

## 300W, 9 to 53V or 9 to 36V Input Non-Isolated Buck-Boost DC-DC Converter



Industrial



Test



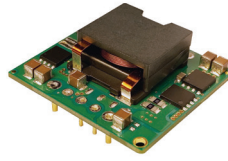
COMM



Broadcast



Robotics



The i7C series of non-isolated step-up / step-down converters are ideal for generating additional DC output voltage rails up to 300 W from a single output 12V, 24V or 48V AC-DC power supply. The highly efficient i7C series accepts a very wide DC input and has a wide output adjustment range. Three mechanical configurations are available; low profile open frame, baseplate construction for conduction cooling, or integral heat sink for convection or forced air cooling. A full feature\* Power Good signal, switching frequency synchronization and output current monitoring option is available.

Features	Benefits
• Up to 300W in a 1/16th Brick Pin-Out	• High Power Density, Less Board Area Needed
• High Efficiency - Up to 97%	• Longer Battery Life / Low Power Consumed
• Wide 5 to 28V, 8 to 24V or 9.6 to 48V Output Adjustment	• One Part Supports Multiple System Voltages
• Wide 9 to 36V or 9 to 53V Input Range	• Can Operate From Different DC Source Voltages
• Low Component Count With Minimal External Components	• Low Cost
• Low Airflow With Minimal Derating Requirements	• Easy To Cool In End System

Model Selector									
Model	Input Voltage (V)	Output Voltage (V)	Max Current (A)	Max Power (W)	Positive Logic On/Off	Negative Logic On/Off	Full Feature*	Integrated Heatsink	Integrated Baseplate
<a href="#">i7C4W008A120V-001-R</a>	9 - 53	9.6 - 48	8	300	-	Yes	-	-	-
<a href="#">i7C4W008A120V-002-R</a>	9 - 53	9.6 - 48	8	300	Yes	-	Yes	-	-
<a href="#">i7C4W008A120V-003-R</a>	9 - 53	9.6 - 48	8	300	-	Yes	Yes	-	-
<a href="#">i7C4W008A120V-0C1-R</a>	9 - 53	9.6 - 48	8	300	-	Yes	-	-	Yes
<a href="#">i7C4W008A120V-0C3-R</a>	9 - 53	9.6 - 48	8	300	-	Yes	Yes	-	Yes
<a href="#">i7C4W008A120V-0F1-R</a>	9 - 53	9.6 - 48	8	300	-	Yes	-	Yes	-
<a href="#">i7C4W008A120V-0F3-R</a>	9 - 53	9.6 - 48	8	300	-	Yes	Yes	Yes	-
<a href="#">i7C4W012A050V-001-R</a>	9 - 53	5 - 28	12.5	300	-	Yes	-	-	-
<a href="#">i7C4W012A050V-002-R</a>	9 - 53	5 - 28	12.5	300	Yes	-	Yes	-	-
<a href="#">i7C4W012A050V-003-R</a>	9 - 53	5 - 28	12.5	300	-	Yes	Yes	-	-
<a href="#">i7C4W012A050V-0C1-R</a>	9 - 53	5 - 28	12.5	300	-	Yes	-	-	Yes
<a href="#">i7C4W012A050V-0C3-R</a>	9 - 53	5 - 28	12.5	300	-	Yes	Yes	-	Yes
<a href="#">i7C4W012A050V-0F1-R</a>	9 - 53	5 - 28	12.5	300	-	Yes	-	Yes	-
<a href="#">i7C4W012A050V-0F3-R</a>	9 - 53	5 - 28	12	300	-	Yes	Yes	Yes	-
<a href="#">i7C2W020A120V-001-R</a>	9 - 36	8 - 24	20	300	-	Yes	-	-	-
<a href="#">i7C2W020A120V-002-R</a>	9 - 36	8 - 24	20	300	Yes	-	Yes	-	-
<a href="#">i7C2W020A120V-003-R</a>	9 - 36	8 - 24	20	300	-	Yes	Yes	-	-

Preferred model \* Consult factory for a part number suffix of other feature combinations.

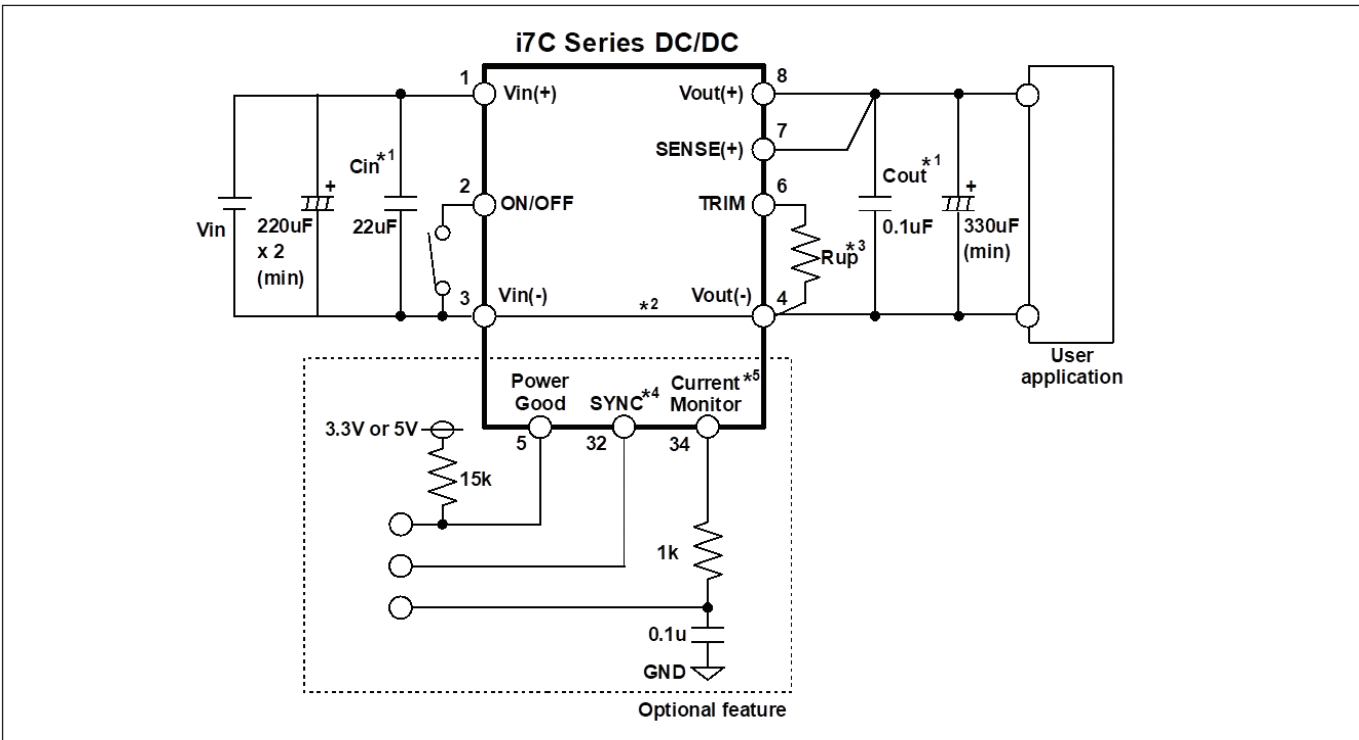
Related Products		
Type	Part Number	Description
DC-DC Buck Converter	<a href="#">i3A</a>	100W, Input 9-53V, Output 5-30V 4.5A or 3.3-16.5V 8A
DC-DC Buck Converter	<a href="#">i6AN</a>	75W, Input 9-40V, Negative Output -3.3 to -30V, 8A
DC-DC Buck Converter	<a href="#">i6A24</a>	250W, Input 9-40V, Output 3.3-24V 14A
DC-DC Buck Converter	<a href="#">i6A4W</a>	250W, Input 9-53V, Output 3.3-40V 10A or 3.3-15V 20A
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
Evaluation Kit	<a href="#">i7C08A-C03-EVK-S1</a>	Evaluation kit with i7C4W008A120V-003-R Full Featured Module
	<a href="#">i7C12A-C03-EVK-S1</a>	Evaluation kit with i7C4W012A050V-003-R Full Featured Module
	<a href="#">i7C20A-C03-EVK-S1</a>	Evaluation kit with i7C2W020A120V-003-R Full Featured Module

Specification				
Model		i7C4W012A050V	i7C4W008A120V	i7C2W020A120V
<b>Input</b>				
Input Voltage range	Vdc	9 - 53 (Turn on at 9.5V typ)		9 - 36 (Turn on at 9.5V typ)
Input Current (max)	A	25		30
Standby Input Current (typ)	mA	0.25 (Nominal input, ON/OFF = OFF)		
No Load Input Current, Vin = 24 V (typ)	mA	5.0 (Vo = 12 V)		5.0 (Vo = 24 V)
Efficiency	%	91 - 96	93 - 97	94 - 97
Safety Agency Certifications	-	IEC/UL/CSA/EN62368-1, 60950-1, CE Mark		
<b>Output</b>				
Output Voltage Tolerance	%	± 4		
Switching Frequency	kHz	250		
Line Regulation	%	0.8	0.8	0.8
Load Regulation	%	0.8	0.5	0.8
External Load Capacitance	uF	330 - 3000		1000 - 5000
Ripple & Noise	mV	200	180	200
Overcurrent Protection Threshold (typ)	A	17	15	26
Overtemperature Protection	-	Yes		
Remote Sense	-	(+) Sense, compensating up to 5% of output voltage		
Remote On/Off	-	See Model Selector		
Power Good	-	Optional (Full Feature Version)		
Frequency Synchronization (Sync)	-	Optional (Full Feature Version)		
Current Monitor	-	Optional (Full Feature Version)		
Parallel Operation	-	Not possible		
Series Operation	-	Not possible		
<b>Environmental</b>				
Operating Temperature	°C	-40 to 125 (See <a href="#">i7C4W Specification</a> ; <a href="#">i7C2W Specification</a> for Derating)		
Storage Temperature	°C	-55 to 125		
Humidity (non condensing)	%RH	5 - 95 (Operating & Storage)		
Cooling	-	Convection, conduction (baseplate) or forced air		Convection or forced air
<b>Other</b>				
Weight (Typ)	g	Open Frame: 25g, with Baseplate: 50g, with Heatsink: 70g		Open Frame: 28g
Size (LxWxH)	mm	Open Frame: 34 x 36.8 x 12.2		34 x 36.8 x 14.7
		With Baseplate: 34 x 36.8 x 13.0		-
		With Heatsink: 34 x 36.8 x 24.9		-
Size (LxWxH)	Inches	Open Frame: 1.34 x 1.45 x 0.5		1.34 x 1.45 x 0.58
		With Baseplate: 1.34 x 1.45 x 0.51		-
		With Heatsink: 1.34 x 1.45 x 0.98		-
MTBF - Telcordia SR-332	-	> 10 Mhrs; 100% Load; Ta = 40 °C		
Warranty	yrs	3		

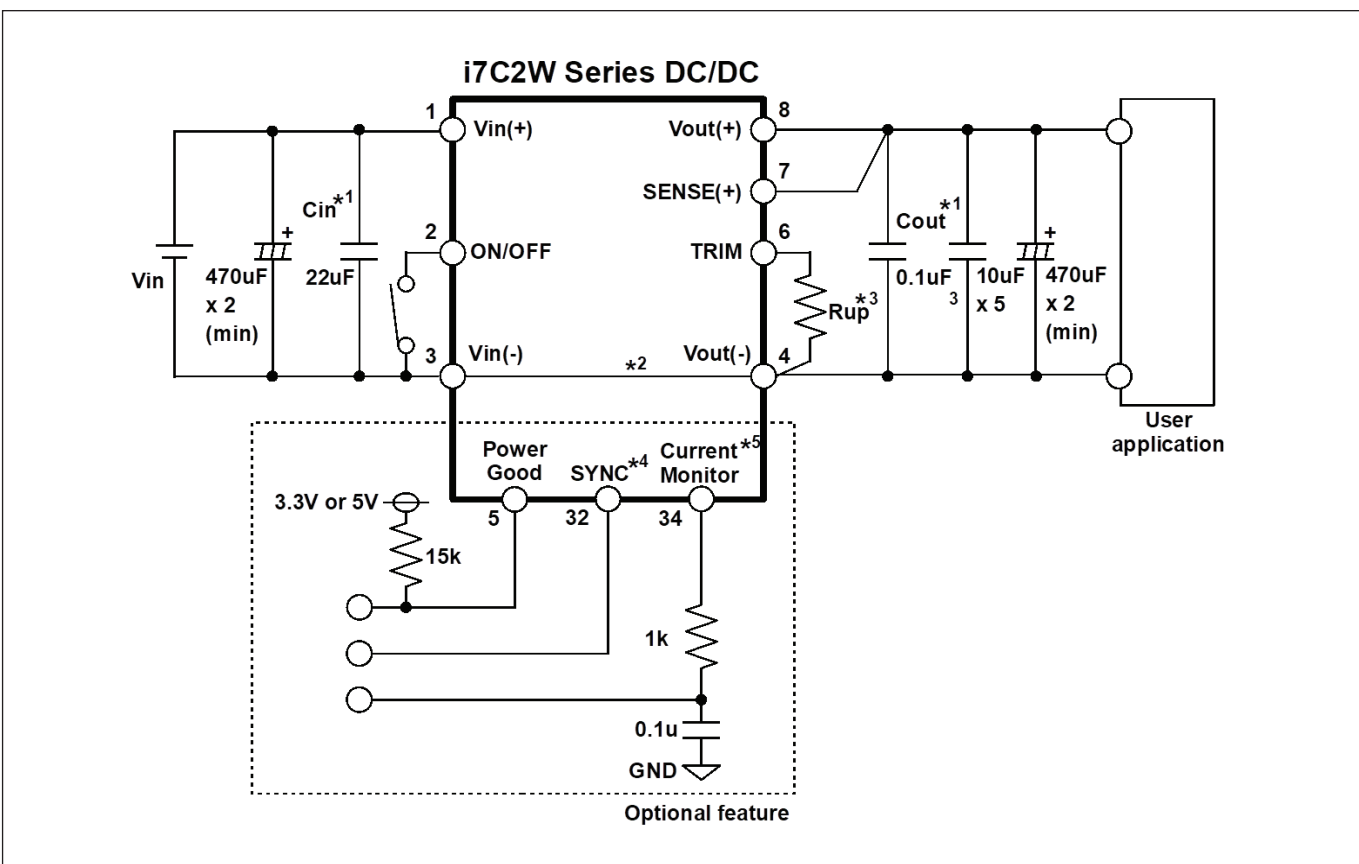
## Notes

See website for detailed specifications and test methods.

**Typical Application Circuit (i7C4W)**



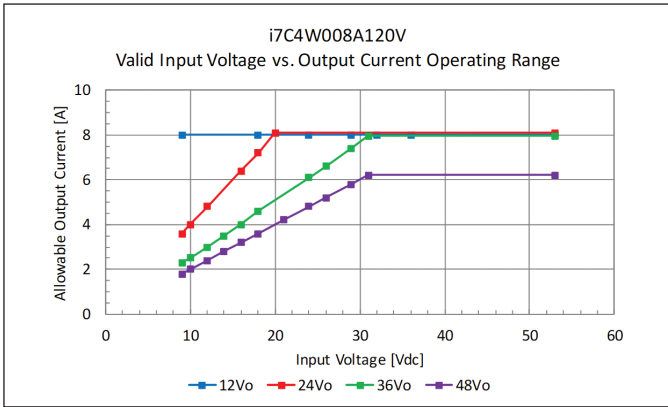
**Typical Application Circuit (i7C2W)**



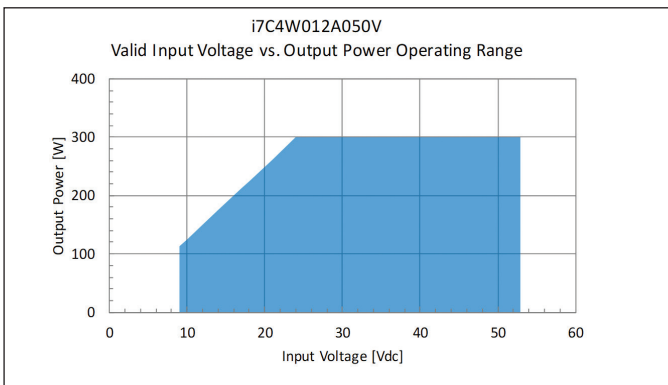
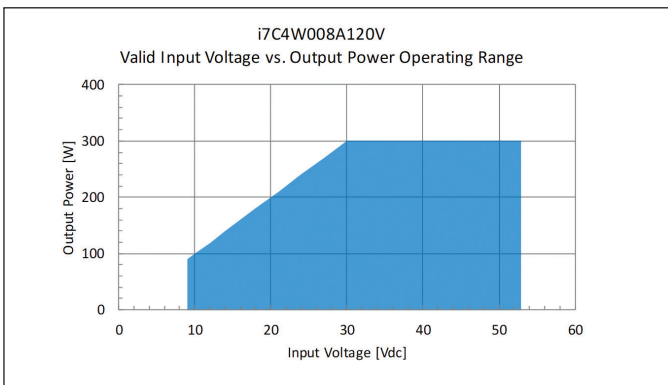
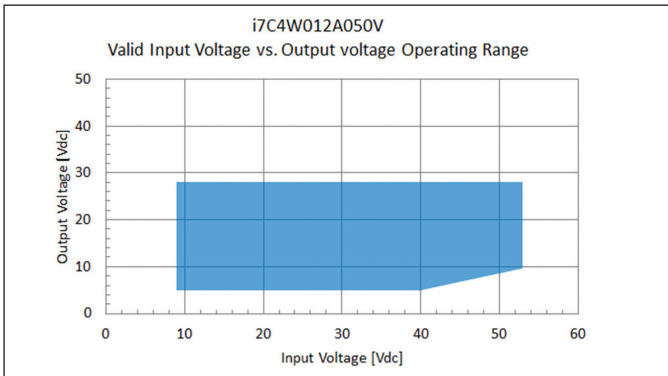
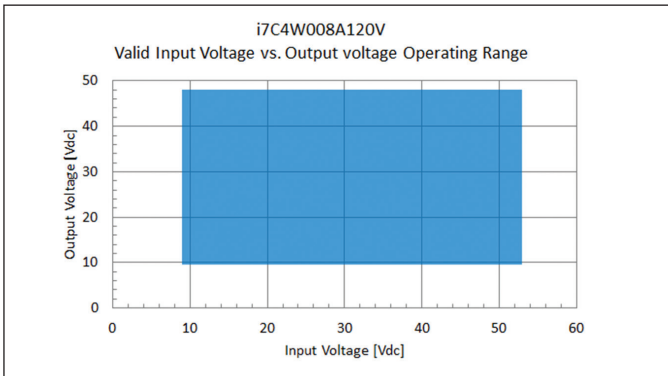
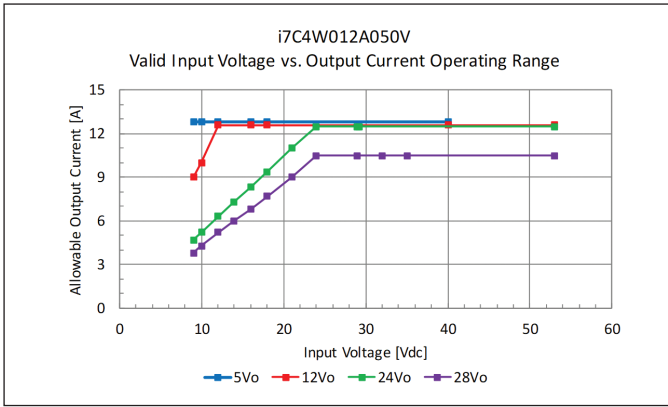
Recommendations:

1. Cin/Cout MLCC should be connected to the i7C module as close as possible in order to reject high frequency noise.
2. Connect Vin(-) and Vout(-) to copper ground plane underneath the i7C module.
3. TRIM resistor "Rup" should be connected to the i7C module as close as possible.
4. SYNC must be connected to GND when not in use.
5. External R-C filter is needed for Current Monitor, as shown, for Current Monitor.

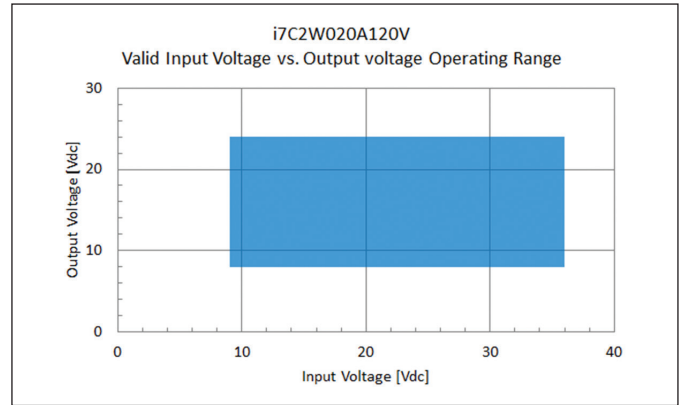
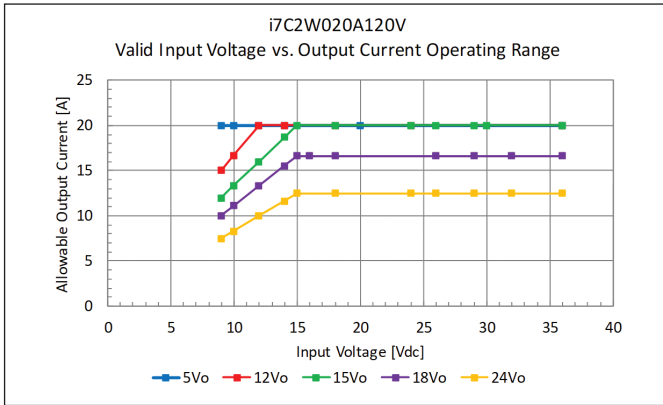
**Operating Range i7C4W008A120V**



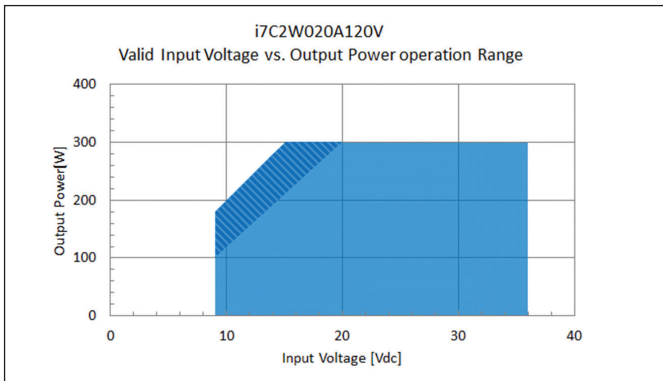
**Operating Range i7C4W012A050V**



## Operating Range i7C2W020A120V

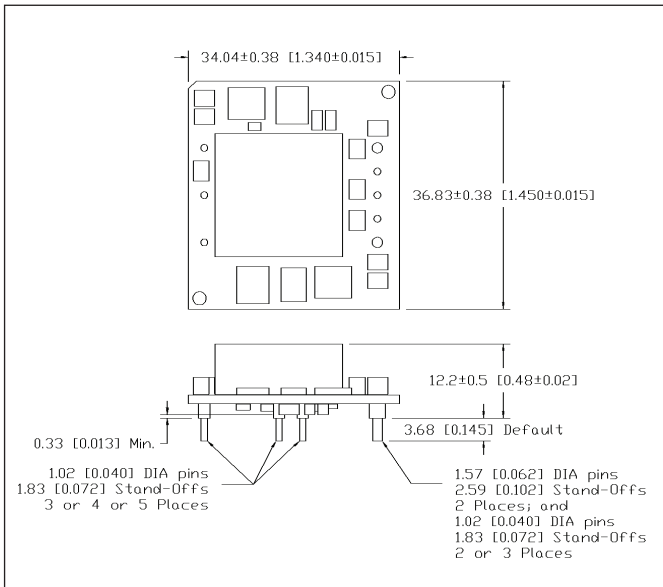


Wider output regulation tolerance (dark blue shaded region) expected during step-up/boost Operation when  $V_{in} < 20V$ ,  $P_{out} > 100W$ . See i7C2W Specifications for related load regulation charts.

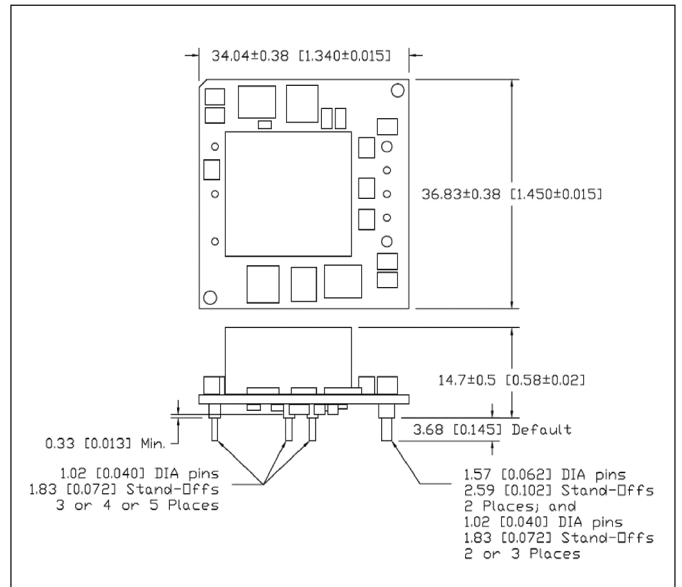


## Mechanical Specification

### Openframe - 00x-R Series (i7C4W)

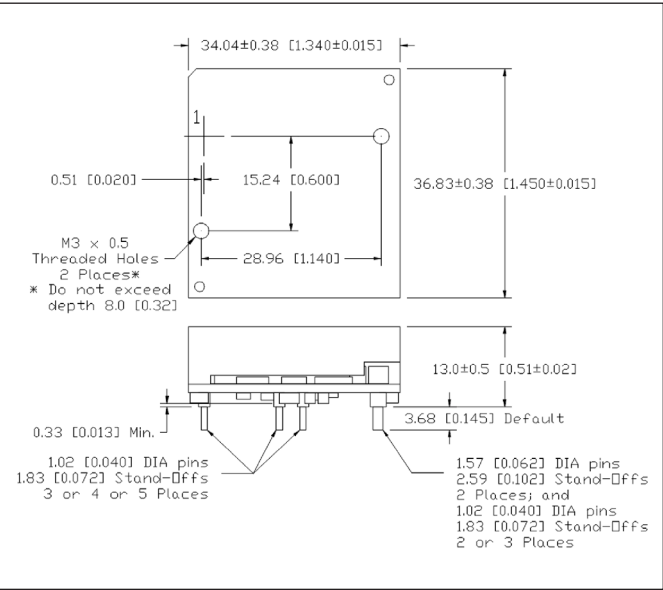


### Openframe - 00x-R Series (i7C2W)

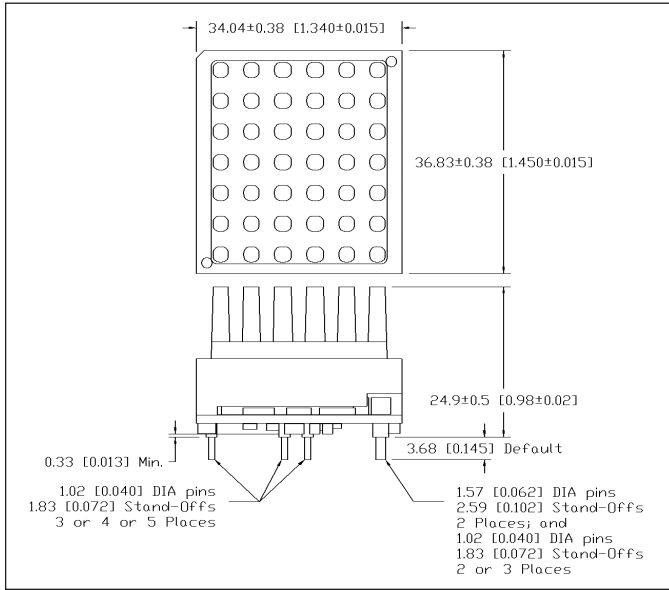


**Mechanical Specification**

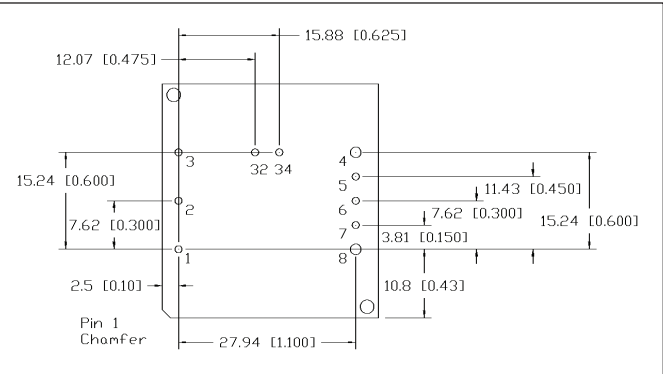
**Baseplate - xCx-R Series (i7C4W)**



**Heatsink - xFx-R Series (i7C4W)**



**Mechanical Pin-Out / Spacing**

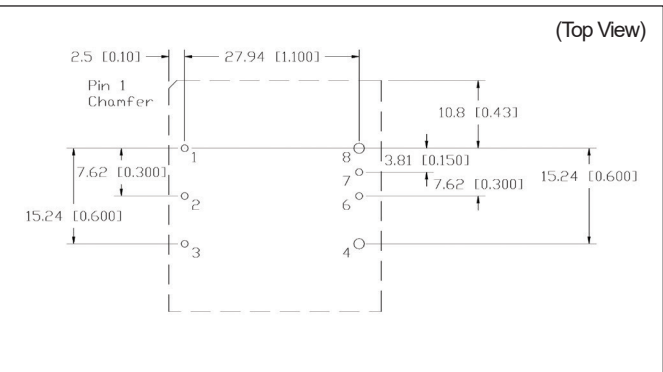


**Pinout**

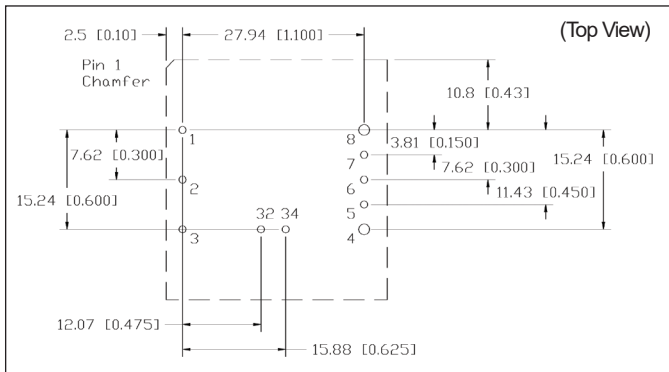
PIN	Function	PIN	Function
1	VIN (+)	6	TRIM
2	ON / OFF	7	SENSE (+)
3	VIN (-) / GND	8	VOUT (+)
4	VOUT (-) / GND	32	Sync (Option)
5	PWR GOOD (Option)	34	Current Monitor (Option)

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

**Recommended Hole Pattern – STANDARD – xx1-R**



**Recommended Hole Pattern – FULL FEATURE – xx2-R / -xx3-R**





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