

# CR20EY

MEDIUM POWER, INVERTER USE  
NON-INSULATED TYPE, GLASS PASSIVATION TYPE

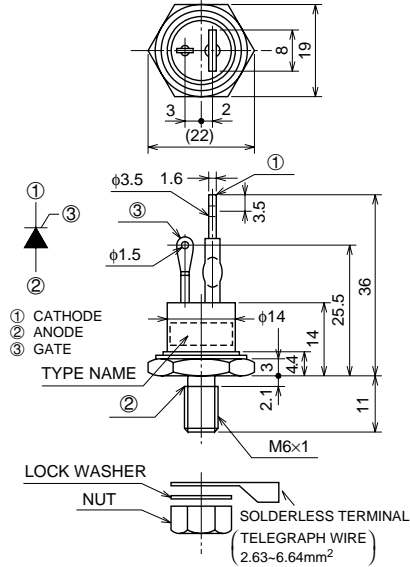
CR20EY



- $I_T$  (AV) ..... 20A
- $V_{DRM}$  ..... 400V/600V/800V
- $I_{GT}$  ..... 50mA

OUTLINE DRAWING

Dimensions  
in mm



## APPLICATION

Inverter, DC choppers, pulse generator

## MAXIMUM RATINGS

Symbol	Parameter	Voltage class			Unit
		8	12	16	
$V_{RRM}$	Repetitive peak reverse voltage	400	600	800	V
$V_{RSM}$	Non-repetitive peak reverse voltage	480	720	850	V
$V_{DRM}$	Repetitive peak off-state voltage	400	600	800	V
$V_{DSM}$	Non-repetitive peak off-state voltage	480	720	800	V

Symbol	Parameter	Conditions	Ratings	Unit
$I_T$ (RMS)	RMS on-state current		31.5	A
$I_T$ (AV)	Average on-state current	Commercial frequency, sine half wave, 180° conduction, $T_c=74^\circ\text{C}$	20	A
$I_{TSM}$	Surge on-state current	60Hz sine half wave 1 full cycle, peak value, non-repetitive	300	A
$I_t^2$	$I_t^2$ for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	380	A <sup>2</sup> s
$di/dt$	Critical rate of rise of on-state current	$V_D=1/2V_{DRM}$ , $I_{TM}=60\text{A}$ , $I_G=0.1\text{A}$ , $T_J=25^\circ\text{C}$ , $f=60\text{Hz}$	100	A/ $\mu\text{s}$
$P_{GM}$	Peak gate power dissipation		5.0	W
$P_G$ (AV)	Average gate power dissipation		0.5	W
$V_{FGM}$	Peak gate forward voltage		10	V
$V_{RGM}$	Peak gate reverse voltage		5	V
$I_{FGM}$	Peak gate forward current		2	A
$T_J$	Junction temperature		-30 ~ +125	°C
$T_{stg}$	Storage temperature		-30 ~ +125	°C
—	Mounting torque		30	kg-cm
—	Weight	Typical value	2.94	N-m
—			20	g

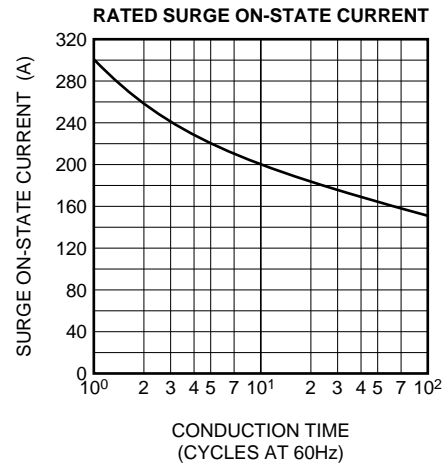
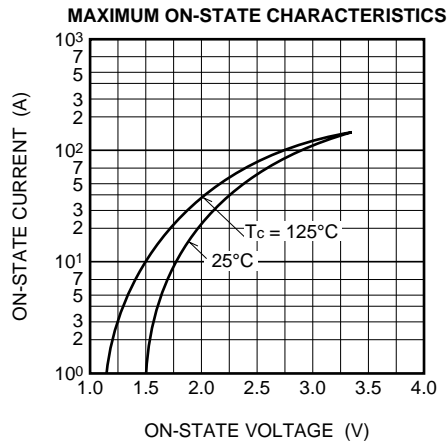
# CR20EY

MEDIUM POWER, INVERTER USE  
NON-INSULATED TYPE, GLASS PASSIVATION TYPE

## ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IRRM	Repetitive peak reverse current	$T_J=125^\circ\text{C}$ , $V_{RRM}$ applied	—	—	6.0	mA
IDRM	Repetitive peak off-state current	$T_J=125^\circ\text{C}$ , $V_{DRM}$ applied	—	—	6.0	mA
$V_{TM}$	On-state voltage	$T_c=25^\circ\text{C}$ , $I_{TM}=60\text{A}$ , Instantaneous value	—	—	2.5	V
$dv/dt$	Critical rate of rise of off-state voltage	$T_J=125^\circ\text{C}$ , $V_D=2/3V_{DRM}$	100	—	—	V/ $\mu\text{s}$
$V_{GT}$	Gate trigger voltage	$T_J=25^\circ\text{C}$ , $V_D=6\text{V}$ , $I_T=0.5\text{A}$	—	—	3.0	V
$V_{GD}$	Gate non-trigger voltage	$T_J=125^\circ\text{C}$ , $V_D=1/2V_{DRM}$	0.25	—	—	V
$I_{GT}$	Gate trigger current	$T_J=25^\circ\text{C}$ , $V_D=6\text{V}$ , $I_T=0.5\text{A}$	—	—	50	mA
$t_{gt}$	Turn-on time	$T_J=25^\circ\text{C}$ , $V_D=100\text{V}$ , $I_T=15\text{A}$ , $I_G=0.1\text{A}$	—	—	10	$\mu\text{s}$
$t_q$	Turn-off time	$I_T=20\text{A}$ , $V_R=50\text{V}$ , $V_D=1/2V_{DRM}$ , $T_J=125^\circ\text{C}$ , $dv/dt=20\text{V}/\mu\text{s}$	—	—	15	$\mu\text{s}$
$R_{th(j-c)}$	Thermal resistance	Junction to case	—	—	1.0	$^\circ\text{C}/\text{W}$
$R_{th(c-f)}$	Contact thermal resistance	Case to fin, greased	—	—	0.40	$^\circ\text{C}/\text{W}$

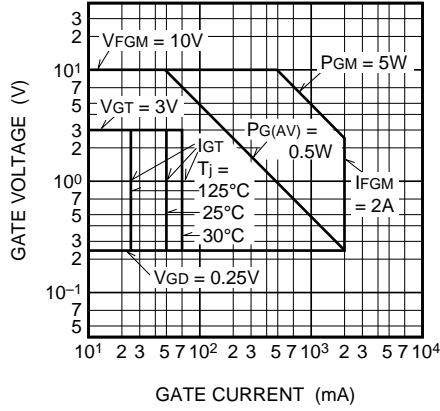
## PERFORMANCE CURVES



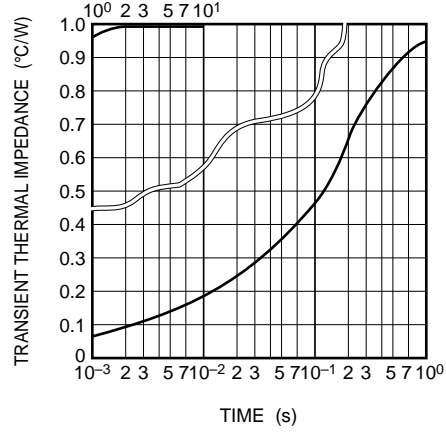
# CR20EY

MEDIUM POWER, INVERTER USE  
NON-INSULATED TYPE, GLASS PASSIVATION TYPE

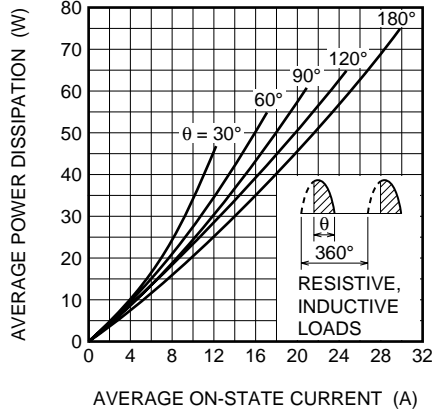
**GATE CHARACTERISTICS**



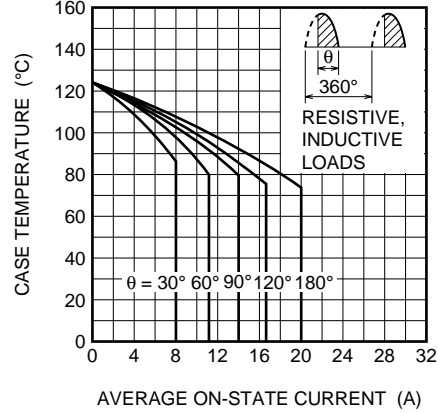
**MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)**



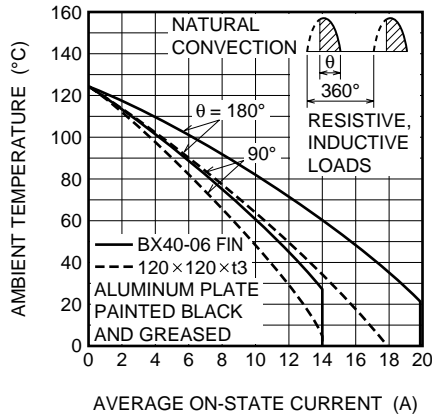
**MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE HALF WAVE)**



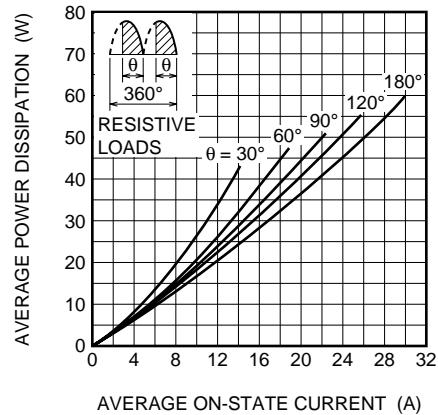
**ALLOWABLE CASE TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE HALF WAVE)**



**ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE HALF WAVE)**



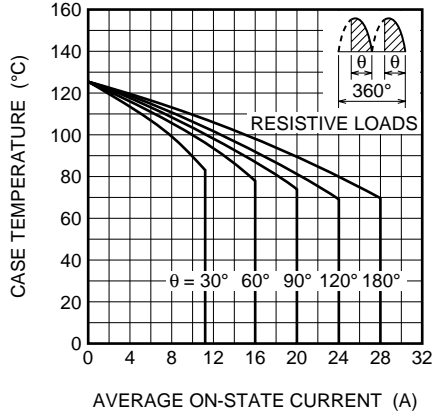
**MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE FULL WAVE)**



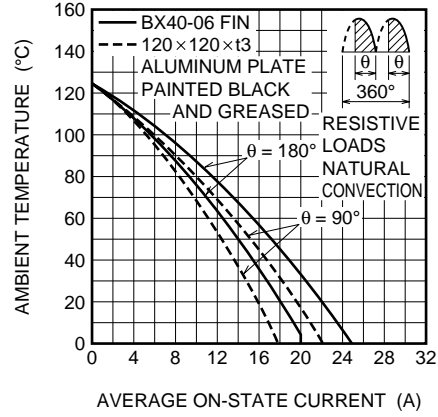
CR20EY

MEDIUM POWER, INVERTER USE  
NON-INSULATED TYPE, GLASS PASSIVATION TYPE

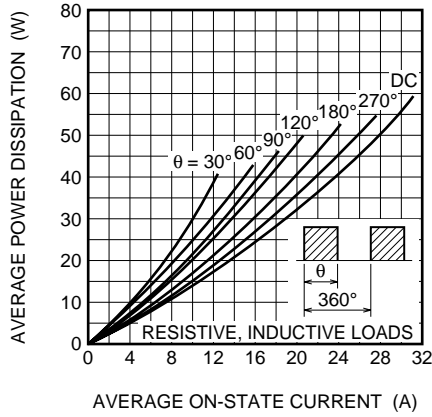
ALLOWABLE CASE TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE FULL WAVE)



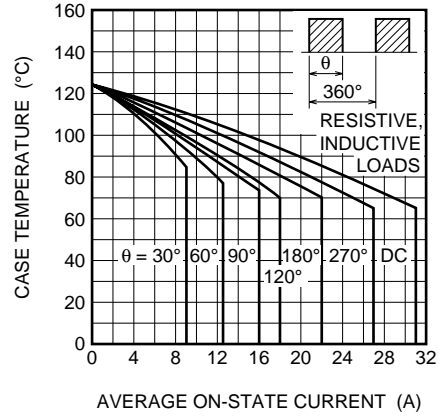
ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE FULL WAVE)



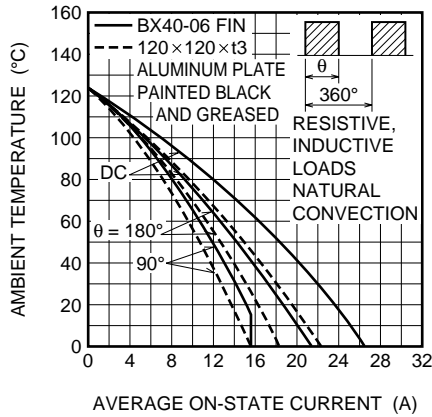
MAXIMUM AVERAGE POWER DISSIPATION (RECTANGULAR WAVE)



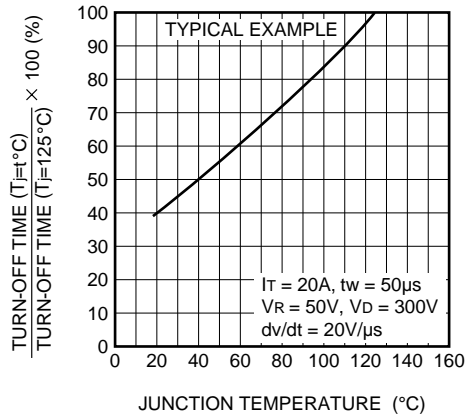
ALLOWABLE CASE TEMPERATURE VS. AVERAGE ON-STATE CURRENT (RECTANGULAR WAVE)



ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (RECTANGULAR WAVE)



TURN-OFF TIME VS. JUNCTION TEMPERATURE



**CR20EY**

MEDIUM POWER, INVERTER USE  
NON-INSULATED TYPE, GLASS PASSIVATION TYPE

