

# LCR824

## 24A standard SCRs

$I_{T(AV)}$	24 A
$V_{DRM}/V_{RRM}$	800 V
$I_{GT}$	20 mA
$T_J$	-40°C to +125°C

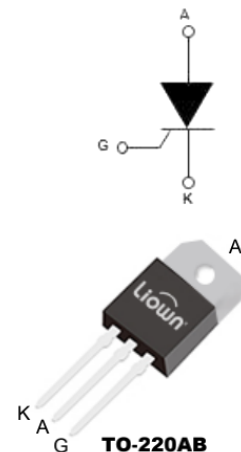
### Features

- On-state rms current,  $I_{T(RMS)}$ : 36 A
- Repetitive peak off-stat voltage,  $V_{DRM}$ ,  $V_{RRM}$ : 800V
- Triggering gate current,  $I_{GT}$ : 20 mA

### Description

These standard SCRs are suitable for applications where in-rush current conditions are critical, such as overvoltage crowbar protection circuits in power supplies, in-rush current limiting circuits, solid state relays (in back to back configuration), welding equipment, high power motor control circuits.

Using clip assembly technology, they provide a superior performance in high surge current capabilities.



### Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	On-state rms current (180° conduction angle)		$T_c = 95\text{ °C}$ 36	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)		$T_c = 95\text{ °C}$ 24	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3\text{ ms}$	$T_j = 25\text{ °C}$ 360	A
		$t_p = 10\text{ ms}$		
$I^2t$	$I^2t$ Value for fusing	$t_p = 10\text{ ms}$	$T_j = 25\text{ °C}$ 1060	$A^2_s$
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$	F = 60 Hz	$T_j = 125\text{ °C}$ 50	A/ $\mu s$
$I_{GM}$	Peak gate current	$t_p = 20\text{ }\mu s$	$T_j = 125\text{ °C}$ 4	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
$V_{RGM}$	Maximum peak reverse gate voltage		5	V

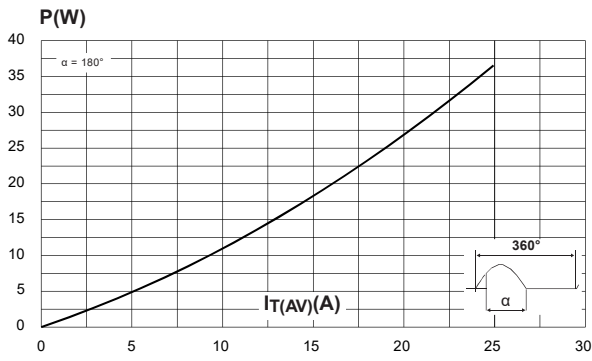
### Electrical Characteristics ( $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions		Value	Unit	
$I_{GT}$	$V_D = 12\text{ V}$ $R_L = 33\ \Omega$	MIN.	3.5	mA	
		MAX.	20		
$V_{GT}$		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.	75	mA
$I_L$	$I_G = 1.2 \times I_{GT}$		MAX.	150	mA
dV/dt	$V_D = 67\% V_{DRM}$ Gate open	$T_j = 125\text{ }^\circ\text{C}$	MIN.	1000	V/ $\mu\text{s}$
$V_{TM}$	$I_{TM} = 80\text{ A}$ $t_p = 380\ \mu\text{s}$	$T_j = 25\text{ }^\circ\text{C}$	MAX.	1.35	V
$V_{i0}$	Threshold voltage	$T_j = 125\text{ }^\circ\text{C}$	MAX.	0.85	V
$R_d$	Dynamic resistance	$T_j = 125\text{ }^\circ\text{C}$	MAX.	10	m $\Omega$
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$	$T_j = 25\text{ }^\circ\text{C}$	MAX.	5	$\mu\text{A}$
		$T_j = 125\text{ }^\circ\text{C}$		4	mA

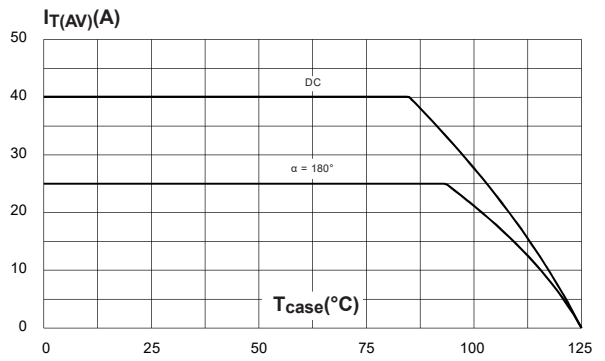
### Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (DC)	0.8	$^\circ\text{C/W}$
$R_{th(j-a)}$	Junction to ambient (DC)	60	$^\circ\text{C/W}$

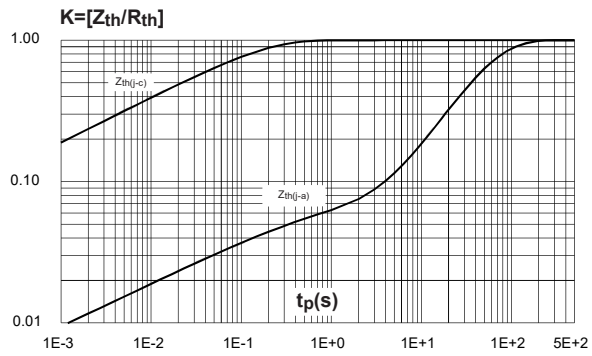
**Figure 1. Maximum average power dissipation versus average on-state current**



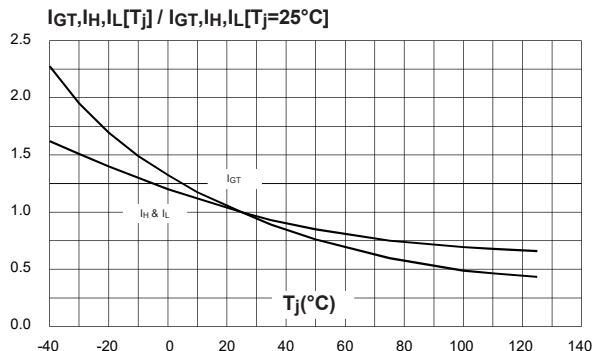
**Figure 2. Average and DC on-state current versus case temperature**



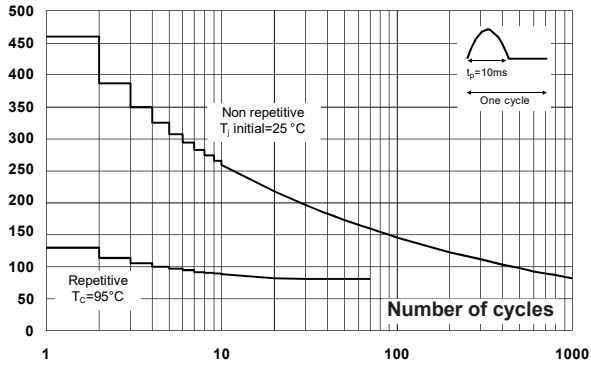
**Figure 3. Relative variation of thermal impedance versus pulse duration**



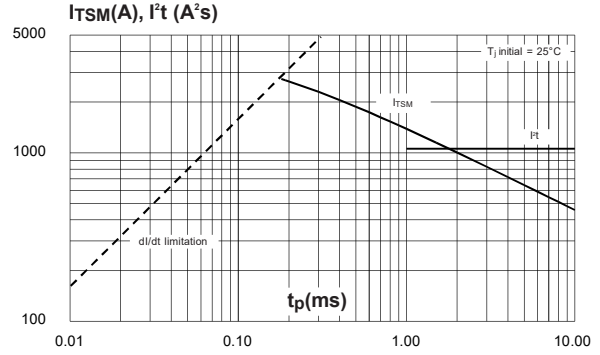
**Figure 4. Relative variation of gate trigger current, holding current and latching current versus junction temperature**



**Figure 5. Surge peak on-state current versus number of cycles**



**Figure 6. Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms, and corresponding values of  $I^2t$**



**Figure 7. On-state characteristics (maximum values)**

