LED Driver
USVI RDL Series

USVI RDL

Highlights & Features

- Constant voltage design
- Universal input voltage from 120-277Vac
- Up to 90% efficiency for 100W and 80W
- Wide operating temperature range -40°C to +55°C
- Dry and Damp location rated
- Particular in refrigeration display lighting application
- Safety certificated for household and refrigerator appliances
- Suitable for Class I and Class II systems

Safety Standards

Dimensions (L x W x D):

USVI-100024FR1	241.3 x 43.1 x 30.0 mm (9.50 x 1.70 x 1.18 inch)
USVI-080024FR1	241.3 x 43.1 x 30.0 mm (9.50 x 1.70 x 1.18 inch)
USVI-060024FR	241.3 x 43.1 x 30.0 mm (9.50 x 1.70 x 1.18 inch)

General Description

Delta's USVI-RDL series of fixed output voltage LED drivers are suitable for refrigerated display lighting, retail display lighting and linear accent lighting applications. These drivers are global approbations and certifications: SELV 24V output, which ensures safety even if wiring or LED boards was damaged; Installation friendly by designing drivers for Class I and Class II systems. Moreover, energy savings can be carried out through high efficiency rate to meet 2021 ErP regulations, and best EMC performance was also taken into consideration in product developing. They are meticulously designed and rigorously tested to work under various refrigeration display lighting conditions. Ultimate robustness, offering peace of mind and lower maintenance costs for customers.

Model Information

USVI RDL LED Driver

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
USVI-100024FR1	108 - 305Vac	24Vdc	4.00A
USVI-080024FR1	108 - 305Vac	24Vdc	3.33A
USVI-060024FR	108 - 305Vac	24Vdc	2.50A

Model Numbering

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Safety Approval cULus CSA CE ENEC	Constant Voltage	Indoor		Output Power 100 – 100W 080 – 80W 060 – 60W	Output Voltage 024 – 24Vdc	Function F – Fixed output	Variable R –refrigerated display lighting application

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Specifications

Model Number		USVI-100024FR1	USVI-080024FR1	USVI-060024FR
Input Ratings / Characteristics				
Normal Input Voltage		120-277Vac		
Input Voltage Range		108-305Vac		
Normal Input Frequency		50-60 Hz		
Input Frequency Range		47-63 Hz		
Input Current		0.91 typ.	0.76 typ.	0.59 typ.
Efficiency[1] @ 230Vac		90% typ.	90% typ.	87% typ.
Inrush Current Peak >50% Duration		70A/ 200us	70A/ 200us	50A/ 200us
Max. no. of LED Driver for Circuit Breaker	B16	10pcs	10pcs	14pcs
	C16	17pcs	17pcs	24pcs
Power Factor @ max. Load.		> 0.95		
Total Harmonic Distortion @ max. Load.		< 20%		
Leakage Current		< 0.7mA @ 230Vac		

1) 100% Load (typical) and tested after 30 minutes warm up.

Output Ratings / Characteristics

Nominal Output Voltage	24.0Vdc		
Output Current Range	0.1 - 4.00A	0.1 - 3.33A	0.1 - 2.50A
Max. No Load Output Voltage	25.6Vdc		
Max. Output Power	96W	80W	60W
Output Voltage Tolerance	± 3%		
Line Regulation	± 1%		
Load Regulation	± 3%		
Output Voltage Ripple	400mV		
Rise Time	< 50ms		
Start-up Time	< 1.0s		

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Model Number	USVI-100024FR1	USVI-080024FR1	USVI-060024FR

Mechanical

Casing		Metal sheet, Color : Black
Dimensions (L x W x H)	[mm]	241.3 x 43.1 x 30.0 mm
	[inch]	9.50 x 1.70 x 1.18 inch
Unit Weight	[kg]	0.60
	[lb]	1.32
Cooling System		Convection
Commercial Packaging Carton Box: Pieces per carton box		10pcs
Commercial Packaging Carton Box: Weight/ carton box	[kg]	7.0
	[lb]	15.5
Input Wire		Line: Black, Neutral: White, Wire Length 300mm
Output Wire		Positive: Red, Negative: Black, Wire Length 300mm
Noise (30cm distance)		Sound Pressure Level (SPL) < 24dBA

Environment

Ambient Temperature	Operating	-40°C to +55°C		
	Storage	-40°C to +85°C		
Maximum Case Temperature		+85°C	+85°C	+85°C
Lifetime Case Temperature		+80°C	+80°C	+75°C
Relative Humidity	Operating	10 to 90% RH (Non-Condensing)		
	Storage	5 to 95% RH (Non-Condensing)		
Environmental Locations		Dry / Damp		
Operating Altitude		< 2,000m		

Protections

Over Voltage	Auto-Recovery when the fault is removed
Overload / Overcurrent	Auto-Recovery when the fault is removed
Short Circuit	Auto-Recovery when the fault is removed
Over Temperature	Auto-Recovery when the fault is removed
Suitable for Luminaires Class	Class II. Insulation Class according to IEC 60598

Reliability Data

Lifetime	50,000 hrs. at lifetime case temperature
MTTF	850,000 hrs. @ta: +45°C (as per Telcordia SR-332 , total failure rate less than 10%)

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Safety Standards / Directives

Electrical Safety	UL	UL 8750, Class P, type “HL”. Class 2 Output		
	CSA	CAN/CSA C22.2 No.250.13		
	CB scheme	IEC 61347-1, IEC 61347-2-13, IEC 60335-1, IEC 60335-2-89 and Annex BB, IEC 60335-2-24 and Annex CC, SELV Output		
CE		In conformance with : Low Voltage Directive 2014/35/EU ; EMC Directive 2014/30/EU ; RoHS Directive 2011/65/EU+ (EU) 2015/863 and Erp Directive 2009/125/EC Implementing measure Commission Regulation (EU) 2019/2020.		
UKCA		In conformance with : Elecrtical Equipment (Safety) Regulations 2016; Electromagnetic Compatibility Regulations 2016 and The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended 2019,2020)		
Isolation		Input	Output	Case
	Input	N/A	3000Vac	3000Vac
	Output	3000Vac	N/A	500Vac
	Case	3000Vac	500Vac	N/A

EMC

Emissions (CE & RE)	Compliance to BS EN/ EN 55015 & FCC Part 15 Class A	
Immunity	Compliance to BS EN/ EN 61547	
Electrostatic Discharge	IEC 61000-4-2	ESD, Criteria A[1] or B[2] Air Discharge: 8kV; Contact Discharge: 4kV
Radiated Field	IEC 61000-4-3	RS, Criteria A[1] 80MHz-1GHz, 3V/m with 1kHz Sine Wave / 80% AM Modulation
Electrical Fast Transient / Burst	IEC 61000-4-4	1kV, Criteria A[1] or B[2]
Surge	IEC 61000-4-5 ANSI C62.41	Criteria A[1] or B[2] Common Mode[3]: 2kV; Differential Mode[4]: 1kV 1.2/50μs, 8/20μs Combination Wave with 2ohms (L-N), 12ohms (L-PE & N-PE) source impedance Category A1 with a 2.5kV/100kA ring wave, Criteria A[1]
Conducted Disturbance	IEC 61000-4-6	150kHz-80MHz, 3Vrms, Criteria A[1]
Power Frequency Magnetic Fields	IEC 61000-4-8	3A/Meter, Criteria A[1]
Voltage Dips	IEC 61000-4-11	Criteria A[1] or B[2] ; 100% dip; 0.5 cycle; Self Recoverable 30% dip; 10 cycle; Self Recoverable
Harmonic Current Emission	BS EN/ EN 61000-3-2	Class C (230Vac @ 100% load)
Voltage Fluctuation and Flicker	BS EN/ EN 61000-3-3	$P_{st} \leq 1.0$; $d_{max} \leq 4\%$; $P_{lt} \leq 0.65$; $d_c \leq 3.3\%$; $T_{max} \leq 500ms$

1) Criteria A: Normal performance within the specification limits
2) Criteria B: Temporary degradation or loss of function, which is self-recoverable
3) Asymmetrical: Common mode (Line to earth)
4) Symmetrical: Differential mode (Line to line)

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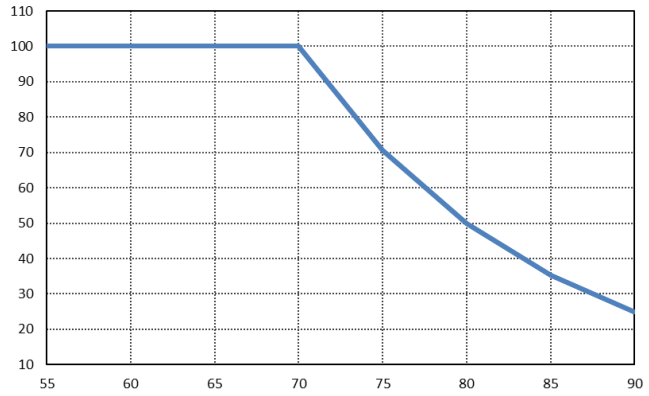
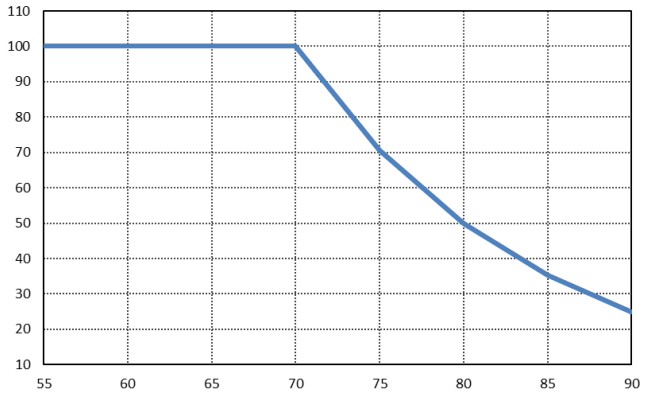
Driver Lifetime vs. Case Temperature

USVI-100024FR1



USVI-080024FR1



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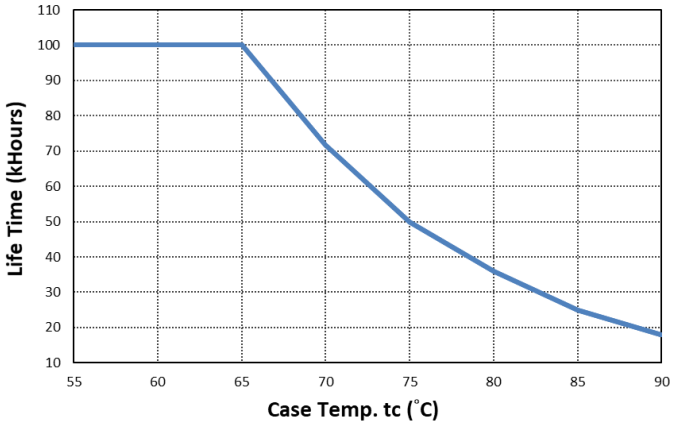

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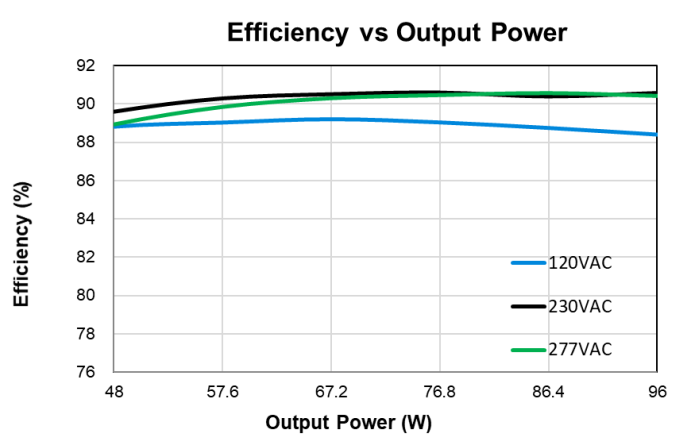
Efficiency vs. Output Power

USVI-100024FR1



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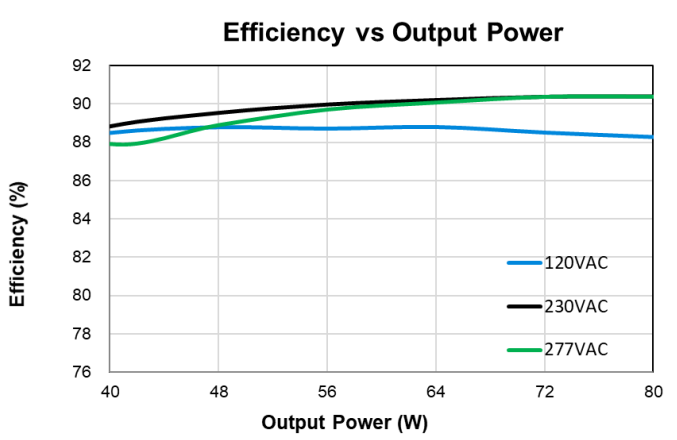

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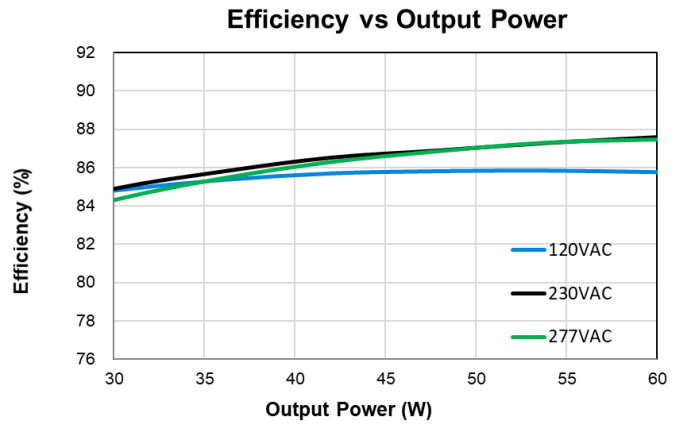

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Power Factor vs. Output Power

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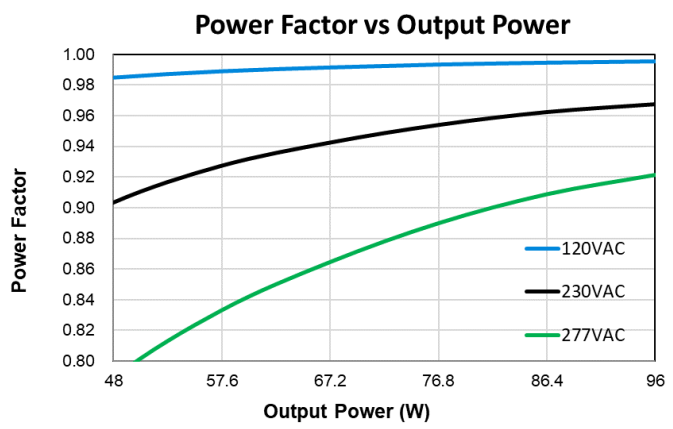

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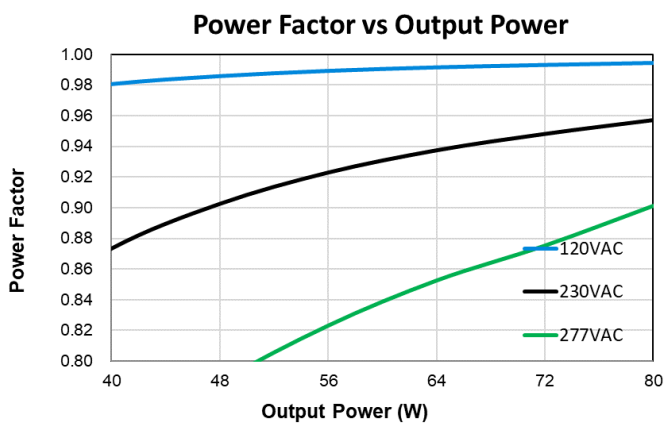

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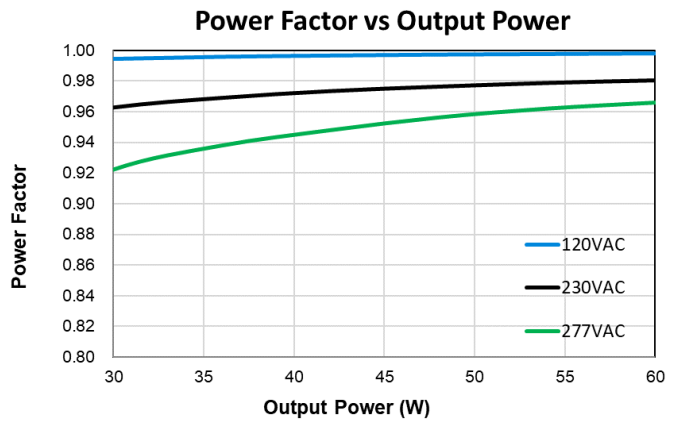

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Total Harmonic Distortion vs. Output Power

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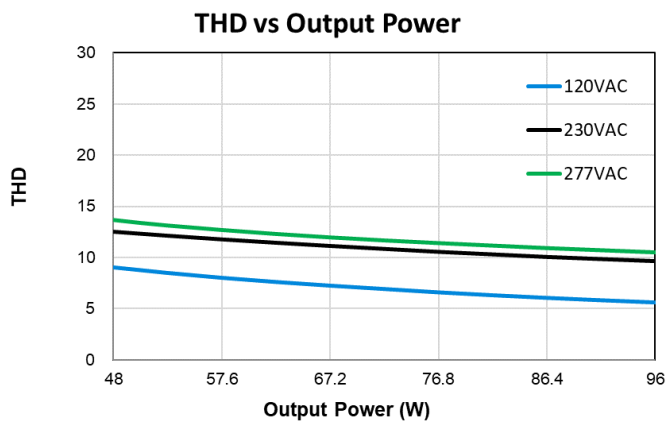

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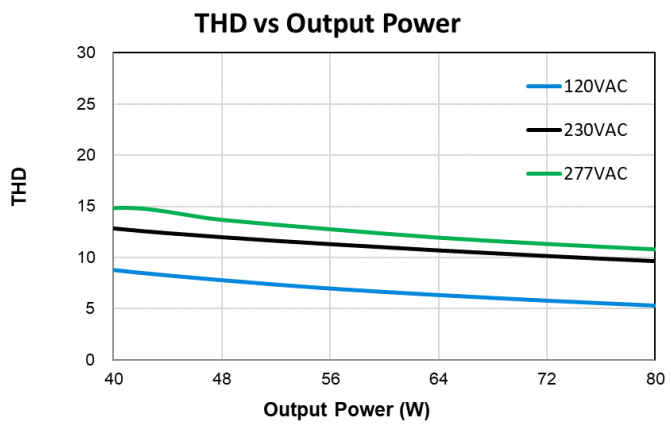

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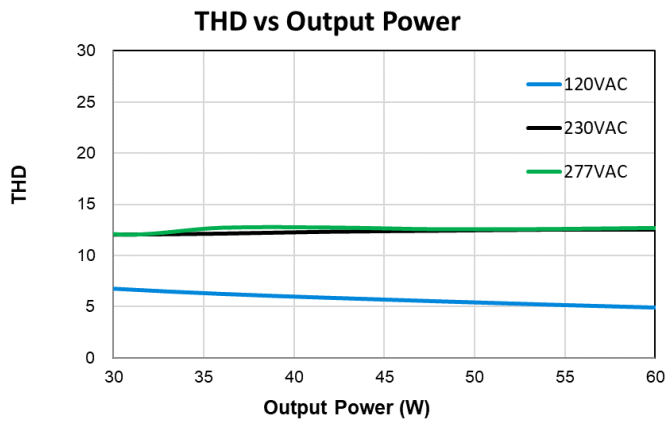

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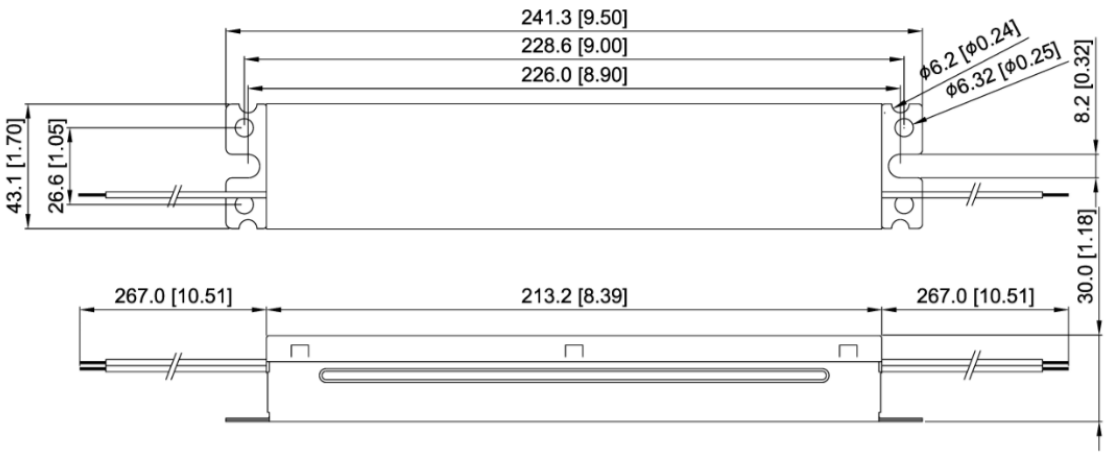
Dimensions

USVI-100024FR1 / USVI-080024FR1 / USVI-060024FR



Unit:mm

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