

## 160W BASEPLATE COOLED

AC-DC POWER SUPPLIES

The ASB160 series is a range of complete low profile, full brick, baseplate cooled AC-DC power supplies which requires no external components.

The series includes a complete built in EMC filter and AC fuse as well as bulk storage capacitor providing a complete AC-DC power solution ready for installation into end applications.

The ASB160 offers high efficiency to minimise waste heat and heat sinking requirements and operates from -40°C to +90°C on the module baseplate.



### Features

- Complete AC-DC power supply
- No extra components required
- Baseplate cooled full brick package
- Low profile
- Input range 90 to 264VAC
- Single outputs from 12 to 54VDC
- Output voltage trim  $\pm 5\%$
- High efficiency - up to 93%
- Over current, over voltage and over temperature protection
- Optional heatsink available
- -40 to +90°C baseplate operating temperature
- 3 year warranty

### Applications



AC-DC Converters



Industrial Electronics



Instrumentation



Railway



Security



Technology

### Dimensions

2.40 x 4.60 x 0.78" (61.0 x 116.8 x 19.7 mm)

### Models & Ratings

| Model number <sup>(1)</sup> | Output Power | Output Voltage | Output Current | Ripple & Noise | Efficiency <sup>(2)</sup> |
|-----------------------------|--------------|----------------|----------------|----------------|---------------------------|
| ASB160PS12                  | 160W         | 12.0V          | 13.30A         | 120mV          | 92.0%                     |
| ASB160PS15                  |              | 15.0V          | 10.66A         | 150mV          | 93.0%                     |
| ASB160PS24                  |              | 24.0V          | 6.66A          | 240mV          | 92.0%                     |
| ASB160PS36                  |              | 36.0V          | 4.44A          | 360mV          | 93.0%                     |
| ASB160PS48                  |              | 48.0V          | 3.33A          | 480mV          | 93.0%                     |
| ASB160PS54                  |              | 54.0V          | 2.96A          | 540mV          | 91.0%                     |

#### Notes:

1. Add suffix '-HK' to receive with optional heat-sink fitted.
3. Optional heatsink can be ordered as a separate item using part number IFH HEATSINK

2. Typical efficiency with 230VAC input and full load.

## Input

| Characteristic        | Minimum                               | Typical  | Maximum | Units | Notes & Conditions         |
|-----------------------|---------------------------------------|----------|---------|-------|----------------------------|
| Input Voltage         | 90                                    |          | 264     | VAC   |                            |
| Input Frequency       | 47                                    |          | 63      | Hz    |                            |
| Input Current         |                                       | 1.7/0.82 |         | A     | 115VAC/230VAC              |
| Inrush Current        |                                       |          | 100     | A     | 230VAC, cold start at 25°C |
| Earth Leakage Current |                                       |          | 750     | µA    | 264VAC, 60Hz               |
| Power Factor          | 0.9                                   |          |         |       | Full load                  |
| No Load Input Power   |                                       |          | 0.5/0.7 | W     | 12V-48V/54V                |
| Input Protection      | Internal T3.15A/250VAC fitted in line |          |         |       |                            |

## General

| Characteristic             | Minimum | Typical    | Maximum | Units             | Notes & Conditions                       |
|----------------------------|---------|------------|---------|-------------------|--|
| Efficiency                 |         | 92         |         | %                 | See models and ratings table             |
| Isolation: Input to Output |         |            | 3000    | VAC               |  |
| Input to Ground            |         |            | 1500    | VAC               |  |
| Output to Ground           |         |            | 500     | VAC               |  |
| Switching Frequency        | 180     |            | 250     | kHz               | Main converter, variable, load dependant |
|                            | 100     |            | 150     |                   | PFC                                      |
| Power Density              |         | 18.5       |         | W/in <sup>3</sup> |  |
| Mean Time Between Failure  | 160     |            |         | khrs              | MIL-HDBK-217F at 25°C GB and 115VAC      |
| Weight                     |         | 0.62 (280) |         | lb(g)             |  |

## Output

| Characteristic           | Minimum  | Typical | Maximum | Units   | Notes & Conditions  |
|--------------------------|--|---------|---------|---------|---|
| Output Voltage           | 12   |         | 54      | VDC     | See Models and Ratings table  |
| Initial Set Accuracy     |  | 1       |         | %       | At 60% load   |
| Output Voltage Trim      | 95   |         | 105     | %       | Of nominal output voltage. See application note   |
| Minimum Load             |  |         |         |         | No minimum load required  |
| Start Up Delay           |  |         | 1.3     | s       |   |
| Start Up Rise Time       |  |         | 10      | ms      |   |
| Hold Up Time             | 8  | 10      |         | ms      | Full load and 115VAC  |
| Line Regulation          |  |         | ±0.5    | %       |   |
| Load Regulation          |  |         | ±0.5    | %       |   |
| Transient Response       |  |         | 2       | %       | Maximum deviation, recovering to less than 1% within 300µs for 25% step load                                  |
| Ripple and Noise         |  |         | 1       | % pk-pk | 20MHz bandwidth, measured with 20MHz Bandwidth and 10µF electrolytic in parallel with 0.1µF ceramic capacitor |
| Overload Protection      | 110  |         | 140     | %       |   |
| Overvoltage Protection   | 110  |         | 150     | %       | Auto recovery except 54V version recycle AC to reset  |
| Short Circuit Protection | Trip and restart (hiccup), auto resetting            |         |         |         |   |
| Thermal Protection       | Measured internally at the baseplate, auto resetting |         |         |         |   |
| Temperature Coefficient  |  | 0.02    |         | %/°C    | After 20 minute warm up   |
| Remote Sense             |  |         | 5       | %       | Maximum compensation  |

## Environmental

| Characteristic        | Minimum   | Typical | Maximum | Units | Notes & Conditions                        |
|-----------------------|---|---------|---------|-------|---|
| Operating Temperature | -40   |         | +90     | °C    | Baseplate Temperature, see derating curve |
| Cooling               | Conduction cooled via baseplate                                   |         |         |       |   |
| Operating Humidity    | 5   |         | 90      | %RH   | Non-condensing                            |
| Storage Temperature   | -40   |         | +90     | °C    |   |
| Operating Altitude    |   |         | 5000    | m     |   |
| Shock                 | IEC68-2-27, 30g, 11ms half sine, 3 times in each of 6 axes        |         |         |       |   |
| Vibration             | IEC68-2-6, 10-500Hz, 2g 10 mins/sweep, 60 mins for each of 3 axes |         |         |       |   |

## EMC: Emissions

| Phenomenon        | Standard    | Test Level | Notes & Conditions |
|-------------------|-------------|------------|--------------------|
| Conducted         | EN55032     | Level B    |                    |
| ESD               |             |            |                    |
| Harmonic Currents | EN61000-3-2 | Class A    |                    |
| Voltage Flicker   | EN61000-3-3 |            |                    |

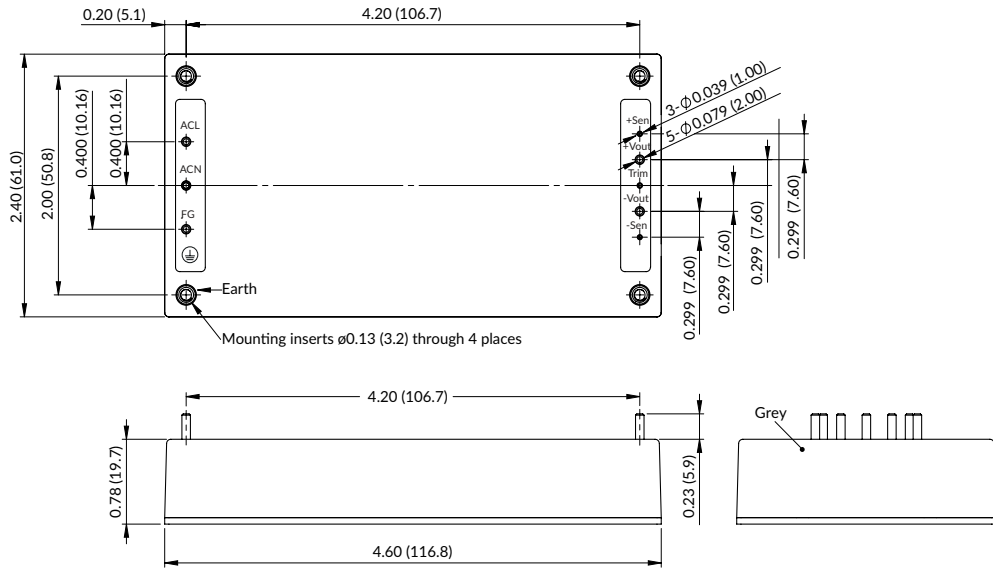
## EMC: Immunity

| Phenomenon             | Standard     | Test Level           | Criteria | Notes & Conditions    |
|------------------------|--------------|----------------------|----------|-----------------------|
| Radiated               | EN61000-4-2  | 3/2                  | A        | ±8kV air/±4kV contact |
| Radiated Immunity      | EN61000-4-3  | 3V/m                 | A        |                       |
| EFT/Burst              | EN61000-4-4  | 2                    | A        |                       |
| Surge                  | EN61000-4-5  | Installation Class 3 | A        |                       |
| Conducted              | EN61000-4-6  | 3V                   | A        |                       |
| Dips and Interruptions | EN61000-4-11 | Dip: 100% 10ms       | A/B      | High Line/Low Line    |
|                        |              | Dip: 30% 500ms       | A/B      | High Line/Low Line    |
|                        |              | Int: 100% 5000ms     | B        |                       |

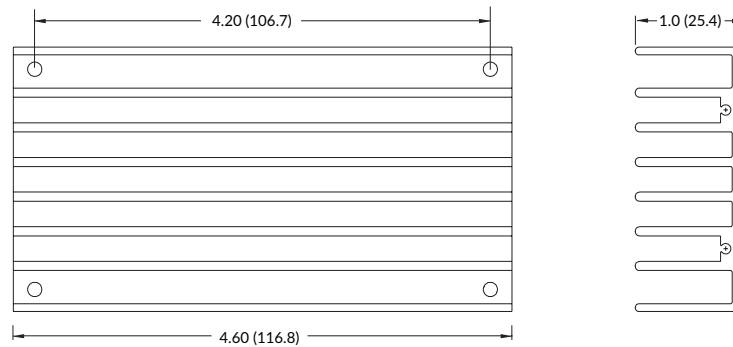
## Safety Approvals

| Safety Agency | Standard                         | Notes & Conditions |
|---------------|----------------------------------|--------------------|
| UL            | UL62368-1                        |                    |
| TUV           | EN62368-1                        |                    |
| CB            | IEC62368-1                       |                    |
| CE            | Meets all applicable directives  |                    |
| UKCA          | Meets all applicable legislation |                    |

## Mechanical Details



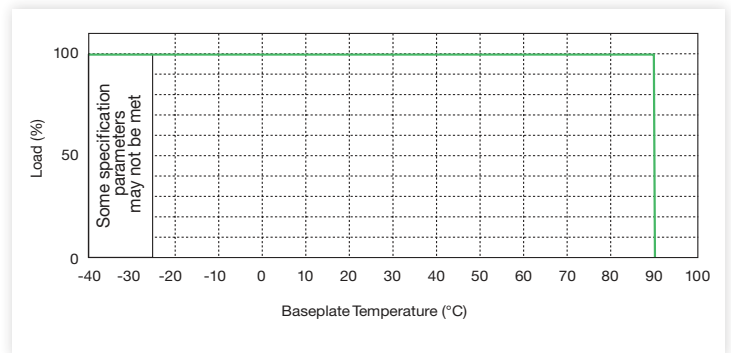
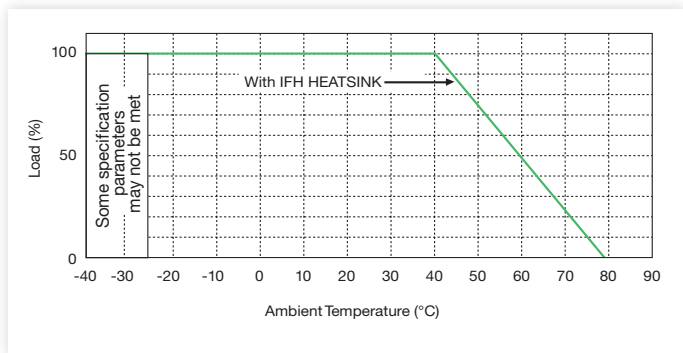
### Heatsink Option



### Notes:

1. Dimensions shown in inches (mm).
2. Weight: 0.62lb (280g)
3. Pin diameter:  $0.08 \pm 0.002$  ( $2.0 \pm 0.05$ )
4. Pin pitch tolerance:  $\pm 0.014$  ( $\pm 0.35$ )
5. Case tolerance:  $\pm 0.02$  ( $\pm 0.5$ )
6. Baseplate is connected to FG Pin

## Derating Curve

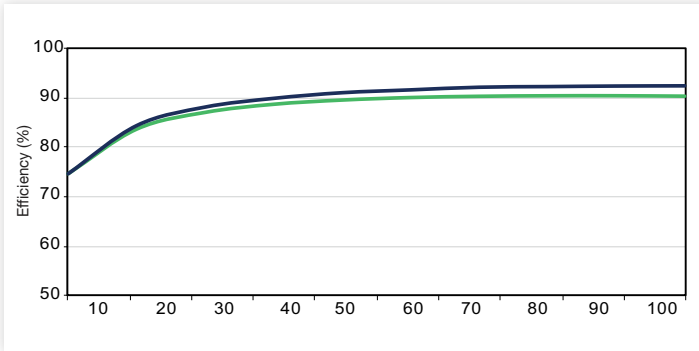


When ASB160 is fitted with IFH HEATSINK and mounted in horizontal position with heatsink upper most, the baseplate temperature will typically be 85°C in an ambient of 40°C.

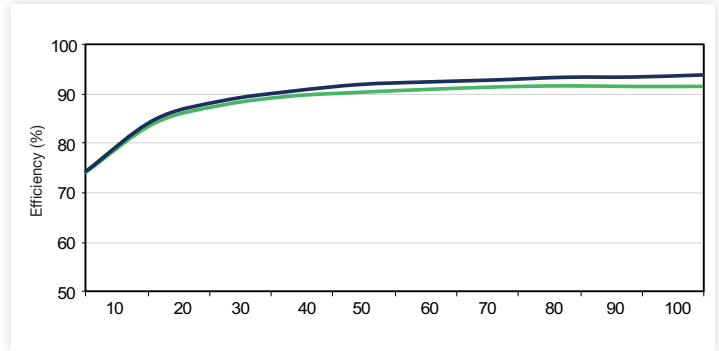
# ASB160 Series

## Efficiency Curves

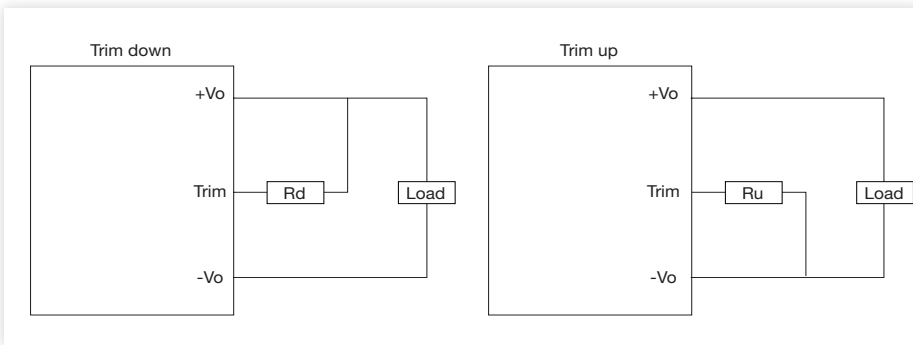
ASB160PS12



ASB160PS24



## Output Voltage Adjustment



### To Trim Down

Connecting an external resistor ( $R_d$ ) between the Trim pin and the +Vo pin decreases the output voltage. The following table can be used to determine the required external resistor value to obtain a percentage output voltage change of 5%.

| Trim Down (%) | 12V     | 15V   | 24V | 36V  | 48V  | 54V  |
|---------------|---------|-------|-----|------|------|------|
|               | Rd (kΩ) |       |     |      |      |      |
| 5             | 288.7   | 398.5 | 738 | 1215 | 1776 | 2005 |

### To Trim Up

Connecting an external resistor ( $R_u$ ) between the Trim pin and the -Vo pin increases the output voltage. The following table can be used to determine the required external resistor value to obtain a percentage output voltage change of 5%.

| Trim Up (%) | 12V     | 15V | 24V  | 36V  | 48V  | 54V  |
|-------------|---------|-----|------|------|------|------|
|             | Ru (kΩ) |     |      |      |      |      |
| 5           | 79      | 84  | 90.8 | 92.8 | 89.4 | 90.8 |