240W Constant Current Mode Output LED Driver

Features

- Universal AC Input Range: 90～305VAC
- Ultra-High Efficiency : up to 94.0%
- Constant Current(CC) Mode Output
- Manual Adjustment of 50%~100% I_{O_max}(Optional)
- Integrate Constant Voltage (CV) Mode at the Max. Output Voltage
- Compatible Dimming with Two Dimming Cables(Optional)
  - 0-10V/10V PWM/Resistance Dimming
  - Dimming to Off via Regulating V_o Very Low
- Surge Protection: 4kV(L to N), 6kV(L,N to PE)
- Input UVLO, Output SCP and OVP and OTP
- IP65/IP67 for Indoor/Outdoor Application
- UL Listed Certification
  - UL File Number: **E488080**
  - Pass UL8750 **Class P**
- 5 Years Warranty

Product Information

Part Number	Max. P_O	I_{o_max}	$V_{o(CC)}$ (V)	$V_{omax(CV)}$ (V)	Certification
LIM240-A1S103C-YY	240.0	10.00	12.0~24.0	26.0	-
LIM240-A1S602C-YY	258.0	6.00	15.0~43.0	45.0	-
LIM240-A1S552C-YY	240.7	5.52	30.0~43.6	45.0	UL Listed
LIM240-A1S452C-YY	240.3	4.45/4.00	30.0~54.0 / 54.0~60	61.5	UL Listed
LIM240-A1S352C-YY	240.1	3.50	36.0~68.6	76.0	UL Listed
LIM240-A1S212C-YY	240.0	2.10	59.0~114.3	125.0	UL Listed
LIM240-A1S182C-YY	240.1	1.75	70.0~137.2	153.0	UL Listed
LIM240-A1S142C-YY	240.1	1.40	89.0~171.5	185.0	UL Listed
LIM240-A1S102C-YY	240.4	1.01	119.0~238.0	245.0	UL Listed

Part Number Encoding

LIM 240 – A1 S 602C – YY

- YY: Options: Dimmable, Adjustable
- 602C: Rated Constant Output Current
- S: Single Channel Output
- A1: 90-305VAC Input Voltage
- 240: Typical Input Power
- LIM: Product Family Name

Type (YY)	IP Level	Dimmable:0-10V/10V PWM/Resistance Dimming with the two dimming cables	Adjustable: I_{omax} and $V_{omax(CV)}$ are adjusted by rotating the internal potentiometers
D	IP65	Yes	Yes
A	IP65	No	Yes
SD	IP67	Yes	No
Default	IP67	No (Fixed I_o and $V_{O\ (CV)}$)	No (Fixed I_o and $V_{O\ (CV)}$)

Electrical Specifications

Parameter Name		Min.	Typ.	Max.	Unit	Comment
Input						
Rated Supply Voltage		100	-	277	VAC	
AC Operating Voltage		90	115/230/27	305	VAC	
DC Operating Voltage		127	-	431	VDC	
Frequency		47	50/60	63	Hz	
Input AC Current (RMS)			2.5/1.3/1.1	3.5	A	Typ. And Min. Input
Input Power		-	240	-	W	Typ. Input and Output
Inrush Current ($T_{Duration}$ = 800μs, measured at 50% I_p)		-	75	-	A	Cold Start,230VAC/90°
Power Factor (see Fig.5)	115 VAC	0.96	0.99			⩾35% Max. Load
	230 VAC	0.92	0.95			⩾70% Max. Load
	277 VAC	0.88	0.90			⩾70% Max. Load
THD	115VAC Input			20	%	⩾10% Max. Load
	230/277VAC Input			20		⩾50% Max. Load
Input Power Loss without load (I_O=0A)			2.5	3	W	115VAC Input
			1.5	2		230/277VAC Input
Leakage Current				0.75	mA	277VAC/60Hz
Output						
I_{o_max} Max. Setting Point of Constant Current	LIM240-A1S103C-YY	9800	10000	10200	mA	connect a resistor of 100kΩ to the dimming cables, 115/230/2777VAC Input, CV Load , Typ. Output Voltage
	LIM240-A1S602C-YY	5880	6000	6120		
	LIM240-A1S552C-YY	5410	5520	5630		
	LIM240-A1S452C-YY	4361	4450	45390		
	LIM240-A1S352C-YY	3430	3500	3570		
	LIM240-A1S212C-YY	2058	2100	2142		
	LIM240-A1S182C-YY	1715	1750	1785		
	LIM240-A1S142C-YY	1372	1400	1428		
	LIM240-A1S102C-YY	990	1010	1030		
Constant Current Accuracy				±3.0	%	Full Range
Adjustable Output Current		0.5		1.0	I_{o_max}	through rotating a internal potentiometer A and D Type Only
Adjustable Rated Output Voltage of Constant Voltage Mode	LIM240-A1S103C-YY	22	-	26	V	through rotating a internal potentiometer, A and D Type Only
	LIM240-A1S602C-YY	39	-	45		
	LIM240-A1S552C-YY	39	-	45		
	LIM240-A1S452C-YY	55	-	62		
	LIM240-A1S352C-YY	68	-	76		
	LIM240-A1S212C-YY	112	-	125		
	LIM240-A1S182C-YY	137	-	153		
	LIM240-A1S142C-YY	168	-	185		
	LIM240-A1S102C-YY	220	-	245		

Parameter Name		Min.	Typ.	Max.	Unit	Comment
$V_{omax(CV)}$ (Max. Constant Voltage Setting Point)	LIM240-A1S103C-YY	25.48	26.00	26.52	V	115/230/277VAC Input, Half CC Load Output
	LIM240-A1S602C-YY	44.10	45.00	45.90		
	LIM240-A1S552C-YY	44.10	45.00	45.90		
	LIM240-A1S452C-YY	60.10	61.30	62.50		
	LIM240-A1S352C-YY	74.48	76.00	77.52		
	LIM240-A1S212C-YY	122.50	125.00	127.50		
	LIM240-A1S182C-YY	149.94	153.00	156.06		
	LIM240-A1S142C-YY	181.30	185.00	188.70		
	LIM240-A1S102C-YY	240.10	245.00	249.90		
Constant Voltage Accuracy				±3.0	%	Full Range
Rated Output Voltage Under Constant Current Mode	LIM240-A1S103C-YY	12.0	21.0	24.0	V	Full Range
	LIM240-A1S602C-YY	15.0	36.0	43.0		
	LIM240-A1S552C-YY	30.0	40.0	43.6		
	LIM240-A1S452C-YY	30.0	50.0	54.0		I_{omax}=4.5A, Full Range
		54.0	56.0	60.0		I_{omax}=4.0A, Full Range
	LIM240-A1S352C-YY	36.0	63.8	68.6		Full Range
	LIM240-A1S212C-YY	59.0	106.3	114.3		
	LIM240-A1S182C-YY	70.0	127.5	137.2		
	LIM240-A1S142C-YY	89.0	159.5	171.5		
	LIM240-A1S102C-YY	119.0	221.0	238.0		
Efficiency @115VAC	LIM240-A1S103C-YY	88.5	90.5	-	%	115VAC Input, Max. Load
	LIM240-A1S602C-YY	89.0	91.0	-		
	LIM240-A1S552C-YY	89.0	91.0	-		
	LIM240-A1S452C-YY	88.5	90.5	-		
	LIM240-A1S352C-YY	88.5	90.5	-		
	LIM240-A1S212C-YY	88.5	90.5	-		
	LIM240-A1S182C-YY	89.0	91.0	-		
	LIM240-A1S142C-YY	89.0	91.0	-		
	LIM240-A1S112C-YY	89.0	91.0	-		
Efficiency @230VAC / 277VAC	LIM240-A1S103C-YY	90.5	92.5	-		230/277VAC Input, Max. Load
	LIM240-A1S602C-YY	90.5	92.5	-		
	LIM240-A1S552C-YY	90.5	92.5	-		
	LIM240-A1S452C-YY	91.0	93.0	-		
	LIM240-A1S352C-YY	91.0	93.0	-		
	LIM240-A1S212C-YY	91.5	93.5	-		
	LIM240-A1S182C-YY	91.5	94.0	-		
	LIM240-A1S142C-YY	92.0	94.0	-		
	LIM240-A1S102C-YY	91.5	93.5	-		
Line Regulation				±1	%	Rated Output

Parameter Name		Min.	Typ.	Max.	Unit	Comment
Load Regulation		-	-	±1	%	115/230/277VAC
Output Voltage Ripple&Noise[2]	LIM240-A1S103C-YY	-	-	150	mV	115/230/277VAC Input Max. Load
	LIM240-A1S602C-YY	-	-	250		
	LIM240-A1S552C-YY	-	-	250		
	LIM240-A1S452C-YY	-	-	350		
	LIM240-A1S352C-YY	-	-	450		
	LIM240-A1S212C-YY	-	-	800		
	LIM240-A1S182C-YY	-	-	1000		
	LIM240-A1S142C-YY	-	-	1500		
	LIM240-A1S102C-YY	-	-	2500		
Output Current Ripple		-	-	8	$\%I_o$	Full Load
Setup Rise Time	LIM240-A1S103C-YY	-	50/50	100/100	mS	115/230VAC Input, Full Load
	LIM240-A1S602C-YY	-	50/50	100/100		
	LIM240-A1S552C-YY	-	50/50	100/100		
	LIM240-A1S452C-YY	-	50/50	100/100		
	LIM240-A1S352C-YY	-	50/50	100/100		
	LIM240-A1S212C-YY	-	150/150	200/200		
	LIM240-A1S182C-YY	-	150/150	200/200		
	LIM240-A1S142C-YY	-	200/200	250/250		
	LIM240-A1S102C-YY	-	200/200	250/250		
Setup Delay Time	LIM240-A1S103C-YY	-	0.5/0.3	1.0/0.8	S	
	LIM240-A1S602C-YY	-	0.5/0.3	1.0/0.8		
	LIM240-A1S552C-YY	-	0.5/0.3	1.0/0.8		
	LIM240-A1S452C-YY	-	0.5/0.3	1.0/0.8		
	LIM240-A1S352C-YY	-	0.5/0.3	1.0/0.8		
	LIM240-A1S212C-YY	-	0.8/0.5	1.2/1.0		
	LIM240-A1S182C-YY	-	0.8/0.5	1.2/1.0		
	LIM240-A1S142C-YY	-	1.0/0.8	1.5/1.2		
	LIM240-A1S102C-YY	-	1.0/0.8	1.5/1.2		
Temperature Coefficient				0.03	%/℃	
Dimming Function						
Dimming off Voltage		0.1	0.3	0.5	V	115/230/277VAC
Dimming on Voltage		0.3	0.5	0.7		
Hysteresis		-	0.2	-		
Input Standby Power while dimming is turned off (Dimming Voltage<0.3V)		-	0.5	1	W	115VAC
		-	2.5	3		230/277VAC
Operating Voltage		0	-	12	V	between DIM+ and DIM-
Absolute Voltage		-12	-	$V_{omax(CV)}$		
Dimming Source Current		-	100	-	uA	
Protection Function						
Short Circuit Power Loss at 230VAC		-	-	2.8	W	Hiccup , Auto-recovery

Parameter Name		Min.	Typ.	Max.	Unit	Comment
No Load Power Loss at 230VAC input		-	-	3.0	W	CV Regulating
Over Temperature Protection[3]	Threshold @115VAC	-	98	-	℃	Auto-recovery
	Threshold@230/277V	-	106	-	℃	Auto-recovery
	Hysteresis	-	10	-	℃	
Output Over Voltage Protection (transient)	LIM240-A1S103C-YY	-	31.0	-	V	Hiccup mode Auto- recovery, 115/230/277VAC, Half Load
	LIM240-A1S602C-YY	-	51.6	-		
	LIM240-A1S552C-YY	-	51.6	-		
	LIM240-A1S452C-YY	-	63.0	-		
	LIM240-A1S352C-YY	-	79.8	-		
	LIM240-A1S212C-YY	--	131.2	-		
	LIM240-A1S182C-YY	-	160.6	-		
	LIM240-A1S142C-YY	-	190.5	-		
	LIM240-A1S102C-YY	-	252.3	-		
Environmental Requirements						
Operating Ambient Temperature		-40		50	℃	See Note (4)
Safety Case Temperature[4]		-40		90	℃	
Warranty Case Temperature		-40		75		5 Years Warranty
Storage Ambient Temperature		-40		85	℃	
Humidity		10		95	%	
Others						
MTBF		-	220,000	-	h	MIL-HDBK-217F (25℃)
Net Weight		-	1.25	-	kg	
Dimensions (L*W*H)		245.4*68.7*42.0 / 220.0*68.7*42.0			mm	W/O Mounting Ear
		9.66*2.70*1.65 / 8.66*2.70*1.65			inch	

Note: (1) All parameters NOT specially mentioned are measured at 25℃ of ambient temperature (T_a = 25℃).

(2) A ceramic capacitor (0.1uF) and an electrolytic capacitor (10uF) should be paralleled with the Output.

(3) The test point is at the maximum temperature position on the case surface, which is in the center of the left case side viewing from the input side.

(4) If the input voltage is less than 100VAC, please refer to the derating curve of T_a vs Load or use the heat sink to ensure that the T_C is not more than 90℃.

Safety & EMC Compliance

Safety			
Safety Standards	UL/CUL	UL8750, CAN/CSA-C22.2 No.250.13-12	
	CE(ENEC)	EN61347-1, EN61347-2-13, EN62384 Independent	
Dielectric Withstanding Voltage	I/P-O/P	≥3.75KVAC	-
	I/P-FG	≥2.0KVAC	
	O/P-FG	≥0.5KVAC	
Insulation Resistance	I/P-O/P	≥100MΩ	500V
EMC Emission (EMI)[1]			
CE, RE	EN55015		
	FCC part15	Class B	
Harmonic Current Emissions	EN 61000-3-2	Class B	

Voltage Fluctuations & Flicker	EN 61000-3-3		
EMC Immunity			
Electrostatic Discharge (ESD)	EN 61000-4-2	8 kV air discharge, 4 kV contact discharge Level3	
Radio-Frequency Electromagnetic Field Test-RS	EN 61000-4-3	Level 3, Criteria A Susceptibility	
Electrical Fast Transient / Burst-EFT	EN 61000-4-4	Level 3, Criteria A	
Surge Immunity Test	EN 61000-4-5	AC Power Line: L-N:4KV; L,N-FG:6KV	
Conducted Radio Frequency Disturbances Test-CS,	EN 61000-4-6	Level 3 Criteria A	
Power Frequency Magnetic Field Test	EN 61000-4-8	3A/m , Criteria A	
Voltage Dips	EN61000-4-11	Criteria B	
Electromagnetic Immunity Requirements Applies to Lighting Equipment	EN61547		

Note: (1) The LED driver is in combination with a final equipment as a component. Since the installation will affect the final EMC performance, EMC Directive on the complete installation must be re-qualified.

Characteristics Curve

1 Derating Curve

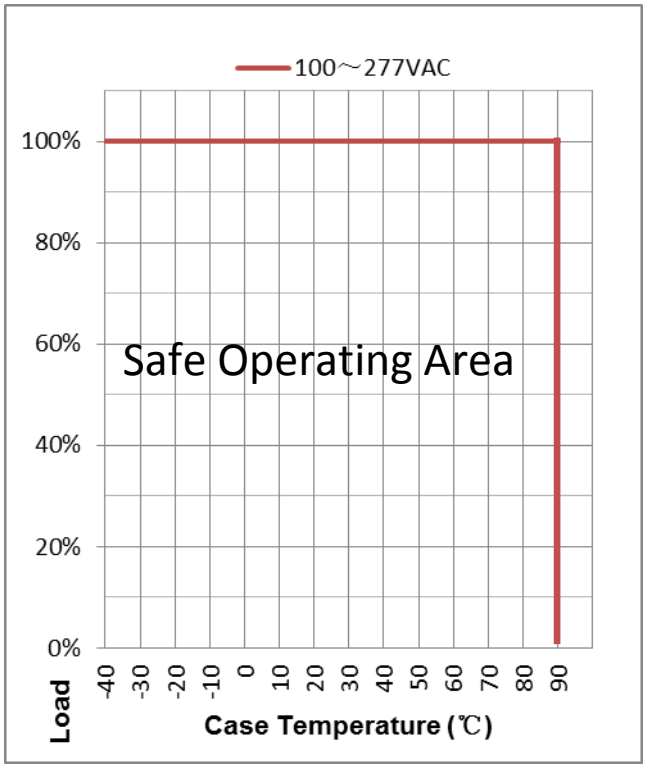


Fig.1 T_C vs. Load

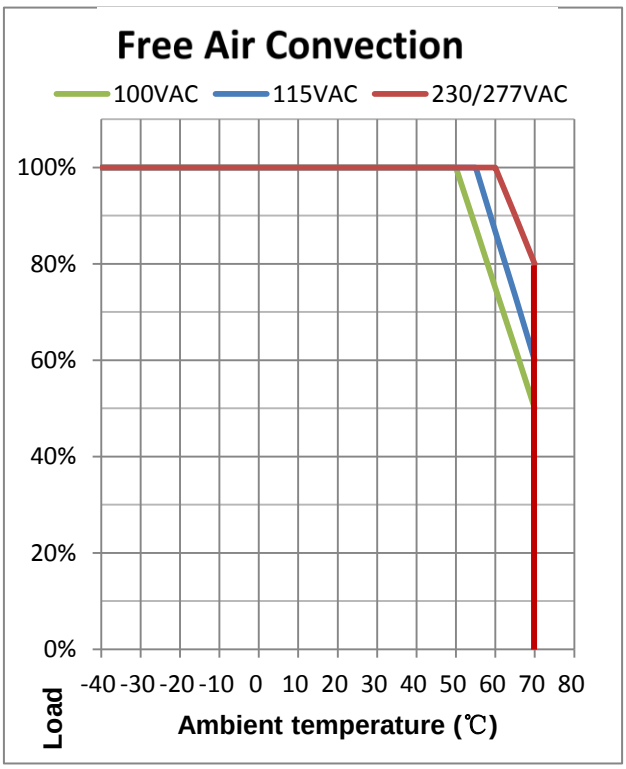


Fig.2 T_a vs. Load (without heat sink)

2 Lifetime vs. Temperature

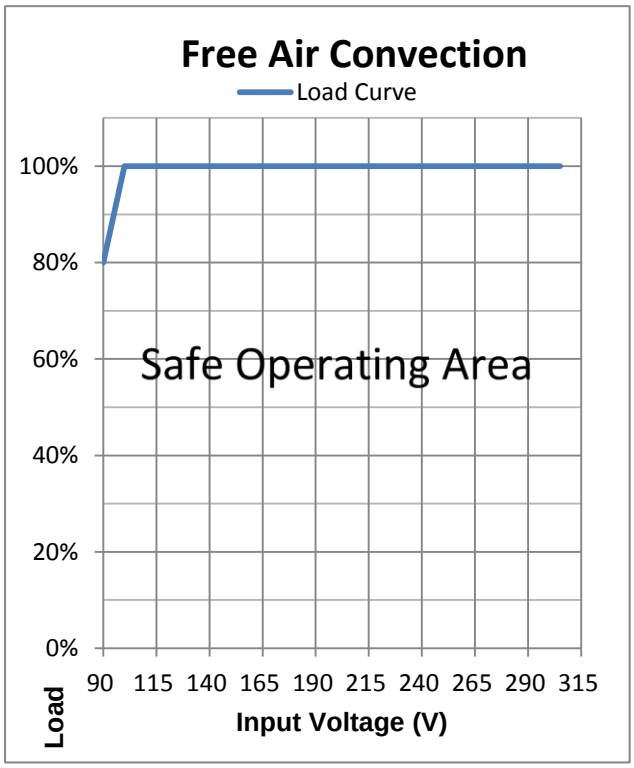


Fig.3 Load vs. Input Voltage

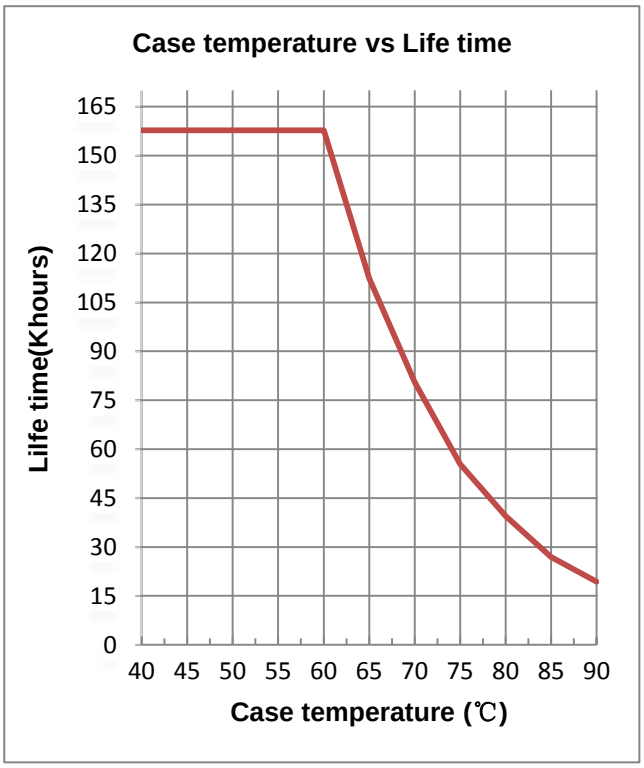


Fig.4 Lifetime vs. T_C

3 Power Factor vs. Load

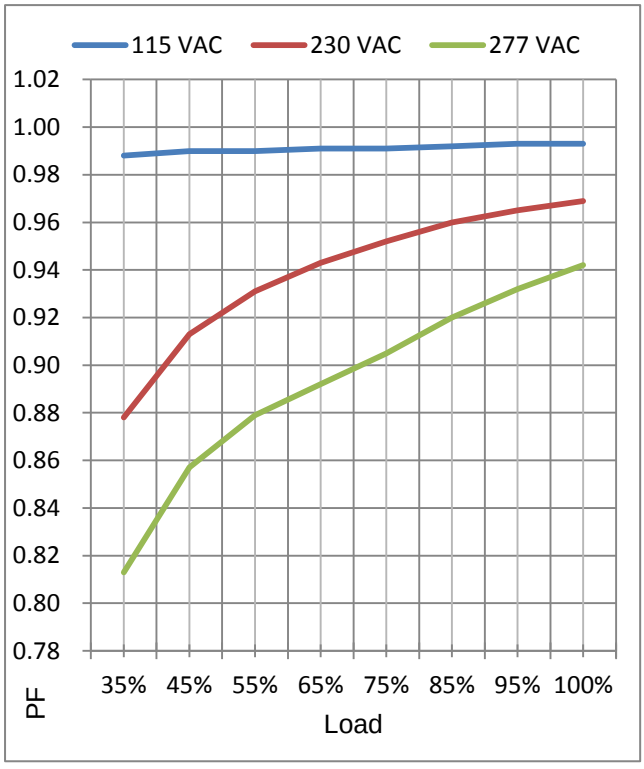


Fig.5 PF vs. Load

4 Total Harmonic Distortion(THD) vs. Load

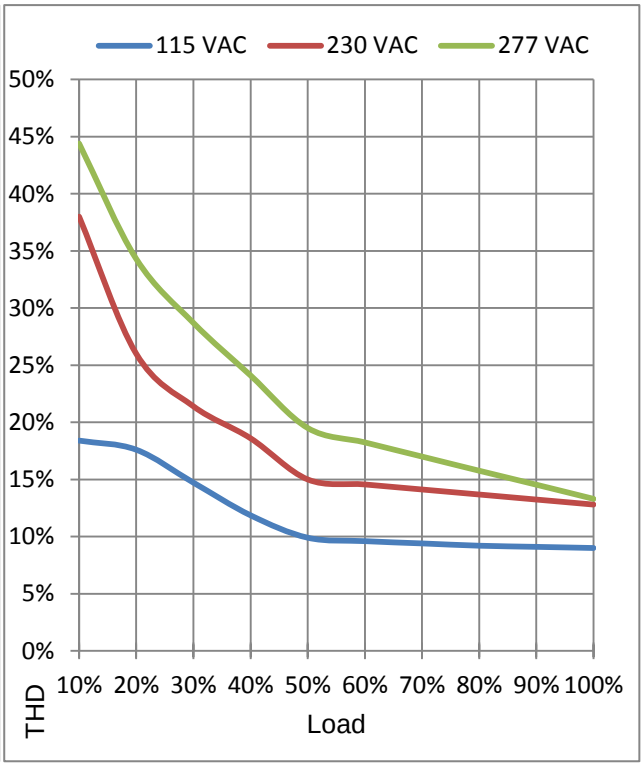


Fig. 6 THD vs. Load

5 Efficiency Curve

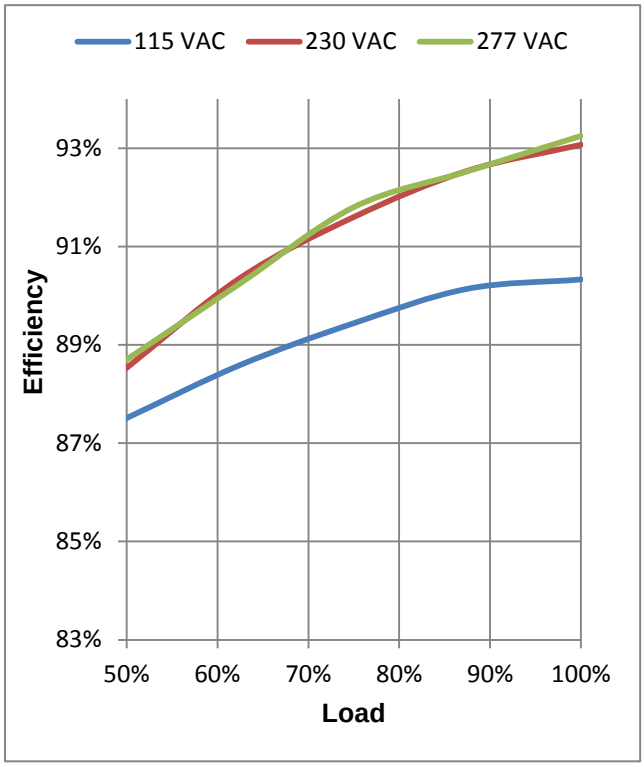


Fig. 7 Efficiency vs. Load—LIM240-A1S103C-YY

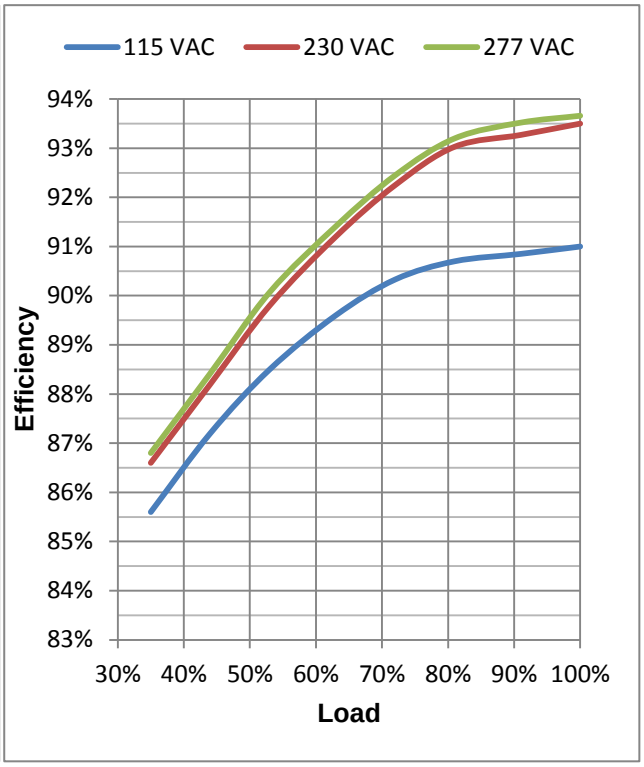


Fig. 8 Efficiency vs. Load—LIM240-A1S602C-YY and LIM240-A1S552C-YY

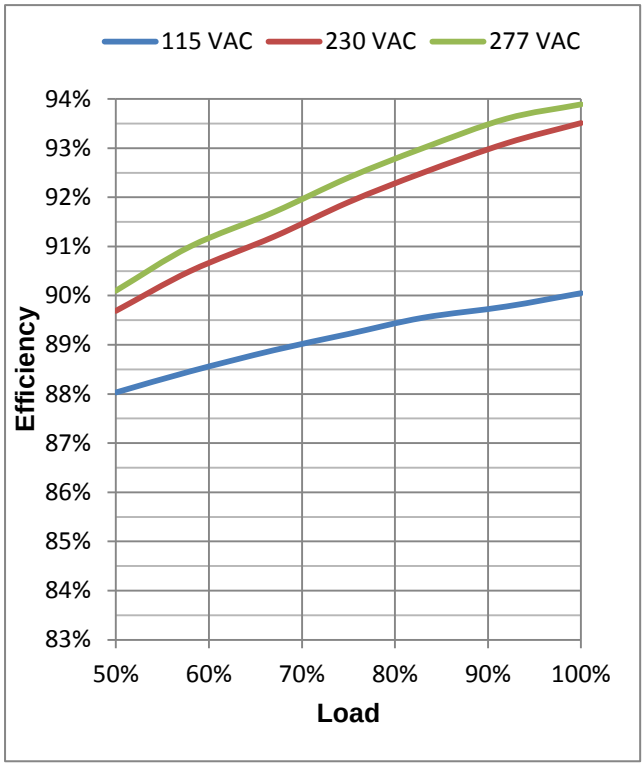


Fig. 9 Efficiency vs. Load—LIM240-A1S452C-YY

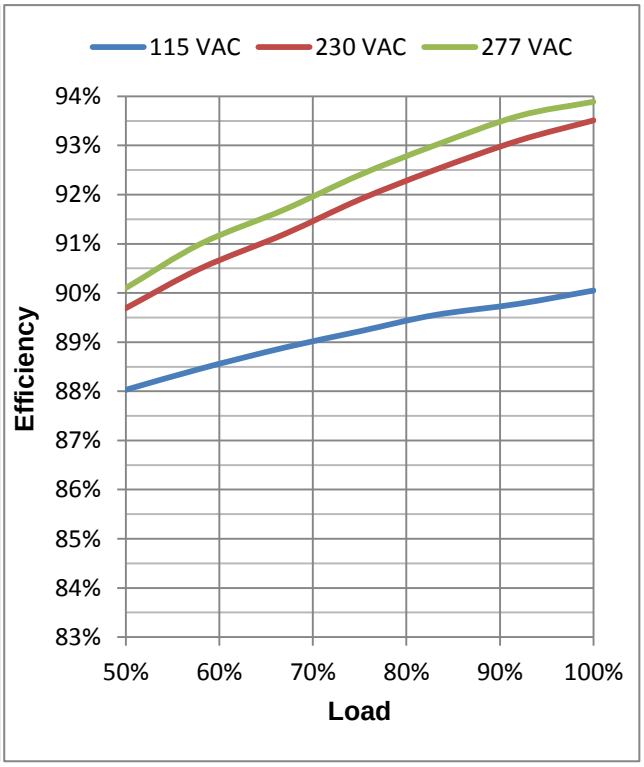


Fig. 10 Efficiency vs. Load—LIM240-A1S352C-YY

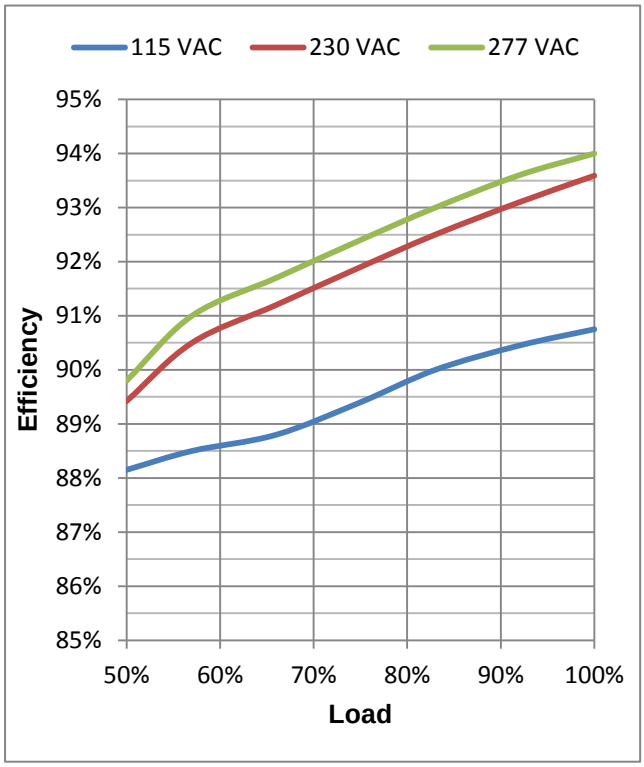


Fig. 11 Efficiency vs. Load—LIM240-A1S212C-YY

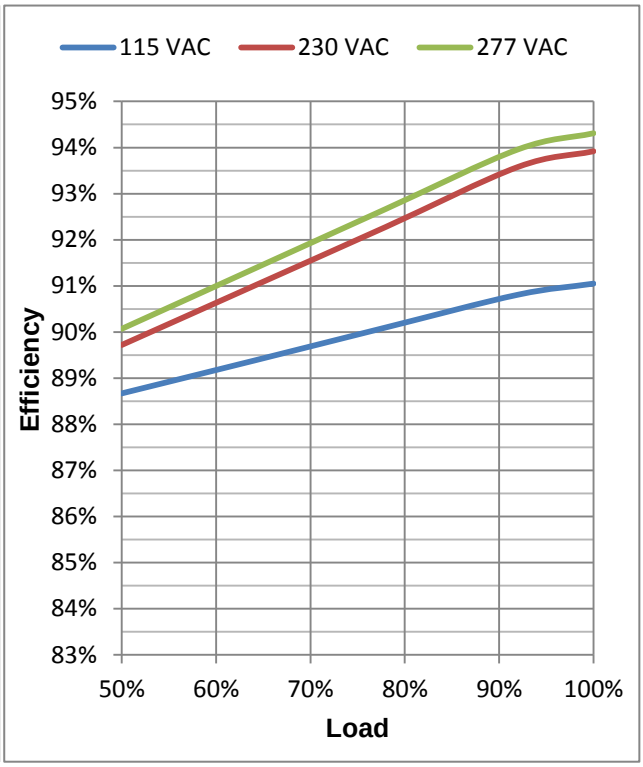


Fig. 12 Efficiency vs. Load—LIM240-A1S182C-YY

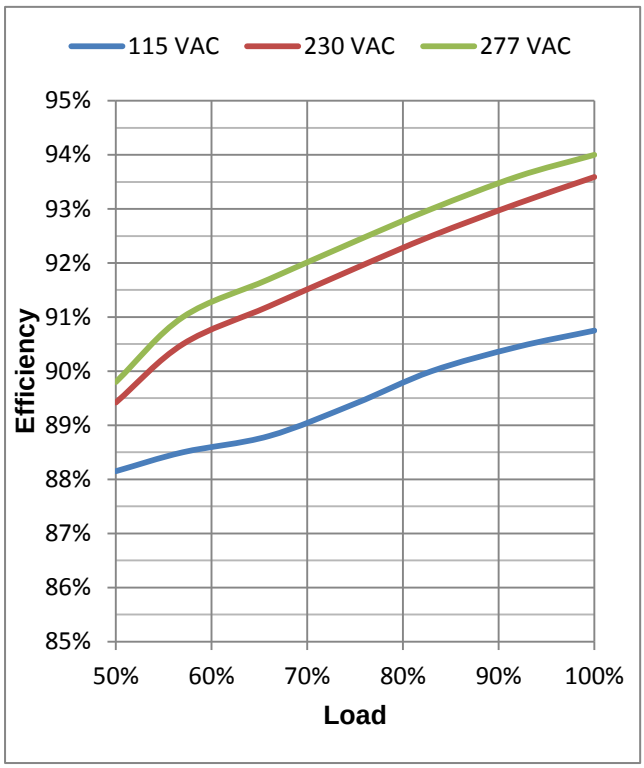


Fig. 13 Efficiency vs. Load—LIM240-A1S142C-YY

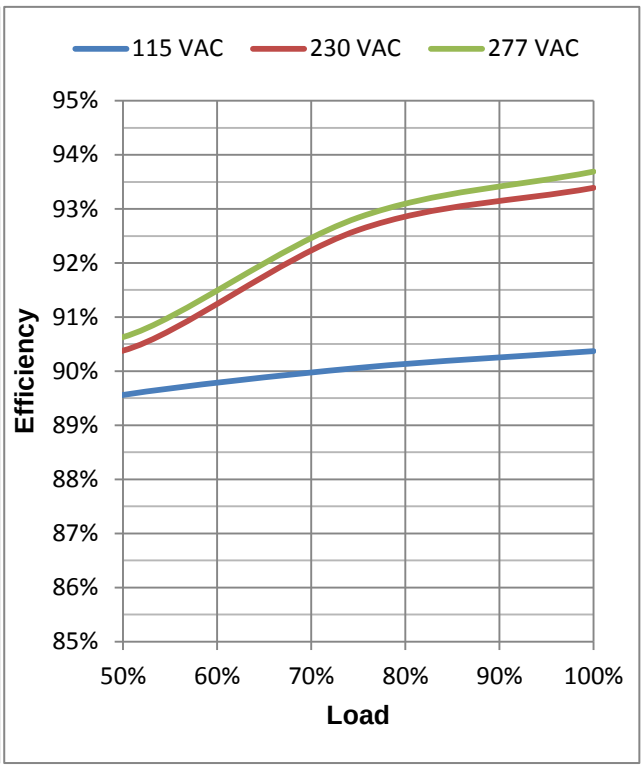


Fig. 14 Efficiency vs. Load - LIM240-A1S102C-YY

Dimming Function

Built-in 3 in 1 dimming function. The Dimming function is to adjust the output current through the Dim+ and Dim- cables connected with a resistor or a 0-10VDC voltage signal or 10V PWM signal between DIM+ and DIM-. The driven LED light can be shut off while the voltage between DIM+ and DIM- is less than 0.3V via regualting the output voltage very low.

1. Reference resistance Value for output current adjustment（Typ.）see Fig. 15 ,18

Resistance Value (KΩ)	10	20	30	40	50	60	70	80	90	100	OPEN
Percentage of rated current (%)	10	20	30	40	50	60	70	80	90	100	95~105

2. 0-10V dimming function for output current adjustment (Typ.) see Fig. 16 ,18

Voltage (V)	0.3	0.5	1	2	3	4	5	6	7	8	9	10	OPEN
Percentage of rated current (%)	0	5	10	20	30	40	50	60	70	80	90	100	95~105

3. 10V PWM signal (Frequency range: 100Hz~3kHz) for output current adjustment (Typ.) see Fig. 17,19

Duty Value (%)	10	20	30	40	50	60	70	80	90	100	OPEN
Percentage of rated current (%)	10	20	30	40	50	60	70	80	90	100	95~105

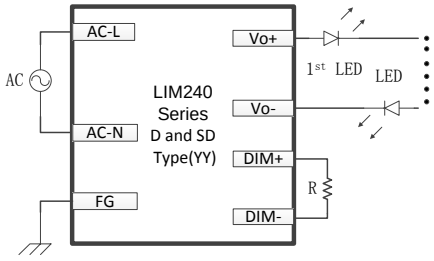


Fig.15 Resistor Dimming Application

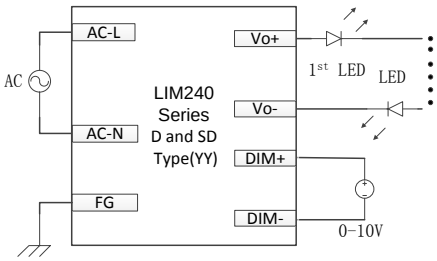


Fig. 16 0-10V Dimming Application

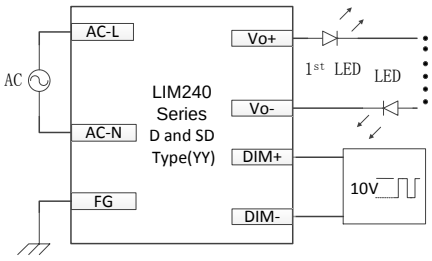


Fig. 17 10V PWM Dimming Application

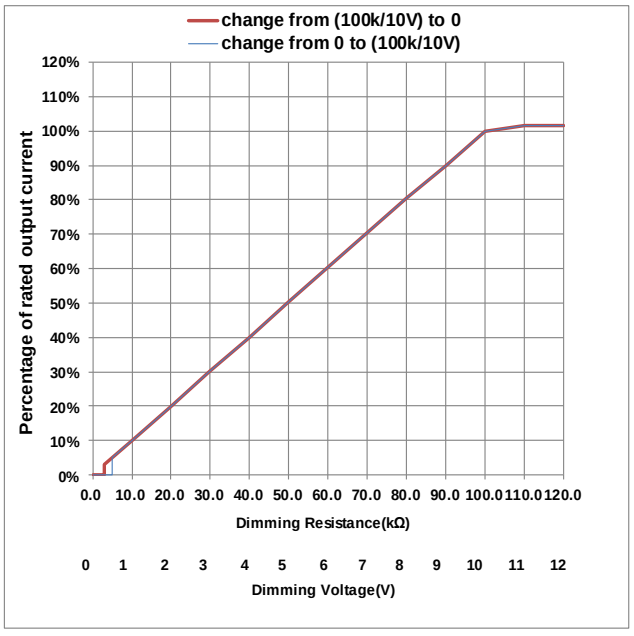


Fig. 18 Dimming resistance and Voltage vs. Output current (constant current mode)

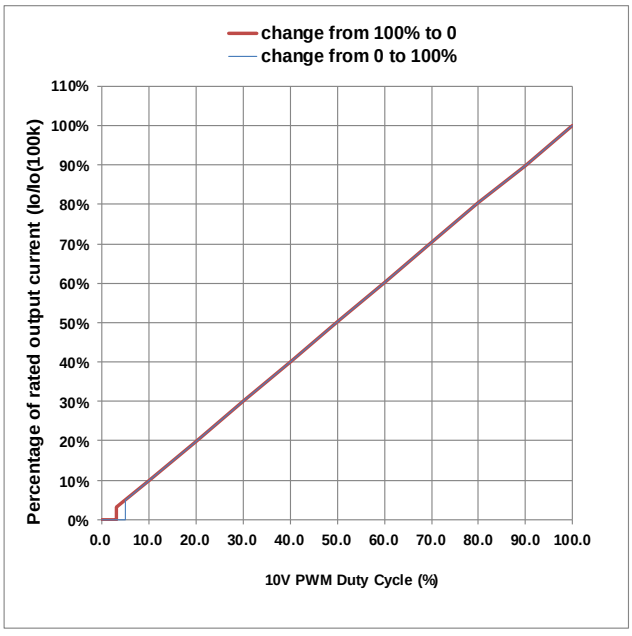
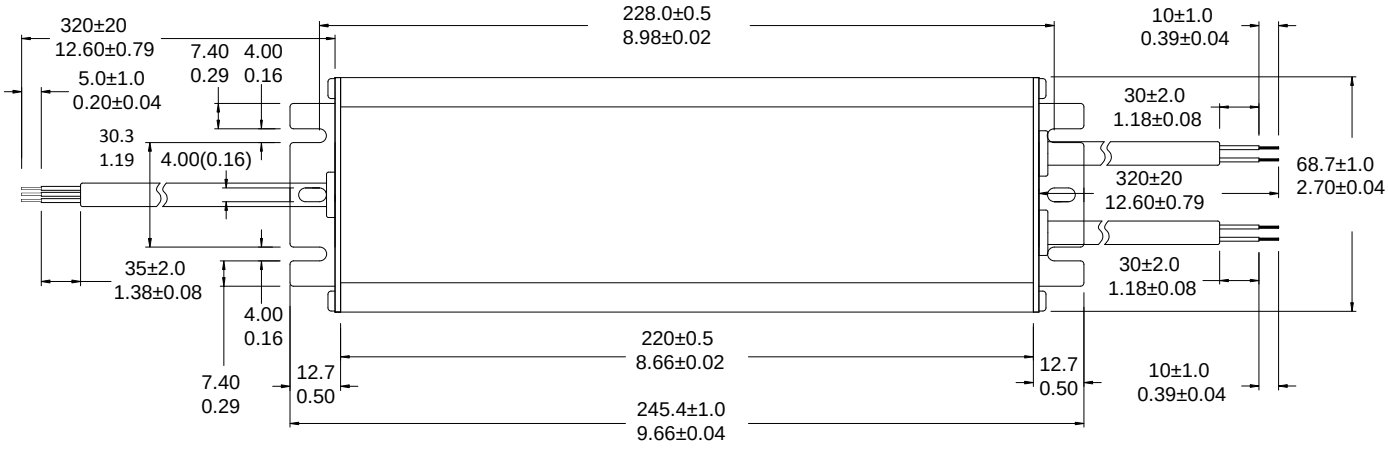


Fig. 19 Dimming PWM Duty vs. Output Current (constant current mode)

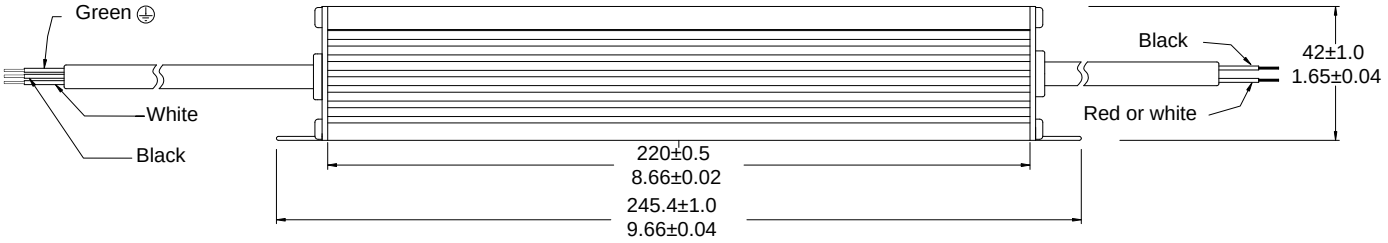
Mechanical Specifications

1. Mechanical Drawing (unit: mm/inch)

1) Top View



2) Side View



2. Interface Terminal Definition

Terminal Name	Description	Specification
AC-N	White Color, Input terminal, Connected to L or N lines	White Color, Wire Gauge #18
AC-L	Black Color, Input terminal, Connected to L or N lines	Black Color, Wire Gauge #18
FG	Green Color, Input terminal, Connected to Earth Ground	Green Color, Wire Gauge #18
Vo+	Red or White Color, Output terminal, Connected to the positive pole of LEDs	Red or White Color, Wire Gauge #14
Vo-	Black Color, Output terminal, Connected to the negative pole of LEDs	Black Color, Wire Gauge #14
DIM+	Red or White Color, Input terminal, Connected to the positive pole of Dimming	Red or White Color, Wire Gauge #18
DIM-	Black Color, Input terminal, Connected to the negative pole of Dimming	Black Color, Wire Gauge #18