



# MT60CB08T1 THRU MT60CB18T1

## THYRISTOR DIODE MODULE

Reverse Voltage - 800 to 1800 Volts    Forward Current - 60 Ampere

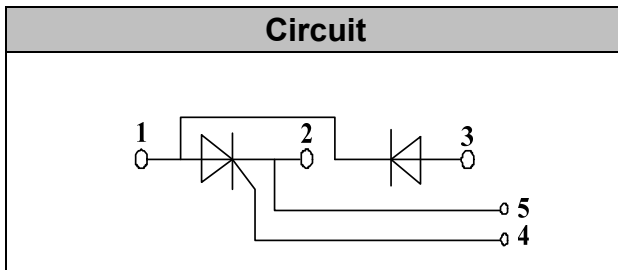


### Thyristor/Diode Modules

**VRRM / VDRM**    800 to 1800V  
**IFAV / ITAV**        60Amp

#### Applications

- Power Converters
- Lighting Control
- DC Motor Control and Drives
- Heat and temperature control



#### Features

- International standard package
- High Surge Capability
- Glass passivated chip
- Simple Mounting
- Heat transfer through aluminum oxide DBC ceramic isolated metal baseplate
- UL recognized applied for file no. E360040

### Module Type

TYPE	VRRM/VDRM	V <sub>RSM</sub>
MT60CB08T1	800V	900V
MT60CB12T1	1200V	1300V
MT60CB16T1	1600V	1700V
MT60CB18T1	1800V	1900V

### ◆ Diode

#### Maximum Ratings

Symbol	Item	Conditions	Values	Units
I <sub>D</sub>	Output Current(D.C.)	T <sub>c</sub> =85°C	60	A
I <sub>FSM</sub>	Surge forward current	t=10mS T <sub>vj</sub> =45°C	1500	A
i <sup>2</sup> t	Circuit Fusing Consideration		11000	A <sup>2</sup> s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
T <sub>vj</sub>	Operating Junction Temperature		-40 to +125	°C
T <sub>stg</sub>	Storage Temperature		-40 to +125	°C
M <sub>t</sub>	Mounting Torque	To terminals(M5)	3±15%	Nm
M <sub>s</sub>		To heatsink(M6)	5±15%	Nm
Weight	Module (Approximately)		100	g



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### Thermal Characteristics

Symbol	Item	Conditions	Values	Units
Rth(j-c)	Thermal Impedance, max.	Junction to Case	0.29	°C/W
Rth(c-s)	Thermal Impedance, max.	Case to Heatsink	0.10	°C/W

### Electrical Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
V <sub>FM</sub>	Forward Voltage Drop, max.	T=25°C I <sub>F</sub> =200A			1.65	V
I <sub>RRM</sub>	Repetitive Peak Reverse Current, max.	T <sub>vj</sub> =25°C V <sub>RD</sub> =V <sub>RRM</sub> T <sub>vj</sub> =125°C V <sub>RD</sub> =V <sub>RRM</sub>			≤0.5 ≤6	mA mA

### ◆ Thyristor

#### Maximum Ratings

Symbol	Item	Conditions	Values	Units
I <sub>TAV</sub>	Average On-State Current	Sine 180°;T <sub>c</sub> =85°C	60	A
I <sub>TSM</sub>	Surge On-State Current	T <sub>vj</sub> =45°C t=10ms, sine T <sub>vj</sub> =125°C t=10ms, sine	1500 1250	A
i <sup>2</sup> t	Circuit Fusing Consideration	T <sub>vj</sub> =45°C t=10ms, sine T <sub>vj</sub> =125°C t=10ms, sine	11000 8000	A2s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
T <sub>vj</sub>	Operating Junction Temperature		-40 to +125	°C
T <sub>stg</sub>	Storage Temperature		-40 to +125	°C
M <sub>t</sub>	Mounting Torque	To terminals(M5)	3 ± 15%	Nm
M <sub>s</sub>		To heatsink(M6)	5 ± 15%	Nm
di/dt	Critical Rate of Rise of On-State Current	T <sub>vj</sub> = T <sub>vJM</sub> , 2/3V <sub>DRM</sub> , I <sub>G</sub> =500mA Tr<0.5us,tp>6us	150	A/us
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	T <sub>j</sub> =T <sub>vJM</sub> ,2/3V <sub>DRM</sub> linear voltage rise	1000	V/us
a	Maximum allowable acceleration		50	m/s <sup>2</sup>



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### Thermal Characteristics

Symbol	Item	Conditions	Values	Units
Rth(j-c)	Thermal Impedance, max.	Junction to Case	0.57	°C/W
Rth(c-s)	Thermal Impedance, max.	Case to Heatsink	0.20	°C/W

### Electrical Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
V <sub>TM</sub>	Peak On-State Voltage, max.	T=25°C I <sub>T</sub> =200A			1.65	V
I <sub>RRM</sub> /I <sub>DRM</sub>	Repetitive Peak Reverse Current, max. / Repetitive Peak Off-State Current, max.	T <sub>VJ</sub> =T <sub>VJM</sub> , V <sub>R</sub> =V <sub>RRM</sub> , V <sub>D</sub> =V <sub>DRM</sub>			15	mA
V <sub>TO</sub>	On state threshold voltage	For power-loss calculations only (T <sub>VJ</sub> =125°C)			0.9	V
r <sub>T</sub>	Value of on-state slope resistance. max	T <sub>VJ</sub> =T <sub>VJM</sub>			3.5	mΩ
V <sub>GT</sub>	Gate Trigger Voltage, max.	T <sub>VJ</sub> =25°C , V <sub>D</sub> =6V			3.0	V
I <sub>GT</sub>	Gate Trigger Current, max.	T <sub>VJ</sub> =25°C , V <sub>D</sub> =6V			150	mA
V <sub>GD</sub>	Non-triggering gate voltage, max.	T <sub>VJ</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>			0.25	V
I <sub>GD</sub>	Non-triggering gate current, max.	T <sub>VJ</sub> =125°C, V <sub>D</sub> =2/3V <sub>DRM</sub>			6	mA
I <sub>L</sub>	Latching current, max.	T <sub>VJ</sub> =25°C , R <sub>G</sub> = 33 Ω		300	600	mA
I <sub>H</sub>	Holding current, max.	T <sub>VJ</sub> =25°C , V <sub>D</sub> =6V		150	250	mA
tgd	Gate controlled delay time	T <sub>VJ</sub> =25°C, I <sub>G</sub> =1A, diG/dt=1A/us	1			us
tq	Circuit commutated turn-off time	T <sub>VJ</sub> =T <sub>VJM</sub>	80			us



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### Performance Curves

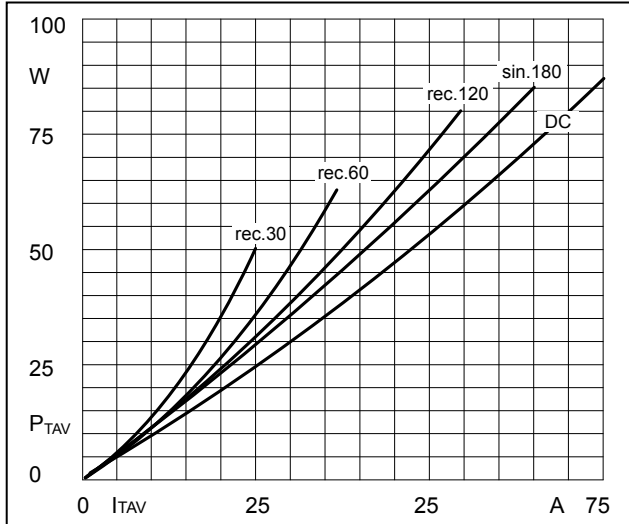


Fig1. Power dissipation

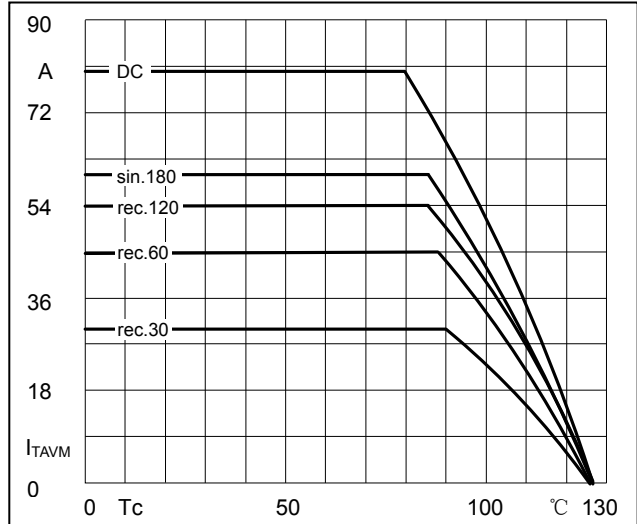


Fig2. Forward Current Derating Curve

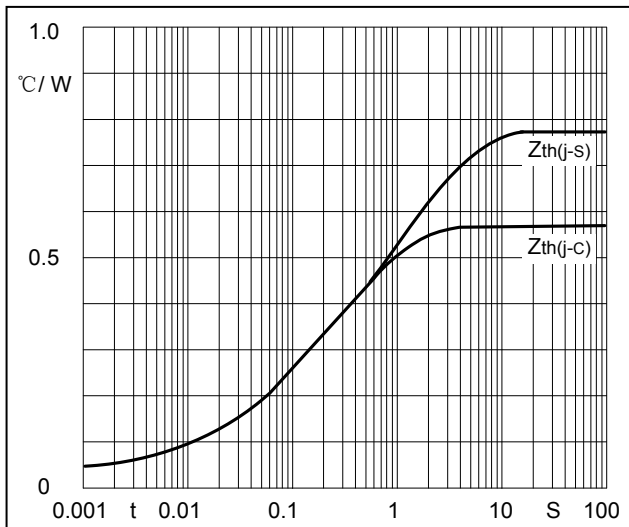


Fig3. Transient thermal impedance

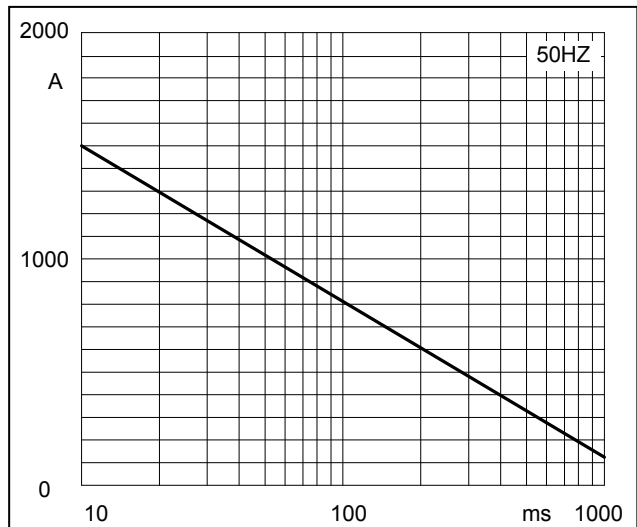


Fig4. Max Non-Repetitive Forward Surge Current

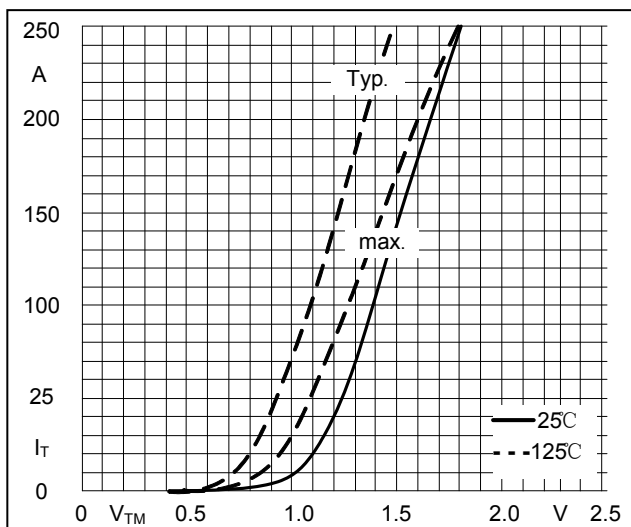


Fig5. Forward Characteristics



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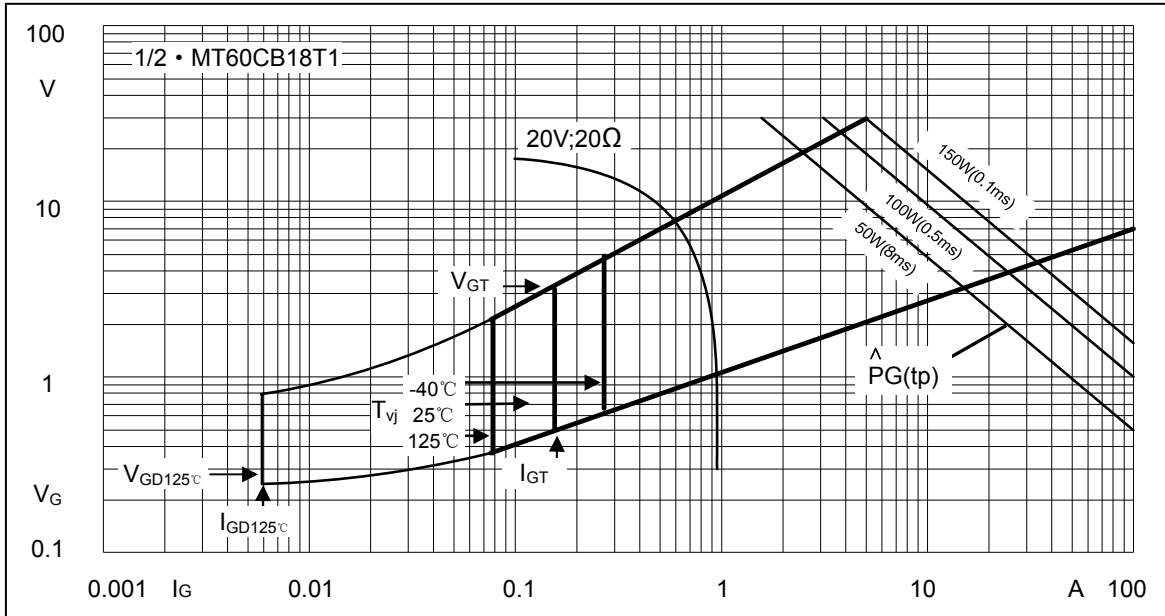
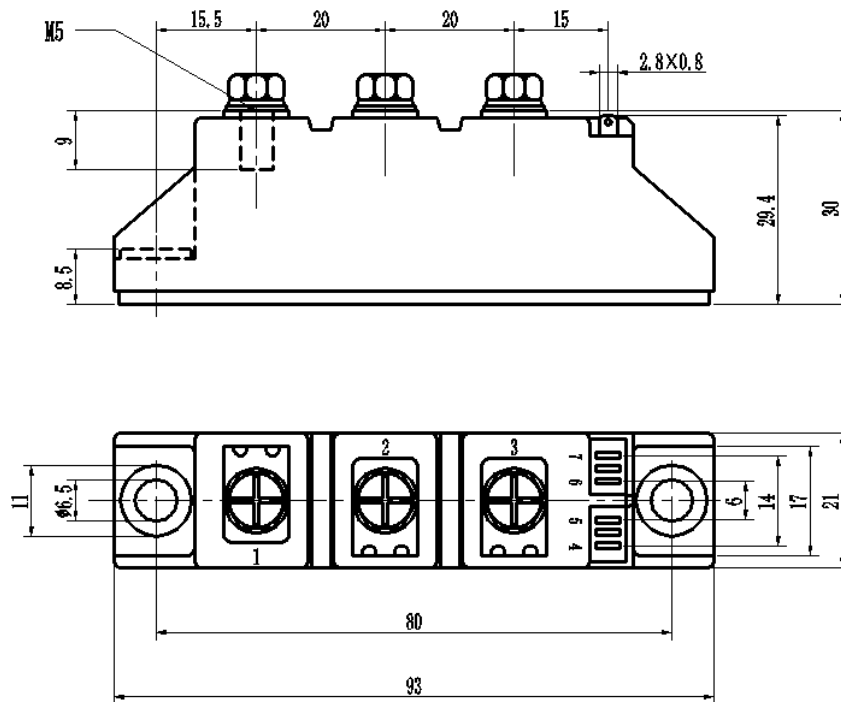


Fig6. Gate trigger Characteristics

### Package Outline Information

#### CASE: T1



Dimensions in mm