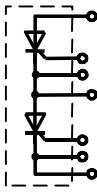
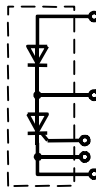
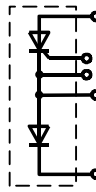


## Thyristor/Diode Modules M## 320

### 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, $V_{RM} \leq 10$ 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, $V_{RM} \leq 10$ 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
	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  $T_v$  below  $25^\circ\text{C}$ .
- Single phase; 50 Hz,  $180^\circ$  half-sinewave.
- Half-sinewave,  $125^\circ\text{C}$   $T_{vj}$  initial.
- $V_D = 67\% V_{DRM}$ ,  $I_{FG} = 2$  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

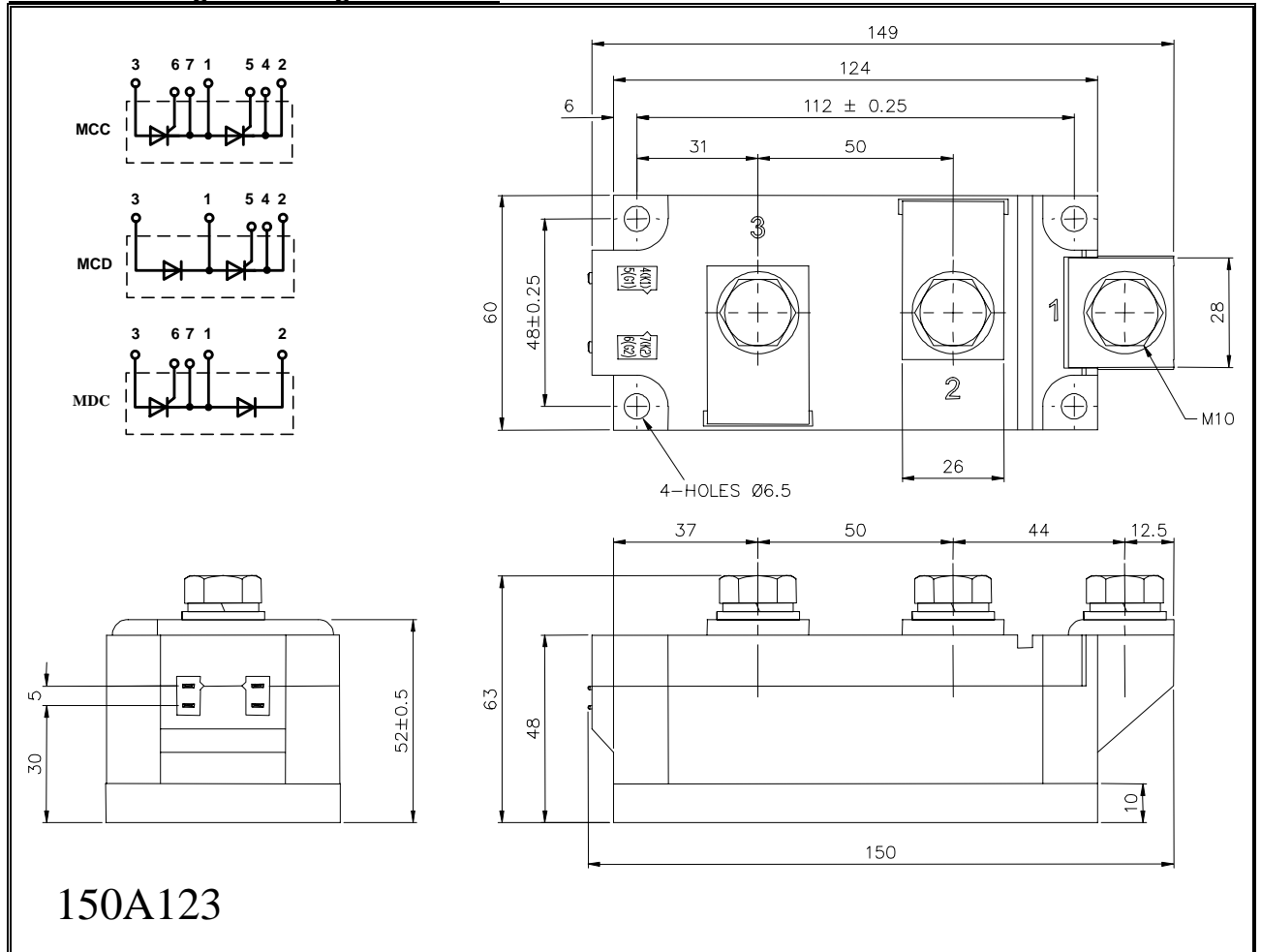
**Characteristics**

	PARAMETER	MIN.	TYP.	MAX.	TEST CONDITIONS <sup>1)</sup>	UNITS
$V_{TM}$	Maximum peak on-state voltage	-	-	2.20	$I_{TM} = 785 \text{ A}$ , $T_{vj} = 25^\circ\text{C}$	V
$V_{TO}$	Threshold voltage	-	-	1.15		V
$r_T$	Slope resistance	-	-	0.80		m $\Omega$
$(dv/dt)_{cr}$	Critical rate of rise of off-state voltage	1000	-	-	$V_D = 67\% V_{DRM}$ , linear ramp, Gate o/c	V/ $\mu\text{s}$
$I_{DRM}$	Peak off-state current	-	-	200	Rated $V_{DRM}$	mA
$I_{RRM}$	Peak reverse current	-	-	200	Rated $V_{RRM}$	mA
$V_{GT}$	Gate trigger voltage	-	-	2.50	$T_{vj} = 25^\circ\text{C}$ , $V_D = 12 \text{ V}$ , $I_T = 3 \text{ A}$	V
$I_{GT}$	Gate trigger current	-	-	250		mA
$V_{GD}$	Gate non-trigger voltage	0.35	-	-	$67\% V_{DRM}$	V
$I_{GD}$	Gate non-trigger current	15	-	-	$67\% V_{DRM}$	mA
$I_L$	Latching current	-	-	1000	$V_D = 12 \text{ V}$ , $T_{vj} = 25^\circ\text{C}$	mA
$I_H$	Holding current	-	-	300	$V_D = 12 \text{ V}$ , $T_{vj} = 25^\circ\text{C}$	mA
$t_{gd}$	Gate controlled turn-on delay time	-	-	3.0	$I_{FG} = 2 \text{ A}$ , $di_g/dt = 1 \text{ A}/\mu\text{s}$ , $V_D = 40\% V_{DRM}$ , $I_{TM} = 320 \text{ A}$ , $di/dt = 10 \text{ A}/\mu\text{s}$ , $T_{vj} = 25^\circ\text{C}$	$\mu\text{s}$
$t_q$	Turn-off time	-	-	320	$I_{TM} = 320 \text{ A}$ , $di/dt = 10 \text{ A}/\mu\text{s}$ , $V_R = 100 \text{ V}$ , $V_{DR} = 67\% V_{DRM}$ , $dv_{DR}/dt = 50 \text{ V}/\mu\text{s}$	$\mu\text{s}$
$R_{thJC}$	Thermal resistance, junction to case	-	-	0.0650	Per arm	K/W
		-	-	0.0325	Whole Module	K/W
$R_{thCH}$	Thermal resistance, case to heatsink	-	-	0.0200	Per arm	K/W
		-	-	0.0100	Whole Module	K/W
$F_1$	Mounting force (to heatsink)	5.1	-	6.9		Nm
$F_2$	Mounting force (to terminals)	10.8	-	13.2	<sup>2)</sup>	Nm
$W_t$	Weight	-	1.5	-		kg

**Notes:**

- 1) Unless otherwise indicated  $T_{vj}=125^\circ\text{C}$ .
- 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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