

## 250W, 9 to 40V, or 9 to 53V Input Non-Isolated Ruggedized DC-DC Buck Converters

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



The rugged RGA non-isolated DC-DC step-down converters are encapsulated in a five-sided aluminum case and rated for up to 110°C operation. The modules have the industry standard 1/16th brick pin-out, are qualified to MIL-STD-810G (shock and vibration) and designed for fan-less, conduction cooled applications. The series accepts a wide input range to support multiple DC bus and battery voltages. Standard and optional features include remote on/off, remote sense, power good, frequency synchronization and output sequencing, making the modules a truly versatile power solution. The wide output adjustment range allows one model to be used in multiple positions, assisting inventory and part number reduction.

Features	Benefits
• Up to 250W in a 1/16th Brick Pin-Out	• High Power Density, Less Board Area Needed
• Encapsulated in a 5-sided Aluminum case	• Improves EMI
• 110 °C maximum case temperature	• Ruggedized deployment in harsh environment with high shock & vibration exposure
• Efficiency - Up to 98%	• Longer Battery Life / Low Power Consumed
• Wide 3.3 to 15V, 3.3 to 24V or 3.3 to 40V Output Adjustment	• One Part Supports Multiple System Voltages
• Wide 9 to 40V or 9 to 53V Input Range	• Can Operate From Different DC Source Voltages
• Low Component Count With Minimal External Components	• Low Cost

Model Selector						
Model	Input Voltage (V)	Output Voltage (V)	Max Current (A)	Max Power (W)	Negative Logic On/Off	Full Feature*
<a href="#">RGA24250W014A-001</a>	9 - 40	3.3 - 24	14	250	Yes	No
<a href="#">RGA24250W014A-003</a>	9 - 40	3.3 - 24	14	250	Yes	Yes
<a href="#">RGA4W250W010A-001</a>	9 - 53	3.3 - 40	10	250	Yes	No
<a href="#">RGA4W250W010A-003</a>	9 - 53	3.3 - 40	10	250	Yes	Yes
<a href="#">RGA4W250W020A-001</a>	9 - 53	3.3 - 15	20	250	Yes	No
<a href="#">RGA4W250W020A-003</a>	9 - 53	3.3 - 15	20	250	Yes	Yes

Preferred model

\* Full feature includes Power Good signal, Frequency Synchronization, Output Sequencing

Related Products		
Type	Part Number	Description
Ruggedized DC-DC Buck-Boost Converter	<a href="#">RGC</a>	300W, Input 9-53V or 9-36V, Output 9.6-48V, 8A; 5-28V, 12.5A; or 8-24V, 20A
DC-DC Buck Converter	<a href="#">i7A</a>	500-750W, Input 18-60V or 18-36V, 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
DC-DC Buck Converter	<a href="#">i6A4W</a>	250W, Input 9-53V, Output 3.3-40V, 10A; 3.3-15V, 20A
Isolated DC-DC Converter	<a href="#">GQA</a>	120W Industrial, Input 9-36V, Isolated Quarter Brick
Isolated DC-DC Converter	<a href="#">HQA</a>	120W MIL-COTS, Input 9-40V, Isolated Quarter Brick
Evaluation Board	<a href="#">i367X-C01-EVK-S0</a>	Evaluation Board with no module. Order required RGA part number separately.

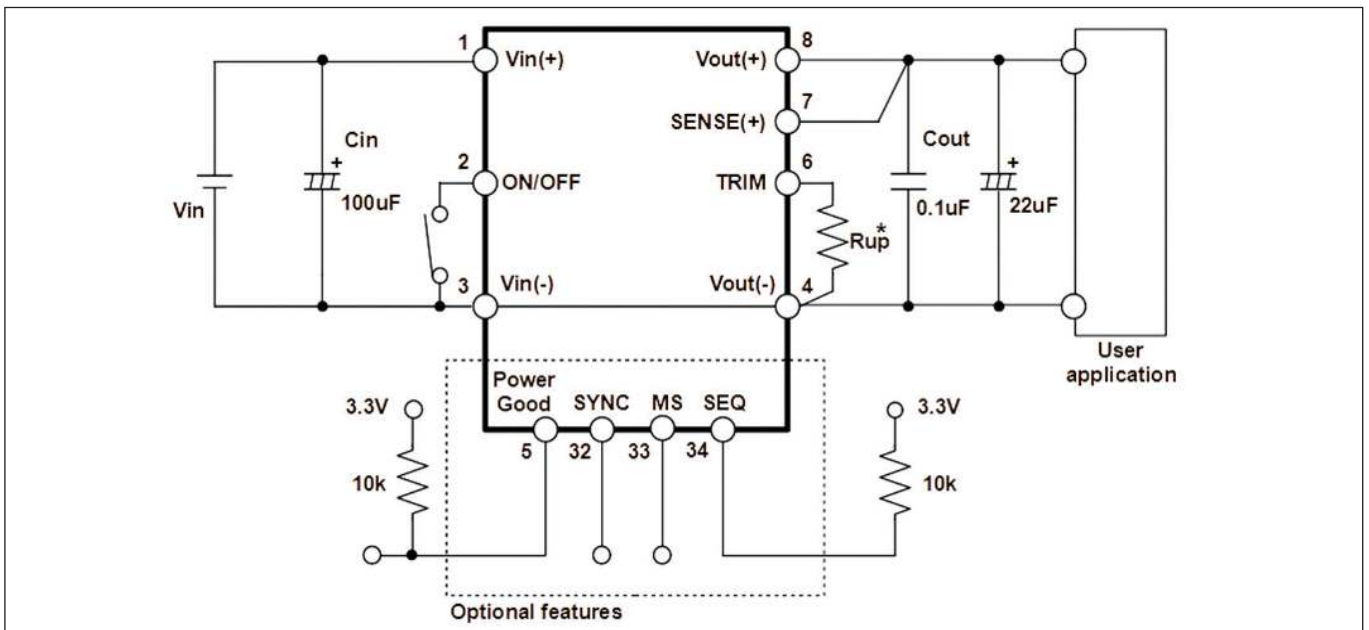
Specification		RGA24250W014A	RGA4W250W010A	RGA4W250W020A
<b>Input</b>				
Input Voltage Range	Vdc	9 - 40	9 - 53	
Input Current (max)	A	15	20	
Standby Input Current (typ)	mA	1.5		
Turn-ON Input Voltage	Vdc	8		
Turn-OFF Input Voltage	Vdc	7 - 9		
Efficiency	%	92.5 - 98	94 - 97.5	90 - 97
Safety Certifications and Markings	-	CE, UKCA Mark		
<b>Output</b>				
Output Voltage Tolerance	%	± 4		
Switching Frequency	kHz	400		
Line Regulation	%	0.3	0.3	0.4
Load Regulation	%	1	0.9	1.2
External Load Capacitance	µF	0 - 2200	0 - 1500	0 - 1800
Ripple & Noise	mVpp	20	50	20
Overcurrent Protection Threshold (typ)	A	22	15	27
Overtemperature Protection	-	Yes		
Output Voltage Adjustment Range	-	See full specifications for output trim equation.		
Remote Sense	-	(+) Sense, compensating up to 5% of output voltage		
Remote On/Off	-	Negative Logic		
Power Good	-	Optional (Full Feature Version)		
Frequency Synchronization (SYNC)	-	Optional (Full Feature Version)		
Output Sequencing (SEQ)	-	Optional (Full Feature Version)		
<b>Environmental</b>				
Operating Temperature (Tcase)	°C	-40 to 110		
Storage Temperature	°C	-55 to 125		
Humidity (non condensing)	%RH	5 - 95 (Operating & Storage)		
Altitude <sup>(2)</sup>	m	2000		
Cooling	-	Conduction Cooling		
Shock	-	MIL-STD-810G 516.6 Procedure I & IV		
Vibration	-	MIL-STD-810G 514.6 Procedure I, Cat 10		
Thermal Cycling Test (TCT)	-	Qualified to 700 cycles / -40 to 125°C, 60°C/min ramp, 30 min dwell time		
<b>Other</b>				
Weight (Typ)	g	42.5 max		
Size (LxWxH)	mm	35.6 x 35.6 x 13.0 35.6 x 25.6 x 13.0 (Mounting tab excluded)		
Size (LxWxH)	Inches	1.40 x 1.40 x 0.51 1.40 x 1.01 x 0.51 (Mounting tab excluded)		
MTBF - Telcordia SR-332	-	> 12 Mhrs; 100% Load; Ta = 40 °C		
Warranty	yrs	3 years		

Notes

(1) See website for detailed product [specification](#).

(2) Contact Technical Support for operation at higher altitudes.

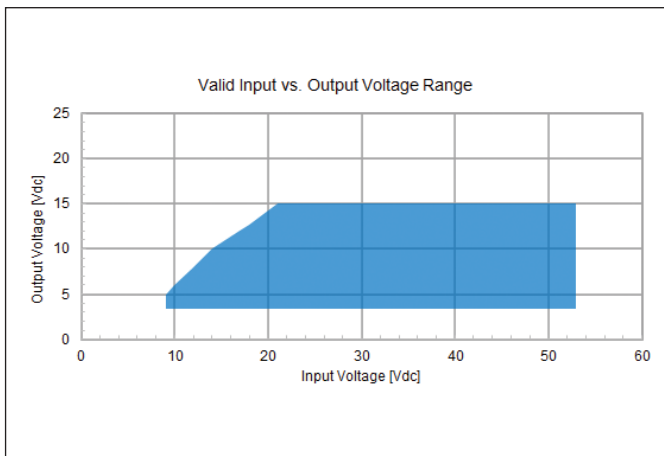
## Typical Application Circuit (RGA)



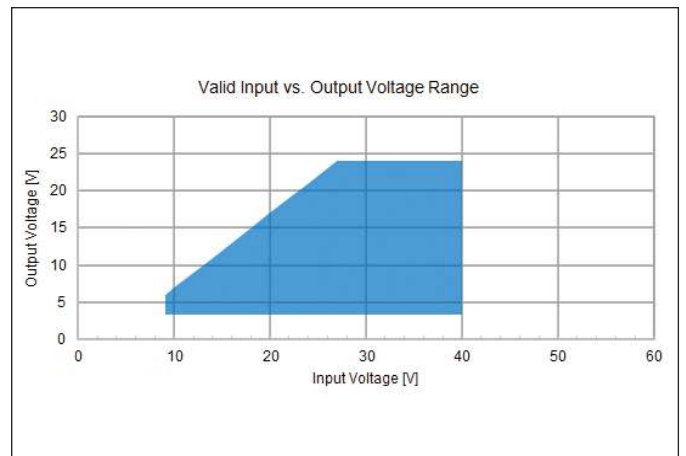
### Recommendation

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

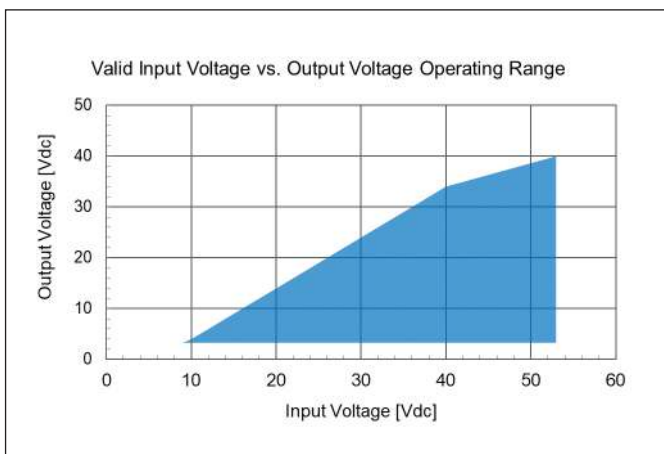
### Operating Range (RGA4W250W020A-xxx)



### Operating Range (RGA24250W014A-xxx)



### Operating Range (RGA4W250W010A-xxx)



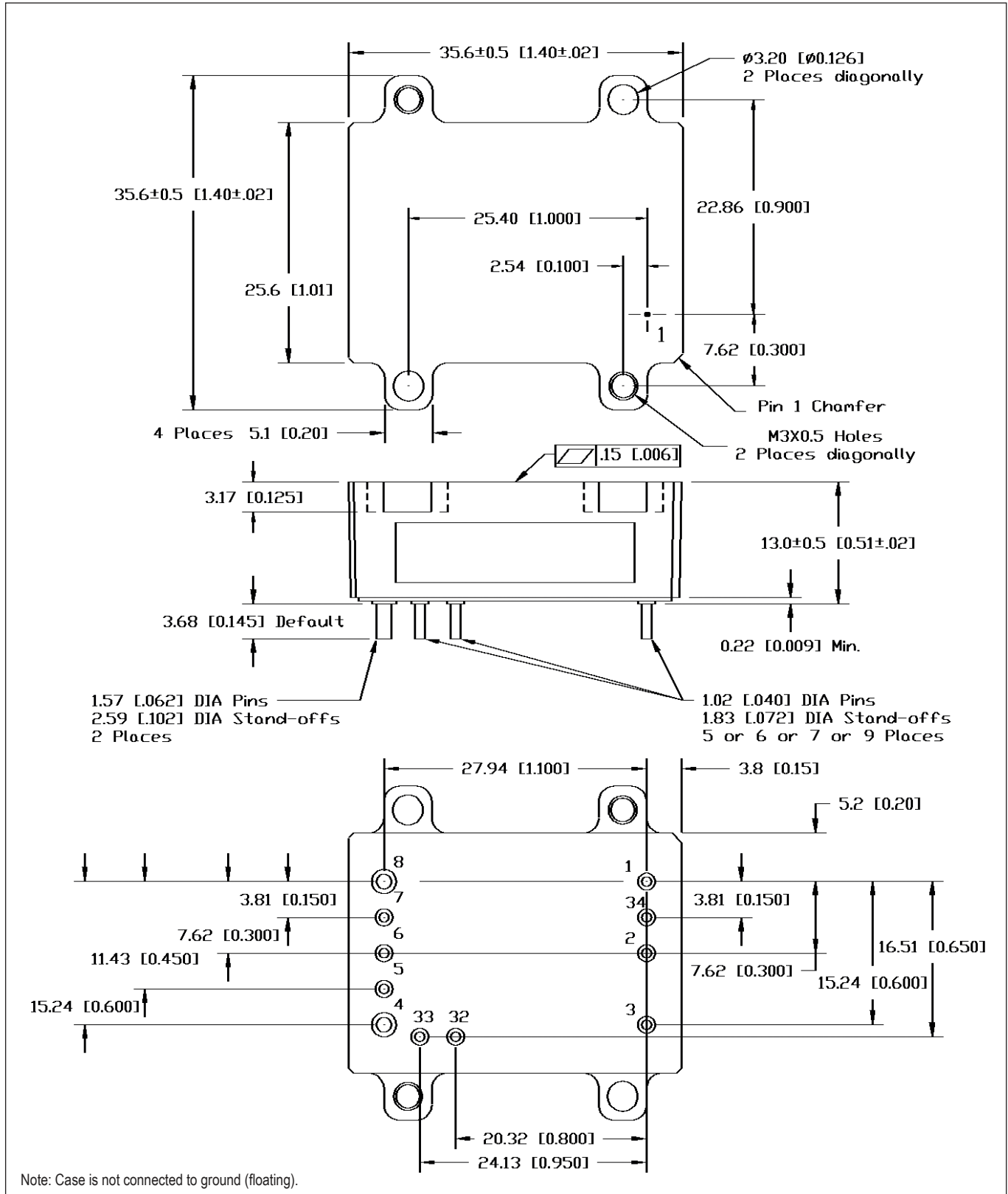
### Pinout

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		

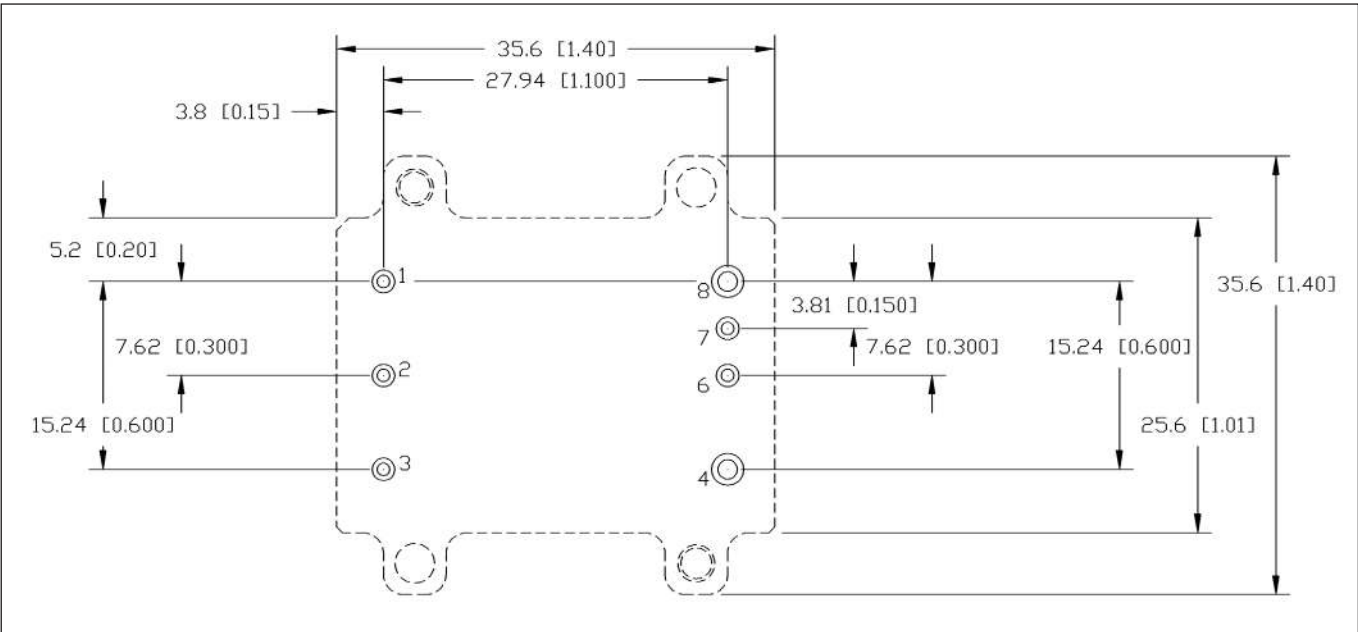
Pin base material is brass or copper with gold over nickel plating.

Mechanical Specification

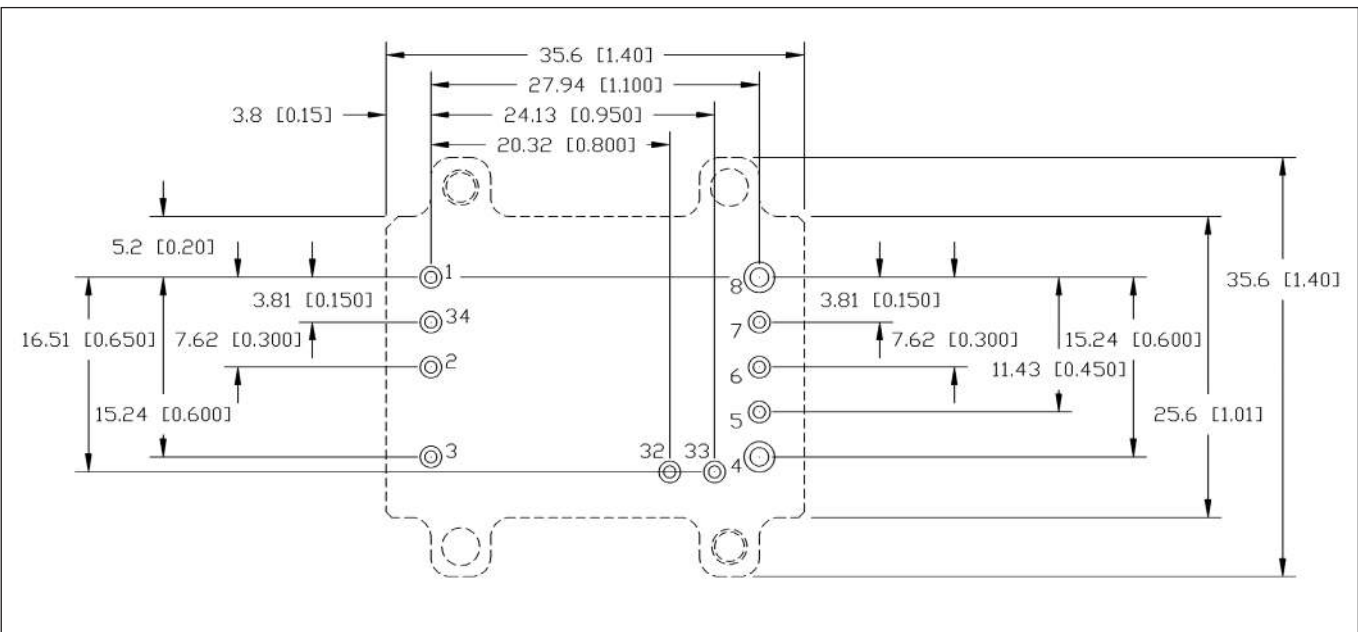
Dimensions are in mm [in]. Unless otherwise specified tolerances are:  $x.x \pm 0.5$  [0.02],  $x.xx \pm 0.25$  [0.010].



**Recommended Hole Pattern (Suffix -001)**



**Recommended PCB Hole Pattern (Suffix -003)**





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