

ELECTRO POWER

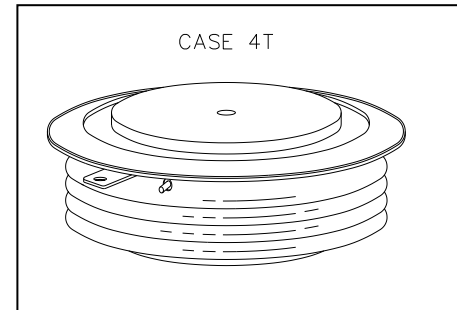
REP1178NS - Power Thyristor

**500 - 1400 V_{DRM}; 2000 A rms**

HIGH POWER THYRISTOR FOR INVERTER AND CHOPPER APPLICATIONS

Features:

- . All Diffused Structure
- . Interdigitated Amplifying Gate Configuration
- . Blocking capability up to 1400 volts
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device



ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V _{RRM} (1)	V _{DRM} (1)	V _{RSM} (1)
REP1178NS05	500	500	600
REP1178NS06	600	600	720
REP1178NS08	800	800	960
REP1178NS10	1000	1000	1150
REP1178NS12	1200	1200	1300
REP1178NS14	1400	1400	1500

V_{RRM} = Repetitive peak reverse voltageV_{DRM} = Repetitive peak off state voltageV_{RSM} = Non repetitive peak reverse voltage (2)

Repetitive peak reverse leakage and off state leakage	I _{RRM} / I _{DRM}	15 mA 65 mA (3)
Critical rate of voltage rise	dV/dt (4)	500 V/μsec

Notes:

All ratings are specified for T_j=25 °C unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range -40 to +125 °C.

(2) 10 msec. max. pulse width

(3) Maximum value for T_j = 125 °C.(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM}. Gate open. T_j = 125 °C.

(5) Non-repetitive value.

(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 μF capacitor and 20 ohms resistance in parallel with the thyristor under test.

Conducting - on state

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
RMS value of on-state current	I _{TRMS}		2397		A	Nominal value
Peak one cycle surge (non repetitive) current	I _{TSM}		17000		A	10.0 msec (50Hz), sinusoidal waveshape, 180° conduction, T _j = 125 °C
I square t	I ² t		1.76x10 ⁶		A ² s	10msec
Latching current	I _L		1000		mA	V _D = 24 V; R _L = 12 ohms
Holding current	I _H		500		mA	V _D = 24 V; I = 2.5 A
Peak on-state voltage	V _{TM}		2.2		V	I _{TM} = 2000 A; Duty cycle ≤ 0.01%
Critical rate of rise of on-state current (5, 6)	di/dt		800		A/μs	Switching from V _{DRM} ≤ 1000 V, non-repetitive
Critical rate of rise of on-state current (6)	di/dt		400		A/μs	Switching from V _{DRM} ≤ 1000 V

ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd) REP1278NS**- Power Thyristor

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		200		W	$t_p = 40 \mu s$
Average gate power dissipation	$P_{G(AV)}$		5		W	
Peak gate current	I_{GM}		10		A	
Gate current required to trigger all units	I_{GT}		300		mA	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 25^\circ C$
Gate voltage required to trigger all units	V_{GT}	0.30	3		V	$V_D = 6 V; R_L = 3 \text{ ohms}; T_j = 25^\circ C$
Peak negative voltage	V_{GRM}		5		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		1.5	0.7	μs	$I_{TM} = 50 A; V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20 V; R_G = 20 \text{ ohms}; t_r = 0.1 \mu s; t_p = 20 \mu s$
Turn-off time (with $V_R = -50 V$)	t_q	25	40		μs	$I_{TM} = 1000 A; di/dt = 100 A/\mu s;$ $V_R \geq -50 V; \text{Re-applied } dV/dt = 200 V/\mu s \text{ linear to } 80\% V_{DRM}; V_G = 0;$ $T_j = 125^\circ C; \text{Duty cycle } \geq 0.01\%$
Reverse recovery charge	Q_{rr}		*	200	μC	$I_{TM} = 1000 A; di/dt = 100 A/\mu s;$ $V_R \geq -50 V$

* For guaranteed max. value, contact factory.

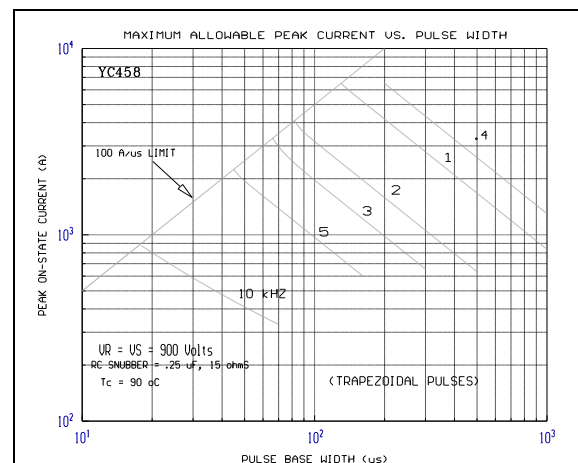
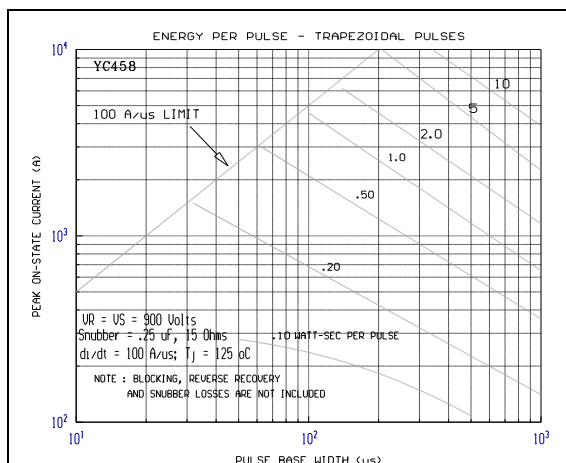
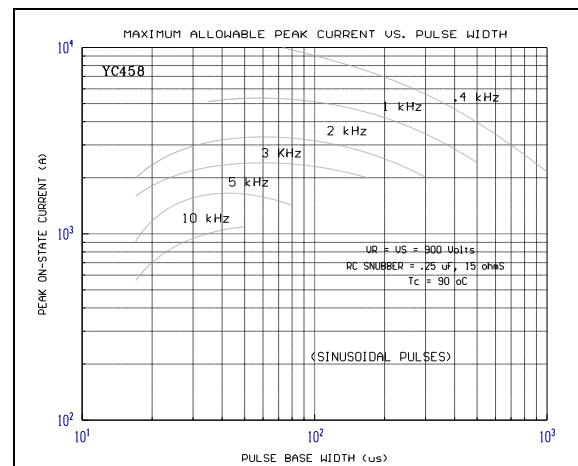
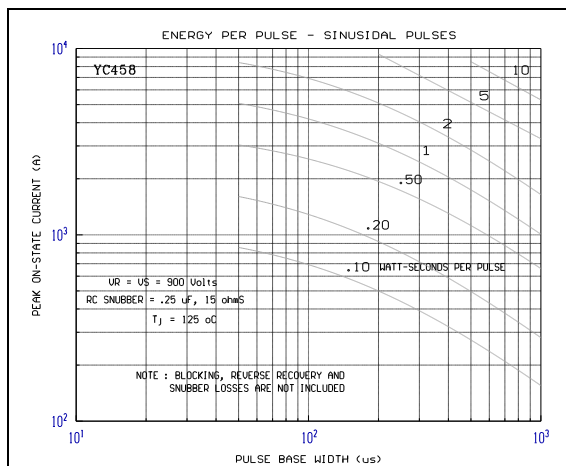
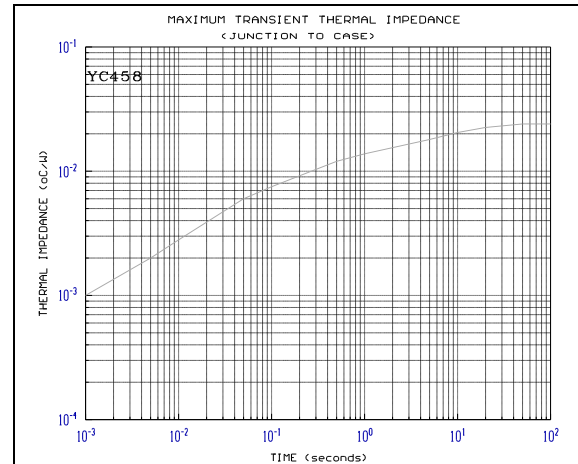
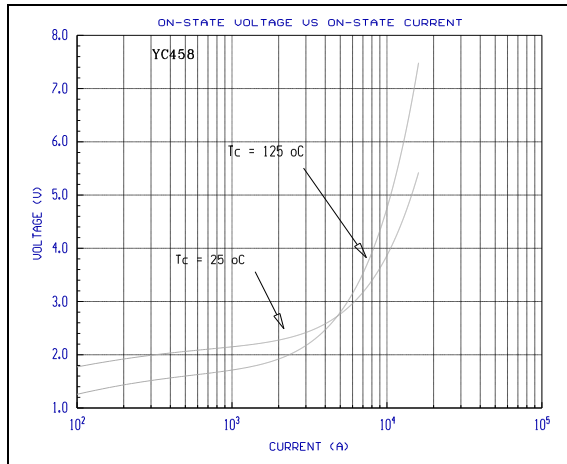
THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		$^\circ C$	
Storage temperature	T_{stg}	-40	+150		$^\circ C$	
Thermal resistance - junction to case	$R_{\theta(j-c)}$		0.023 0.045		$^\circ C/W$	Double sided cooled Single sided cooled
Thermal resistance - case to sink	$R_{\theta(c-s)}$		0.010 0.020		$^\circ C/W$	Double sided cooled * Single sided cooled *
Mounting force	P	5500 24.5	6000 26.7		lb. kN	
Weight	W			16 460	oz. g	

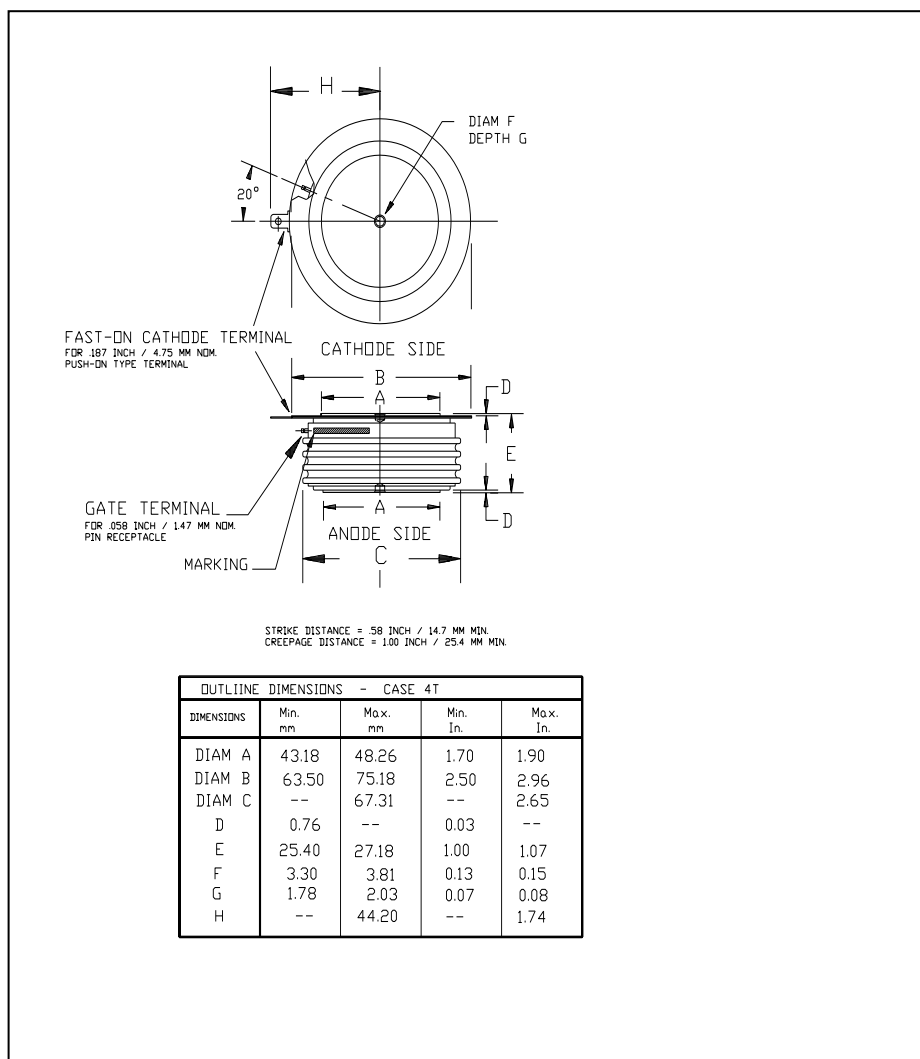
* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 4 of this Technical Data

ELECTRICAL CHARACTERISTICS AND RATINGS (cont'd) REP1178NS - Power Thyristor



REP1178NS**- POWER THYRISTOR



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