



Micro Commercial Components



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

## Features

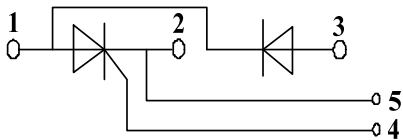
- Lead Free Finish/RoHS Compliant (NOTE 1) ("P" Suffix designates RoHS Compliant. See ordering information)
- International standard package
- Heat transfer through aluminum oxide DBC ceramic isolated metal baseplate
- Glass passivated chip
- Simple Mounting

## Applications

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

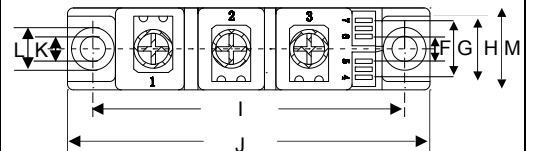
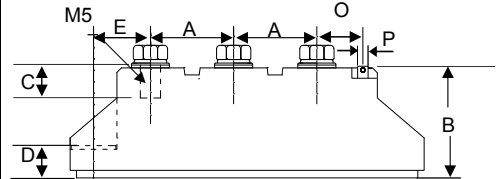


**Circuit**



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

T1



**DIMENSIONS**

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.776	0.799	19.50	20.50	
B	1.169	1.193	29.50	30.50	
C	0.343	0.366	8.50	9.50	
D	0.323	0.346	8.00	9.00	
E	0.602	0.622	15.10	16.00	
F	0.224	0.248	5.50	6.50	
G	0.539	0.563	13.50	14.50	
H	0.657	0.681	16.50	17.50	
I	3.138	3.161	79.50	80.50	
J	3.650	3.673	92.50	93.50	
K	0.256		6.50		∅
L	0.421	0.445	10.50	11.50	
M	0.815	0.839	20.50	21.50	
O	0.579	0.602	14.50	15.50	
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
Id	Output Current(D.C.)	Tc=85°C	90	A
IFSM	Surge forward current	t=10mS Tvj =45°C	2000	A
i <sup>2</sup> t	Circuit Fusing Consideration		20000	A <sup>2</sup> s
Visol	Isolation Breakdown Voltage(R.M.S)	a.c.50HZ;r.m.s.;1min	3000	V
Tvj	Operating Junction Temperature		-40 to +125	°C
Tstg	Storage Temperature		-40 to +125	°C
Mt	Mounting Torque	To terminals(M5)	3±15%	Nm
Ms		To heatsink(M6)	5±15%	Nm
Weight	Module (Approximately)		100	g

### Thermal Characteristics

Symbol	Item	Conditions	Values	Units
Rth(j-c)	Thermal Impedance, max.	Junction to Case	0.14	°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.	
VFM	Forward Voltage Drop, max.	T=25°C IF =300A			1.65	V
IRRM	Repetitive Peak Reverse Current, max.	Tvj =25°C VRD=VRRM	≤0.5			mA
		Tvj =125°C VRD=VRRM	≤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	$\text{m/s}^2$

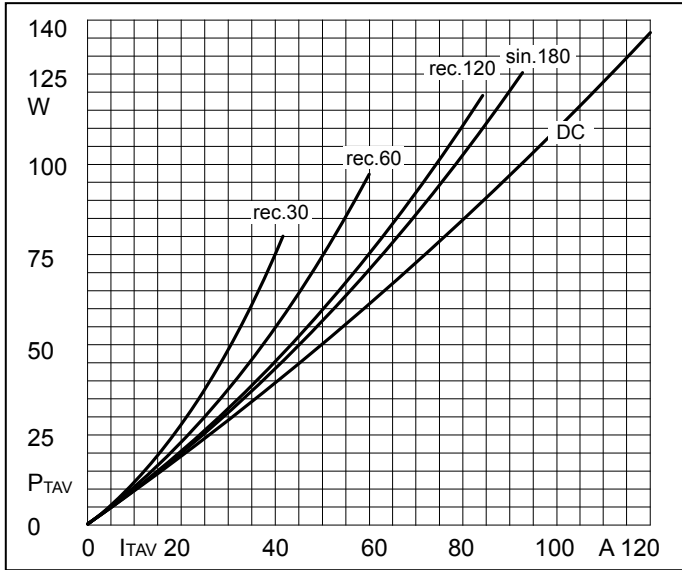
### Thermal Characteristics

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

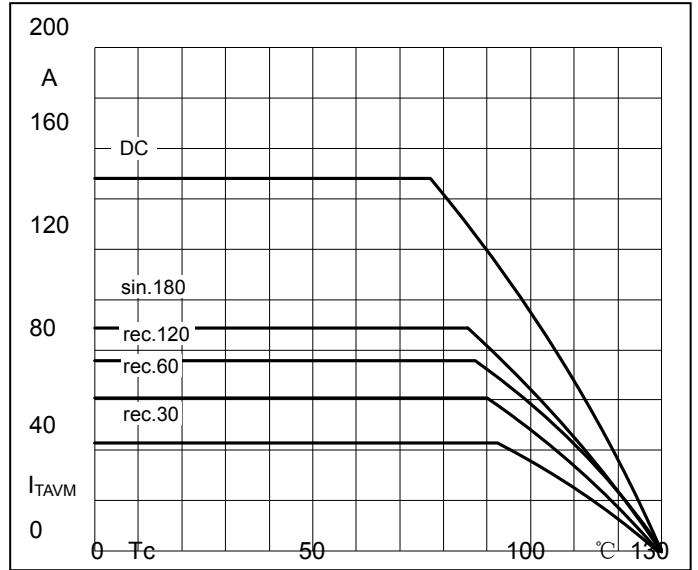
### Electrical Characteristics

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			$\mu$
tq	Circuit commutated turn-off time	$T_{VJ}=T_{VJM}$	100			us

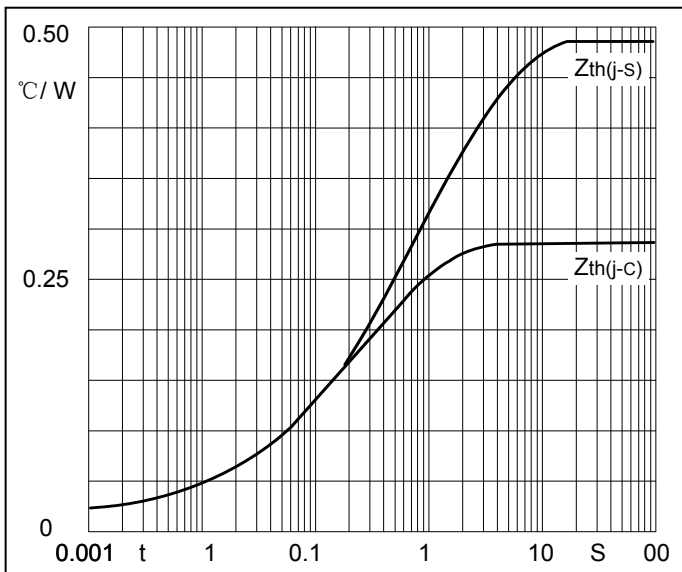
**Performance Curves**



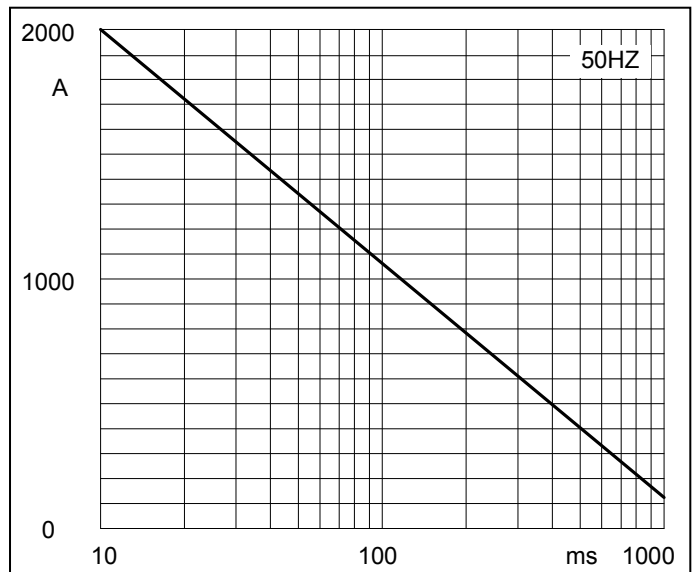
**Fig1. Power dissipation**



**Fig2. Forward Current Derating Curve**



**Fig3. Transient thermal impedance**



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

Performance Curves

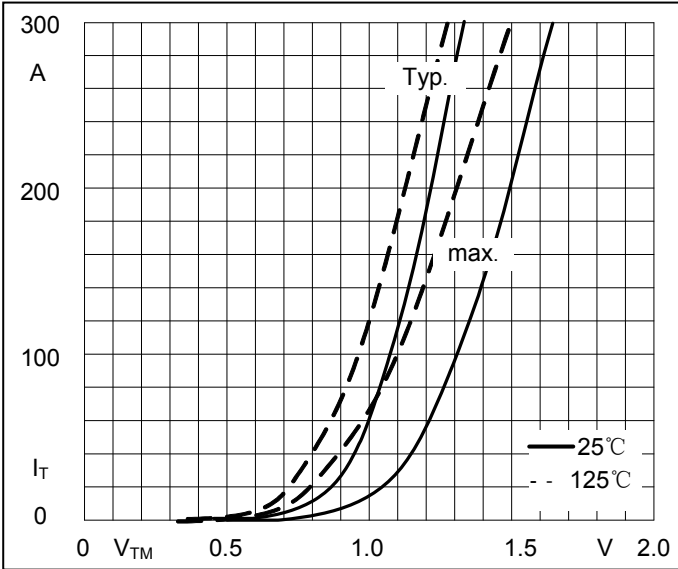


Fig5. Forward Characteristics

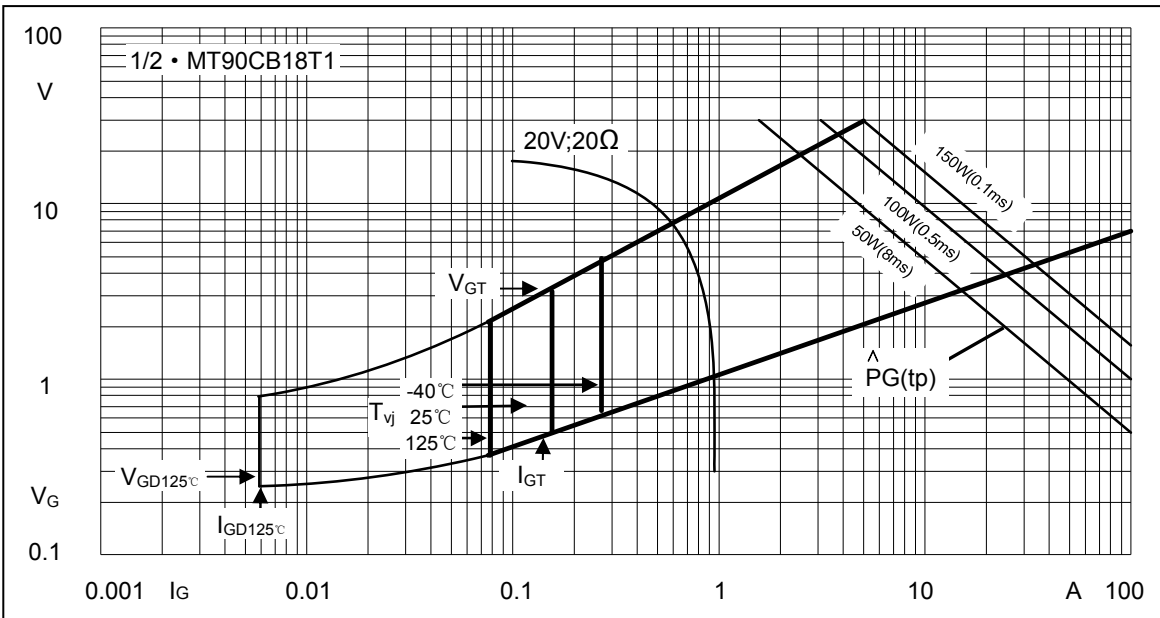


Fig6. Gate trigger Characteristics



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Ordering Information :

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

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