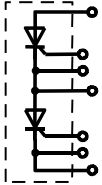
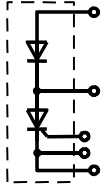
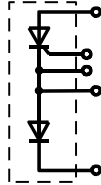


## Thyristor/Diode Modules M## 320

### Absolute Maximum Ratings

$V_{RRM}$ $V_{DRM}$ [V]	 MCC	 MCD	 MDC
3000	320-30io2	320-30io2	320-30io2
3200	320-32io2	320-32io2	320-32io2
3400	320-34io2	320-34io2	320-34io2
3600	320-36io2	320-36io2	320-36io2

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
$V_{DRM}$	Repetitive peak off-state voltage <sup>1)</sup>	3000 - 3600	V
$V_{DSM}$	Non-repetitive peak off-state voltage <sup>1)</sup>	3100 - 3700	V
$V_{RRM}$	Repetitive peak reverse voltage <sup>1)</sup>	3000 - 3600	V
$V_{RSM}$	Non-repetitive peak reverse voltage <sup>1)</sup>	3100 - 3700	V

	OTHER RATINGS	MAXIMUM LIMITS	UNITS
$I_{T(AV)M}$	Maximum average on-state current, $T_C = 85^\circ\text{C}$ <sup>2)</sup>	327	A
$I_{T(AV)M}$	Maximum average on-state current, $T_C = 100^\circ\text{C}$ <sup>2)</sup>	229	A
$I_{T(RMS)M}$	Nominal RMS on-state current, $T_C = 55^\circ\text{C}$ <sup>2)</sup>	765	A
$I_{T(d.c.)}$	D.C. on-state current, $T_C = 55^\circ\text{C}$	624	A
$I_{TSM}$	Peak non-repetitive surge $t_p = 10$ ms, $V_{RM} = 60\%V_{RRM}$ <sup>3)</sup>	5.0	kA
$I_{TSM2}$	Peak non-repetitive surge $t_p = 10$ ms, $V_{RM} \leq 10\text{V}$ <sup>3)</sup>	5.5	kA
$I^2t$	$I^2t$ capacity for fusing $t_p = 10$ ms, $V_{RM} = 60\%V_{RRM}$ <sup>3)</sup>	$125 \times 10^3$	$\text{A}^2\text{s}$
$I^2t$	$I^2t$ capacity for fusing $t_p = 10$ ms, $V_{RM} \leq 10\text{V}$ <sup>3)</sup>	$150 \times 10^3$	$\text{A}^2\text{s}$
$(di/dt)_{cr}$	Critical rate of rise of on-state current (non-repetitive) <sup>4)</sup>	400	$\text{A}/\mu\text{s}$
$V_{RGM}$	Peak reverse gate voltage	5	V
$P_{G(AV)}$	Mean forward gate power	4	W
$V_{ISOL}$	Isolation Voltage <sup>5)</sup>	3000	V
$V_{ISOL}$	Isolation Voltage <sup>6)</sup>	3600	V
$T_{vj\ op}$	Operating temperature range	-40 to +125	$^\circ\text{C}$
$T_{stg}$	Storage temperature range	-40 to +125	$^\circ\text{C}$

#### Notes:

- De-rating factor of 0.13% per  $^\circ\text{C}$  is applicable for  $T_{vj}$  below  $25^\circ\text{C}$ .
- Single phase; 50 Hz,  $180^\circ$  half-sinewave.
- Half-sinewave,  $125^\circ\text{C}$   $T_{vj}$  initial.
- $V_D = 67\% V_{DRM}$ ,  $I_{FG} = 2\text{A}$ ,  $t_r \leq 0.5\mu\text{s}$ ,  $T_C = 125^\circ\text{C}$ .
- AC RMS voltage, 50 Hz, 1 minute test
- AC RMS voltage, 50 Hz, 1 second test

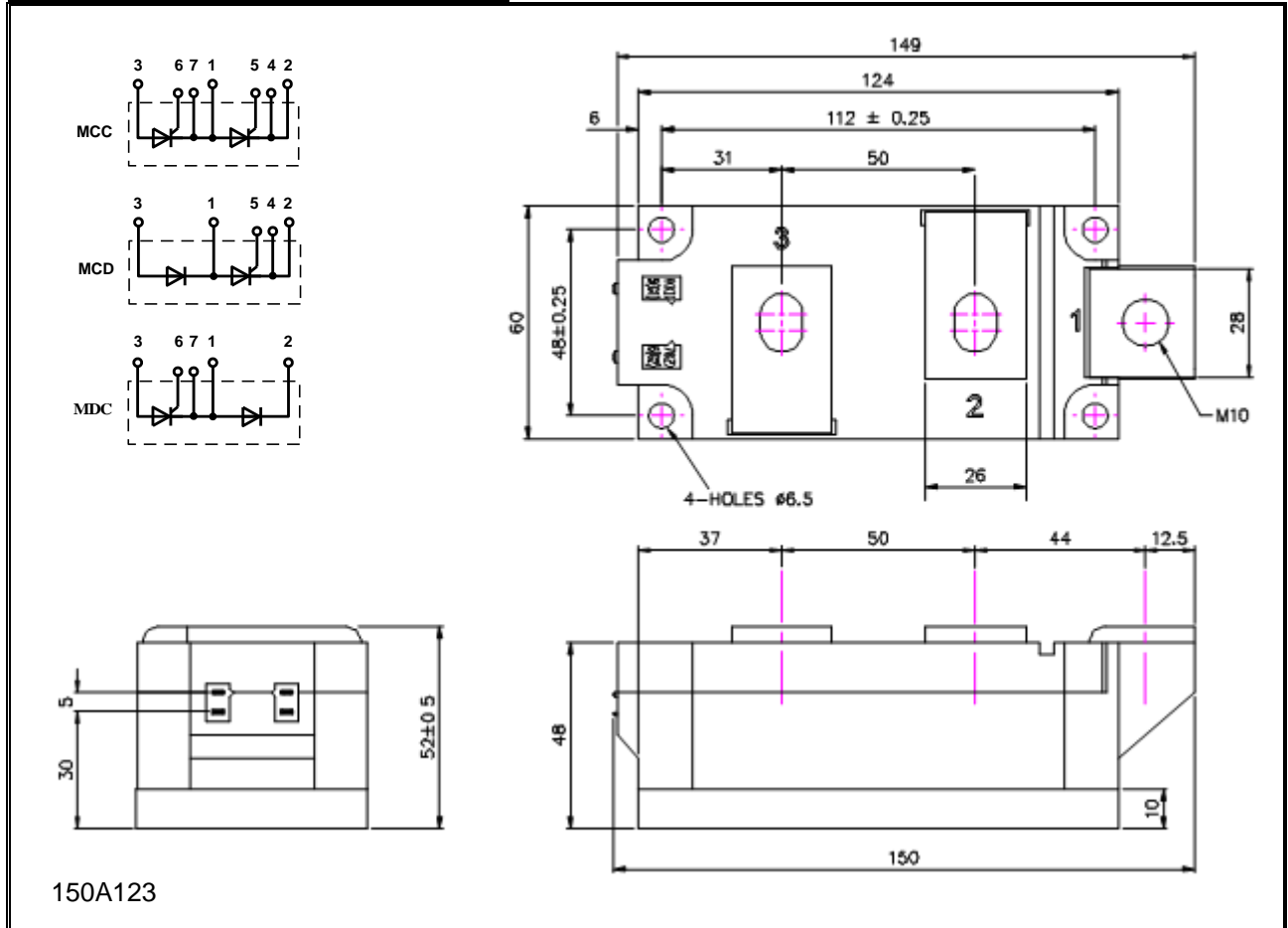
**Characteristics**

	PARAMETER	MIN.	TYP.	MAX.	TEST CONDITIONS <sup>1)</sup>	UNITS
V <sub>TM</sub>	Maximum peak on-state voltage	-	-	2.20	I <sub>TM</sub> = 785 A, T <sub>vj</sub> = 25°C	V
V <sub>TO</sub>	Threshold voltage	-	-	1.15		V
r <sub>T</sub>	Slope resistance	-	-	0.80		mΩ
(dv/dt) <sub>cr</sub>	Critical rate of rise of off-state voltage	1000	-	-	V <sub>D</sub> = 67% V <sub>DRM</sub> , linear ramp, Gate o/c	V/μs
I <sub>DRM</sub>	Peak off-state current	-	-	200	Rated V <sub>DRM</sub>	mA
I <sub>RDM</sub>	Peak reverse current	-	-	200	Rated V <sub>RDM</sub>	mA
V <sub>GT</sub>	Gate trigger voltage	-	-	2.50	T <sub>vj</sub> = 25°C, V <sub>D</sub> = 12 V, I <sub>T</sub> = 3 A	V
I <sub>GT</sub>	Gate trigger current	-	-	250		mA
V <sub>GD</sub>	Gate non-trigger voltage	0.35	-	-	67% V <sub>DRM</sub>	V
I <sub>GD</sub>	Gate non-trigger current	15	-	-	67% V <sub>DRM</sub>	mA
I <sub>L</sub>	Latching current	-	-	1000	V <sub>D</sub> = 12 V, T <sub>vj</sub> = 25°C	mA
I <sub>H</sub>	Holding current	-	-	300	V <sub>D</sub> = 12 V, T <sub>vj</sub> = 25°C	mA
t <sub>gd</sub>	Gate controlled turn-on delay time	-	-	3.0	I <sub>FG</sub> = 2 A, di <sub>g</sub> /dt = 1 A/μs, V <sub>D</sub> = 40% V <sub>DRM</sub> , I <sub>TM</sub> = 320 A, di/dt = 10 A/μs, T <sub>vj</sub> = 25°C	μs
t <sub>q</sub>	Turn-off time	-	-	320	I <sub>TM</sub> = 320 A, di/dt = 10 A/μs, V <sub>R</sub> = 100 V, V <sub>DR</sub> = 67% V <sub>DRM</sub> , dv <sub>DR</sub> /dt = 50 V/μs	μs
R <sub>thJC</sub>	Thermal resistance, junction to case	-	-	0.0650	Per arm	K/W
		-	-	0.0325	Whole Module	K/W
R <sub>thCH</sub>	Thermal resistance, case to heatsink	-	-	0.0200	Per arm	K/W
		-	-	0.0100	Whole Module	K/W
F <sub>1</sub>	Mounting force (to heatsink)	5.1	-	6.9		Nm
F <sub>2</sub>	Mounting force (to terminals)	10.8	-	13.2	<sup>2)</sup>	Nm
W <sub>t</sub>	Weight	-	1.5	-		kg

**Notes:**

- 1) Unless otherwise indicated T<sub>vj</sub>=125°C.
- 2) Screws must be lubricated.

**Outline Drawing & Ordering Information**



150A123

**ORDERING INFORMATION**

(Please quote 11 digit code as below)

<b>M</b>	<b>##</b>	<b>320</b>	<b>◆◆</b>	<b>io</b>	<b>2</b>
Fixed Type Code	Configuration code CC, CD or DC	Fixed Type Code	Voltage code $V_{RRM}/100$ 30-36	i = Critical dv/dt 1000 V/μs o = Typical turn-off time	Fixed Version Code

Typical order code: MCC320-36io2- MCC configuration, 3600V  $V_{RRM}$

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