	-60~180		
Flame Rating		V-0		UL 94
Note		General Thermal Pad, Reinforced, No Tackiness		

Properties	Units	Product Type: Silicone Thermal Gap Filler				Test Method
		BOYD Part Number				
		BCTIM-211-1014	BCTIM-211-1015	BCTIM-211-1016	BCTIM-211-1017	
Color		Gray				Visual
Reinforce Layer		No				
Surface Tack (0, 1 or 2 sided)		2	2	2	2	
Thermal Conductivity	W/m-K	1	2	3	4	ASTM D5470
Hardness	Shore OO (Shore A)	50~60	50~60	50~60	50~60	ASTM D2240
Thickness	mm	0.5 ~ 25	0.5 ~ 25	0.5 ~ 25	0.5 ~ 25	ASTM D374
Volume Resistivity	$\Omega$ -cm	$10^{13}$	$10^{13}$	$10^{12}$	$10^{12}$	ASTM D257
Breakdown Voltage	KV/mm	10	6	6	6	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		General Thermal Gap Filler, 2 Side Tacky				

Properties	Units	Product Type: Silicone Thermal Gap Filler				Test Method
		BOYD Part Number				
		BCTIM-211-1018	BCTIM-211-1019	BCTIM-212-1020	BCTIM-212-1021	
Color		Gray				Visual
Reinforce Layer		No				
Surface Tack (0, 1 or 2 sided)		2	2	2	2	
Thermal Conductivity	W/m-K	5	6	1	2	ASTM D5470
Hardness	Shore OO (Shore A)	50~60	50~60	20~30	20~30	ASTM D2240
Thickness	mm	0.5 ~ 25	0.5 ~ 25	0.5 ~ 6	0.5 ~ 6	ASTM D374
Volume Resistivity	$\Omega$ -cm	$10^{12}$	$10^{12}$	$10^{13}$	$10^{13}$	ASTM D257
Breakdown Voltage	KV/mm	6	6	10	6	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		General Thermal Gap Filler, 2 Side Tacky		Ultrasoft Thermal Gap Filler, 2 Side Tacky		

# TRANSTHERM™

Thermal Management Products by **BOYD CORPORATION**

Properties	Units	Product Type: Silicone Thermal Gap Filler				Test Method
		BOYD Part Number				
		BCTIM-212-1022	BCTIM-213-1023	BCTIM-213-1024	BCTIM-213-1025	
Color		Gray	Pink / White			Visual
Reinforce Layer		No	Fiberglass			
Surface Tack (0, 1 or 2 sided)		2	1	1	1	
Thermal Conductivity	W/m-K	3	1	2	3	ASTM D5470
Hardness	Shore OO (Shore A)	20~30	50~60	50~60	50~60	ASTM D2240
Thickness	mm	0.5 ~ 6	0.5 ~ 6	0.5 ~ 6	0.5 ~ 6	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>12</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	10	6	6	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		Ultrasoft Thermal Gap Filler, 2 Side Tacky	Soft Thermal Gap Filler, Reinforced, 1 Side Tacky			

Properties	Units	Product Type: Silicone Thermal Gap Filler				Test Method
		BOYD Part Number				
		BCTIM-213-1026	BCTIM-213-1027	BCTIM-214-1028	BCTIM-214-1029	
Color		Pink / White				Visual
Reinforce Layer		Fiberglass				
Surface Tack (0, 1 or 2 sided)		1	1	1	1	
Thermal Conductivity	W/m-K	4	5	1	2	ASTM D5470
Hardness	Shore OO (Shore A)	50~60	50~60	5	5	ASTM D2240
Thickness	mm	0.5 ~ 6	0.5 ~ 6	0.5 ~ 6	0.5 ~ 6	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	6	10	6	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		Soft Thermal Gap Filler, Reinforced, 1 Side Tacky		Ultra Soft Thermal Gap Filler, Reinforced, 1 Side Tacky		

Properties	Units	Product Type: Silicone Thermal Gap Filler				Test Method
		BOYD Part Number				
		BCTIM-214-1030	BCTIM-215-1031	BCTIM-215-1032	BCTIM-215-1033	
Color		Pink / White	Gray			Visual
Reinforce Layer		Fiberglass				
Surface Tack (0, 1 or 2 sided)		1	2	2	2	
Thermal Conductivity	W/m-K	3	1	2	3	ASTM D5470
Hardness	Shore OO (Shore A)	5	25	40	40	ASTM D2240
Thickness	mm	0.5 ~ 6	0.25 ~0.75	0.25 ~0.75	0.25 ~0.75	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>12</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	10	10	10	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		Ultra Soft Thermal Gap Filler, Reinforced, 1 Side Tacky	Thin Thermal Gap Filler, Reinforced, 2 Side Tacky			

# TRANSTHERM™

Thermal Management Products by **BOYD CORPORATION**

Properties	Units	Product Type: Silicone Thermal Gap Filler				Test Method
		BOYD Part Number				
		BCTIM-215-1034	BCTIM-216-1035	BCTIM-216-1036	BCTIM-216-1037	
Color		Blue	Gray			Visual
Reinforce Layer		Fiberglass	No			
Surface Tack (0, 1 or 2 sided)		2	2	2	2	
Thermal Conductivity	W/m-K	2.5	7	11	11	ASTM D5470
Hardness	Shore OO (Shore A)	75	70	70	40	ASTM D2240
Thickness	mm	0.25~0.75	0.5 ~ 6	0.5 ~ 6	0.5 ~ 6	ASTM D374
Volume Resistivity	Ω-cm	9.6x10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	6	6	6	ASTM D149
Continuous Usage Temperature	°C	-45~200	-50~200	-50~200	-50~200	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		Thin Thermal Gap Filler, Reinforced, 2 Side Tacky	High Performance Thermal Gap Filler, 2 Side Tacky			

Properties	Units	Product Type: Silicone Thermal Gap Filler			Test Method
		BOYD Part Number			
		BCTIM-216-1038	BCTIM-216-1039	BCTIM-216-1040	
Color		Gray		Blue	Visual
Reinforce Layer		No			
Surface Tack (0, 1 or 2 sided)		2	2	2	
Thermal Conductivity	W/m-K	13	17	6.5	ASTM D5470
Hardness	Shore OO (Shore A)	75	80	75	ASTM D2240
Thickness	mm	0.5 ~ 7	0.5 ~ 8	0.25~0.75	ASTM D374
Volume Resistivity	Ω-cm	11 <sup>12</sup>	12 <sup>12</sup>	9.6*10 <sup>12</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	6	6	ASTM D149
Continuous Usage Temperature	°C	-50~200	-50~200	-45~200	
Flame Rating		V-0	V-0	V-0	UL 94
Note		High Performance Thermal Gap Filler, 2 Side Tacky			

Properties	Units	Product Type: Non Silicone Thermal Gap Filler			Test Method
		BOYD Part Number			
		BCTIM-217-1041	BCTIM-217-1042	BCTIM-217-1043	
Color		Green	White / Ivory		Visual
Reinforce Layer		No			
Surface Tack (0, 1 or 2 sided)		1	1	1	
Thermal Conductivity	W/m-K	2~3	1.5	3	ASTM D5470
Hardness	Shore OO (Shore A)	40	<10(Asker C)	<30 (Asker C)	ASTM D2240
Thickness	mm	0.45 ~ 2	0.5~ 2	0.5~ 2	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>12</sup>	10 <sup>12</sup>	>10 <sup>14</sup>	ASTM D257
Breakdown Voltage	KV/mm	16	-	10	ASTM D149
Continuous Usage Temperature	°C	-20~120	-40~125	-40~125	
Flame Rating		-	V-0	V-0	UL 94
Note		Non Silicone Thermal Gap Pad (Binder: Acrylic)			

# TRANSTHERM™

Thermal Management Products by **BOYD CORPORATION**

Properties	Units	Product Type: Thermal Gap Filler - Putty Type			Test Method
		BOYD Part Number			
		BCTIM-218-1044	BCTIM-218-1045	BCTIM-218-1046	
Color		Gray			Visual
Reinforce Layer		Yes			
Surface Tack (0, 1 or 2 sided)		2	2	2	
Thermal Conductivity	W/m-K	6	6	11	ASTM D5470
Hardness	Shore OO (Shore A)	NA	NA	NA	ASTM D2240
Thickness	mm	1.5 / 2.0	0.11	1.5 / 2.0	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>9</sup>	10 <sup>9</sup>	10 <sup>7</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	6	6	ASTM D149
Continuous Usage Temperature	°C	-55~200	-55~200	-55~200	
Flame Rating		V-0	V-0	V-0	UL 94
Note		High Performance Thermal Gap Filler, Putty Type, 2 Side Tacky			

Properties	Units	Product Type: Thermal Gap Filler - Putty Type	Test Method
		BOYD Part Number	
		BCTIM-218-1047	
Color		Gray	Visual
Reinforce Layer		Yes	
Surface Tack (0, 1 or 2 sided)		2	
Thermal Conductivity	W/m-K	17	ASTM D5470
Hardness	Shore OO (Shore A)	NA	ASTM D2240
Thickness	mm	0.2~0.5	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>9</sup>	ASTM D257
Breakdown Voltage	KV/mm	6	ASTM D149
Continuous Usage Temperature	°C	-55~200	
Flame Rating		V-0	UL 94
Note		High Performance Thermal Gap Filler, Putty Type, 2 Side Tacky	

Properties	Units	Product Type: Thermal Adhesive Tape				Test Method
		BOYD Part Number				
		BCTIM-219-1048	BCTIM-219-1049	BCTIM-219-1050	BCTIM-219-1051	
Color		White				Visual
Reinforce Layer		No				
Surface Tack (0, 1 or 2 sided)		2	2	2	2	
Thermal Conductivity	W/m-K	1.5	1.5	1.5	1.5	ASTM D5470
Hardness	Shore OO (Shore A)	50~60	50~61	50~62	50~63	ASTM D2240
Thickness	mm	0.125	0.25	0.375	0.5	ASTM D374
Volume Resistivity	Ω-cm	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	10 <sup>12</sup>	ASTM D257
Breakdown Voltage	KV/mm	16	16	16	16	ASTM D149
Continuous Usage Temperature	°C	-20~120	-20~120	-20~120	-20~120	
Flame Rating		V-0	V-0	V-0	V-0	UL 94
Note		Non Silicone Thermal Adhesive Tape (Binder: Acrylic)				

Properties	Units	Product Type: Thermal Adhesive Tape		Test Method
		BOYD Part Number		
		BC-TIM-219-1052	BCTIM-219-1053	
Color		White		Visual
Reinforce Layer		Fiberglass		
Surface Tack (0, 1 or 2 sided)		2	2	
Thermal Conductivity	W/m-K	0.82	0.82	ASTM D5470
Hardness	Shore OO (Shore A)	NA	NA	ASTM D2240
Thickness	mm	0.15	0.25	ASTM D374
Volume Resistivity	$\Omega$ -cm	-	-	ASTM D257
Breakdown Voltage	KV/mm	13	20	ASTM D149
Continuous Usage Temperature	°C	-10~80	-10~80	
Flame Rating		-	-	UL 94
Note		Non Silicone Thermal Adhesive Tape (Binder: Acrylic)		

Properties	Units	Product Type: Phase Change		Test Method
		BOYD Part Number		
		BCTIM-220-1054		
Color		Gray		Visual
Reinforce Layer		-		
Surface Tack (0, 1 or 2 sided)		2		
Thermal Conductivity	W/m-K	3~5		ASTM D5470
Hardness	Shore OO (Shore A)	-		ASTM D2240
Thickness	mm	0.2		ASTM D374
Volume Resistivity	$\Omega$ -cm	10 <sup>12</sup>		ASTM D257
Breakdown Voltage	KV/mm	N/A		ASTM D149
Continuous Usage Temperature	°C	-40~125		
Phase Change Temperature	°C	50		
Flame Rating		-		UL 94
Note		Phase Change Material		