

## Embedded Switch Mode Power Supplies (SMPS)

### FEATURES

- Universal 85 - 264V AC Active PFC
- Slimline design: width 32mm
- Efficiency up to 93%
- DC OK function
- Operating temperature range - 40°C to +70°C
- DC ON output status indicator LED
- Output short circuit, over-current, over-voltage protection.
- EMI performance meets. CISPR32 / EN55032 CLASS B
- Safety according to IEC/EN/UL62368/IEC/EN60079/UL 61010
- ATEX, IECEx increased safety type explosion-proof certification approved

## RS PRO Embedded Switch Mode Power Supplies

RS Stock No: 2205411



RS Professionally Approved Products bring to you professional quality parts across all product categories. Our product range has been tested by engineers and provides a comparable quality to the leading brands without paying a premium price.

# Embedded Switch Mode Power Supplies (SMPS)

## Product Description

AC-DC DIN rail power supply suitable for a wide range of Industrial, Machinery and Instrumentation applications. cost-effective, energy efficient **explosion-proof solution** for standard DIN-rail mounting. The products offer a high level of stability and immunity to noise, compliant with international IEC62368 standards for EMC and safety specifications meet IEC/EN/UL62368, IEC/EN60079. These lightweight AC-DC converters also have an extremely compact design for space saving and are ideal for applications such as industrial control equipment, machinery, and all kinds of applications in a harsh environments. The power supply meets the 'ec' increased safety and 'nC' enclosed-break type n explosion-proof certification and is suitable for explosive environments where the equipment protection level is Gc in zone 2.

## General Specifications

<b>Model</b>	AC-DC 120W ATEX and IECEx power supply
<b>Mounting Type</b>	DIN Rail mount
<b>MTBF</b>	MIL-HDBK-217F@25°C > 300,000 h
<b>Applications</b>	Industrial control systems, instrumentation and machinery equipment

RS Stock#	Input Voltage	Output Voltage	Output Current	Adj'range (V)	Wattage	Efficiency (Typ)
2205410	85 to 264V ac 120 to 370V dc	12V	10A	11.8-14V	120W	92%
2205411	85 to 264V ac 120 to 370V dc	24V	5A	23.5-28V	120W	93%

## Input Specifications

Input Specification	
<b>Voltage Range</b>	85 to 264V ac, 120 to 370V dc
<b>Frequency</b>	47 to 63Hz
<b>AC Current Rating</b>	1.5A/115V ac, 0.75A/230V ac
<b>Inrush Current</b>	15A/ 115V ac, 30A / 230V ac
<b>Leakage</b>	<1mA
<b>Power Factor</b>	0.98 115Vac, 0.94 230Vac

## Output Specifications

Output Specification		
RS PRO stock number	2205410	2205411
Output voltage	12V	24V
Trim range	11.8-14V	23.5-28V
Rated Current	10A	5A
Ripple & Noise (max.) *	100mV	100mV
Rated Power	120W	120W
Line Regulation typ.	±0.5%	±0.5%
Load Regulation typ.	±1%	±1%
Max Capacitive load $\mu\text{F}$	80,000 $\mu\text{F}$	50,000 $\mu\text{F}$
Minimum Load	0%	0%

Hold Up Time (Typ)	15ms					
DC OK Signal*	30VDC/1A Max					
Over Voltage Protection	12V output $\leq 18\text{V}$ (Hiccup, self-recovery after the abnormality is removed)					
	24V output $\leq 35\text{V}$ (Hiccup, self-recovery after the abnormality is removed)					
Over-current Protection	105% - 200% $I_o$ , self-recovery					
Short Circuit Protection	Constant current hiccup mode (constant current mode works 1s and stop 10s) continuous, self-recovery.					
Over-temperature Protection	230VAC, 30% load	Over-temperature protection start	-	105	-	$^{\circ}\text{C}$
		Over-temperature protection release	60	-	-	
Isolation	3KVAC					

Note: \*The "Tip and barrel method" is used for ripple and noise test, output parallel 47 $\mu\text{F}$  electrolytic capacitor and 0.1 $\mu\text{F}$  ceramic capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information.

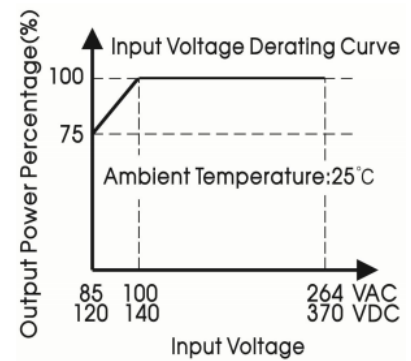
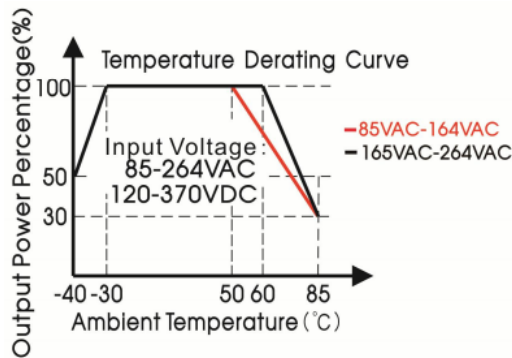
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## General Specifications

Item		Operating Conditions		Min	Typ	Max.	Unit
Isolation	Input-Output	Electric strength test for 1min., leakage current <15mA		3000	-	-	VAC
	Input-Earth			1500	-	-	
	Output-Earth			500	-	-	
Insulation Resistance	Input-Earth	At 500VDC		100	-	-	MΩ
	Input-Output			100	-	-	
	Output-Earth			100	-	-	
Operating Temperature				-40	-	+85	°C
Storage Temperature				-40	-	+85	
Storage Humidity		Non-condensing		20	-	90	%RH
Operating Humidity				-	-	95	
Power Derating	Operating temperature derating	-40 to -30°C		5	-	-	% / °C
		+55 to +85°C	85VAC-164VAC	2.0			
		+60 to +70°C	165VAC-264VAC	2.8			
	Input voltage derating	85VAC-100VAC		1.67	-	-	
Safety Standard				Meet IEC/EN/UL62368/IEC/EN60079/UL61010			
Safety Certification				IEC/EN60079/EN62368/UL61010 (UL61010 Pending)			
Safety Class				CLASS I (PE and must be connected)			
MTBF		MIL-HDBK-217F@25°C		> 300,000 h			

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## Derating



Note: 1. With an AC input voltage between 85 -100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves.

## EMC Specifications

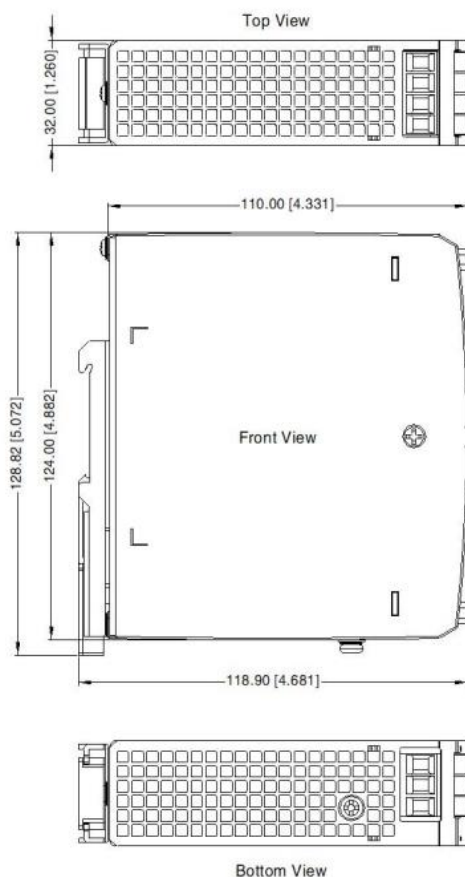
Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
	Harmonic Current	IEC/EN61000-3-2 CLASS D	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±4KV	Perf. Criteria A
	Surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV	Perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	Perf. Criteria A
	DIP (AC input)	IEC/EN61000-4-11 0%, 70%	Perf. Criteria B

# Embedded Switch Mode Power Supplies (SMPS)


## Mechanical Specifications

<b>Case Material</b>	Metal (AL1100, SPCC) and Plastic (PC940)
<b>Dimensions</b>	110.00 x 32.00 x 124mm
<b>Weight</b>	500g (Typ.)
<b>Cooling Method</b>	Free air convection

## Dimensions and recommended layout



THIRD ANGLE PROJECTION 

Pin-Out	
Pin	Mark
1	-Vo
2	-Vo
3	+Vo
4	+Vo
5	AC(N)
6	AC(L)
7	

**Note:**

Unit: mm[inch]

DC ON: Output status indicator LED

ADJ: Output adjustable resistor

Wire range: 26-10 AWG

Tightening torque: Max 0.4 N·m

Mounting rail: TS35, rail needs to connect safety ground

General tolerances:  $\pm 1.00 [\pm 0.039]$

Notice: Keep the following installation clearances: 20mm on top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

# Embedded Switch Mode Power Supplies (SMPS)

## Explosion Proof Information

The power supply is equipment intended for use in explosive atmospheres classified as Zone 2, EPL Gc. The equipment is protected by type of protection Ex 'ec' and the relay inside is protected by type of protection Ex 'nC' sealed device. It's a well performance AC-DC module with one-phase input and single output. It has functions such as output over-current protection, output over-voltage protection, output short circuit protection, over-temperature protection and so on, with well combined regulation and high efficiency. When input voltage is between 85VAC - 164VAC, and ambient temperature is between +50°C to +85°C, power derating off 2.0%/K is required; when input voltage is between 165VAC - 264VAC, and ambient temperature is between +60°C to +85°C, power derating off 2.8%/K is required.



### ATEX contents

1. Satisfied standard This product complies with the EU Explosion proof certification ATEX directive 2014/34/EU.

EN IEC 60079-0:2018	Equipment - General requirements
EN IEC 60079-7:2015+A1:2018	Equipment protection by increased safety "e"
EN 60079-15:2010	Equipment protection by type of protection "n"

2. Specific conditions for safe use while the equipment services in explosive gas atmosphere: ① The equipment shall only be used in an area of pollution degree 2 or lower, as defined in EN60664-1; ② The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with EN60079-0; ③ Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment; ④ The equipment shall be installed according to EN60079-14; ⑤ The ambient temperature ( $T_{amb}$ ), as specified above, has to be seen as the temperature of the surrounding atmosphere where the equipment is installed at (Operating temperature); ⑥ Minimum 5mm mounting clearances shall be remained between top, bottom, left, right and back to other device or side.

# Embedded Switch Mode Power Supplies (SMPS)



## IECEX contents

### 1. Satisfied standard

IEC 60079-0:2017	Equipment - General requirements
IEC 60079-7:2017	Equipment protection by increased safety "e"
IEC 60079-15:2017	Equipment protection by type of protection "n"

Specific conditions of use while the equipment services in explosive gas atmosphere :

- 1.The equipment shall only be used in an area of pollution degree 2 or lower, as defined in IEC60664-1.
2. The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with IEC60079-0.
- 3.Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.
- 4.The equipment shall be installed according to IEC60079-14.
- 5.The ambient temperature (Tamb), as specified above, has to be seen as the temperature of the surrounding atmosphere where the equipment is installed at (Operating temperature).
6. Minimum 5mm mounting clearances shall be remained between top, bottom, left, right and back to other device or side.


## Approvals

<b>Safety Standards</b>	Meet IEC/EN/UL62368/IEC/EN60079/UL61010
<b>Safety Certification</b>	IEC/EN60079/EN62368/UL61010 (UL61010 Pending)
<b>Safety Class</b>	Class I (PE and must be connected)

Note:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity.
2. The room temperature derating of 5°C/1000m is needed for operating altitude greater than 2000m.
3. All index testing methods in this datasheet are based on our company corporate standards.
4. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability.
5. Products are related to laws and regulations: see "Features" and "EMC".
6. The case needs to be connected to the earth of system when the terminal equipment in operating.
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units



 **WARNING** Risk of electrical shock, fire, personal injury or death:

1. Do not use the power supply without proper grounding (Protective Earth). Use the terminal on the input block for earth connection and not one of the screws on the housing.
2. Turn power off before working on the device, protect against inadvertent re-powering.
3. Make sure that the wiring is correct by following all local and national codes.
4. Do not modify or repair the unit.
5. Do not open the unit as high voltages are present inside.
6. Use caution to prevent any foreign objects from entering the housing.
7. Do not use in wet locations or in areas where moisture or condensation can be expected.
8. Do not touch during power-on, and immediately after power-off, hot surfaces may cause burns