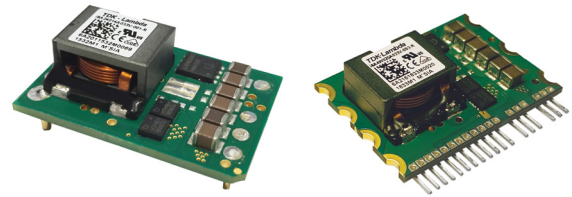


## 250W, 9 to 53V Input Non-Isolated Step Down DC-DC Converter

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



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	Benefits
• Up to 250W in a 1/16th brick or SIP package	• Very High Power Density
• Very high Efficiency up to 97%	• Easier Thermal Management
• Wide Output Adjustment 3.3 to 15V & 3.3 to 40V	• One Part For Multiple Applications
• Minimal External Components Needed	• Less Board Area Required
• Low Airflow With Minimal Derating Requirements	• 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
<a href="#">i6A4W010A033V-001-R</a>	3.3 to 40	10	250	-	Yes	-	DIP
<a href="#">i6A4W010A033V-0S1-R</a>	3.3 to 40	10	250	-	Yes	-	SIP
<a href="#">i6A4W020A033V-000-R</a>	3.3 to 15	20	250	Yes	-	-	DIP
<a href="#">i6A4W020A033V-001-R</a>	3.3 to 15	20	250	-	Yes	-	DIP
<a href="#">i6A4W020A033V-0S1-R</a>	3.3 to 15	20	250	-	Yes	-	SIP
<a href="#">i6A4W020A033V-002-R</a>	3.3 to 15	20	250	Yes	-	Yes	DIP
<a href="#">i6A4W020A033V-003-R</a>	3.3 to 15	20	250	-	Yes	Yes	DIP
<a href="#">i6A4W020A033V-0S3-R</a>	3.3 to 15	20	250	-	Yes	Yes	SIP
<a href="#">i6A4W020A033V-005-R</a>	3.3 to 15	20	250	-	Yes	Yes <sup>(2)</sup>	DIP

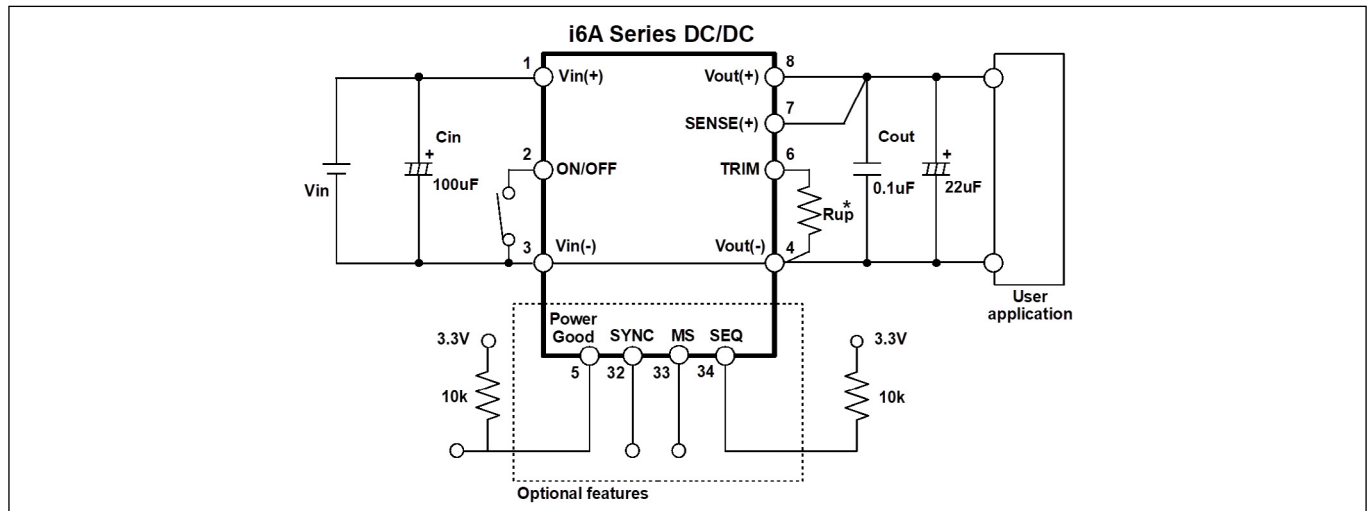
Preferred model

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
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>	Compact Evaluation kit with i6A4W010A033V-001-R module
	<a href="#">i6A20A-001-EVK-S1CC</a>	Evaluation kit with i6A4W020A033V-001-R modules set for constant current operation
	<a href="#">i6A20A-C01-EVK-S1</a>	Compact Evaluation kit with i6A4W020A033V-001-R module
	<a href="#">i6A10A-001-EVK-S1CC</a>	Evaluation kit with i6A4W010A033V-001-R modules set for constant current operation

Specification		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	

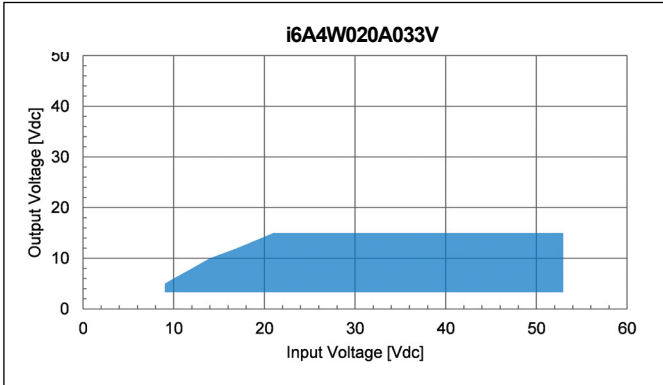
- Notes
- (1) Output voltage cannot exceed input voltage. Refer to Input vs. Output graphs provided.
  - (2) Full Feature module but without the SEQ (Sequencing) Pin 34 installed. This eliminates the need for external pull-up resistor when Sequencing feature is not being used.
  - (3) If the Sequencing 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**

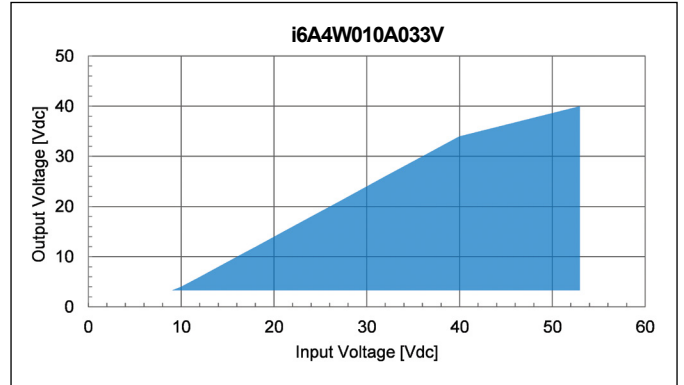


Recommendation  
 1. TRIM resistor Rup should be connected to the i6A module as close as possible.

## Output vs. Input Voltage Operating Range

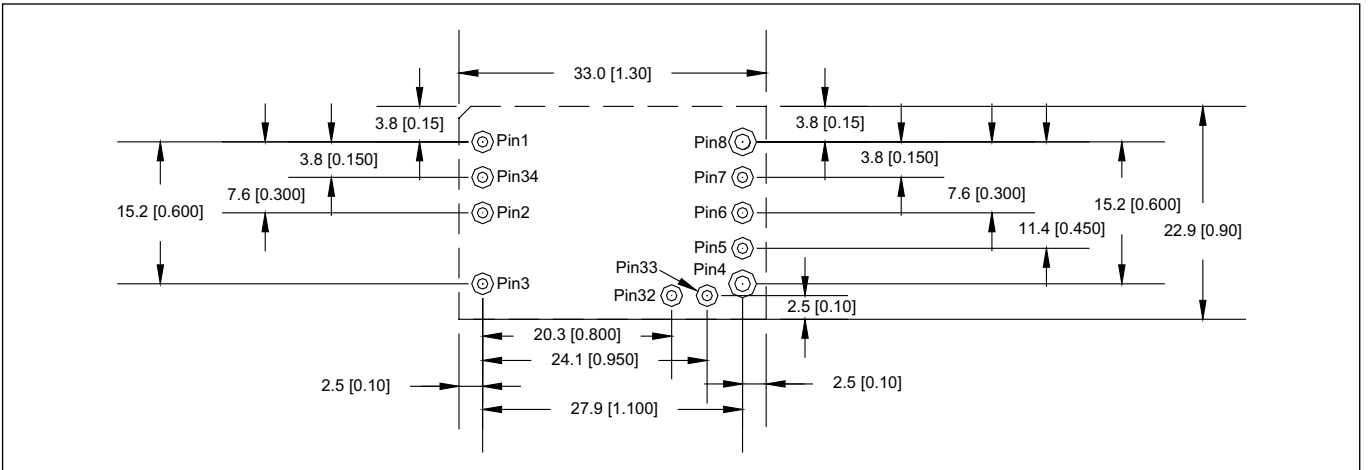


## Output vs. Input Voltage Operating Range



## Mechanical Specification (Horizontal Mount Through Hole)

### Recommended Hole Pattern (top view)

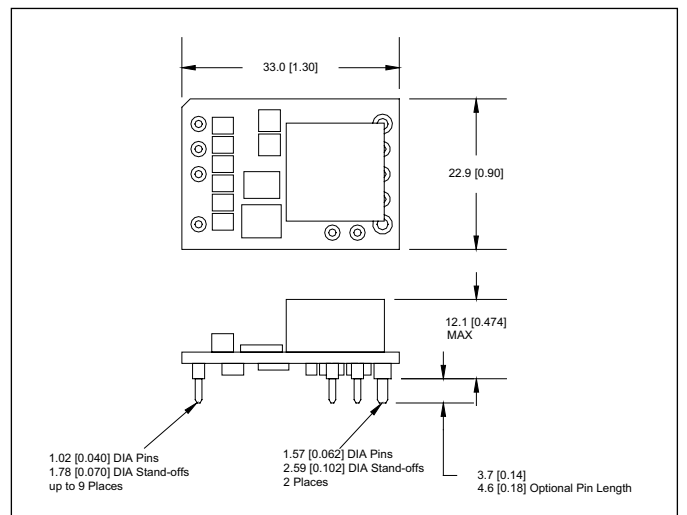


### Pinout

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		

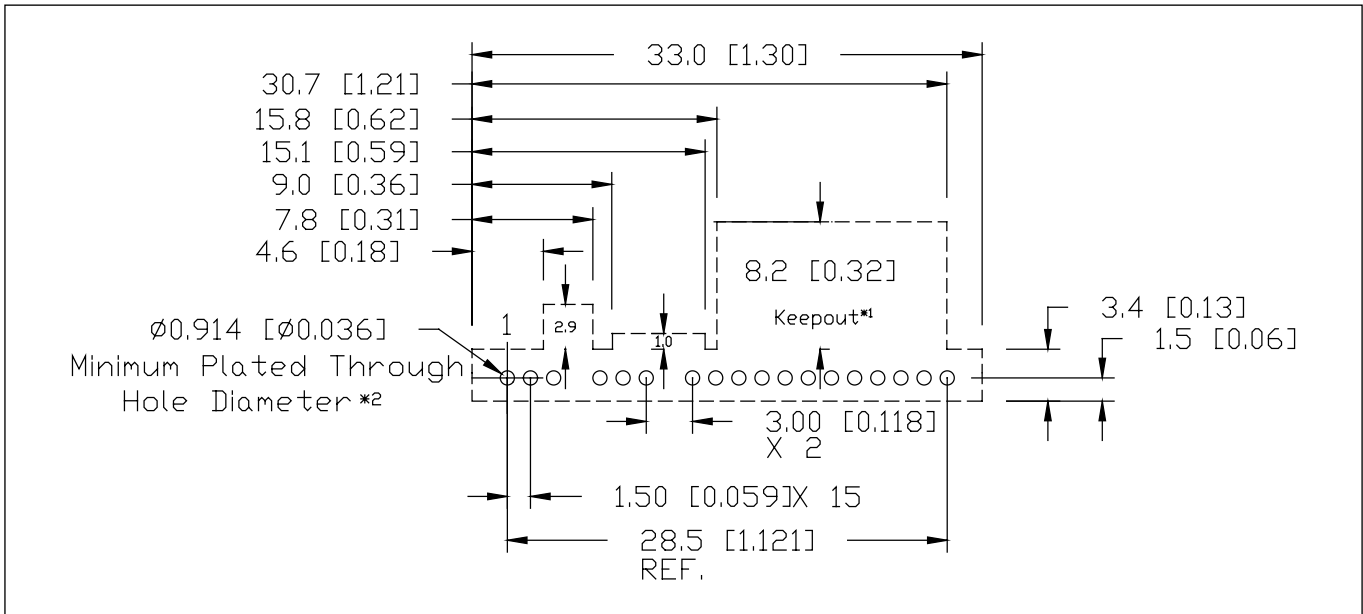
Pin base material is brass or copper with gold over nickel plating.

### Mechanical Specification



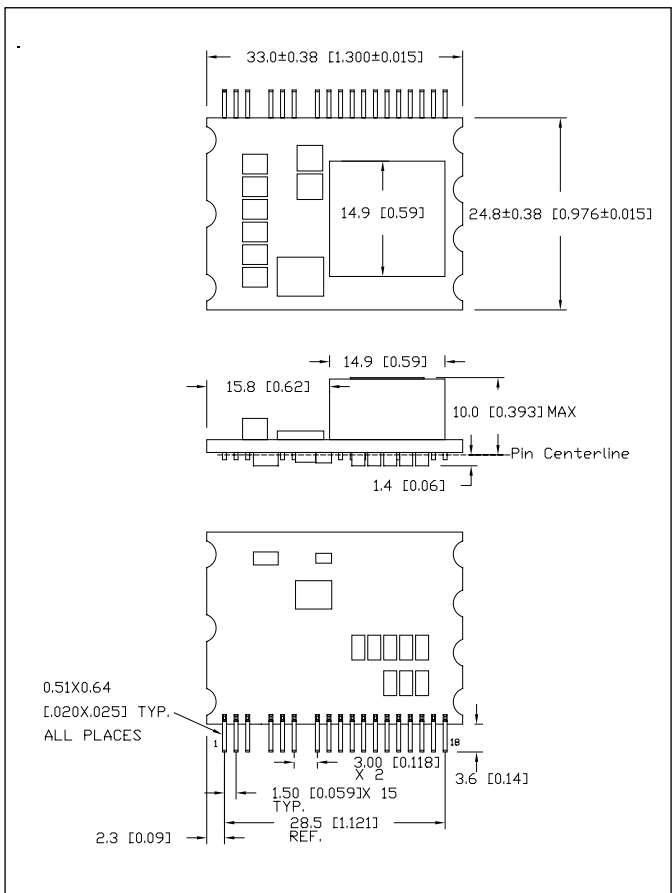
**Mechanical Specification (SIP - Through Hole)**

**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.



## TDK-Lambda France SAS

Tel: +33 1 60 12 71 65  
france@fr.tdk-lambda.com  
www.emea.lambda.tdk.com/fr



## Italy Sales Office

Tel: +39 02 61 29 38 63  
info.italia@it.tdk-lambda.com  
www.emea.lambda.tdk.com/it



## Netherlands

info@nl.tdk-lambda.com  
www.emea.lambda.tdk.com/nl



## TDK-Lambda Germany GmbH

Tel: +49 7841 666 0  
info@de.tdk-lambda.com  
www.emea.lambda.tdk.com/de



## Austria Sales Office

Tel: +43 2256 655 84  
info@at.tdk-lambda.com  
www.emea.lambda.tdk.com/at



## Switzerland Sales Office

Tel: +41 44 850 53 53  
info@ch.tdk-lambda.com  
www.emea.lambda.tdk.com/ch



## Nordic Sales Office

Tel: +45 8853 8086  
info@dk.tdk-lambda.com  
www.emea.lambda.tdk.com/dk



## TDK-Lambda UK Ltd.

Tel: +44 (0) 12 71 85 66 66  
info@uk.tdk-lambda.com  
www.emea.lambda.tdk.com/uk



## TDK-Lambda Ltd.

Tel: +9 723 902 4333  
info@tdk-lambda.co.il  
www.emea.lambda.tdk.com/il



## C.I.S.

### Commercial Support:

Tel: +7 (495) 665 2627

### Technical Support:

Tel: +7 (812) 658 0463  
info@tdk-lambda.ru  
www.emea.lambda.tdk.com/ru



## TDK-Lambda Americas

Tel: +1 800-LAMBDA-4 or 1-800-526-2324  
powersolutions@us.tdk-lambda.com  
www.us.lambda.tdk.com



## TDK Electronics do Brasil Ltda

Tel: +55 11 3289-9599  
sales.br@tdk-electronics.tdk.com  
www.tdk-electronics.tdk.com/en



## TDK-Lambda Corporation

Tel: +81-3-6778-1113  
www.jp.lambda.tdk.com



## TDK-Lambda (China) Electronics Co. Ltd.

Tel: +86 21 6485-0777  
powersolutions@cn.tdk-lambda.com  
www.lambda.tdk.com.cn



## TDK-Lambda Singapore Pte Ltd.

Tel: +65 6251 7211  
tts.mkt@sg.tdk-lambda.com  
www.sg.lambda.tdk.com



## TDK India Private Limited, Power Supply Division

Tel: +91 80 4039-0660  
mathew.philip@in.tdk-lambda.com  
www.sg.lambda.tdk.com

