https://product.tdk.com/en/power/i7a
www.emea.lambda.tdk.com/i7a

400W-1000W, 9-18V, 18-32V, 18-50V or 28-60V Input Non-Isolated Step Down DC-DC Converter



Industrial Test COMM Broadcast Robotics

The i7A series of high-efficiency, non-isolated buck converters delivers scalable power solutions up to 1000W in a compact 1/16th brick pinout, addressing key design challenges such as limited board space, inefficient power delivery, and complex thermal management. With output currents up to 100A and wide input/output voltage ranges, it simplifies various power distribution architectures and part number management while reducing the need to parallel multiple converters. Its fast transient response and low ripple ensure stable performance, while three thermal configurations—open frame, baseplate, and heatsink—offer flexible cooling options tailored to system requirements. Available with positive or negative logic remote on/off and an optional adjustable OCP current limit threshold, the i7A is ideal for industrial, communications, test and measurement, and battery-powered applications, including mobile robotics.

Features	Benefits
• Up to 1000W in a 1/16th Brick Pin-Out	• High Power Density, Less Board Area Needed
• High Efficiency - Up to 99%	• Reduced Energy Consumption / Longer Battery Life
• Wide 0.8 to 8V or 3.3V up to 32V Output Adjustment	• One Part Supports Multiple System Voltages
• 9 to 18V, 18 to 32V, 18 to 60V or 28 to 60V Input	• Can Operate From Different DC Source Voltages Including Batteries
• Adjustable OCP, Current Limit Threshold	• Reduces Overload and Thermal Stress Without Additional Circuitry
• Minimal Derating Requirements in Low Airflow Environments	• Easy To Cool In End System

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-Boost Converter	i1C	200W, Input 9-36V or 18-75V, Output 9.6-28V, 1x1 inch Footprint
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
DC-DC Buck Converter	RGA	250W, Input 9 up to 53V, Output 3.3 up to 40V, Rugged Modules
DC-DC Buck Converter	RGB	400-750W, Input 9 to 18V or 18 up to 60V, Output 0.8 tp 8V or 3.3 up to 24V, Rugged Modules
DC-DC Buck-Boost Converter	RGC	300W, Input 9-53V, Output 9.6-48V 8A or 5-28V 12.5A, Rugged Modules
EMI Filter Module	RGF	80V, 20A or 40A Differential Mode Filter Module
ORing FET Module	i1R	60V/60A; 30V/80A ORring FET (Ideal Diode) Modules
Evaluation Kit	i7A20A-C01-EVK-S1	Evaluation kit with I7A48020A033V-001-R Module
Evaluation Kit	i7A33A-C01-EVK-S1	Evaluation kit with I7A4W033A033V-001-R Module
Evaluation Kit	i7A45A-C01-EVK-S1	Evaluation kit with I7A24045A033V-001-R Module
Evaluation Kit	i7A60A-C01-EVK-S1	Evaluation kit with I7A12060A008V-001-R Module
Evaluation Kit	i7AS60A-C03-EVK-S1	Evaluation kit with high power I7A4W060A033V-0C3-R Module
Evaluation Kit	i7AS80A-C03-EVK-S1	Evaluation kit with high power I7A24080A033V-0C3-R Module
Evaluation Kit	i7AS100A-C03-EVK-S1	Evaluation kit with high power I7A12100A008V-0C3-R Module
Evaluation Kit	i7ASX-C03-EVK-S0	Evaluation kit for I7A series with no DC-DC module mounted

Model Selector

Model	Max O/P Power (W)	Input Voltage (V)	Output Voltage (V)	Max O/P Current (A)	Typical Efficiency	Remote ON/OFF Logic	Adjustable (OCP) Current Limit	Construction	Height / Profile mm (inch)
General Purpose Wide Input Range									
i7A4W033A033V-000-R	500	18 - 60	3.3 - 24	33	97%	Positive	-	Openframe	11.5 [0.45]
i7A4W033A033V-001-R #	500	18 - 60	3.3 - 24	33	97%	Negative	-	Openframe	11.5 [0.45]
i7A4W033A033V-003-R #	500	18 - 60	3.3 - 24	33	97%	Negative	Yes / Pin 5	Openframe	11.5 [0.45]
i7A4W033A033V-0C1-R #	500	18 - 60	3.3 - 24	33	97%	Negative	-	Baseplate	12.7 [0.50]
i7A4W033A033V-0C3-R	500	18 - 60	3.3 - 24	33	97%	Negative	Yes / Pin 5	Baseplate	12.7 [0.50]
i7A4W033A033V-0F1-R #	500	18 - 60	3.3 - 24	33	97%	Negative	-	Heatsink	24.9 [0.98]
i7A4W033A033V-0F3-R	500	18 - 60	3.3 - 24	33	97%	Negative	Yes / Pin 5	Heatsink	24.9 [0.98]
i7A4W060A033V-0C0-R	720	18 - 60	3.3 - 28	60	99%	Positive	-	Enhanced Baseplate	19.8 [0.78]
i7A4W060A033V-0C1-R #	720	18 - 60	3.3 - 28	60	99%	Negative	-		19.8 [0.78]
i7A4W060A033V-0C3-R	720	18 - 60	3.3 - 28	60	99%	Negative	Yes / Pin 5		19.8 [0.78]
24V Input Optimized									
i7A24045A033V-000-R	750	18 - 32	3.3 - 18	45	97%	Positive	-	Openframe	11.5 [0.45]
i7A24045A033V-001-R #	750	18 - 32	3.3 - 18	45	97%	Negative	-	Openframe	11.5 [0.45]
i7A24045A033V-003-R #	750	18 - 32	3.3 - 18	45	97%	Negative	Yes / Pin 5	Openframe	11.5 [0.45]
i7A24045A033V-0C1-R #	750	18 - 32	3.3 - 18	45	97%	Negative	-	Baseplate	12.7 [0.50]
i7A24045A033V-0C3-R	750	18 - 32	3.3 - 18	45	97%	Negative	Yes / Pin 5	Baseplate	12.7 [0.50]
i7A24045A033V-0F1-R #	750	18 - 32	3.3 - 18	45	97%	Negative	-	Heatsink	24.9 [0.98]
i7A24045A033V-0F3-R	750	18 - 32	3.3 - 18	45	97%	Negative	Yes / Pin 5	Heatsink	24.9 [0.98]
i7A24080A033V-0C0-R	1000	18 - 32	3.3 - 18	80	98%	Positive	-	Enhanced Baseplate	19.8 [0.78]
i7A24080A033V-0C1-R #	1000	18 - 32	3.3 - 18	80	98%	Negative	-		19.8 [0.78]
i7A24080A033V-0C3-R	1000	18 - 32	3.3 - 18	80	98%	Negative	Yes / Pin 5		19.8 [0.78]
48V Input Optimized									
i7A48020A033V-000-R	500	28 - 60	3.3 -32	20	97%	Positive	-	Openframe	11.5 [0.45]
i7A48020A033V-001-R #	500	28 - 60	3.3 -32	20	97%	Negative	-	Openframe	11.5 [0.45]
i7A48020A033V-003-R #	500	28 - 60	3.3 -32	20	97%	Negative	Yes / Pin 5	Openframe	11.5 [0.45]
i7A48020A033V-0C1-R #	500	28 - 60	3.3 -32	20	97%	Negative	-	Baseplate	12.7 [0.50]
i7A48020A033V-0C3-R	500	28 - 60	3.3 -32	20	97%	Negative	Yes / Pin 5	Baseplate	12.7 [0.50]
i7A48020A033V-0F1-R #	500	28 - 60	3.3 -32	20	97%	Negative	-	Heatsink	24.9 [0.98]
i7A48020A033V-0F3-R	500	28 - 60	3.3 -32	20	97%	Negative	Yes / Pin 5	Heatsink	24.9 [0.98]
12V Input Optimized									
i7A12060A008V-000-R	400	9 - 18	0.8 - 8	60	97%	Positive	-	Openframe	11.5 [0.45]
i7A12060A008V-001-R #	400	9 - 18	0.8 - 8	60	97%	Negative	-	Openframe	11.5 [0.45]
i7A12060A008V-003-R #	400	9 - 18	0.8 - 8	60	97%	Negative	Yes / Pin 5	Openframe	11.5 [0.45]
i7A12060A008V-0C1-R #	400	9 - 18	0.8 - 8	60	97%	Negative	-	Baseplate	12.7 [0.50]
i7A12060A008V-0C3-R	400	9 - 18	0.8 - 8	60	97%	Negative	Yes / Pin 5	Baseplate	12.7 [0.50]
i7A12060A008V-0F1-R #	400	9 - 18	0.8 - 8	60	97%	Negative	-	Heatsink	24.9 [0.98]
i7A12060A008V-0F3-R	400	9 - 18	0.8 - 8	60	97%	Negative	Yes / Pin 5	Heatsink	24.9 [0.98]
i7A12100A008V-0C0-R **	550	9 - 18	0.8 - 8	100	96%	Positive	-	Enhanced Baseplate	19.8 [0.78]
i7A12100A008V-0C1-R #**	550	9 - 18	0.8 - 8	100	96%	Negative	-		19.8 [0.78]
i7A12100A008V-0C3-R **	550	9 - 18	0.8 - 8	100	96%	Negative	Yes / Pin 5		19.8 [0.78]

High Power i7A Series with enhanced baseplate design includes redundant input and output pins. Please refer to the PIN assignment table on page 7.

i7A modules with rated I_{OUT} ≥ 45A includes redundant input pins. Please refer to the PIN assignment table on page 7.

Preferred Models

** Consult Technical Support for availability.

Specification

Model		i7A4W033A033V / i7A4W060A033V	i7A24045A033V / i7A24080A033V	i7A12060A008V / i7A12100A008V	i7A48020A033V
Input					
Input Voltage Range	Vdc	18 - 60	18 - 32	9 - 18	28 - 60
Input Transient (<100 ms)	Vdc	65 max	36 max	22 max	65 max
Turn On (typ)	Vdc	16.5	16.5	8.1	24
Turn Off (typ)	Vdc	15	15	7.6	20
Safety Certifications and Markings	-	IEC/EN/UL/CSA/EN62368-1, CE Mark and UKCA Mark			
		i7A4W033A033V	i7A24045A033V	i7A12060A008V	i7A48020A033V
Input Current (max)	A	50		65	35
Efficiency	%	91 - 98	93 - 98.5	86 - 97	92 - 96
		i7A4W060A033V	i7A24080A033V	i7A12100A008V	
Input Current (max)	A	60	80	100	
Efficiency	%	90 - 98.5	93 - 99	89 - 98	
Model		i7A4W033A033V	i7A24045A033V	i7A12060A008V	i7A48020A033V
Output					
Output Current (max)	A	33	45	60	20
Output Power (max)	W	500	750	400	500
Output Voltage Tolerance	%	± 3.5			
Line Regulation	%	0.2			
Load Regulation	%	0.4			
Ripple & Noise	mVpp	25	25	40	25
Overcurrent Protection Threshold (typ)	A	45	63	70	30
External Load Capacitance	uF	220 - 10000	330 - 10000		
Switching Frequency	kHz	330			
Dynamic Response		420mV / 70µs Vo=12V, 1A/µs 25% to 75% max Io	4250mV / 80µs Vo=12V, 1A/µs 25% to 50% max Io	400mV / 100µs Vo=3.3V, 1A/µs 25% to 50% max Io	500mV / 180µs Vo=12V, 1A/µs 25% to 75% max Io
Model		i7A4W060A033V	i7A24080A033V	i7A12100A008V	
Output					
Output Current (max)	A	60	80	100	
Output Power (max)	W	720	1000	550	
Output Voltage Tolerance	%	± 3.5			
Line Regulation	%	0.2		2mV	
Load Regulation	%	0.4		8mV	
Ripple & Noise	mVpp	80	60	60	
Overcurrent Protection Threshold (typ)	A	75	105	165	
External Load Capacitance	uF	330 - 10000			
Switching Frequency	kHz	200			
Dynamic Response		800mV / 75µs Vo=12V, 1A/µs 25% to 75% max Io	1200mV / 150µs Vo=12V, 1A/µs 25% to 50% max Io	400mV / 150µs Vo=12V, 1A/µs 25% to 50% max Io	
		i7A4W033A033V / i7A4W060A033V	i7A24045A033V / i7A24080A033V	i7A12060A008V / i7A12100A008V	i7A48020A033V
Overtemperature Protection	-	Yes			
Remote Sense	-	Sense(+), up to 5% of Vout			
Remote On/Off	-	See Model Selector.			
Output Voltage Adjust	-	For Output Trim Equation, refer to i7A Specification and i7A High Power Specification.			
Output Current Limit Adjust	-	Suffix -XX3-R. See Model Selector and detailed specifications			

Notes

(1) See website for detailed i7A Specification and i7A High Power Specification.
(2) Contact Technical Support for operation at higher alttiudes.

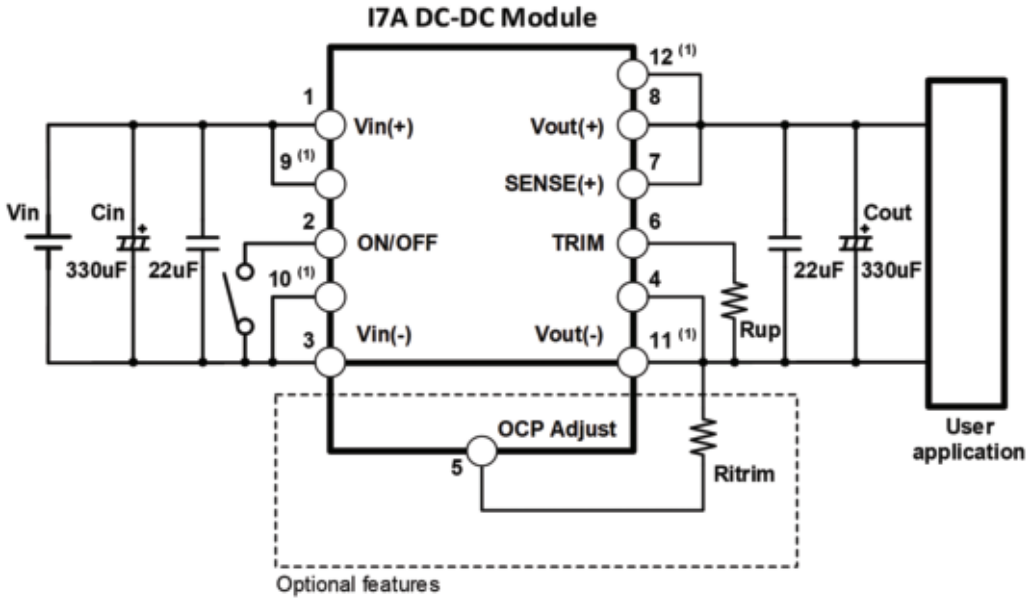
Specification

Model		i7A4W033A033V / i7A4W060A033V	i7A24045A033V / i7A24080A033V	i7A12060A008V / i7A12100A008V	i7A48020A033V
Environmental					
Operating Temperature (Tref)	°C	-40 to 115 (For Derating, see i7A Specification and i7A High Power Specification)			
Storage Temperature	°C	-55 to 125			
Humidity (non condensing)	%RH	5 - 95 (Operating & Storage)			
Cooling	-	Convection, conduction (baseplate) or forced air			
Altitude (2)	m	2000			
Random Vibration (Operating)	-	IEC 60068-2-64 / IPC9592B: 2.40 Grms, 10-500Hz, 30 min per x, y, z axis			
Shock (Operating)	-	IEC 60068-2-27 / IPC9592B: 30G, 11 ms per x, y, z axis			
Other					
Weight (Typ)	g	Open Frame:	25		
		With Baseplate:	50		
		With Heatsink:	70		
		Enhanced Baseplate:	85		
Size (LxWxH)	mm	Open Frame:	34 x 36.8 x 11.5		
		With Baseplate:	34 x 36.8 x 12.7		
		With Heatsink:	34 x 36.8 x 24.9		
		Enhanced Baseplate:	34 x 36.8 x 19.8		
Size (LxWxH)	Inches	Open Frame:	1.34 x 1.45 x 0.45		
		With Baseplate:	1.34 x 1.45 x 0.50		
		With Heatsink:	1.34 x 1.45 x 0.98		
		Enhanced Baseplate:	1.34 x 1.45 x 0.78		
MTBF - Telcordia SR-332		> 5 MHrs; 100% Load; Ta = 40 °C			
Warranty	yrs	3 years			

Notes

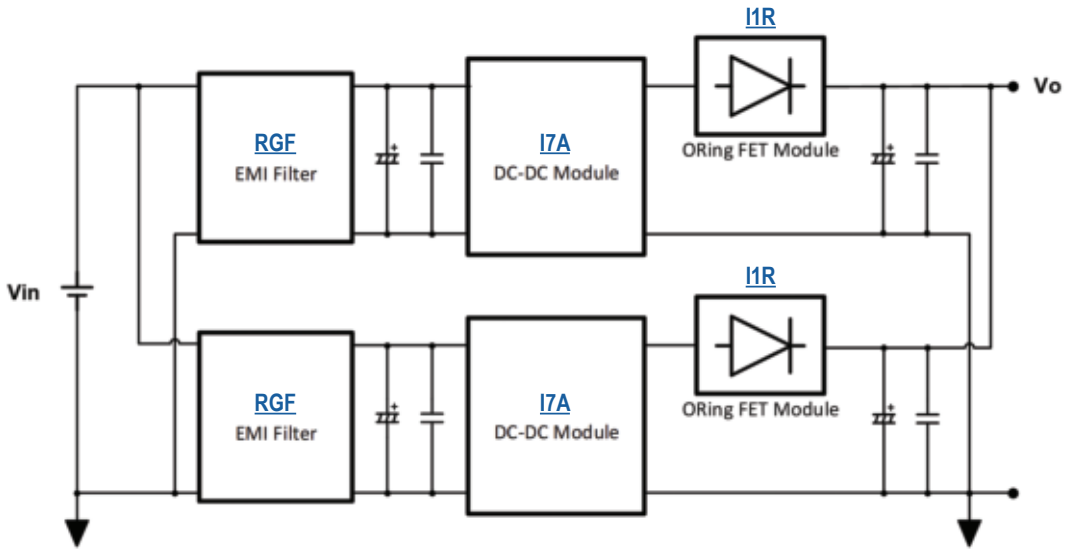
(1) See website for detailed i7A Specification and i7A High Power Specification.
(2) Contact Technical Support for operation at higher alttiudes.

Typical Application Circuit



Note
1. Certain model numbers have redundant input (9, 10) and/or output (11, 12) pins. Please refer to the PIN assignment table on page 7.
2. The input and output capacitor values can vary depending upon the application requirements.
3. Output voltage TRIM resistor “Rup” and OCP/Current Limit Adjust resistor, “Ritrim” should be connected to the i7A module as close as possible.

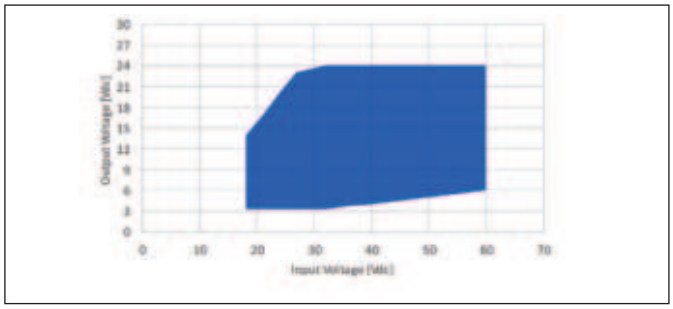
Simplified Building Block Diagram for Redundant / Parallel Configuration *(supporting accessory products shown)*



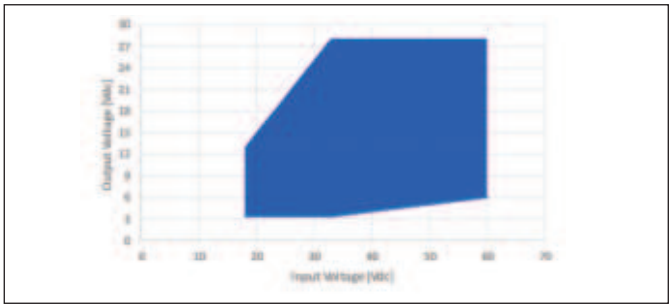
Note: 1) Verify that the selected RGF filter and I1R ORing modules are appropriately rated for the intended application and operating conditions.
2) For applications requiring i7A parallel connections for higher output power, contact Technical Support for additional guidance.

Output vs. Input Voltage Operating Range

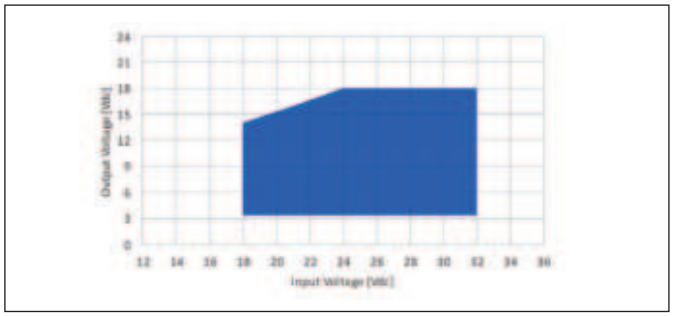
i7A4W033A033V (500W)



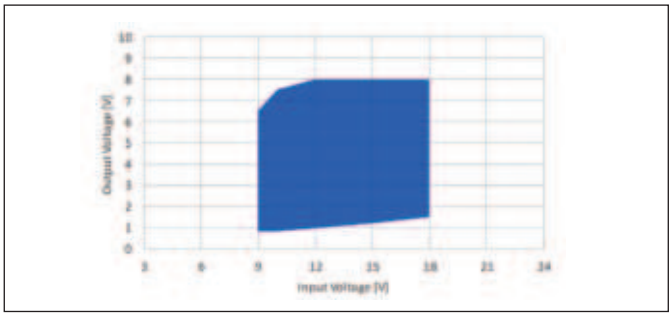
i7A4W060A033V (720W)



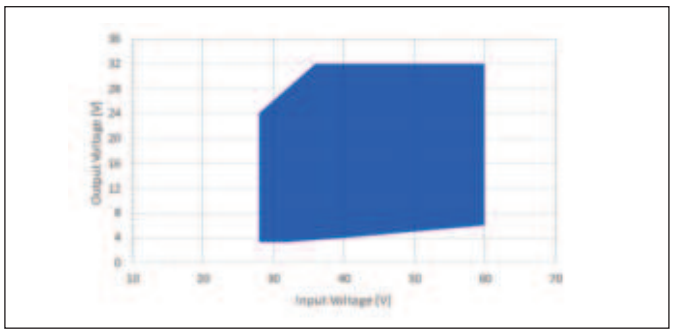
i7A24045A033V (750W) / I7A24080A033V (1000W)



i7A12060A008V (400W) / I7A12100A008V (550W)

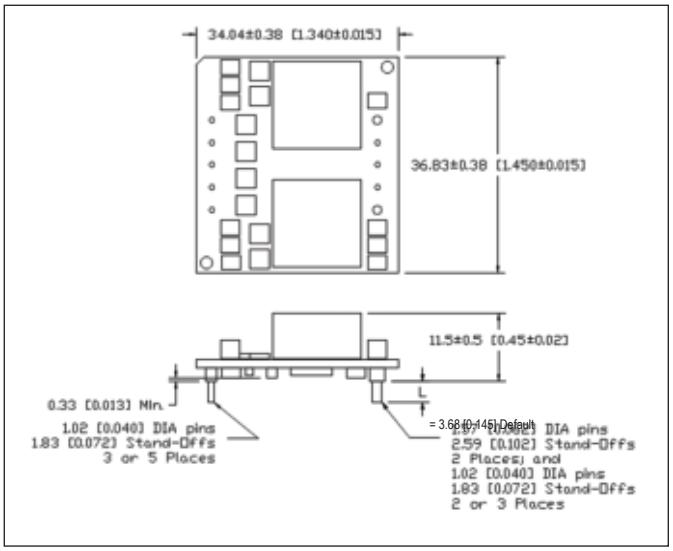


i7A48020A033V (500W)

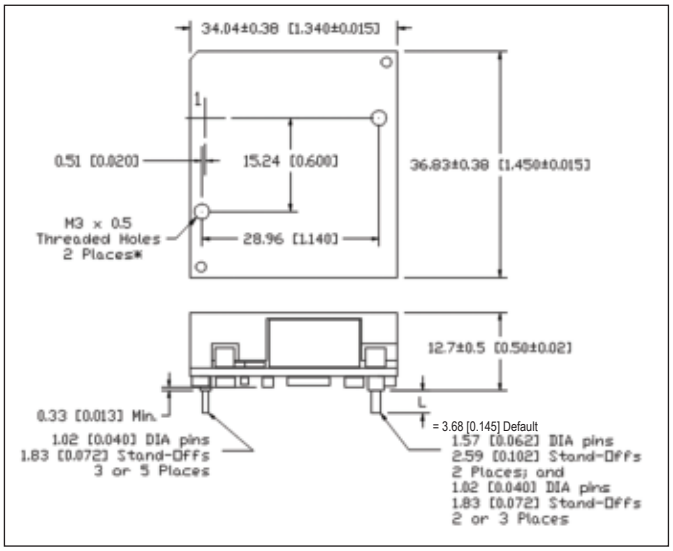


Mechanical Specification

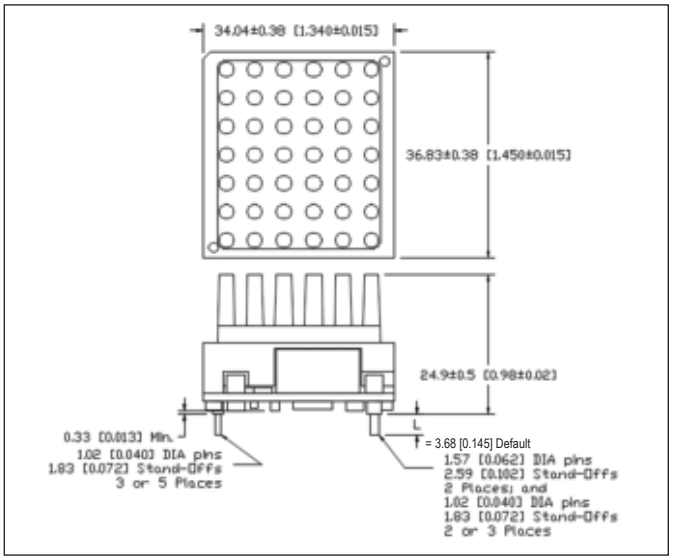
Outline Drawing Open frame –00x-R product options



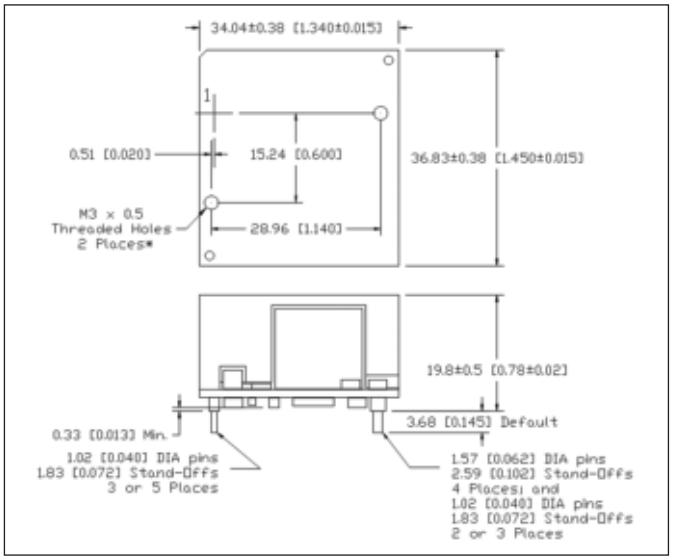
Outline Drawing With Baseplate –xCx-R product options



Outline Drawing With Heatsink –xFx-R product options

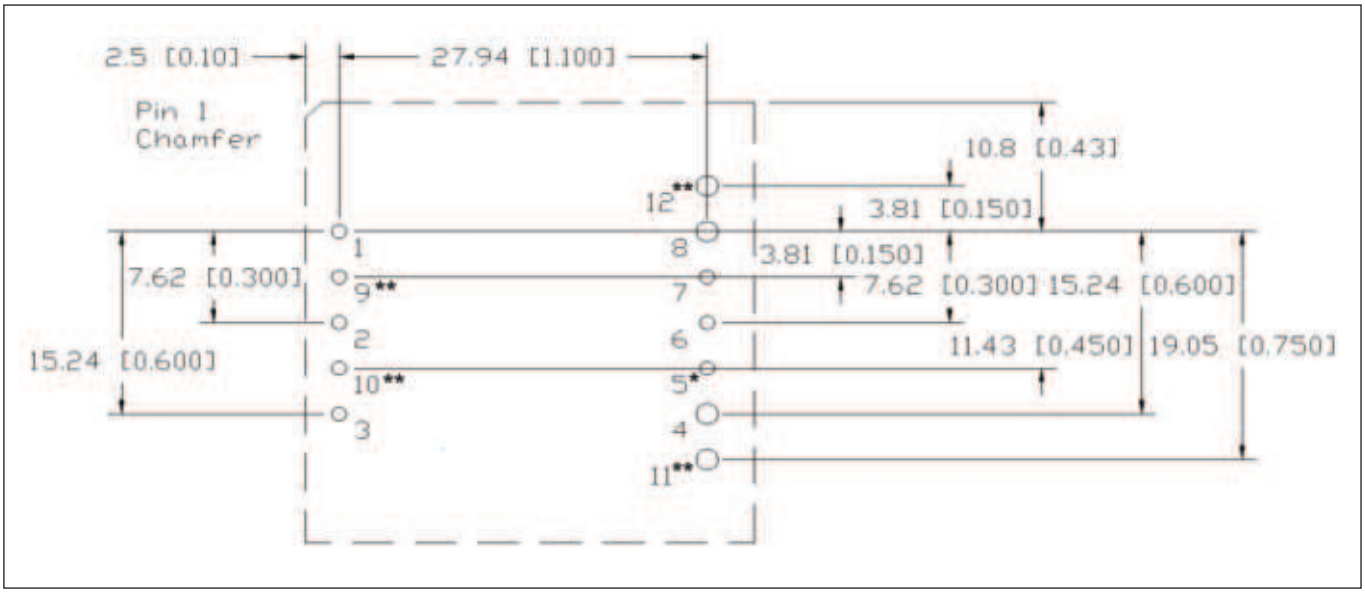


Outline Drawing with Enhanced Baseplate



Mechanical Specification

Recommended Hole Pattern (Top View)



Pinout

PIN	FUNCTION	PIN	FUNCTION
1	Vin (+)	7	SENSE+
2	On / Off	8	Vout (+)
3	Vin (-) / GND	9**	Vin (+)
4	Vout (-) / GND	10**	Vin (-) / GND
5*	Current Limit (OCP) Adjust	11**	Vout (-) / GND
6	TRIM	12**	Vout (+)

Note
* Pin 5 is populated when this feature is present (xx3-R suffix).
** Redundant input and/or output power pins are populated on certain high-current model numbers. See related table to identify which series utilizes these pins.
Pin base material is brass or copper with gold over nickel plating.

Redundant Power Pin Usage

Series	PIN 9	PIN 10	PIN 11	PIN12
	INPUT		OUTPUT	
i7A4W033A033V	N	N	N	N
i7A24045A033V	Y	Y	N	N
i7A12060A008V	Y	Y	N	N
i7A48020A033V	N	N	N	N
i7A4W060A033V	Y	Y	Y	Y
i7A24080A033V	Y	Y	Y	Y
i7A12100A008V	Y	Y	Y	Y



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