

# POWERBLOCK MODULES

## THYRISTOR MODULES

$I_T$ (AV) per Device	25A (Note 1)	55A (Note 1)	70A (Note 1)	90A (Note 1)	90A (Note 1)	160A (Note 1)	250A (Note 1)
Circuit Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number
1	5708	5710	5714	5720	5724	5726	5728
2		5711		5721			
3		5712		5722			
$V_{RRM}$	1600V	1200V	1600V	1200V	1600V	1600V	1600V
$V_F$ (Max)	1.55V @ 75A	1.4V @ 165A	1.48V @ 210A	1.4V @ 270A	1.4V @ 270A	1.7V @ 480A	1.73V @ 750A
$T_J$	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C
$di/dt$ ( $T_J = +125^\circ\text{C}$ )	100A/°s	100A/°s	50A/°s	100A/°s	100A/°s	800A/°s	100A/°s
$dv/dt$ ( $T_J = +125^\circ\text{C}$ )	500V/°s	500V/°s	800V/°s	500V/°s	500V/°s	100V/°s	800V/°s
$I_{TSM}$ (1/2 Cycle, 60Hz)	400A	1500A	1600A	1950A	1950A	5400A	8500A
$I^2t$ ( $t = 8.3\text{ms}$ )	670A <sup>2</sup> sec	9350A <sup>2</sup> sec	16000A <sup>2</sup> sec	15800A <sup>2</sup> sec	15800A <sup>2</sup> sec	146000A <sup>2</sup> sec	360000A <sup>2</sup> sec
$I_{GT}$ (Max @ +25°C)	150mA	150mA	100mA	150mA	150mA	150mA	180mA
$V_{GT}$ (Max @ +25°C)	3.0V	3.0V	2.5V	3.0V	3.0V	2.5V	3.0V
$P_{G(AV)}$	500mW	500mW	–	500mW	500mW	–	–
$V_{GM}$ (Max, Reverse)	5V	5V	–	5V	5V	–	–
$R_{THJC}$ (Per Module)	0.40°C/W	0.25°C/W	0.20°C/W	0.14°C/W	0.14°C/W	0.17°C/W	0.04°C/W
$V_{ISOL}$	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	3600V <sub>RMS</sub>
Diag. No.	422	422	422	422	422	609	610

## RECTIFIER MODULES

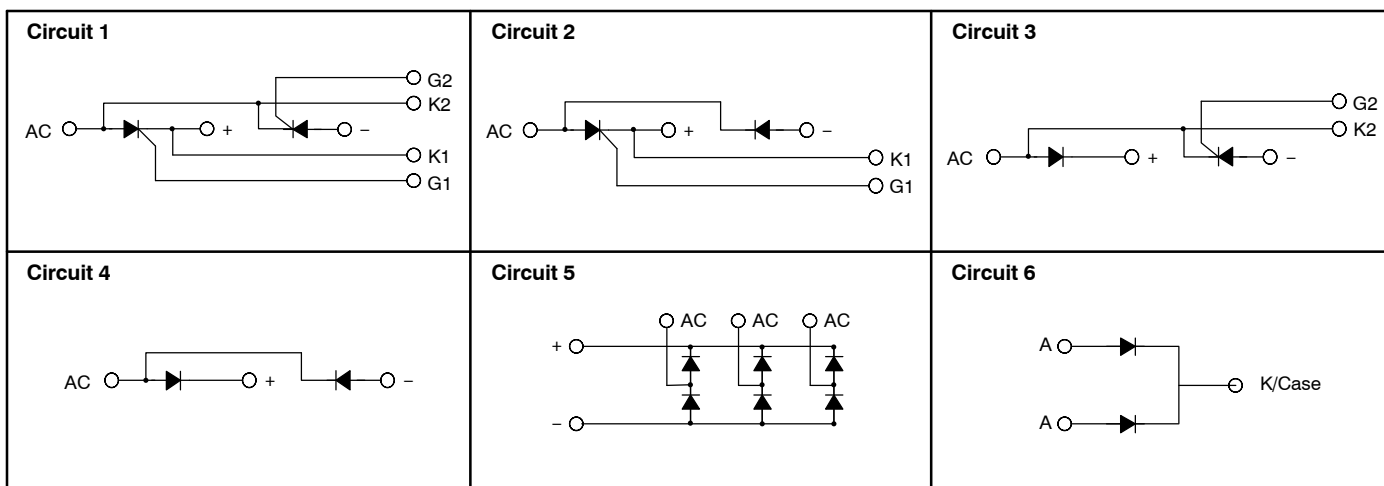
$I_T$ (AV) per Device	55A (Note 1)	60A (Note 1)	90A (Note 1)	100A (Note 2)	190A (Note 2)	200A (Note 3)	250A (Note 2)	320A (Note 2)
Circuit Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number
4	6220	6222	6230	6232	6234		6236	6238
5						6218		
$V_{RRM}$	1200V	1600V	1200V	1600V	1600V	600V	1600V	1600V
$V_F$ (Max)	1.4V @ 165A	1.4V @ 165A	1.33V @ 270A	1.45V @ 330A	1.38V @ 600A	1.45V @ 200A	1.29V @ 785A	1.28V @ 1004A
$T_J$	-40° to +125°C	-40° to +125°C	-40° to +125°C	-40° to +150°C	-40° to +150°C	-55° to +150°C	-40° to +150°C	-40° to +150°C
$di/dt$ ( $T_J = +125^\circ\text{C}$ )	100A/°s	100A/°s	–	–	–	–	–	–
$dv/dt$	500V/°s	500V/°s	–	–	–	–	–	–
$I_{TSM}$ (1/2 Cycle, 60Hz)	1500A	1500A	2.3KA	2.6KA	8.0KA	2000A	7345A	10580A
$I^2t$ ( $t = 8.3\text{ms}$ )	9350A <sup>2</sup> sec	9350A <sup>2</sup> sec	26.9A <sup>2</sup> s * 10 <sup>3</sup>	34.4A <sup>2</sup> s * 10 <sup>3</sup>	326A <sup>2</sup> s * 10 <sup>3</sup>	–	225000A <sup>2</sup> sec	466000A <sup>2</sup> sec
$I_{GT}$ (Max @ +25°C)	–	150mA	–	–	–	–	–	–
$V_{GT}$ (Max @ +25°C)	–	3.0V	–	–	–	–	–	–
$P_{G(AV)}$	–	500mW	–	–	–	–	–	–
$V_{GM}$ (Max, Reverse)	–	5V	–	–	–	–	–	–
$R_{THJC}$ (Per Module)	0.25°C/W	0.25°C/W	0.47°C/W	0.35°C/W	0.21°C/W	0.30°C/W	0.16°C/W	0.125°C/W
$V_{ISOL}$	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	2500V <sub>RMS</sub>	–	3000V <sub>RMS</sub>	3000V <sub>RMS</sub>
Diag. No.	422	422	422	422	744	752	610	610

## 3 PHASE BRIDGE MODULES

$I_O$ per Diode	30A	30A	75A	75A	100A	100A
Circuit Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number	NTE Number
5	5740	5741	5742	5743	5744	5745
$V_{RRM}$	800V	1600V	800V	1600V	800V	1600V
$V_F$ (Max)	1.1V @ 30A	1.1V @ 30A	1.15V @ 75A	1.15V @ 75A	1.15V @ 100A	1.3V @ 100A
$T_J$	-40°C to +125°C	-40°C to +125°C	-40°C to +150°C	-40°C to +150°C	-40°C to +150°C	-40°C to +150°C
$I_{TSM}$ (1 Cycle, 50Hz)	500A	500A	1000A	1000A	1200A	1200A
$R_{THJC}$	0.44°C/W	0.44°C/W	0.3°C/W	0.3°C/W	0.22°C/W	0.2°C/W
Diag. No.	757	757	618	618	618	745

Note 1.  $T_C = +85^\circ\text{C}$       Note 2.  $T_C = +100^\circ\text{C}$       Note 3.  $T_C = +90^\circ\text{C}$

# DIMENSIONAL OUTLINE DRAWINGS



## POWERBLOCK NOTES:

**MOUNTING:** Careful mounting of powerblocks on the heatsink is one of the most important requirements of reliable satisfactory application.

The contact surfaces of powerblock and heatsink must be clean, free from contamination and damage. Finish and flatness of heatsink contact surface should be  $\leq 10\mu\text{m}$ .

A thin and uniform film of interface thermal compound should be applied to contact surface of powerblock and heatsink.

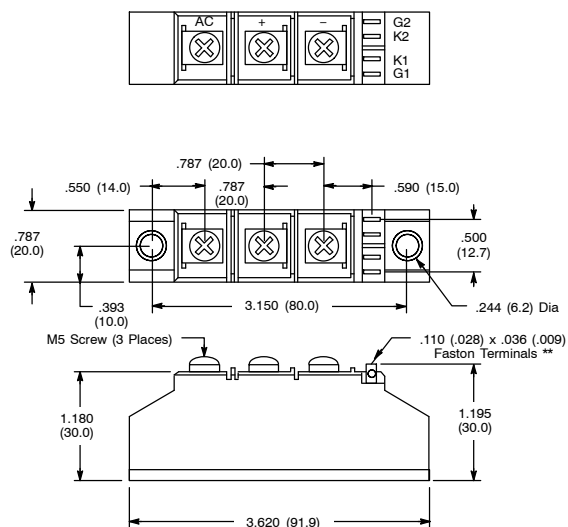
Fixing bolts have to be uniformly tightened with the specified mounting torque. Cross sections of busbars or cables have to be dimensioned so that heating up

the powerblock will be avoided. This applies in particular for series connected fuses.

**MAINTENANCE:** Powerblocks are maintenance-free. The assembly group should, however, be cleaned from time to time to ensure the insulation capability, the heat dissipation and thus the availability of the power converter.

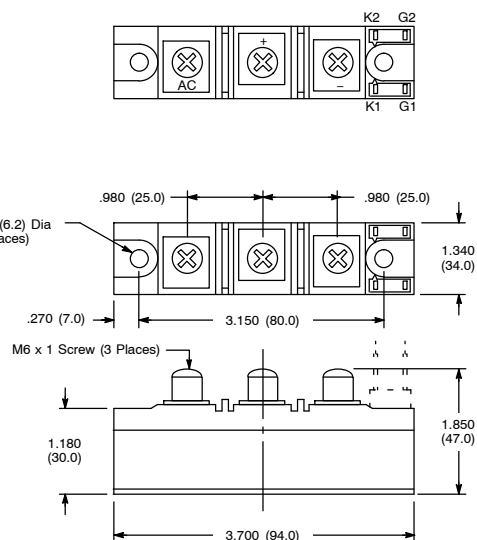
**WARNING:** Beryllium oxide is used in the powerblock assembly for insulation. Do not destroy the powerblock case because the beryllium oxide dust resulting from such action is hazardous if inhaled.

Diagram 422



NOTE: Can be used with Heat Sink NTE441A  
\*\* NTE6232 does not contain these pins.

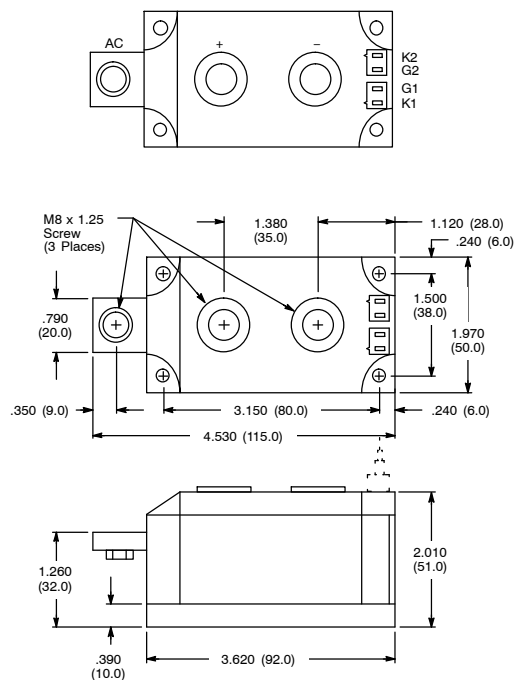
Diagram 609



NOTE: Can be used with Heat Sink NTE441A

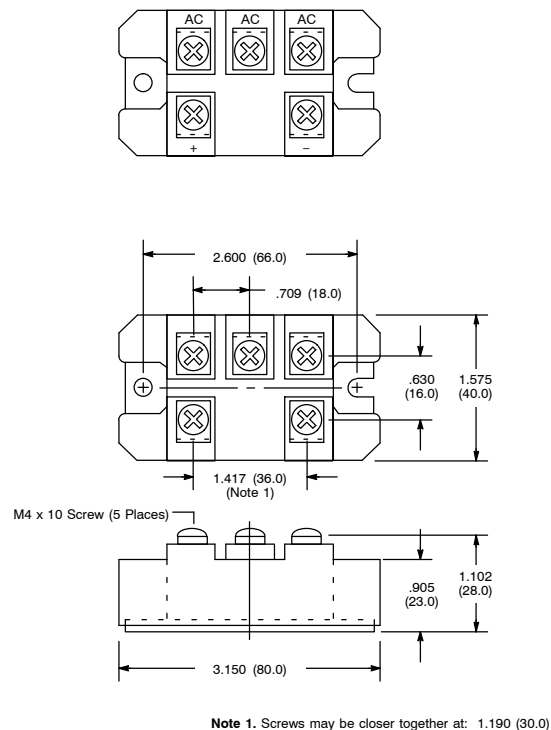
# DIMENSIONAL OUTLINE DRAWINGS

**Diagram 610**



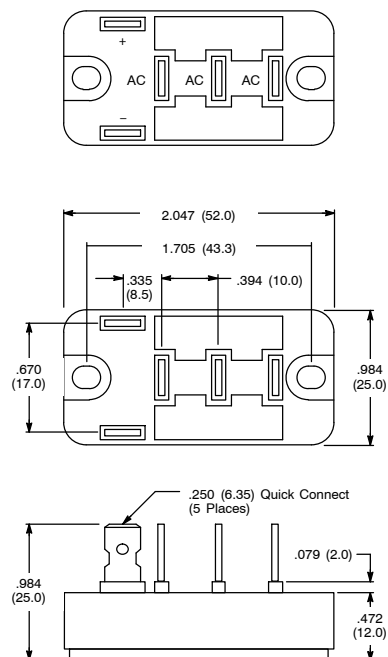
**NOTE:** Can be used with Heat Sink NTE441A

**Diagram 618**

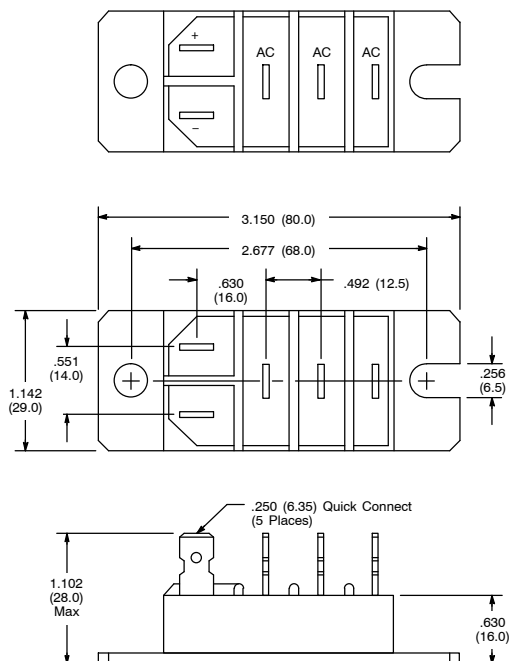


**Note 1.** Screws may be closer together at: 1.190 (30.0)

**Diagram 619**



**Diagram 620**



# DIMENSIONAL OUTLINE DRAWINGS

Diagram 744

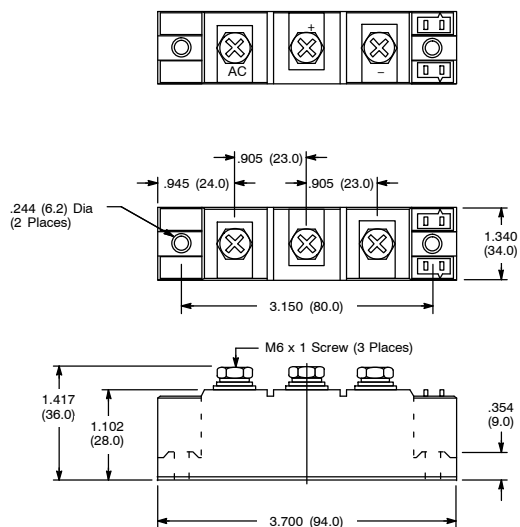


Diagram 745

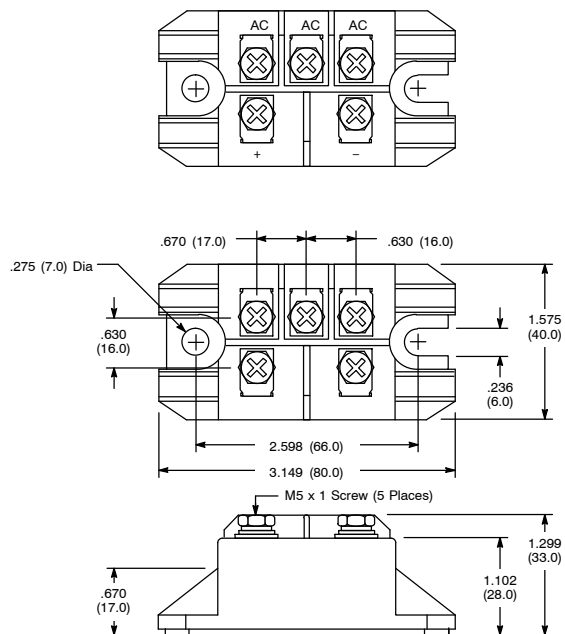


Diagram 752

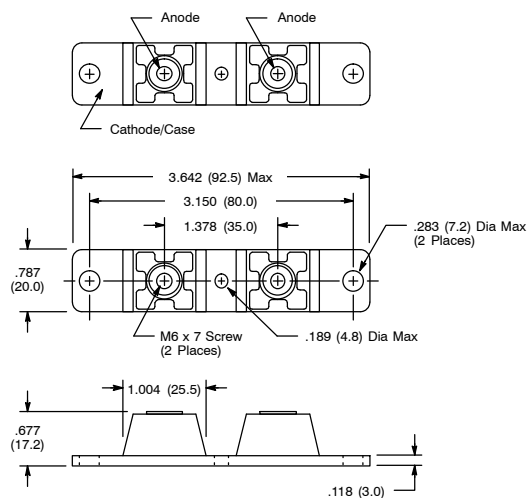
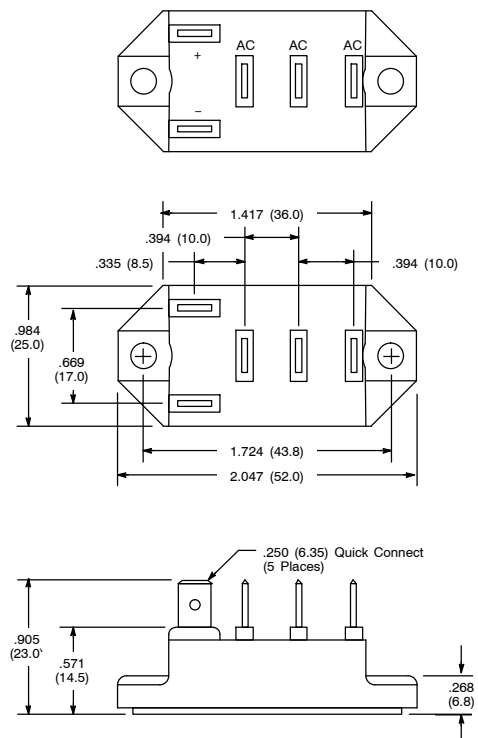


Diagram 757



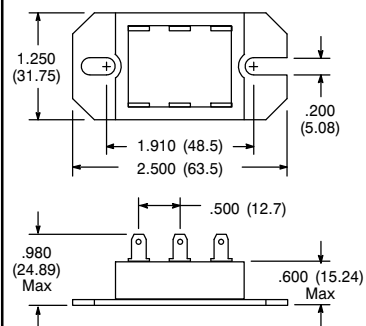
# HYBRID MODULES

NTE No.	Description	Terminal Positions	Schematic Diagrams
5700	Single Phase, Hybrid Bridge, Common Cathode, Freewheeling Diode		
5701	Single Phase, Hybrid Bridge, Common Anode, Freewheeling Diode		
5702	Single Phase, All SCR Bridge		
5703	SCR AC Switch		
5704	Hybrid Doubler		
5705	SCR Doubler		

Symbol	Rating	Unit
$V_{DRM}$	1200	V
$I_T(AV)$ **	1.25	A
$I_T(RMS)$ **	28	A
$I_{TSM}$ (1 Cycle)	375	A
$P_{GT}$ (Max)	8	W
$I_{GT}$ (Max)	60	mA
$V_{GT}$ (Max)	2	V
$V_{ISO}$	2500	V
$V_F$ (Max)	1.35	V
$I_O$ ***	25	A
$I^2T$	580	A <sup>2</sup> sec
$I_{Hold}$	100	mA
$dv/dt$	200	V/ $\mu$ sec
Terminal Torque	5	Nm

\*\* Per SCR or Rectifier  
 \*\*\* This Rating Applies to NTE5700, NTE5701, and NTE5702 Only

Diagram 452



NOTE: Can be used with Heat Sink NTE441A

\* For transient protection, a Metal Oxide Varistor (MOV) may be connected externally across terminals AC1 & AC2.