Product Document

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Application Note

AN001005

EGA2000

Pulse Handling Capability

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Content Guide

1 Introduction

The EGA2000 is a product family of VCSEL (Vertical-Cavity Surface-Emitting Laser) based high-power flood illuminators.

This document shows data on pulse handling capability of the product based on simulation data (i.e ams OSRAM wear out lifetime model) and characterization on a few amount of devices. Thus, this shows only typical device performance for information purpose only.

The user can get the optimum pulse handling capability by having a good thermal management at system level.

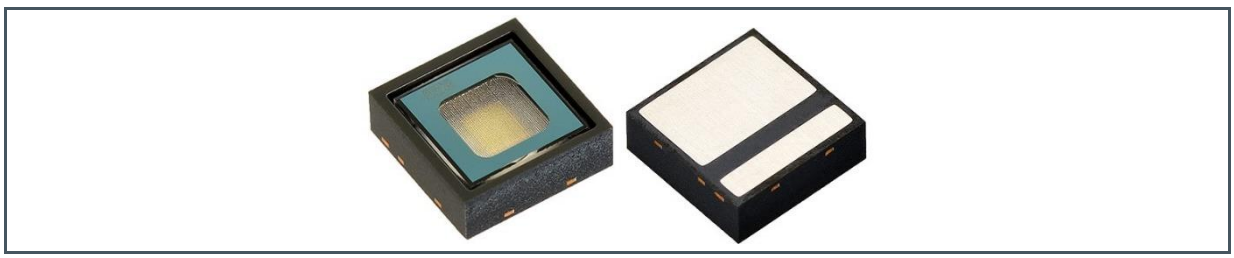
1.1 Product Overview

The EGA2000 enables 2D near infrared (NIR) imaging and 3D time-of-flight (ToF) systems for industrial applications.

Figure 1:
Added Value Overview

Benefits	Features
Small package size	4.1 mm x 4.1 mm x 1.38 mm ± 0.100 mm
Power efficient	High power conversion efficiency
Easy component mounting	Standard lead-free solder reflow compatible
Uniform power distribution	100% tested for uniformity in the far field
Full traceability	Unit level track with 2D barcode

Figure 2:
Top and Bottom View of EGA2000



1.2 Ordering Information

Ordering Code	Description
ASDX-00	EGA2000-850-UW
ATDX-00	EGA2000-940-UW
ASCX-00	EGA2000-850-W
ATCX-00	EGA2000-940-W
ASBX-00	EGA2000-850-N
ATBX-00	EGA2000-940-N

2 Scope

It is important for the user to know the user to know the permissible pulse handling capability in order to use the device in the optimum conditions by taking into consideration the product lifetime.

As the active component inside the module is the VCSEL, it is obvious that this is driving the pulse handling capability of the module.

The characteristics of the module is highly dependent on the thermal management meaning the junction temperature and ambient or solder temperature. This parameter is important to be considered for the product lifetime.

Hereunder is shown how is defined the temperature.

Figure 3:
Solder and Ambient Temperatures

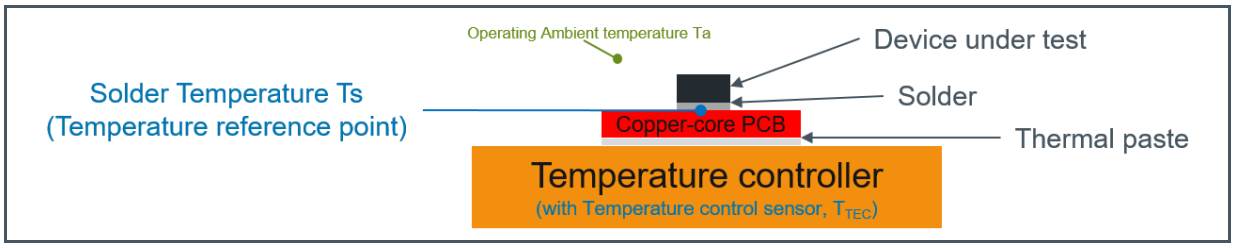
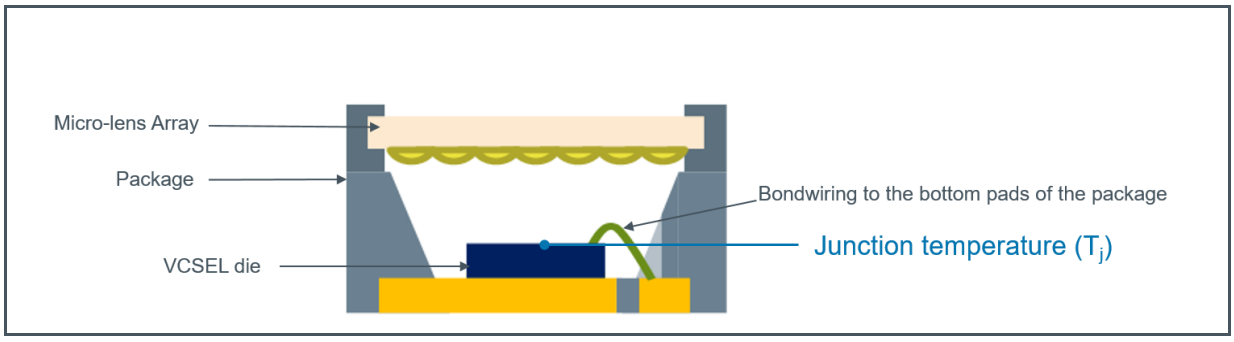


Figure 4:
Junction Temperature



The lifetime and mission profile of the product for reliability use is as follow:

Figure 5:
Operating Lifetime and Mission Profile(1)

Temperature (deg)	Usage (%)	Operating Time (h)
-20	10	1000
25	20	2000
40	55	5500
85	15	1500

(1) The product shall survive above 10000-hours of operating time.

The outcome of this permissible pulse handling capability study is a graph providing the maximum allowed current vs the pulse width at different duty cycles and for two specific solder temperatures (high temperature reflecting the maximum temperatures in the targeted applications.

3 Data at 850nm

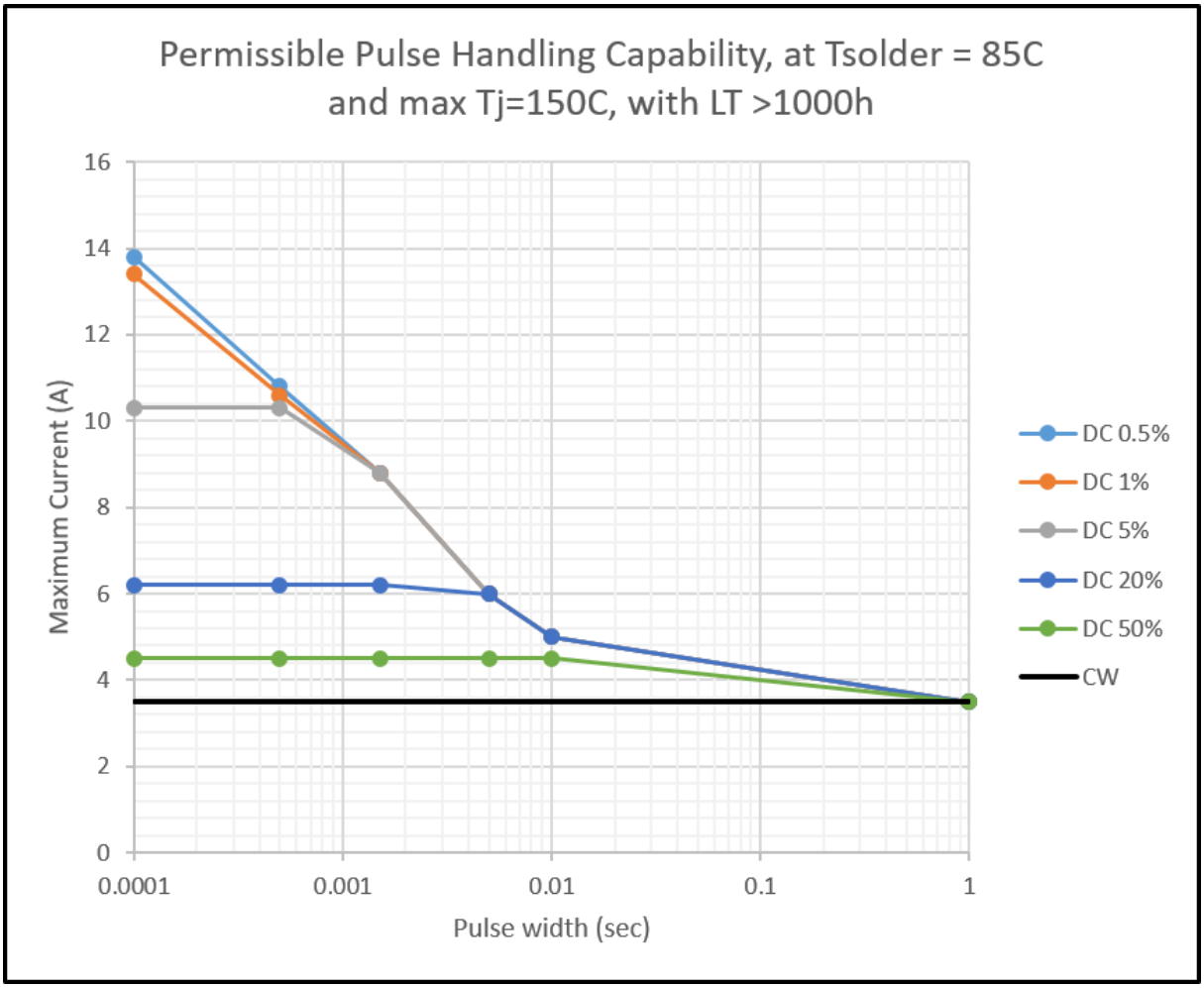
3.1 Permissible Pulse Handling Capability

3.1.1 At 85°C Solder Temperature

The current limiting conditions are:

- Junction temperature ≤ 150 °C.
- Lifetime > 1000 hours (based on median value calculated using wear out lifetime model).

Figure 6:
Permissible Pulse Handling Capability

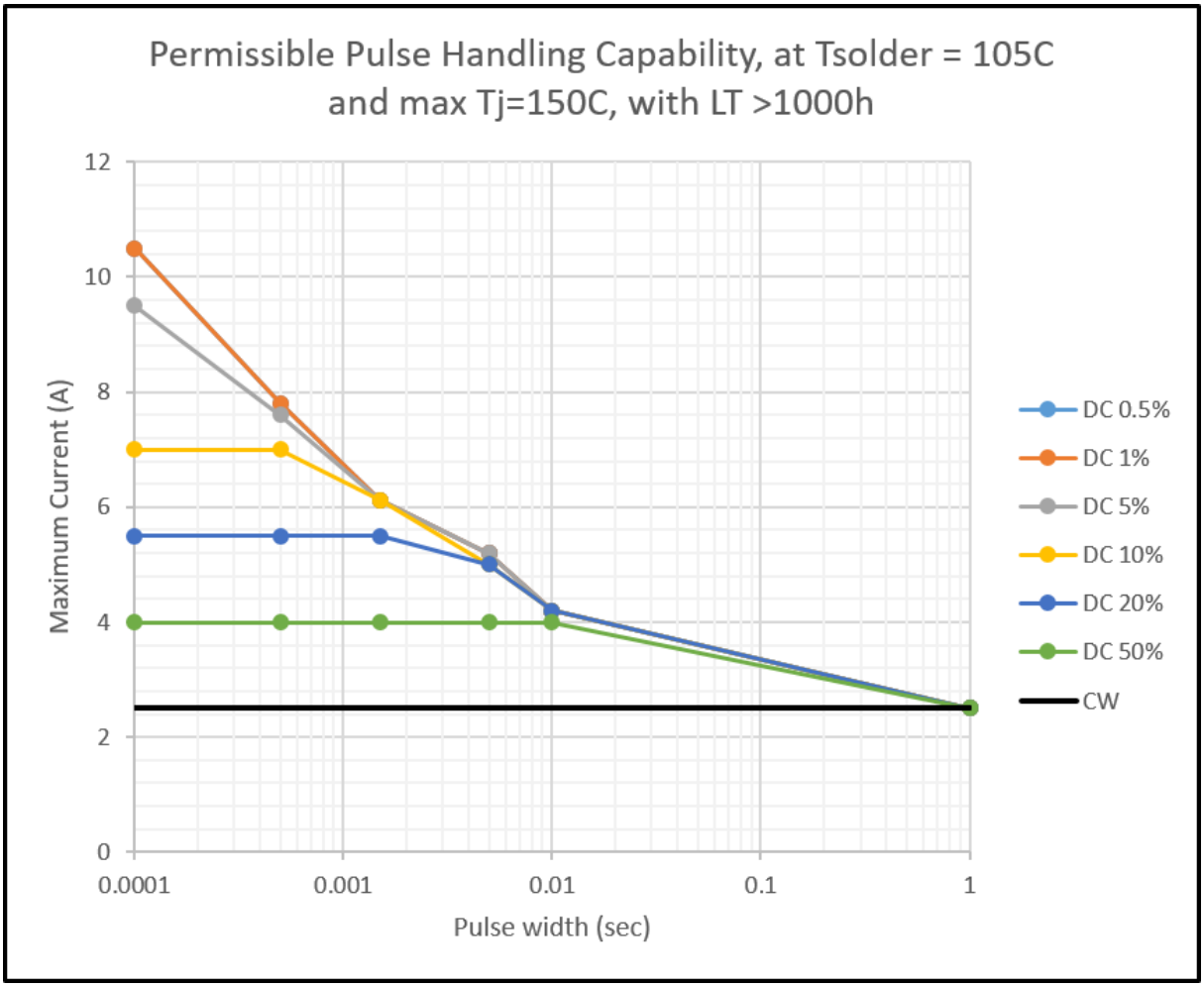


3.1.2 At 105°C Solder Temperature

The current limiting conditions are:

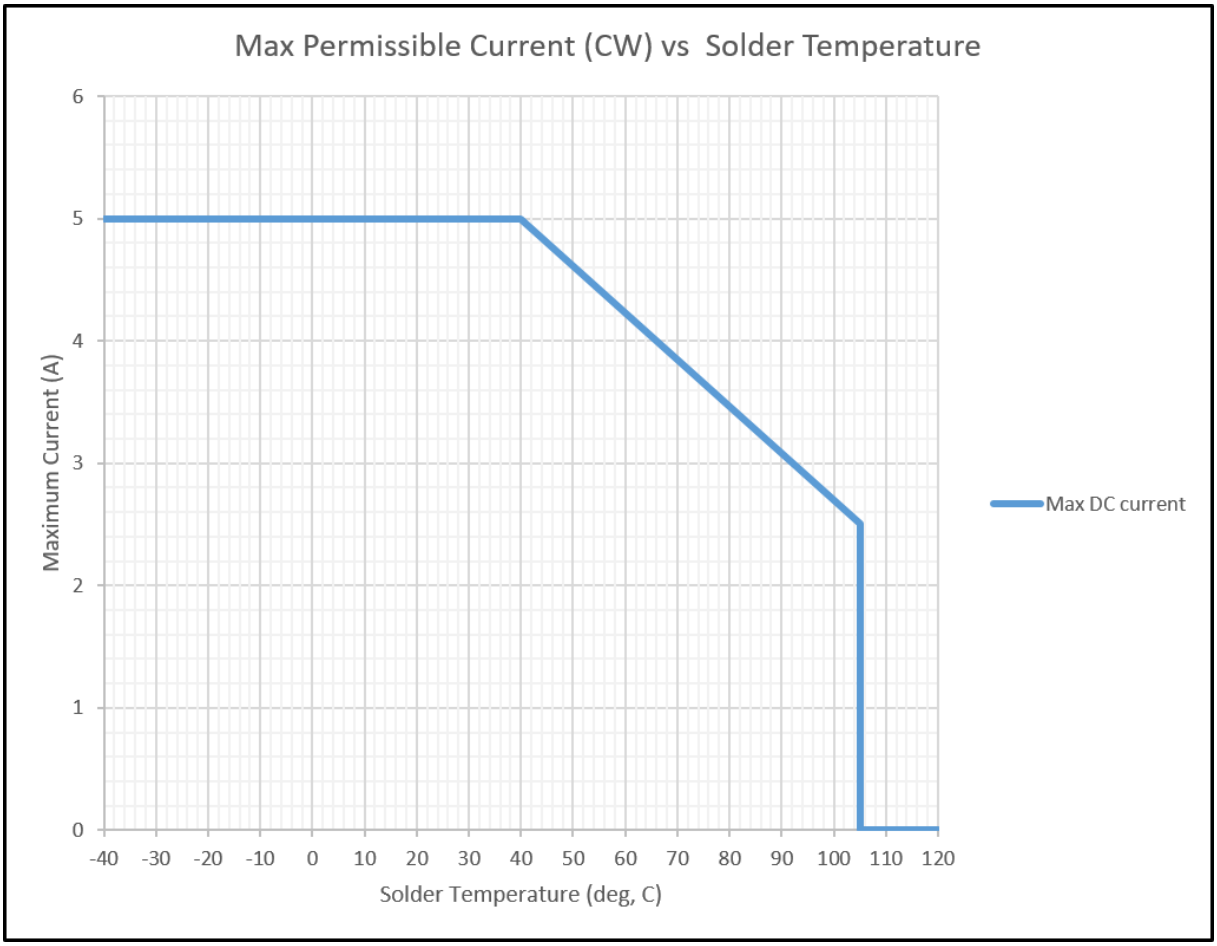
- Junction temperature ≤ 150 °C.
- Lifetime > 1000 hours (based on median value calculated using wear out lifetime model).

Figure 7:
Permissible Pulse Handling Capability



3.2 Maximum Permissible Current

Figure 8:
Maximum Permissible Current



4 Data at 940nm

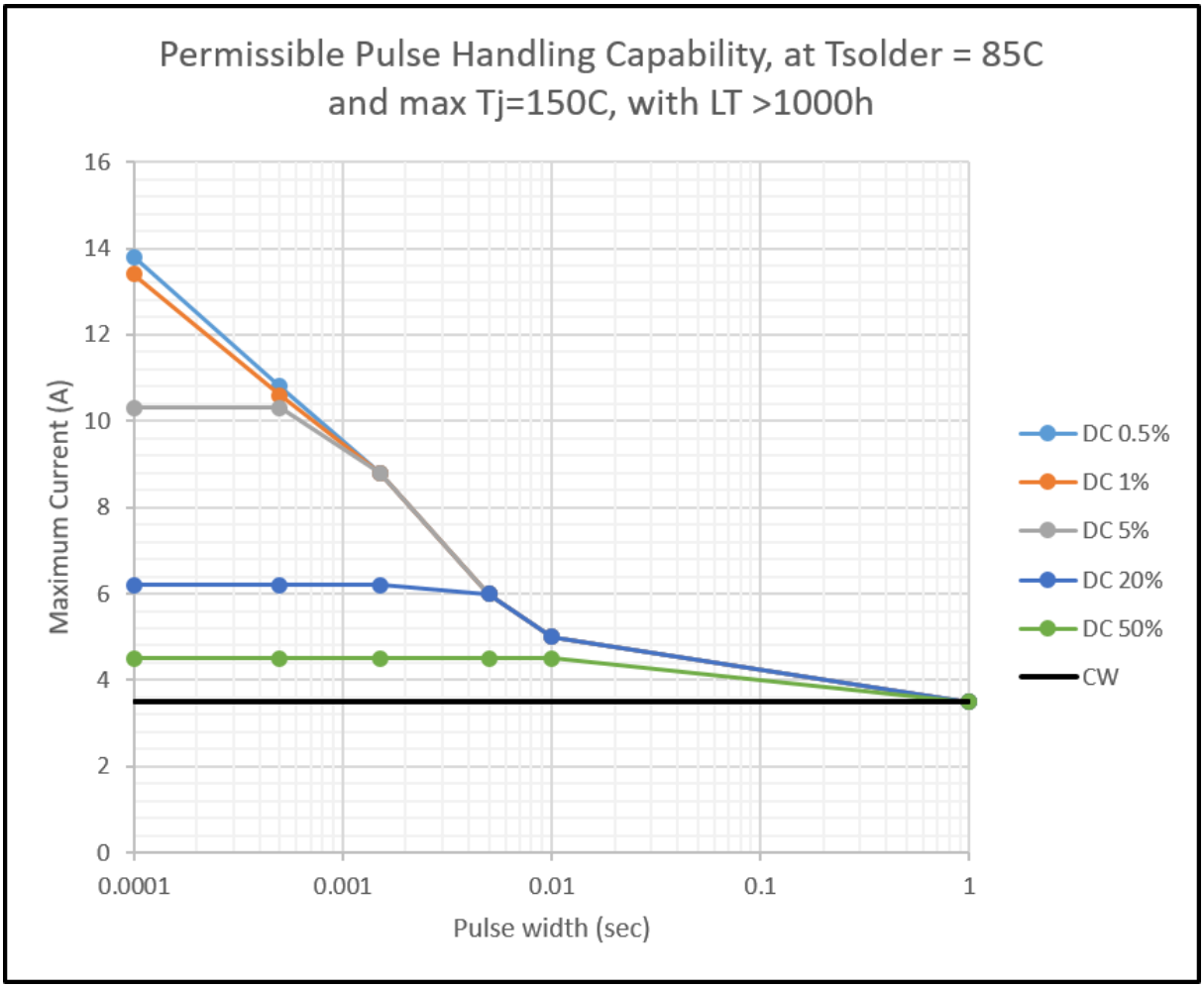
4.1 Permissible Pulse Handling Capability

4.1.1 At 85°C Solder Temperature

The current limiting conditions are:

- Junction temperature ≤ 150 ºC.
- Lifetime > 1000 hours (based on median value calculated using wear out lifetime model).

Figure 9:
Permissible Pulse Handling Capability

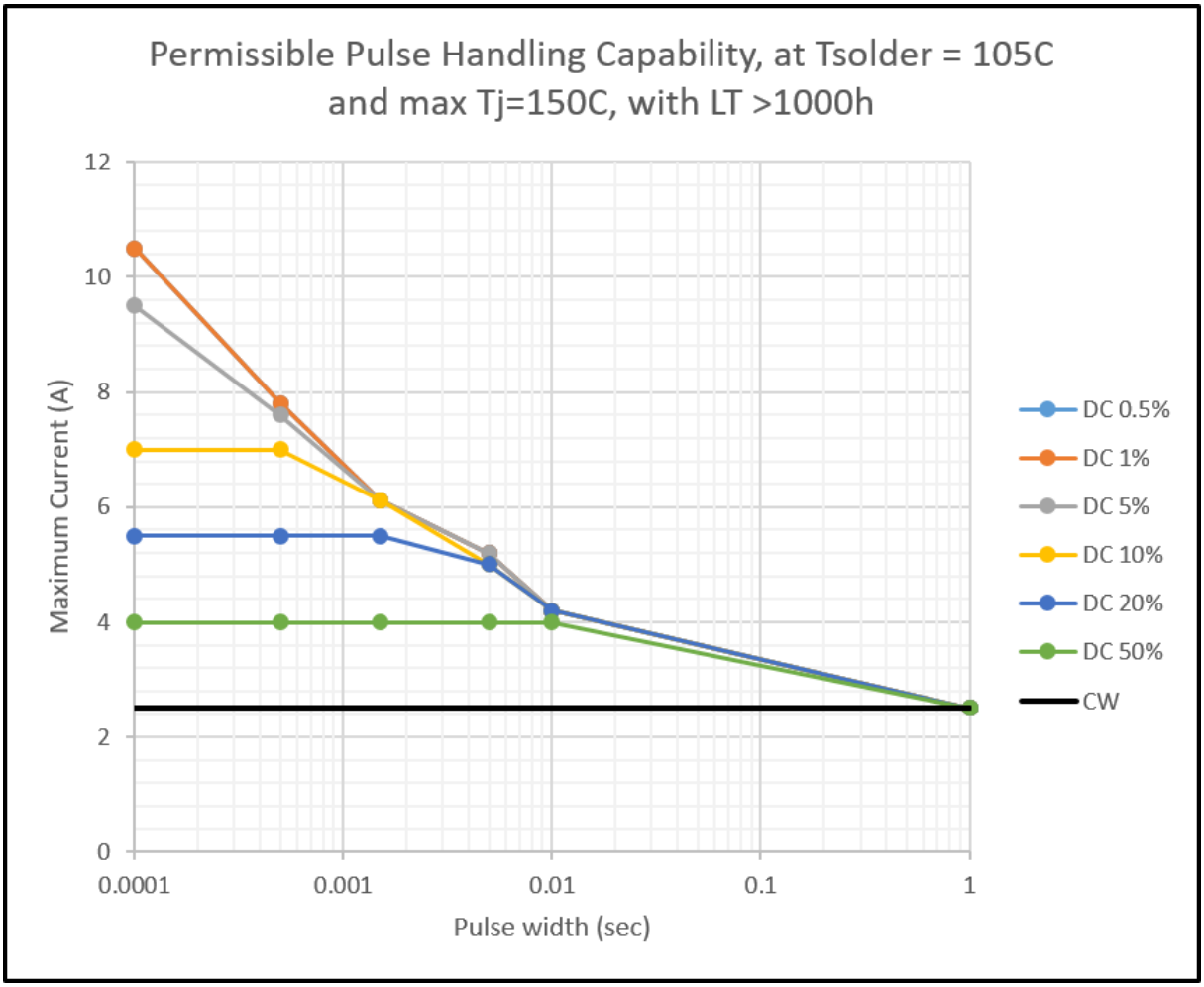


4.1.2 At 105°C Solder Temperature

The current limiting conditions are:

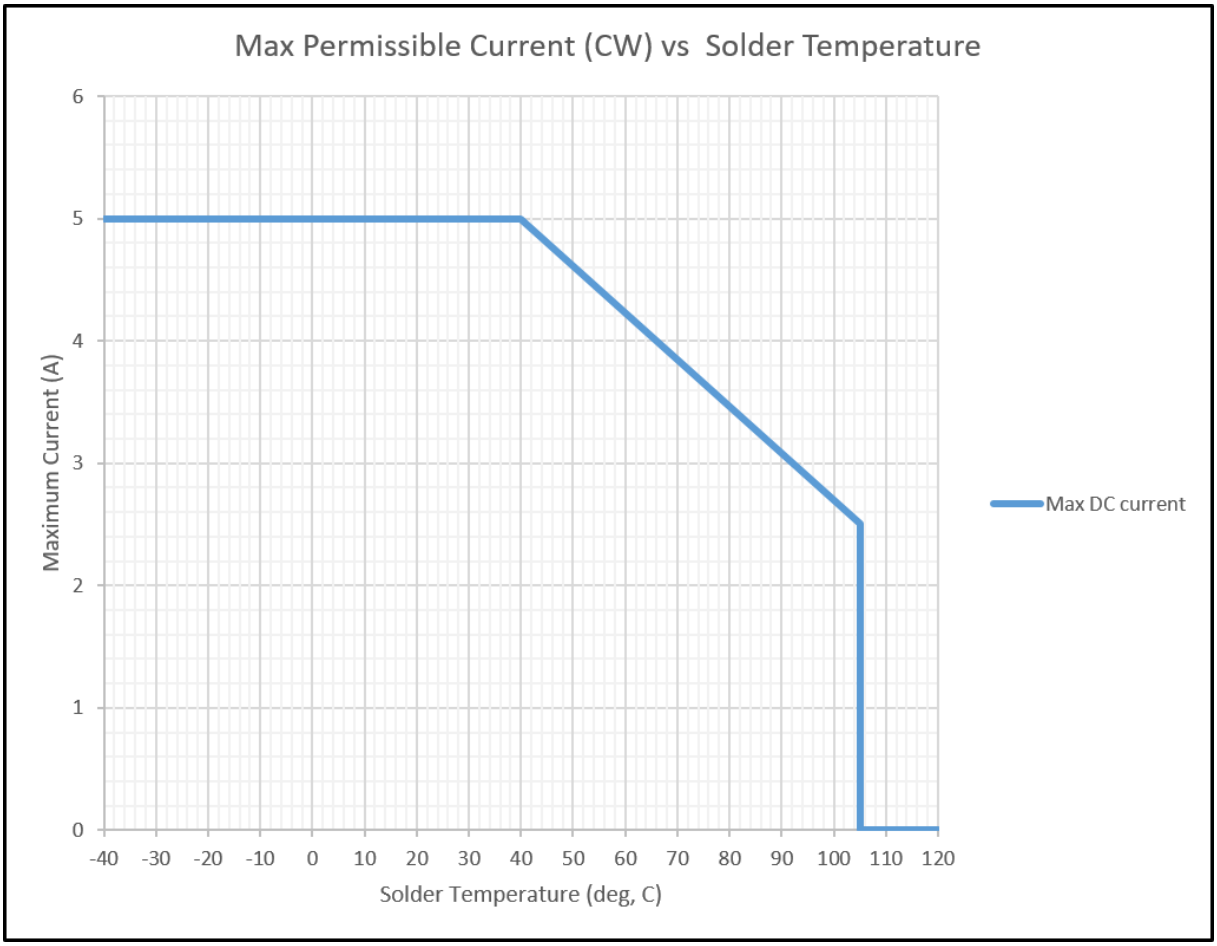
- Junction temperature ≤ 150 ºC.
- Lifetime > 1000 hours (based on median value calculated using wear out lifetime model).

Figure 10:
Permissible Pulse Handling Capability



4.2 Maximum Permissible Current

Figure 11:
Maximum Permissible Current



5 Revision Information

Changes from previous version to current revision v2-00	Page
Document security class changed from “Confidential” to “Public”	

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

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