

250W, 9 to 40V Input Non-Isolated Step-Down DC-DC Buck Converter

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



The i6A series of non-isolated DC-DC step-down converters are ideal for creating additional high current output voltage rails from a single output 12V or 24V AC-DC or DC-DC power supply. The highly efficient i6A series accepts a wide DC input and has a wide output adjustment range in compact 1/16th brick 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 250 W in a 1/16th brick package	• High Power Density, Less Board Area Needed
• High Efficiency Up to 98%	• Longer Battery Life / Less Power Consumed
• Wide Output Adjustment 3.3 to 24 V	• One Part Supports Multiple System Voltages
• 9 to 40V Input Range	• Can Operate From Different DC Source Voltages Including Batteries
• Low Component Count With Minimal External Components	• Low Cost
• Minimal Derating Requirements in Low Airflow Environments	• Easy to Cool in End System

Model Selector							
Model	Input Voltage (V)	Output Voltage (V)	Max Current (A)	Max Power (W)	Negative Logic On/Off	Positive Logic On/Off	Full Feature
i6A24014A033V-000-R	9 - 40	3.3 - 24	14	250	-	Yes	-
i6A24014A033V-001-R	9 - 40	3.3 - 24	14	250	Yes	-	-
i6A24014A033V-002-R	9 - 40	3.3 - 24	14	250	-	Yes	Yes
i6A24014A033V-003-R	9 - 40	3.3 - 24	14	250	Yes	-	Yes

Preferred model

Related Products		
Type	Part Number	Description
DC-DC Buck Converter	i3A	100W, Input 9-53V, Output 5-30V 4.5A or 3.3-16.5V 8A
DC-DC Buck Converter	i6A4W	250W, Input 9-53V, Output 3.3-40V 10A or 3.3-15V 20A
DC-DC Buck Converter	i6AN	75W, Input 9-40V, Negative Output -3.3 to -30V, 8A
Ruggedized DC-DC Buck Converter	RGA	250W, Input 9-40V or 9-53V, Output 3.3-24V or 3.3 up to 40V
DC-DC Buck Converter	i7A	500-750W, Input 18-60V or 18-32V, Output 3.3-24V 33A or 3.3-18V 45A
DC-DC Buck-Boost Converter	i7C	300W, Input 9-53V or 9-36V, Output 9.6-48V 8A, 5-28V 12.5A or 8-24V 20A
Evaluation Kit	i6A14A-C01-EVK-S1	Compact Evaluation kit with i6A24014A033V-001-R module
Evaluation Kit	i6A14A-001-EVK-S1PX	Evaluation kit with i6A24014A033V-001-R module
Evaluation Kit	i6A14A-001-EVK-D2PN	Evaluation kit with i6A24014A033V-001-R module and i6A24008A033V-N01-R modules

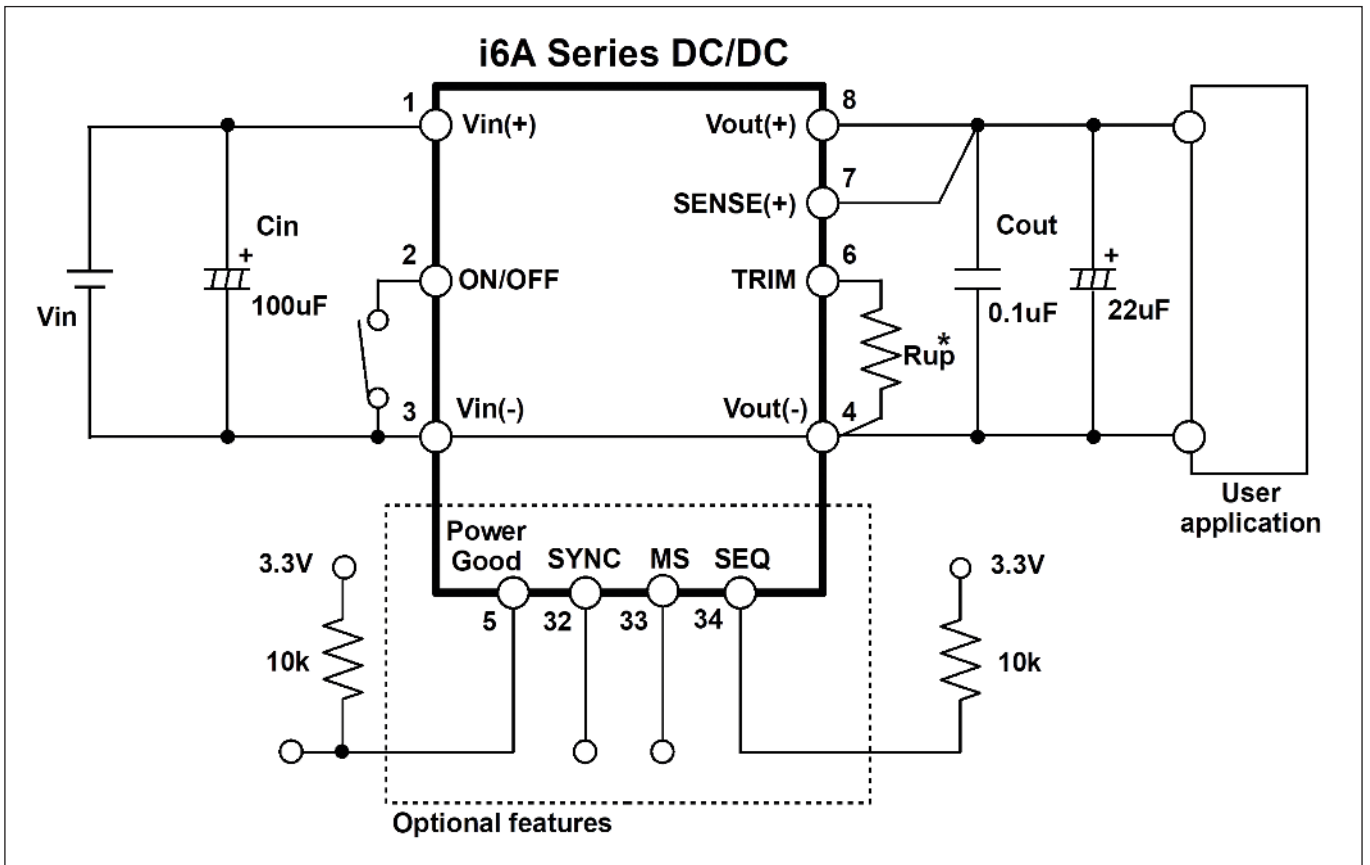
Specification			
Model		i6A24014A033V	
Input			
Input Voltage Range	Vdc	9 - 40	
Input Current (max)	A	15	
Turn-ON Input Voltage	Vdc	8	
Turn-OFF Input Voltage	Vdc	7 - 9	
Efficiency	%	92.5 - 98	
Safety Certifications and Markings	-	IEC/UL/CSA/EN 62368-1, 60950-1, CE Mark and UKCA Mark	
Output			
Output Voltage Tolerance	%	± 4	
Line Regulation	%	0.3	
Load Regulation	%	1	
External Load Capacitance	µF	0 - 2000	
Ripple & Noise	mVpp	20	
Switching Frequency	kHz	400	
Overcurrent Protection Threshold (typ)	A	22	
Overtemperature Protection	-	Yes	
Output Voltage Adjustment Range		3.3 to 24	
		See product specifications for output trim equation	
Remote Sense	-	(+) Sense, compensating up to 5% of output voltage	
Remote On/Off	-	Negative or Positive Logic	
Power Good	-	Optional (Full Feature Version)	
Frequency Synchronization	-	Optional (Full Feature Version)	
Output Sequencing	-	Optional (Full Feature Version)	
Environmental			
Operating Temperature (Tref)	°C	-40 to 125	
Storage Temperature	°C	-55 to 125	
Humidity (non condensing)	%RH	5 - 95 (Operating & Storgae)	
Cooling	-	Convection or forced air	
Other			
Weight (Typ)	g	15	
Size (LxWxH)	mm	33.0 x 22.9 x 12.1	
Size (LxWxH)	Inches	1.30 x 0.90 x 0.47	
MTBF - Telcordia SR-332	-	> 10 Mhrs; 100% Load; Ta = 40 °C	
Warranty	yrs	3 years	

See website for detailed [product specifications](#).

Pinout			
PIN	Function	PIN	Function
1	Vin (+)	7	Sense +
2	On / Off	8	Vout (+)
3	Vin (-) / GND	32	SYNC (Option)
4	Vout (-) / GND	33	MS (Option)
5	Power Good (Option)	34	SEQ (Option)
6	Trim		

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

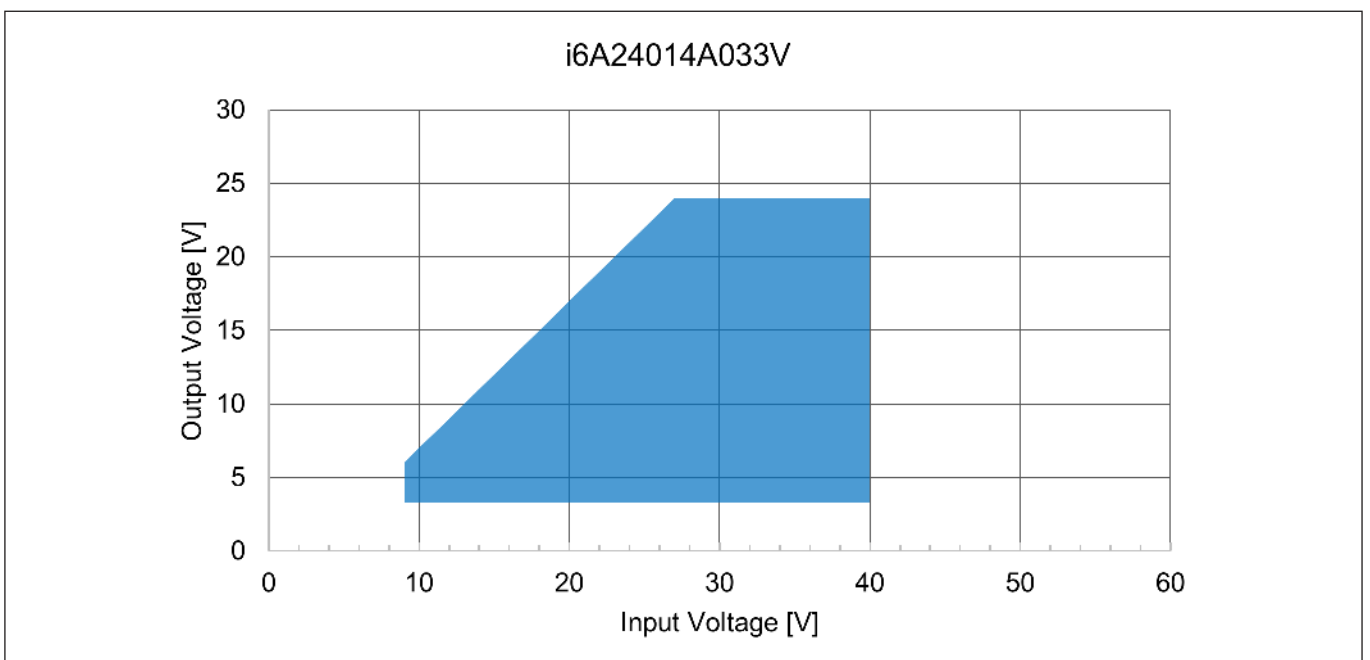
Typical Application Circuit (i6A)



Recommendation:

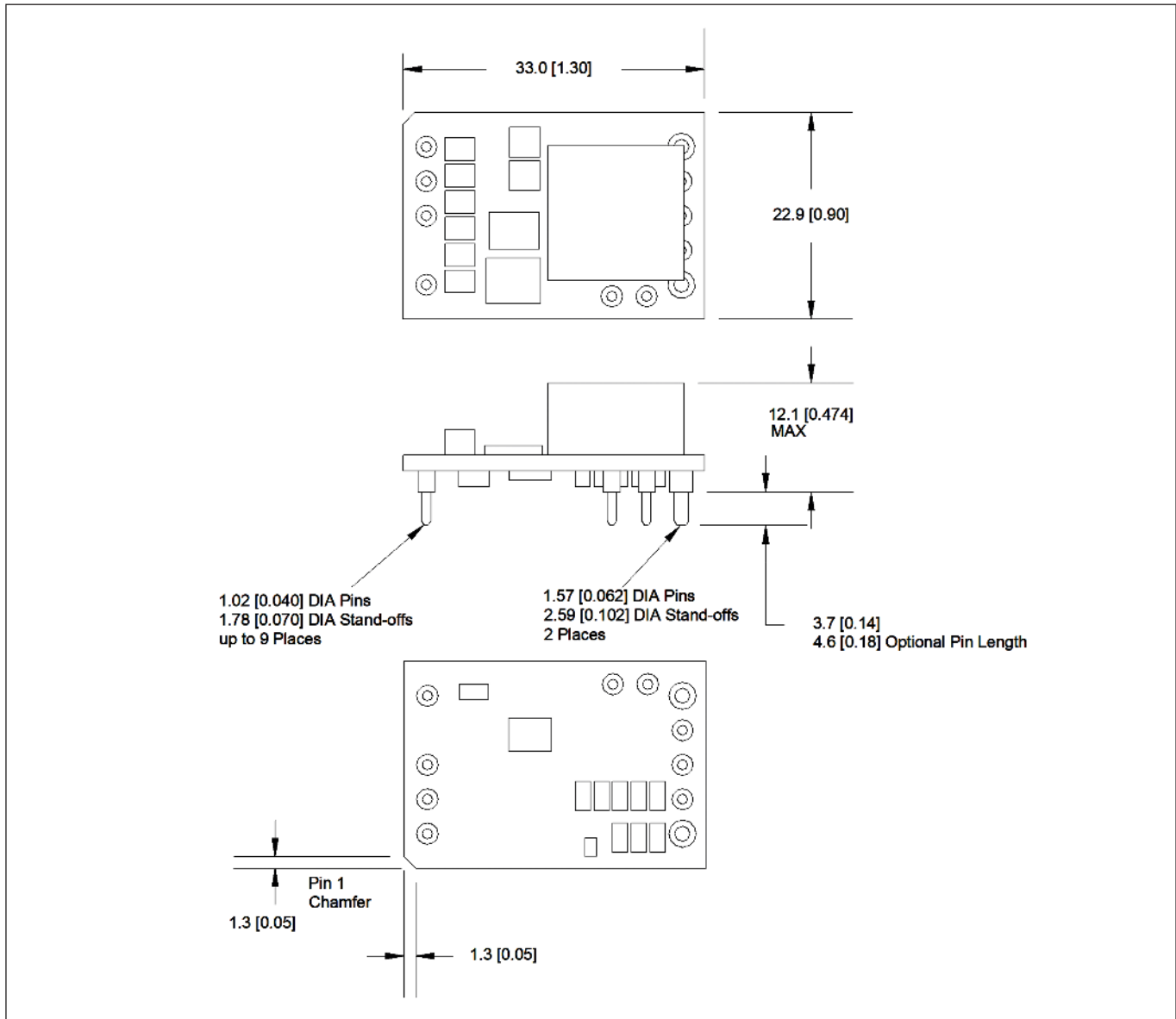
1. TRIM resistor R_{up} should be connected to the i6A module as close as possible.

Output vs. Input Voltage Operating Range

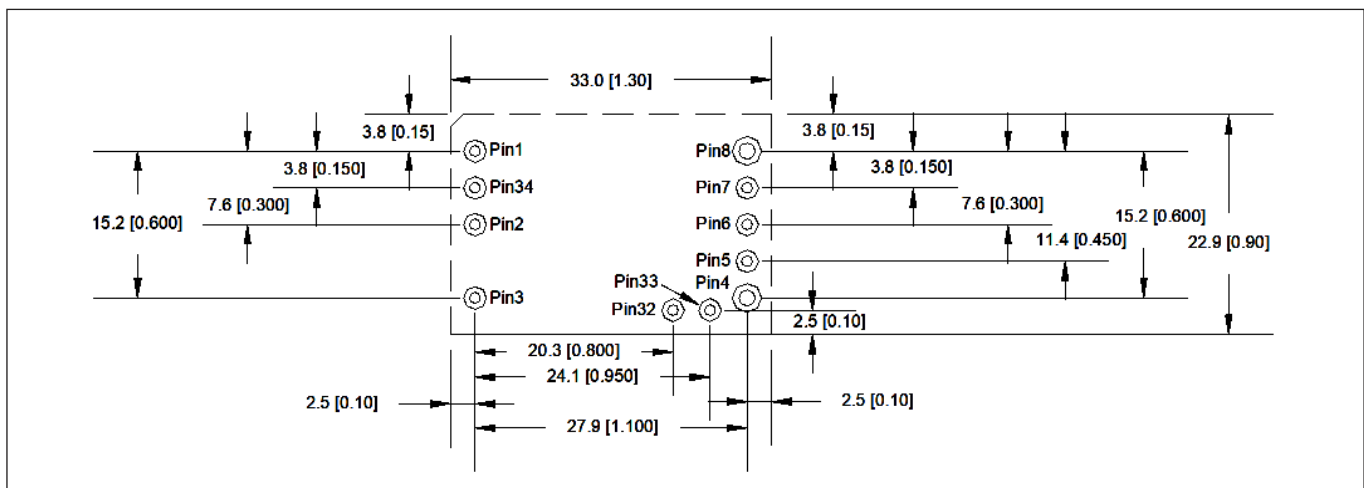


Mechanical Specification

Dimensions are in mm [in]. Unless otherwise specified tolerances are: $x.x \pm 0.5$ [0.02], $x.xx \pm 0.25$ [0.010]



Recommended Hole Pattern (Top View)





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