iC-TL46 BLCC SD1C

Blue LED - SMD, 3.4 mm spot size

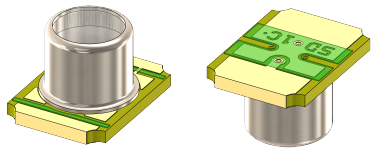
FEATURES

- Emission peak at 460 nm
- Optimized irradiance pattern
- Temperature range -40 to 125 °C
- High switching speed
- Packages suitable for SMT mounting

APPLICATIONS

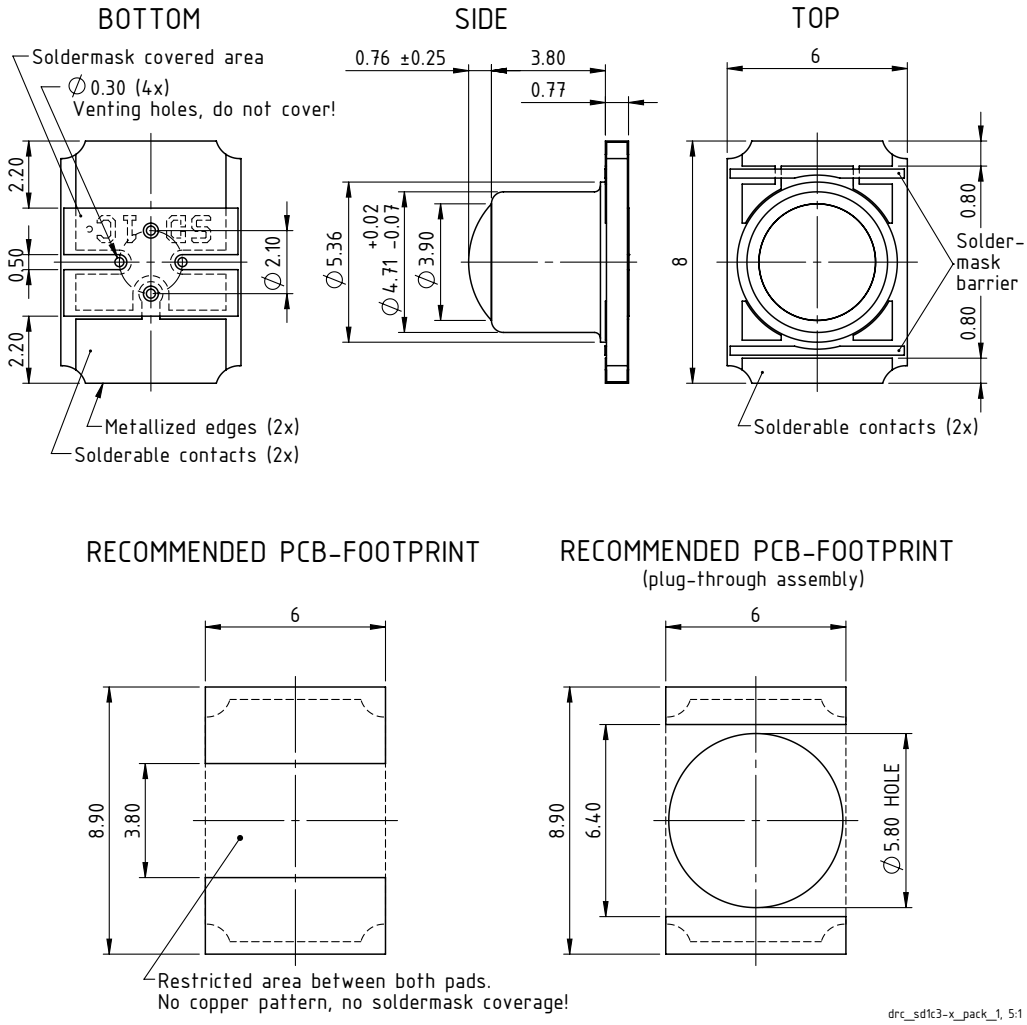
- Illumination for high resolution optical encoder
- Modulated light barriers

PACKAGE



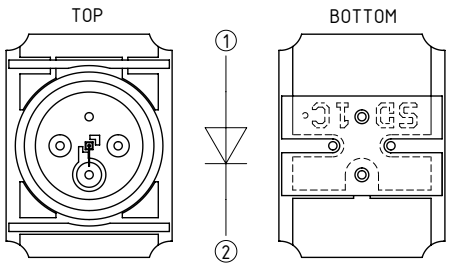
BLCC SD1C

DIMENSIONS



PACKAGING INFORMATION

PIN CONFIGURATION SD1C



PIN FUNCTIONS

No.	Name	Function
1	A	Anode
2	C	Cathode

ABSOLUTE MAXIMUM RATINGS

Beyond these values damage may occur (Ta = 25°C, unless otherwise noted)

Item No.	Symbol	Parameter	Conditions	Min.	Max.	Unit
G001	IF	Forward Current (DC)			50	mA
G002	IFSM	Surge Forward Current	1/10 duty cycle @ 1 kHz		100	mA
G003	VR	Reverse Voltage			5	V
G004	P	Power Dissipation	Case temperature 25°C		150	mW
G005	Tj	Junction Temperature		-40	125	°C

All voltages are referenced to ground unless otherwise stated.
All currents flowing into the device pins are positive; all currents flowing out of the device pins are negative.

THERMAL DATA

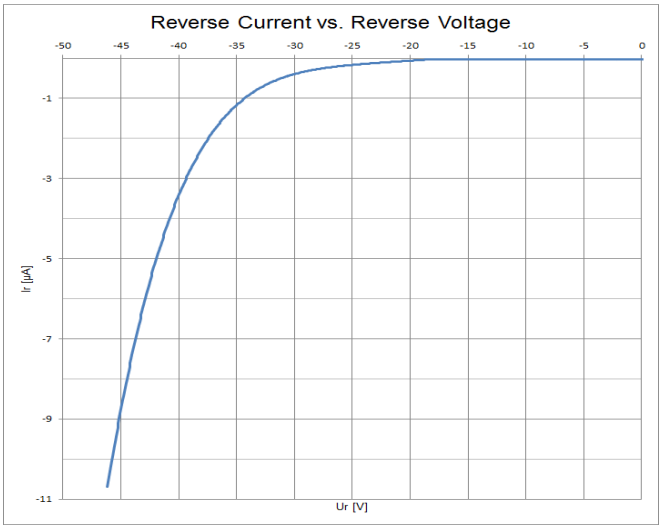
Item No.	Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
T01	Ta	Operating Ambient Temperature Range		-40		125	°C
T02	Ts	Storage Temperature Range		-40		125	°C
T03	Tpk	Reflow Soldering Peak Temperature	Convection reflow: tpk < 20 s, MSL 1 (unlimited floor live at 30 °C and 60 % RH); Please refer to customer information file No. 7 for details. Not suitable for vapor phase soldering.			260	°C
T04	Rthja	Thermal Resistance Junction to Ambient			270		K/W

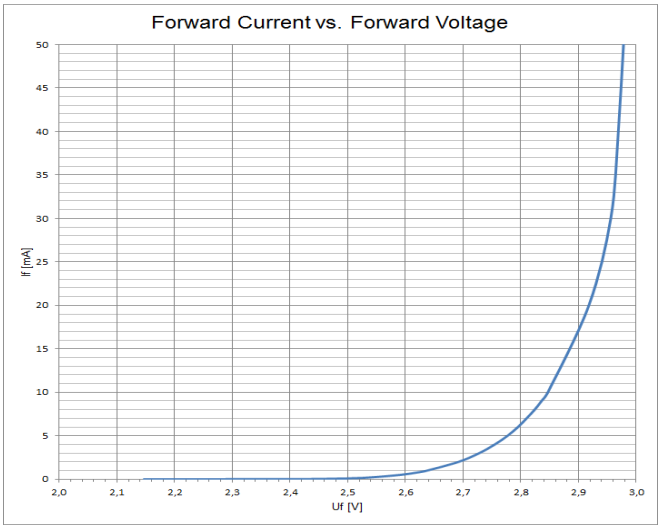
ELECTRICAL CHARACTERISTICS

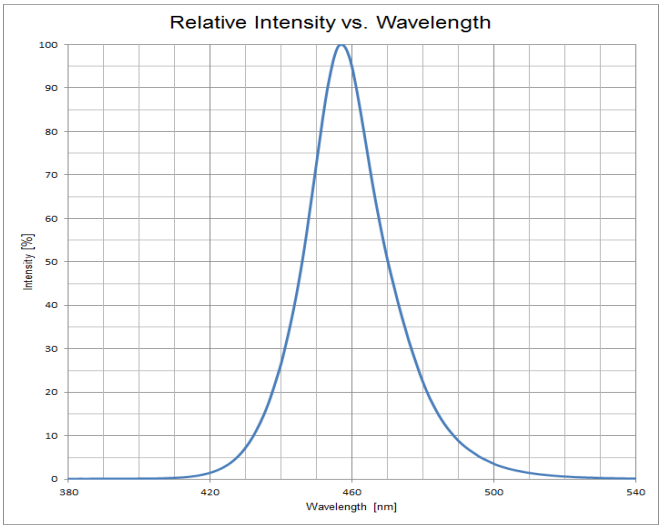
Ta = 25 °C, unless otherwise noted

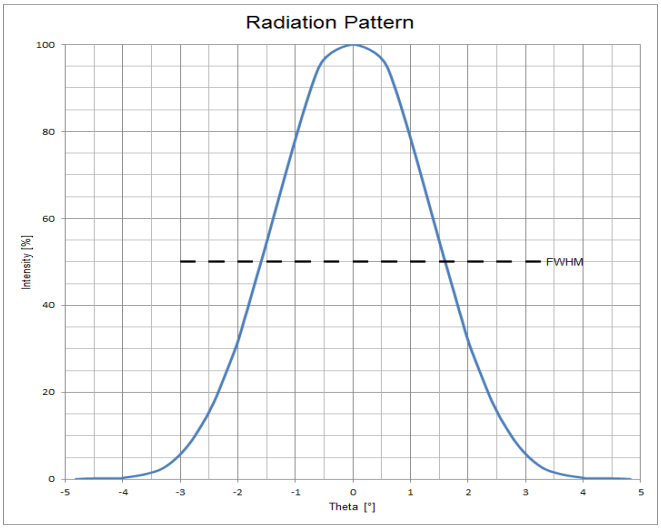
Item No.	Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Electrical and Optical Characteristics							
001	VF	Forward Voltage	IF = 20 mA		2.9	3.8	V
002	VR	Reverse Voltage	IR = 5 µA	5			V
003	Φ_e	Radiant Power	IF = 20 mA	5	6.5		mW
004	TK(Φ_e)	Temperature Coefficient of Radiant Power	IF = 20 mA, Tj = 25 °C...125 °C		-0.3		%/K
005	λ_p	Peak Wavelength	IF = 20 mA	450	460	470	nm
006	$\Delta\lambda$	Spectral Half Width	IF = 20 mA		25		nm
007	2ϕ	Divergence, Far Field	IF = 20 mA, FWHM (Full Width Half Maximum)		3.5		deg.
008	tr, tf	Switching Time	Pulsed IF = 100 mA, RL = 50 Ω		20		ns

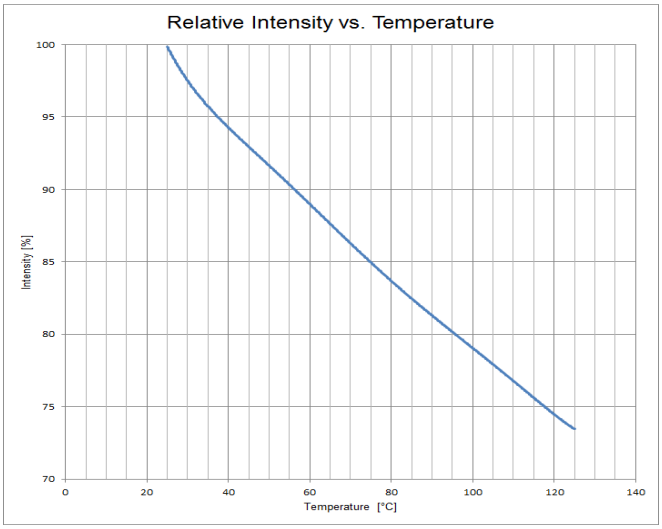
DIAGRAMS

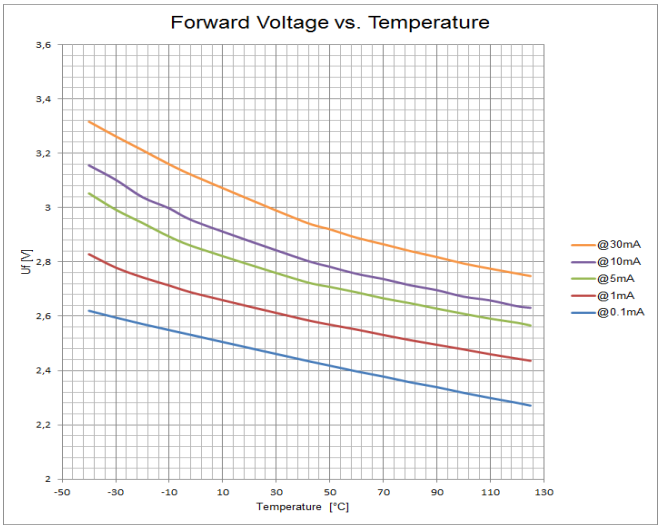

Reverse Current vs. Reverse Voltage
-50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0
-1 -3 -5 -7 -9 -11
Ir [µA]
Ur [V]


Forward Current vs. Forward Voltage
50 45 40 35 30 25 20 15 10 5 0
If [mA]
2,0 2,1 2,2 2,3 2,4 2,5 2,6 2,7 2,8 2,9 3,0
Uf [V]


Relative Intensity vs. Wavelength
100 90 80 70 60 50 40 30 20 10 0
Intensity [%]
380 420 460 500 540
Wavelength [nm]


Radiation Pattern
100 80 60 40 20 0
Intensity [%]
FWHM
-5 -4 -3 -2 -1 0 1 2 3 4 5
Theta [°]


Relative Intensity vs. Temperature
100 95 90 85 80 75 70
Intensity [%]
0 20 40 60 80 100 120 140
Temperature [°C]


Forward Voltage vs. Temperature
3,6 3,4 3,2 3 2,8 2,6 2,4 2,2 2
Uf [V]
-50 -30 -10 10 30 50 70 90 110 130
Temperature [°C]
@30mA
@10mA
@5mA
@1mA
@0.1mA

SAFETY ADVICES

Depending on the mode of operation, these devices emit highly concentrated visible blue light which can be hazardous to the human eye. A direct and prolonged irradiation of the eye especially with short wavelengths should be avoided. For assembly activities during operation protective glasses and appropriate instructions are recommended. Products which incorporate these devices have to follow the safety precautions given in IEC 62471.

GENERAL NOTICE

Epoxy resins (such as solder resists, IC package and injection molding materials, as well as adhesives) may show discoloration, yellowing, and surface changes in general when exposed longterm to high temperatures, humidity, irradiation, or due to thermal treatments for soldering and other manufacturing processes.

Equally, standard molding materials used for IC packages can show visible changes induced by irradiation, among others when exposed to light of shorter wavelengths, blue light for instance. Such surface effects caused by visible or IR LED light are rated to be of cosmetic nature, without influence to the chip's function, its specifications and reliability.

Note that any other material used in the system (e.g. varnish, glue, code disc) should also be verified for irradiation effects.

iC-TL46 SD1C is a non-hermetically sealed LED-device based on FR4 substrate with open vias. Such venting holes are required during production process and must not be sealed or covered during device assembly to maintain airing also during lifetime. Incorporation of organic impurities like flux, adhesives, solvents into the LED housing is prohibited to prevent photochemical degradation under short wavelength irradiation.

HANDLING ADVICES

Because of the specific housing materials and geometries used, these LED devices are sensitive to rough handling or assembly and can thus be easily damaged or may fail in regard to their electro-optical operation. Excessive mechanical stress or load on the lens surface or to the glued cap must be avoided.

VOLATILE ORGANIC COMPOUND (VOC) DISCOLORATION

During operation, high heat flux and high photonic energy generated from the chip may cause VOC oxidation or degradation, resulting typically in a thin dark layer forming on the chip surface.

To avoid VOC-involved encapsulation discoloration, careful consideration should be given before the LED assembly. The LED package should not be placed or operated around any potentially hazardous VOCs. In addition, any conformal coating applied to the LED packages or sealants around the LED packages should not be "air tight" - sufficient gas exchange should be allowed for VOC escape, while still maintaining insulation from corrosive gas. Glues, adhesives, sealants or rubber foams used in the luminaire assembly may have excess VOC outgas and change the LED lumen performance.

(Source: Osram Application Note AN122, "Chemical compatibility of LEDs")

DESIGN REVIEW: Notes On Chip Characteristics

iC-TL46			
No.	Chip Design	Function, Parameter/Code	Description and Application Hints
1	iC-TL46	initial chip release	

Table 4: Notes on chip characteristics

REVISION HISTORY

Rel.	Rel. Date*	Chapter	Modification	Page
A1	2015-01-09	...	Initial release	all

Rel.	Rel. Date*	Chapter	Modification	Page
A2	2015-09-09	PACKAGING INFORMATION	Added LED symbol	all

Rel.	Rel. Date*	Chapter	Modification	Page
A3	2017-01-31	ABSOLUTE MAXIMUM RATINGS	Item G005: Junction Temperature	2
		THERMAL DATA	Item T01: Extended Temperature Range, item T02: Storage Temperature Range	3
		DESIGN REVIEW	Added Chip Design	5

Rel.	Rel. Date*	Chapter	Modification	Page
B1	2019-08-21	PACKAGE	BLCC package drawing	1
		DIMENSIONS	BLCC package drawing	1
		PACKAGING INFORMATION	BLCC package drawing	2
		SAFETY ADVICES	IEC 60825-1 removed	5

Rel.	Rel. Date*	Chapter	Modification	Page
C1	2020-03-13	PACKAGE	BLCC package drawing SD1C3	1
		DIMENSIONS	BLCC package drawing SD1C3	1
		PACKAGING INFORMATION	BLCC package drawing SD1C3	2

Rel.	Rel. Date*	Chapter	Modification	Page
C2	2021-01-27	DIMENSIONS	Callout introduced in package drawing (bottom view) for venting holes	1
		GENERAL NOTICE	Notice extended with respect to package venting holes	5

Rel.	Rel. Date*	Chapter	Modification	Page
C3	2021-02-22	DIMENSIONS	Recommended footprint introduced for top and bottom mounting	1

Rel.	Rel. Date*	Chapter	Modification	Page
C4	2021-07-21	VOLATILE ORGANIC COMPOUND (VOC) DISCOLORATION	Additional advices regarding effects of VOC's	5

* Release Date format: *YYYY-MM-DD*

ORDERING INFORMATION

Type	Package	Order Designation
iC-TL46	2-Pin BLCC, 8 mm x 6 mm, height 5.3 mm RoHS compliant	iC-TL46 BLCC SD1C

Please send your purchase orders to our order handling team:

Fax: +49 (0) 61 35 - 92 92 - 692
E-Mail: dispo@ichaus.com

For technical support, information about prices and terms of delivery please contact:

iC-Haus GmbH
Am Kuemmerling 18
D-55294 Bodenheim
GERMANY

Tel.: +49 (0) 61 35 - 92 92 - 0
Fax: +49 (0) 61 35 - 92 92 - 192
Web: http://www.ichaus.com
E-Mail: sales@ichaus.com

Appointed local distributors: http://www.ichaus.com/sales_partners