



Micro Commercial Components



Micro Commercial Components  
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**MT90CB08T1**  
**MT90CB12T1**  
**MT90CB16T1**  
**MT90CB18T1**

## Features

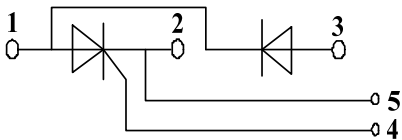
- Lead Free Finish/RoHS Compliant (NOTE 1) ("P" Suffix designates RoHS Compliant. See ordering information)
- International standard package
- Heat transfer through aluminum oxide DBC ceramic isolated metal baseplate
- Glass passivated chip
- Simple Mounting

## Applications

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

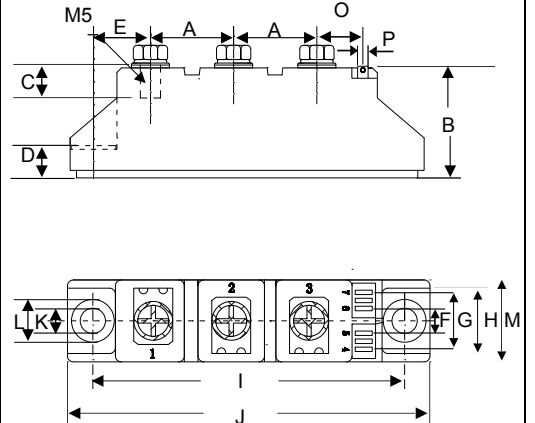


**Circuit**



**90 Amp**  
**THYRISTOR/DIODE**  
**MODULE**  
**800~1800 Volts**

T1



**DIMENSIONS**

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.776	.799	19.70	20.30	
B	1.169	1.193	29.70	30.30	
C	.343	.366	8.70	9.30	
D	.323	.346	8.20	8.80	
E	.602	.622	15.30	15.80	
F	.224	.248	5.70	6.30	
G	.539	.563	13.70	14.30	
H	.657	.681	16.70	17.30	
I	3.138	3.161	79.70	80.30	
J	3.650	3.673	92.70	93.30	
K	.256		6.50		∅
L	.421	.445	10.70	11.30	
M	.815	.839	20.70	21.30	
O	.579	.602	14.70	15.30	
P	0.11X0.032		2.8X0.8		

## Module Type

TYPE	VRRM	VRSM
MT90CB08T1	800V	900V
MT90CB12T1	1200V	1300V
MT90CB16T1	1600V	1700V
MT90CB18T1	1800V	1900V

## ◆ Diode

### Maximum Ratings

Symbol	Item	Conditions	Values	Units
$I_D$	Output Current(D.C.)	$T_c=85^\circ\text{C}$	90	A
$I_{FSM}$	Surge forward current	$t=10\text{mS } T_{vj}=45^\circ\text{C}$	2000	A
$i^2t$	Circuit Fusing Consideration		20000	$\text{A}^2\text{s}$
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
$T_{vj}$	Operating Junction Temperature		-40 to +125	$^\circ\text{C}$
$T_{stg}$	Storage Temperature		-40 to +125	$^\circ\text{C}$
$M_t$	Mounting Torque	To terminals(M5)	$3\pm 15\%$	Nm
$M_s$		To heatsink(M6)	$5\pm 15\%$	Nm
Weight	Module (Approximately)		100	g

### Thermal Characteristics

Symbol	Item	Conditions	Values	Units
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to Case	0.14	$^\circ\text{C/W}$
$R_{th(c-s)}$	Thermal Impedance, max.	Case to Heatsink	0.10	$^\circ\text{C/W}$

### Electrical Characteristics

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
$V_{FM}$	Forward Voltage Drop, max.	$T=25^\circ\text{C } I_F=300\text{A}$			1.65	V
$I_{RRM}$	Repetitive Peak Reverse Current, max.	$T_{vj}=25^\circ\text{C } V_{RD}=V_{RRM}$	$\leq 0.5$			mA
		$T_{vj}=125^\circ\text{C } V_{RD}=V_{RRM}$	$\leq 6$			mA

**◆Thyristor**
**Maximum Ratings**

Symbol	Item	Conditions	Values	Units
$I_{TAV}$	Average On-State Current	Sine 180°; $T_C=85^\circ\text{C}$	90	A
$I_{TSM}$	Surge On-State Current	$T_{VJ}=45^\circ\text{C}$ $t=10\text{ms}$ , sine $T_{VJ}=125^\circ\text{C}$ $t=10\text{ms}$ , sine	2000 1750	A
$i^2t$	Circuit Fusing Consideration	$T_{VJ}=45^\circ\text{C}$ $t=10\text{ms}$ , sine $T_{VJ}=125^\circ\text{C}$ $t=10\text{ms}$ , sine	20000 15000	A <sup>2</sup> s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
$T_{vj}$	Operating Junction Temperature		-40 to +130	°C
$T_{stg}$	Storage Temperature		-40 to +125	°C
$M_t$	Mounting Torque	To terminals(M5)	$3 \pm 15\%$	Nm
$M_s$		To heatsink(M6)	$5 \pm 15\%$	Nm
di/dt	Critical Rate of Rise of On-State Current	$T_{VJ}=T_{VJM}$ , $2/3V_{DRM}$ , $I_G=500\text{mA}$ $T_r < 0.5\mu\text{s}$ , $t_p > 6\mu\text{s}$	150	A/ $\mu\text{s}$
dv/dt	Critical Rate of Rise of Off-State Voltage, min.	$T_J=T_{VJM}$ , $2/3V_{DRM}$ linear voltage rise	1000	V/ $\mu\text{s}$
a	Maximum allowable acceleration		50	$\text{m/s}^2$

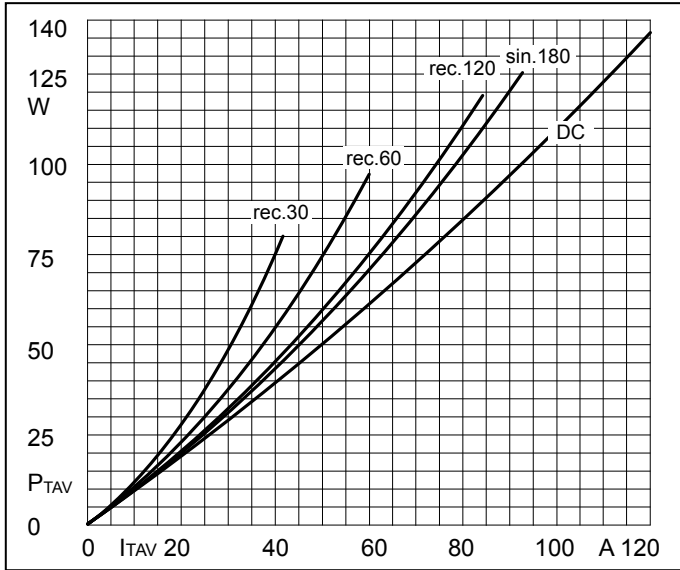
**Thermal Characteristics**

Symbol	Item	Conditions	Values	Units
$R_{th(j-c)}$	Thermal Impedance, max.	Junction to Case	0.28	°C/W
$R_{th(c-s)}$	Thermal Impedance, max.	Case to Heatsink	0.20	°C/W

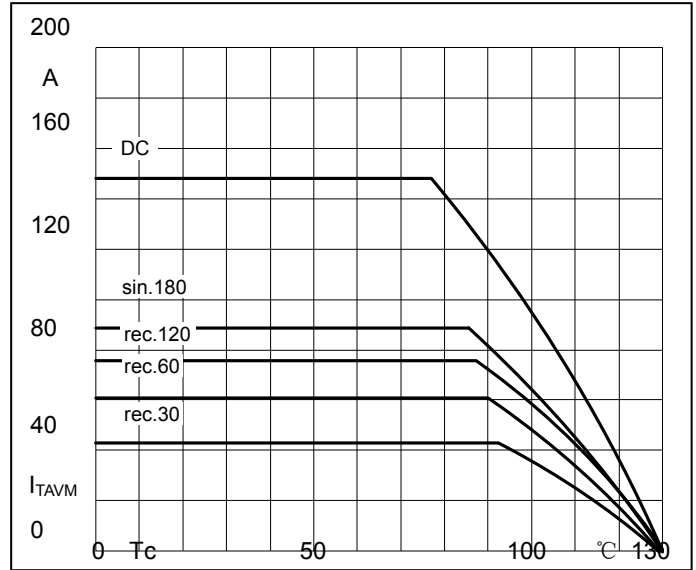
**Electrical Characteristics**

Symbol	Item	Conditions	Values		Units
$V_{TM}$	Peak On-State Voltage, max.	$T=25^\circ\text{C}$ $I_T=300\text{A}$		1.65	V
$I_{RRM}/I_{DRM}$	Repetitive Peak Reverse Current, max. / Repetitive Peak Off-State Current, max.	$T_{VJ}=T_{VJM}$ , $V_R=V_{RRM}$ , $V_D=V_{DRM}$		20	mA
$V_{TO}$	On state threshold voltage	For power-loss calculations only ( $T_{VJ}=125^\circ\text{C}$ )		0.9	V
$r_T$	Value of on-state slope resistance. max	$T_{VJ}=T_{VJM}$		2	m $\Omega$
$V_{GT}$	Gate Trigger Voltage, max.	$T_{VJ}=25^\circ\text{C}$ , $V_D=6\text{V}$		3	V
$I_{GT}$	Gate Trigger Current, max.	$T_{VJ}=25^\circ\text{C}$ , $V_D=6\text{V}$		150	mA
$V_{GD}$	Non-triggering gate voltage, max.	$T_{VJ}=125^\circ\text{C}$ , $V_D=2/3V_{DRM}$		0.25	V
$I_{GD}$	Non-triggering gate current, max.	$T_{VJ}=125^\circ\text{C}$ , $V_D=2/3V_{DRM}$		6	mA
$I_L$	Latching current, max.	$T_{VJ}=25^\circ\text{C}$ , $R_G=33\ \Omega$	300	600	mA
$I_H$	Holding current, max.	$T_{VJ}=25^\circ\text{C}$ , $V_D=6\text{V}$	150	250	mA
tgd	Gate controlled delay time	$T_{VJ}=25^\circ\text{C}$ , $I_G=1\text{A}$ , $diG/dt=1\text{A}/\mu\text{s}$	1		$\mu\text{s}$
tq	Circuit commutated turn-off time	$T_{VJ}=T_{VJM}$	100		$\mu\text{s}$

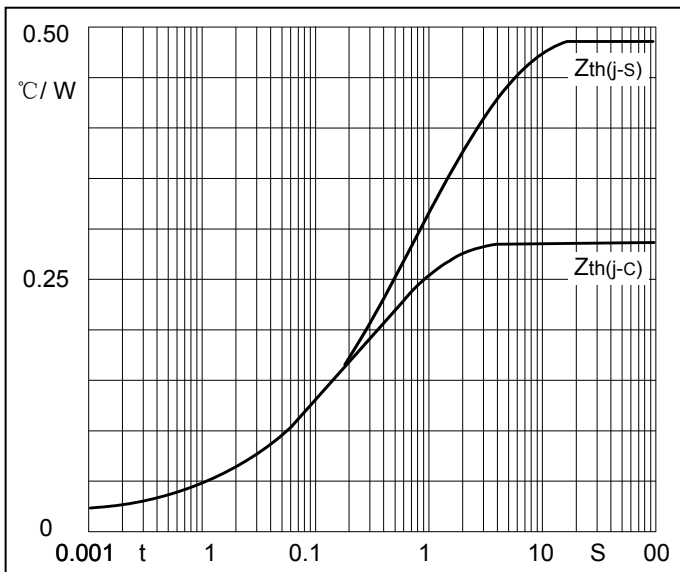
**Performance Curves**



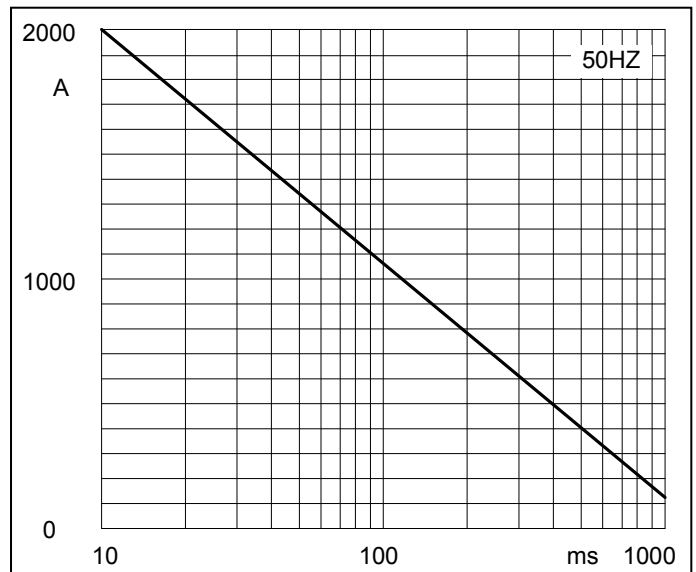
**Fig1. Power dissipation**



**Fig2. Forward Current Derating Curve**

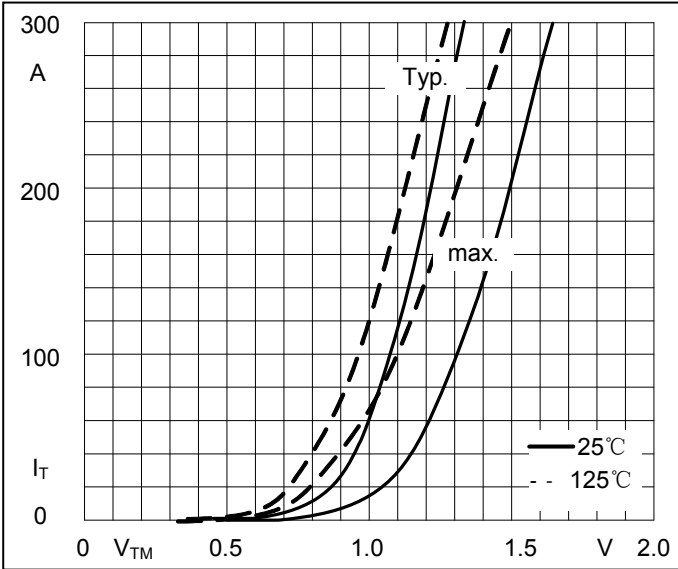


**Fig3. Transient thermal impedance**

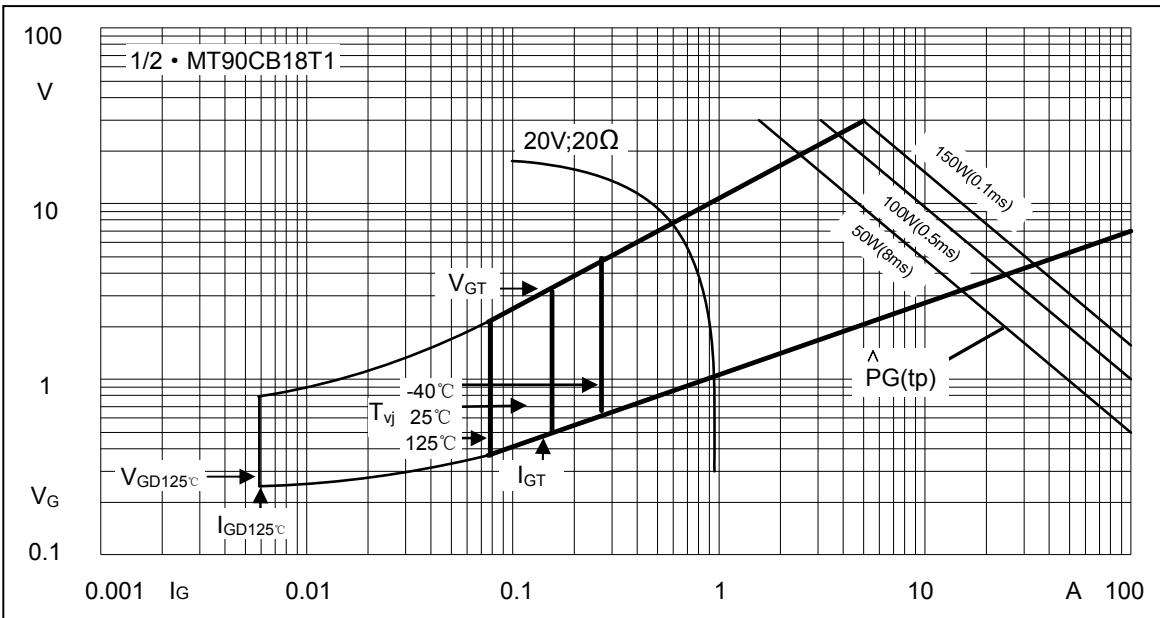


**Fig4. Max Non-Repetitive Forward Surge Current**

**Performance Curves**



**Fig5. Forward Characteristics**



**Fig6. Gate trigger Characteristics**



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## Ordering Information :

Device	Packing
Part Number-BP	Bulk: 10PCS/BOX ;100PCS/CTN

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