

## 250W, 9 to 53V Input Non-Isolated Step Down DC-DC Converter

<https://product.tdk.com/en/power/i6a>  
[www.emea.lambda.tdk.com/i6a](http://www.emea.lambda.tdk.com/i6a)



Industrial



Test



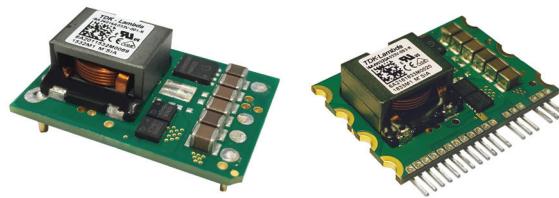
COMM



Broadcast



Robotics



The i6A4W series of non-isolated DC-DC step-down converters are ideal for creating additional high current output voltage rails from a single output 12V, 24V or 48V AC-DC or DC-DC power supply. The highly efficient i6A4W series accepts a very wide DC input and has a wide output adjustment range, with a choice of 1/16th brick footprint or SIP package. Output trim, remote sense, negative or positive logic remote On-Off comes as standard features. Power good, frequency synchronization and output sequencing are optional features.

### Features

- Up to 250W in a 1/16th brick or SIP package
- Very high Efficiency up to 97%
- Wide Output Adjustment 3.3 to 15V & 3.3 to 40V
- Minimal External Components Needed
- Low Airflow With Minimal Derating Requirements

### Benefits

- Very High Power Density
- Easier Thermal Management
- One Part For Multiple Applications
- Less Board Area Required
- Easier To Cool In End System

### Model Selector

Model	Output Voltage (V) <sup>(1)</sup>	Max Current (A)	Max Power (W)	Positive Logic On/Off	Negative Logic On/Off	Full Feature	Package
i6A4W010A033V-001-R	3.3 to 40	10	250	-	Yes	-	DIP
i6A4W010A033V-0S1-R	3.3 to 40	10	250	-	Yes	-	SIP
i6A4W020A033V-000-R	3.3 to 15	20	250	Yes	-	-	DIP
i6A4W020A033V-001-R	3.3 to 15	20	250	-	Yes	-	DIP
i6A4W020A033V-0S1-R	3.3 to 15	20	250	-	Yes	-	SIP
i6A4W020A033V-002-R	3.3 to 15	20	250	Yes	-	Yes	DIP
i6A4W020A033V-003-R	3.3 to 15	20	250	-	Yes	Yes	DIP
i6A4W020A033V-0S3-R	3.3 to 15	20	250	-	Yes	Yes	SIP
i6A4W020A033V-005-R	3.3 to 15	20	250	-	Yes	Yes <sup>(2)</sup>	DIP

Preferred model:

### Related Products

Type	Part Number	Description
DC-DC Buck Converter	<a href="#">i3A</a>	100W, Input 9-53V, Output 5-30V 4.5A or 3.3-16.5V 8A
DC-DC Buck Converter	<a href="#">i6AN</a>	75W, Input 9-40V, Negative Output -3.3 to -30V, 8A
DC-DC Buck Converter	<a href="#">i6A24</a>	250W, Input 9-40V, Output 3.3-24V 14A
Ruggedized DC-DC Buck Converter	<a href="#">RGA</a>	250W, Input 9-40V or 9-53V, Output 3.3-24V or 3.3 up to 40V
DC-DC Buck Converter	<a href="#">i7A</a>	500-750W, Input 18-60V or 18-32V, Output 3.3-24V 33A or 3.3-18V 45A
DC-DC Buck-Boost Converter	<a href="#">i7C</a>	300W, Input 9-53V or 9-36V, Output 9.6-48V 8A, 5-28V 12.5A or 8-24V 20A
Evaluation Kit	<a href="#">i6A10A-C01-EVK-S1</a> <a href="#">i6A20A-001-EVK-S1CC</a> <a href="#">i6A20A-C01-EVK-S1</a> <a href="#">i6A10A-001-EVK-S1CC</a>	Compact Evaluation kit with i6A4W010A033V-001-R module Evaluation kit with i6A4W020A033V-001-R modules set for constant current operation Compact Evaluation kit with i6A4W020A033V-001-R module Evaluation kit with i6A4W010A033V-001-R modules set for constant current operation

**Specification**

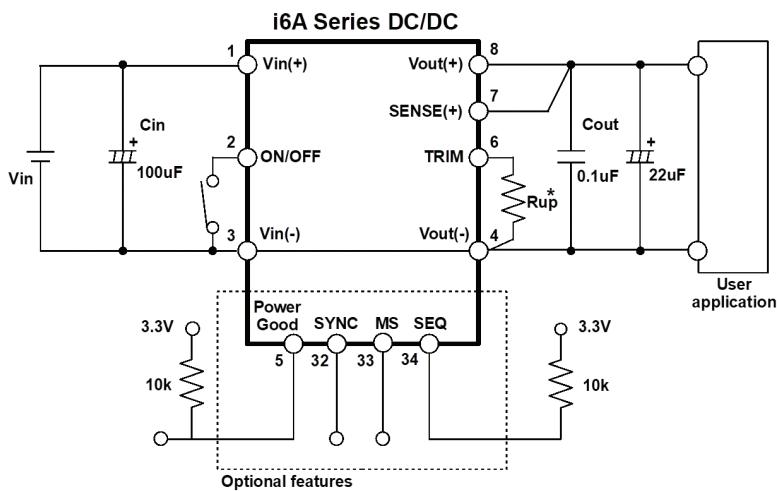
Model	i6A4W010A033V	i6A4W020A033V
<b>Input</b>		
Input Voltage Range	Vdc	9 to 53V (Turn on at 8V typ)
Input Current	A	20A maximum
Efficiency	%	94 - 97.5   90 - 97.0
Safety Certifications and Markings	-	IEC/UL/CSA/EN 62368-1, 60950-1, CE Mark and UKCA Mark
<b>Output</b>		
Output Voltage Tolerance	%	±4
Switching Frequency	kHz	400
Line Regulation	%	0.3   0.4
Load Regulation	%	0.9   1.2
External Load Capacitance	uF	0 - 1500
Output Ripple & Noise (pk-pk)	mV	50   20
Overcurrent Protection Threshold	A	15   27
Remote On / Off	-	See options table
Remote Sense	-	(+) Sense, compensating up to 5% of output voltage
Power Good	-	Optional (Full Feature Version)
Frequency Synchronization	-	Optional (Full Feature Version)
Output Sequencing	-	Optional (Full Feature Version)
Parallel Operation	-	Not possible
Series operation	-	Not possible
<b>Environmental</b>		
Operating Temperature	°C	-40 to 125 (see thermal data on website)
Storage Temperature	°C	-55 to 125
Cooling	-	Convection or forced air
<b>Other</b>		
Weight	g	15
Size (LxWxH)	mm	DIP Version: 33 x 22.9 x 12.1, SIP Version: 33 x 11.4 x 24.8
Size (LxWxH)	In	DIP Version: 1.30 x 0.9 x 0.74, SIP Version: 1.30 x 0.45 x 0.98
MTBF - Telcordia SR-332	-	> 12 Mhrs; 100% Load; Ta = 40 °C
Warranty	yrs	3

## Notes

See website for detailed [specifications](#).

(1) Output voltage cannot exceed input voltage. Refer to Input vs. Output graphs provided.

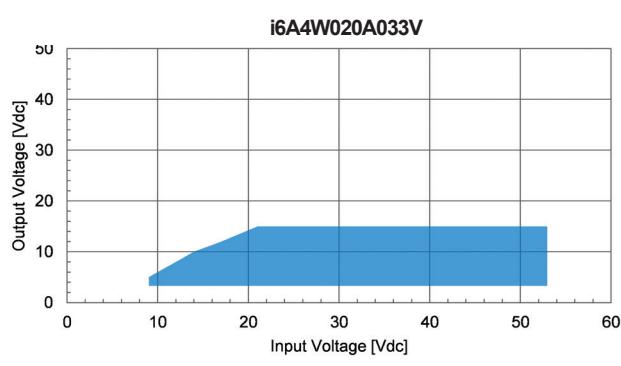
(2) Full Feature module but without the SEQ (Sequencing) Pin 34 installed. This eliminates the need for external pull-up resistor when Sequencing feature is not being used.

(3) If the Sequencing feature will not be used, the SEQ Pin 34 needs to be tied to a 1.8-3.3V source via a 10k resistor. See [Full specification](#) for details.**Typical Application Circuit**

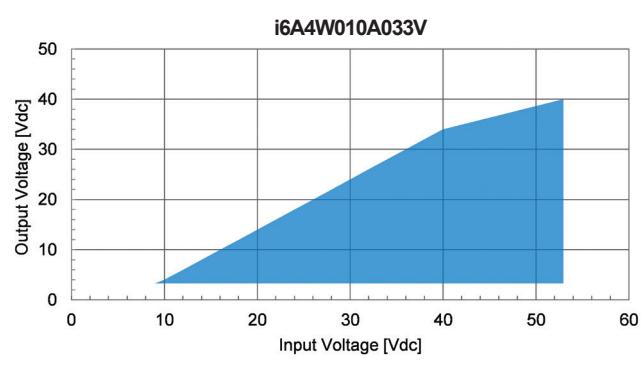
## Recommendation

- TRIM resistor Rup should be connected to the i6A module as close as possible.

## Output vs. Input Voltage Operating Range

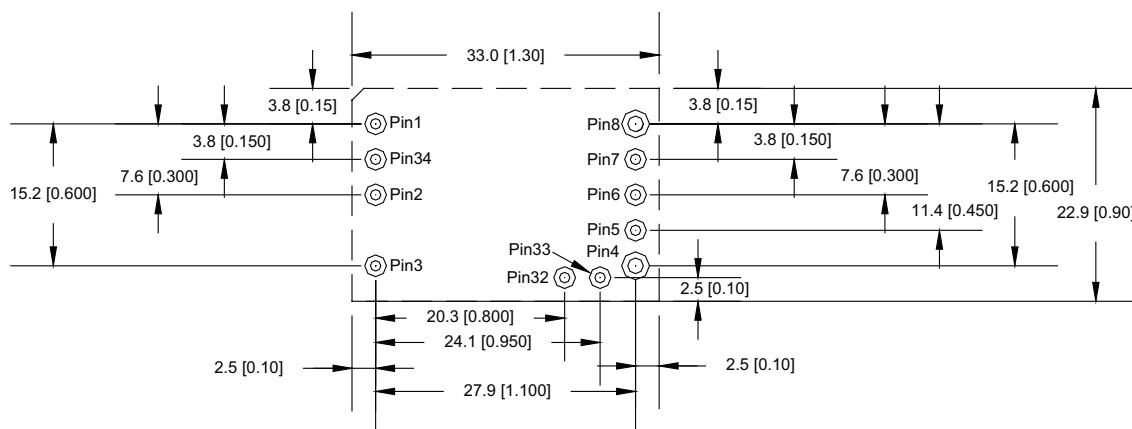


## Output vs. Input Voltage Operating Range



## Mechanical Specification (Horizontal Mount Through Hole)

### Recommended Hole Pattern (top view)

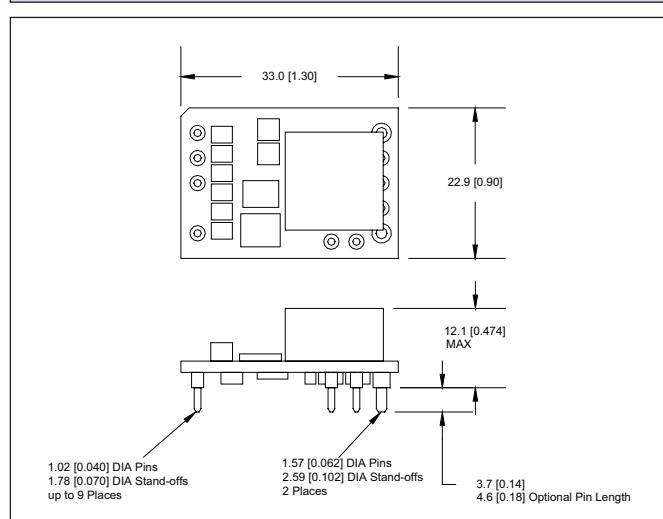


### Pinout

PIN	Function	PIN	Function
1	VIN (+)	7	SENSE (+)
2	ON / OFF	8	VOUT (+)
3	VIN (-)	32	Sync (Option)
4	VOUT (-)	33	MS (Option)
5	PWR GOOD (Option)	34	SEQ (Option)
6	TRIM		

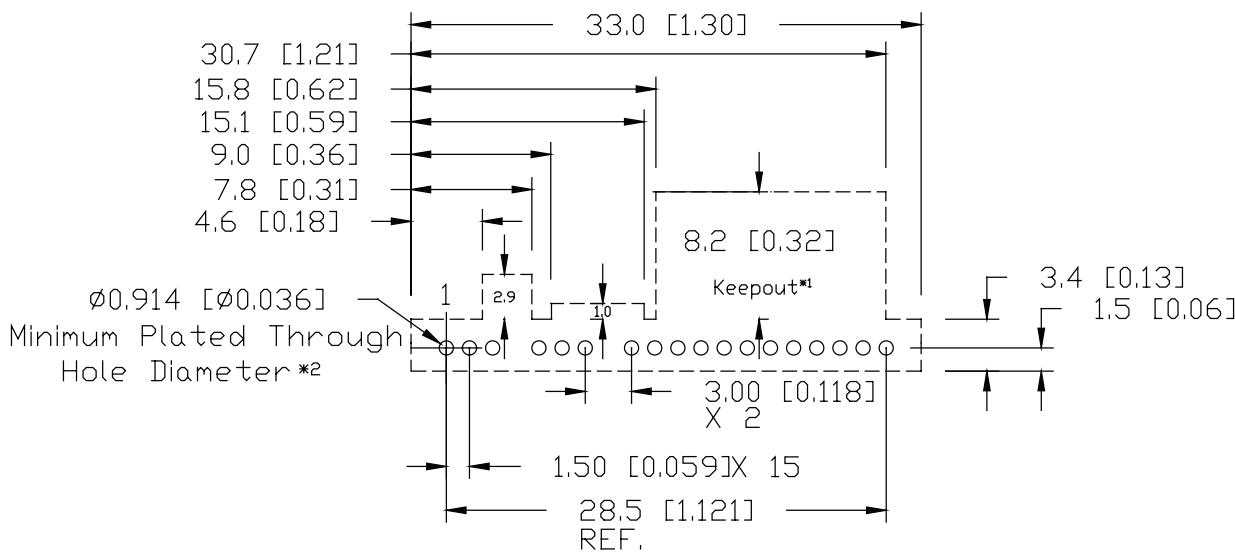
Pin base material is brass or copper with gold over nickel plating.

### Mechanical Specification



## Mechanical Specification (SIP - Through Hole)

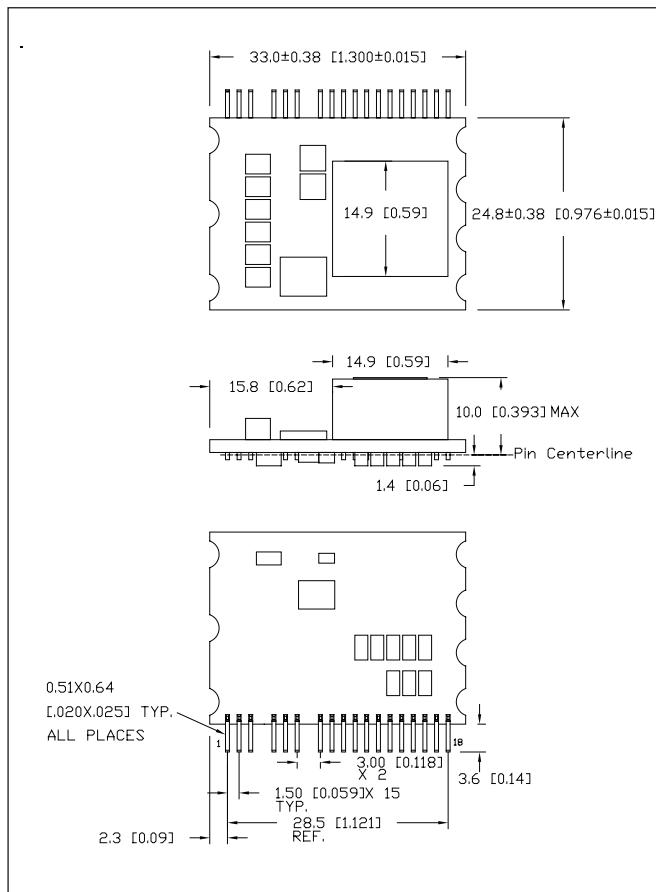
## Recommended Hole Pattern (top view)



## Pinout

PIN	Function	PIN	Function
1	VIN (+)	10	TRIM
2	VIN (+)	11	VOUT (-)
3	VIN (+)	12	VOUT (-)
4	VIN (-)	13	VOUT (-)
5	ON / OFF	14	SENSE (+)
6	MS (Option)	15	VOUT (+)
7	Sync (Option)	16	VOUT (+)
8	SEQ (Option)	17	VOUT (+)
9	PWR GOOD (Option)	18	VOUT (+)

## Mechanical Specification



Pin base material is brass or copper with matte tin over nickel plating.



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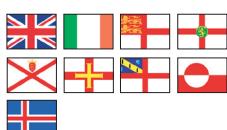
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