

TP978FC-630 Reverse-conducting Thyristor

2400 V_{DRM}; 1500A rms

RCT FOR INVERTER AND CHOPPER APPLICATIONS

Features:

- . All Diffused Structure
- . Interdigitated Amplifying Gate Configuration
- . Blocking capability up to 2400 volts
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device

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.

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V _{DRM} (1)	V _{DSM} (1)
TP978F-16	1600	1600
TP978F-18	1800	1800
TP978F-20	2000	2000
TP978F-22	2200	2200
TP978F-24	2400	2400

V_{DRM} = Repetitive peak off state voltage

Repetitive peak off state leakage	I _{DRM}	20 mA 80mA (3)
Critical rate of voltage rise	dV/dt (4)	1000 V/μsec

Conducting - on state

Parameter	Symbol	Max.	Typ.	Units	Conditions
RMS value of on-state current	I _{TRMS}	1500		A	Nominal value
Average on-state current	I _{T(AV)}	630		A	Continuous single-phase, half sine wave, 180° conduction
Peak one cycle surge (non repetitive) current	I _{TSM}	14000		A	10 msec, sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t	9.8.x 10 ⁵		A ² s	10.0 msec
RMS reverse currnt	I _{R(RMS)}	631		A	
Average reverse current	I _{R(AV)}	402		A	Continuous single-phase, half sine wave, 180° conduction
Peak on-state voltage	V _{TM}	3.1		V	I _{TM} =3000A
Peak reverse voltage	V _{RM}	2.6		V	I _{RM} =1000A
Critical rate of rise of on-state current	di/dt	400		A/μs	V _D =1/2V _{DRM} , I _{TM} =800A f=60Hz I _{GM} =1.5A, di _G /dt=1.0A/us, T _j =125 °C

ELECTRICAL CHARACTERISTICS AND RATINGS (cont.)

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		16		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}		350		mA	$V_D = 6 V; R_L = 2 \text{ ohms}; T_j = +25^\circ C$
Gate voltage required to trigger all units	V_{GT}		4		V	$V_D = 6 V; R_L = 2 \text{ ohms}; T_j = 25^\circ C$
Peak non- trigger voltage	V_{GD}		0.2		V	$T_j = 125^\circ C; V_D = 1/2 V_{DRM}$

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Turn-off time	t_q	32	63		μs	$I_{TM} = 630 A; di_1/dt = -50A/\mu s;$ $di_2/dt = 50A/\mu s; dV/dt = 700 V/\mu s$ $V_{DR} = 67\% V_{DRM}$ $T_j = 125^\circ C; t_w = 60 \mu s$

* For guaranteed max. value, contact factory.

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

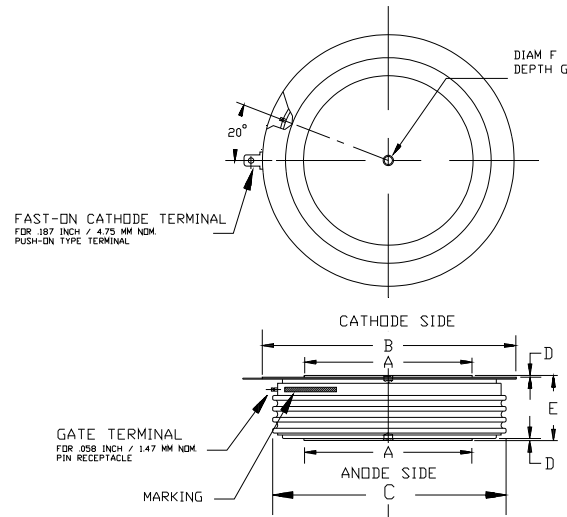
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		$^\circ C$	
Storage temperature	T_{stg}	-40	+125		$^\circ C$	
Thyristor part thermal resistance - junction to fin	$R_{\Theta I(j-f)}$		0.022		$^\circ C/W$	Double sided cooled
Diode part thermal resistance - junction to fin	$R_{\Theta III(j-f)}$		0.045		$^\circ C/W$	Double sided cooled
Mounting force	F		30		kN	
Weight	W		950		g	

* Mounting surfaces smooth, flat and greased

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

CASE OUTLINE AND DIMENSIONS.

Reverse-conducting Thyristor



CASE6T
NOMINAL OUTLINE DIMENSIONS

DIMENSIONS	INCH	mm
DIAM A	2.48	63
DIAM B	3.66	93
DIAM C	3.27	83
D	0.03	0.76
E	0.83	26
F	0.14	3.56
G	0.08	2.03