



Design-in guide

Philips Certaflux DL-S GEN2

August 2014



3 CertaFlux DL-S G2 System

PHILIPS

Contents

Introduction to this guide	2
Information or support	2
Introduction to the CertaFlux DL-S G2 System	3
Mechanical characteristics	4
4'' 550lm and 900lm	4
6'' 900lm	4
6'' 1200lm, 1500lm and 2000lm	5
Lighting characteristics	6
Beam shape	6
Unified Glare Rating (UGR)	6
Color Rendering Index (CRI) & SDCM	6
Thermal management	8
Case Temperature (Tc) of the module	8
Surface Temperature of the Module	8
Performance & Reliability	9
Installation instructions and safety	10
Operating Conditions	10
Environmental Parameters	10
Ceiling Use Conditions	10
Maintenance & Handling	12
Packaging & Storage Environment, Disposal	12
Inrush current	13
Approbations, Certifications, Standards, Others	14
Chemical compatibility	14
EMC:	14
Safety:	14
Cosmetics & Construction:	14

Introduction to this guide

Thank you for choosing the Philips CertaFlux DL-S G2. In this guide you will find the information you need to design this system into a luminaire.

This edition describes the CertaFlux DL-S G2 System. Extensions to the range will be included in future updates of this guide. We advise you to consult our websites for the latest up-to-date information.

Information or support

If you require any further information or support please consult your local Philips office or visit:

OEM website www.philips.com/technology

Note

LED technology is continuously improving. For the latest updated information, please check www.philips.com/technology

Introduction to the CertaFlux DL-S G2 System

Lumen Output	550lm	900lm	900lm	1200lm	1500lm	2000lm
Input Voltage (Vac)	220~240					
Frequency (Hz)	50~60					
Typical Wattage (W)	6.8	11.7	11.4	15.2	18.8	24.1
CRI	80					
Beam Angle, FWHM	100°	100°	102°	102°	102°	102°
Lifetime (B50L70)	25Khrs @ 25C ambient					
Size, fits to ceiling cutout	4"	4"	6"	6"	6"	6"
Optimum Ambient Temp	25°C					
Max. ambient Temp	40°C					
Case Temp, at defined point*	65°C	85°C	80°C	65°C	70°C	80°C
Luminaire Type	Class I					

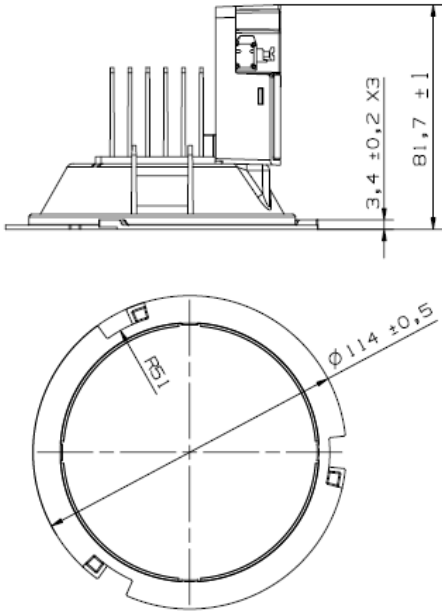
Wattage of a conventional downlight source	Lumen of a conventional downlight source*	DL-S G2 Recommended Equivalent
10	600	DL-S 550lm
13	780	
18	1080	DL-S 900lm
26	1560	DL-S 1200lm
2x13	1560	
2x18	2160	DL-S 1500lm
2x26	3120	DL-S 2000lm

* The lumen of conventional downlight is typical value of source. The actual luminaire lumen output depends on the ROL.

From a lumen point of view, compared to a conventional downlight the CertaFlux DL-S may be suitable to replace a 10W up to 2x18W light source. In addition to considering the light levels, please note that when recommending a suitable lighting solution the OEM should always also look at other factors such the regulated requirements for the application, the customers' requirements, safety considerations, installations factors, replaceability and others.

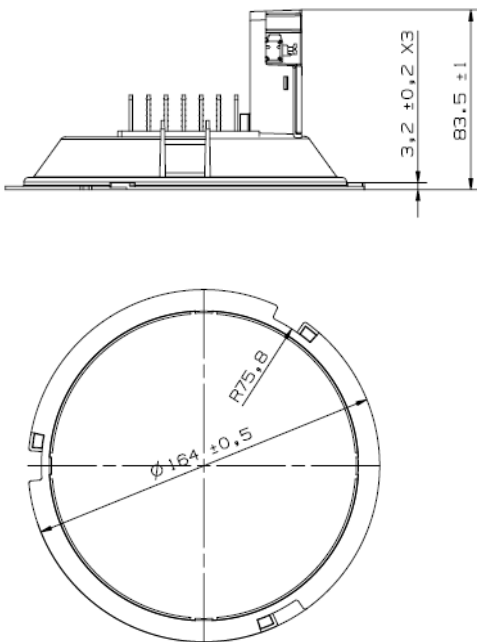
Mechanical characteristics

4'' 550lm and 900lm



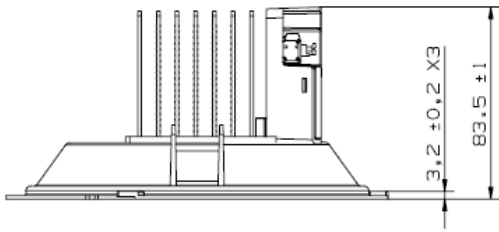
Dimension	Value			Unit
	Min.	Typ.	Max.	
Outer Diameter	113.5	114	114.5	mm
Height	80.7	81.7	82.7	mm

6'' 900lm

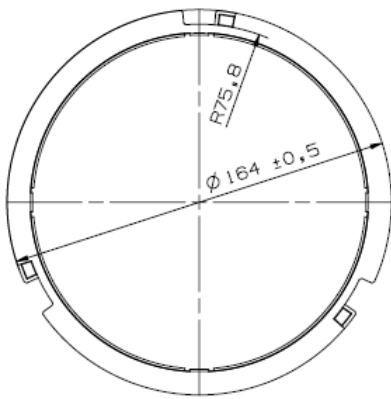


Dimension	Value			Unit
	Min.	Typ.	Max.	
Outer Diameter	163.5	164	164.5	mm
Height	82.5	83.5	84.5	mm

6'' 1200lm, 1500lm and 2000lm



Dimension	Value			Unit
	Min.	Typ.	Max.	
Outer Diameter	163.5	164	164.5	mm
Height	82.5	83.5	84.5	mm



Lighting characteristics

Beam shape

The typical beam angle of the DL-S G2 module is 100 degrees for 4'' and 102 degrees for 6''. This is measured by a goniometer. If a secondary diffuser and/or reflector extender is added to the module, the beam angle could change. It is advised that measurements are calculated again.

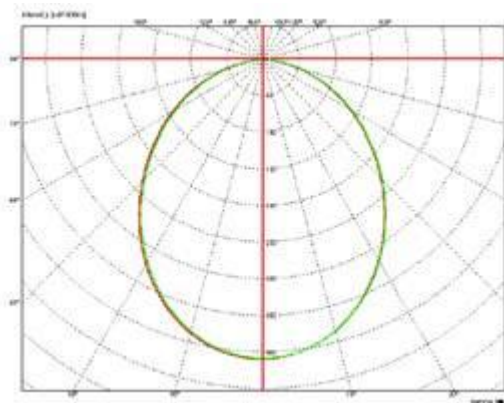
Unified Glare Rating (UGR)

The rounded average UGR is 26. If the application requires a lower UGR a possible solution would be to add a diffuser and/or reflector extender. For example, using a reflector extender that extends the 900lm DL-S G2 from a 4'' opening to a 6'' may reduce the UGR from 26 to around 22.

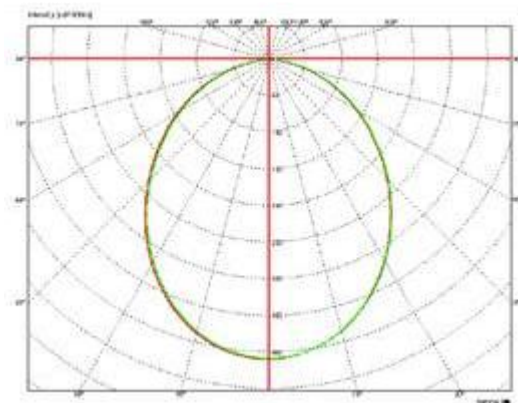
Color Rendering Index (CRI) & SDCM

The normal CRI is 80 for all the DL-S G2 covered in this document. The typ. SDCM is 5.

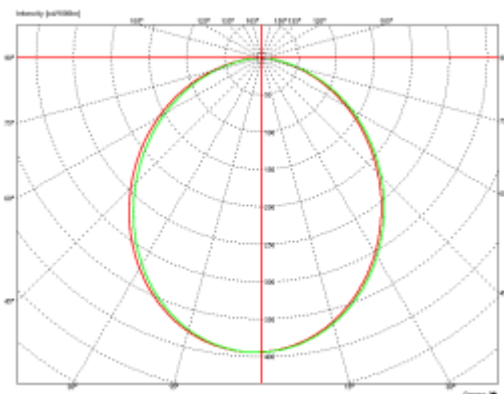
4'' 550lm



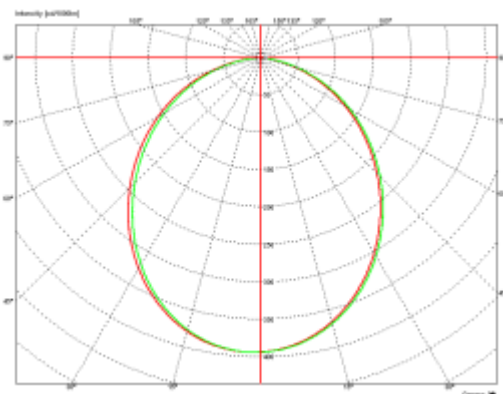
4'' 900l m



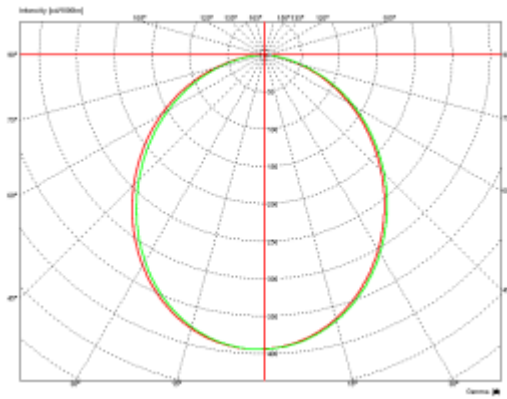
6'' 900 Lm



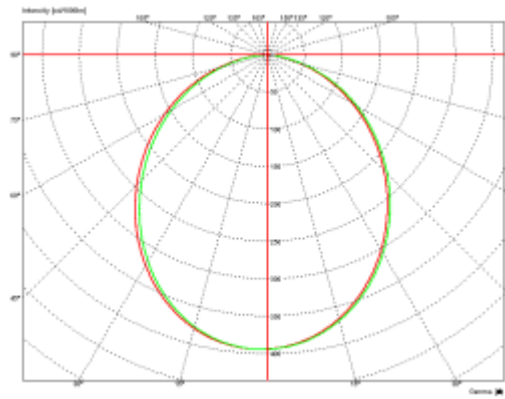
6'' 1200lm



6'' 1500lm



6'' 2000 Lm



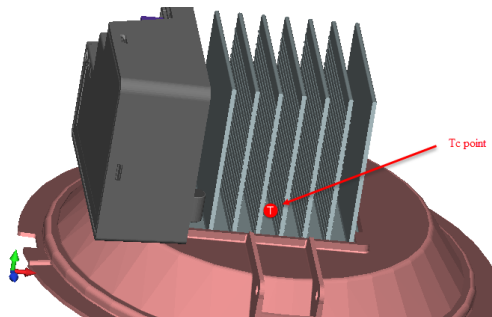
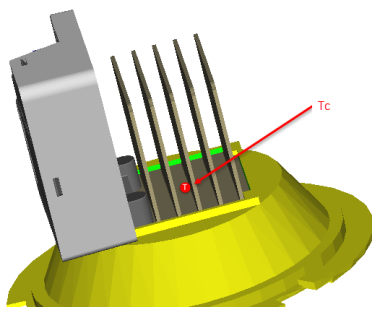
Thermal management

Case Temperature (Tc) of the module

Tc point definition as below: in the center of base between fins

Module Type	4'' 550lm	4'' 900lm	6'' 900lm	6'' 1200lm	6'' 1500lm	6'' 2000lm
Max. Tc	65°C	85°C	80°C	65°C	70°C	80°C

It is measured at the predefined point (see illustration) using guidelines recommended by IEC 60598. For these modules a test box measuring 500 x 500 x 200 mm was used and the reading is taken after the temperature stabilizes.



Surface Temperature of the Module

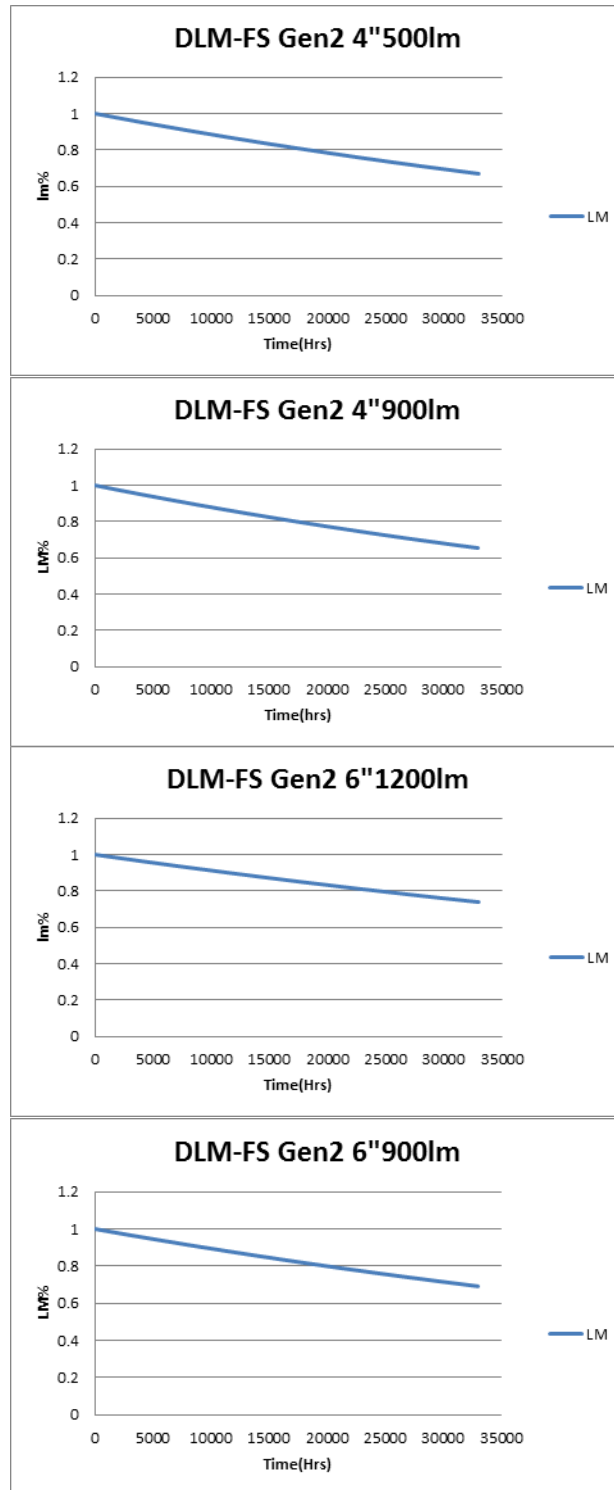
The module has been designed & tested so that the surface temperature doesn't exceed the commonly accepted limits for touchable surfaces. However it is recommended that at all times the module and/or fixture is not touched whenever it is turned on. If it is necessary to touch the surface, for any reasons such as reinstallations or adjustments, please always turn it off for at least 5 minutes until the surface temperature cools down.

IEC 60598-1 guides that touchable surfaces that are made of metal parts are 60 degrees Celcius (and below) and for non-metal parts 75 degrees Celcius (and below).

Touchable surfaces are generally described as any point on a surface where persons usually stand or move about to the limits which a person can reach with the hand, in any direction, without assistance. When the DL-S G2 module is assembled as a fixture and installed in the application area the touchable surface could mean the inner surface of the heat sink that faces down and the rim accessory.

Performance & Reliability

The DL-S G2 module has a lifetime of 25k hours (L70B50) when the operating and environmental parameters in this guide are met.



Installation instructions and safety

Operating Conditions

These factors are conditions that must be met for the performance of the CertaFlux DL-S G2 to be effective.

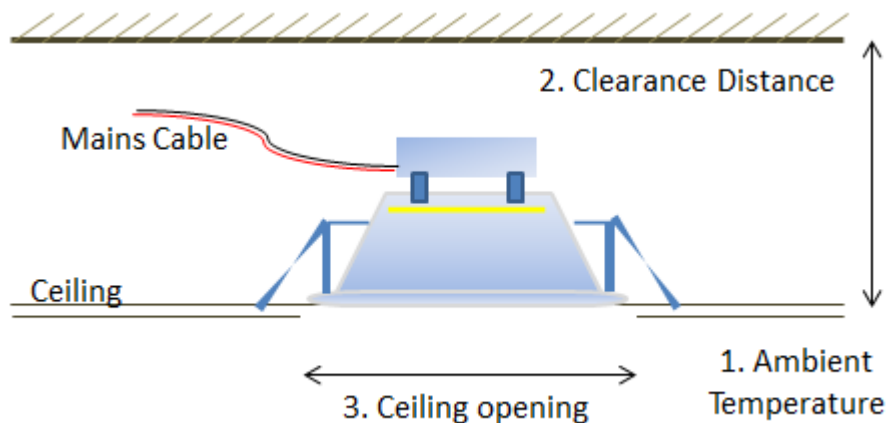
Environmental Parameters

Symbol	Parameter	Conditions	Value			Unit
			Min.	Typ.	Max.	
Tamb	Ambient temperature		-20	25	40	°C
Vin	Input voltage	RMS	198	220-240	264	Vac
f	Mains frequency		47	50/60	63	Hz
Hop	Relative humidity	Non condensing	10		90	%

The expected average operating time per year in a common downlight application is 4,000 per year. This is an average of 10-11 hours per day continuously throughout its lifetime. Furthermore the expected average switching cycles is 1 cycle per day, e.g where the module is turned on once and turned off once per day.

Average operating time per year	4000 hrs
Average number of on/off switching cycles over life time	1 cycle/day

Ceiling Use Conditions



- The optimum ambient temperature below the ceiling should be 25C
- The clearance from the main ceiling to an upper surface should be 200mm or more
- Hole in the bottom to let the light out (reflector opening) should match the size of the fixture.



For detailed instructions on how to build a fixture using the DL-S G2 module and instructions on installed the completed fixture into the application area (ceiling) please refer to the Quick Installation Guide.

To build a proper fixture using the DL-S G2 module several parts are needed, including:

- DL-S G2 Module
- Springs
- Cosmetic ring
- Cables
- Screws and nuts
- Driver connector cover
- Reflector extender(optional)

Please check your application requirements and local regulations which may require additional parts or steps to make a proper and safe fixture.

CertaFlux DL-S G2 is compatible with the accessories for DL-S G1. The accessories do not form part of the CertaFlux DL-S system offering. This is an added-value area for OEMs, offering the possibility to differentiate. However, there are complementary accessories partners, who have a standard portfolio of compatible accessories available, enabling quick and easy luminaire creation. Please contact your local Philips sales representative for detail information.

Depending on the cosmetic ring and/or reflector extender option selected, the fixture could fit into the following cut out ceiling sizes:

Module	Ring size	Min. Cut-out	Cut-out for Hua sheng accessories
DL-S G2 4''	4''	Φ 100mm	Φ 120mm
	5''	Φ 135mm	Φ 135mm
	6''	Φ 150mm	Φ 150mm
DL-S G2 6''	6''	Φ 150mm	Φ 170mm
	8''	Φ 200mm	Φ 200mm

Maintenance & Handling

The DL-S G2 module does not require special maintenance and handling. As part of the application area's general maintenance the fixture can be clean using regular dry or damp cloth. Please always ensure that the fixture is turned-off before proceeding.

During the assembly of the module into the fixture, it will be necessary to perform a twist action to connect the rim accessory onto the modules rim. In doing so the driver box may be held to rotate the accessory into place. For reference, please see the guideline below.

Item	Value	Item	Value
Driver Enclosure Torque	>5N-m	Driver Enclosure Fixation	Pull off Force>100N
Max force on Bracket	N.A	Screw hole size for strain relief	Dia:φ2.4mm Depth:7mm
IP Rating	20		

Packaging & Storage Environment, Disposal

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
T _{st}	Storage temperature		-40		65	°C
P _{op}	Operating pressure		290			kPa
H _{st}	Relative humidity	Non condensing	5		95	%

The DL-S G2 module is categorized as an electronic product. As such please consult the local regulation with regards to how electronic components and parts are handled.

Inrush current

The current that flows during the very first few milliseconds after a luminaire or an entire lighting installation has been switched on is called the inrush current. This current plays a very important role in the choice of switch gear and fusing, e.g. circuit breakers, miniature circuit breakers (MCB). The inrush current is determined in part by the circuitry in use and in part by the properties of the mains supply, i.e. the mains supply impedance and the supply-cable resistance. The moment of switching in relation to the sine wave of the supply voltage also helps to determine the value of the inrush current. The highest inrush current occurs when the driver is connected to the mains at the peak of the mains voltage.

Type	Maximum LED drivers on MCB type B16	Inrush current peak (A)	Inrush current width (µs)
DL-S G2 4'' 550lm	40	3.46	20
DL-S G2 4'' 900lm	40	3.55	22.6
DL-S G2 6'' 900lm	40	3.21	24.5
DL-S G2 6'' 1200lm	40	3.56	35
DL-S G2 6'' 1500lm	40	3.52	35
DL-S G2 6'' 2000lm	40	4.3	41

Conversion table for max. quantities of modules on other types of MCB

MCB Type	Rating	Relative number of DL-S G2 modules
B	16A	100% (see table)
B	10A	100%
C	16A	100%
C	10A	100%
L, I	16A	100%
L, I	10A	100%
G, U, II	16A	100%
G, U, II	10A	100%
K, III	16A	100%
K, III	10A	100%

Approbations, Certifications, Standards, Others

Chemical compatibility

In the current market medium power LEDs exist, containing a silver-finished (Ag)Lead frame. The lead frame finish is sensitive to pollution and or corrosion when exposed to certain Volatile Organic Components [VOCs] like for example substances containing Sulfur or Chlorine. In that case parts of the lead frame may blacken, which will impair the lumen output or the color point of the LED light.

Materials that are known to have a higher risk to be a source of Sulfur and Chlorine are for example natural rubbers used for cables, cable entries or sealing, or corrugated carton.

We recommend ensuring that the direct environment of these LEDs in the luminaire does not contain materials that can be a source of Sulfur or Chlorine, for optimal reliability of the LED, LED module and/or LED luminaire. Furthermore, make sure that the products with these LEDs are not stored or used in vicinity of sources of Sulfur or Chlorine, and the production environment is also free of these materials. Also avoid cleaning of the LED products with these types of LEDs with abrasive substances, brushes or organic solvents like Acetone and TCE. The Philips DL-S family makes use of LEDs with above explained type of lead frame. Therefore above recommendations apply for the CertaFlux DL-S modules.

The DL-S G2 meets the CQC standard and has completed relevant CB tests.

In addition, the following are some of the relevant compliance that the product meets.

EMC:

Conducted and Radiated Emissions of Lighting Equipment CISPR 15 ed 7.2 2007

Harmonic Current Emission IEC 61000-3-2 :2006 +A1+A2

Voltage fluctuations and flicker IEC 61000-3-3 :2008

Lighting Immunity IEC 61547 :2009

Environmental: ROHS

Safety:

LED modules for general lighting, safety specifications IEC 62031

Photobiological safety of lamps and lamp systems IEC 62471

Lamp control gear - 2.13 d.c. or a.c. supplied electronic control gear for LED modules EN/IEC 61347-2-13

DC or AC supplied electronic control gear for LED modules - Performance requirements EN/IEC 62384

Cosmetics & Construction:

Internal guidelines that cover tolerances on mechanical and visual defects on the reflector and driver cover.

For more information on these and other topics please contact the local Philips sales organization.

For more information please visit:
www.philips.com/technology



© 2013 Koninklijke Philips Electronics N.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent or other industrial or intellectual property rights