

Product Datasheet



The global certified APD-040-C is a dual stage high efficiency smart LED driver. 10kV surge protection level, 100khour long life and 7-year warranty provide high confidence to luminaire users. It supports not only traditional 0-10V control, but also D4i smart protocols with NFC programmability. All around protections including digital OTP (internal and external by NTC) with auto-recovery secure 24hour non-stop operation for luminaires.

- Street
- Flood
- Tunnel
- Shoe box
- Architectural



- Features 2
- Model List 2
- Technical Data 2
- Safety/EMC Compliance 3
- Dimming 4
- Programming 5
- Lifetime vs. Case Temperature 6
- Power Factor vs. Load 6
- THD vs. Load 7
- Efficiency vs. Load 7
- Inrush Current 8
- Dielectric Strength 8
- Packaging Information 9
- Mechanical Design and Tc Point 10
- Output Operation Range 11
- Revision History 12

■ Features

- Supply Voltage: 176-264Vac
- Great Surge Immunity 10kV
- **DPAC™ Tech (D4i Plus 0-10V Combo)**
- D4i/DALI2.0 Comply with IEC62386-101,102,150,207,250,251,252,253
- Integrated 16Vdc Bus Power Supply
- $\pm 1\%$ Energy Report Accuracy
- Dim Off with 0.5W Standby Power
- 24V 3W (10W Transient Peak) Aux-Power
- 100,000Hour Life @ Tc=75°C & 7 Year Warranty @ Tc<=75°C
- +/-2% Output Current Accuracy
- Airset™ NFC Programmability
- Class II and Class I Combo
- Safety according to EN 61347-1, 61347-2-13, 62384

■ Model List

Model Number	Input Voltage Range	Output Power	Output Voltage	Full Power Settable Current Min	Full Power Settable Current Max	Dimming	Certification
APD-040-C070-ARE	176-264Vac	40 W	34-89Vdc	450mA	700mA	D4i&0-10V Combo	ENEC/CB/EL/CE
APD-040-C070-ERE	176-264Vac	40 W	34-89Vdc	450mA	700mA	0-10V	
APD-040-C105-ARE	176-264Vac	40 W	23-57Vdc	700mA	1050mA	D4i&0-10V Combo	
APD-040-C105-ERE	176-264Vac	40 W	23-57Vdc	700mA	1050mA	0-10V	

- Note:** 1. For –ARE model, D4i priority is higher than 0-10V if both dimming control signals exist.
2. See the **Output Operation Range Section** for details.

■ Technical Data

Input Voltage	176~264Vac or 127V-300Vdc , 380Vac for 2 hours
Input Frequency	47~63Hz
Power Factor	>0.9@60-100%load, refer to PF vs. Load curve
THD	<15%@60-100%load, refer to THD vs. Load curve
Input Current	0.4 Amax@120Vac & Full-Load, 0.22Amax@220Vac & Full-Load
Inrush Current	See Inrush Current Section in the datasheet
Leakage Current	1mA max @277Vac 60Hz, UL8750, 0.75mAmax @220Vac 50Hz, IEC61347-1
Input Under Voltage	Shut down and auto-recovery
Surge Protection	Line to line 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	$\pm 2\%$ lo for programmable model, $\pm 5\%$ lo for non-programmable model

40W, DPACT™ Tech, D4i and NFC Programmable LED Driver

Ripple Current	$I_{p-p}: 5\% I_o \text{ max}$
Setup Time	1.2s max
Overshoot	10% $I_o \text{ max}$ & LED Load
Output Over Voltage	120% $V_{o\text{max}}$, typ.
Short Circuit	Auto recovery. The output recovers when short is removed.
Over Temperature	Lower the output current when $T_c \geq 105 \pm 10^\circ\text{C}$; Auto Recovery When $T_c \leq 70 \pm 10^\circ\text{C}$
Auxiliary Power (Vaux)	24V+/-5%, 3W (10W Transient Peak)
Operating Temperature	Case Temperature $T_c = -40^\circ\text{C} \sim +90^\circ\text{C}$; 10%RH ~ 100%RH
Storage Temperature	$-40^\circ\text{C} \sim +85^\circ\text{C}$; 5%RH ~ 100%RH
MTBF	$\geq 320,000$ hours, 50°C case temperature (MIL-HDBK-217F)
Lifetime	$\geq 100,000$ hours, 75°C case temperature, refer to life vs. T_c curve
Case Temperature	90°C max, marked in the T_c point of label
Dimension	133.0 x 77.0 x 40.0 by mm
Net Weight	550g
Packing	See Package Information Section in the datasheet

Notes: Unless specified, all the test results are measured in 25°C room temperature.

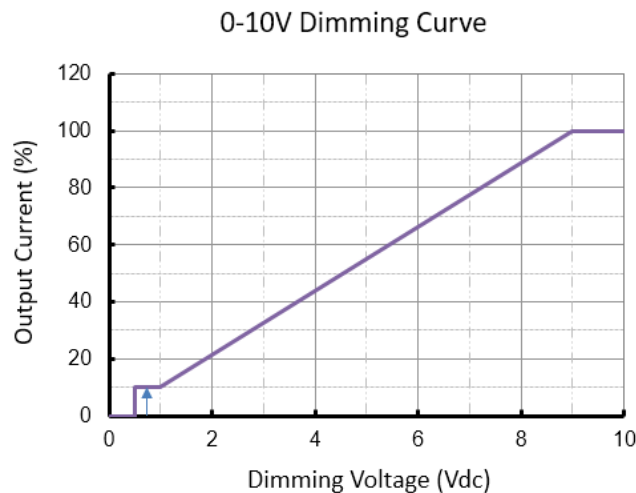
■ Safety/EMC Compliance

Safety Standard	Description
UL8750	Light emitting diode(LED) equipment for use in lighting products
UL1012/1310	Power units other than class 2 / Class 2 power units
IEC 61347-1	Lamp control gear Part 1: general and safety requirements
IEC 61347-2-13	Lamp control gear Part 2-13: particular requirement for d.c. or a.c. supplied electronic control gear for LED modules
EMI Standards	Description
IEC 55015	Conducted emission test & radiated emission test
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
FCC Part 15	ANSI C63.4:2009 Class B
EMS Standards	Description
IEC 61000-4-2	Electrostatic discharge (ESD): 8 kV air discharge, 4 kV contact discharge
IEC 61000-4-3	Radio frequency electromagnetic field susceptibility test (RS)
IEC 61000-4-4	Electrical fast transient (EFT)
IEC 61000-4-5	Surge immunity test
IEC 61000-4-6	Conducted radio frequency disturbances test (CS)
IEC 61000-4-8	Power frequency magnetic field test
IEC 61000-4-11	Voltage dips
IEC 61547	Electromagnetic immunity requirements applies to lighting equipment

■ Dimming

D4i Related Parameter	Min.	Typ.	Max.
DALI Interface Standard	IEC62386-101,102,150,207,250,251,252,253		
Dimming Range	10%	-	100%
DA1,DA2 High Level	9.5V	16V	22.5V
DA1,DA2 Low Level	-6.5V	0	6.5V
DA1,DA2 Current	0		2mA
Bus Power Supply Voltage	12Vdc	16Vdc	20Vdc
Bus Power Supply Current	52mA	-	60mA
Auxiliary Power Voltage	21.6V	24V	26.4V
Auxiliary Power	3W	-	4W
Auxiliary Power Endurance @6W	3.8ms/6ms	-	4.5ms/6ms
Auxiliary Power Endurance @10W	1.8ms/6ms	-	2.2ms/6ms
Bus Power Supply Current	52mA	-	60mA
0-10V Related Parameter	Min.	Typ.	Max.
Vdim Sourcing Current	100uA	150uA	200uA
Vdim Allowed Input Voltage	-20 V		20 V
0-10V Dimming Range	10% (Vdim=1V)	Linear	100% (Vdim=9~10V)
Dim off threshold	0.4V	0.5V	0.6V
Dim on threshold	0.6V	0.7V	0.8V

- Dimming Curve

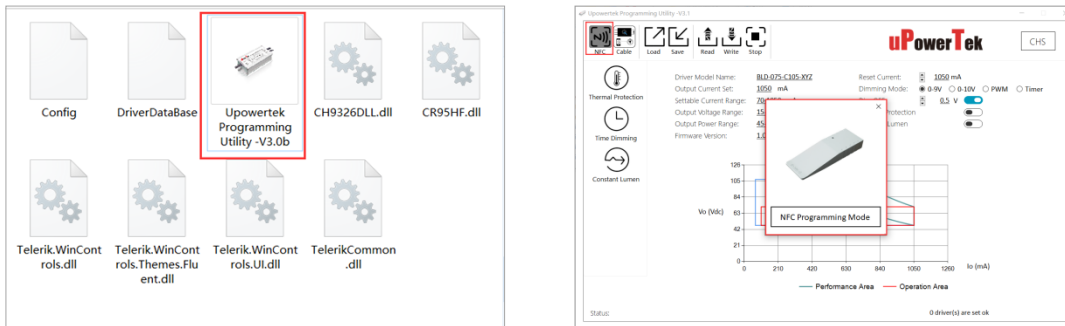


■ Programming

- NFC Programming by PC/Laptop

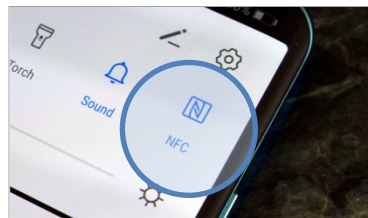


- Download PC Software at <https://www.upowertek.com/download-2/>
- Click Upowertek Programming Utility.exe
- The GUI start and notify you the programming mode (cable programming or NFC programming)
- Click “NFC” button if it’s not NFC programming mode.



- NFC Programming by Smartphone

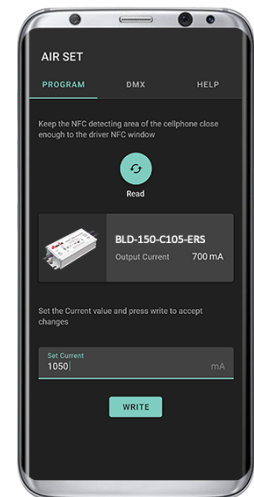
- Download Android APP at <https://www.upowertek.com/download-2/>
- Only available on Android cellphone (iPhone is not supported)
- The cellphone should have NFC function and make sure it is enabled.



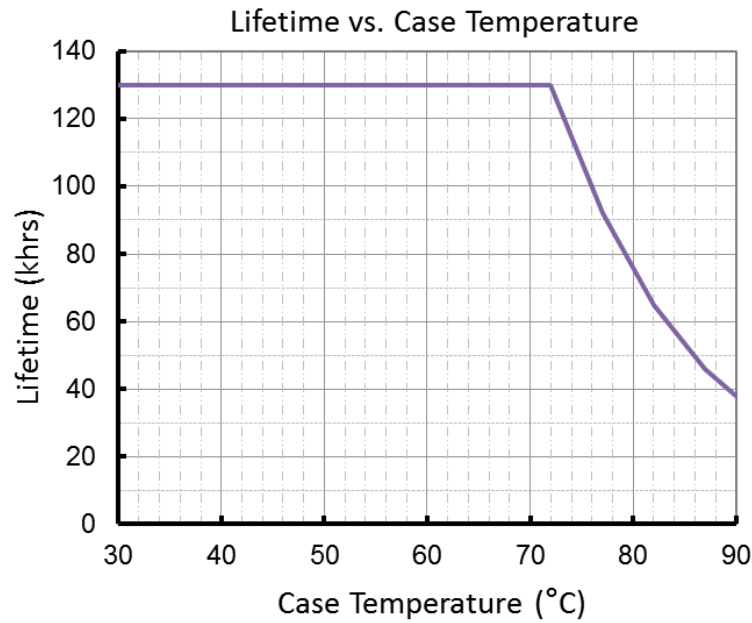
- Turn on NFC switch of cellphone, then open the APP by icon below.



uPowerTek
Airset

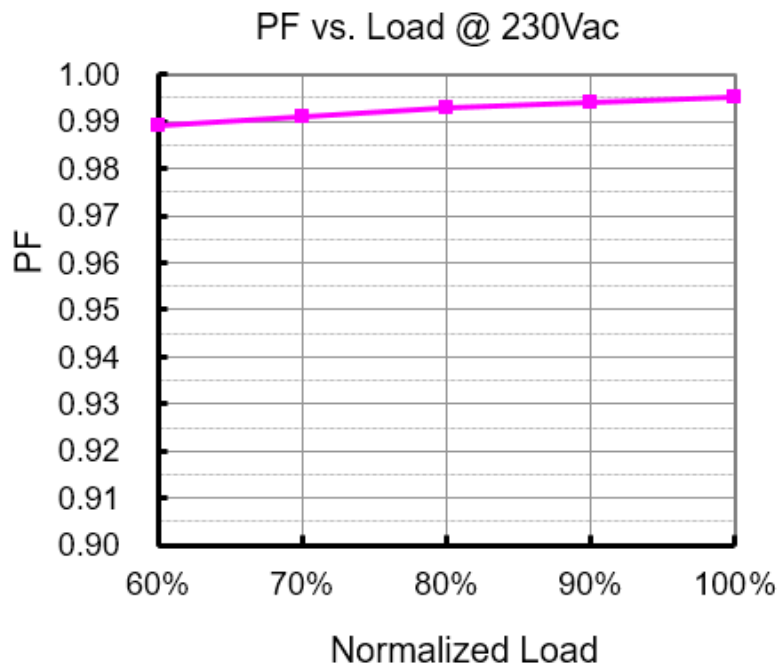


■ Lifetime vs. Case Temperature

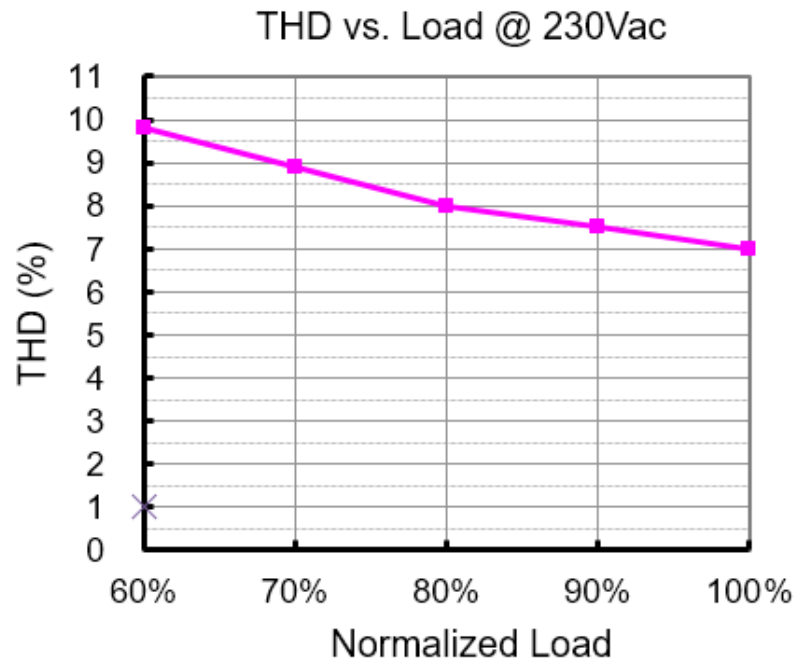


(End of Life: Maximum Failure Rate=10%)

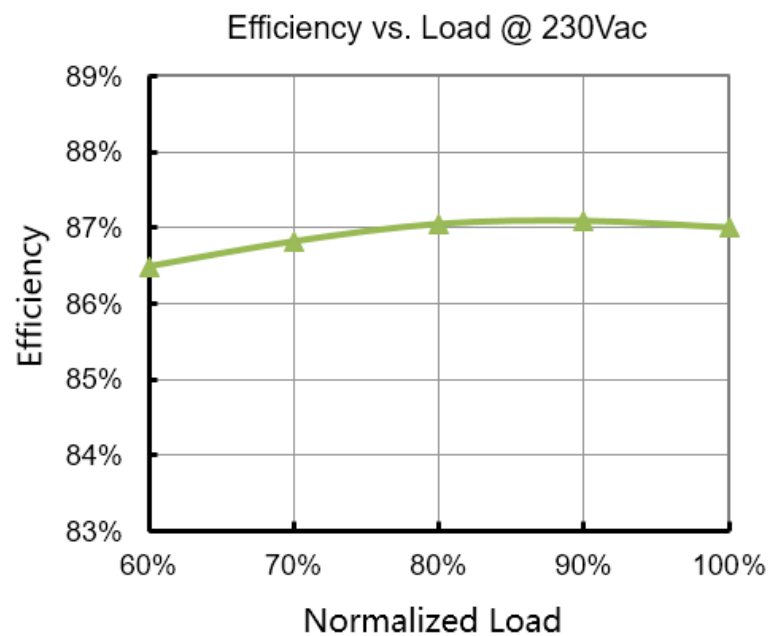
■ Power Factor vs. Load



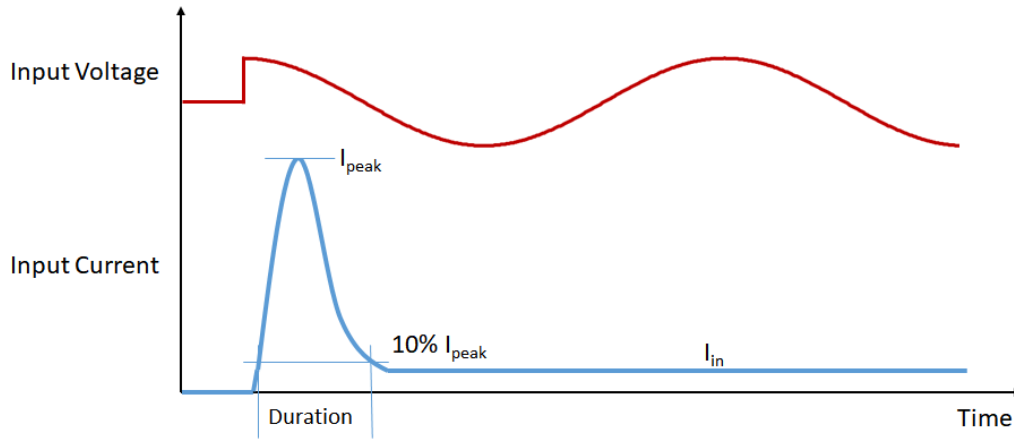
THD vs. Load



Efficiency vs. Load



■ Inrush Current



Input Voltage	I_{peak}	Duration
230Vac	62.8A	809us

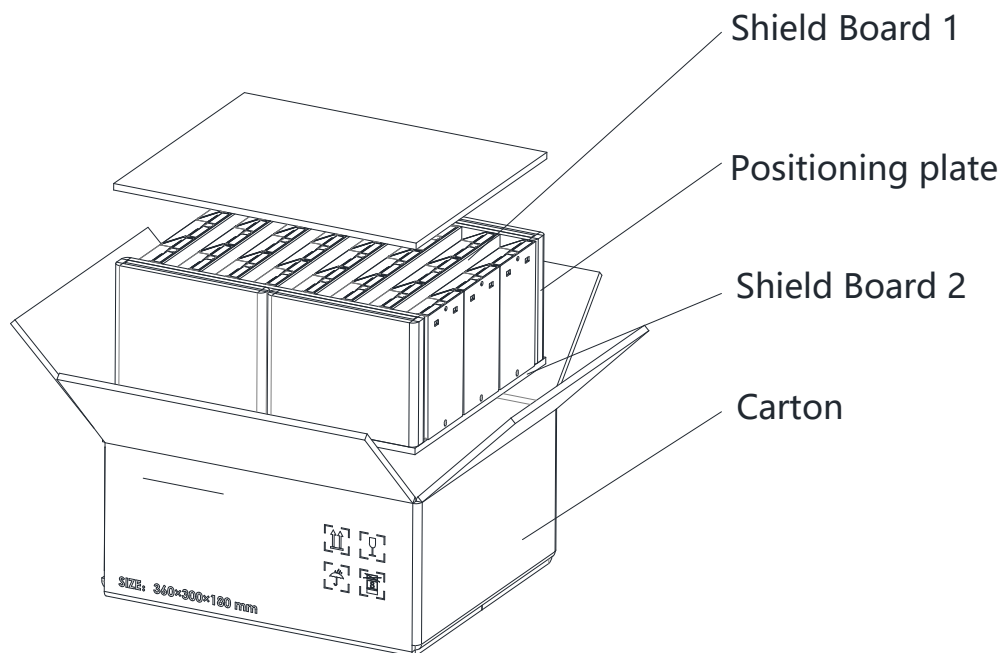
Please contact with us for MCB calculation and waveforms.

■ Dielectric Strength

Unit: Vac	Input	Output (SELV)	NTC/Dimming/Vaux (SELV)	Case/PE
Input	-	3750	3750	1554
Output (SELV)	3750	-	1554	1554
Dimming/Vaux/NTC (SELV)	3750	1554	-	1554
Case/PE	1554	1554	1554	-

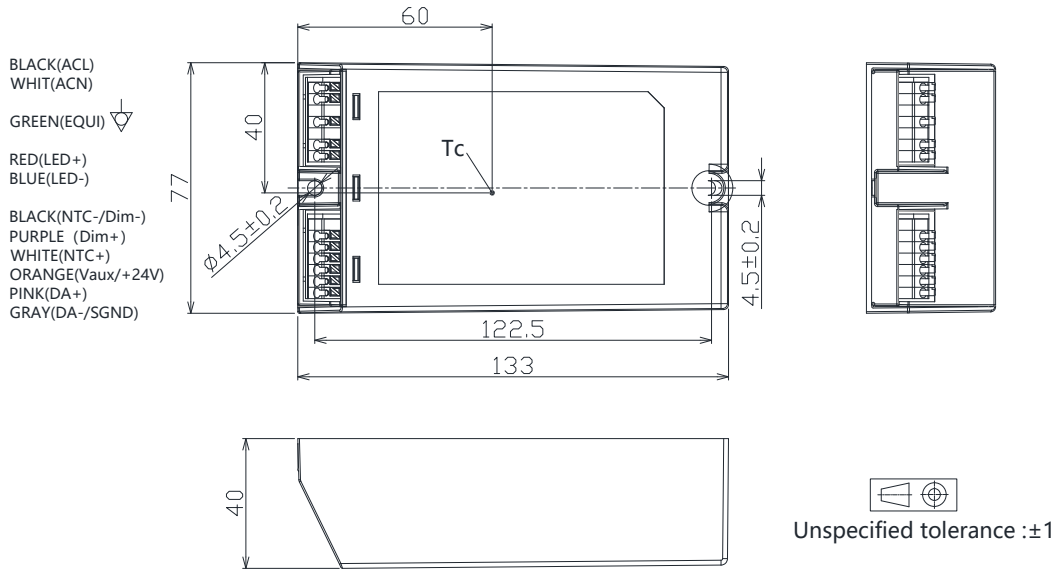
■ Packaging Information

Typical Carton Dimension(L×W×H)	360×300×180 mm
Shield Board 1	7pcs/carton
Positioning plate	2pcs/carton
Shield Board	2pcs/carton
LED Drivers	24pcs/carton
Net Weight	13.3kg/carton
Gross Weight	14.0 kg/carton

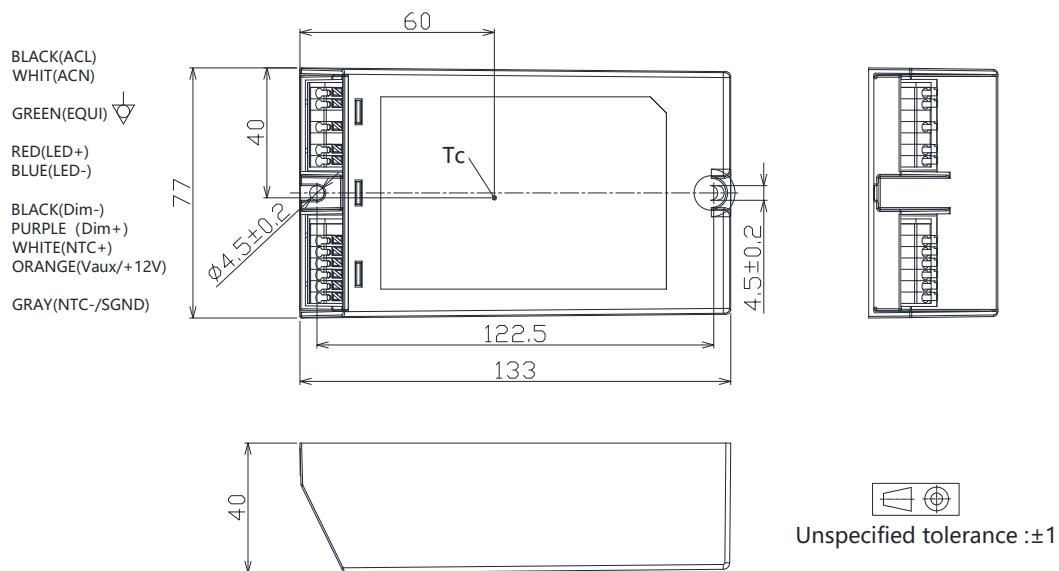


Mechanical Design and Tc Point

- APD-040-Cxxx-ARE



- APD-040-Cxxx-ERE



■ Output Operation Range

Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C070	700	40	34	57	70
	650	40	37	62	65
	600	40	40	67	60
	550	40	44	73	55
	500	40	48	80	50
	450	40	53	89	45
	400	36	53	89	45
	350	31	53	89	45
	300	27	53	89	45

	45	4	53	89	45
Model	Typical Set Output Current (mA)	Max Output Power (W)	Output Voltage Min (V)	Output Voltage Max(V)	Minimum Dimming Current (mA)
-C105	1050	40	23	38	105
	1000	40	24	40	100
	950	40	25	42	95
	900	40	27	44	90
	850	40	28	47	85
	800	40	30	50	80
	750	40	32	53	75
	700	40	34	57	70
	650	37	34	57	70
	600	34	34	57	70
	550	31	34	57	70
	500	29	34	57	70
	450	26	34	57	70
	400	23	34	57	70
	350	20	34	57	70
	300	17	34	57	70

	70	4	34	57	70

■ Revision History

Revision	Date	Contents
A	2022-07-22	1. First release
B	2022-10-27	1. Mechanical design and Tc point updated. 2. Packaging information updated.
C	2022-11-3	1. New 0.45-0.7A programmable model added.