T143-500

Phase Control Thyristor
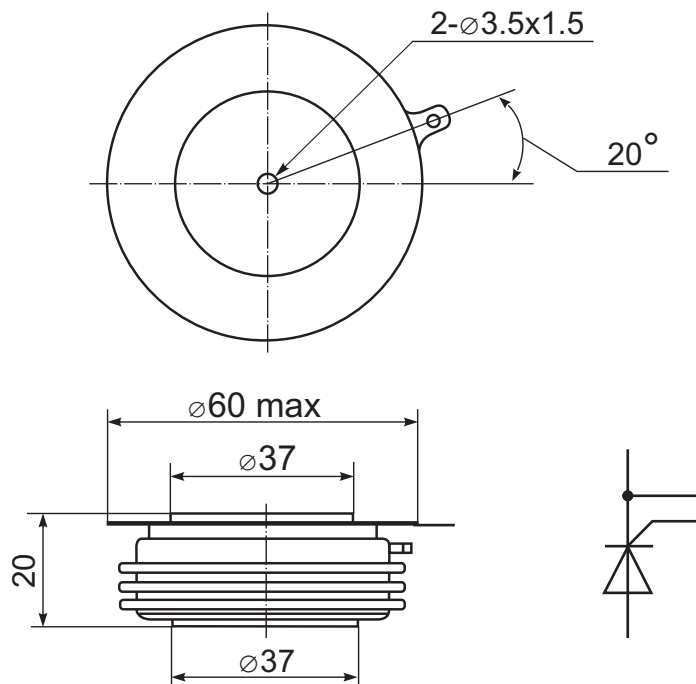
Type	V_{RSM}, V_{DSM}	V_{RRM}, V_{DRM}
T143-500-4	500	400
T143-500-6	700	600
T143-500-8	900	800
T143-500-10	1100	1000
T143-500-12	1300	1200
T143-500-14	1500	1400
T143-500-16	1700	1600

Symbol	Parameter	Test Conditions	Value	Unit
I_{TAVM}	average on-state current	$T_C=75^oC$	500	A
I_{TRMS}	maximum RMS on-state current	$T_J=T_{JM}$	1160	A
I_{TSM}	surge-current	$T_C=25^oC$; $t_P=10ms$	12.0	kA
		$T_J=T_{JM}$; $t_P=10ms$	10.8	
i^2t	i^2t-value	$T_C=25^oC$; $t_P=10ms$	720	$kA^2 \cdot s$
		$T_J=T_{JM}$; $t_P=10ms$	605	
$(di/dt)_{cr}$	critical rate of rise of on-state current	$T_J=T_{JM}$; $V_D=0.67 \cdot V_{DRM}$; f=50 Hz; $I_{GM}=1A$; $di_G/dt=1A/\mu s$	100	A/µs
$(dv/dt)_{cr}$	critical rate of rise of off-state voltage	$T_J=T_{JM}$; $V_D=0.67 \cdot V_{DRM}$; gate open	1000	V/µs
I_{RRM}/I_{DRM}	off-state Leakage current	$T_J=T_{JM}$; $V_R=V_{RRM}$; $V_D=V_{DRM}$	30	mA
V_{RRM}	reverse repeat peak value voltage	$T_J=T_{JM}$; 180^oC sine wave, 50 Hz; gate open	300-2400	V
V_{DRM}	off state repeat peak value voltage		300-2400	V
V_{RSM}	non-repetitive peak reverse voltage	$T_J=T_{JM}$	400-2500	V
V_{TM}	on-state voltage	$T_J=T_{JM}$; $I_{TM}=1500A$	1.80	V
r_T	slope resistance	$T_J=T_{JM}$	0.57	m
V_{GT}	gate trigger voltage	$T_J=25^oC$; $V_D=12V$	3.50	V
I_{GT}	gate trigger current	$T_J=25^oC$; $V_D=12V$	0.25	A
V_{GD}	gate non-trigger voltage	$T_J=T_{JM}$; $V_D=0.67 \cdot V_{DRM}$	0.50	V
I_{GD}	gate non-trigger current	$T_J=T_{JM}$; $V_D=0.67 \cdot V_{DRM}$	10.0	mA
I_H	holding current	$T_J=25^oC$; $V_D=12V$; gate open	300	mA
I_L	latching current	$T_J=25^oC$; $V_D=12V$; $t_G=20\mu s$; $I_{GM}=1A$; $di_G/dt=1A/\mu s$	700	mA

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| t_{gd}	delay time	$T_J=25^{\circ}C$; $V_D=0.5 \cdot V_{DRM}$; $I_{GM}=1A$; $di_G/dt=1A/\mu s$	7	μs
t_q	turn-off time	$T_J=T_{JM}$; $I_T=I_{TAVM}$; $di_R/dt=5A/\mu s$; $V_D=0.67 \cdot V_{DRM}$; $V_R=100V$; $dV_D/dt=50V/\mu s$	250	μs
V_{TO}	threshold voltage	$T_J=T_{JM}$	1.10	V
T_J	working junction temperature		-60...+125	$^{\circ}C$
T_{JM}	maximum working junction temperature		125	$^{\circ}C$
T_{stg}	storage temperature		-60...+50	$^{\circ}C$
R_{thJC}	thermal resistance; junction to case	DC, two-sided cooling	0.034	$^{\circ}C/W$
F	clamping force		14...17	kN
W	weight		260	g
a	maximum allowable acceleration		50	m/s^2

Features:
- Hermetic metal case with ceramic insulator
- Capsule packages for double sided cooling
- International standard case
- Amplifying gates

Typical Applications:
- DC motor control
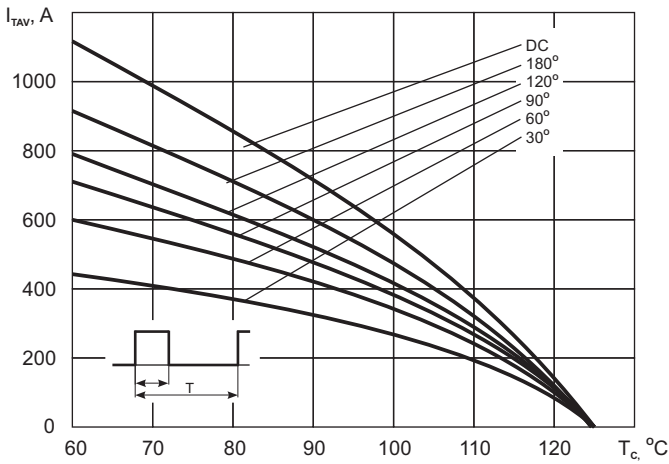- AC motor soft starter
- Controlled rectifiers
- AC controllers
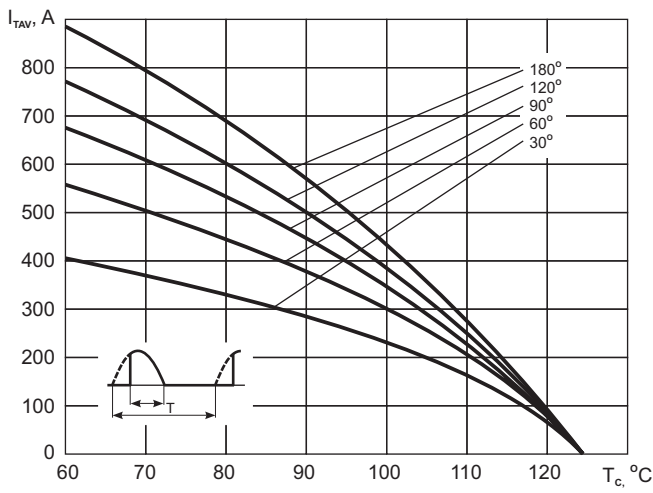
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Max. case temperature vs. average on-state current, sine waveform, f=50Hz, T=1/f
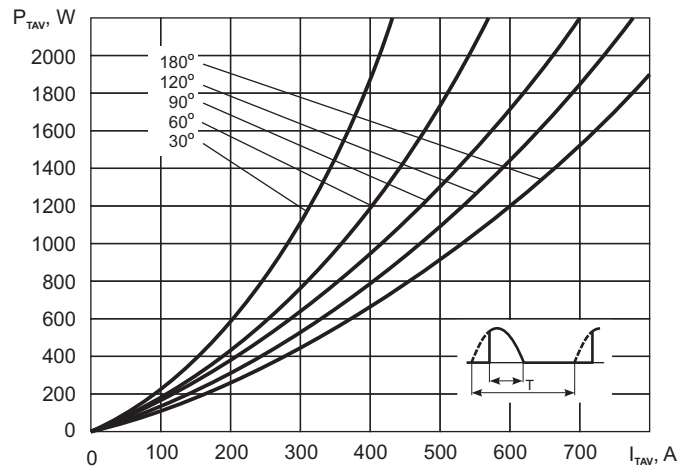
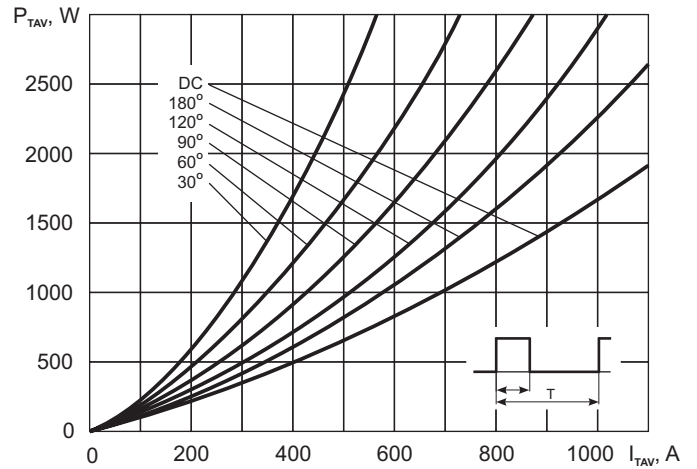
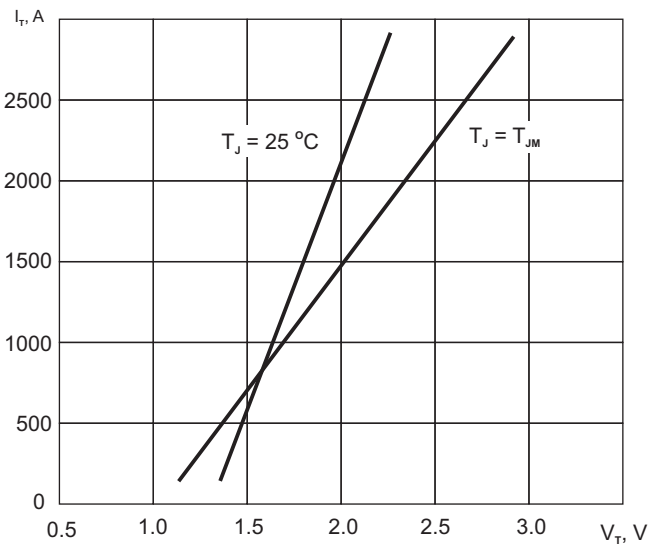On-state power loss vs. average on-state current, sine waveform, f=50Hz, T=1/f
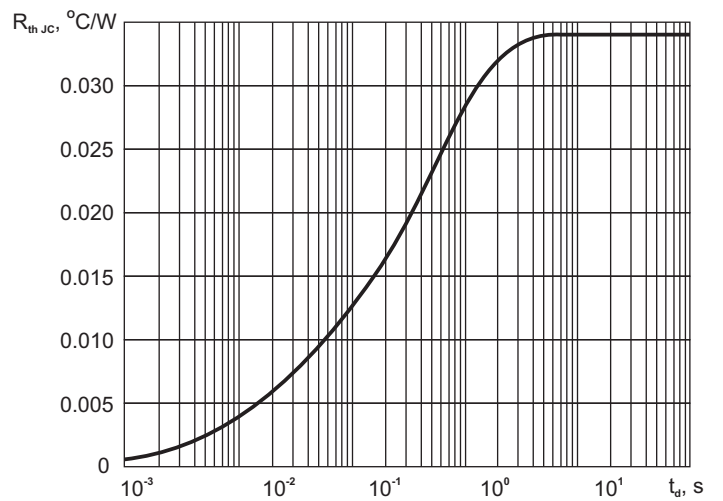

Max. case temperature vs. average on-state current, square waveform, f=50Hz, T=1/f

On-state power loss vs. average on-state current, square waveform, f=50Hz, T=1/f

Limiting on-state characteristic $I_T = f(V_T)$

Transient thermal impedance $R_{th\,JC} = f(t_d)$
t_d - square wave pulse duration