STRATO 35W LED DRIVERS

DESCRIPTION

STRATO 35 switch mode driver technology is designed to generate one constant current output from a wide range AC input. The size and performance of these products make them the ideal choice for LED lighting applications. This series is not allowed to work in standby mode and is not intended for no-load operation.

MAIN FEATURES

- Wide Input Range: 120/220-240/277 V_{AC}
- Constant Current Output
- High Efficiency up to 91 % (see below table)
- SELV
- Compact Design
- Trimmable Output Current Settings
- Dimmable with 0-10 V / 1-10 V Dimmers
- Over-Temperature Protection for LEDs (NTC)
- Convection Cooled
- Wide Operating Temperature Range
- Long Life
- RoHS Compliant
- Compliance with Regulation (EU) 2019/2020 (Ecodesign)

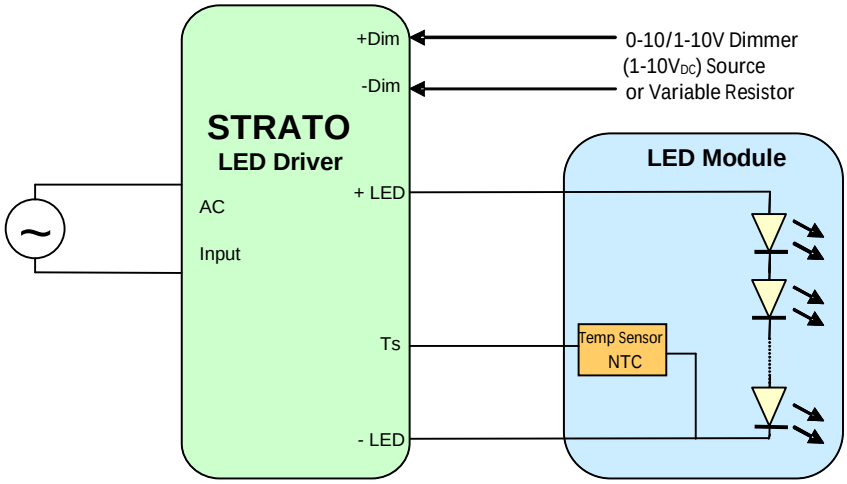
APPLICATIONS AND BENEFITS

STRATO is designed for directly powering LEDs in commercial & industrial lighting applications.

The product's extremely **small form factor** and **high efficiency** makes it suitable for integration into most light fixtures and standard electrical junction boxes.

A host of integrated **control features:**

- Simplify Light Fixture Design
- Ease Safety Approval Cycles
- Lower Fixture Complexity and Cost



STRATO's versatile control features:

- A Temperature sensor (NTC thermistor) protects the LED from over-temperature.
- A 2 wire Dimming input provides both output trimming, and 10-100 % I_{OUT} Dimming function.

MODEL CODING AND OUTPUT RATINGS

Model number	I_{OUT} Max [mA]	P_{OUT} Max [W]	Absolute Minimum V_{OUT} [1] [V_{DC}]	Output Operative Voltage Range[1] [V_{DC}]	No Load V_{OUT} [V_{DC}]	Typical Efficiency[3] (%)
RSLD035-8B	350	9.8	21.0	21.6 ÷ 28.0	35.0	80
RSLD035-12A	350	14.7	31.5	32.5 ÷ 42.0	50.0	86
RSLD035-12J	500	21.0	31.5	32.5 ÷ 42.0	50.0	88
RSLD035-12C	600	25.2	31.5	32.5 ÷ 42.0	50.0	88
RSLD035-9A	700	22.1	22.5	23.2 ÷ 31.5	37.8	88
RSLD035-10	700	24.5	25.0	25.8 ÷ 35.0	42.0	88
RSLD035-11	700	27.0	27.5	28.3 ÷ 38.5	46.2	89
RSLD035-12	700	29.4	30.0	30.9 ÷ 42.0	50.0	89
RSLD035-13	700	31.9	32.5	33.5 ÷ 45.5	54.6	89
RSLD035-14	700	34.3	35.0	36.1 ÷ 49.0	59.5	90
RSLD035-15	700	36.8	37.5	38.6 ÷ 52.5	60.0	90
RSLD035-16	700	39.2	40.0	41.2 ÷ 56.0	60.0	91
RSLD035-7A[2]	720	17.6	17.5	18.0 ÷ 24.5	29.4	86
RSLD035-12E	800	33.6	31.5	32.5 ÷ 42.0	50.0	89
RSLD035-12G	850	35.7	31.5	32.5 ÷ 42.0	50.0	90
RSLD035-13A	850	38.7	34.0	35.0 ÷ 45.5	59.2	89
RSLD035-12H	900	37.8	31.5	32.5 ÷ 42.0	50.0	89
RSLD035-09	1000	31.5	22.5	23.2 ÷ 31.5	37.8	89
RSLD035-11A	1050	39.9	28.5	29.3 ÷ 38.0	49.4	89
RSLD035-4A[2]	1300	18.2	10.0	10.3 ÷ 14.0	16.0	83
RSLD035-06	1400	29.4	15.0	15.4 ÷ 21.0	25.0	88
RSLD035-07	1400	34.3	17.5	18.0 ÷ 24.5	29.4	89
RSLD035-05	1750	30.6	12.5	12.9 ÷ 17.5	21.0	87

Table 1: LED Driver Ratings

[1] The Output Operative Ranges have been specified in order to avoid possible hiccup phenomena at lower limits determined by certain working conditions (maximum LED temperature, minimum output current). However, the drivers can operate between the Absolute Minimum V_{OUT} and V_{OUT} (max) limits.

[2] Certain models have lower output set points for compatibility with specific LED modules and arrays. As a result, these units will exhibit lower efficiency and lower power factor than herein specified.

[3] at max load, 230V_{AC}

INPUT AND OUTPUT SPECIFICATION

Specification	Test Conditions / Notes	Min	Nom	Max	Units
AC Input Voltage	120/220-240/277 V_{AC} Device starts and operates at 90 V_{AC} at all load conditions	90	120/220-240/277	305	V_{AC}
Input Frequency		47	50/60	63	Hz
Input Current	120 V_{AC} Rated Load 230 V_{AC} Rated Load 277 V_{AC} Rated Load	- - -	- - -	0.50 0.26 0.22	A
Power Factor[4]	120 V_{AC} 230 V_{AC} with output voltage between 93 % and 100 % 277 V_{AC} and rated output current	0.9 0.9 0.9	- - -	- - -	
THD[5]	120 V_{AC}	-	-	20	%
Inrush Current (peak)	120 V_{AC} Half Value time: 100 µs 230 V_{AC} Half Value time: 80 µs 277 V_{AC} Half value time: 80 µs	- - -	- - -	10.9 25.5 28.0	A
Efficiency	see above (Table 1)	-	-	-	%
Harmonic Current	Complies with EN-61000-3-2, Class C load >25W with output voltage between 93% and 100%				

[4] Power Factor for models rated <20 W @ 277 V_{AC} is >0.9 with max output voltage and rated current only. Power factor for model RSLD035-8B shall be ≥ 0.88 @ 220-240V_{AC} and ≥ 0.85 @ 277V_{AC} when measured with max LED load

[5] Total Harmonic Distortion <20% @ 120 V_{AC} with output voltage between 93 % and 100 % and rated output current is achieved in the following models only: RSLD035-13A, RSLD035-12A, RSLD035-12C, RSLD035-12E, RSLD035-12G, RSLD035-12H, RSLD035-12J, RSLD035-11A, RSLD035-8B.

OUTPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min	Nom	Max	Units
Output Power Rating	check Model Coding and Output Ratings table	9.8	-	39.9	W
Output Voltage	check Model Coding and Output Ratings table	10.0		56.0	V
Output Current	check Model Coding and Output Ratings table	350		1750	mA
Ripple Current	All models measured ($I_{OUT\_Pk\text{-}pk}$/RMS)	-	-	45	%
Output Regulation[6]		-	-	±3	%I_{OUT}
Start-up time	With no dimmer connected	-	-	500	ms

[6] For the following models Output regulation is **±5%**: RSLD035-13A, RSLD035-12A, RSLD035-12C, RSLD035-12E, RSLD035-12G, RSLD035-12H, RSLD035-12J, RSLD035-11A, RSLD035-8B.

PROTECTION FEATURES

Specification	Test Conditions / Notes	Min	Nom	Max	Units
Output Over Voltage		110	-	130	%V_{MAX}
Output Short-Circuit	Hiccup, auto Recovery	-	-	-	-
Over-Temperature Tc	Hiccup, auto Recovery if the PSU exceeds the rated Tc temperature		90		°C
No Load	Check No Load Voltage in **Table 1**	16.0		60.0	V
Isolation Primary-to-Secondary	Reinforced/double Insulation meets IEC/EN61347-2-13 Class II				

CONTROLS

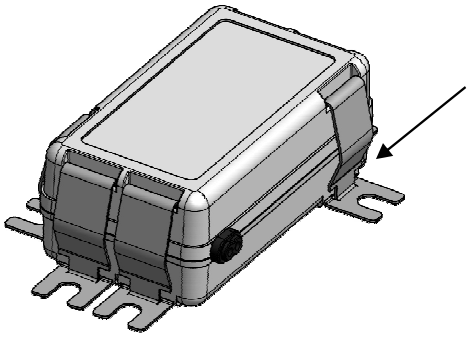
Output Controls: Two dedicated inputs provide control and safety features.

Dim: A dimming input can be used to adjust the output setting via a standard commercial wall dimmer, an external control voltage source (1 to 10 V_{DC}), or a variable resistor when using the recommended number of LEDs. The input permits 100 % to 80 % trimming and 100 % to 10 % dimming. This permits active control of the driver and may be used for trimming and dimming purposes. See STRATO **Application Note #1** for details on functionality and compatibility with standard industry practices.

Ts: The Temperature input may be connected to a 100k NTC thermistor. The thermistor should be located on the LED assembly to monitor its temperature. If the temperature exceeds a predetermined set point, the output current of the module is automatically reduced to regulate the temperature of the LED at a safe level. See STRATO **Application Note #1** for details.

MECHANICAL DETAILS

Packaging Options:	Partially Encapsulated with ABS plastic body enclosure
I/O Connections:	Flying leads, 18AWG on power leads, 20AWG on control leads, 152 mm long, 105 °C Rated, Stranded, Stripped by approximately 9.5 mm and tinned. Double insulation input wires.
Ingress Protection:	IP20, UL damp rated
Mounting Details:	Universal Mounting Clips, and 6 mounting locations per package allow installer to choose the most suitable position for the mounting feet. 2x clips RHML000686-xx included (additional clips upon request).



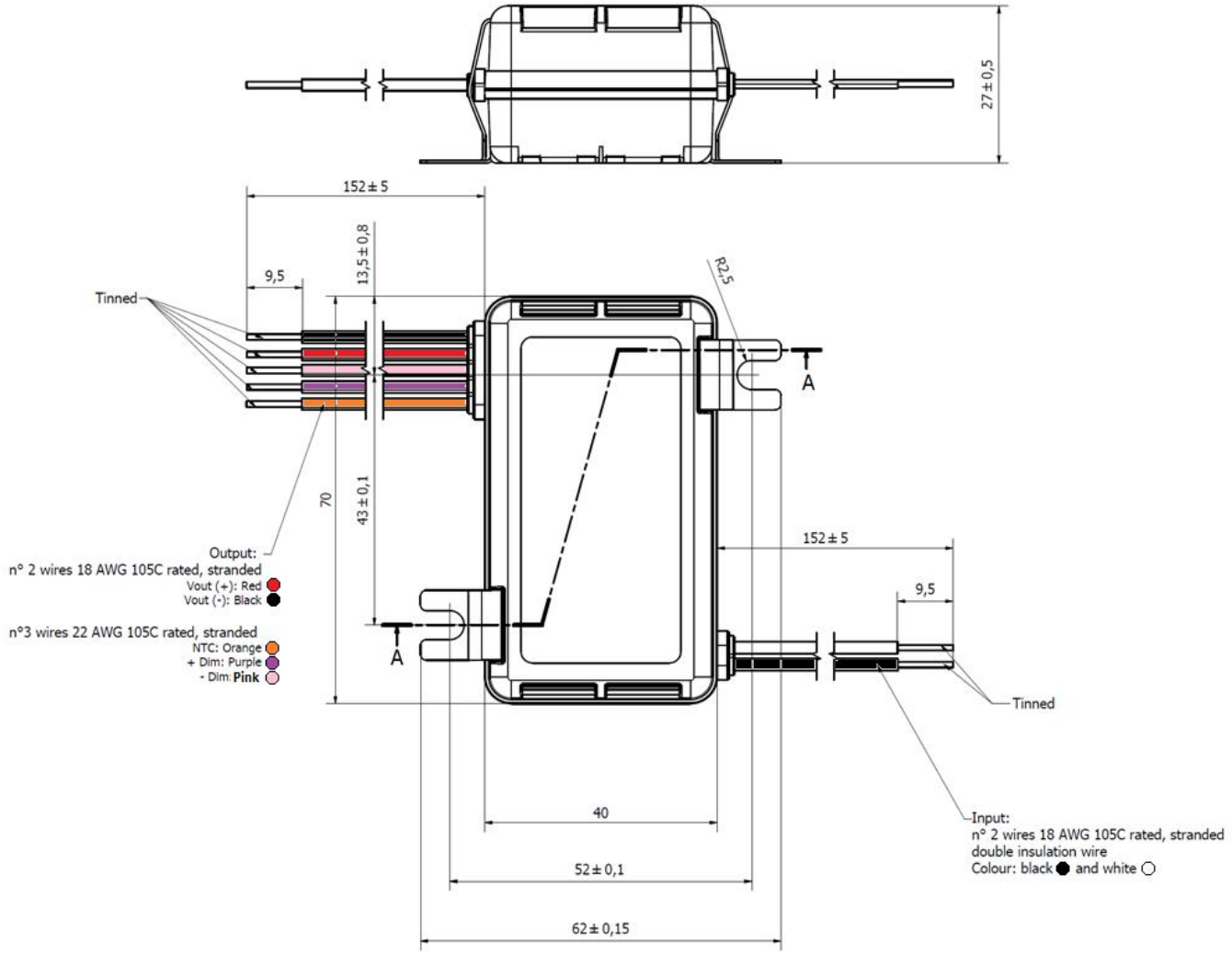
OUTLINE DRAWINGS

Package: RSLD035

Dimensions: 70 x 40 x 27mm (2.76 x 1.57 x 1.06 in)

Volume: 75.6 cm^3 (4.59 in^3)

Mass: 142 g (5 oz)



ENVIRONMENTAL SPECIFICATIONS

Specification	Test Conditions / Notes	Min	Nom	Max	Units
Top Case Temperature Range	Top case temperature without derating	-30	-	90	°C
Ambient Temperature Range	As long as Tc temperature is within the limits	-30	-	70	°C
Storage Temperature		-40	-	85	°C
Operating Relative Humidity	Non-condensing	5	-	95	%
Surface Temperature	Exposed surfaces temperature under all operating conditions	-	-	90	°C
Cooling	Convection cooled				
Shock EN 60068-2-27	Operating: Half sine, 30g, 18ms, 3 axes, 6x each (3 positive and 3 negative). Non-Operating: Half sine, 50g, 11ms, 3 axes, 6x each (3 positive and 3 negative).				
Vibration EN 60068-2-64	Operating: 5 – 500Hz, 1gRMS (0.02 g^2/Hz), 3 axes, 30 min. Non-Operating: 5 – 500Hz, 2.46gRMS (0.0122 g^2/Hz), 3 axes, 30 min.				
Vibration EN 60068-2-6	Operating Sine, 10 – 500Hz, 1g, 3 axes, 1 oct/min., 60 min.				
MTBF	Typical Load, 70 °C Tc, MIL.HDBK-217E	-	250.000	-	Hours
Useful Life	Nominal V_{AC}, 70 °C Tc Nominal Load	-	50.000	-	Hours

ELECTROMAGNETIC COMPATIBILITY (EMC) – EMISSIONS

Phenomenon	Conditions / Notes	Standard	Performance Class
Conducted Emission	Test at $120V_{AC}$	EN55022; FCC Part 15	Class B
	Test at $230V_{AC}$	EN55015	-
	Test at $277V_{AC}$	EN55022; FCC Part 15	Class A
Radiated Emission	Test at $120V_{AC}$	FCC CFR47-part15	Class B
	Test at $230V_{AC}$	EN55015	-
	Test at $277V_{AC}$	FCC CFR47- part 15	Class A
Harmonic Current Emissions		EN61000-3-2	Class C
Voltage Changes, Fluctuation and Flicker		EN61000-3-3	

ELECTROMAGNETIC COMPATIBILITY (EMC) – IMMUNITY

Phenomenon	Conditions / Notes	Standard	Note
Equipment for general lighting purposes -EMC Immunity Req.		EN61547	
ESD (Electrostatic Discharge)		EN61000-4-2	
Radiated Radio-Frequency electromagnetic field		EN61000-4-3	
Electric Fast Transient / Burst	Level ±1.0 kV L-L	EN61000-4-4	
Surge	Level ±1.0 kV L-L	EN61000-4-5	
Conducted disturbances induced by Radio-Frequency fields		EN61000-4-6	
Voltage Dips, short interruptions and Voltage Variations		EN61000-4-11	
Non-repetitive damped oscillatory transient, Ring wave	2.5 kV	ANSI C.62.41	Category A

SAFETY AGENCY APPROVALS

Certification Body	Safety Standards
c UL us	UL Recognized ANSI / UL8750, CSA C22.2 No.250.13 Models with output voltages <60 V_{DC} include UL and CSA approval (cURus) as Class 2 output LED Driver suitable for dry and damp location
	IEC/EN 62384 Electronic control gear for LED modules – Performance Requirements IEC/EN, 61347-1, IEC/EN 61347-2-13 Electronic control gear for LED Modules – Safety
CE	To obtain the "CE Declaration of Conformity" please contact info@enedopower.com
CB	IECEE CB Certified, IEC/EN 61347-1, IEC/EN 61347-2-13 electronic control gear for LED Modules All models are isolated control gears, SELV equivalent, with internal reinforced insulation as per IEC/EN61347-2-13 Drivers to be incorporated in the luminaire
	Reinforced/double Insulation meets IEC/EN61347-2-13 Class II