

# LCR832

## 32A 800V non insulated SCR thyristor

$I_{T(AV)}$	32 A
$V_{DRM}/V_{RRM}$	800 V
$I_{GT}$	25 mA
$T_J$	-40°C to +125°C

### Features

- On-state rms current: 48 A
- Blocking voltage: 800 V
- Gate current: 50 mA

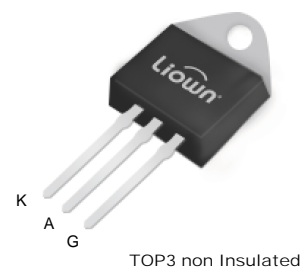
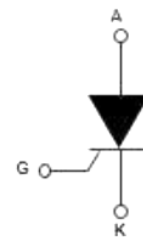
### Applications

- Solid state relay
- Battery charging system
- Uninterruptible power supply
- Variable speed motor drive
- Industrial welding systems
- By pass AC switch

### Description

Available in non insulated TOP3 high power package, the LCR832 is suitable for applications where power switching and power dissipation are critical, such as by-pass switch, controlled AC rectifier bridge, in solid state relay, battery charger, uninterruptible power supply, welding equipment and motor driver applications.

Based on a clip assembly technology, the LCR832 offers a superior performance in surge current handling and thermal cooling capabilities.



TOP3 non Insulated

### Absolute maximum ratings (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	On-state current rms (180° conduction angle)		$T_c = 102\text{ °C}$	48	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)		$T_c = 102\text{ °C}$	32	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3\text{ ms}$	$T_j = 25\text{ °C}$	480	A
		$t_p = 10\text{ ms}$		700	
$I_t^2$	$I_t^2$ Value	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$	2450	A <sup>2</sup> s
dI/dt	Critical rate of rise of on-state current Gate supply: $I_G = 100\text{ mA}$ , $dI_G/dt = 1\text{ A}/\mu\text{s}$			100	A/ $\mu\text{s}$
$I_{GM}$	Peak gate current	$t_p = 20\text{ }\mu\text{s}$	$T_j = 125\text{ °C}$	8	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125\text{ °C}$	1	W
$T_{stg}$ $T_j$	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	°C
$V_{GM}$	Maximum peak reverse gate voltage			5	V

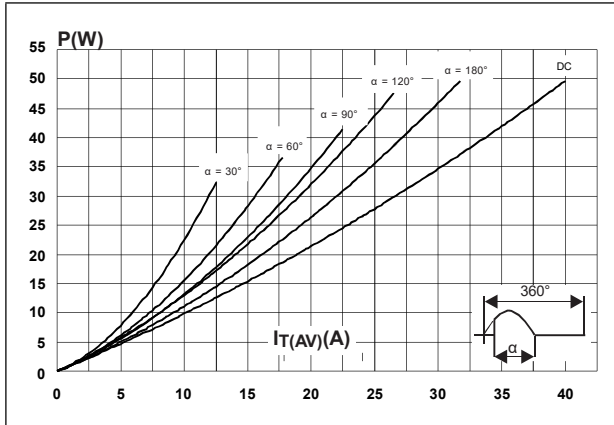
### Electrical characteristics ( $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Symbol	Test conditions		Value	Unit		
$I_{GT}$	$V_D = 12\text{ V}$ , $R_L = 33\ \Omega$	MIN.	8	mA		
		MAX.	25			
$V_{GT}$		MAX.	1.3	V		
$V_{GD}$	$V_D = V_{DRM}$ , $R_L = 3.3\text{ k}\Omega$	$T_j = 125\text{ }^\circ\text{C}$	MIN.	0.2	V	
$I_H$	$I_T = 500\text{ mA}$ , gate open		MAX.	100	mA	
$I_L$	$I_G = 1.2 \times I_{GT}$		TYP.	125	mA	
$t_{gt}$	$I_T = 50\text{ A}$ , $V_D = V_{DRM}$ , $I_G = 200\text{ mA}$ , $di_G/dt = 0.2\text{ A}/\mu\text{s}$		TYP.	2	$\mu\text{s}$	
$dV/dt$	$V_D = 67\% V_{DRM}$ , gate open	$T_j = 125\text{ }^\circ\text{C}$	MIN.	1000	$\text{V}/\mu\text{s}$	
$t_q$	$V_D = 800\text{ V}$ , $I_{TM} = 50\text{ A}$ , $V_R = 75\text{ V}$ , $t_p = 100\ \mu\text{s}$ , $di_{TM}/dt = 30\text{ A}/\mu\text{s}$ , $dV_D/dt = 20\text{ V}/\mu\text{s}$	$T_j = 125\text{ }^\circ\text{C}$	TYP.	100	$\mu\text{s}$	
$V_{TM}$	$I_{TM} = 100\text{ A}$ , $t_p = 380\ \mu\text{s}$	$T_j = 25\text{ }^\circ\text{C}$	MAX.	1.35	V	
$V_{t0}$	Threshold voltage		$T_j = 125\text{ }^\circ\text{C}$	MAX.	0.9	V
$R_D$	Dynamic resistance		$T_j = 125\text{ }^\circ\text{C}$	MAX.	8.5	$\text{m}\Omega$
$I_{DRM}$ $I_{RRM}$	$V_D = V_{DRM}$ $V_R =$ $V_{RRM}$	$T_j = 25\text{ }^\circ\text{C}$	MAX.	10	$\mu\text{A}$	
		$T_j = 125\text{ }^\circ\text{C}$		5	mA	

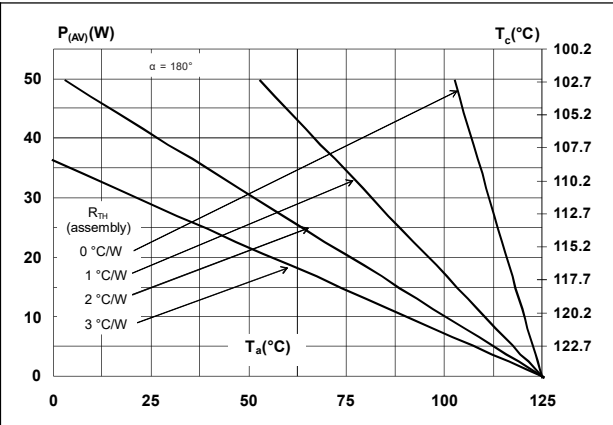
### Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (DC, typ.)	0.45	$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient (DC)	50	$^\circ\text{C}/\text{W}$

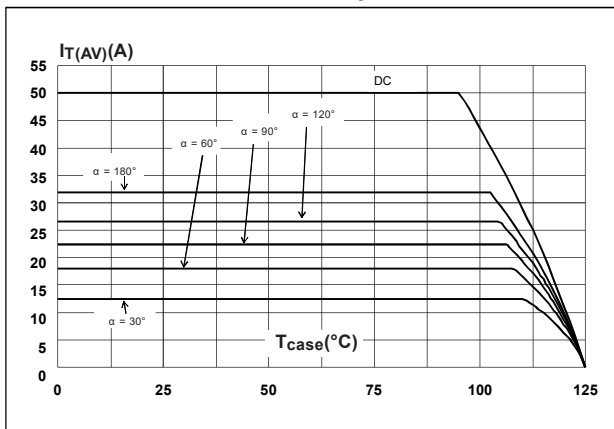
**Figure 1. Maximum average power dissipation versus average on-state current**



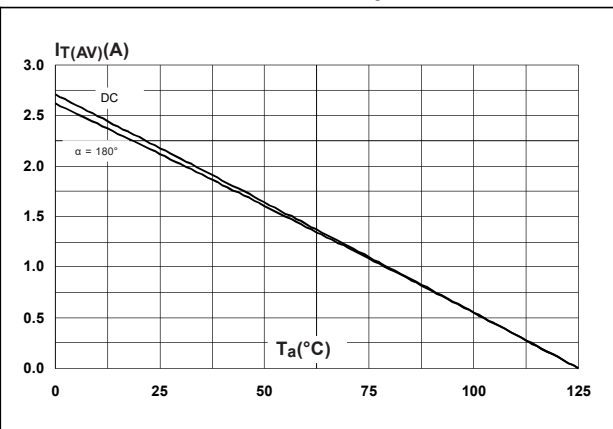
**Figure 2. Correlation between maximum average power dissipation and maximum allowable temperatures**



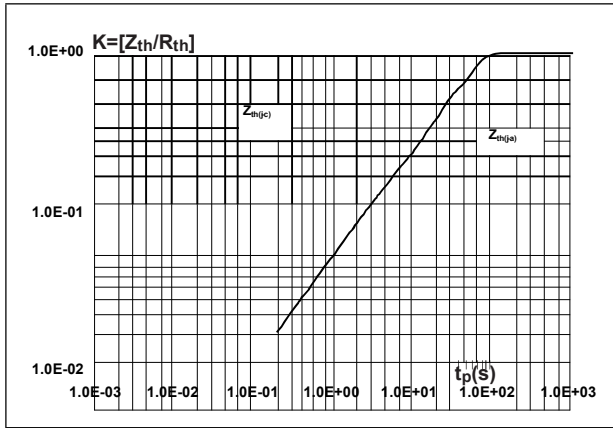
**Figure 3. Average and DC on-state current versus case temperature**



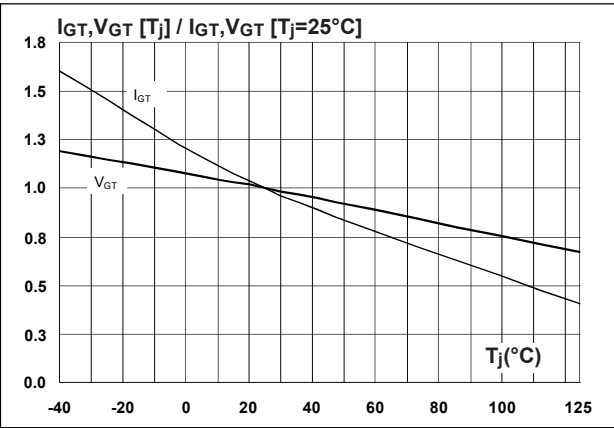
**Figure 4. Average and DC on-state current versus ambient temperature**



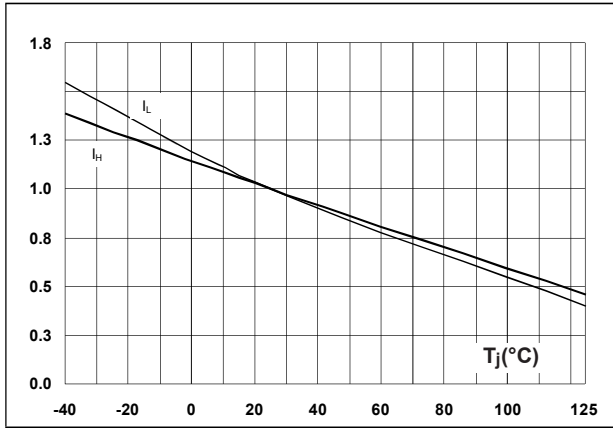
**Figure 5. Relative variation of thermal impedance versus pulse duration**



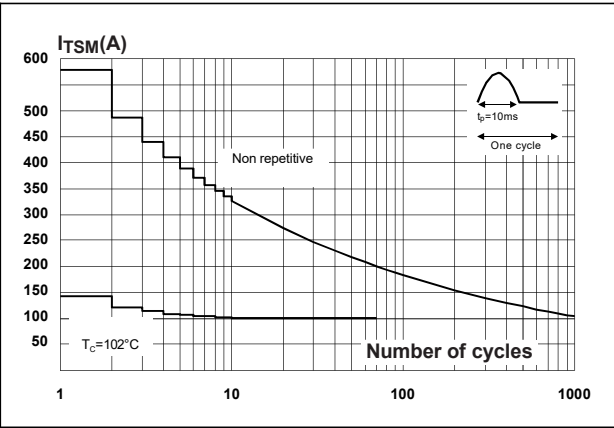
**Figure 6. Relative variation of gate trigger current and gate trigger voltage versus junction temperature (typical value)**



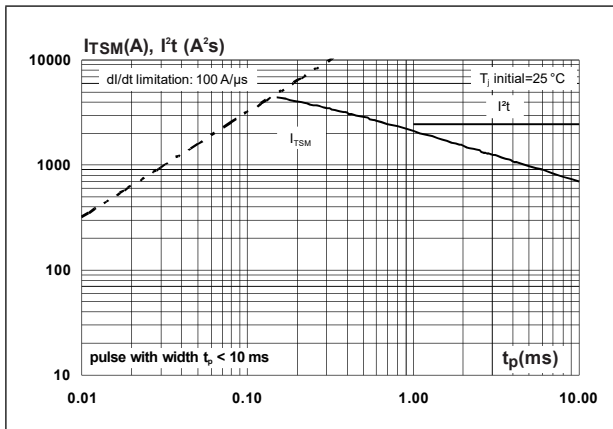
**Figure 7. Relative variation of holding, and latching currents versus junction temperature (typical values)**



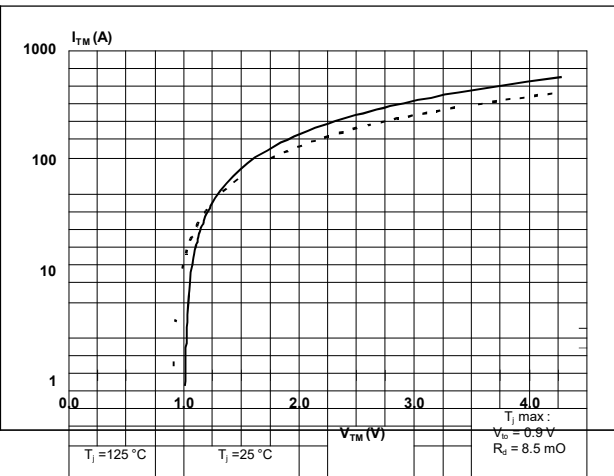
**Figure 8. Surge peak on-state current versus number of cycles**



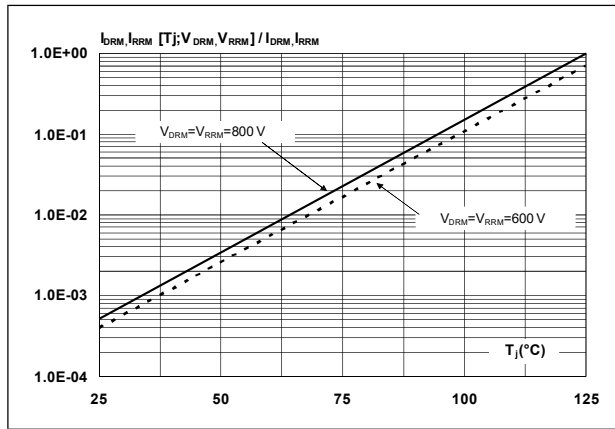
**Figure 9. Non repetitive surge peak on-state current and corresponding value of I²t versus sinusoidal pulse**



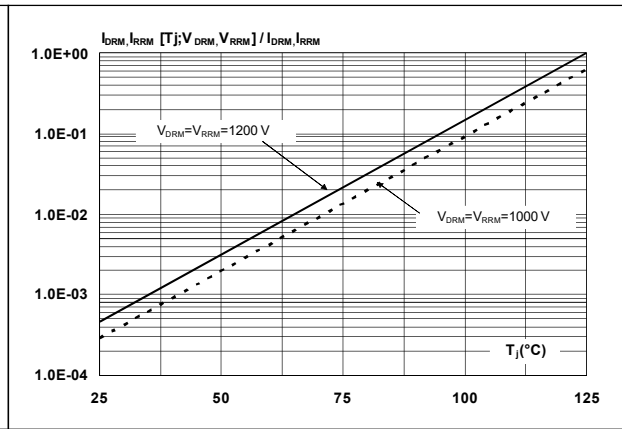
**Figure 10. On-state characteristics (maximum values)**



**Figure 11. Relative variation of leakage current versus junction temperature for different values of blocking voltage (600 and 800 V)**



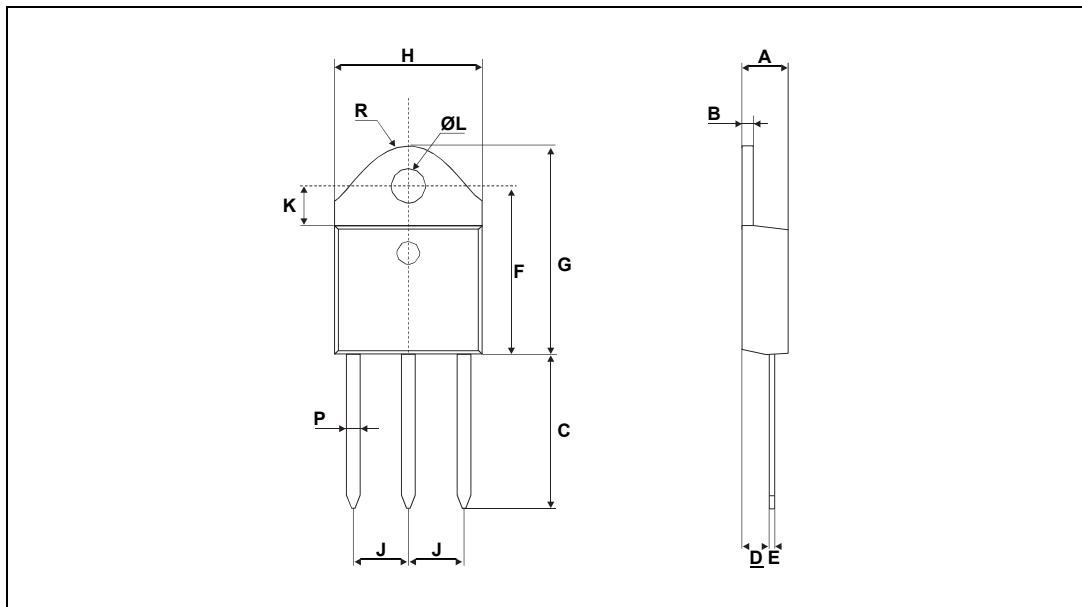
**Figure 12. Relative variation of leakage current versus junction temperature for different values of blocking voltage (1000 and 1200 V)**



## Package information

- Epoxy meets UL94,V0
- Lead-free packages
- Cooling method: by conduction (C)
- Recommended torque value: 0.9 to 1.2 N·m

### TOP3 dimension definitions and values



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	1.45	1.55	0.057	0.061
C	14.35	15.60	0.565	0.614
D	0.5	0.7	0.020	0.028
E	2.7	2.9	0.106	0.114
F	15.8	16.5	0.622	0.650
G	20.4	21.1	0.815	0.831
H	15.1	15.5	0.594	0.610
J	5.4	5.65	0.213	0.222
K	3.4	3.65	0.134	0.144
ØL	4.08	4.17	0.161	0.164
P	1.20	1.40	0.047	0.055
R	4.60 typ.		0.181 typ.	