

Features

- Hermetic ceramic -metal seal
- high dv/dt
- tested according to IEC standards

Typical Applications

- DC motor controls
- Controlled DC power supplies
- AC controllers

Major Ratings and Characteristics

Parameters	T110As	Units
$I_{T(AV)}$	110	A
$@ T_c$	85	°C
$I_{T(RMS)}$	160	A
I_{TSM} @ 50Hz	2000	A
@ 60Hz	2100	A
$I^2 t$ @ 50Hz	20	KA ² s
@ 60Hz	18	KA ² s
V_{DRM} / V_{RRM}	400 to 1800	V
T_q typical	200	µs
T_J range	- 40 to 125	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM}/V_{DRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM}/I_{DRM} max. @ $T_J = T_{J \text{ max.}}$ mA
T110As	04	400	500	30
	08	800	900	
	12	1200	1300	
	14	1400	1500	
	18	1800	1900	

On-state Conduction

Parameter	T110As	Units	Conditions
$I_{T(AV)}$ Maximum average on-state current @ Case temperature	110	A	180° conduction, half sine wave
	85	°C	
$I_{(RMS)}$ Maximum RMS on-state current	160	A	180° conduction, half sine wave @ $T_C = 80^\circ\text{C}$
I_{TSM} Maximum peak, one-cycle non-repetitive surge current	2000	A	$t = 10\text{ms}$ No voltage
	2100		$t = 8.3\text{ms}$ reappplied
	1850		$t = 10\text{ms}$ 100% V_{RRM}
	1900		$t = 8.3\text{ms}$ reappplied
$I^2 t$ Maximum $I^2 t$ for fusing	20	$\text{KA}^2 \text{s}$	$t = 10\text{ms}$ No voltage
	18		$t = 8.3\text{ms}$ reappplied
	17		$t = 10\text{ms}$ 100% V_{RRM}
	16		$t = 8.3\text{ms}$ reappplied
$I^2 \sqrt{t}$ Maximum $I^2 \sqrt{t}$ for fusing	200	$\text{KA}^2 \sqrt{\text{s}}$	$t = 0.1$ to 10ms , no voltage reappplied
V_{TM} Maximum on-state or forward	2.2	V	pk = 600A, $T_J = 25^\circ\text{C}$, $t_p = 10\text{ms}$ sine pulse
I_H Maximum holding current	200	mA	$T_J = 25^\circ\text{C}$, anode supply 12V resistive load
I_L Typical latching current	350		

Switching

Parameter	T110As	Units	Conditions
di/dt ax. non-repetitive rate of rise of turned-on current	200	A/ μs	Gate drive 20V, 20Ω , $t_r \leq 1\mu\text{s}$ $T_J = T_{J \text{ max.}}$, anode voltage $\leq 80\% V_{DRM}$
t_d ical delay time	1.0	μs	Gate current 1A, $dig/dt = 1\text{A}/\mu\text{s}$ $V_d = 0.67\% V_{DRM}$, $T_J = 25^\circ\text{C}$
T_q pical turn-off time	200	μs	$I_{TM} = 300\text{A}$, $T_J = T_{J \text{ max.}}$, $di/dt = 20\text{A}/\mu\text{s}$, $V_R = 50\text{V}$ $dv/dt = 20\text{V}/\mu\text{s}$, Gate 0V 100Ω , $t_p = 500\mu\text{s}$

Blocking

Parameter	T110As	Units	Conditions
dv/dt Maximum critical rate of rise of off-state voltage	400	V/ μ s	T _J = T _J max linear to 80% rated V _{DRM}
I _{DRM} Max. peak reverse and off-state leakage current	15	mA	T _J = T _J max, rated V _{DRM} /V _{RRM} applied

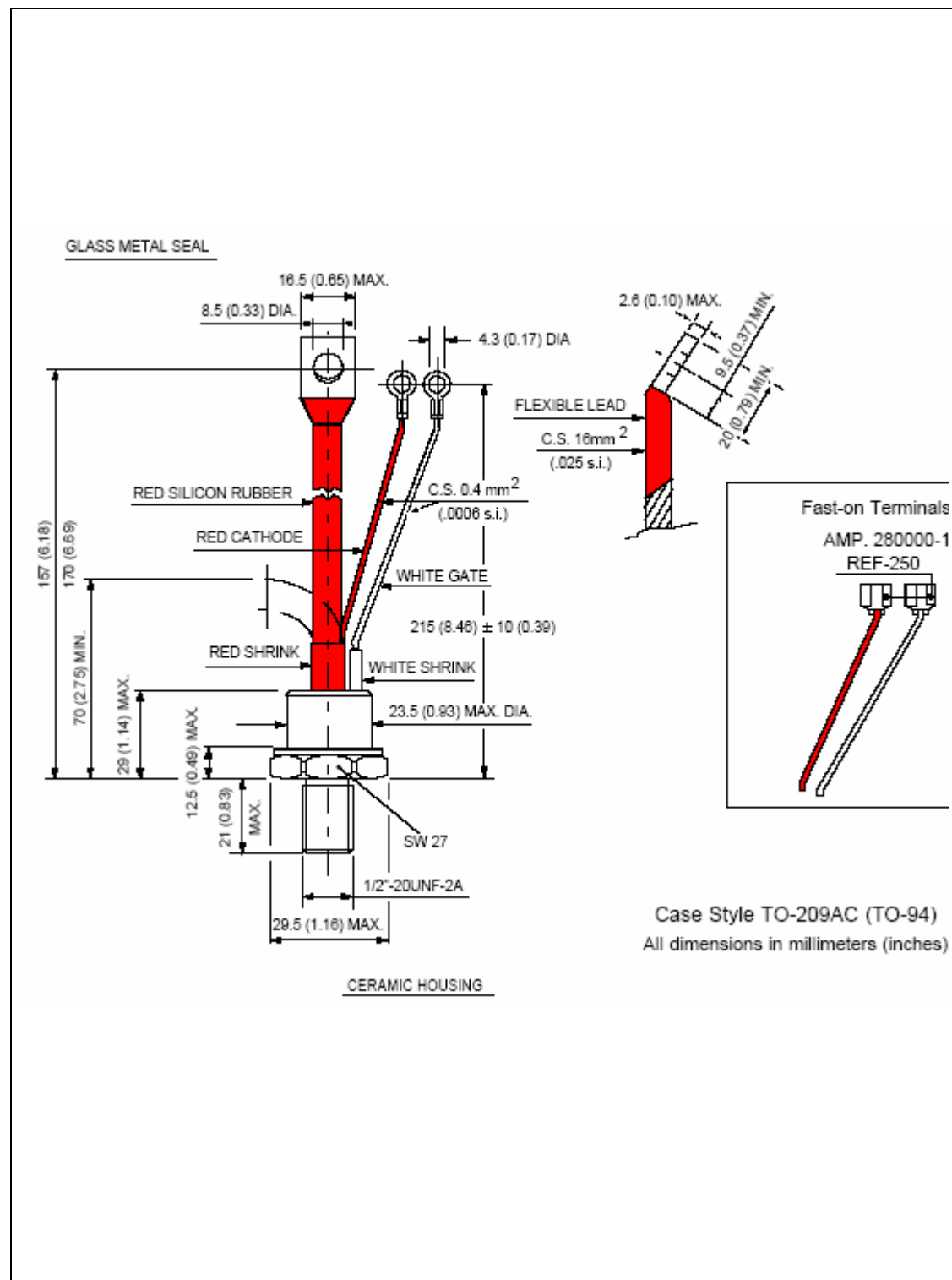
Triggering

Parameter	T110As	Units	Conditions
P _{GM} Maximum peak gate power	13	W	T _J = T _J max, t _p ≤ 5ms
P _{G(AV)} Maximum average gate power	3.0		T _J = T _J max, f = 50Hz, d% = 50
I _{GM} Max. peak positive gate current	3.0	A	T _J = T _J max, t _p ≤ 5ms
+V _{GM} Maximum peak positive gate voltage	20	V	T _J = T _J max, t _p ≤ 5ms
-V _{GM} Maximum peak negative gate voltage	8		
I _{GT} DC gate current required to trigger	TYP.	MAX.	T _J = - 40°C T _J = 25°C T _J = 125°C Max. required gate trigger/ current/ voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
	180	-	
	90	150	
	40	-	
V _{GT} DC gate voltage required to trigger	2.9	-	T _J = - 40°C T _J = 25°C T _J = 125°C
	1.8	30	
	1.2	-	
I _{GD} DC gate current not to trigger	8	mA	T _J = T _J max Max. gate current/ voltage not to trigger is the max. value which will not trigger any unit with rated V anode-to-cathode applied
V _{GD} DC gate voltage not to trigger	0.25	V	

Thermal and Mechanical Specification

Parameter	T110As	Units	Conditions
T _J Max. operating temperature range	-40 to 125	°C	
T _{stg} Max. storage temperature range	-40 to 150		
R _{thJC} Max. thermal resistance, junction to case	0.3	K/W	DC operation
R _{thCS} Max. thermal resistance, case to heatsink	0.1		Mounting surface, smooth, flat and greased
T Mounting torque, ± 10%	16(138)	Nm	Non lubricated threads
	14(120)	(lbf-in)	Lubricated threads
wt Approximate weight	200	g	

Outline Table



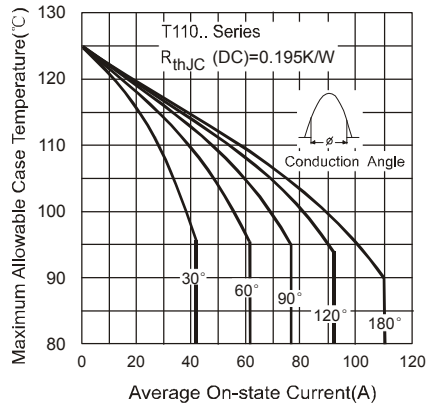


Fig.1-Current Ratings Characteristics

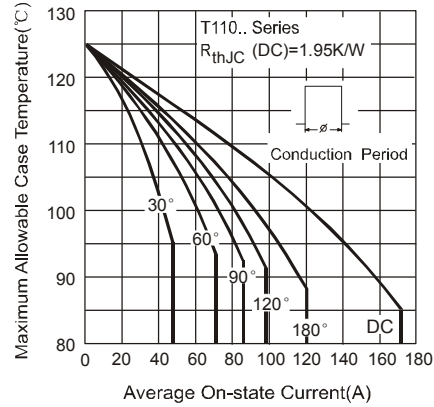


Fig.2-Current Ratings Characteristics

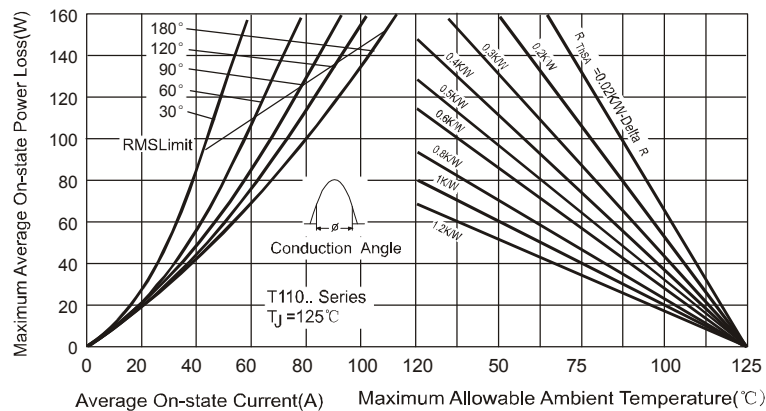


Fig.3-On-state Power Loss Characteristics

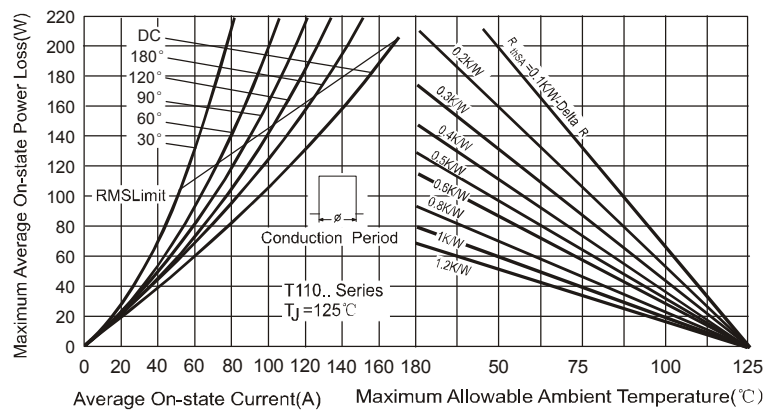


Fig.4-On-state Power Loss Characteristics

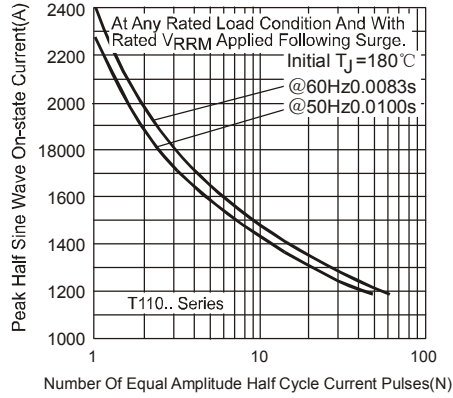


Fig.5-Maximum Non-Repetitive Surge Current

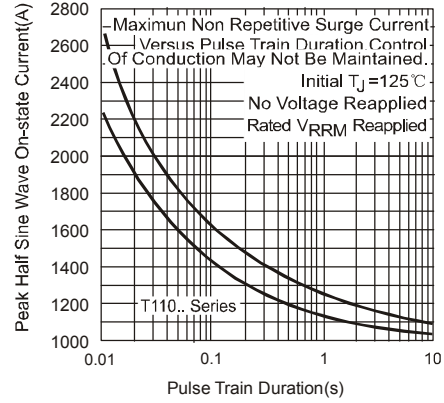


Fig.6-Maximum Non-Repetitive Surge Current

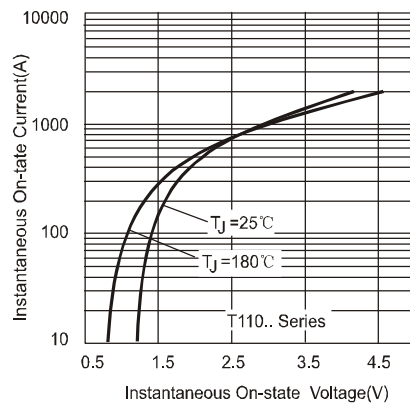


Fig.7-On-state Voltage Drop Characteristics

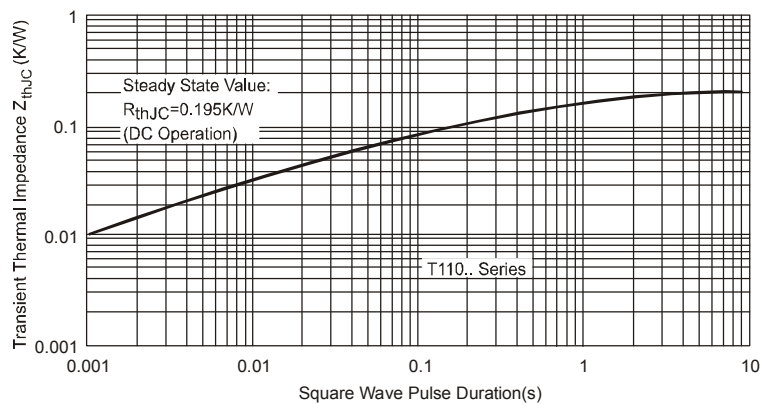


Fig.8-Thermal Impedance Z_{thJC} Characteristics