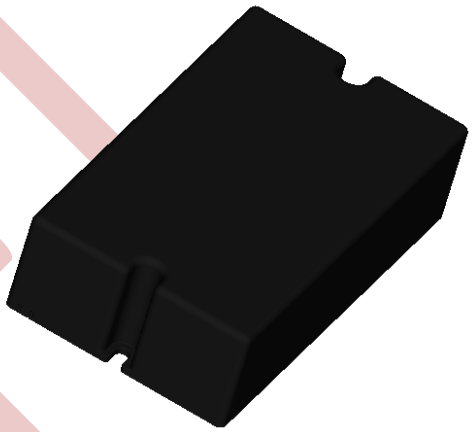
Datasheet 1 - 95 W/ 50 - 700mA
CORtronic LED-Driver

Overview

Brand Name	*CORtronic*
Description	*1 - 95 W LED-Driver*
Input Voltage	*230 ± 10 %*
Input Frequency	*50 / 60 Hz*
Output Voltage	*15 – 150 V*
Output Current	*0.05 – 0.7A*
Standby-Power	*< 0,7 W*
Size L x W x H	*168mm x 97mm x 45mm*
Weight	*1.2 kg*
IP Classification	*IP66*
Status	*Preliminary*



Electrical specification / Product Data

Parameter	Value/Range	Unit
Input Voltage	230 ± 10%	V_{AC}
Input Frequency	50/60	Hz
Inrush Current T(@50%)=2,8µs	< 50	A_{pk}
Maximum Output Power	95	W
Output Voltage	15-150	V_{DC}
Output Current	0.05-0.70	A
Output current tolerance	±5	%
Standby Power	<0.7	W
Efficiency @ Max Load	>92.5	%
Power Factor @ Max Load	>0.98	%
Surge protection Common/Differential *IEC 61000-4-5*	>4	kV
Ambient Temp Range	-30 to +55	°C
Max Case Temperature	85	°C
Related Standards	*IEC 55015* *IEC 61000-3-2* *IEC 61347-1* *IEC 61347-2-13* *IEC 61547* *IEC 62384*	-

Table 1: Electrical ratings/Product Data 100W / 700mA LED driver

Dimming Methods

Dimming Methods	Dimming Range		Minimum Output Current (A)	Min (typ). Output Power (W)	Comments
1-10V Isolated	10% - 100%		0.05	1	Dimming source current: 130µA
DALI Isolated	1-255	10%-100%	0.05	1	Linear or Logarithmic variation
Standalone night light reduction	10% - 100%		0.05	1	Internal dimming by dimming timer
Internal line voltage dimming	10% - 100%		0.05	1	Internal dimming by line voltage
Constant output current	10% - 100%		0.05	1	Fixed output current

Table 2: Applicable dimming methods

1-10V Isolated Interface

The 1-10V-Interface is electrically isolated from the mains power supply and the DC-output. **Figure 1** shows the characteristic of the implemented interface. An advantage of the CORtronic 1-10V-Interface is that the output can be switched off and the ballast then has a power consumption less than <0.7W.

The CORtronic software is configurable in order to meet the typical 1-10V-Interface specification. Between 0 and 1 Volt the output power is than 10% of the maximal power.

The whole configuration (e.g. start voltage V_{dim}, max output current, etc.) can be modified with the separately available programming tool from alpitronic.

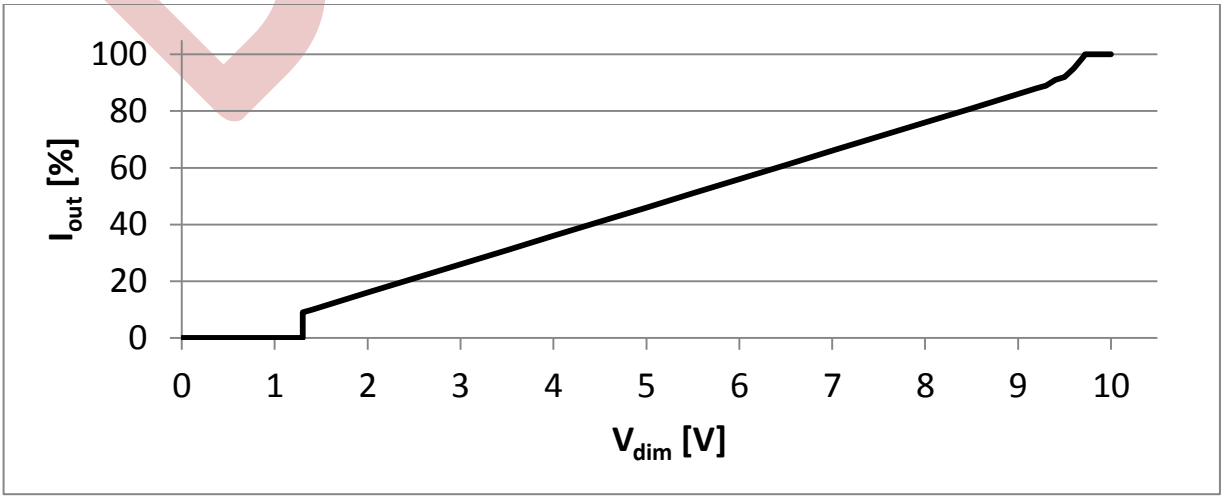


Figure 1: Typical correlation between the control voltage V_{dim} and the Output current I_{out}

DALI Isolated

CORtronic uses the same two wires for DALI and the 1-10V-Interface. Furthermore the different dimming methods can be set through these two wires, as described below under programming tool.

CORtronic is equipped with a standard-conform DALI (Digital Addressable Lighting Interface) Implementation that allows the user to control the output current from 10-100%. The ballast can be installed in existing DALI-networks up to a maximum number of 63 ballasts.

For further information about DALI, please see the ***DALI MANUAL***.

Standalone night light reduction

CORtronic has implemented an internal dimming method that uses a timer to control the output current. The on time (t_{on}→ t_{half}=t_{on}/2) is saved and used, in addition with two programmable times (t_{pre} and t_{post}), to determine the dimming time of the following day. The output is being reduced in the time from t_{half} - t_{pre} to t_{half} + t_{post}

Figure 2 shows an example of the standalone night light reduction method, with the parameters t_{pre}=30min, t_{post}=240min and t_{on}=13h.

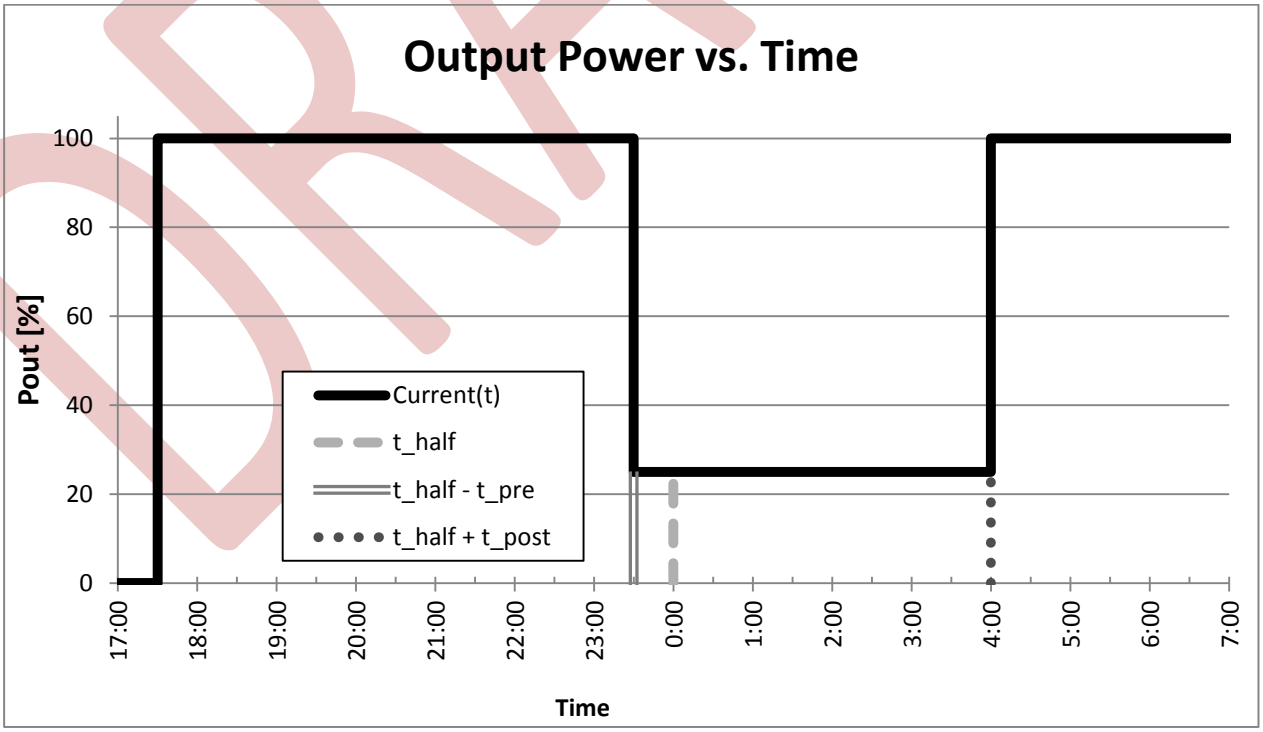


Figure 2: Typical current waveform for standalone night light reduction

Line Voltage Dimming

Another possible dimming method is the line voltage dimming. By reducing the mains voltage, the ballast understands that the output power has to be reduced.

At a typical line voltage of 185V CORtronic reduces the output power at a configurable level. When an increase of the line voltage above typical 195V happens, the ballast returns in the normal operation state.

Constant Output Current

The LED-Driver CORtronic can be configured as a constant output current source. The current is set with the programming tool to a fixed value. The current in this mode cannot be changed on run by an interface.

Highlights

Surge Protection

CORtronic is supplied with an advanced surge protection, that protects the ballast from heavy over voltages and surges, which can occur between L-N, L-PE and N-PE. In addition also a protection against over voltages between the control interface and PE is guaranteed.

The standard IEC61547 (Immunity against EMI for LED-Driver) prescribe an overvoltage protection of ±1kV between Line and Neutral and ±2kV between Line/Neutral and PE.

The behavior of CORtronic against the prescribed peaks was tested in an accredited test laboratory. The test was passed without any damage on the LED-Driver.

To show the advanced surge protection of CORtronic, the test was repeated according to IEC 61000-4-5 with an elevated peak voltage of ±4kV between L-N and L/N and PE. Also this test was passed without damage.

The surge protection of CORtronic includes varistors and gas-discharge-tubes (GDT). They are interconnected to intervene in short time, which saves the LED-Driver from damages. Due to the use of GDT and varistors there is only a very low leakage current, which saves power in stand-by and normal operation.

The components of CORtronic's surge protection are selected to withstand single voltage pulses up to 10kV.

Programming Tool

As described above, CORtronic has a lot of functions and parameters, with which the behavior can be modified.

To set the desired function or parameter respectively, a programming tool is needed, which is separately available. The tool interacts with CORtronic easily through the control interface, which in normal function, can be used as 1-10V or DALI interface. The hardware of the CORtronic LED-Driver is designed to be used with the whole above described dimming functions.

In the following table below a list of settable parameters and functions can be found.

Parameter	Possible configuration	Description
functions	- *1-10V dimming* - *DALI* - *Standalone night reduction* - *Line voltage dimming* - *Constant current* - **Constant Lumen Output (CLO)** - **Over the life (OTL)** - **Dimming curve (lin/log)**	Applied functions (N.B. bold functions can independently be activated/disabled; only one of the italic functions can be activated at the time)
i_nom	350 – 700mA	Nominal current
min_ctrl_level	0 - 10V	Min level accepted as input level
temp_brd_warn	0 - 90°C	Temperature warning value
temp_brd_max	0 - 90°C	Temperature failure value
clo_limit	0 – 255 x 1000 hours	Time limit for CLO
clo_factor	0 – 255	CLO factor
nax_i	10 – 100%	Target power level during reduced output power (standalone light reduction, line voltage dimming)
t_pre	0 – 255 minutes	Pre-time for standalone light reduction
t_post	0 – 255 minutes	Post-time for standalone light reduction
otl_ontime_max	0 – 255 x 1000 hours	Maximal allowed operating time before OTL is active

Table 3: User changeable parameters

The programming tool can also be used to read some parameters from the internal memory of CORtronic. These are listed in the following table.

Parameter	Range	Description
serial_number	0x000000 – 0xFFFFFF	Every CORtronic ballast has an unique serial number
hw_version	0x0000 – 0xFFFF	Number of the Hardware version
sw_version	0x0000 – 0xFFFF	Number of the Software version
ontime_1000hrs	0 – 255	Counter, which every 1000 working hours increases
ontime_minutes	0 – 65536	Counter, which every 60000 minutes is reset to 0 and ontime_1000hrs is increased
nas_lastday_ontime	0 – 1440 minutes	Last day operating time
corr_error	0x0000 – 0xFFFF	Errors present at last OFF
temp_run_max	-20 – 100°C	Maximal temperature in the ballast life

Table 4: User readable parameters

Safety Aspects

EMC Compatibility

The LED-Driver CORtronic was tested in an accredited laboratory for the EMC compatibility according the standards:

IEC 55055:2006 + A1:2007 + A2:2009
IEC 61000-3-2:2006 + A1:2009 + A2:2009
IEC 61347-3-3:2008
IEC 61547:2009

Short and open circuit protection

The ballast CORtronic is equipped with a short- and open circuit protection at the output wires. Once the protection has intervened, the output capacitance is being discharged and the LED-Driver is switched in a FAIL-state. To bring the driver afterwards back to normal state a power-cycle is needed.

Isolation

The driver is designed to meet the requirements of the protection class II.

Between the main input and the LED output, between mains input and control and between control and LED output double insulation (basic + reinforced) is kept.

The output wires are also provided with double isolation.

Between the three parts of the driver (mains input, LED output and control) the creeapage- and clearance distances for up to 4kV and 3000m altitude are kept.

Qualifications

The LED-Driver CORtronic meets all requirements for the CE-conformity.

The driver is designed to meet the ENEC requirements. The verification of an entity according the following standards is pending:
IEC 62384
IEC 61347-1
IEC 61347-2-13

Diagrams

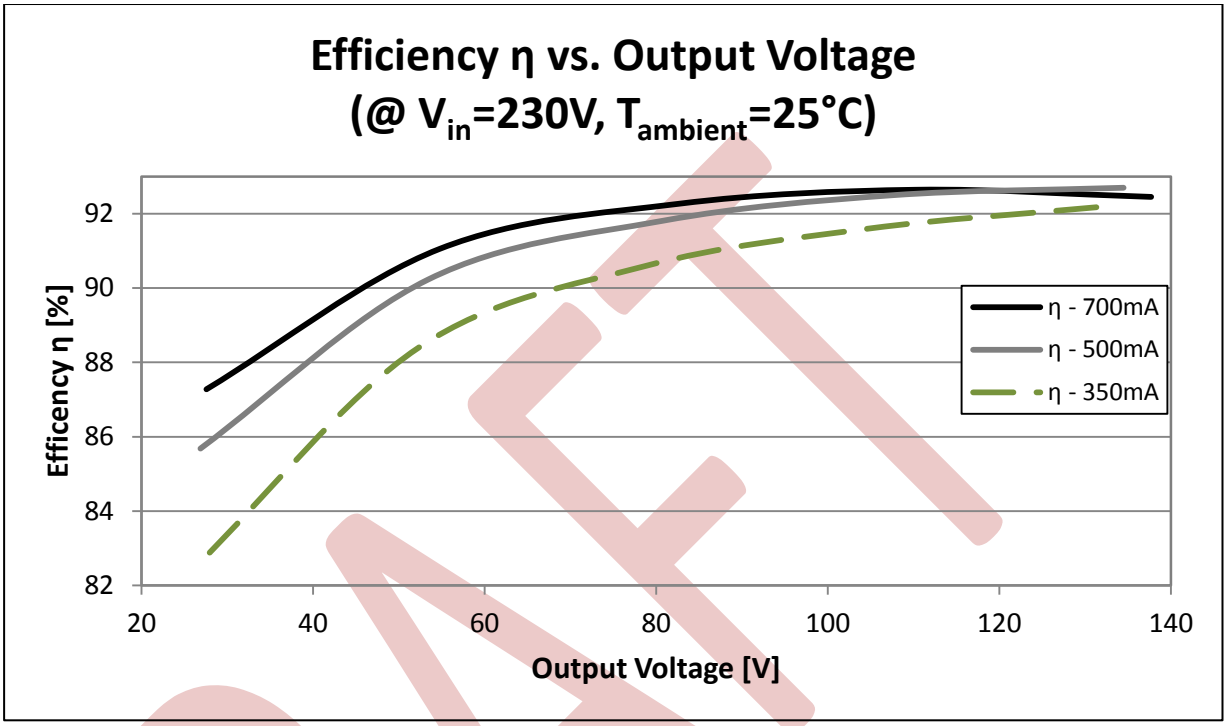


Figure 3: Efficiency @ variable loads

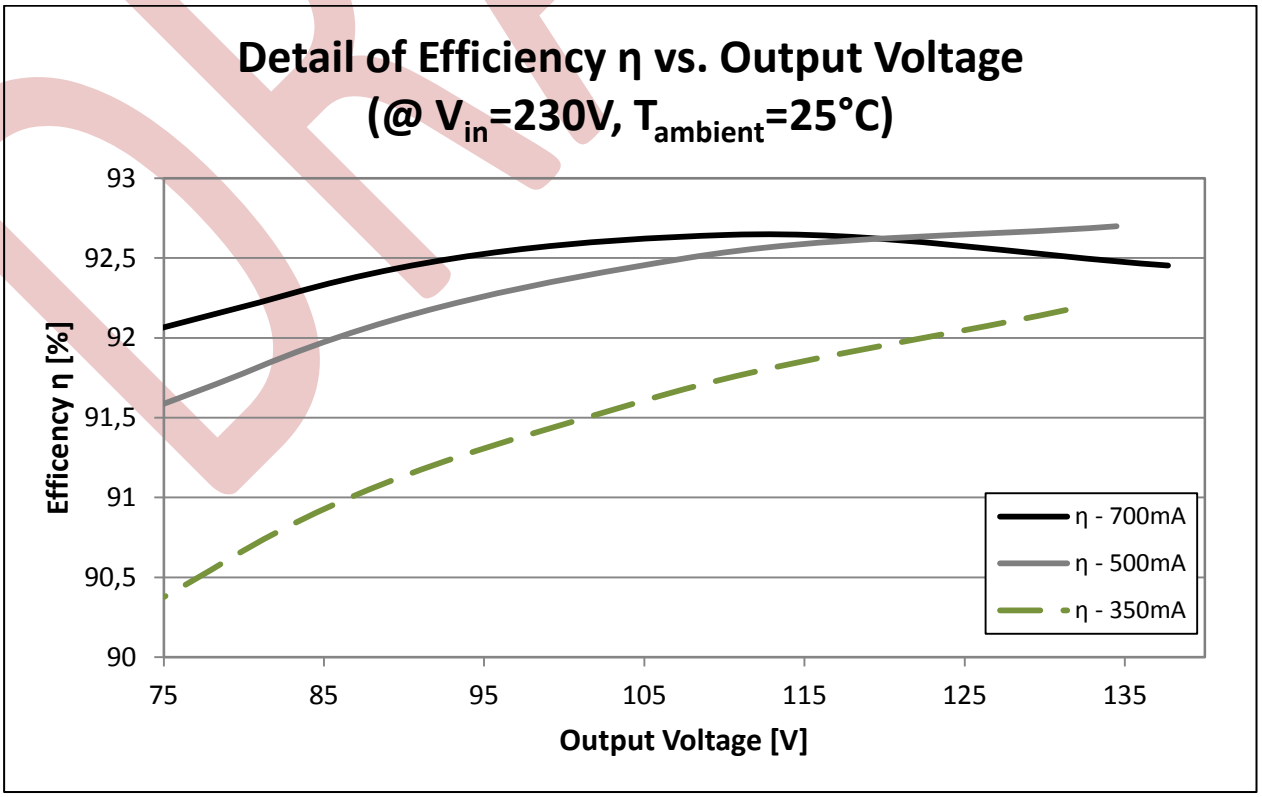


Figure 4: Detailed Efficiency vs. Output Voltage @ variable loads

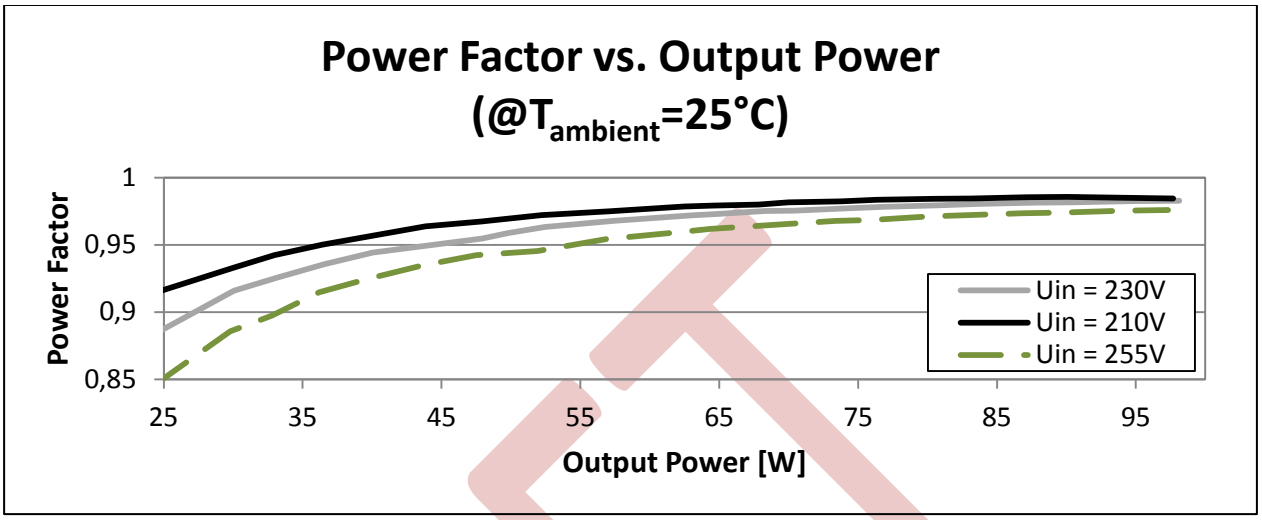


Figure 5: Power Factor λ @ variable load and Input Voltage

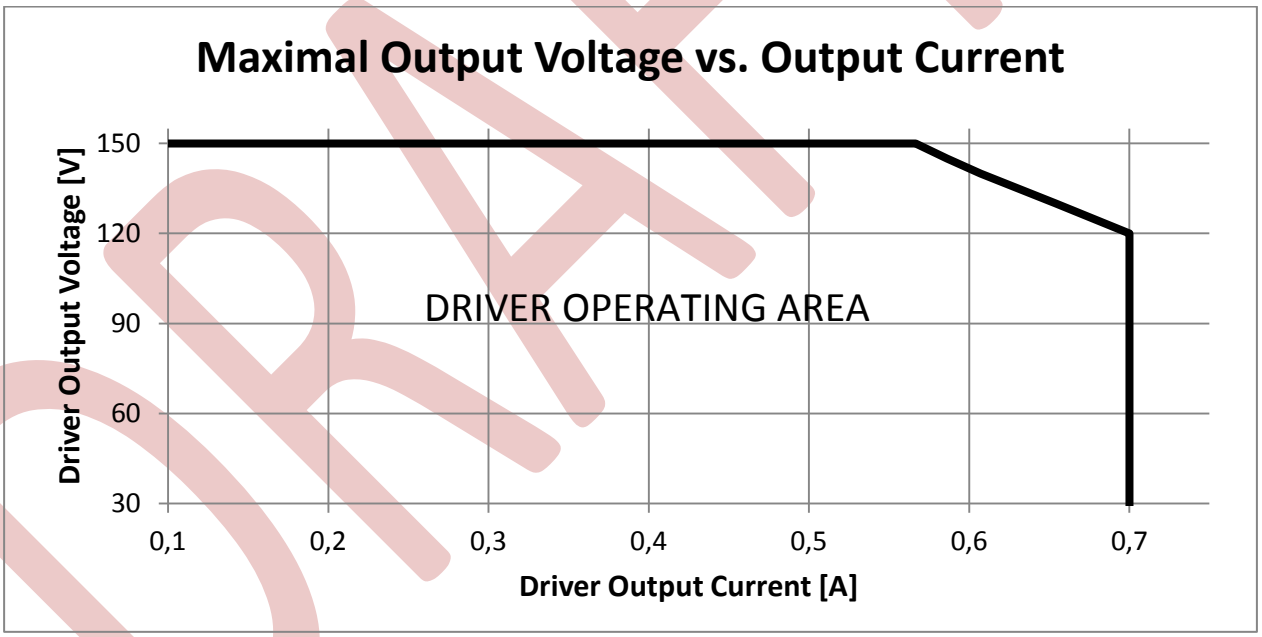


Figure 6: Operating Area of CORtronic. Maximal Output voltage vs. Output current

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