Features

Regulated Converters

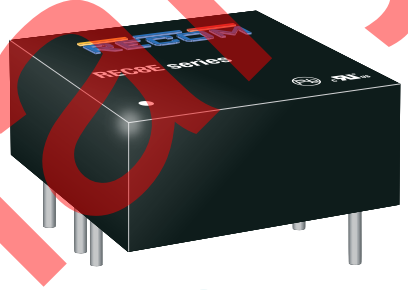
- 8W in a compact 1x1" package
- 2:1 input voltage range
- 12, 24, and 48VDC nominal voltage options
- UL/IEC/EN62368-1 + IEC60950-1 (pending)
- UVLO and ON/OFF pin

RECOM
DC/DC Converter

REC8E

8 Watt 1" x 1" Single and Dual Output

3 YEAR Warranty



UL62368-1 certified
CSA/CAN C22.2 No. 62368-1 certified
IEC62368-1 2nd + 3rd Ed. certified
EN62368-1 2nd + 3rd Ed. certified
CB Report

c UL us
E224736

Description

The REC8E series is a high power density, wide input voltage range, 8W DC/DC converter with single and dual outputs in a compact 1x1" package. Control ON/OFF is offered as standard, and the outputs are fully protected against short circuits and overcurrent. The series is fully certified to UL/EN/IEC 62368-1 standards. With nominal input options of 12, 24, and 48VDC, the REC8E is suitable for higher power industrial applications where board space is at a premium.

Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
REC8E-1205S/CTRL/X1	9-18	5	1600	83.5	4700
REC8E-1209S/CTRL/X1	9-18	9	888	84.5	2200
REC8E-1212S/CTRL/X1	9-18	12	666	84.5	680
REC8E-1215S/CTRL/X1	9-18	15	533	84.5	470
REC8E-1224S/CTRL/X1	9-18	24	333	84.5	220
REC8E-1212D/CTRL/X1	9-18	±12	±333	84.5	±340
REC8E-1215D/CTRL/X1	9-18	±15	±267	84.5	±240
REC8E-2405S/CTRL/X1	18-36	5	1600	83.5	4700
REC8E-2409S/CTRL/X1	18-36	9	888	84.5	2200
REC8E-2412S/CTRL/X1	18-36	12	666	84.5	680
REC8E-2415S/CTRL/X1	18-36	15	533	84.5	470
REC8E-2424S/CTRL/X1	18-36	24	333	84.5	220
REC8E-2412D/CTRL/X1	18-36	±12	±333	84.5	±340
REC8E-2415D/CTRL/X1	18-36	±15	±267	84.5	±240
REC8E-4805S/CTRL/X1	20-60	5	1600	83.0	4700
REC8E-4809S/CTRL/X1	20-60	9	888	83.0	2200
REC8E-4812S/CTRL/X1	20-60	12	666	83.0	680
REC8E-4815S/CTRL/X1	20-60	15	533	83.0	470
REC8E-4824S/CTRL/X1	20-60	24	333	83.0	220
REC8E-4812D/CTRL/X1	20-60	±12	±333	83.0	±340
REC8E-4815D/CTRL/X1	20-60	±15	±267	83.0	±240

Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient
Note2: Max Cap Load is tested at nominal input and full resistive load

Model Numbering

REC8E- __ __ /CTRL / X1

- nom. Output Power
- nom. Input Voltage
- Output Voltage
- **S**ingle or **D**ual
- CTRL function
- UVLO function

Ordering Examples:

REC8E-1205S/CTRL/X1	9-18Vin	5Vout	Single Output	with CTRL Pin and UVLO
REC8E-2412D/CTRL/X1	18-36Vin	±12Vout	Dual Output	with CTRL Pin and UVLO
REC8E-4815S/CTRL/X1	20-60Vin	15Vout	Single Output	with CTRL Pin and UVLO

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

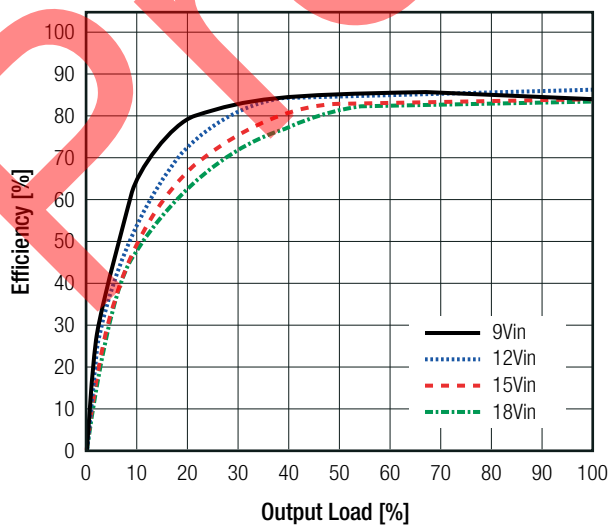
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter					Pi type
Input Voltage Range	2:1 Input	nom. Vin= 12VDC	9VDC		18VDC
		nom. Vin= 24VDC	18VDC		36VDC
		nom. Vin= 48VDC	20VDC		60VDC
Input Surge Voltage	100ms max.	nom. Vin= 12VDC			25VDC
		nom. Vin= 24VDC			50VDC
		nom. Vin= 48VDC			70VDC
Under Voltage Lockout (UVLO)	nom. Vin= 12VDC	DC-DC ON		8VDC	9VDC
		DC-DC OFF		7VDC	
	nom. Vin= 24VDC	DC-DC ON			18VDC
		DC-DC OFF		17VDC	
	nom. Vin= 48VDC	DC-DC ON			20VDC
		DC-DC OFF		19VDC	
Quiescent Current	nom Vin= 12VDC			55mA	
	nom Vin= 24VDC			32mA	
	nom Vin= 48VDC			21mA	
Input Current Range	nom Vin= 12VDC				800mA
	nom Vin= 24VDC				400mA
	nom Vin= 48VDC				200mA
Standby Current	nom Vin= 12VDC			0.5mA	
	nom Vin= 24VDC			0.6mA	
	nom Vin= 48VDC			0.7mA	
Minimum Load			0%		
ON/OFF CTRL	DC-DC ON				Open or 3VDC<V_{CTRL}<12VDC
	DC-DC OFF				Short or 0VDC<V_{CTRL}<1.2VDC
Input Current of CTRL Pin	nom Vin= 12VDC, 24VDC				0.3mA
	nom Vin= 48VDC				0.4mA
Internal Operating Frequency				350kHz	
Output Ripple and Noise [3]	20MHz BW				100mVp-p

Notes:

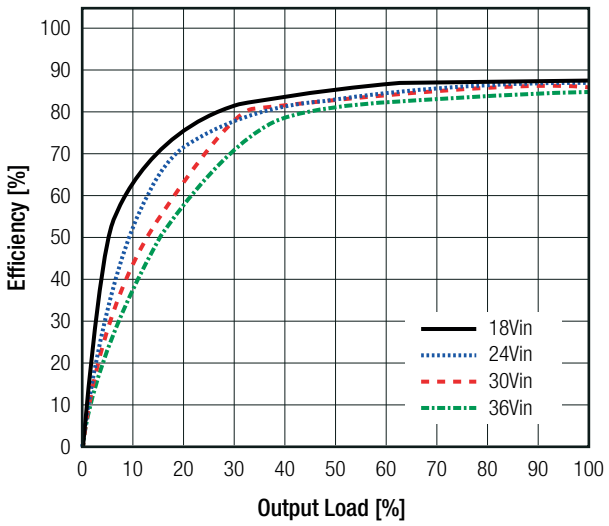
Note3: Measurements are made with a 0.47µF MLCC across output (low ESR)

Efficiency vs. Load

REC8E-1205S/CTRL/X1



REC8E-2405S/CTRL/X1



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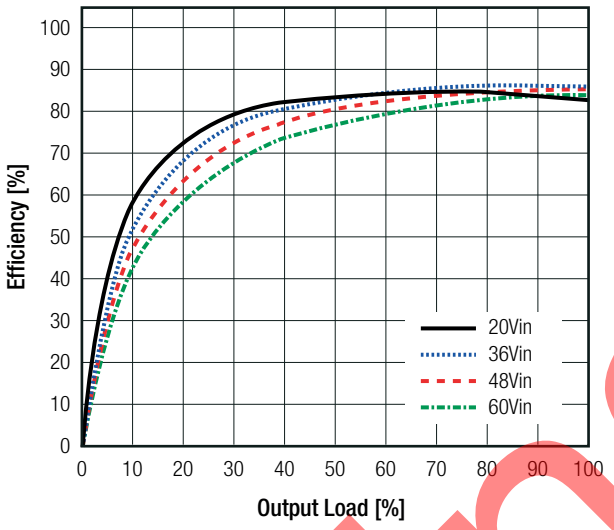
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Efficiency vs. Load

REC8E-4805S/CTRL/X1



REGULATIONS

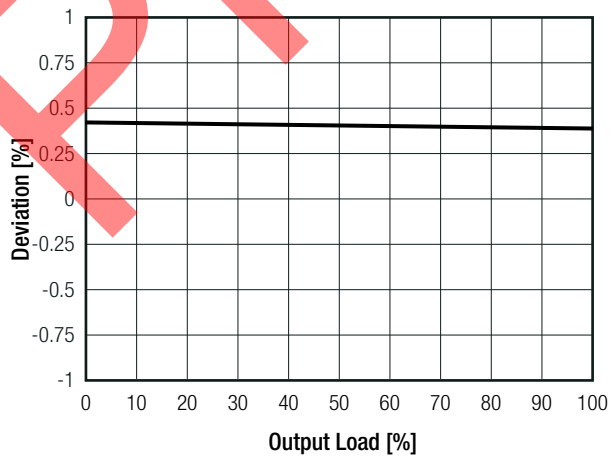
Parameter	Condition	Value
Output Accuracy		±1.0% typ.
Line Regulation	low line to high line, full load	±0.4% max.
Load Regulation (4)	10% to 100% load	0.5% max.
Cross Regulation		±5.0% typ.

Notes:

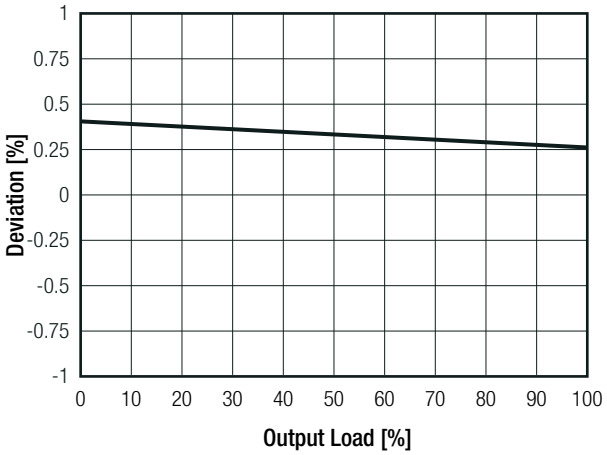
Note4: Operation below 10% load will not harm the converter, but specifications may not be met

Deviation vs Load

REC8E-1205S/CTRL/X1



REC8E-2405S/CTRL/X1
REC8E-4805S/CTRL/X1



Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PROTECTIONS

Parameter	Type		Value
Short Circuit Protection (SCP)	below 100mΩ		continuous, automatic recovery
Over Current Protection (OCP)			120%, hiccup, automatic recovery
Isolation Voltage (5)	I/P to O/P	tested for 1 minute	1.6kVDC
Isolation Resistance			1GΩ min.
Isolation Capacitance			2200pF max.

Notes:

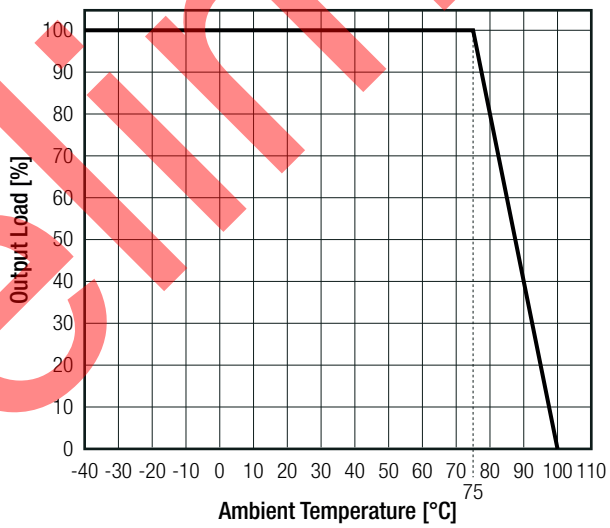
Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage

Note6: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	without derating (refer to ***"Derating Graph"***)		-40°C to +75°C
Maximum Case Temperature			+95°C
Temperature Coefficient			±0.05%/K
Thermal Impedance			15K/W
Operating Altitude			5000m
Operating Humidity	non-condensing		5% - 95% RH max.
Pollution Degree			PD2
Vibration			MIL-STD-202G
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	1532 x 10^3 hours

Derating Graph
(@ Chamber and natural convection 0.1m/s)



SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report Number	Standard
Audio/video, information and communication technology equipment - Safety requirements	E224736-A6007-UL	UL62368-1:2014 CAN/CSA-C22.2 No. 62368-1:2014
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)	2003047-3-CB	IEC62368-1:2014 2nd Edition
Audio/video, information and communication technology equipment - Safety requirement		EN62368-1:2014 + A11:2017
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)	2003047-4-CB	IEC62368-1:2018 3rd Edition
Audio/video, information and communication technology equipment - Safety requirements		EN IEC 62368-1:2020 + A11:2020
RoHS2		RoHS 2011/65/EU + AM2015/863

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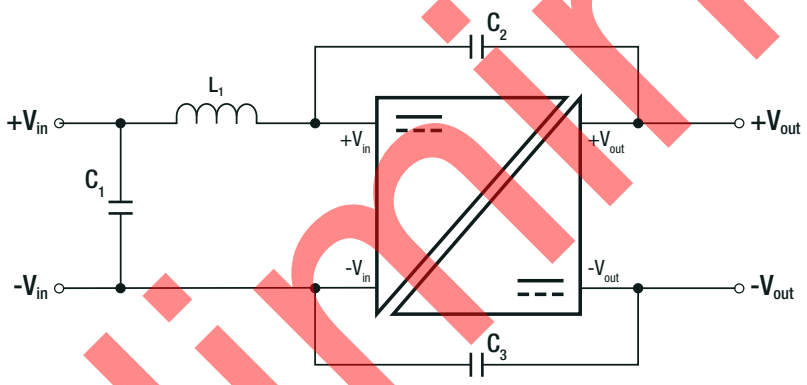
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

EMC Compliance	Condition	Standard / Criterion
Electromagnetic Compatibility of Multimedia Equipment - Emission Requirements (7)	refer to ***"EMC Filtering"***	EN55032:2015+AC:2016, Class A/B
Electromagnetic compatibility of multimedia equipment – Immunity requirements		EN55035:2017
ESD Electrostatic Discharge Immunity Test	Air: ±2, 4, 8kV, Contact: ±2, 4, 6kV	IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, Radio-Frequency, Electromagnetic Field Immunity Test	3V/m (80-1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz)	IEC/EN61000-4-3:2006+A2:2010 Criteria A
Fast Transient and Burst Immunity	DC Port: ±0.5, 2kV	IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	DC Port: ±0.5, 1kV	IEC/EN61000-4-5:2014, Criteria A
Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields	3Vrms (0.15-10MHz) 3-1Vrms (10-30MHz) 1Vrms (30-80MHz)	IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	1A/m 50Hz	IEC61000-4-8:2009 EN61000-4-8:2010
Limitations on the amount of electromagnetic interference allowed from digital and electronic devices		FCC 47 CFR Part 15 Subpart B Class B

EMC Filtering Suggestions according to EN55032 (7)



Component List Class A

MODEL	C1	L1
REC8E-1205S/CTRL/X1 REC8E-2405S/CTRL/X1 REC8E-2415S/CTRL/X1 REC8E-4805S/CTRL/X1 REC8E-4815S/CTRL/X1	10µF, 100V	5.6µH choke RLS-567

Component List Class B

MODEL	C1	C2, C3	L1
REC8E-1205S/CTRL/X1 REC8E-2405S/CTRL/X1 REC8E-2415S/CTRL/X1 REC8E-4805S/CTRL/X1 REC8E-4815S/CTRL/X1	10µF, 100V	680pF 2kVDC	5.6µH choke RLS-567

Notes:

Note7: Filter suggestions are valid for indicated part numbers only.
For other part numbers, please contact RECOM for advice.

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting	non-conductive plastic, (UL94 V-0) epoxy, (UL94 V-0)
Dimension (LxWxH)		25.4 x 25.4 x 10.5mm
Weight		17g typ.

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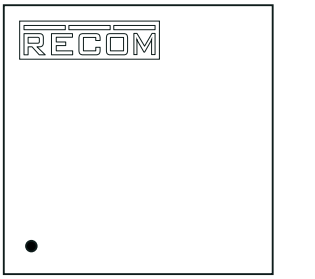
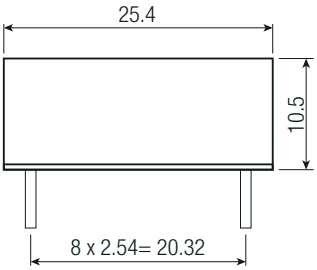
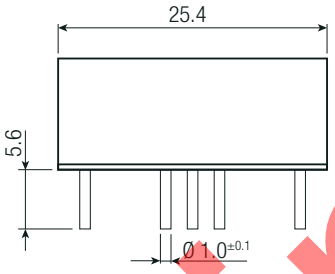
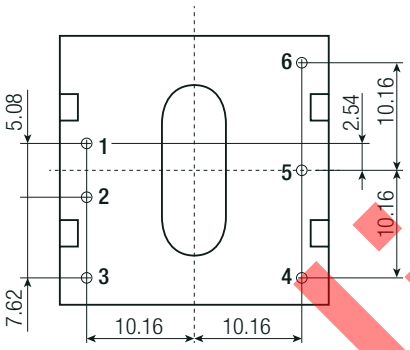
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)

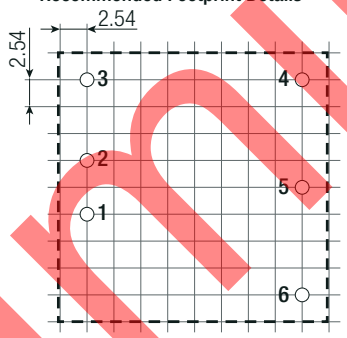








Recommended Footprint Details



Pinning Information

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	-Vout	-Vout
5	no Pin	Com
6	+Vout	+Vout

Tolerance: xx.x= ±0.5mm
xx.xx= ±0.25mm

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	260.0 x 28.5 x 20.8mm
Packaging Quantity		8pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.