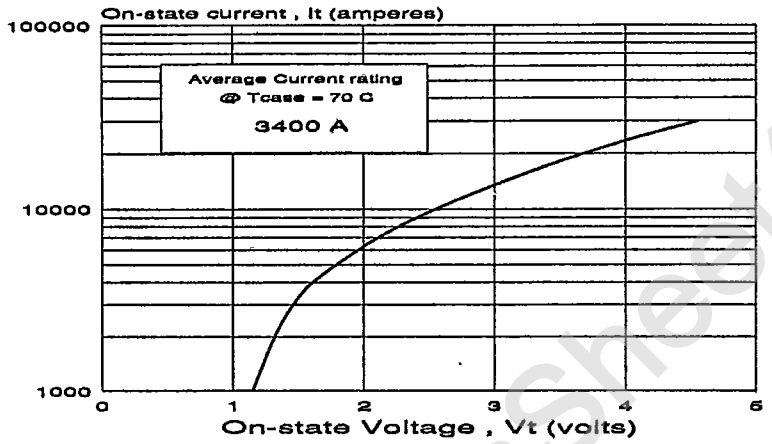
GE-SPCO

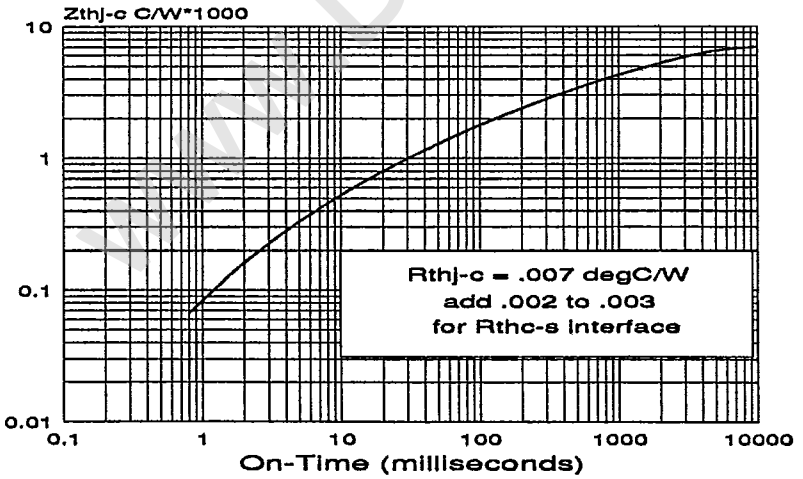
C793 T-25-21
100mm THYRISTOR PRESSPAK
4000V / 3400A

The GE type C793 thyristor is suitable for phase control applications such as for HVDC valves,static VAR compensators and synchronous motor drives.The silicon junction design utilizes a second generation pilot gate and a unique orientation of emitter shorts which promote the lateral expansion of conducting plasma resulting in lower spreading losses while achieving high dv/dt withstand.It is supplied in an industry accepted disc-type package,ready to mount using commercially available heat dissipators and mechanical clamping hardware.

ON-STATE CHARACTERITIC
Process Maximum @ 105 C



THERMAL IMPEDANCE vs. TIME
Junction to Case (DC)



REPETITIVE PEAK REVERSE AND OFF-STATE BLOCKING VOLTAGE
T_j = 0 to 125 C
(volts)

MODEL	V_{DRM}	V_{RRM}
C793DP	4000	.4000
C793CT	3900	3900
C793CN	3800	3800
C793CS	3700	3700
C793CM	3600	3600
C793CE	3500	3500

MECHANICAL OUTLINE

0A = 5.6 in (142 mm)
0B = 3.9 in (99mm)
D = 1.5 in (38 mm)
ELECTRICAL CREEPAGE / STRIKE
1.6 / 1.0 in
40.6 / 25.4 mm.
CLAMPING FORCE
(range)
17000-19000 lb.

GE-STATIC POWER COMPONENT OPERATION
205 GREAT VALLEY PKWY. , MALVERN , PA 19355
USA

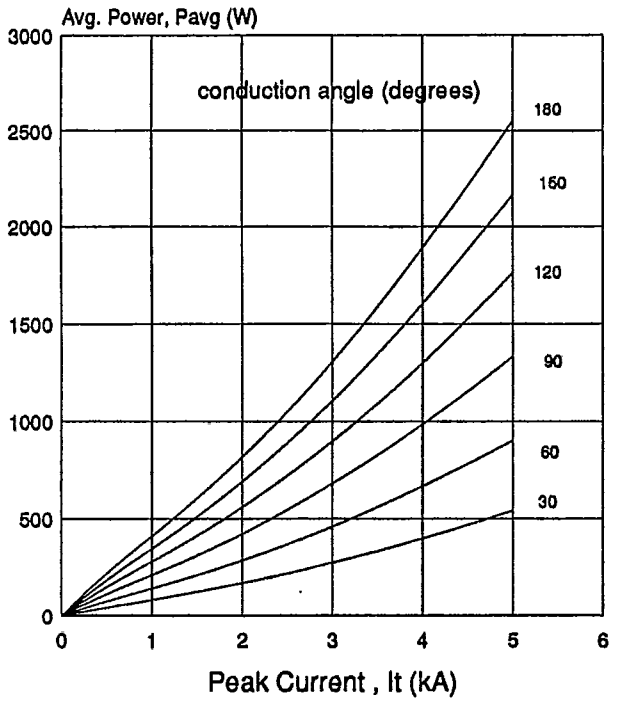
LIMITING CHARACTERISTICS AND RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAXIMUM VALUES	UNIT S
Repetitive peak off-state and reverse voltage	V_{DRM} V_{RRM}	T_j=0 to +125°C	see table	V
Repetitive working crest voltage	V_{DWM} V_{RWM}	T_j=0 to 125°C	.8V_{DRM} .8V_{RRM}	V
Rep.off-state and reverse leakage current	I_{DWM} I_{RRM}	V_{DWM} V_{RWM} T_j=125°C	250 250	ma ma
On-state Voltage	V_{TM}	I_T=2000A t_p=8.3ms T_j=105°C	1.30	V
Critical DC gate current/voltage to trigger on	I_{GT} V_{GT}	V_D=12VDC T_j=25°C	150 3	ma V
Non-trigger gate current/voltage	I_{GD} V_{GD}	V_D=.8V_{DRM} T_j=125°C	8 –	ma V
Critical rate of rise of off-state	dv/dt	0.67V_{DRM} T_j=125C	2000	V/us
Critical rate of of on-state	di/dt_{rep}	0.67V_{DRM} see req'd gating	150	A/us
Peak recovery current	$I_{RM(rec)}$	di/dt=2A/us T_j=105°C	95	A
Peak half-cycle non-repetitive surge current	I_{TSM}	t_p=8.3ms t_p=10 ms	50 45	kA
Circuit commutated turn-off time	t_q	di/dt=5A/us dv/dt=20V/us	500	us

GATE SUPPLY REQUIREMENT

Open circuit voltage	30 V minimum
Short circuit current	3 A minimum
Current risetime	0.5 us nomimal
Pulse duration	10-20 us

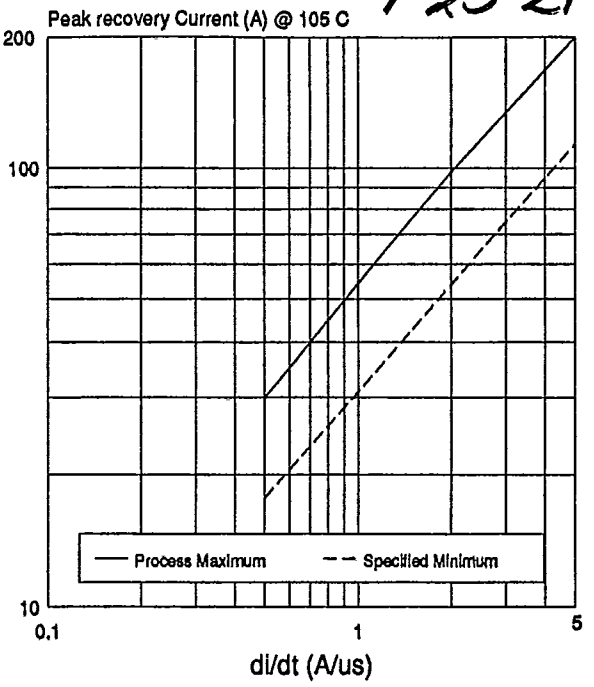
FULL CYCLE AVERAGE POWER DISSIPATION
Sine Wave - Includes spread loss
as function of Conduction Angle



6RT301

PEAK RECOVERY CURRENT
versus
COMMUTATING dI/dt

T-25-21



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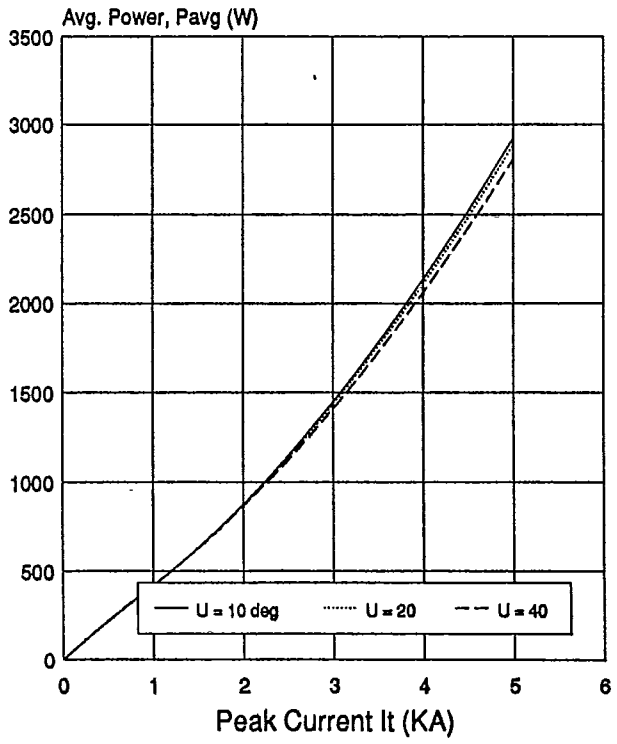
FULL CYCLE AVERAGE POWER DISSIPATION
120-deg Conduction -Includes spread loss
as function of Overlap Angle , U



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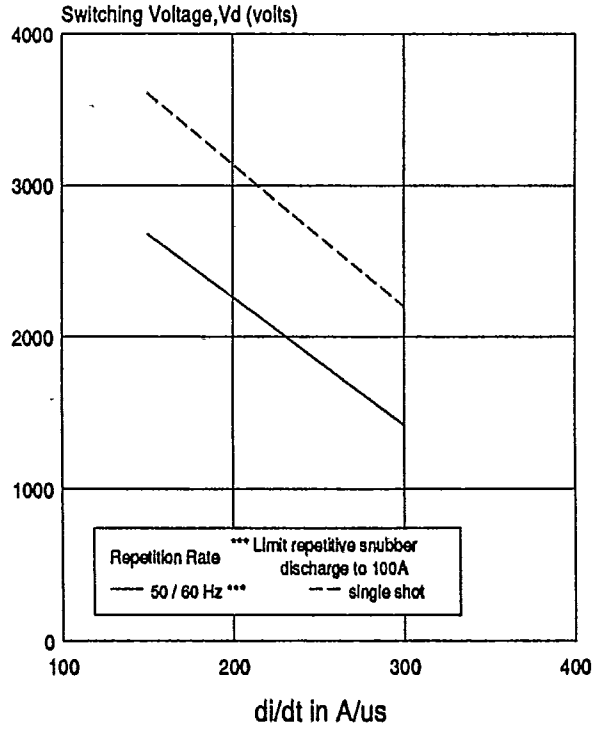
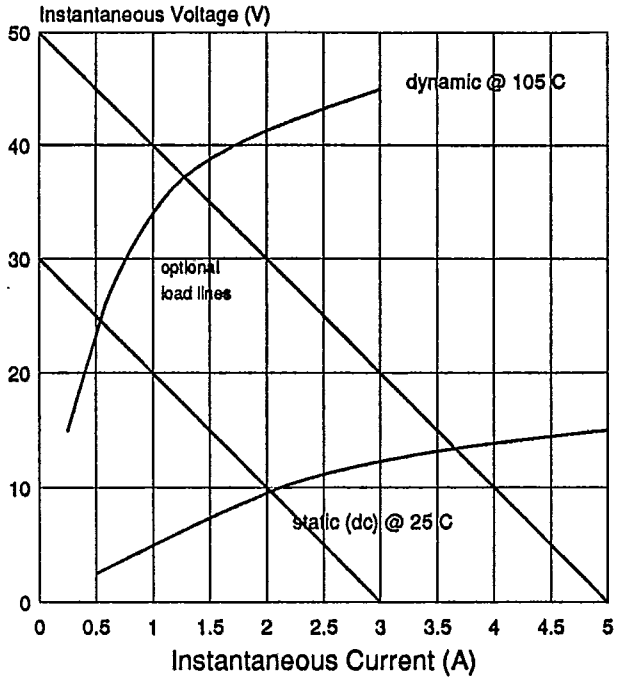
INRUSH CURRENT (dI/dt) RATING
versus
SWITCHING VOLTAGE



T301

Gate Characteristics and Gate Supply Requirements



T302

- THYRISTOR GATE IMPEDANCE
  Enhanced by fast rising gate voltage,increasing anode bias and junction temperature.It is at a minimum for dc current, zero anode bias and low temperature.
- GATE SUPPLY
  At least 30V/10 ohm is necessary to support the dI/dt rating and life expectancy. The short circuit current risetime should be nominally 0.5us and the duration longer than the expected delay time for all magnitudes of anode bias. Practically 10-30us is recommended followed by a back porch of 750ma if needed to sustain conduction.
- MINIMUM ACCEPTABLE GATE CURRENT
  The intersection of the load line and gate impedance characteristic indicates the minimum value of actual current needed during the delay time interval to support dI/dt.A different load line meeting this criterion may be used.
- MAXIMUM GATE RATINGS
  Peak gate power,Pgm(100us) = 300 W
  Average gate power,Pg(av) = 50W
  Peak gate current,Igfm = 25 A
  Peak reverse voltage,Vgrm = 25 V

MOUNTING PRESSPAKS TO HEAT DISSIPATORS

The following instruction is essential for maintaining low, stable thermal and electrical resistances associated with the PRESSPAK to heat dissipator surfaces.

1. INSPECTION OF MATING SURFACES
   Check each mating surface for nicks,scratches and surface finish.The PRESSPAK surface has a total indicator reading TIR < .0005 inch and surface finish 32 prior to factory electrical test in pressure fixtures. The dissipator surface should be equally as good.The TIR of a fully tested PRESSPAK may run higher but not exceed 0.002 inch not including some minor nicks and scratches associated with the test fixtures. Any bow created by clamp system at assembly must keep flatness within 0.002 inch.

2. SURFACE DEOXIDATION AND CLEANING
   Although plated surfaces are recommended for aluminum and copper heat dissipators, bare surfaces may be used if careful attention to cleaning and treating is assured. Plated surfaces and PRESSPAKS should be lightly sanded with 600 grit paper, then oil or compound applied as recommended. Unplated aluminum surfaces should be vigorously abraided with a fine wire brush or 3M "Scotchbrite" coated with Alcoa EJC #2 compound. The EJC # 2 should be removed and the recommended compound applied.

3. FINAL SURFACE TREATMENT
   Apply silicone oil or a very thin layer of grease or compound as indicated below. Rotate the PRESSPAK to properly distribute the applied agent.
   - . bare copper - use G322L or LS2037
   - . bare aluminum - use EJC #2 or G322L
   - . tin plated copper or aluminum
     - preferably reapply DC550 or SF1154
     - alternatively use G623 or G322L
   - . nickel plated aluminum - use DC550,G623 or G322L
   - . silver plating - not recommended

   Recommended silicone oils are SF1154 or DC550 (200 centistoke)

4. MOUNTING
   Assemble with specified mounting force applied through a self-leveling swivel connection. The diameter of the swivel should be preferably equal but not smaller than the poleface diameter of the PRESSPAK. Center holes on the top and bottom of the PRESSPAK are for locating.

   NOTES:
   Silicone oil DC550 (200 centistoke) is a product of DOW CORNING; clear silicone grease G623, yellow G322L and SF1154(200 centistoke) GE Silicones Waterford NY; EJC# 2 from ALCOA and black LS2037 from ARCO , 7301 Bessemer Ave. Cleveland OH.
   Limit maximum joint temperature to:
   - 95 C using EJC #2
   - 150 C using SF1154,DC550 or G322L

5. APPLIED MOUNTING FORCE
   The selection of an appropriate commercially available spring clamping hardware* should consider eatablishing and maintaining the specified mounting force over the operating temperature range and operating life of the PRESSPAK.Thus essential ratings such as thermal resitance ,dI/dt,surge current and thermal cycling will not be impaired.
   Specified forces for this product are as follows:
   17000-19000 lbs.
   75.6 - 84.5 kN
   7725 - 9500 kg

   * Consult factory for recommendations or more detailed instructions.