

LCR1645

45A 1600V standard SCR

$I_{T(AV)}$	45 A
V_{DRM}/V_{RRM}	1600 V
I_{GT}	20-60 mA
T_J	-40°C to +125°C

Features

- Max. Repetitive Blocking Voltage = V_{DRM} , $V_{RRM} = 1600$ V
- I_{GT} maximum = 60 mA
- High static and dynamic commutation:
 - $di/dt = 100A/\mu s$
 - $dV/dt = 2000V/\mu s$

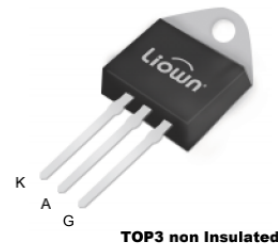
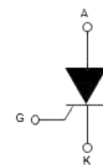
Applications

- Solar / Wind renewable energy inverters and rectifiers
- Solid state relay (SSR)
- Uninterruptible power supply (UPS)
- Industrial SMPS
- Bypass
- AC DC inrush current limiter (ICL)
- Battery charger
- AC DC voltage controlled rectifier
- Industrial welding systems
- Off board automotive battery charger
- Soft starter
- Heating systems

Description

The LCR1645 SCR is suitable in industrial applications where high immunity is required with a lower gate current and ceramic isolated tab,

Available in through-hole high power package TOP3 isolated tab.



Absolute maximum ratings (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	On-state RMS current (180 ° conduction angle)		65	A	
$I_{T(AV)}$	Average on-state current (180 ° conduction angle)				
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25 °C)		$t_p = 8.3$ ms	650	A
			$t_p = 10$ ms	400	
I^2t	I^2t value for fusing		$t_p = 10$ ms	800	A ² s
di/dt	Critical rate of rise of on-state current $I_G = 100$ mA, $di_G/dt = 1$ A/ μ s	$f = 60$ Hz	$T_j = 125$ °C	100	A/ μ s
I_{GM}	Maximum peak positive gate current	$t_p = 20$ μ s	$T_j = 125$ °C	8	A
V_{GM}	Maximum peak positive gate voltage			5	V
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125$ °C	1	W
V_{RGM}	Maximum peak reverse gate voltage			3.5	V
T_{stg}	Storage junction temperature range			-40 to +150	°C
T_j	Operating junction temperature range			-40 to +125	

Electrical characteristics (T_j = 25 °C unless otherwise specified)

Symbol	Test conditions			Value	Unit	
I _{GT}	V _D = 12 V, R _L = 33 Ω			Min.	20	mA
				Max.	60	
V _{GT}				Max.	1.5	V
V _{GD}	V _D = V _{DRM} , R _L = 3.3 kΩ	T _j = 125 °C		Min.	0.2	V
I _H	I _T = 500 mA, gate open			Max.	100	mA
I _L	I _G = 1.2 × I _{GT}			Max.	130	mA
dV/dt	V _D = 67% V _{DRM} , gate open	T _j = 125 °C		Min.	2	kV/μs
t _{gt}	I _T = 40 A, V _D = V _{DRM} , I _G = 200 mA, (dI _G /dt) max = 0.2 A/μs			Typ.	2	μs
t _q	I _{TM} = 40 A, V _D = 800 V, dI _{TM} /dt = 30 A/μs, V _R = 75 V, dV _D /dt = 20 V/μs	T _j = 125 °C		Typ.	100	μs

Static characteristics

Symbol	Test conditions			Value	Unit
V _{TM}	I _{TM} = 80 A, t _p = 380 μs	T _j = 25 °C	Max.	1.4	V
V _{TO}	Threshold voltage	T _j = 125 °C	Max.	0.9	
R _D	Dynamic resistance	T _j = 125 °C	Max.	9.8	mΩ
I _{DRM} , I _{RRM}	V _{DRM} = V _{RRM} = 1200 V	T _j = 25 °C	Max.	10	μA
		T _j = 125 °C		5	mA

Thermal parameters

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case (DC)	Typ.	1.1	°C/W
R _{th(j-a)}	Junction to ambient (DC)		50	

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

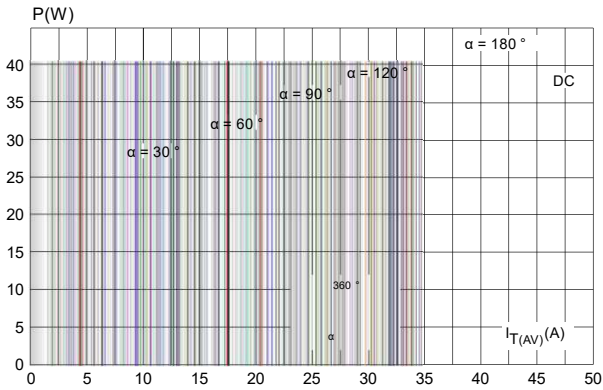


Figure 2. Average and DC on-state current versus case temperature

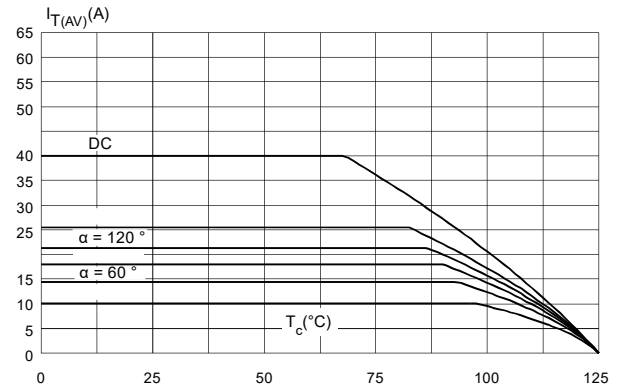


Figure 3. On-state characteristics (maximum values)

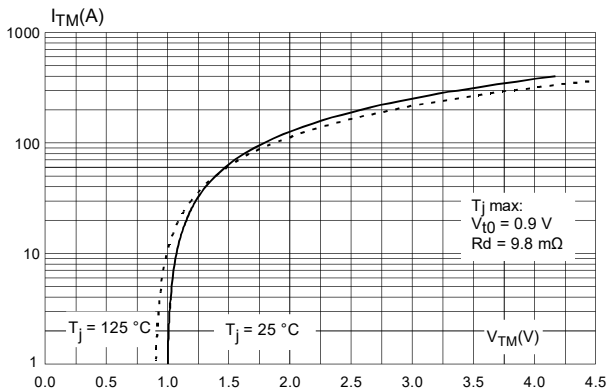


Figure 4. Average and D.C. on-state current versus ambient temperature

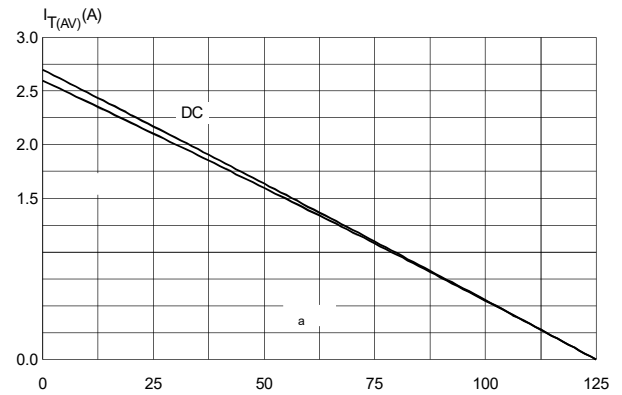


Figure 5. Relative variation of thermal impedance junction to case and junction to ambient versus pulse duration

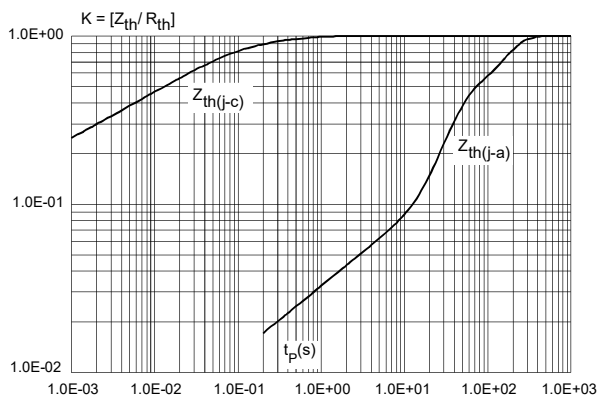


Figure 6. Surge peak on-state current versus number of cycles

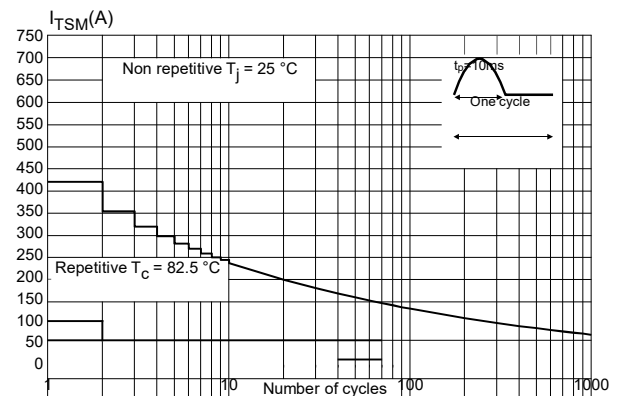


Figure 7. Non repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms

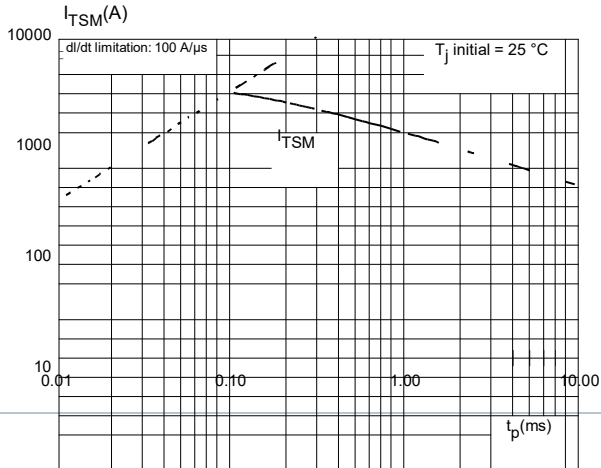


Figure 8. Relative variation of gate trigger current and gate trigger voltage versus junction temperature (typical value)

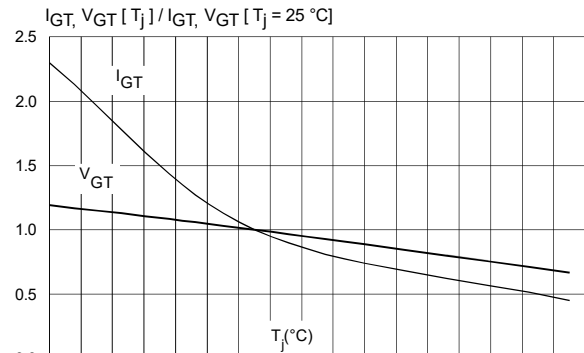


Figure 9. Relative variation of holding and latching current versus junction temperature (typical value)

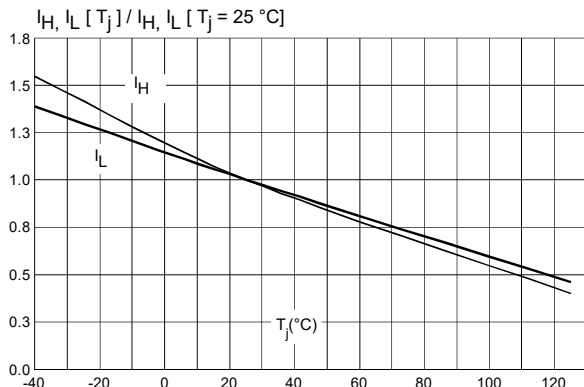


Figure 10. Relative variation of static dV/dt immunity versus junction temperature

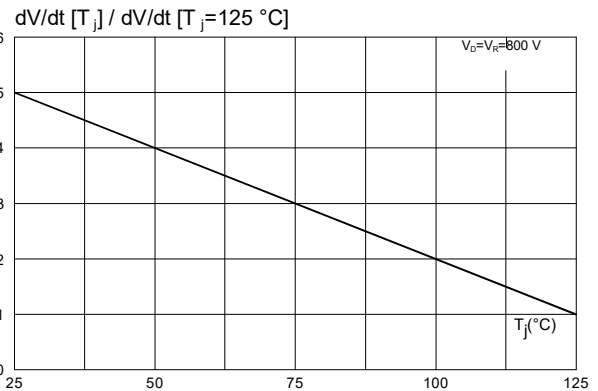


Figure 11. Relative variation of leakage current versus junction temperature for different values of blocking voltage (typical values)

