

DIGITRON SEMICONDUCTORS

MAC216(A) SERIES

SILICON BIDIRECTIONAL THYRISTORS

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak repetitive off-state voltage, gate open MAC216(A)-4 MAC216(A)-6 MAC216(A)-7 MAC216(A)-8	V_{DRM}	200 400 500 600	Volts
Peak gate voltage	V_{GM}	10	Volts
RMS on-state current ($T_C = 80^\circ\text{C}$)	$I_{T(RMS)}$	6	Amps
Peak non-repetitive surge current (1 cycle, 60 Hz)	I_{TSM}	60	Amps
Circuit fusing considerations ($t = 1.0\text{ms}$)	I^2t	18	A^2s
Critical rate of rise of on-state current	di/dt	10	$\text{A}/\mu\text{s}$
Peak gate power (pulse width = $10\mu\text{s}$)	P_{GM}	10	Watts
Average gate power ($T_C = 80^\circ\text{C}$, $t = 8.3\text{ms}$)	$P_{G(AV)}$	0.5	Watts
Peak gate current (pulse width = $10\mu\text{s}$)	I_{GM}	3.5	Amps
Operating junction temperature range	T_J	-40 to +100	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +125	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta JC}$	2.2	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak off state current ⁽¹⁾ (Rated V_{DRM} = peak off state voltage, gate open @ $T_C = 25^\circ\text{C}$) (Rated V_{DRM} = peak off state voltage, gate open @ $T_C = 100^\circ\text{C}$)	I_{DRM}	- -	0.01 0.2	0.1 0.5	mA
Peak on-state voltage ⁽¹⁾ (Pulse width = 1.0ms , duty cycle < 2%, $I_{TM} = 8.5\text{A}$ peak)	V_{TM}	-	1.4	1.83	Volts
Critical rate of rise of off-state voltage ⁽¹⁾ (Rated V_{DRM} , gate open, exponential waveform, $T_C = 100^\circ\text{C}$)	dv/dt	50	100	-	$\text{V}/\mu\text{s}$
Critical rate of rise of commutating off-state voltage ⁽¹⁾ ($I_{T(RMS)}$ = Rated RMS on-state current, V_{DRM} = rated peak off-state voltage, gate open, commutating $di/dt = 3.2\text{A}/\text{ms}$)	$dv/dt(c)$	4	-	-	$\text{V}/\mu\text{s}$
Gate trigger current ⁽²⁾ ($V_D = 12\text{V}$, trigger mode) MT2(-),G(+), $R_L = 50\Omega$, "A" only MT2(+),G(+), $R_L = 100\Omega$ MT2(-),G(-), $R_L = 100\Omega$ MT2(+),G(-), $R_L = 50\Omega$ MT2(+),G(+), $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ MT2(-),G(-), $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ MT2(+),G(-), $R_L = 25\Omega$, $T_C = -40^\circ\text{C}$ (MAC216) MT2(-),G(+), $R_L = 50\Omega$, $T_C = -40^\circ\text{C}$ (MAC216A)	I_{GT}	- - - - - - - -	40 10 20 25 - - - -	75 50 50 50 80 80 75 120	mA

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Characteristic	Symbol	Min	Typ.	Max	Unit
Gate trigger voltage ⁽²⁾ ($V_D = 12V$, trigger mode) MT2(-),G(+), $R_L = 50\Omega$, "A" only MT2(+),G(+), $R_L = 100\Omega$ MT2(-),G(-), $R_L = 100\Omega$ MT2(+),G(-), $R_L = 50\Omega$ MT2(+),G(+), $R_L = 50\Omega$, $T_C = -40^\circ C$ MT2(-),G(-), $R_L = 50\Omega$, $T_C = -40^\circ C$ MT2(+),G(-), $R_L = 25\Omega$, $T_C = -40^\circ C$ (MAC216) MT2(-),G(-), $R_L = 50\Omega$, $T_C = -40^\circ C$ (MAC216A) MT2(+),G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ MT2(-),G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ MT2(+),G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ MT2(-),G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$	V_{GT}	-	0.8	2.5	Volts
Holding current ⁽¹⁾ ($V_D = 24V$, initiating current = 0.5A, pulse width = 1ms, duty cycle $\leq 2\%$, gate trigger source = 7V, 20 Ω) $T_C = 25^\circ C$ $T_C = -40^\circ C$	I_H	-	15	50 100	mA
Latching current ⁽²⁾ ($V_D = 24V$, gate trigger source = 15V, 100 Ω , trigger mode) MT2(-),G(+) "A" only MT2(+),G(+) MT2(-),G(-) MT2(+),G(-) MT2(+),G(+), $T_C = -40^\circ C$ MT2(-),G(-), $T_C = -40^\circ C$ MT2(+),G(-), $T_C = -40^\circ C$ (MAC216) MT2(-),G(+), $T_C = -40^\circ C$ (MAC216A)	I_L	-	-	200 100 100 200 200 200 200 400	mA

Note 1: Value apply for either polarity of Main Terminal 2 characteristics reference to Main Terminal 1.
 Note 2: Main Terminal 1 is the reference terminal.

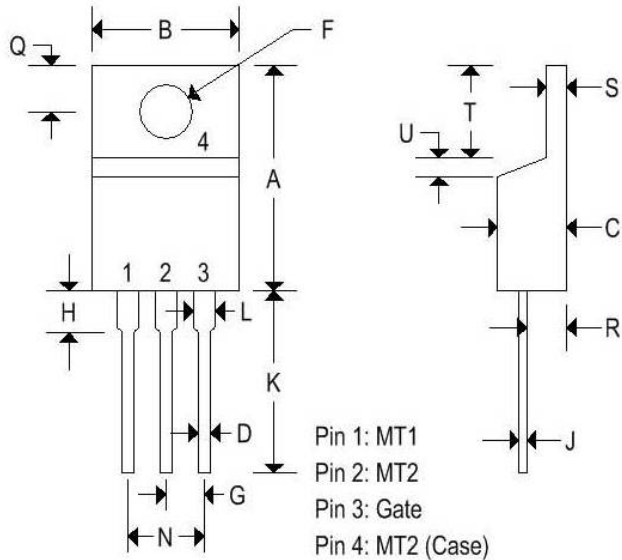
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MECHANICAL CHARACTERISTIC

Case	TO-220AB
Marking	Body painted, alpha-numeric
Pin out	See below



	TO-220AB			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.575	0.620	14.600	15.750
B	0.380	0.405	9.650	10.290
C	0.160	0.190	4.060	4.820
D	0.025	0.035	0.640	0.890
F	0.142	0.147	3.610	3.730
G	0.095	0.105	2.410	2.670
H	0.110	0.155	2.790	3.930
J	0.014	0.022	0.360	0.560
K	0.500	0.562	12.700	14.270
L	0.045	0.055	1.140	1.390
N	0.190	0.210	4.830	5.330
Q	0.100	0.120	2.540	3.040
R	0.080	0.110	2.040	2.790
S	0.045	0.055	1.140	1.390
T	0.235	0.255	5.970	6.480
U	-	0.050	-	1.270
V	0.045	-	1.140	-
Z	-	0.080	-	2.030

