

# LCRW20

## Sensitive gate 4A SCRs

$I_{T(AV)}$	2 A
$V_{DRM}/V_{RRM}$	800 V
$I_{GT}$	200 $\mu$ A
$T_J$	-40°C to +110°C

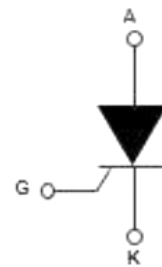
### Features

- On-state RMS current: 4A
- Repetitive peak off-state voltage (VDRM, VRRM) 800V
- Triggering gate current, IGT 200  $\mu$ A

### Description

Thanks to highly sensitive triggering levels, the device is suitable for all applications where the available gate current is limited, such as motor control for hand tools, kitchen aids, overvoltage crowbar protection for low power supplies among others.

Available in through-hole and surface-mount packages, they provide an optimized performance in a limited space area



### Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (180 ° conduction angle)		$T_C = 115^\circ\text{C}$	4	A
$I_{T(AV)}$	Average on-state current (180 ° conduction angle)		$T_C = 115^\circ\text{C}$	2	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	$T_{j \text{ initial}} = 25^\circ\text{C}$	20	A
		$t_p = 10 \text{ ms}$		30	
$I^2t$	$I^2t$ value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^\circ\text{C}$	4.5	$\text{A}^2\text{s}$
$di/dt$	Critical rate of rise of on-state current $I_G = 10 \text{ mA}$ , $dI_G / dt = 0.1 \text{ A}/\mu\text{s}$	$f = 60 \text{ Hz}$ $f = 60 \text{ Hz}$	$T_j = 125^\circ\text{C}$	50	$\text{A}/\mu\text{s}$
$I_{GM}$	Peak gate current	$t_p = 20 \mu\text{s}$		1.2	A
$P_{G(AV)}$	Average gate power dissipation			0.2	W
$V_{RGM}$	Maximum peak reverse gate voltage			5	V
$T_{stg}$	Storage junction temperature range			-40 to +150	$^\circ\text{C}$
$T_j$	Maximum operating junction temperature			-40 to +110	$^\circ\text{C}$

## Device timings

Symbol	Parameter	Test conditions	Value	Unit
$t_{GT}$	Gate controlled turn on time	$I_{TM} = 10\text{ A}$ , $T_j = 25\text{ }^\circ\text{C}$ , $V_D = V_{DRM}(\text{max.})$ , $I_{GT} = 10\text{ mA}$ , $dI_G/dt = 0.2\text{ A}/\mu\text{s}$ , $R_G = 1\text{ k}\Omega$	0.5 (typ.)	$\mu\text{s}$
$t_Q$	Circuit controlled turn off time	$I_{TM} = 8\text{ A}$ , $T_j = 125\text{ }^\circ\text{C}$ , $V_D = 67\% V_{DRM}(\text{max.})$ , $V_R = 10\text{ V}$ , $dI_T/dt = 10\text{ A}/\mu\text{s}$ , $dV_D/dt = 2\text{ V}/\mu\text{s}$ , $R_G = 1\text{ k}\Omega$	60 (typ.)	

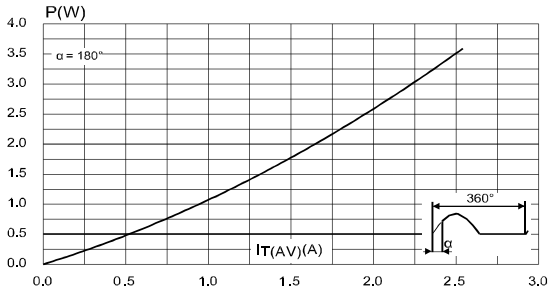
## Electrical characteristics ( $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Symbol	Test Conditions	Value	Unit
$I_{GT}$	$V_D = 12\text{ V}$ , $R_L = 33\text{ }\Omega$	Max. 200	$\mu\text{A}$
$V_{GT}$		Max. 0.8	V
$V_{GD}$	$V_D = V_{DRM}$ , $R_L = 33\text{ k}\Omega$ , $R_{GK} = 220\text{ }\Omega$	Min. 0.1	V
$I_H$	$I_T = 50\text{ mA}$ , $R_{GK} = 1\text{ k}\Omega$	Max. 5	mA
$I_L$	$I_G = 2\text{ mA}$ , $R_{GK} = 1\text{ k}\Omega$	Max. 6	mA
$dV/dt$	$V_D = 67\% V_{DRM}$ , $R_{GK} = 220\text{ }\Omega$	Min. 5	$\text{V}/\mu\text{s}$
$V_{TM}$	$I_{TM} = 8\text{ A}$ , $t_P = 380\text{ }\mu\text{s}$	Max. 1.35	V
$V_{T0}$	Threshold voltage	Max. 0.85	V
$R_D$	Dynamic resistance	Max. 90	$\text{m}\Omega$
$I_{DRM}$	$V_D = V_R = V_{DRM} = V_{RRM}$ ; $R_{GK} = 220\text{ }\Omega$	Max. 5	$\mu\text{A}$
$I_{RRM}$		1	mA

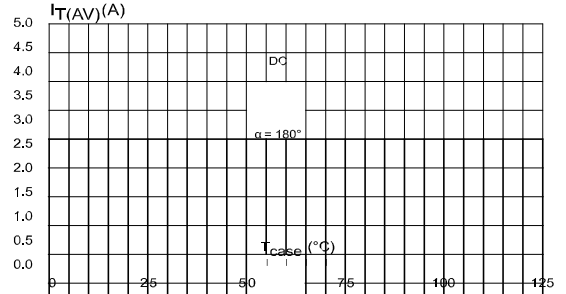
## Thermal parameters

Symbol	Parameter	Value	Unit	
$R_{th(j-c)}$	Junction to case (DC)	3.0	$^\circ\text{C}/\text{W}$	
$R_{th(j-a)}$	Junction to ambient (DC)	$S^{(1)} = 0.5\text{ cm}^2$ , DPAK		70
		IPAK		100
		TO-220AB		60

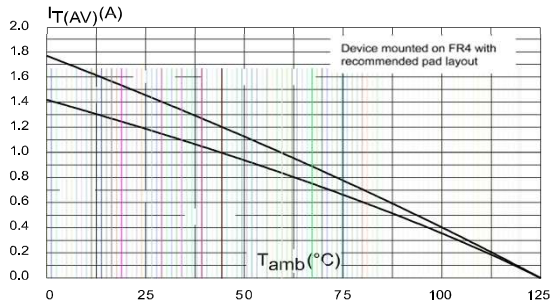
**Figure 1: Maximum average power dissipation versus average on-state current**



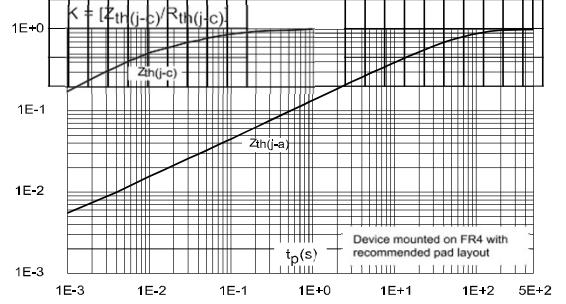
**Figure 2: Average and DC on-state current versus case temperature**



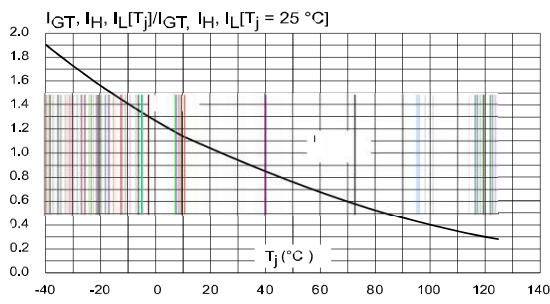
**Figure 3: Average and D.C. on state current versus ambient temperature (DPAK)**



**Figure 4: Relative variation of thermal impedance junction to ambient versus pulse duration (DPAK)**



**Figure 5: Relative variation of gate trigger current and holding current versus junction temperature**



**Figure 6: Relative variation of holding current versus gate-cathode resistance (typical values)**

