

DIGITRON SEMICONDUCTORS

SC245, SC246, (MAC245) SC245()3 SERIES

THYRISTOR

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⁽¹⁾ ($T_C = -40$ to $+100^\circ\text{C}$) SC245B, SC246B, S245B3, MAC245B SC245D, SC246D, S245D3, MAC245D SC245E, SC246E, S245E3, MAC245M SC245M, SC246M, S245M3, MAC245N	V_{DRM}	200 400 500 600	Volts
Forward on-state current RMS	$I_{\text{T(RMS)}}$	10	Amps
Peak forward surge current (one cycle, sine wave, 60Hz)	I_{TSM}	100	Amps
Circuit fusing considerations ($t = 1\text{ms}$) ($t = 8.3\text{ms}$)	I^2t	20 41.5	A^2s
Peak gate power	P_{GM}	10	Watts
Average gate power	$P_{\text{G(AV)}}$	0.5	Watts
Operating junction temperature range	T_J	-40 to +100	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +125	$^\circ\text{C}$
Stud torque		30	In. lb.

Note 1: Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta\text{JC}}$	2.0	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Peak off state current⁽²⁾ ($V_D =$ rated V_{DRM} , gate open) $T_C = 25^\circ\text{C}$ $T_C = 115^\circ\text{C}$	I_{DRM}	- -	- -	0.1 0.5	mA
Peak on-state voltage⁽²⁾ ($I_{\text{TM}} = 14\text{A}$ peak, pulse width = 1ms, duty cycle $\leq 2\%$)	V_T	-	-	1.65	Volts
Critical rate of rise of off-state voltage⁽²⁾ (Rated V_{DRM} , gate open, exponential waveform, $T_C = 100^\circ\text{C}$)	dv/dt	-	50	-	$\text{V}/\mu\text{s}$
Critical rate of rise of commutating off-state voltage⁽²⁾ ($I_{\text{T(RMS)}}$ = Rated RMS on state current, $V_D = V_{\text{DRM}}$, gate open, commutating $di/dt = 5.4\text{A}/\text{ms}$, $T_C = 78.5^\circ\text{C}$)	$dv/dt(c)$	4	-	-	$\text{V}/\mu\text{s}$
Gate trigger current⁽³⁾ ($V_D = 12\text{V}$), trigger mode 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(-), $R_L = 25\Omega$, $T_C = -40^\circ\text{C}$	I_{GT}	- - - - - -	- - - - - -	50 50 50 80 80 80	mA

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Characteristic	Symbol	Min.	Typ.	Max.	Unit
Gate trigger voltage ⁽³⁾ ($V_D = 12V$), trigger mode 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(-), $R_L = 25\Omega$, $T_C = -40^\circ C$ MT2(+), G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽⁴⁾ MT2(-), G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽⁴⁾ MT2(+), G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽⁴⁾ MT2(-), G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽⁴⁾	V_{GT}	-	-	2.5	Volts
Holding current ⁽²⁾ (main terminal voltage = 24V, peak initiating current = 0.5A, pulse width = 0.1 to 10ms, gate trigger source = 7V, 20 Ω) $T_C = 25^\circ C$ $T_C = -40^\circ C$	I_H	-	-	50	mA
Latching current ⁽²⁾ (main terminal voltage = 24V, gate trigger source = 15V, 100 Ω , pulse width = 50 μs , rise and fall times maximum = 5 μs) MT2(+), G(+) MT2(-), G(-) MT2(+), G(-) MT2(+), G(+), $T_C = -40^\circ C$ MT2(-), G(-), $T_C = -40^\circ C$ MT2(+), G(-), $T_C = -40^\circ C$	I_L	-	-	100	mA

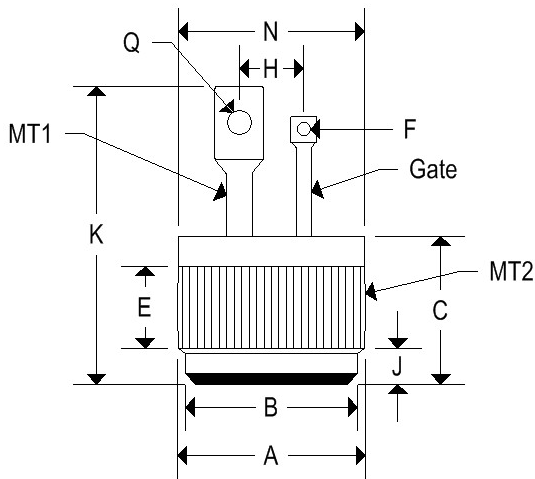
Note 2: Values apply for either polarity of Main Terminal 2 characteristics referenced to Main Terminal 1.

Note 3: Main Terminal 1 is the reference terminal.

Note 4: With V_D to rated off-state voltage.

MECHANICAL CHARACTERISTICS

Case	Digi PF1 (SC246 Series)
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	DIGI PF1			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.501	0.505	12.730	12.830
F	-	0.160	-	4.060
G	0.085	0.095	2.160	2.410
H	0.060	0.070	1.520	1.780
J	0.300	0.350	7.620	8.890
K	-	1.050	-	26.670
L	-	0.670	-	17.020
Q	0.055	0.085	1.400	2.160

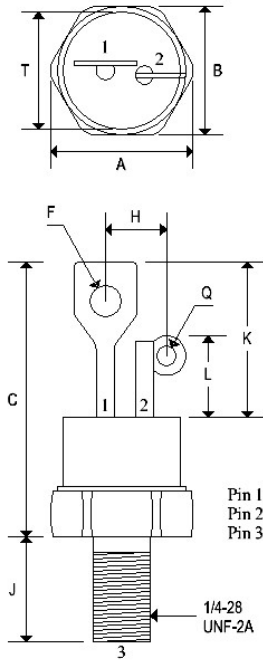
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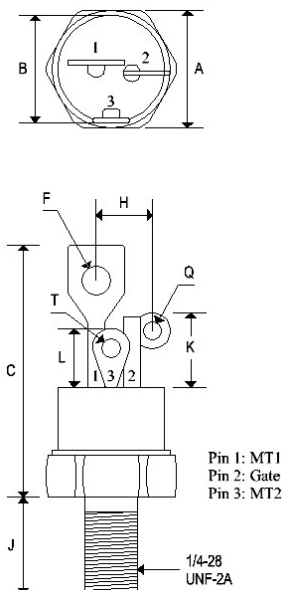
Case	TO-48 (SC245 & MAC245 Series)
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.604	0.614	15.340	15.600
B	0.551	0.559	14.000	14.200
C	1.050	1.190	2.670	30.230
F	0.135	0.160	3.430	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.620	0.670	15.750	17.020
L	0.300	0.350	7.620	8.890
Q	0.055	0.085	1.400	2.160
T	0.501	0.505	12.730	12.830

MECHANICAL CHARACTERISTICS

Case	TO-48 ISO (SC245()3 Series)
Marking	Body painted, alpha-numeric
Polarity	Cathode is stud



	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810