

JASPER ELECTRONICS

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General Product Specifications:

Model TC206LS (24V)
AC Input, 120W Single DC Output.

This document outlines the general specifications for Jasper Electronics (JE) model TC206LS component power supply module, generally compliant to the State of California Department of Transportation (CalTrans)

Transportation Electrical Equipment Specification (TEES) March 12, 2009,

but modified for a new application and designated Caltrans model **206LS**. Changes affecting the form, fit, function or other features outlined in this document shall not be permitted without prior notification and approval of the user.



Specific design requirements are detailed in the TEES document. Generally, JE model TC206LS is a chassis mounted, open frame, single output switching power supply capable delivering up to 120 Watts DC and intended specifically for use in Caltrans TEES 332L, 334L and 336L cabinets fitted with PDA2-LS Power Distribution Assemblies. Designed for non-redundant “cold pluggable” installation in the end product. AC input, PE, and DC power output connections are through a 6-circuit connector at the rear of the supply. Convection cooled, with an extended operating temperature range. It is not interchangeable with earlier CalTrans Model 206 linear or current 206L switching type power supplies without requiring cabinet modifications.

-INPUT-

Voltage/Current
Label RatingAC 90-250V, 47-63Hz, 1.6A max, Single Phase;
TEES MinimumAC 90-132V, 57-63Hz, 1.6A max.
Power Factor>0.98 line PFC typical at AC 115V, full load.
Inrush CurrentSoft start (~25°C cold start) 30Apk @ AC 115V.

FusingAC 3.15A, 250V delayed (slow-blow) action
5x20mm AG cartridge type external line fuse
provided, operator accessible. Fuse IEC 60127
certified.
EfficiencyAt AC 115V: >75% @ 1.0A;
>84% @ 2.5A;
>86% @ 5.0A.

-OUTPUTS-

Voltage/Current (V/A)	V1
Model TC206LS	24.0V, 5.0A
<u>Total loading NOT to exceed 120 Watts at 74°C.</u>	
Output Voltage	
Setpoint	Factory preset within $\pm 2.0\%$ of nominal voltage.
Line Regulation	$< \pm 2.0\%$ at the output connection over the full AC input range and 0 – 100% output loading.
Minimum Loading	None required.
Output Turn-on Delay	$< 200\text{mSec}$ from AC turn-on.
Over/Under Shoot	None at turn-on or turn-off.
Stability	$< \pm 0.2\%$ output drift after 20 minute warm-up.
Temp. Coefficient	$< \pm 0.02\%/^{\circ}\text{C}$, 0° – 50°C , after 20 minute warm-up.
Dynamic Response	$< \pm 5.0\%$ deviation with a 50% load change at a slew rate of $1\text{A}/\mu\text{sec}$. Output recovers to within 5% in less than 300 μsec .
Ripple and Noise (PARD)	2.0V max peak-to-peak / 500mV RMS nominal at the output terminal with a 20 MHz bandwidth limit. May be measured with a 0.1 μF ceramic capacitor in parallel with a 22 μF tantalum capacitor connected between the measured output and its return.
Over Voltage Protection (OVP)	Non-crowbar type from 27.6V to 32.4V.
Over Temperature Protection	Internal temperature sensing. Causes output to shut down. Automatic recovery.
Over Current/Short Circuit Protection	Protected against overload from 6A to 8A and short-circuit faults. Automatic recovery when overload removed.
Output Transient Protection	Minimum 1400W voltage transient suppressor provided.
Output Fusing	AC 8.0A, 250V delayed (slow-blow) action 5x20 AG cartridge type external fuse provided in the (+) output, operator accessible. Fuse IEC 60127 certified.

-SIGNALS, INDICATORS and CONTROLS-

AC Power Indicator	Front panel mounted, single-color LED. Red indicates AC power ON. Off indicates an input fault.
DC Power Indicator	Front panel mounted, single-color LED. Green indicates DC power ON. Off indicates an output fault.
Output Test Points	Two "banana jack" type test sockets provided on the front panel, color coded red and black. Allows operator to verify output voltage.

-MECHANICAL-

(Refer to JE Outline Configuration Dwg, P/N 03751-000.)

Weight	1.35Kg [3.00lbs].
Retaining Fastener	A single operator accessible 10-32 UNC captive panel fastener is provided on the front panel. PEM PF-11.
Mounting Orientation	Designed for vertical insertion into a TEES specified Power Distribution Assembly PDA # 2LS.

-OPERATING ENVIRONMENT-

Operating Temperature	-34.6° – $+165.2^{\circ}\text{F}$ (-37.0° – $+74.0^{\circ}\text{C}$) ambient at full load.
Cooling	Convection only.
Relative Humidity	Up to 95% RH, non-condensing.
Operational Vibration	0.75G peak, 5 – 500Hz along three orthogonal axis.
Storage Temperature	-40° to $+185^{\circ}\text{F}$ (-40° to $+85^{\circ}\text{C}$).
Altitude	Operating to 10,000 ft. Storage to 30,000 ft.
MTBF	Designed for 150,000 hrs at 25°C .

-INTERCONNECT-

Input/Output Connector	6-circuit (2x3) panel-to-panel plug with 0.250"[6.35mm]x0.055"[1.40mm] blade type contact terminals, rated 15A/pin. General purpose black phenolic insulator material. Secured in the unit rear panel. Cinch model P-2406H-SB. Mates with Cinch model S-2406-SB or equivalent.
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Note: Use of the specified mating connector is required to insure proper current capacity.

<u>Pin#</u>	<u>Function</u>
7	+V1 (+24VDC) Output.
8	DC Ground.
9	Earth Ground.
10	No Connection.
11	N – Neutral (ACC) Input.
12	L – Line (AC) Input.

Note: Pin number assignments per CalTrans spec TEES 2009.

-SAFETY, REGULATORY and EMC-

Designed to comply with the relevant industry standards of the authorities having jurisdiction, typically UL 60950-1, CSA 22.2 and IEC 60950.

EMI Filtering	Meets CISPR22B Level B, EN55022 Level B, and FCC Part 15, Level B, for conducted emissions.
Harmonics	Meets EN 61000-3 (harmonics and voltage fluctuations).

Touch Current

1.2mA max @ 50/60Hz, 264V AC per UL 60950 test procedures (Sec. 5.0).

Routine Factory Tests

Di-electric strength (hi-pot) to 2121V DC input-to-chassis and input-to-outputs; MegOhm to 500V output-to-chassis.

-MARKING and LABELING-

A 4.00"x1.75" (or smaller) adhesive label is applied to the rear panel. Imprinted with JE model identification data, including JE name, input/output ratings, model name, JE part number, a 4-digit (week/year) manufacturing date code and manufacturing facility identification code, and space to apply any future authorized product safety certification marks.

Space is available on labels for modified or custom models for a user specified part number or model description.

Use of non-standard JE labels, or user required marking, such as bar codes, user revision codes, user name or logo, etc, is possible but may incur additional costs. Consult the factory.

-ENVIRONMENTAL CONSIDERATIONS-

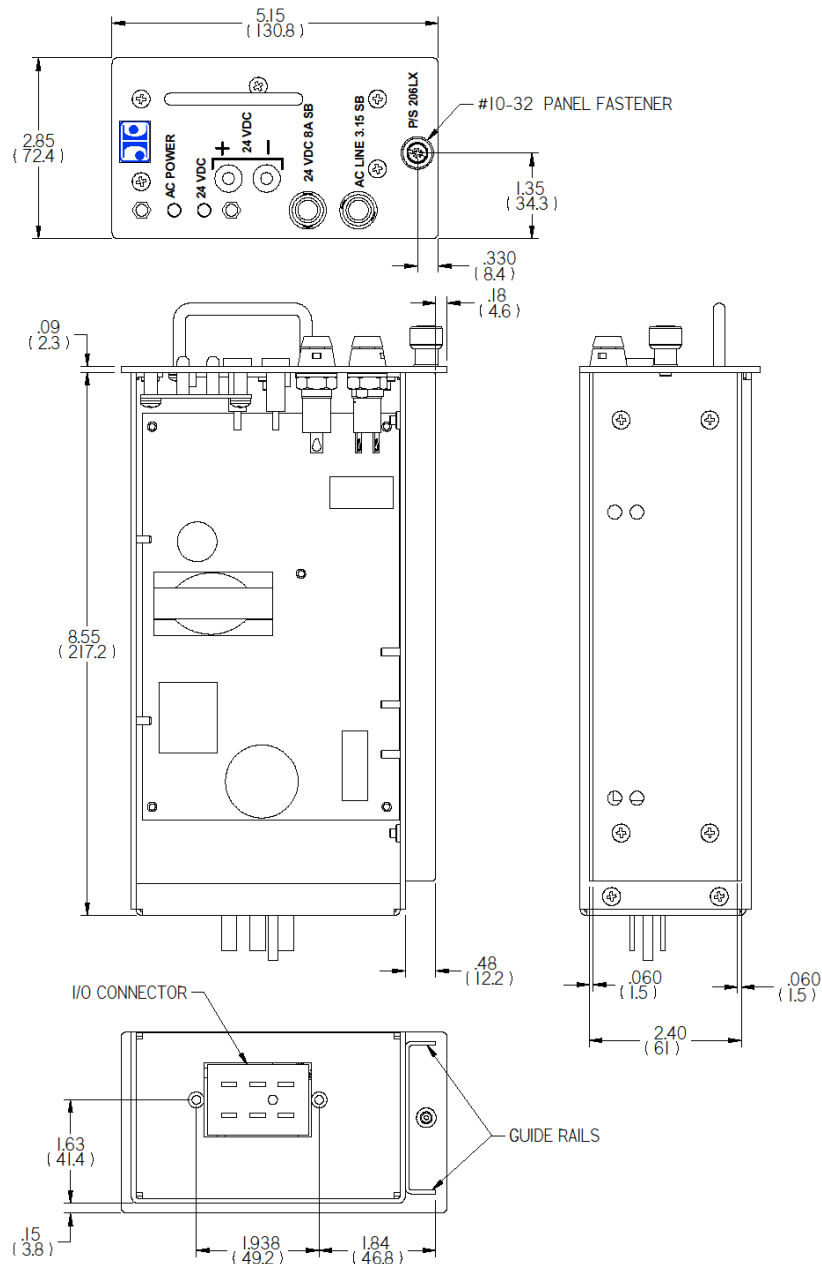
The model TC206LS is fully compliant with the requirements of Directive 2002/95/EC Restrictions of Hazardous Substances (RoHS). RoHS compliant models are identified with the letter code "G" suffix added to the part number on the unit labels and related documents (sales orders, etc). All materials, processes and packaging used in the assembly and shipping of RoHS versions comply. A Certificate of Compliance is available on request. Contact the factory.

-Limited Warranty Policy-

All Jasper Electronics (JE) standard model power supplies and products are guaranteed to be free of defects in workmanship and materials for a minimum of two (2) years from the date of original shipment, when operated within specification. This warranty applies only to defects that result in a failure to comply or perform to published specifications. Non-standard (custom) power supplies and products may be warranted on an individual basis. The unused portion of this warranty is fully transferable with the original equipment in which the power supply is installed.

Mechanical Outline

(Dimensions in inches[millimeters]. Not to scale.)



All statements and technical information contained herein are believed by JE to be reliable as of the publication date of this document, but the accuracy or completeness is not guaranteed, and JE reserves the right to change specifications without prior notification. However, every reasonable effort will be made by JE to inform users of JE products of changes to design form, fit or function that may affect the user's applications. JE manufactures a quality product, equal to any available in the marketplace; however, these products are intended to be used in accordance with the specifications described in these instructions. Any use or application that deviates from the stated operating specifications is not recommended and may be unsafe.

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