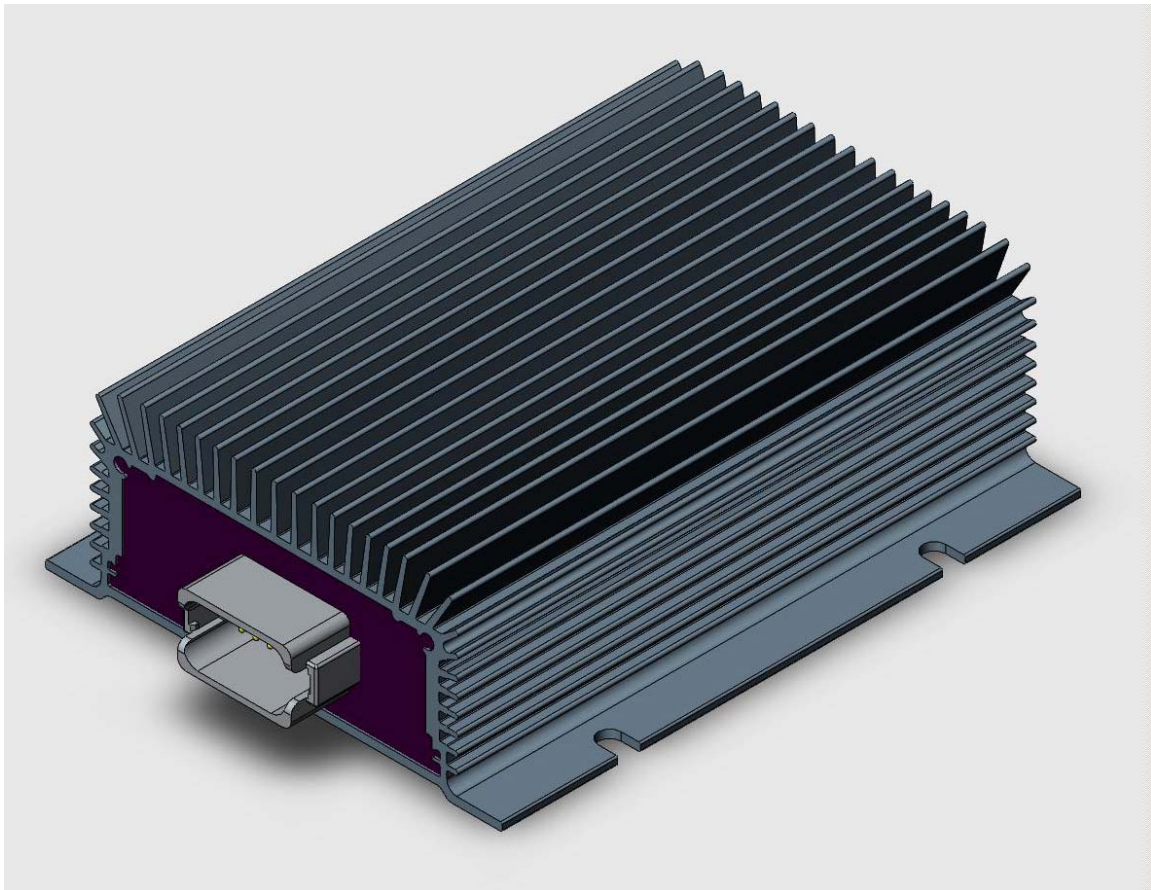


REVISIONS				
REV	ECO	DESCRIPTION	DATE	BY
001	4163	PRODUCTION RELEASE	7/1/04	BF
002	4794	REMOVE FUSE REFERENCES	8/2/06	BF
003	4874	CHARACTERIZE VOUT OVER LOAD	1/17/07	BF
004	4995	UPDATE ENVIR. & ELECTRICAL SPECS MODIFY CHART 1	1/2/08	JT
005	5108	CLARIFY OUTPUT LOAD SPEC	2/6/08	JT

PRODUCT SPECIFICATION

71030i DC/DC Converter

Input Voltage: 72V/96V
Output Voltage: 13.5V
Output Load: 25A Continuous, 30A Intermittent



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES [MM] TOLERANCES ARE: .XX ± .10 [X.X ± 2.5] .XXX ± .030 [X.XX ± 0.76]			
<small>INTERPRET GEOMETRIC DIMENSIONS AND TOLERANCING PER ASME Y14.5-1994 DRAWINGS IN THIS DOCUMENT ARE NOT TO SCALE</small>		TITLE MODEL NO: 71030i 72V/13.5V,25 AMP CONVERTER WITH SWITCHED OUTPUT SPECIFICATION OUTLINE	
APPROVALS		DATE	
<small>DRAWN</small> JD	<small>DATE</small> 6/28/04		
<small>PROJECT ENGR</small>			
<small>ENGR MANAGER</small>			
<small>SALES/MRKTG</small>			
<small>SIZE</small> A	<small>CAGE CODE NO.</small> 55156	<small>DRAWING NO.</small> 71030i	<small>REV</small> 005
<small>SCALE: NONE</small>		<small>FILE: 71030i-005</small>	<small>SHEET 1 OF 5</small>

PROPRIETARY

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SURE POWER INC.

REVISIONS				
REV	ECO	DESCRIPTION	DATE	BY
		- SEE SHEET 1-		

GENERAL DESCRIPTION

The 71030i is a 25A DC-to-DC converter that can drive 30A loads intermittently. The converter is used to provide energy for 12V apparatus from battery systems whose nominal voltage is from 72V to 96V. The output is electrically isolated from the input.

The converter has two outputs. The outputs are called “unswitched” and “switched”. The unswitched output provides power continuously when power is applied to the input. The switched output is controlled by an enable signal. The enable signal turns the switched output on and off. The ENABLE input is referenced to the output side. Typically the ENABLE input would be connected to the unswitched output through a key switch. If this switch is closed, then the switched output turns on. If the switch is open, the switched output turns off.

The converter is designed to withstand reverse battery, over-temperature, over-current, and short circuit without damage to the unit.

The 71030i DC-DC Converter utilizes switching power supply technology.

The converter has protection from under-voltage and over-voltage on the input. If the input is too high or too low the converter will shut off to protect itself. Under-voltage protection incorporates a delay so that momentary battery sags do not turn off the converter.


The operating temperature of the converter is constantly monitored. If the unit becomes too hot, it will fold back to protect itself.

The converter uses current-mode control topology. This topology allows for cycle-by-cycle current limiting during short circuits or overloads.

CONNECTIONS

Connections to the unit are made via the 12-pin Deutsch DT series sealed connector (A keyed).

Pin #	Description
12	VIN POS. Input voltage positive.
1	VIN NEG. Input voltage negative.
3	ENABLE. Input for turning the switched output on and off.
7,8	Output voltage positive switched
9,10	Output voltage positive unswitched
4,5,6	Output voltage negative
2,11	Not used

				
TITLE MODEL NO: 71030i 72V/13.5V,25 AMP CONVERTER WITH SWITCHED OUTPUT SPECIFICATION OUTLINE				
SIZE A	CAGE CODE NO. 55156	DRAWING NO. 71030i	REV 005	
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REVISIONS				
REV	ECO	DESCRIPTION	DATE	BY
		- SEE SHEET 1-		

ENVIRONMENTAL SPECIFICATIONS

Characteristic	Parameter	Unit	Notes:
Operational Temperature Range	-40 to +50	°C	As tested in Tenney model TJR thermal chamber with 30A constant load.
Maximum Heatsink Temperature	100	°C	Heatsink temperature must be kept below this value.
Storage Temperature Range	-55 to +105	°C	
Over-Temp Limit	105	°C	The trip point for over-temp foldback
Thermal Cycle			per SAE J1455 (Aug94) Section 4.1
Humidity	0 to 100	%RH	per SAE J1455 (Aug94), Section 4.2.3
Vibration			per SAE J1455 (Aug94) Section 4.9 and Appendix A, Category 2. See Note 1.
Handling Shock	Will show damage		per SAE J1455 (Aug94) Section 4.10. See Note 1.
ESD – Handling	±15k	V	Ref. SAE J1455 (Aug94) Section 4.11.2.2.5.1 EN 61000-4-2, Part 4, Section 2
ESD – In Vehicle	±15k	V	Ref. SAE J1113-13 (Oct97), Class C EN 61000-4-2, Part 4, Section 2


ELECTRICAL SPECIFICATIONS

MAXIMUM RATINGS:

Maximum ratings establish the maximum electrical rating to which the unit may be subjected without damage.

Characteristic	Parameter	Unit	Notes:
Standoff Voltage	150	V	This is maximum voltage applied between input and GND that the unit will standoff without causing damage to the unit.
Time at Standoff	5	min	
Reverse Polarity	-150	V	This is the maximum reverse voltage that may be applied between VIN POS and VIN NEG.
Time at Reverse Polarity	5	min	Tested at 85°C. Per SAE J1455 (Aug94), Section 4.11.1
Input Current	9.5	A	Maximum input current.
Output Continuous Load	25	A	Maximum continuous output current @ 72V input. Output load is the sum of the currents from the switched and unswitched outputs.
Output Intermittent Load	30	A	Either output may be operated to this level intermittently. The sum of the two output loads cannot exceed the output intermittent load rating.
Electrical Isolation	500	VAC	Input to Output

Note 1: Not validated at this revision. Specification represents design intent.

				
TITLE MODEL NO: 71030i 72V/13.5V,25 AMP CONVERTER WITH SWITCHED OUTPUT SPECIFICATION OUTLINE				
SIZE	CAGE CODE NO.	DRAWING NO.	REV	
A	55156	71030i	005	
SCALE: NONE			FILE: 71030i-005	SHEET 3 OF 5

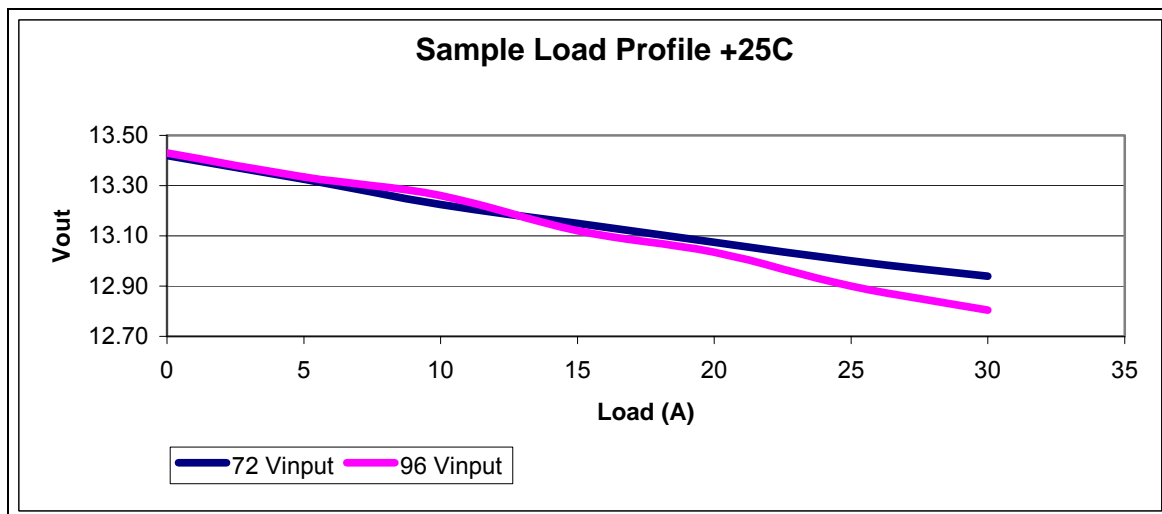
REVISIONS				
REV	ECO	DESCRIPTION	DATE	BY
- SEE SHEET 1-				

ELECTRICAL CHARACTERISTICS

Unless otherwise stated, conditions apply to full temperature range and full input voltage range.

Characteristic	MIN	TYP	MAX	Unit	Notes:
Under-Voltage Turn OFF	55	57	60	V	Below this input voltage and after under-voltage delay the output will shutoff.
Under-Voltage Turn OFF Delay	5	10	15	Sec	Time till shutdown with input voltage at 55V.
Input Over Voltage Turn OFF	118	124	130	V	Voltage on input that causes the converter to turn off.
Quiescent Current		5	8	mA	Input Voltage 72V. Current draw from the input with ENABLE off.
Enable voltage	11			V	Voltage on enable pin must be above this value to turn the switched output on.
Enable current		1.0		mA	ENABLE pin sinking current with ENABLE pin tied to 12V source.
Efficiency	83%	86%			Over entire input voltage range at rated output current.
Output Voltage	13.1	13.5	13.9	V	Unswitched output, no load. Output droop is employed to facilitate parallel output sharing—see Chart 1 for output load characteristics. The switched output has the same voltage minus the drop across the switch.
Switch Resistance	5	8	12	mΩ	Resistance of MOSFET between the unswitched and switched outputs. Causes the switched output voltage to be lower than the unswitched output voltage ($V_{drop} = I_{out} * R_{sw}$)
Output Current Limit		31		A	Output current level where output voltage falls out of regulation.

Chart 1



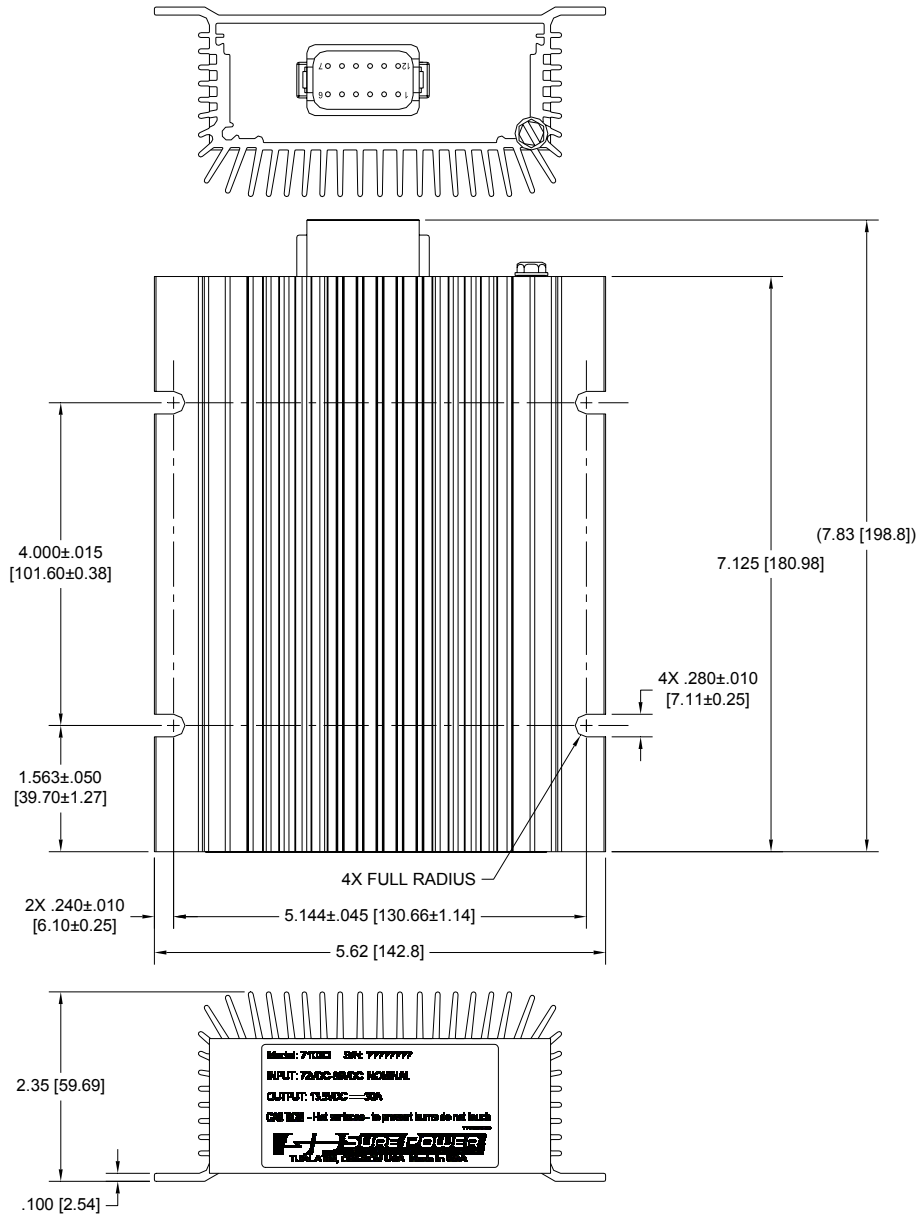
TITLE
MODEL NO: 71030i
72V/13.5V, 25 AMP CONVERTER
WITH SWITCHED OUTPUT
SPECIFICATION OUTLINE

SIZE A	CAGE CODE NO. 55156	DRAWING NO. 71030i	REV 005
SCALE: NONE FILE: 71030i-005			SHEET 4 OF 5

REVISIONS				
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MECHANICAL DIMENSIONS

WEIGHT: Approximately 4.27 lbs (1.94 kg)



MATING CONNECTOR

Deutsch, Industrial Parts Division

- Connector **DT06-12SA**
- Pin (socket) **0462-209-16141**
- Plug (for no-pin) **114017**
- Pin lock **W12S**
- Wire sizes **Outputs: 14AWG, Inputs: 16AWG**

TITLE MODEL NO: 71030i 72V/13.5V, 25 AMP CONVERTER WITH SWITCHED OUTPUT SPECIFICATION OUTLINE				
SIZE A	CAGE CODE NO. 55156	DRAWING NO. 71030i	REV 005	
SCALE: NONE			FILE: 71030i-005	SHEET 5 OF 5