

Technical Data : KN-002

CSR328-11~13ib Fast Switching Reverse-conducting Thyristor

1100~1300 V_{DRM}; 630 A rms

RCT FOR INVERTER AND CHOPPER APPLICATIONS

Features:

- . All Diffused Structure
- . Interdigitated Amplifying Gate Configuration
- . Blocking capability up to 1300 volts
- . Guaranteed Maximum Turn-Off Time
- . High dV/dt Capability
- . Pressure Assembled Device

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V _{DRM} (1)	V _{DSM} (1)
CSR328-11	1100	1100
CSR328-12	1200	1200
CSR328-13	1300	1300

V_{DRM} = Repetitive peak off state voltage

Repetitive peak off state leakage	I _{DRM}	5 mA 40mA (3)
Critical rate of voltage rise	dV/dt (4)	700 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.

Conducting - on state

Parameter	Symbol		Max.	Typ.	Units	Conditions
RMS value of on-state current	I _{TRMS}		630		A	Nominal value
Average on-state current	I _{T(AV)}		235		A	Continuous single-phase, half sine wave, 180° conduction
Peak one cycle surge on-state current (non repetitive)	I _{TSM}		5600		A	50Hz, sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I square t	I ² t		5.5x10 ⁵		A ² s	8.3 msec and 10.0 msec
Peak on-state voltage	V _{TM}		2.5.		V	I _{TM} = 1500A; T _j = 25 °C
Critical rate of rise of on-state current	di/dt		200		A/μs	V _D = 1/2 V _{DRM} , I _{TM} = 250A f = 50Hz I _{GM} = 1.5A, di _G /dt = 1.0A/μs, T _j = 125 °C
Average reverse current	I _{R(AV)}		240		A	Continuous single-phase, half sine wave, 180° conduction
RMS reverse current	I _{R(RMS)}		640		A	
Peak reverse voltage	V _{RM}		2.3		V	I _{RM} = 500A, T _j = 25 °C
Peak one cycle surge reverse current (non repetitive)	I _{RSM}		5600		A	50Hz, sinusoidal wave-shape, 180° conduction, T _j = 125 °C
I _R square t	I _R ² t		5.5x10 ⁵		A ² s	8.3 msec and 10.0 msec

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	$P_{G(AV)}$		8		W	
Peak gate current	I_{GM}		5		A	
Gate current required to trigger all units	I_{GT}		300		mA	$V_D = 6 V; R_L = 2 \text{ ohms}; T_j = +25^\circ C$
Gate voltage required to trigger all units	V_{GT}		3		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		15		μs	$I_{TM} = 400 A; di_1/dt = -50 A/\mu s; di_2/dt = 50 A/\mu s, I_{RM} = 10 A; dV/dt = 350 V/\mu s; V_{DR} = 1250 V; T_j = 125^\circ C; t_w = 60 \mu s$
Reverse recovery time	t_{rr}		2.7		μs	

* For guaranteed max. value, contact factory.

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

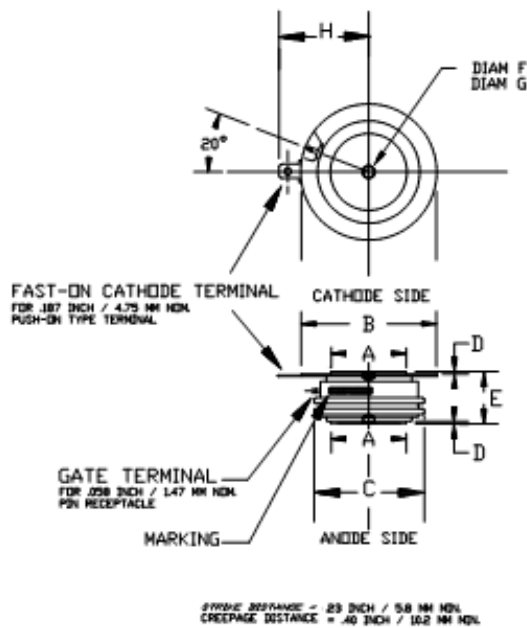
Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_j	-40	+125		$^\circ C$	
Storage temperature	T_{stg}	-40	+150		$^\circ C$	
Thyristor part thermal resistance - junction to fin	$R_{\theta I (j-C)}$		0.08		$^\circ C/W$	Double sided cooled
Diode part thermal resistance – junction to fin	$R_{\theta \Pi (j-S)}$		0.005		$^\circ C/W$	Double sided cooled
Mounting force	P	14.5	16.7		kN	
Weight	W			260	g	

* Mounting surfaces smooth, flat and greased

Note : for case outline and dimensions, see case outline drawing in page 3 of this Technical Data

CASE OUTLINE AND DIMENSIONS.

Reverse-conducting Thyristor



OUTLINE DIMENSIONS				
DIMENSIONS	Min mm	Max mm	Min In	Max In
DIAM A	33.02	34.39	1.30	1.35
DIAM B	55.88	63.50	2.20	2.50
DIAM C	----	54.61	----	2.15
D	0.76	----	0.03	----
E1	25.40	27.18	1.00	1.07
E2	15.24	17.24	0.60	0.68
F	3.30	3.81	0.13	0.15
G	1.78	2.03	0.07	0.08
H	----	36.2	----	1.43

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