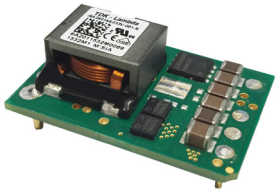
250W, 9 to 53V Input Non-Isolated Step Down DC-DC Converter

https://product.tdk.com/en/power/i6a
www.emea.lambda.tdk.com/i6a



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)(1)	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(2)	DIP

Preferred model

Related Products

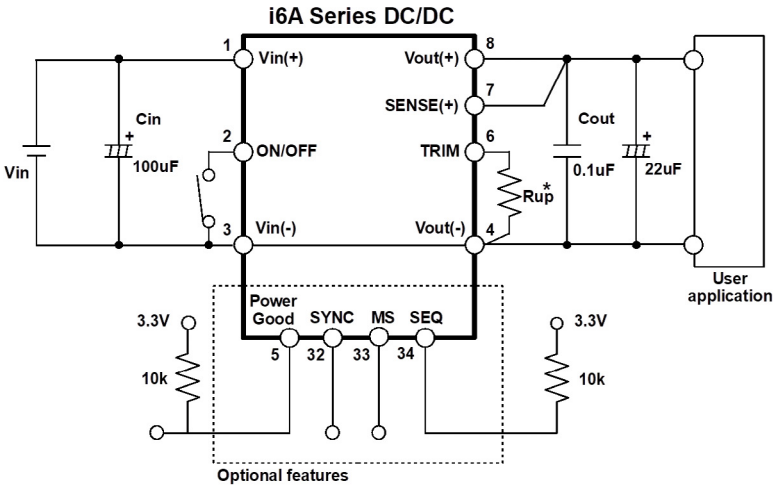
Model	Part Number	Description
Evaluation Kits	i6A20A-001-EVK-S1PX	Populated with i6A4W020A033V-001-R module
	i6A20A-001-EVK-S1CC	Populated with i6A4W020A033V-001-R module set for constant current operation
	i6A10A-001-EVK-S1PX	Populated with i6A4W010A033V-001-R module
	i6A10A-001-EVK-S1CC	Populated with i6A4W010A033V-001-R module set for constant current operation

Specification

Model		i6A4W010A033V	i6A4W020A033V
Input			
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 Agency Certifications	-	IEC/UL/CSA/EN 62368-1, IEC/UL/CSA/EN 60950-1, CE Mark	
Output			
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	
Environmental			
Operating Temperature	°C	-40 to 125 (see thermal data on website)	
Storage Temperature	°C	-55 to 125	
Cooling	-	Convection or forced air	
Other			
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	

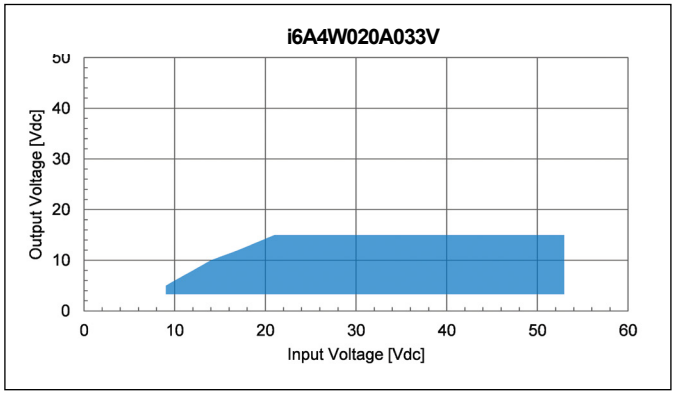
Notes
See website for detailed specifications.
(1) Output voltage cannot exceed input voltage. Refer to Input vs. Output graphs provided.
(2) Full Feature module but without the SEQ (Sequencing) Pin 34 installed. This eliminates the need for external pull-up resistor when Sequencing feature is not being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

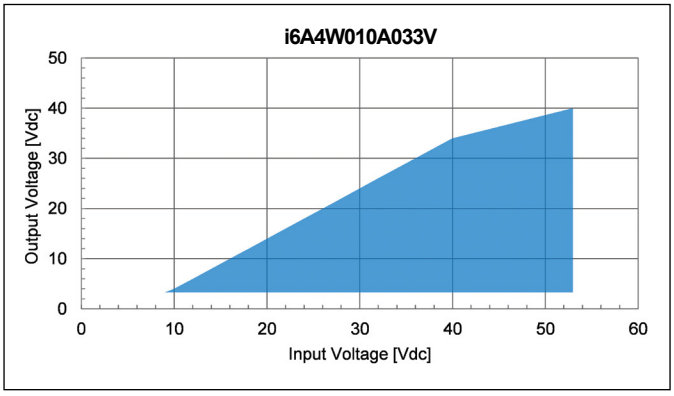


Recommendation
1. TRIM resistor Rup should be connected to the i6A module as close as possible.

Output vs. Input Voltage Operating Range

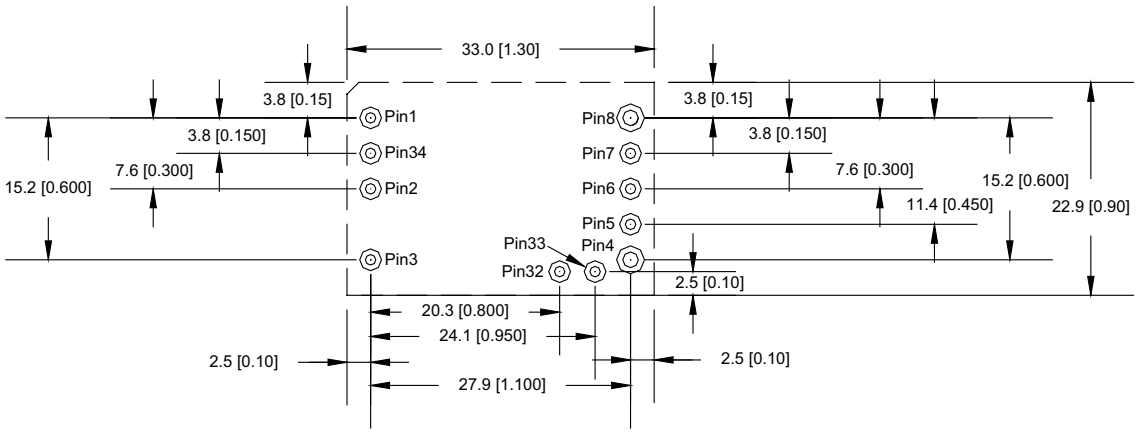


Output vs. Input Voltage Operating Range



Mechanical Specification (Horizontal Mount Through Hole)

Recommended Hole Pattern (top view)

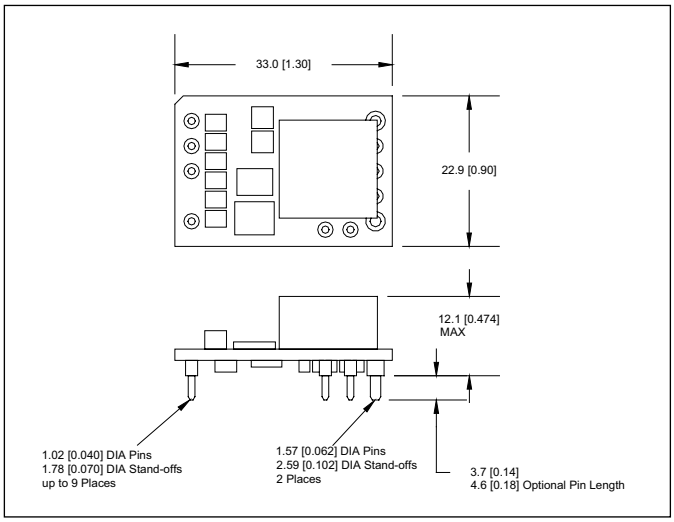


Pinout

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		

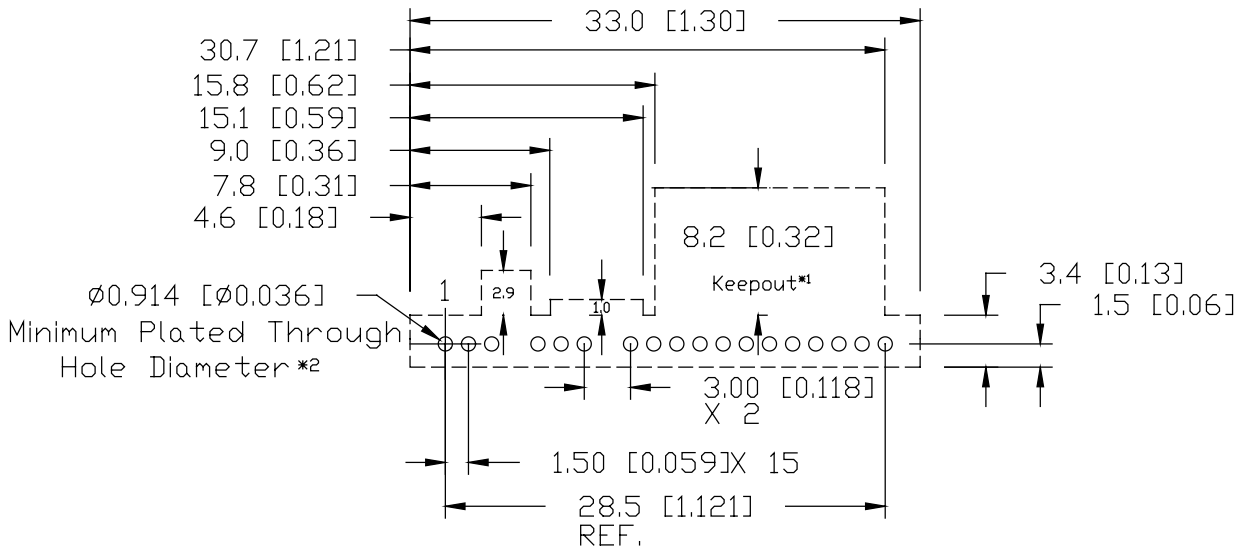
Pin base material is brass or copper with gold over nickel plating.

Mechanical Specification



Mechanical Specification (SIP - Through Hole)

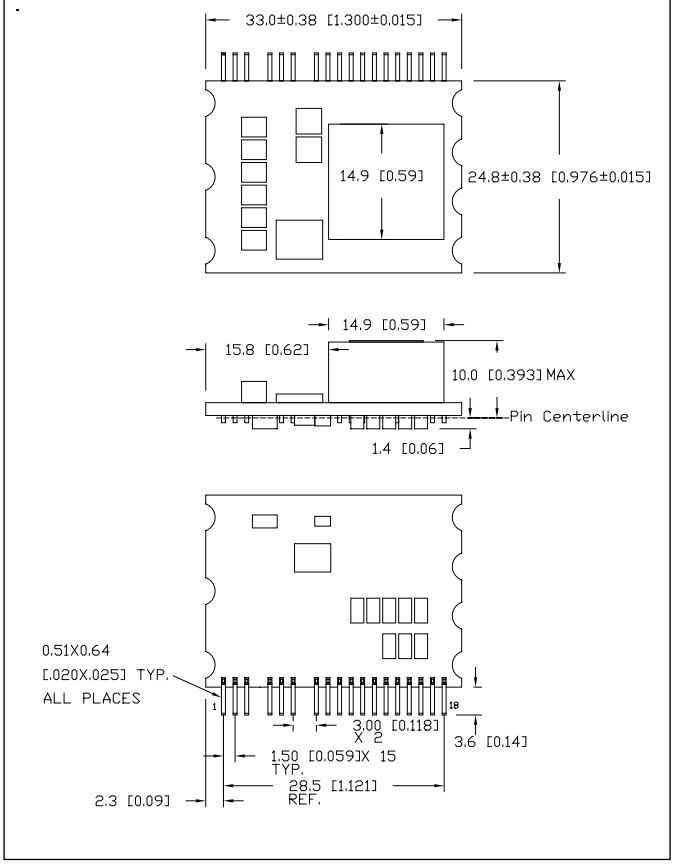
Recommended Hole Pattern (top view)



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

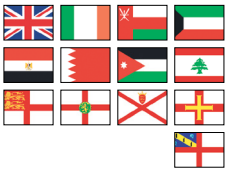
Netherlands
info@nl.tdk-lambda.com
www.emea.lambda.tdk.com/nl

TDK-Lambda Germany GmbH
Tel: +49 7841 666 0
info.germany@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
powersolutions@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
tls.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