

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Repetitive peak off-state voltage, gate open			
SC143B	V_{DRM}	200	Volts
SC143D		400	
SC143E		500	
SC143M		600	
RMS on-state current ($T_C = 80^\circ\text{C}$)	$I_{T(RMS)}$	8	Amps
Peak non-repetitive surge current (One Cycle, 60Hz)	I_{TSM}	120	Amps
Circuit fusing considerations ($t = 1.0\text{ms}$)	I^2t	20	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

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

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ and either polarity of MT2 to MT1 voltage unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak off state current ⁽¹⁾ ($V_D = V_{DRM}$, gate open) $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_{DRM}	-	-	0.1 0.5	mA
Peak on-state voltage ⁽¹⁾ ($I_{TM} = 11\text{A}$ peak, pulse width $\leq 1\text{ms}$, duty cycle $\leq 2\%$) ($I_{TM} = 17\text{A}$ peak, pulse width $\leq 1\text{ms}$, duty cycle $\leq 2\%$)	V_{TM}	-	-	1.55 1.65	Volts
Critical rate of rise of off-state voltage ⁽¹⁾ ($V_D = \text{Rated } V_{DRM}$, gate open, exponential waveform, $T_C = 100^\circ\text{C}$)	dv/dt	-	150	-	$\text{V}/\mu\text{s}$
Critical rate of rise of commutating voltage ⁽¹⁾ ($I_{T(RMS)} = \text{Rated RMS current on state current}$, $V_{DRM} = \text{Rated peak off state voltage, gate open}$, commutating $di/dt = 4.3\text{A/ms}$, $T_C = 80^\circ\text{C}$)	$dv/dt(c)$	4	-	-	$\text{V}/\mu\text{s}$

DC gate trigger current (continuous dc) ⁽²⁾ ($V_D = 12V$, 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(-), $R_L = 25\Omega$, $T_C = -40^\circ C$	I_{GT}	-	-	50	mA
DC gate trigger voltage (continuous dc) ⁽²⁾ ($V_D = 12V$, 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(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾ MT2(-), G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾ MT2(+), G(-), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾ MT2(-), G(+), $R_L = 1000\Omega$, $T_C = 100^\circ C$ ⁽³⁾	V_{GT}	-	-	2.5	Volts
Holding current ⁽¹⁾ (main terminal voltage = 24V, peak initiating current = 0.5A, pulse width = 1ms, duty cycle $\leq 2\%$, gate trigger source = 7V, 20Ω , $T_C = 25^\circ C$) (main terminal voltage = 24V, peak initiating current = 0.5A, pulse width = 1ms, duty cycle $\leq 2\%$, gate trigger source = 7V, 20Ω , $T_C = -40^\circ C$)	I_H	-	-	50	mA
Latching current ⁽²⁾ (main terminal voltage = 24V, gate trigger source = 15V, 100Ω , trigger mode) 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
		-	-	100	
		-	-	200	
		-	-	200	
		-	-	200	
		-	-	400	

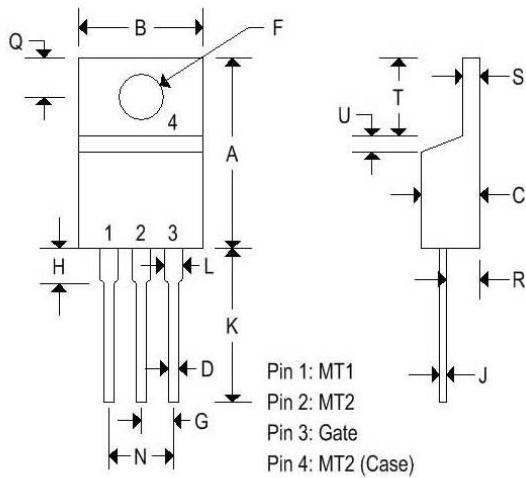
Note 1: Values apply for either polarity of Main Terminal 2 characteristics referenced to Main Terminal 1.

Note 2: Main Terminal 1 is the reference terminal.

Note 3: With V_D equal to rated off-state voltage.

MECHANICAL CHARACTERISTICS

Case	TO-220AB
Marking	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