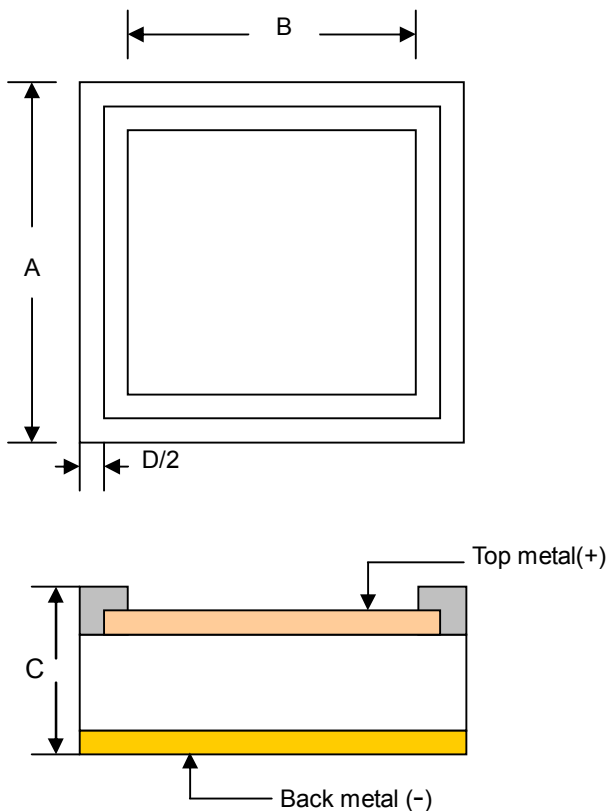# CRD Current Regulative Diode

CRD can provide with a constant current, under a wide range of voltage fluctuations, to LED or other electronics devices especially in LED lighting applications, which makes it more efficient，cost- effective and simpler in power design.

Item	Dimensions	
	um	mil
Die Size（A）	820	32.3
Top Metal (Al)	550	21.6
Top Metal Pad size（B）		
Top Metal (Ag)	510	20
Top Metal Pad size（B）		
Wafer Thickness（C）	260	10.2
Scribe Line Width（D）	60	2.36
Other Information		
Wafer Size	6"	
Gross Die	24000	
Back Side Metal	Ag	

Characteristics

Working Voltage Range：3V~190V
LOW Active Voltage
Negative Temperature Coefficient

Applications

The purpose of CRD constant current is to support and stabilize LED illumination in lighting power，which is an advantage alternative way to switching mode design. This application has been widely applied to LED power such as LED tube lighting，LED street light，LED bulbs, etc.

Specifications (Electrical Characteristics @TA=25°C)

Wafer Part No.	Pinch-Off Current I_P @ V=20V		Active Voltage V_K	Max. Voltage Loading V_B max	Max. Power Loading P_D	Junction & Storage Temp. T_J，T_{stg}	Top Metal
	min	max	V_K @ $0.8I_{Pmin}$	V_B@$1.1I_{Pmax}$	max	Range	
	[mA]	[mA]	Max [V]	[V]	[w]	[℃]	
CPC32S4P5HG	3.6	5.4	2.0	190	1.2	-55~150	Ag
CPC32S5P6HG	4.5	6.7	2.0	190	1.2	-55~150	Ag
CPC32S010HG	8	12	2.5	190	1.2	-55~150	Ag
CPC32S010HL	8	12	2.5	190	1.2	-55~150	Al

	25℃	50℃	75℃	100℃	125℃
CPC32S010	1.01E-02	9.09E-03	8.32E-03	7.71E-03	7.28E-03

I-V Curve @TA=25°C
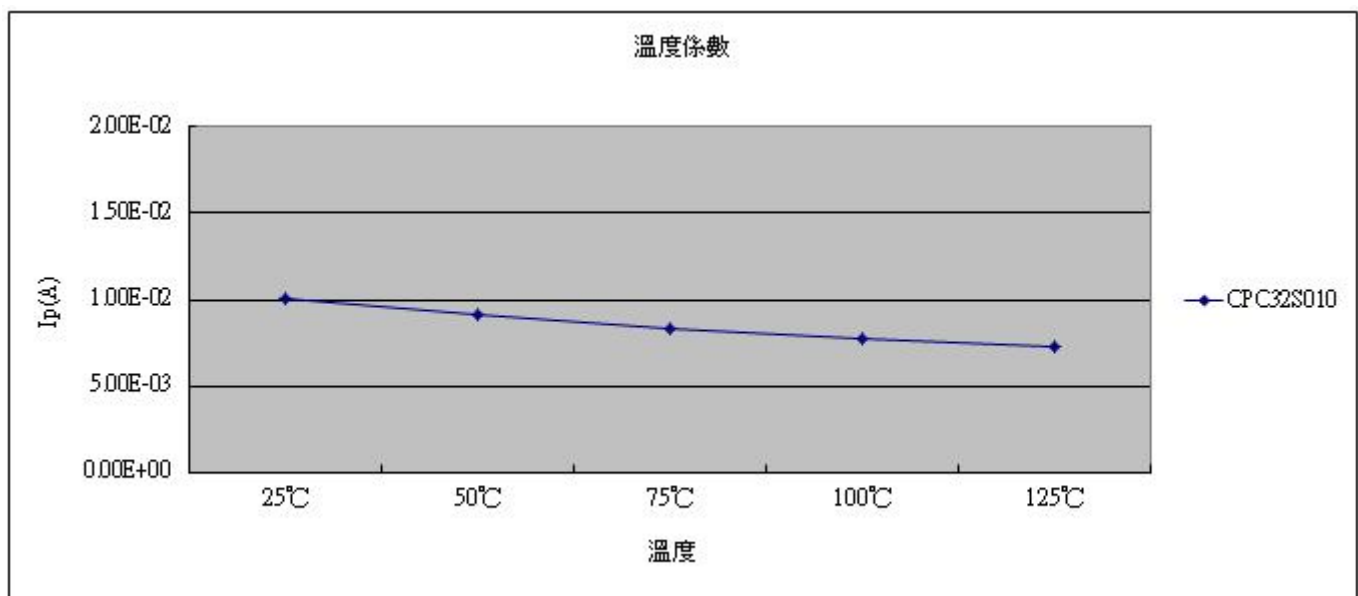
LED lighting application rules

(1) CRD max. loading voltage = peak input voltage (AC voltage x 1.414) – LED total series connection working voltage (VfxN). This value must be lower than the listed Max. Voltage Loading.

(2) The max. no. of LED series connection = (peak input voltage (AC voltage x 1.414) –CRD Active Voltage V_k) / LED working voltage Vf。

(3) The min. no. of LED series connection = (peak input voltage (AC voltage x 1.414) –CRD Max. Loading Voltage V_{Bmax}) / LED working voltage Vf。

(4) Max CRD Power Loading = CRD Max. Voltage Loading x CRD current loading. This value must be lower than the listed Max. Power Loading.

Simple CRD Design Rule reminding：

(1) The max. loading of CRD circuit design should not exceed listed loading limitation to ensure safety concern in application. When designed max. power loading exceeds allowed standard, serious damages could be caused to CRD's.

(2) When T_A goes up, the Vf of LED will drop and simultaneously lead to higher LED voltage loading; consequently, practical reliability tests and essential design modifications are highly recommended to ensure safety issues, before any designed circuits are prepared for mass production.