

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



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

■ Features

- Supply Voltage: 176-264Vac or 186-250Vdc
- 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 (1 to X)
- Programmable EOFx with EL Certified
- 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	Certified
APD-040-C070-NRE	176~264Vac 186-250Vdc	40 W	34-89Vdc	450mA	700mA	N	ENEC/CB/ EL/CE
APD-040-C070-ERE						0-10V	
APD-040-C070-ARE						D4i&0-10V	
APD-040-C070-ARE-B00000			23-57Vdc	700mA	1050mA	D4i	
APD-040-C105-NRE						N	
APD-040-C105-ERE						0-10V	
APD-040-C105-ARE						D4i&0-10V	
APD-040-C105-ARE-B00000						D4i	

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.

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

■ Technical Data

Input Voltage	176-264Vac or 186-250Vdc
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	0.7mA max @240Vac 50/60Hz, IEC60598-1
Input Under Voltage	Shut down and auto-recovery
Surge Protection	Line to line 6kV, line to ground 10kV, IEC 61000-4-5
Current Accuracy	±2%Io for programmable model, ±5%Io for non-programmable model
Ripple Current	Ip-p:5%Io max
Setup Time	1.2s max
Overshoot	10% Io max & LED Load
Output Over Voltage	120% Vomax, 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.

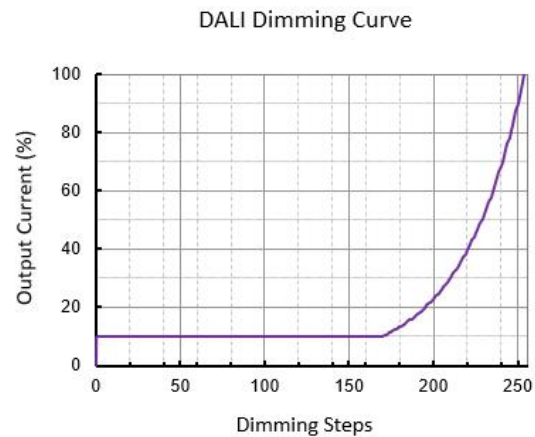
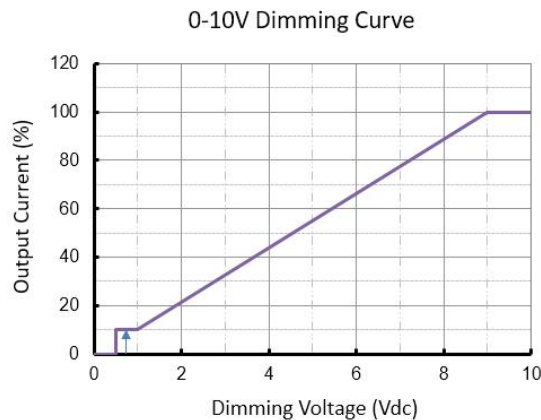
■ Safety/EMC Compliance

Safety Standards	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
IEC 62384	DC or AC supplied electronic control gear for LED modules - Performance requirements
IEC 55015/FCC Part 15	Conducted emission test & radiated emission test; ANSI C63.4:2009 Class B
IEC 61000-3-2	Harmonic current emissions; Class C
IEC 61000-3-3	Voltage fluctuations & flicker
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

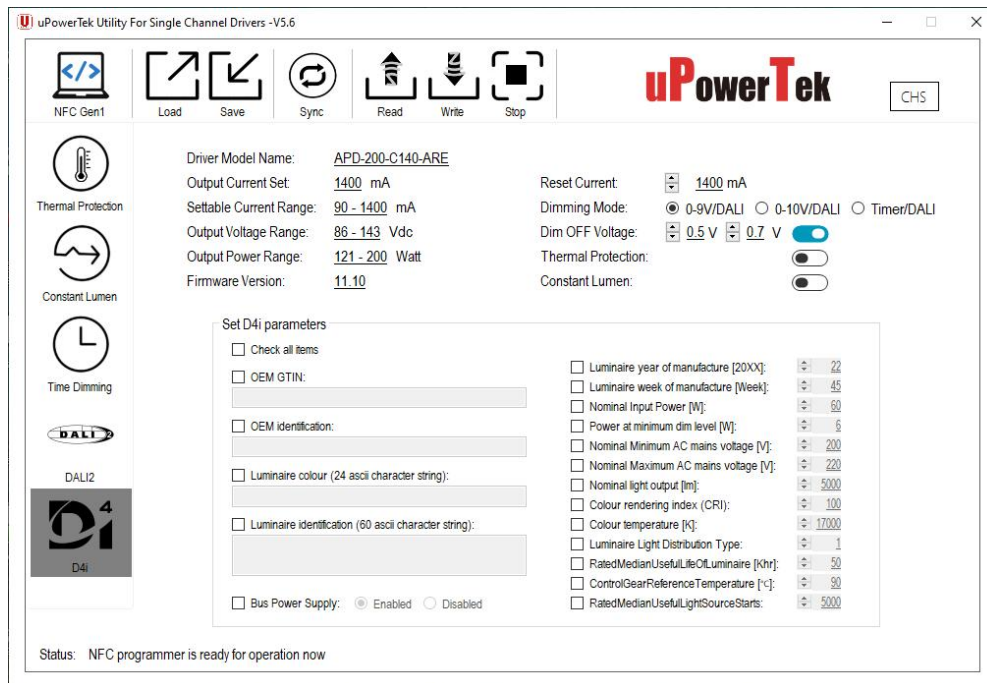
- Dimming Curves



■ Programming

- Programmable Functions

uPowerTek LED drivers offer a range of configurable functions to meet specific lighting requirements. The Output Current, Dimming Mode, Dim Off/On Voltage Threshold, and Timer Dimming can be set as basic programming functions. Constant Lumen Output (CLO) can also be customized to ensure consistent light performance. Additionally, depending on the different product model numbers, users can benefit from programming Thermal Protection by external NTC (with extra cable), DALI/D4i Features, and DMX addressing.



uPowreTek Programming Software Interface

- Required Equipment

To program uPowerTek LED drivers, users will need specific equipment based on their preferred method. For NFC wireless programming, users can use a smartphone with either IOS or Android, the uPowerTek NFC Programmer, or the FEIG NFC Programmers. These tools ensure a seamless and efficient setup process, realizing precise customization of the LED driver settings.



NFC Programmer V1



NFC Programmer V2



FEIG NFC Programmer



FEIG NFC Programmer



Android or iPhone

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

- Connection Guide

This guide provides simple connection diagrams to help users understand the programming system. For more detailed operating instructions, including step-by-step procedures and additional configurations, please visit our website. You can download the comprehensive user manual and necessary software from the following link:

<https://www.upowertek.com/download-2/>.



Wireless Programming

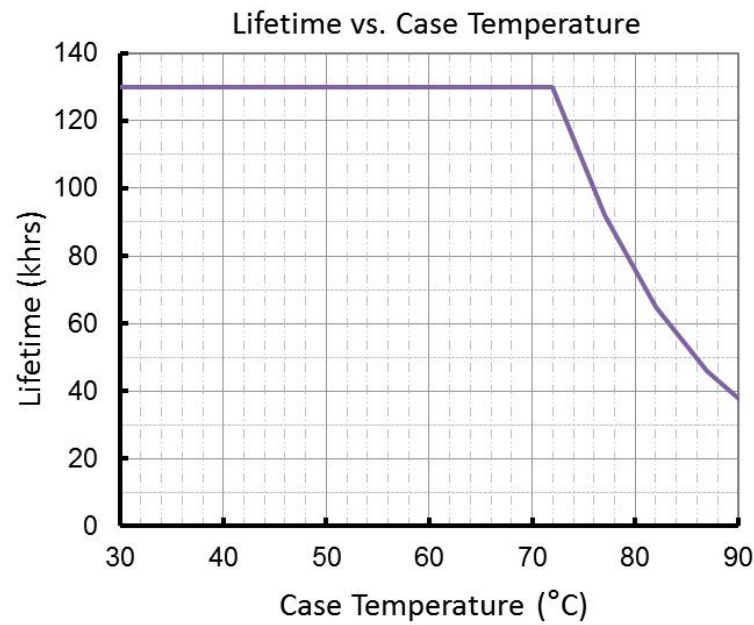


Wireless 1 to X Programming



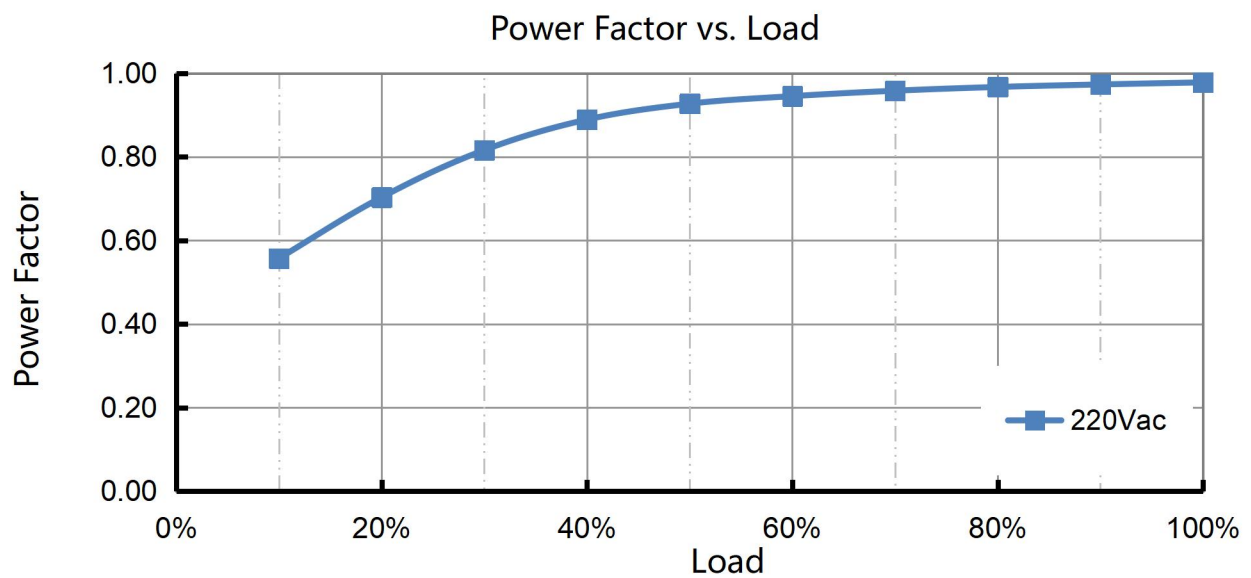
Cellphone Programming

■ Lifetime vs. Case Temperature

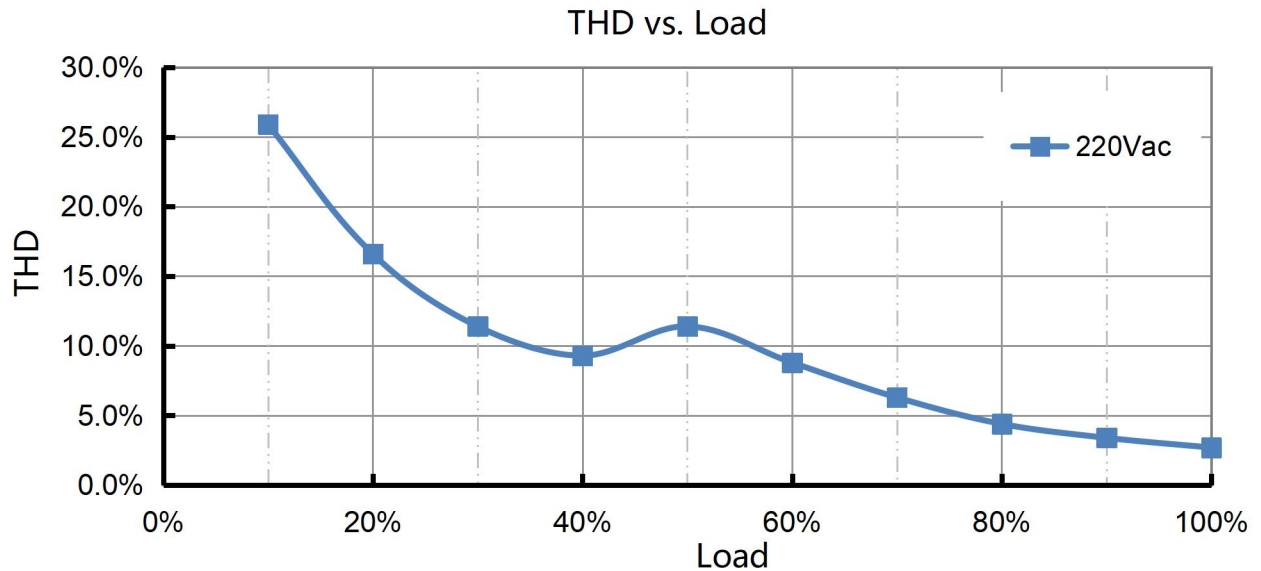


(End of Life: Maximum Failure Rate=10%)

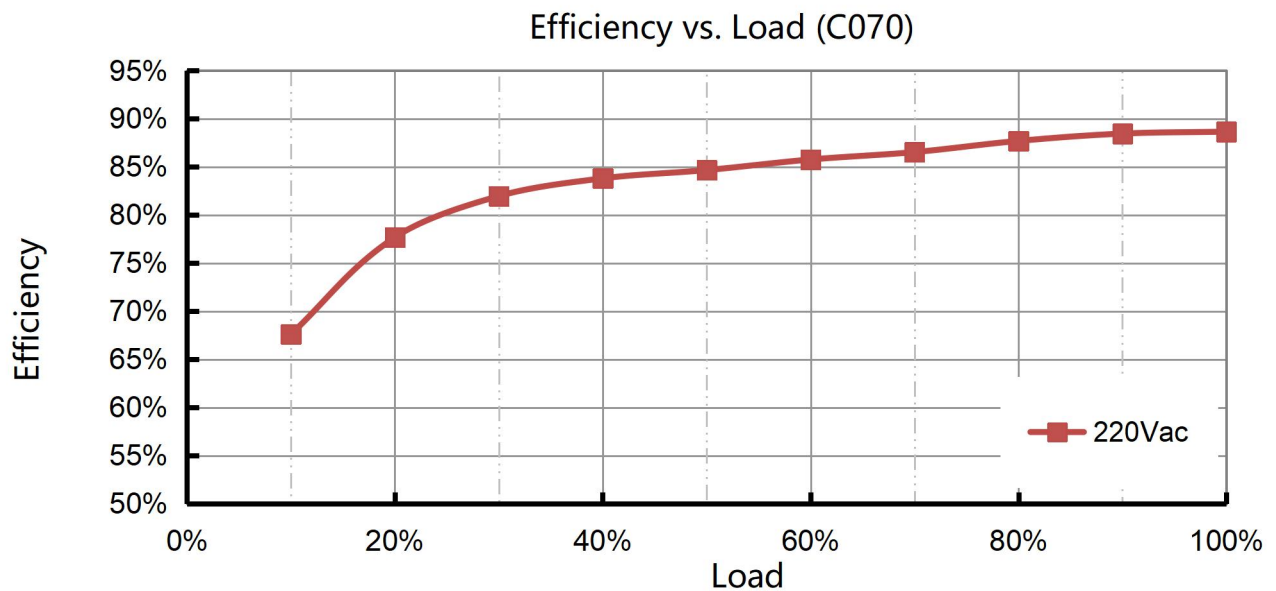
■ Power Factor vs. Load

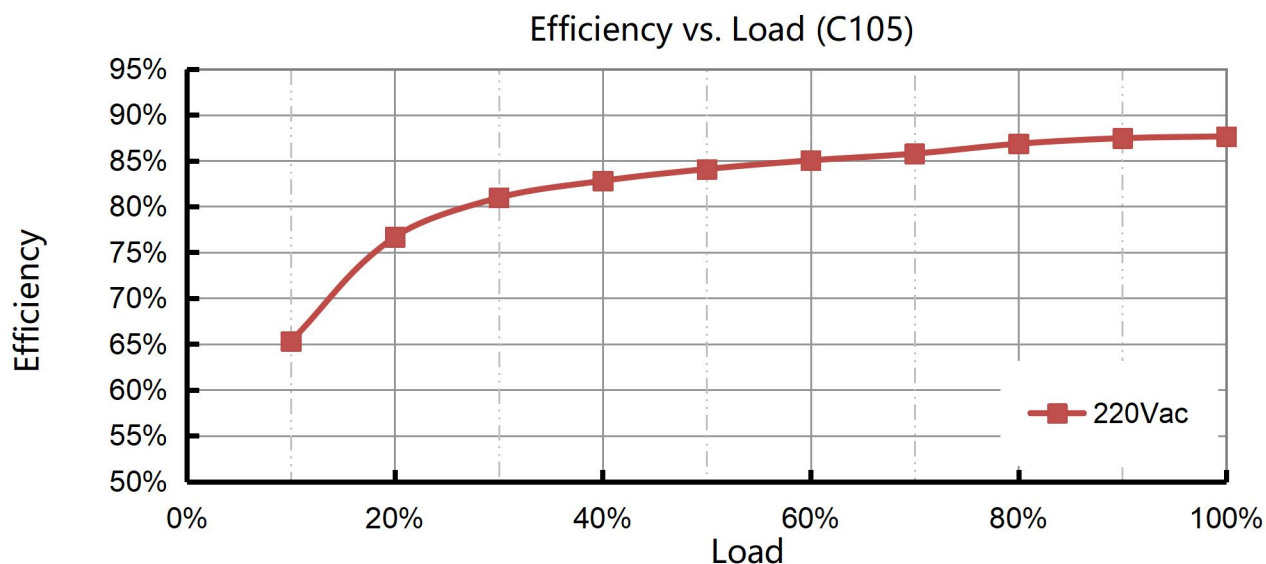


■ THD vs. Load

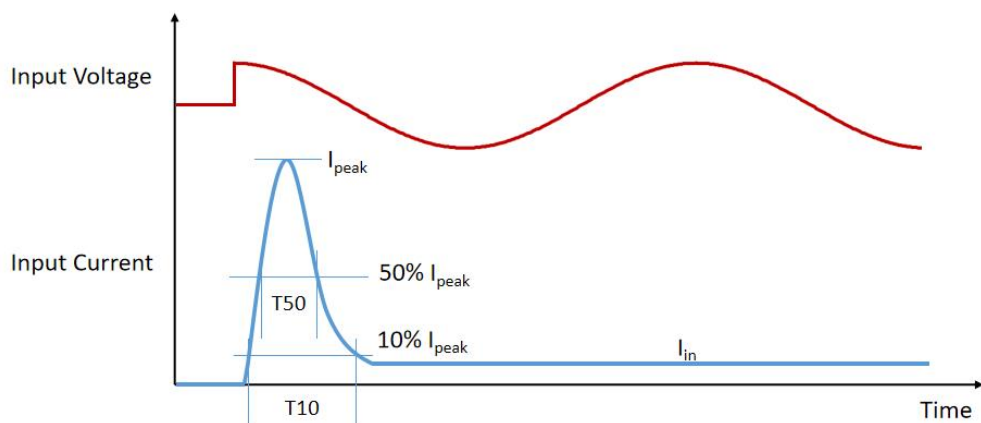


■ Efficiency vs. Load





Inrush Current



Input Voltage	I_{peak}	10% -10% T10 Duration	50% -50% T50 Duration
220Vac	66A	412us	170us

- MCB Suggestion

Type	B10	B16	B25	B32	C10	C16	C25	C32	D10	D16	D25	D32
Driver Quantity	7	11	18	23	12	19	30	38	24	38	60	77

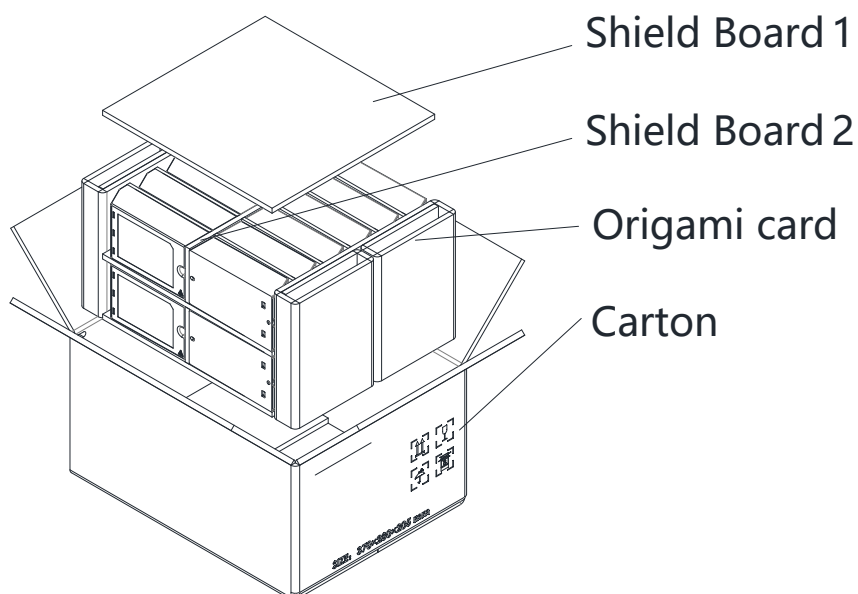
Note: Calculated with MCB S200 series manufactured by ABB at 220Vac Input condition

■ 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	-

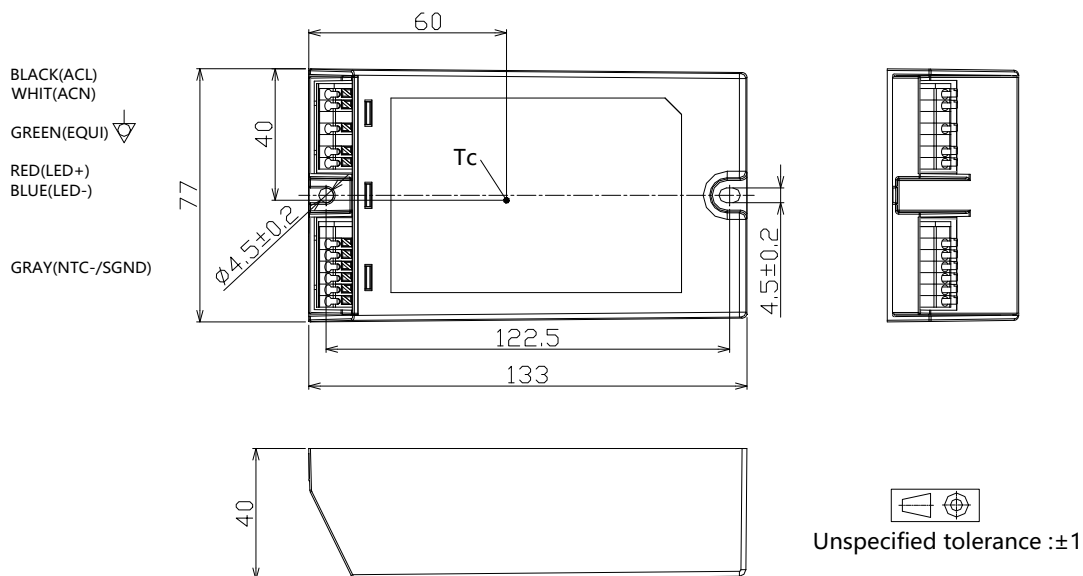
■ Packaging Information

Typical Carton Dimension(L×W×H)	370×280×205 mm
Shield Board 1	3pcs/carton
Origami card	2pcs/carton
Shield Board 2	2pcs/carton
LED Drivers/LED	24pcs/carton
Net Weight	13.3 kg/carton
Gross Weight	14.1 kg/carton

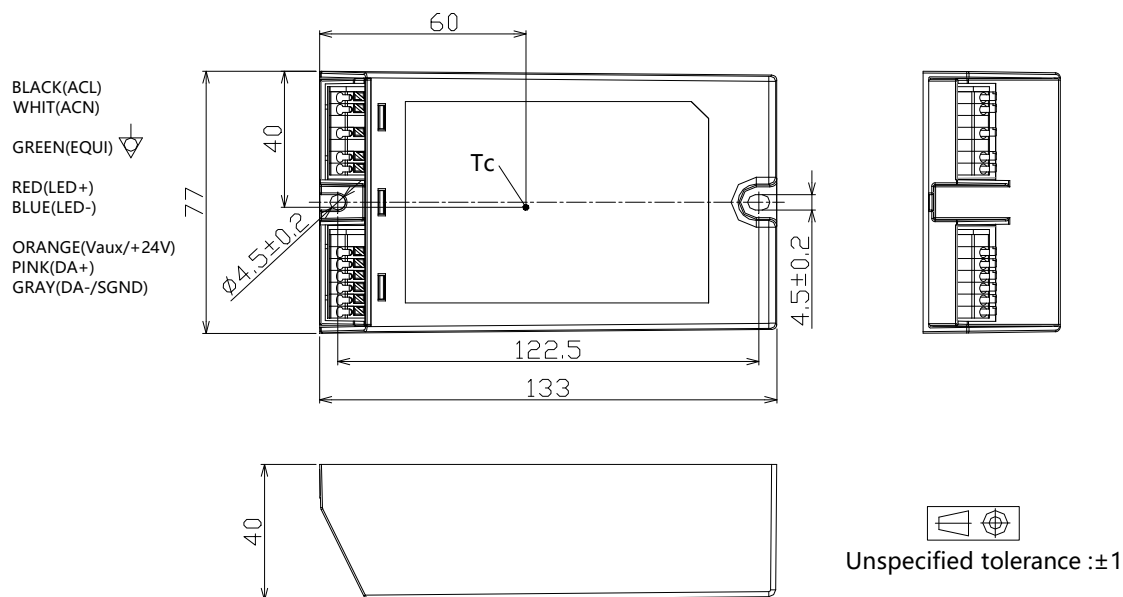


Mechanical Design and Tc Point

- APD-040-Cxxx-NRE

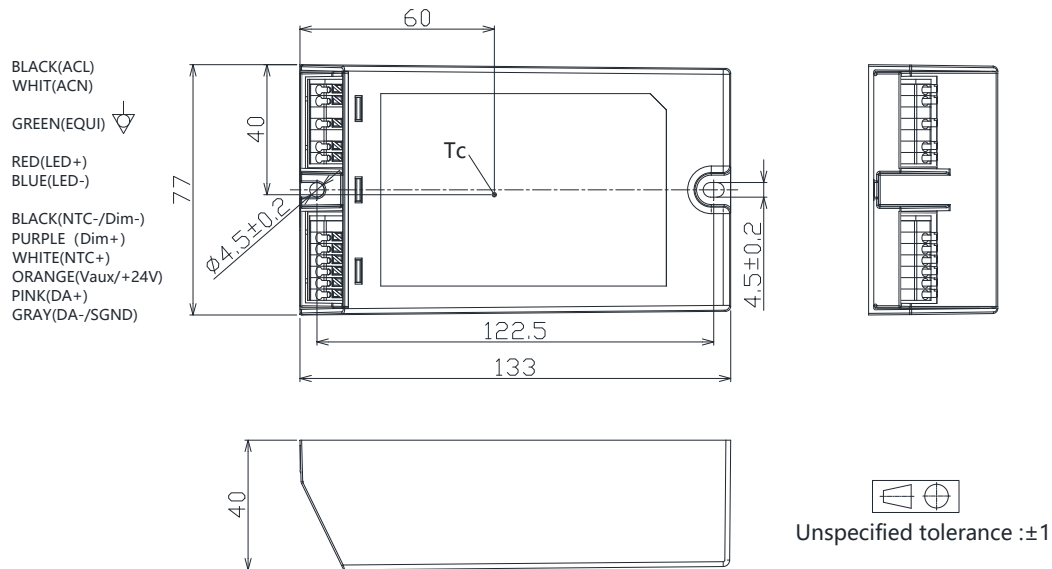


- APD-040-Cxxx-ARE-B00000 (D4i Only)

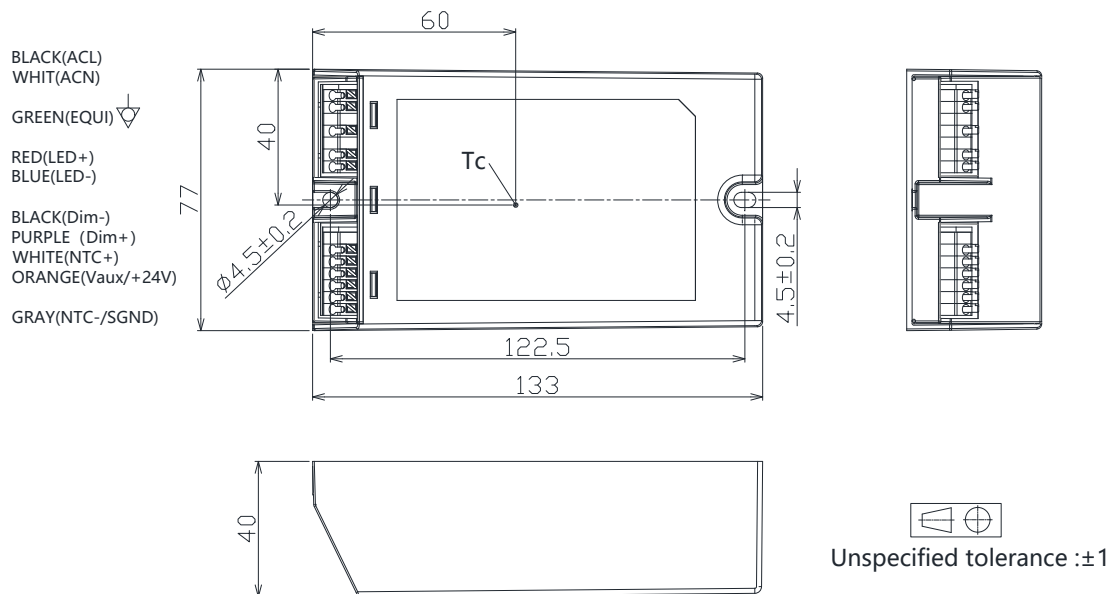


40W, DPAC™ Tech, D4i and NFC Programmable LED Driver

- APD-040-Cxxx-ARE (D4i and 0-10V Combo)



- 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.
D	2023-07-14	1. Update leakage current
E	2023-10-08	1. DC input range updated 2. EL mark with EOFx programmability added
F	2024-04-19	1. Update the mechanical drawing for -ERE models
G	2024-07-25	1. NNE, ARD-B model added. 2. 1 to X programming feature added. 3. Power factor, THD, efficiency curves updated by 10-100% load range 4. MCB usage and driver quantity section added 5. Inrush current data updated