GREEGOO

T290.. SERIES

INVERTER GRADE THYRISTORS

Stud Version

Features

- Center amplifying gate
- All diffused design
- Guaranteed high dv/dt
- Guaranteed high di/dt
- Low thermal impedance
- High speed performance

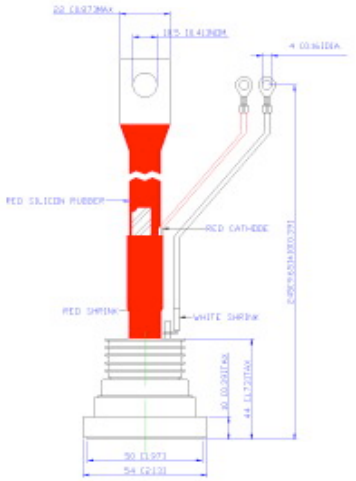
290A

Typical Applications

- Induction heating
- Choppers
- force-commutated converters

Major Ratings and Characteristics

Parameters		T290..	Units
$I_{T(AV)}$		290	A
	@ T_C	65	°C
$I_{T(RMS)}$		455	A
I_{TSM}	@ 50Hz	5000	A
	@ 60Hz	5230	A
I^2t	@ 50Hz	300	KA^2s
	@ 60Hz	280	KA^2s
V_{DRM} /V_{RRM}		400 to 1600	V
Tq	typical	10 to 25	µs
T_J	range	- 40 to 115	°C



case style
TO-209AE (TO-118)

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 max. mA
T290..	04	400	500	50
	08	800	900	
	12	1200	1300	
	14	1400	1500	
	16	1600	1700	

On-state Conduction

	Parameter	T290..	Units	Conditions		
$I_{T(AV)}$	Maximum average on-state current	290	A	180° conduction, half sine wave		
	@ Case temperature	65	°C			
$I_{(RMS)}$	Maximum RMS on-state current	455	A	180° conduction, half sine wave @ T_C = 80°C		
I_{TSM},	Maximum peak, one-cycle non-repetitive surge current	5000	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial T = T max.
		5230		t = 8.3ms		
		4200		t = 10ms	100% V_{RRM} reapplied	
		4400		t = 8.3ms		
I^2t	Maximum I^2t for fusing	300	KA^2s	t = 10ms	No voltage reapplied	
		280		t = 8.3ms		
		180		t = 10ms	100% V_{RRM} reapplied	
		165		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	2600	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
V_{TM}	Maximum on-state or forward	2.60	V	pk = 900A, T_J = 25°C, t p = 10ms sine pulse		
I_H	Maximum holding current	600	mA	T_J = 25°C, anode supply 12V resistive load		
I_L	Typical latching current	1000(300)				
r_{t1}	Low level value of forward slope resistance	0.7	mΩ	(16.7% x π x $I_{T(AV)}$ < I < π x $I_{T(AV)}$), T_J = T_J max.		

Switching

	Parameter	T290..	Units	Conditions
di/dt	ax. non-repetitive rate of rise of turned-on current	1000	A/μs	Gate drive 20V, 20Ω, t_r ≤ 1μs T_J = T_J max, anode voltage ≤ 80% V_{DRM}
t_d	ical delay time	1.0	μs	Gate current 1A, di_g/dt = 1A/μs V_d = 0.67% V_{DRM}, T_J = 25°C
Tq	pical turn-off time	10 to 25	μs	I_{TM} = 500A, T_J = T_J max, di/dt = 40A/μs, V_R = 50V dv/dt = 20V/μs, Gate 0V 100Ω, t_p = 500μs

Blocking

	Parameter	T290..	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/μs	$T_J = T_J$ max linear to 80% rated V_{DRM}
I_{DRM} I_{RRM}	Max. peak reverse and off-state leakage current	30	mA	$T_J = T_J$ max, rated V_{DRM}/V_{RRM} applied

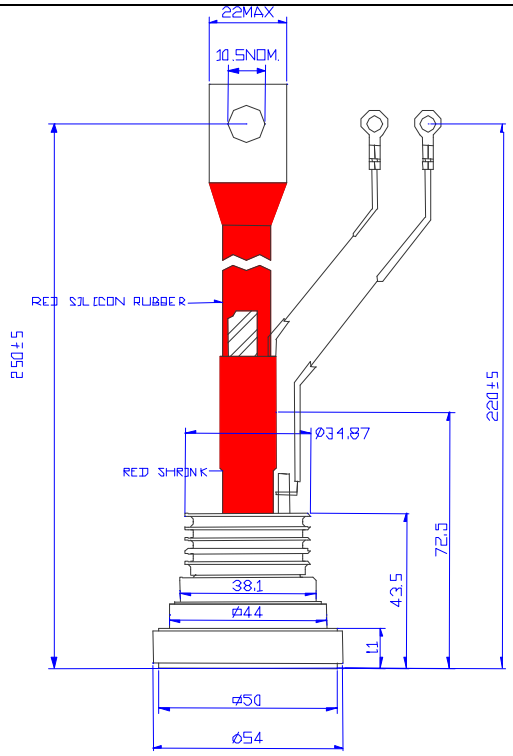
Triggering

	Parameter	T290..		Units	Conditions
P_{GM}	Maximum peak gate power	70		W	$T_J = T_J$ max, $t_p \le 5$ms
$P_{G(AV)}$	Maximum average gate power	11			$T_J = T_J$ max, f = 50Hz, d% = 50
I_{GM}	Max. peak positive gate current	9		A	$T_J = T_J$ max, $t_p \le 5$ms
$+V_{GM}$	Maximum peak positive gate voltage	20		V	$T_J = T_J$ max, $t_p \le 5$ms
$-V_{GM}$	Maximum peak negative gate voltage	5.0			
I_{GT}	DC gate current required to trigger	TYP.	MAX.	mA	Max. required gate trigger/ current/ voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
		180	-		T_J = - 40°C
		90	150		T_J = 25°C
		40	-		T_J = 115°C
V_{GT}	DC gate voltage required to trigger	2.9	-	V	T_J = - 40°C
		1.8	3.0		T_J = 25°C
		1.2	-		T_J = 115°C
I_{GD}	DC gate current not to trigger	20		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	T290..	Units	Conditions
T_J	Max. operating temperature range	-40 to 115	°C	
T_{stg}	Max. storage temperature range	-40 to 130		
R_{thJC}	Max. thermal resistance, junction to case	0.15	K/W	DC operation
R_{thCS}	Max. thermal resistance, case to heatsink	0.03		Mounting surface, smooth, flat and greased
T	Mounting torque, ± 10%	48.5	Nm	Non lubricated threads
wt	Approximate weight	500	g	

Outline Table



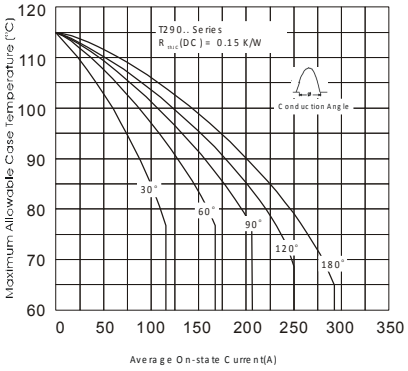


Fig. 1 - Current Ratings Characteristics

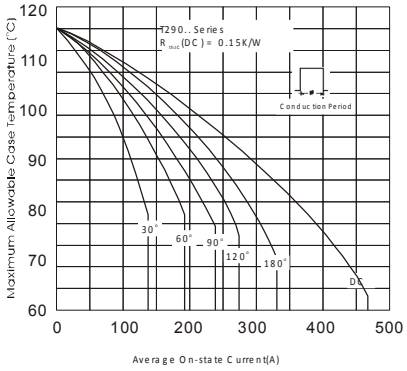
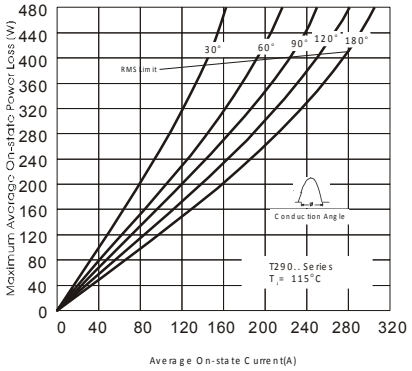


Fig. 2 - Current Ratings Characteristics



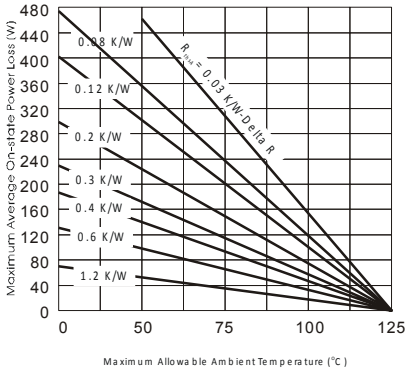


Fig. 3 - On-state Power Loss Characteristics