Astrodyne TDI
Now you have power.

150 Watt, High Efficiency, Quarter Brick DC/DC Converter

ASD150QB series

- Industry Standard Quarter Brick Package
- High Power Density up to 90W/ Inch ³
- High Typical Efficiency of 91%
- Low Output Noise
- Metal Baseplate
- Thermal Protection
- Input Under Voltage Protection
- Output Over Voltage Protection
- Current Limit/Short Circuit Protection
- Adjustable Output Voltage 90-110% of Vo
- Remote Sense
- Positive Remote ON/OFF Control (Negative Logic is Optional)
- RoHS Compliant

DESCRIPTION:
The ASD150QB dc/dc converter is offered in the industry standard "quarter brick" size (2.28in. x 1.45in. x 0.50in.) for circuit board mounting. It is designed for use in a 24/28 Vdc (18-36Vdc) or 48 Vdc (36-75Vdc) input applications where exceptionally high density DC power is required. The ASD150QB utilizes an insulated metal substrate and is therefore well suited for the most rigorous requirements of COTS and thermally challenging industrial applications.

Model Number	Output Voltage	Output Amps	Input Range	Max. Iin FL	Efficiency (Tb=25°C)	O/P Set Point	ISC (Hiccup)
ASD150-24S3.3QB	3.3 VDC	45	18-36 VDC	10A	91%	3.267-3.333V	45 Arms
ASD150-48S3.3QB	3.3 VDC	45.45	36-75 VDC	5A	91%	3.25-3.35V	45.45 Arms
ASD150-24S5QB	5 VDC	30	18-36 VDC	10A	91%	4.95-5.05V	30 Arms
ASD150-48S5QB	5 VDC	30	36-75 VDC	5A	92.5%	4.95-5.05V	30 Arms
ASD150-24S12QB	12 VDC	12.5	18-36 VDC	10A	91.5%	11.88-12.12V	20 Arms
ASD150-48S12QB	12 VDC	12.5	36-75 VDC	5A	92.5%	11.88-12.12V	20 Arms

All specifications are typical at nominal input, full load, and 25DegC unless otherwise noted

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ABSOLUTE MAXIMUM RATINGS (MIN TO MAX.)

Input Voltage (+In to -In)	
24Vin:	-0.3 to 36VDC (50VDC <100mS)
48Vin:	-0.3 to 75VDC (100VDC <100mS)
Logic ON/OFF Voltage	-0.3 to 5V (ON/OFF to -In)
Storage Temperature	-40 to +125°C
Storage Humidity	10 to 95%
Operating Temperature (Note 5)	-40 to 100°C
Operating Humidity	30 to 95%
Output Power	150 Watts

INPUT SPECIFICATIONS

Input Operation Voltage:	See Model Selection Chart PG. 1
Input Current FL @ Nom Vin, FL	See Model Selection Chart PG. 1
Inrush Transient	1A²s
Input Reflected Ripple Current	40mAp-p, typ. (60mA max.)
Input Ripple Rejection	60dB@120Hz
Input Under Voltage Protection (24Vin/48Vin)	
Turn-on Threshold:	17.5-18V/34-36V max.
Turn-off Threshold:	15.5-16V/30-32V typ.
Hysteresis:	1-1.5V/2.0V typ.

OUTPUT SPECIFICATIONS

Output Voltage & Current	See Model Selection Chart PG. 1
Output Set Point (Vo,set; Note 6)	See Model Selection Chart PG. 1
Output Voltage Tolerance Band	+/-3%
Load/Load Regulation	20mV max.
Temperature Coefficient	+/-0.02%/°C, -40 to 100°C
Ripple/Noise p-p max. (Note 1)	3.3, 5Vo: 70mV; 12Vo: 120mV
Dynamic Response (Vo, Set):	6% max., Nom. Vin, Tb=25°C
	(Note 3)
Peak Deviation	300uS duration outside of Vo set
Settling Time	+/-1% error band
Over Voltage Protection	112-140% of Output, Io=0.5A
Over Temperature Protection	100-115°C, auto recover @ 90°C
	See Fig. 3 for location definition
External Capacitance	660 to 5000uF max.
Short Circuit Protection (ISC)	See Model Selection Chart PG. 1
Current Limit (Note 2)	105-145% of Rated Load
Efficiency (Nom. Vin, 80% Load)	See Model Selection Chart PG. 1

STRUCTURAL DYNAMICS

Vibration	(Note 4)
Shock	20g, 166in/sec, Square Wave

ISOLATION SPECIFICATIONS

Input-Output, Input-Case	1500VDC, 60S
Output-Case	500VDC, 60S
Input-Output Capacitance	2000pF
Isolation Resistance	100MΩ @ Tb=25°C & 70%RH
	Output to Baseplate-500VDC

GENERAL SPECIFICATIONS

MTBF	1.8Mhrs Tb=40°C, 80%FL
Weight	2.29 oz (65g)
Dimensions	2.28" x 1.45" x 0.5"
	(57.91 x 36.83 x 12.7mm)

CONTROL SPECIFICATIONS

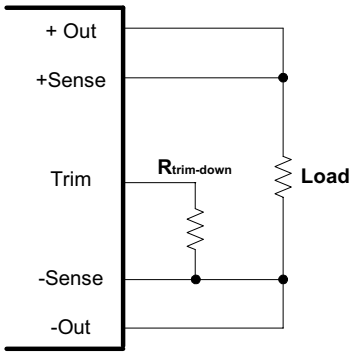
Logic ON/OFF Remote	
Positive Logic:	Off State Voltage: 0.8V max.
	On State Voltage: 2V min.
Negative Logic (optional):	Off State Voltage: 2V min.
	On State Voltage: 0.8V max.
Turn-On Time	40mS, Vo=90% of Vo, set
Trim Adjustment Range	90-110% See **TRIM CIRCUITS**
	Figs 1 & 2

NOTES

1.2.Bandwidth 5Hz to 20MHz and with filter 0.1uF MLCC
Nominal Vin; Io=FL; Tb=25°C; Output Capacitor with 220uF*3.
2. Current Limit inception point Vo=90% of Vo, set.
3. 25%-50%-75% load, Δ Io/ Δ t=0.1A/uS; w/o Cap. 220uF*3 each
4. Sine Wave, 10-55Hz (Sweep for 1 min.), Amplitude 0.825mm
Constant (Max. 5g) X, Y. Z 1 Hour each, at No Operation
5. Temperature measurement shall be taken from the baseplate (Tb).
See Fig. 3 for location definition .
6. Tb=25°C, Nominal Vin, Full Load (FL)

TRIM CIRCUIT:

A. Trim down: The resistor for output voltage trim-down function could be calculated with the following formula:

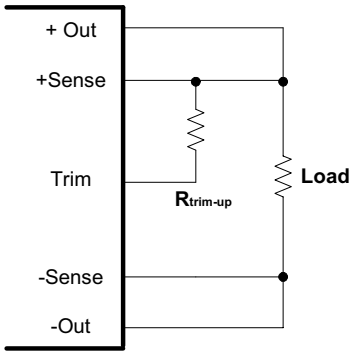


$$R_{trim-down} = \left(\frac{100\%}{\Delta\%} - 2\right)(k\Omega)$$

Δ% : Output voltage change rate against nominal output voltage.

Fig. 1 The schematic for output voltage trim down.

B. Trim up: The resistor for output voltage trim-up function could be calculated with the following formula



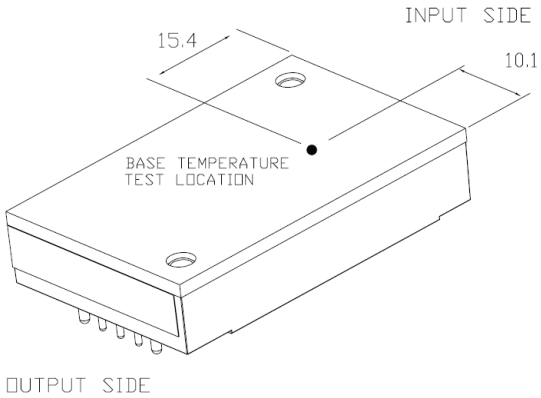
$$R_{trim-up} = \left[\frac{Vo(100\% + \Delta\%)}{1.225\Delta\%} - \frac{(100\% + 2\Delta\%)}{\Delta\%}\right](k\Omega)$$

Vo: The nominal output voltage.

Δ% : Output voltage change rate against nominal output voltage.

Fig. 2 The schematic for output voltage trim up.

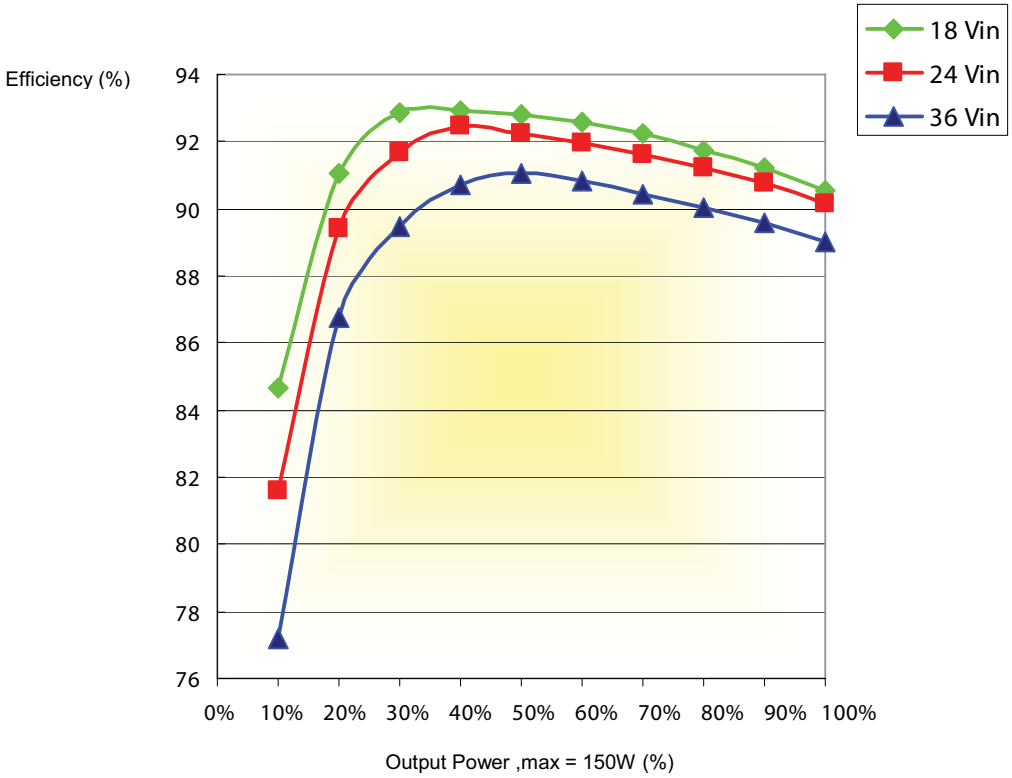
BASEPLATE MEASURE POINT:



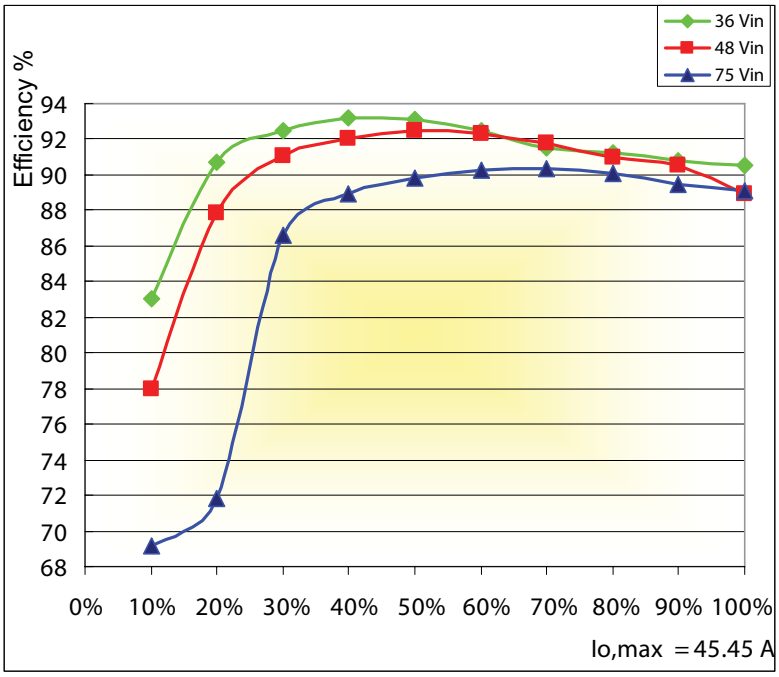
UNIT: mm

Fig. 3 Baseplate Temperature Measure Point.

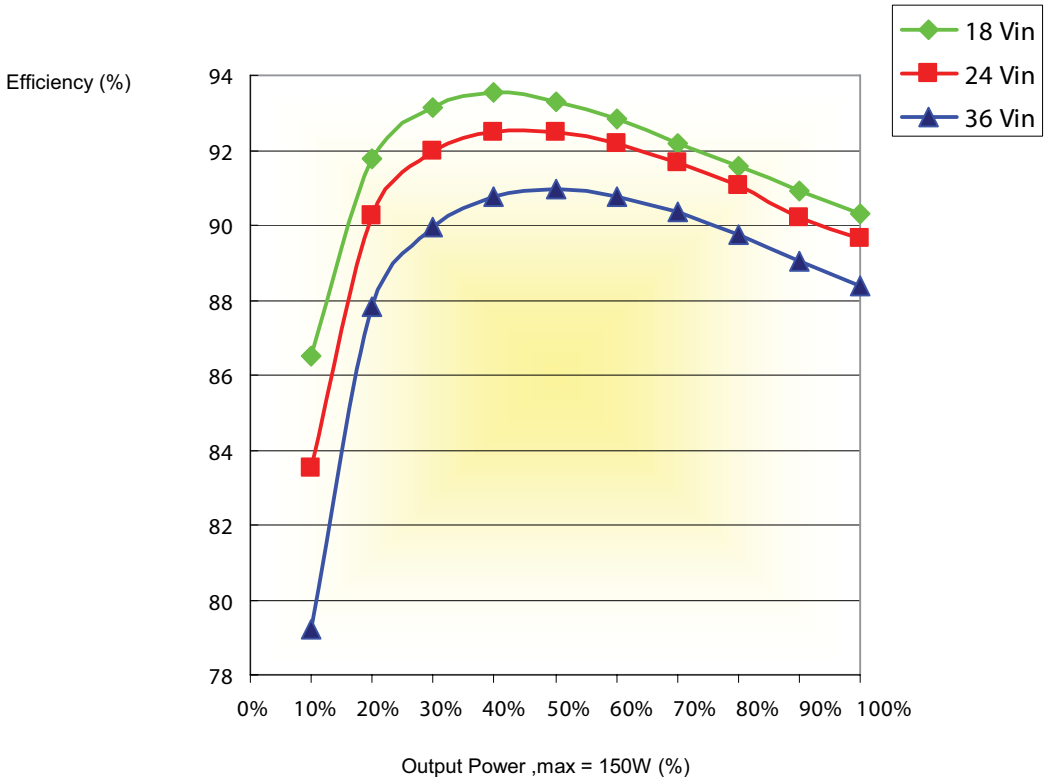
EFFICIENCY CURVE: 24VIN, 3.3VOUT



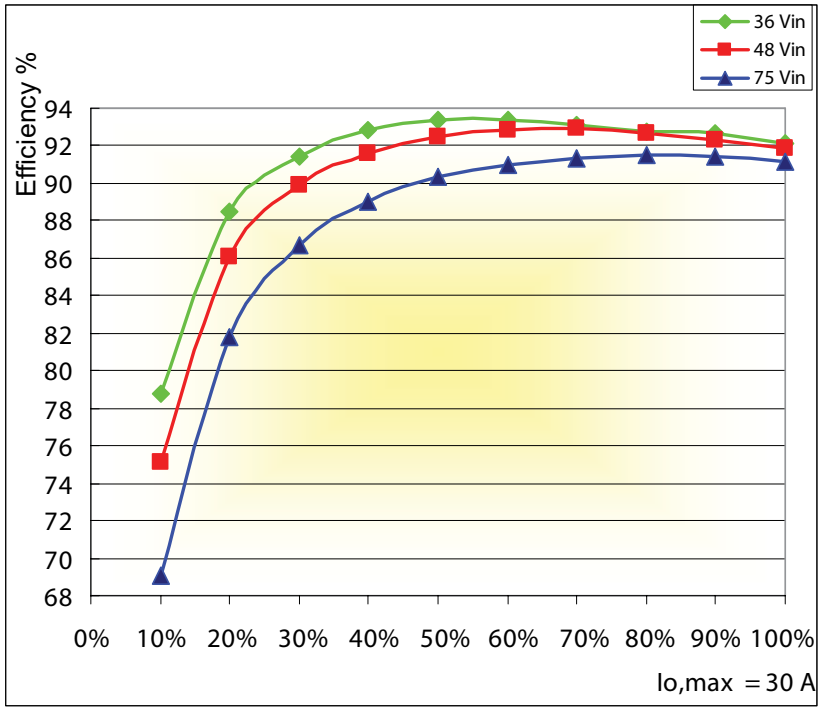
EFFICIENCY CURVE : 48VIN, 3.3VOUT



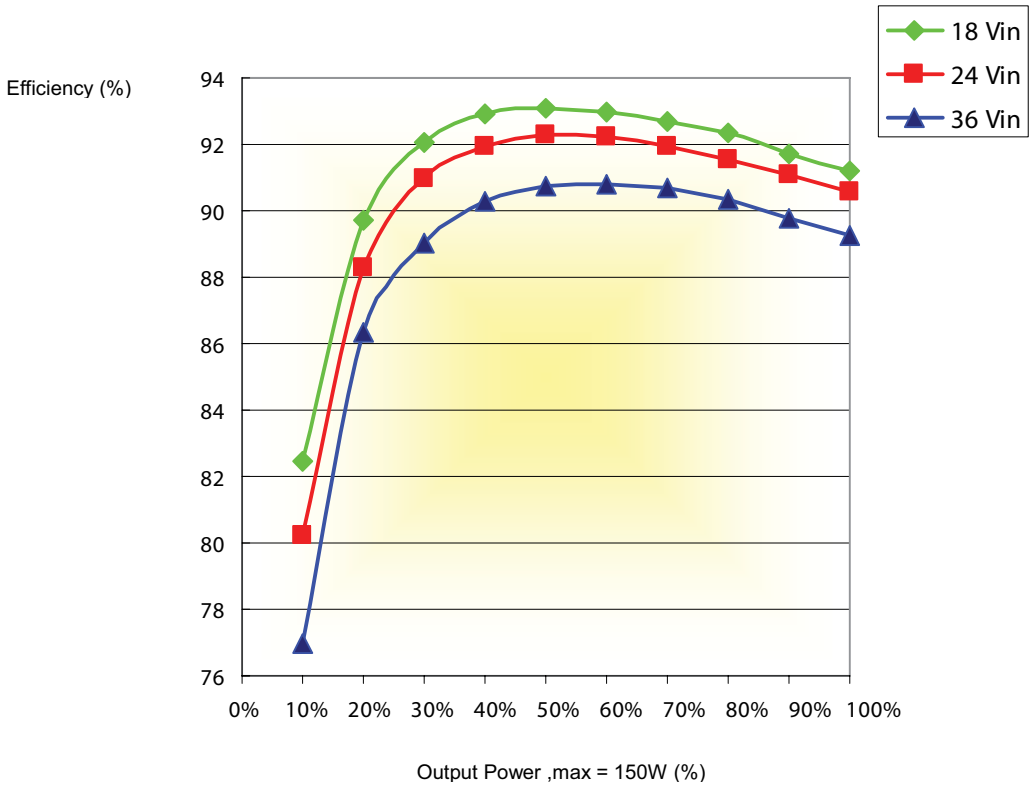
EFFICIENCY CURVE: 24VIN, 5.0VOUT



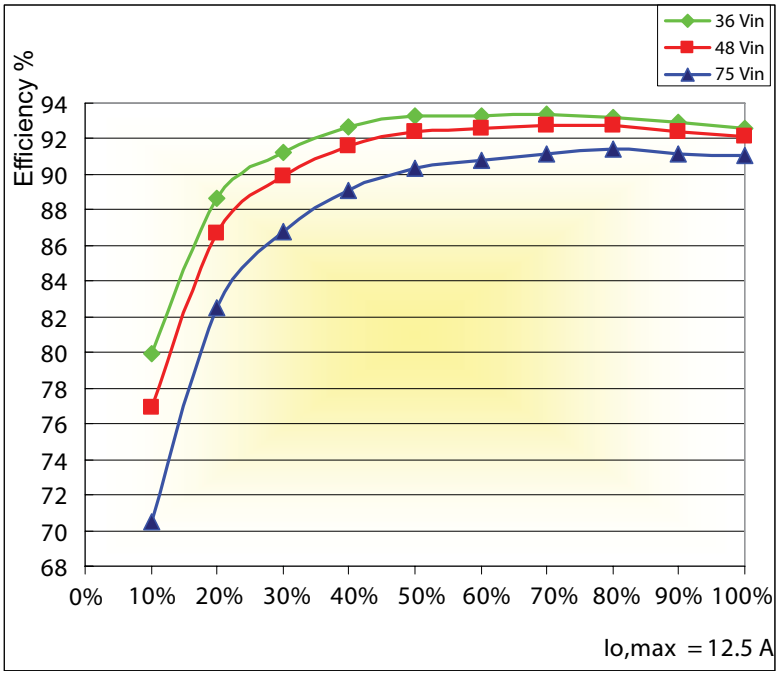
EFFICIENCY CURVE : 48VIN, 5.0VOUT



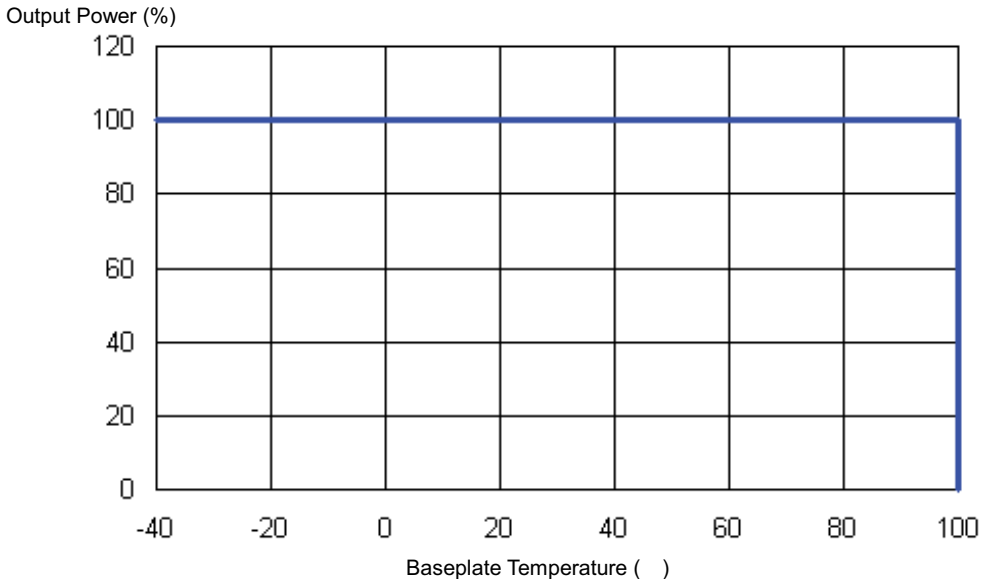
EFFICIENCY CURVE: 24VIN, 12VOUT



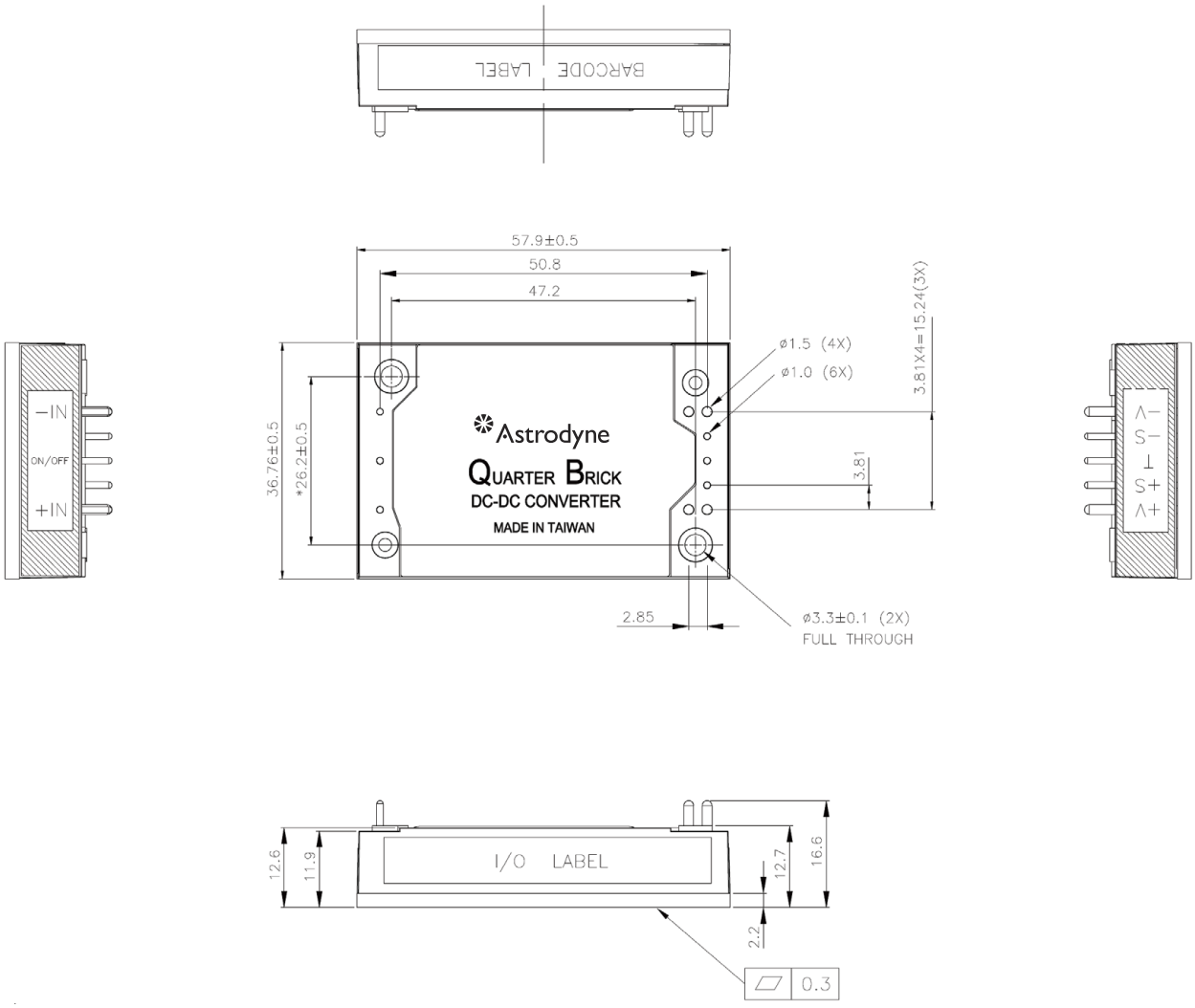
EFFICIENCY CURVE : 48VIN, 12VOUT



DERATING CURVE:



OUTLINE DRAWING:



OUTLINE PIN ASSIGNMENT:

Pin Number	Signal name: 3.3 & 5Vo	Signal name: 12Vo
1	Input (-)	Input (-)
2	On/Off Control	On/Off Control
3	Input (+)	Input (+)
4	Output (+)	No Pin
5	Output (+)	Output (+)
6	Sense (+)	Sense (+)
7	Trim	Trim
8	Sense (-)	Sense (-)
9	Output (-)	Output (-)
10	Output (-)	No Pin