



E-Star Power Development Co., Ltd. (E-STAR)  
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 22069, Taiwan (R.O.C.)  
 Phone : 886-2-2957 5580 Fax : 886-2-2957 7473

**480W LED Driver power supply < HVGC-480**



**■ Features**

- Wide input range 180 ~ 528VAC
- Constant Power mode output
- Metal housing with Class I design
- Built-in active PFC function
- Function options: output adjustable via potentiometer; 3 in 1 dimming (dim-to-off) ; Smart timer dimming
- Typical lifetime>50000 hours
- 5 years warranty

**■ Applications**

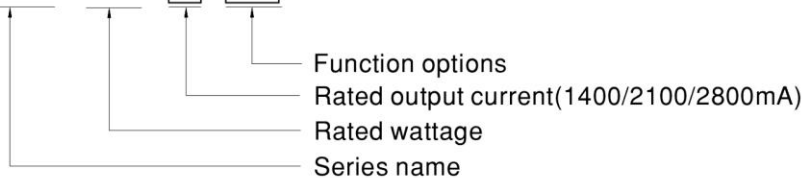
- Harbor lighting
- LED high-bay lighting
- Parking space lighting
- LED fishing lamp
- Type "HL" for use in Class I , Division 2 hazardous (Classified) location.

**■ Description**

HVGC-480 series is a 480W LED AC/DC driver featuring the constant power mode and high voltage output. HVGC-480 operates from 180~528VAC and offers models with different rated current ranging between 1400mA and 3500mA. Thanks to the high efficiency up to 94.5%, with the fanless design, the entire series is able to operate for -40°C~+90°C case temperature under free air convection. The design of metal housing and IP67 ingress protection level allows this series to fit both indoor and outdoor applications. HVGC-480 is equipped with various function options, such as dimming methodologies, so as to provide the optimal design flexibility for LED lighting system.

**■ Model Encoding**

**HVGC - 480 - M - AB**



Type	IP Level	Function	Note
AB	IP65	Standard constant power output with 3 in 1 dimming function (0~10Vdc, 10V PWM signal and resistance) and built-in potentiometer.	In Stock
Blank	IP67	Io and Vo fixed.	By request
D2	IP67	Built-in Smart timer dimming and programmable function.	By request
Dx	IP67	Built-in Smart timer dimming function by user request.	By request
DA	IP67	DALI control technology.	By request



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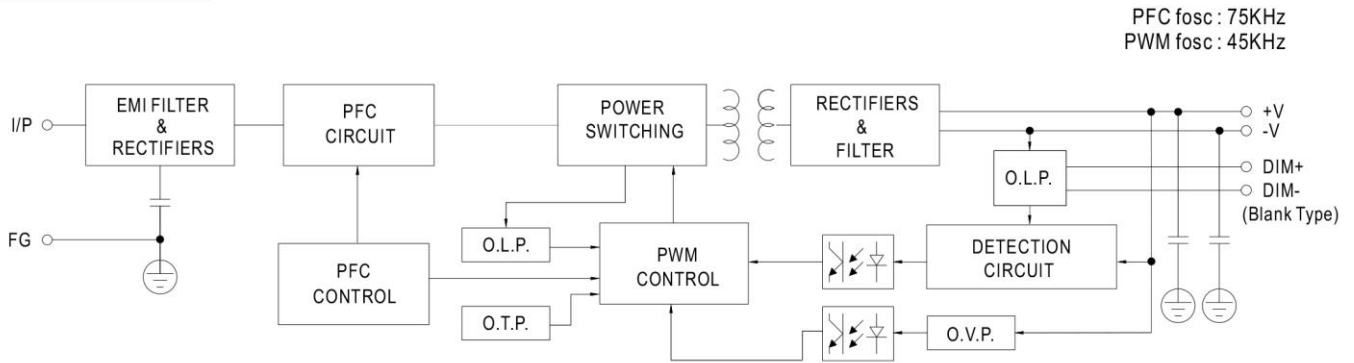
**SPECIFICATION**

MODEL		HVGC-480-L-□	HVGC-480-M-□	HVGC-480-H-□
OUTPUT	RATED CURRENT	1400mA	2100mA	2800mA
	RATED POWER	480W	480W	480W
	CONSTANT CURRENT REGION <small>Note.2</small>	137 ~ 343V	92 ~ 228.5V	68 ~ 171.5V
	FULL POWER CURRENT RANGE	1400~1750mA	2100~2625mA	2800~3500mA
	OPEN CIRCUIT VOLTAGE (max.)	350V	240V	180V
	CURRENT ADJ. RANGE(Typ.)	700~1750mA	1050~2625mA	1400~3500mA
	CURRENT RIPPLE	5.0% max. @rated current		
	CURRENT TOLERANCE	± 5%		
	SET UP TIME <small>Note.4</small>	500ms/230VAC, 347VAC, 480VAC		
INPUT	VOLTAGE RANGE <small>Note.3</small>	180 ~ 528VAC 254VDC ~ 747VDC (Please refer to "STATIC CHARACTERISTIC" section)		
	FREQUENCY RANGE	47 ~ 63Hz		
	POWER FACTOR (Typ.)	PF ≥ 0.98 / 230VAC, PF ≥ 0.98 / 277VAC, PF ≥ 0.97 / 347VAC, PF ≥ 0.96 / 400VAC, PF ≥ 0.95 / 480VAC at full load (Please refer to "Power Factor Characteristic" section)		
	TOTAL HARMONIC DISTORTION	THD < 20% (@ load ≥ 50% at 230VAC/277VAC/347VAC/400VAC/480VAC input (Please refer to "TOTAL HARMONIC DISTORTION (THD)" section)		
	EFFICIENCY (Typ.)	94.5%	94.5%	94.5%
	AC CURRENT (Typ.)	1.52A / 347VAC 1.11A / 480VAC		
	INRUSH CURRENT(Typ.)	COLD START 40A( <small>t</small> width=1100μs measured at 50% I <sub>peak</sub> ) at 480VAC; Per NEMA 410		
	MAX. NO. of PSUs on 16A CIRCUIT BREAKER	2 unit(circuit breaker of type B) / 4 units(circuit breaker of type C) at 480VAC		
PROTECTION	LEAKAGE CURRENT	<0.75mA / 480VAC		
	SHORT CIRCUIT	Constant current limiting, recovers automatically after fault condition is removed		
	OVER VOLTAGE	351 ~ 381V	241 ~ 257V	181 ~ 193V
ENVIRONMENT	OVER TEMPERATURE	Shut down output voltage, re-power on to recovery		
	WORKING TEMP.	T <sub>case</sub> =-40 ~ +90°C (Please refer to "OUTPUT LOAD vs TEMPERATURE" section)		
	MAX. CASE TEMP.	T <sub>case</sub> =+90°C		
	WORKING HUMIDITY	20 ~ 95% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-40 ~ +80°C, 10 ~ 95% RH non-condensing		
	TEMP. COEFFICIENT	± 0.03%/°C (0 ~ 60°C)		
SAFETY & EMC	VIBRATION	10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes		
	SAFETY STANDARDS	UL8750 (type"HL"), CSA C22.2 No. 250.13-14, ENEC EN61347-1, EN61347-2-13 independent, EN62384, IP65 or IP67, EAC TP TC 004 approved		
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:2KVAC O/P-FG:1.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH		
	EMC EMISSION	Compliance to EN55015, EN61000-3-2 Class C (@ load ≥ 50%); EN61000-3-3, FCC Part 15 class B, EAC TP TC 020		
OTHERS	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547, light industry level (surge immunity Line-Earth 4KV, Line-Line 2KV), EAC TP TC 020		
	MTBF	286.1K hrs min. Telcordia SR-332(Bellcore) ; 72.9K hrs min. MIL-HDBK-217F (25°C)		
	DIMENSION	262*125*43.8mm (L*W*H)		
NOTE	PACKING	2.72Kg;4pcs/11.45Kg/0.55CUFT		
	<ol style="list-style-type: none"> <li>All parameters NOT specially mentioned are measured at 347VAC input, rated current and 25°C of ambient temperature.</li> <li>Please refer to "DRIVING METHODS OF LED MODULE".</li> <li>De-rating may be needed under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.</li> <li>Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.</li> <li>The driver is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.</li> <li>This series meets the typical life expectancy of &gt;50,000 hours of operation when T<sub>case</sub>, particularly t<sub>c</sub> point (or TMP, per DLC), is about 80°C or less.</li> <li>To fulfill requirements of the latest ErP regulation for lighting fixtures, this LED driver can only be used behind a switch without permanently connected to the mains.</li> <li>The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).</li> <li>For any application note and IP water proof function installation caution, please refer our user manual before using.</li> </ol>			



**480W LED Driver power supply < HVGC-480**

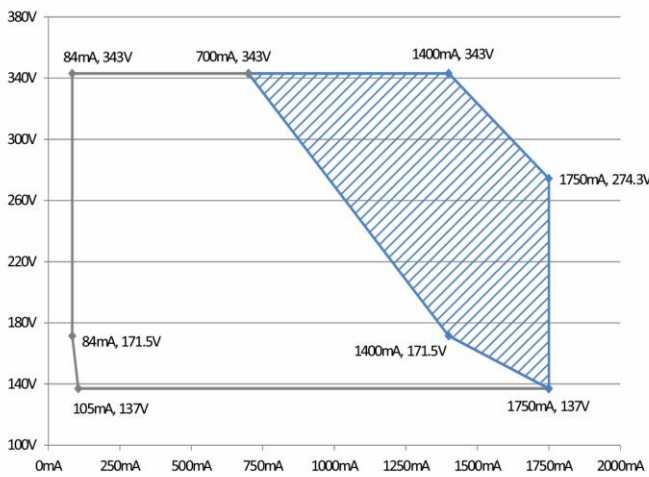
**■ BLOCK DIAGRAM**



**■ DRIVING METHODS OF LED MODULE**

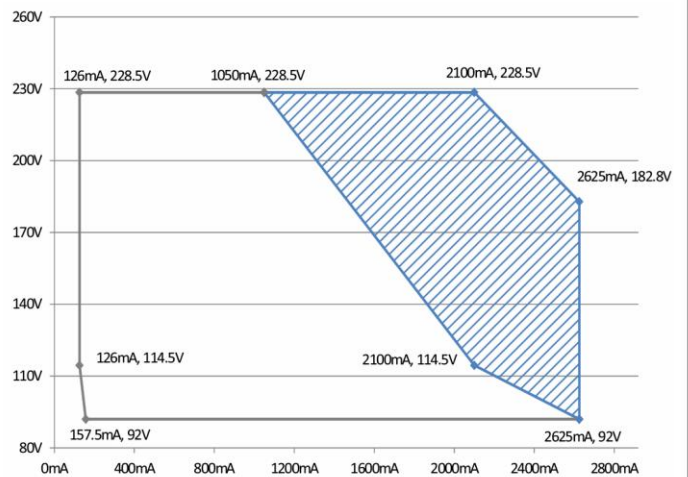
※ I-V Operating Area

◎ HVGC-480-L



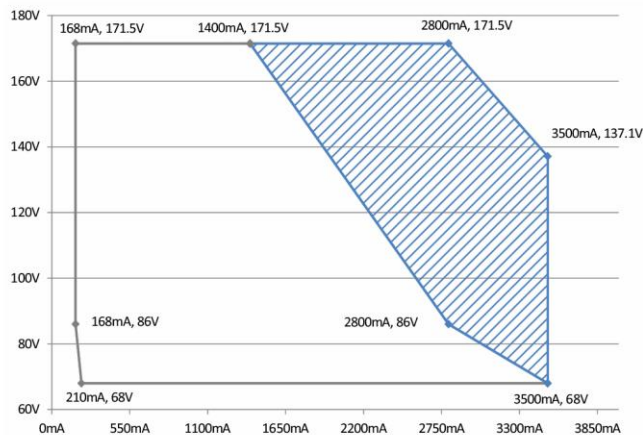
Recommended High Performance Region Allowed Operational Region

◎ HVGC-480-M



Recommended High Performance Region Allowed Operational Region

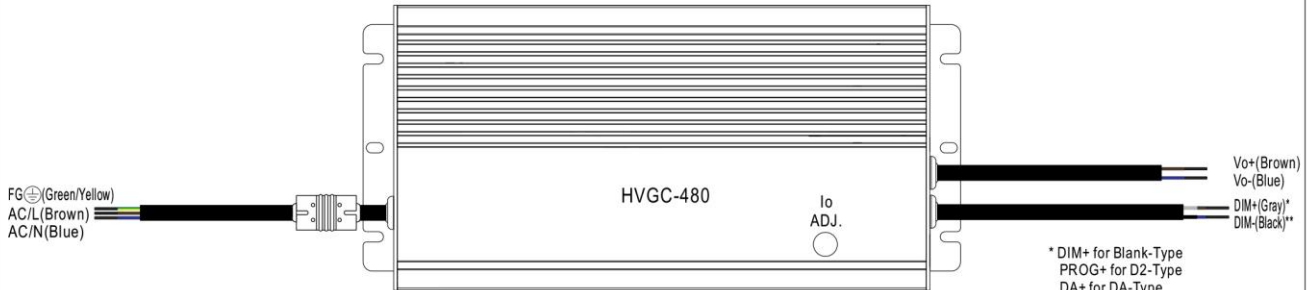
◎ HVGC-480-H



Recommended High Performance Region Allowed Operational Region

**480W LED Driver power supply < HVGC-480**

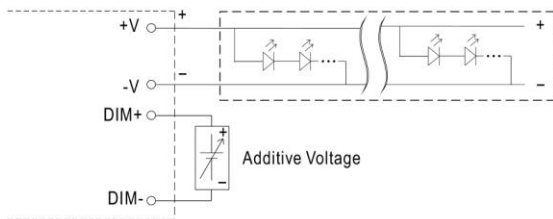
**■ DIMMING OPERATION**



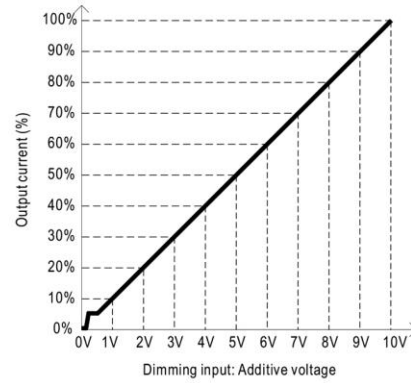
**※ 3 in 1 dimming function (for AB-Type)**

- Output constant current level can be adjusted by applying one of the three methodologies between DIM+ and DIM-: 0 ~ 10VDC, or 10V PWM signal or resistance.
- Direct connecting to LEDs is suggested. It is not suitable to be used with additional drivers.
- Dimming source current from power supply: 100 $\mu$ A (typ.)

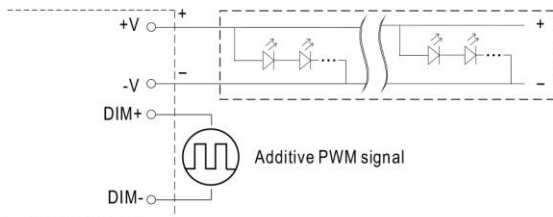
◎ Applying additive 0 ~ 10VDC



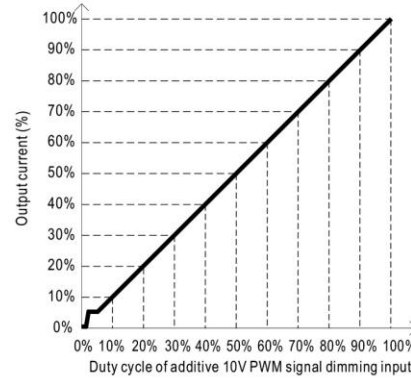
"DO NOT connect "DIM- to -V"



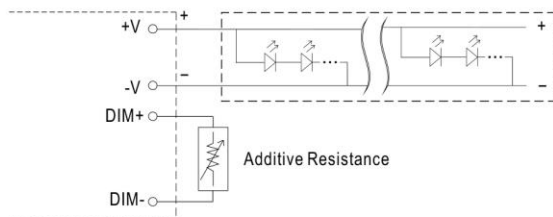
◎ Applying additive 10V PWM signal (frequency range 100Hz ~ 3KHz):



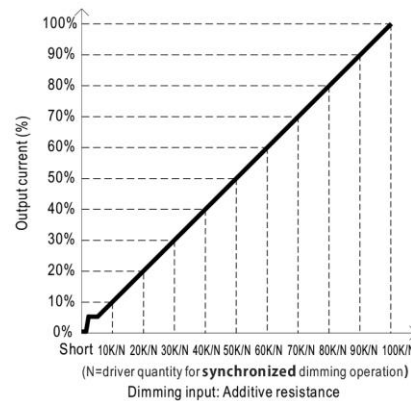
"DO NOT connect "DIM- to -V"



◎ Applying additive resistance:



"DO NOT connect "DIM- to -V"

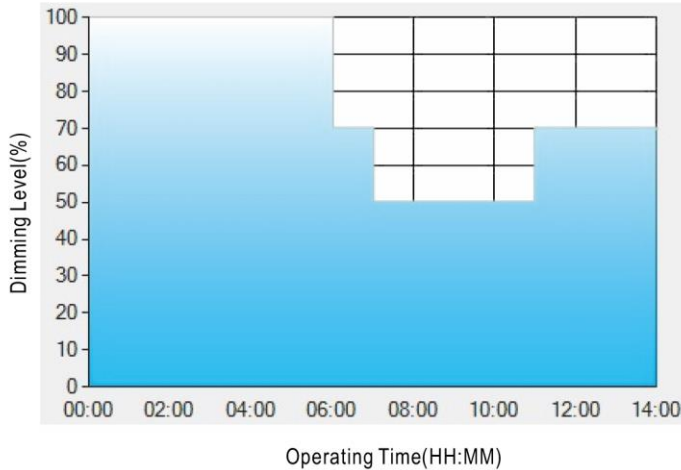


Note : 1. Min. dimming level is about 6% and the output current is not defined when 0% < Iout < 6%.  
 2. The output current could drop down to 0% when dimming input is about 0k $\Omega$  or 0Vdc, or 10V PWM signal with 0% duty cycle.



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Ex: ☉ D01-Type: the profile recommended for residential lighting



Set up for D01-Type in Smart timer dimming software program:

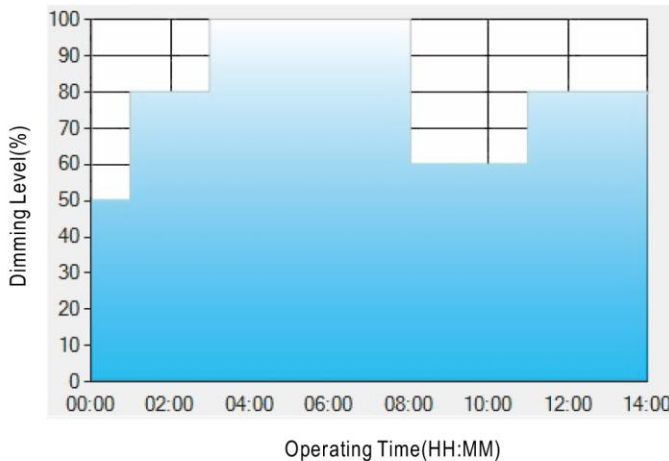
	T1	T2	T3	T4
TIME**	06:00	07:00	11:00	---
LEVEL**	100%	70%	50%	70%

\*\* : TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.

Example: If a residential lighting application adopts D01-Type, when turning on the power supply at 6:00pm, for instance:

- [1] The power supply will switch to the constant current level at 100% starting from 6:00pm.
  - [2] The power supply will switch to the constant current level at 70% in turn, starting from 0:00am, which is 06:00 after the power supply turns on.
  - [3] The power supply will switch to the constant current level at 50% in turn, starting from 1:00am, which is 07:00 after the power supply turns on.
  - [4] The power supply will switch to the constant current level at 70% in turn, starting from 5:00am, which is 11:00 after the power supply turns on.
- The constant current level remains till 8:00am, which is 14:00 after the power supply turns on.

Ex: ☉ D02-Type: the profile recommended for street lighting



Set up for D02-Type in Smart timer dimming software program:

	T1	T2	T3	T4	T5
TIME**	01:00	03:00	8:00	11:00	---
LEVEL**	50%	80%	100%	60%	80%

\*\* : TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.

Example: If a street lighting application adopts D02-Type, when turning on the power supply at 5:00pm, for instance:

- [1] The power supply will switch to the constant current level at 50% starting from 5:00pm.
  - [2] The power supply will switch to the constant current level at 80% in turn, starting from 6:00pm, which is 01:00 after the power supply turns on.
  - [3] The power supply will switch to the constant current level at 100% in turn, starting from 8:00pm, which is 03:00 after the power supply turns on.
  - [4] The power supply will switch to the constant current level at 60% in turn, starting from 1:00am, which is 08:00 after the power supply turns on.
  - [5] The power supply will switch to the constant current level at 80% in turn, starting from 4:00am, which is 11:00 after the power supply turns on.
- The constant current level remains till 6:30am, which is 14:00 after the power supply turns on.



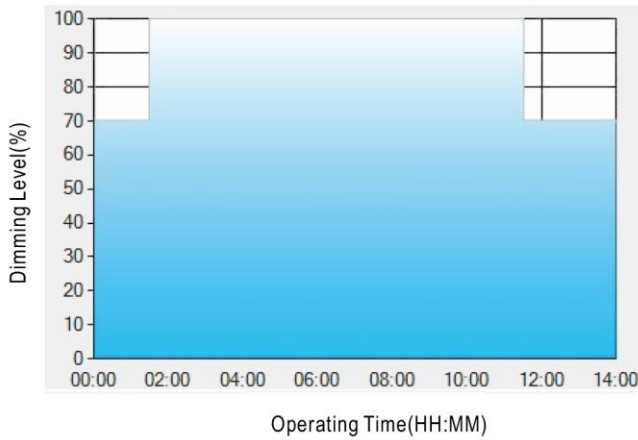
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Ex: ☉ D03-Type: the profile recommended for tunnel lighting



Set up for D03-Type in Smart timer dimming software program:

	T1	T2	T3
TIME**	01:30	11:00	---
LEVEL**	70%	100%	70%

\*\* : TIME matches Operating Time in the diagram whereas LEVEL matches Dimming Level.

Example: If a tunnel lighting application adopts D03-Type, when turning on the power supply at 4:30pm, for instance:

- [1] The power supply will switch to the constant current level at 70% starting from 4:30pm.
  - [2] The power supply will switch to the constant current level at 100% in turn, starting from 6:00pm, which is 01:30 after the power supply turns on.
  - [3] The power supply will switch to the constant current level at 70% in turn, starting from 5:00am, which is 11:00 after the power supply turns on.
- The constant current level remains till 6:30am, which is 14:00 after the power supply turns on.

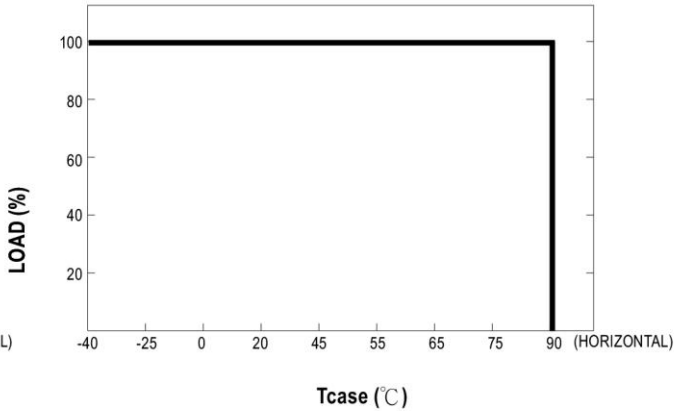
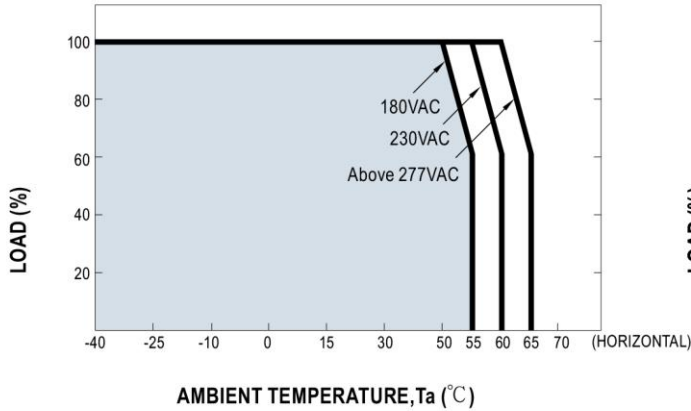
※ **DALI interface(primary side; for DA-Type)**

- Apply DALI signal between DA+ and DA-.
- DALI protocol comprises 16 groups and 64 addresses.
- First step is fixed at 6% of output.



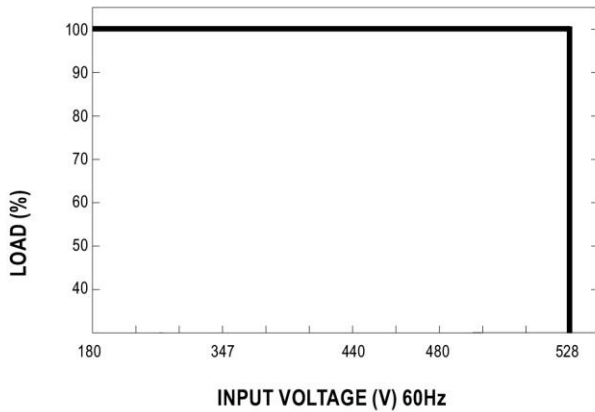
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**OUTPUT LOAD vs TEMPERATURE**

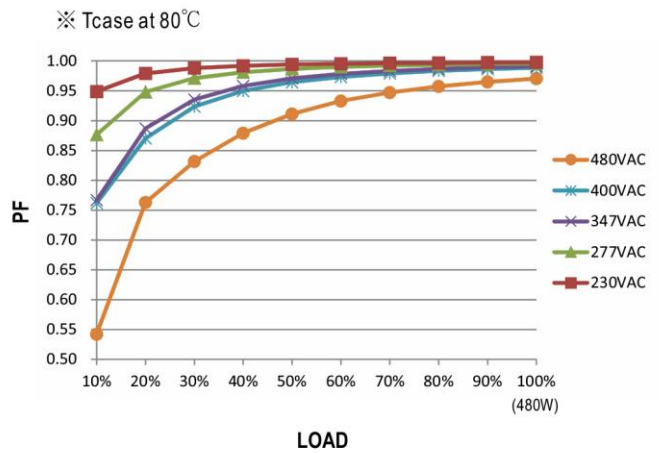


If HVGC-480 operates in Constant Power mode with the rated current, the maximum workable  $T_a$  is 55°C (Typ. 230VAC)

**STATIC CHARACTERISTIC**

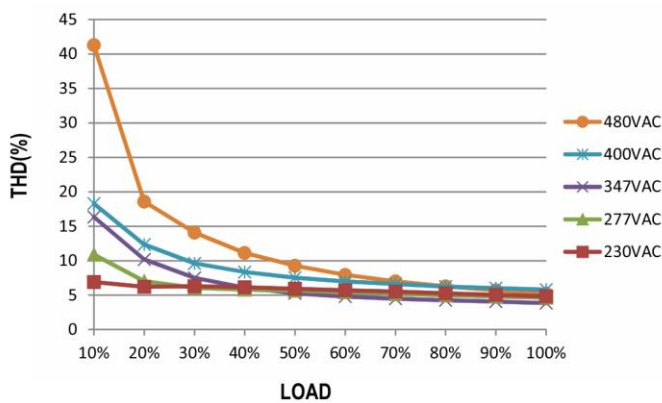


**POWER FACTOR (PF) CHARACTERISTIC**



**TOTAL HARMONIC DISTORTION (THD)**

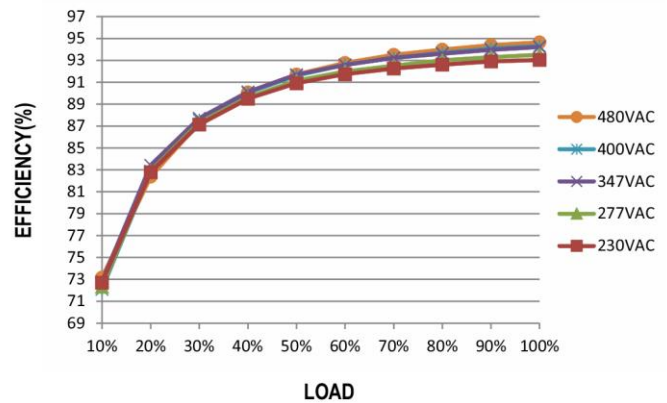
※ L Model,  $T_{case}$  at 80°C



**EFFICIENCY vs LOAD**

HVGC-480 series possess superior working efficiency that up to 94.5% can be reached in field applications.

※ L Model,  $T_{case}$  at 80°C

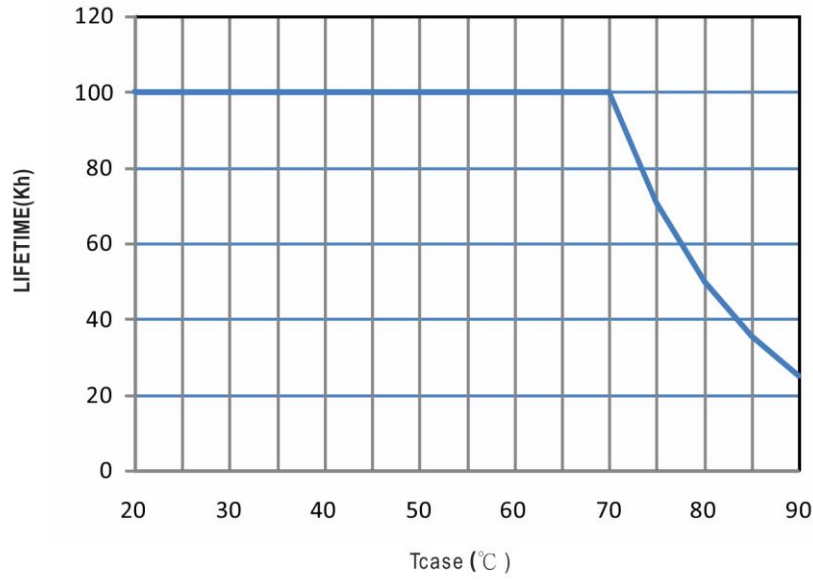




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■ LIFE TIME







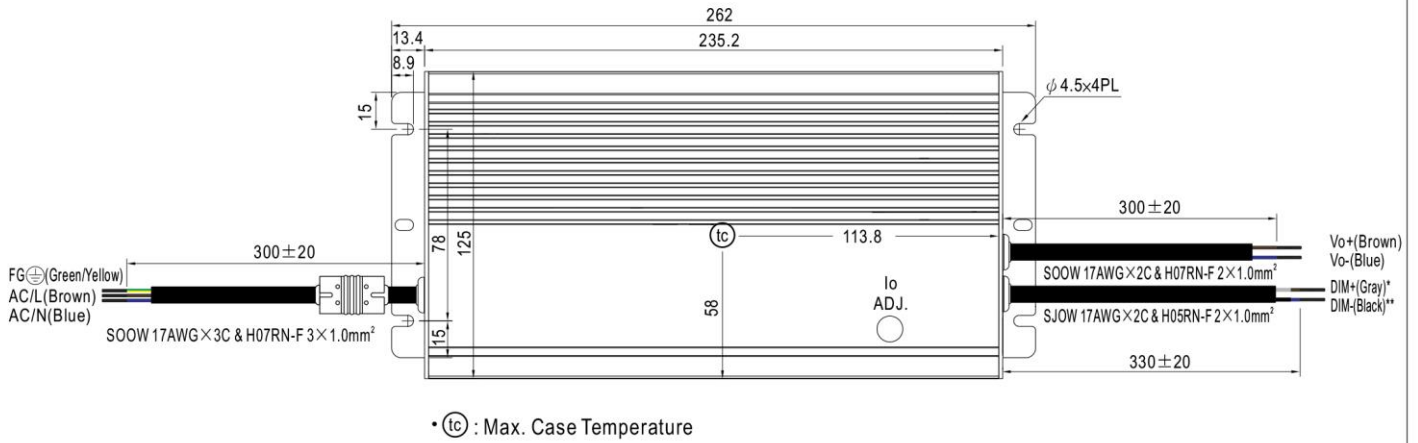
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**MECHANICAL SPECIFICATION**

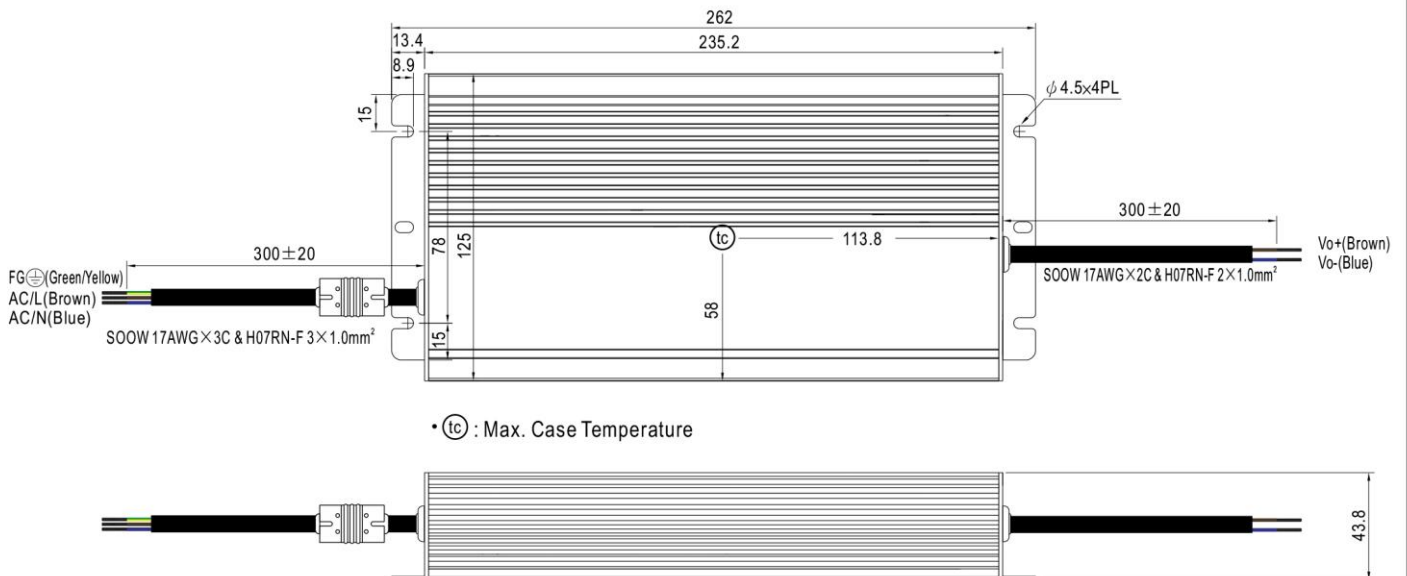
Case No. 251

Unit:mm

※AB-Type



※Blank-Type

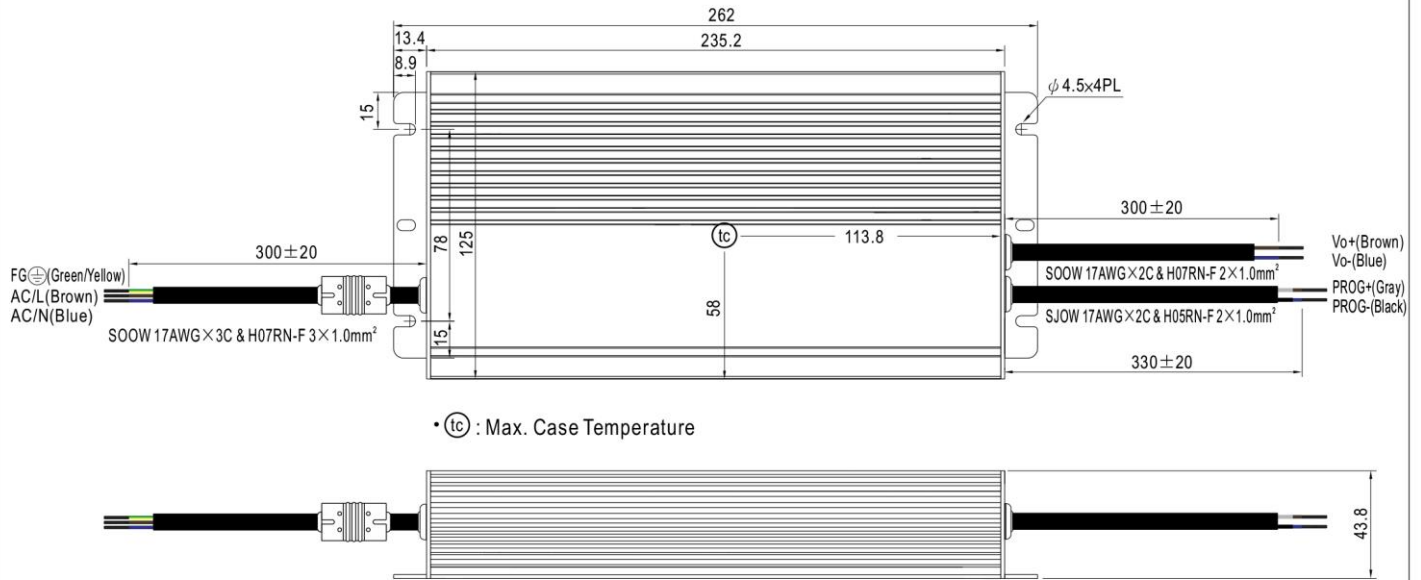




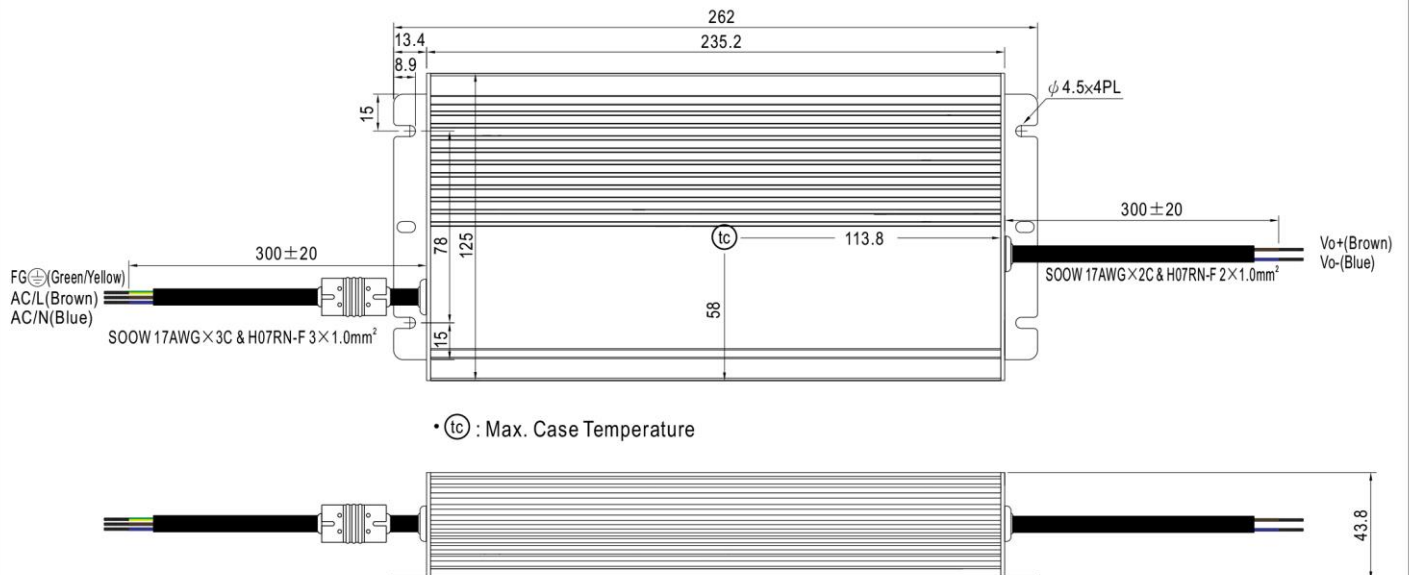
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**MECHANICAL SPECIFICATION**

※D2-Type



※Dx-Type





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※DA-Type

