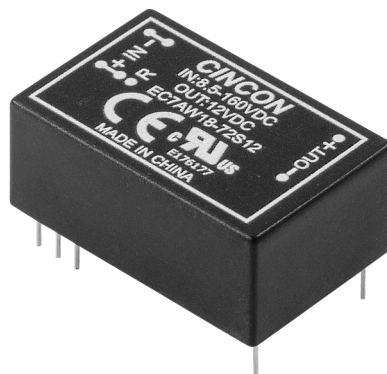




# EC7AW18 SERIES 10 WATT 18:1 INPUT ISOLATED DC-DC CONVERTER

## Features

- Efficiency up to 88%
- Fixed Switching Frequency
- Regulated Outputs
- Remote On/Off
- Low No Load Power Consumption
- Fully protected (OCP/OVP/UVLO)
- 3000Vac I/O Isolation
- Operating Ambient Temperature -40 to +100°C
- 1.25"x0.8"x0.5" Size Meet Industrial Standard
- CB Test Certificate IEC62368-1
- EN50155 Compliant with External Circuits (Coming in Oct.)
- UL62368-1 3rd (Reinforced Insulation) Approval
- Shock & Vibration EN50155 (EN61373) (Coming in Oct.)
- Fire & Smoke EN45545-2 Compliant
- 5000m Operating Altitude



| MODEL NUMBER  | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT |          | INPUT CURRENT |           | % EFF. |     | CAPACITOR LOAD MAX. |
|---------------|---------------|----------------|----------------|----------|---------------|-----------|--------|-----|---------------------|
|               |               |                | MIN.           | MAX.     | NO LOAD       | FULL LOAD | (1)    | (2) |                     |
| EC7AW18-72S05 | 8.5-160 VDC   | 5 VDC          | 0 mA           | 2000 mA  | 6 mA          | 166 mA    | 84     | 82  | 2000μF              |
| EC7AW18-72S12 | 8.5-160 VDC   | 12 VDC         | 0 mA           | 835 mA   | 6 mA          | 158 mA    | 88     | 85  | 835μF               |
| EC7AW18-72S15 | 8.5-160 VDC   | 15 VDC         | 0 mA           | 668 mA   | 6 mA          | 158 mA    | 88     | 85  | 668μF               |
| EC7AW18-72D05 | 8.5-160 VDC   | ±5 VDC         | 0 mA           | ±1000 mA | 6 mA          | 168 mA    | 83     | 82  | 1000μF              |
| EC7AW18-72D12 | 8.5-160 VDC   | ±12 VDC        | 0 mA           | ±416 mA  | 6 mA          | 160 mA    | 87     | 85  | 416μF               |
| EC7AW18-72D15 | 8.5-160 VDC   | ±15 VDC        | 0 mA           | ±333 mA  | 6 mA          | 160 mA    | 87     | 85  | 333μF               |

### NOTE:

1. Nominal Input Voltage 72 VDC.
2. Measured at 110Vin.
3. To meet EN50155 and RIA12 refer to application note.

## PART NUMBER

| Series   | Nominal Input Voltage | Number of Outputs          | Nominal Output Voltage                                                                 | Remote On/Off Logic |
|----------|-----------------------|----------------------------|----------------------------------------------------------------------------------------|---------------------|
| EC7AW18- | II                    | O                          | XX                                                                                     |                     |
| EC7AW18  | 72 : 72 VDC           | S : Single<br><br>D : Dual | 05 : 5.0VDC<br>12 : 12VDC<br>15 : 15VDC<br>05 : ±5 VDC<br>12 : ±12 VDC<br>15 : ±15 VDC | Positive            |

### Part Number Example:

**EC7AW18-72S12:** 1.25"x0.8", 10W, 18:1 8.5-160Vdc Input, Single 12Vdc Output, Positive Logic



# EC7AW18 Series

## TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                     | NOTES and CONDITIONS             | Device | Min. | Typ. | Max. | Units           |
|-------------------------------|----------------------------------|--------|------|------|------|-----------------|
| Input Voltage                 | Continuous                       | All    | -0.3 |      | 160  | V <sub>dc</sub> |
| Input Surge Voltage           | 100ms max.                       | All    |      |      | 200  | V <sub>dc</sub> |
| Operating Ambient Temperature | With derating                    | All    | -40  |      | 100  | °C              |
| Maximum Case Temperature      | At the center part of case plate | All    |      |      | 100  | °C              |
| Storage Temperature           |                                  | All    | -55  |      | 125  | °C              |

### INPUT CHARACTERISTICS

| PARAMETER                         | NOTES and CONDITIONS                     | Device                 | Min. | Typ. | Max. | Units            |
|-----------------------------------|------------------------------------------|------------------------|------|------|------|------------------|
| Operating Input Voltage           |                                          | All                    | 8.5  | 72   | 160  | V <sub>dc</sub>  |
| Input Under Voltage Lockout       |                                          |                        |      |      |      |                  |
| Turn-On Voltage Threshold         | 80% Load                                 | All                    | 8.2  | 9    | 9.5  | V <sub>dc</sub>  |
| Turn-Off Voltage Threshold        | 80% Load                                 | All                    | 6.9  | 7.5  | 8.0  | V <sub>dc</sub>  |
| Lockout Hysteresis Voltage        | 80% Load                                 | All                    | 1.5  |      |      | V <sub>dc</sub>  |
| Maximum Input Current             | V <sub>in</sub> =12V, Full load          | All                    | 1.3  |      |      | A                |
|                                   | V <sub>in</sub> =8.5V, 80% load          |                        |      |      |      |                  |
| No-Load Input Current             | V <sub>in</sub> =72V, I <sub>o</sub> =0A | See Model Number Table |      |      |      | mA               |
| Input Filter                      | LC filter.                               | All                    |      |      |      |                  |
| Inrush Current (I <sup>2</sup> t) | As per ETS300 132-2                      | All                    | 0.1  |      |      | A <sup>2</sup> s |
| Input Reflected Ripple Current    | P-P thru 12uH inductor, 5Hz to 20MHz.    | All                    | 30   |      |      | mA               |

### OUTPUT CHARACTERISTICS

| PARAMETER                                                | NOTES and CONDITIONS                              | Device                   | Min.                       | Typ. | Max.         | Units           |
|----------------------------------------------------------|---------------------------------------------------|--------------------------|----------------------------|------|--------------|-----------------|
| Voltage Set Point Accuracy                               | V <sub>in</sub> =72V, Full load, Tc=25°C          | All                      | -1.0                       |      | +1.0         | %               |
| Output Voltage Balance                                   | V <sub>in</sub> =72V, Full load, Tc=25°C          | Dual                     | -1.0                       |      | +1.0         | %               |
| Output Voltage Regulation                                |                                                   |                          |                            |      |              |                 |
| Load Regulation                                          | Full load to no load                              | Single<br>Dual           |                            |      | ±0.5<br>±1.0 | %               |
| Line Regulation                                          | V <sub>in</sub> =High line to low line, full load | All                      |                            |      | ±0.2         | %               |
| Cross Regulation                                         | Load cross variation 25%/100%                     | Dual                     |                            |      | ±5.0         | %               |
| Temperature Coefficient                                  | Tc=-40°C to 100°C                                 | All                      |                            |      | ±0.02        | %/°C            |
| Output Voltage Ripple and Noise (5Hz to 20MHz bandwidth) |                                                   |                          |                            |      |              |                 |
| Peak-to-Peak                                             | Full load, 2.2uF ceramic capacitors.              | All                      |                            |      | 100          | mV              |
| RMS.                                                     |                                                   | All                      |                            |      | 40           | mV              |
| Output Current Range                                     | V <sub>in</sub> = 8.5 to 12V                      | See Power Derating Curve |                            |      |              | A               |
|                                                          | V <sub>in</sub> = 12 to 160V                      | See Model Number Table   |                            |      |              |                 |
| Over Current Protection                                  | Hiccup mode. Auto recovery                        | All                      | 110                        | 150  | 180          | %               |
| Short Circuit Protection                                 |                                                   | All                      | Continuous, Auto Recovery. |      |              |                 |
| External Load Capacitance                                | Full load (resistive)                             | See Model Number Table   |                            |      |              | uF              |
| Over Voltage Protection                                  | Zener clamp (single output only)                  | 5Vo                      | 6.2                        |      |              | V <sub>dc</sub> |
|                                                          |                                                   | 12Vo                     | 15                         |      |              |                 |
|                                                          |                                                   | 15Vo                     | 18                         |      |              |                 |



# EC7AW18 Series

## EFFICIENCY

| PARAMETER | NOTES and CONDITIONS       | Device                 | Min. | Typ. | Max. | Units |
|-----------|----------------------------|------------------------|------|------|------|-------|
| 100% Load | V <sub>in</sub> =72V, 110V | See Model Number Table |      |      |      | %     |

## DYNAMIC CHARACTERISTICS

| PARAMETER                               | NOTES and CONDITIONS                                                                                                                  | Device | Min. | Typ. | Max. | Units |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------|------|------|------|-------|
| Output Voltage Current Transient        |                                                                                                                                       |        |      |      |      |       |
| Error Band                              | 75% to 100% of I <sub>o_max</sub> step load change<br>d <sub>i</sub> /d <sub>t</sub> =0.1A/us<br>(within 1% V <sub>out</sub> nominal) | All    |      |      | ±5   | %     |
| Recovery Time                           |                                                                                                                                       | All    |      |      | 250  | us    |
| Turn-On Delay and Rise Time             | Full load (constant resistive load)                                                                                                   |        |      |      |      |       |
| Turn-On Delay Time, From On/Off Control | V <sub>on/off</sub> to 10%V <sub>o_set</sub> , Remote on                                                                              | All    |      | 5    |      | ms    |
| Turn-On Delay Time, From Input          | V <sub>in_min</sub> to 10%V <sub>o_set</sub> , Power up                                                                               | All    |      | 5    |      | ms    |
| Output Voltage Rise Time                | 10%V <sub>o_set</sub> to 90%V <sub>o_set</sub>                                                                                        | All    |      | 10   |      | ms    |

## ISOLATION CHARACTERISTICS

| PARAMETER                                                | NOTES and CONDITIONS            | Device | Min. | Typ. | Max.         | Units                              |
|----------------------------------------------------------|---------------------------------|--------|------|------|--------------|------------------------------------|
| Isolation Voltage<br>(100% factory Hi-Pot tested @2sec.) | 1 minute; Input to output       | All    |      |      | 3000<br>4200 | V <sub>ac</sub><br>V <sub>dc</sub> |
| Isolation Resistance                                     | Input to output                 | All    | 1000 |      |              | MΩ                                 |
| Isolation Capacitance                                    | Input to output (100KHz, 0.25V) | All    |      | 16   |              | pF                                 |

## FEATURE CHARACTERISTICS

| PARAMETER                                                                   | NOTES and CONDITIONS                                           | Device | Min.                      | Typ. | Max. | Units |
|-----------------------------------------------------------------------------|----------------------------------------------------------------|--------|---------------------------|------|------|-------|
| Switching Frequency                                                         | Output ripple frequency                                        | All    | 230                       | 255  | 280  | KHz   |
| On/Off Control, Positive Remote On/Off logic, Refer to -V <sub>in</sub> pin |                                                                |        |                           |      |      |       |
| Logic Low (Module Off)                                                      | V <sub>on/off</sub> at I <sub>on/off</sub> =1.0mA              | All    | 0                         |      | 1.2  | V     |
| Logic High (Module On)                                                      | V <sub>on/off</sub> at I <sub>on/off</sub> =0.0uA, Pin open=On | All    | 3.5 or<br>Open<br>Circuit |      | 160  | V     |
| On/Off Current (for both remote on/off logic)                               | I <sub>on/off</sub> at V <sub>on/off</sub> =0V                 | All    |                           | 0.4  | 1    | mA    |
| Leakage Current (for both remote on/off logic)                              | Logic high, V <sub>on/off</sub> =15V                           | All    |                           |      | 30   | uA    |
| Off Converter Input Current                                                 | Shutdown input idle current                                    | All    |                           | 1.5  | 3    | mA    |

## GENERAL SPECIFICATIONS

| PARAMETER        | NOTES and CONDITIONS                                                               | Device                                        | Min. | Typ.                                         | Max. | Units      |
|------------------|------------------------------------------------------------------------------------|-----------------------------------------------|------|----------------------------------------------|------|------------|
| MTBF             | I <sub>o</sub> =100% of I <sub>o_max</sub> ;<br>MIL-HDBK - 217F_Notice 1, GB, 25°C | 5Vo<br>12Vo<br>15Vo<br>±5Vo<br>±12Vo<br>±15Vo |      | 1654<br>2295<br>2363<br>1664<br>2093<br>2335 |      | K<br>hours |
| Weight           |                                                                                    | All                                           |      | 16                                           |      | grams      |
| Case Material    | Plastic, DAP, UL 94V-0                                                             |                                               |      |                                              |      |            |
| Base Material    | Plastic, LCP, UL 94V-0                                                             |                                               |      |                                              |      |            |
| Potting Material | UL 94V-0                                                                           |                                               |      |                                              |      |            |
| Pin Material     | Base: Copper plated steel wire<br>Plating: Tin                                     |                                               |      |                                              |      |            |



# EC7AW18 Series

## GENERAL SPECIFICATIONS

|                                 |                                                     |                                                                                    |                                             |
|---------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------|
| Shock/Vibration                 | MIL-STD-810F/EN61373 Compliant                      |                                                                                    |                                             |
| Humidity                        | 95% RH max. Non Condensing                          |                                                                                    |                                             |
| Altitude                        | 5000m Operating Altitude, 12000m Transport Altitude |                                                                                    |                                             |
| Thermal Shock                   | MIL-STD-810F                                        |                                                                                    |                                             |
| Fire & Smoke                    | EN45545-2 Compliant                                 |                                                                                    |                                             |
| EMI                             | Meets EN50155 Compliant (with external filter)      |                                                                                    | Class A                                     |
| ESD                             | EN61000-4-2                                         | Level 3: Air $\pm 8\text{kV}$ , Contact $\pm 6\text{kV}$                           | Perf. Criteria A                            |
| Radiated immunity               | EN61000-4-3                                         | Level 3: 80~1000MHz, 20V/m                                                         | Perf. Criteria A                            |
| Fast Transient                  | EN61000-4-4                                         | Level 3: On power input port, $\pm 2\text{kV}$ , external input capacitor required | Perf. Criteria A                            |
| Surge                           | EN61000-4-5                                         | Level 4: Line to earth, $\pm 4\text{kV}$ , Line to line, $\pm 2\text{kV}$          | Perf. Criteria A                            |
| Conducted immunity              | EN61000-4-6                                         | Level 3: 0.15~80MHz, 10V                                                           | Perf. Criteria A                            |
| Interruptions of Voltage Supply | EN50155                                             | Class S3: 20ms interruptions                                                       | Perf. Criteria A                            |
| Supply Change Over              | EN50155                                             | Class C2: During a supply break of 30 ms                                           | Perf. Criteria A                            |
| Application Note Link           |                                                     |                                                                                    | <a href="#">EC7AW18-72 Series App Notes</a> |
| Packaging Information Link      |                                                     |                                                                                    | <a href="#">Packaging Information</a>       |

## Immunity to Environmental Conditions

| Phenomenon                                                    | EN50155; 2017 Reference Clause(s) | Reference Standard | Test Conditions                                                                                                                                                                                                                                                                           | Result         |
|---------------------------------------------------------------|-----------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Low Temperature Start-up test                                 | 13.4.4                            | EN 60068-2-1       | Class OT4<br>Temperature: $-40^{\circ}\text{C}$<br>Duration: 2 hrs                                                                                                                                                                                                                        | Coming in Oct. |
| Dry Heat Test                                                 | 13.4.5                            | EN 60068-2-2       | Class OT4 & ST2<br>Temperature: $70^{\circ}\text{C}$<br>Duration: 6 hrs<br>Extended temperature: $85^{\circ}\text{C}$<br>Extended Duration: 10min                                                                                                                                         | Coming in Oct. |
| Low Temperature Storage Test                                  | 13.4.6                            | EN 60068-2-1       | Temperature: $-40^{\circ}\text{C}$<br>Duration: 16 hrs                                                                                                                                                                                                                                    | Coming in Oct. |
| Cyclic Damp Heat Test                                         | 13.4.7                            | EN 60068-2-30      | Temperature: $25^{\circ}\text{C} - 55^{\circ}\text{C}$<br>Humidity: 90% RH<br>Duration: 48 hrs                                                                                                                                                                                            | Coming in Oct. |
| Random Vibration Test                                         | 13.4.11                           | EN 61373           | Temperature: $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$<br>Humidity: 50% $\pm 25\%$ RH<br>Frequency range: 5 ~ 150 Hz<br>Vertical: $1.01 \text{ m/s}^2$<br>Transverse: $0.450 \text{ m/s}^2$<br>Longitudinal: $0.700 \text{ m/s}^2$<br>Duration: 10 min / axis                           | Coming in Oct. |
| Simulated Long Life Test at Increased Random Vibration Levels | 13.4.11                           | EN 61373           | Temperature: $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$<br>Humidity: 50% $\pm 25\%$ RH<br>Frequency range: 5 ~ 150 Hz<br>Vertical: $5.72 \text{ m/s}^2$<br>Transverse: $2.55 \text{ m/s}^2$<br>Longitudinal: $3.96 \text{ m/s}^2$<br>Duration: 5 hrs / axis                              | Coming in Oct. |
| Shock Test                                                    | 13.4.11                           | EN 61373           | Temperature: $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$<br>Humidity: 50% $\pm 25\%$ RH<br>Frequency range: 5 ~ 150 Hz<br>$\pm$ Vertical: $30 \text{ m/s}^2$<br>$\pm$ Transverse: $30 \text{ m/s}^2$<br>$\pm$ Longitudinal: $50 \text{ m/s}^2$<br>Duration: 30ms x18 (Each axis 3 shocks) | Coming in Oct. |



# EC7AW18 Series

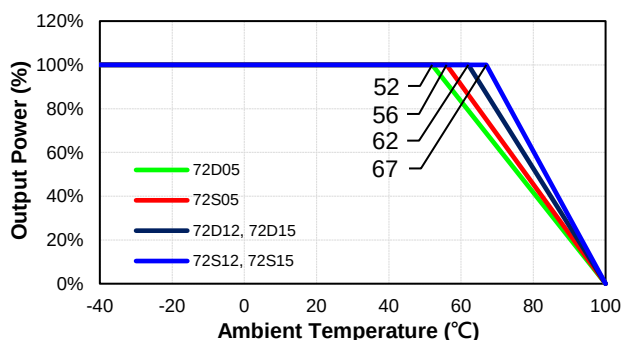
## EN45545-2 Fire & Smoke Test Conditions

| Item |                     | Standard                                 | Hazard Level  |
|------|---------------------|------------------------------------------|---------------|
| R22  | Oxygen Index Test   | EN 45545-2: 2013<br>EN ISO 4589-2: 2006  | HL1, HL2, HL3 |
|      | Smoke Density Test  | EN 45545-2: 2013<br>EN ISO 5659-2: 2013  | HL1, HL2, HL3 |
|      | Smoke Toxicity Test | EN 45545-2: 2013<br>NF X70-100: 2006     | HL1, HL2, HL3 |
| R23  | Oxygen Index Test   | EN 45545-2: 2013<br>EN ISO 4589-2: 2006  | HL1, HL2, HL3 |
|      | Smoke Density Test  | EN 45545-2: 2013<br>EN ISO 5659-2: 2013  | HL1, HL2, HL3 |
|      | Smoke Toxicity Test | EN 45545-2: 2013<br>NF X70-100: 2006     | HL1, HL2, HL3 |
| R24  | Oxygen Index Test   | EN45545-2: 2013<br>EN ISO 4589-2         | HL1, HL2, HL3 |
| R25  | Glow - Wire Test    | EN 45545-2:2013<br>EN 60695-2-11:2001    | HL1, HL2, HL3 |
| R26  | Vertical Flame Test | EN 45545-2: 2013<br>EN 60695-11-10: 2013 | HL1, HL2, HL3 |

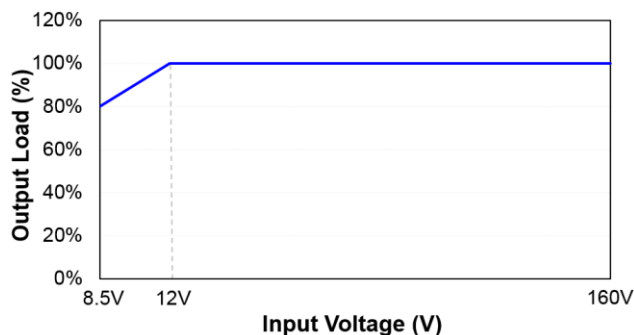
## CHARACTERISTIC CURVE

### Power Derating Curve

EC7AW18-72 Derating Curve (Vin=72V)

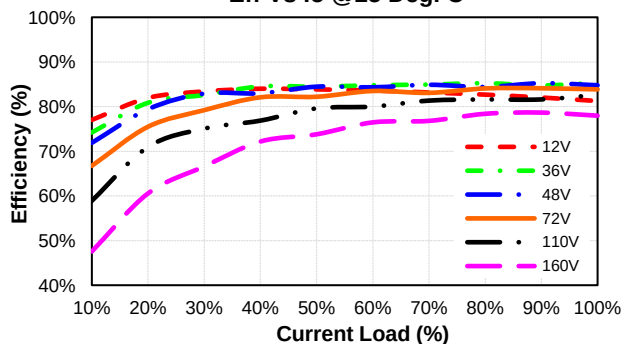


EC7AW18-72 Input Voltage Derating Curve

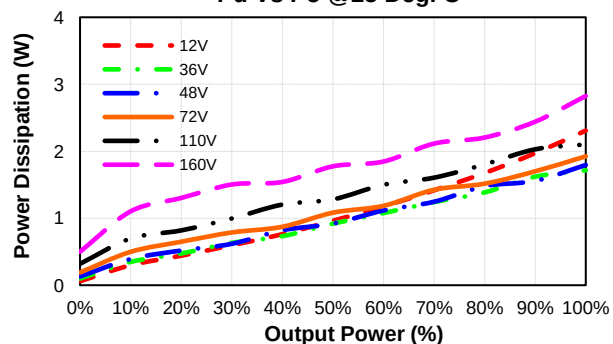


### Performance Data

EC7AW18-72S05  
Eff Vs Io @25 Deg. C



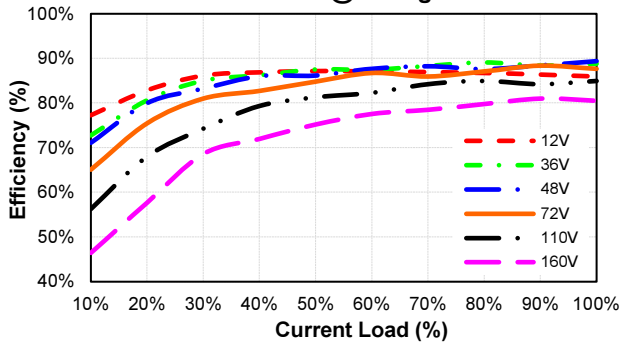
EC7AW18-72S05  
Pd Vs Po @25 Deg. C



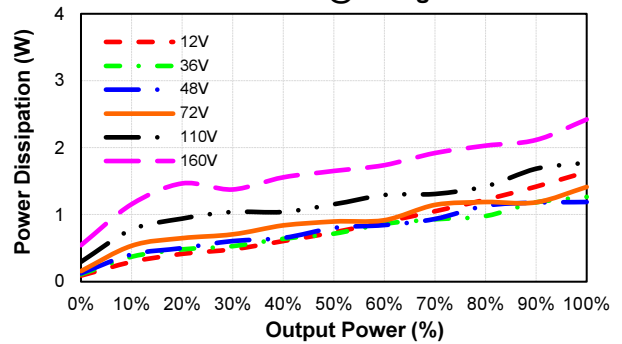


# EC7AW18 Series

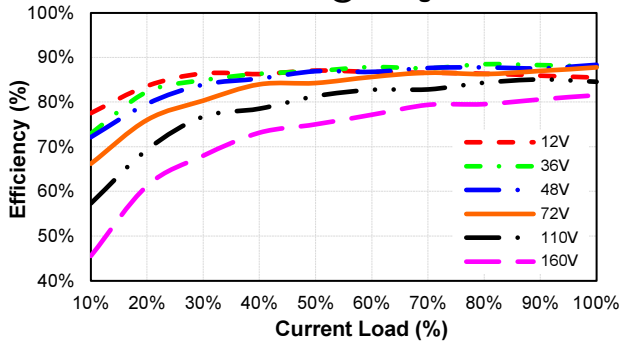
**EC7AW18-72S12**  
Eff Vs Io @25 Deg. C



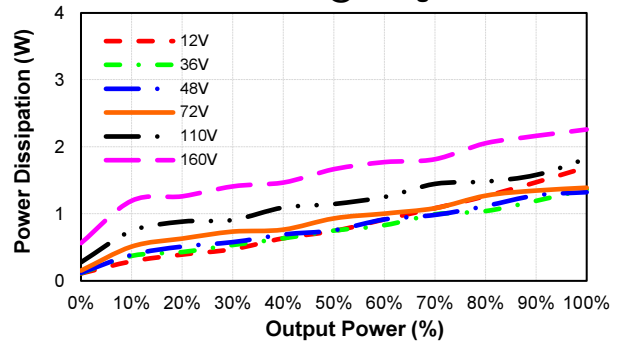
**EC7AW18-72S12**  
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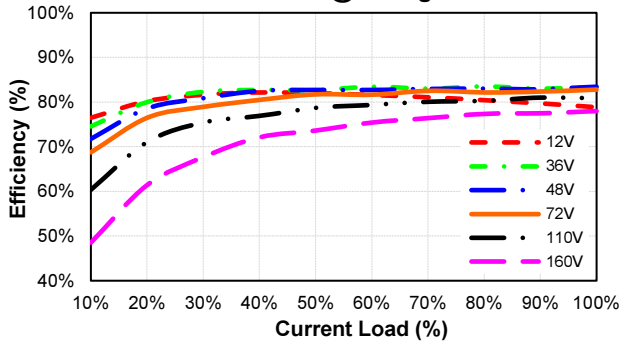
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Eff Vs Io @25 Deg. C



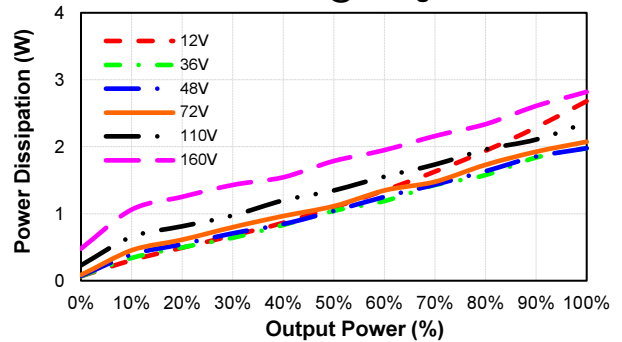
**EC7AW18-72S15**  
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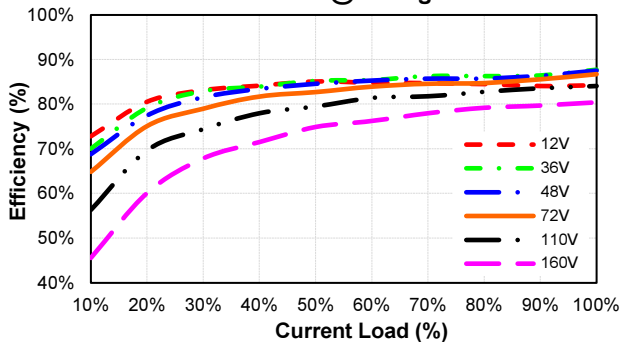
**EC7AW18-72D05**  
Eff Vs Io @25 Deg. C



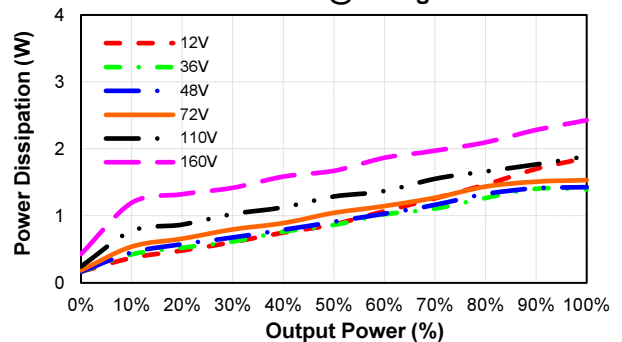
**EC7AW18-72D05**  
Pd Vs Po @25 Deg. C



**EC7AW18-72D12**  
Eff Vs Io @25 Deg. C

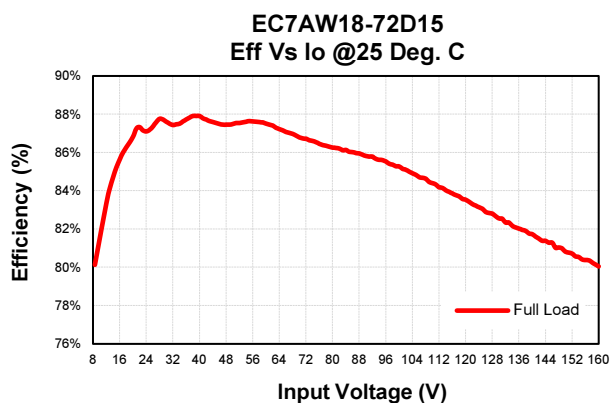
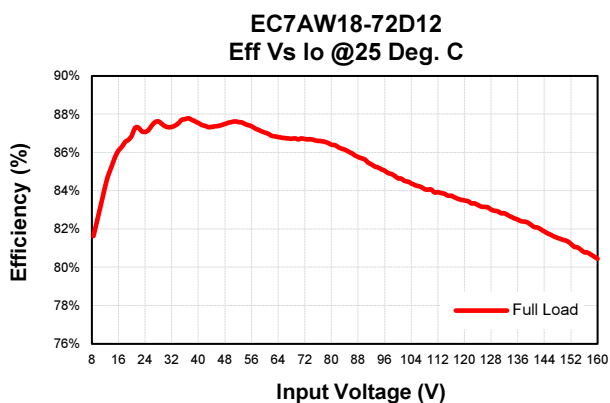
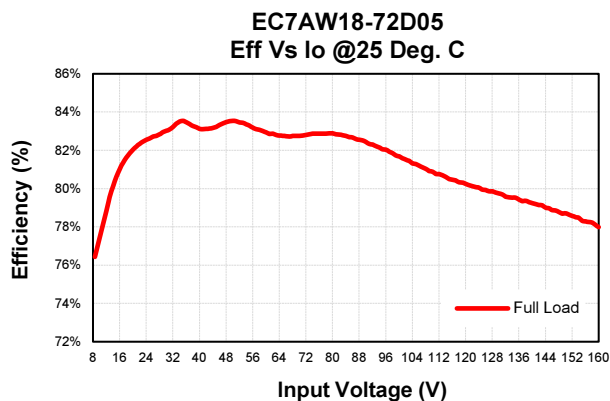
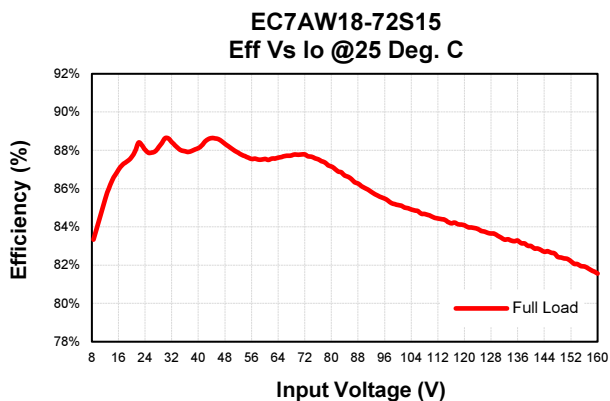
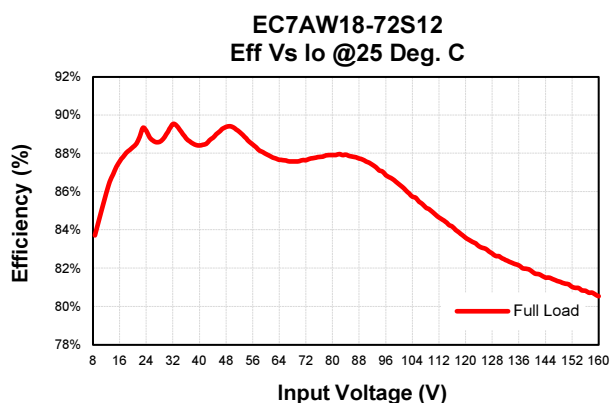
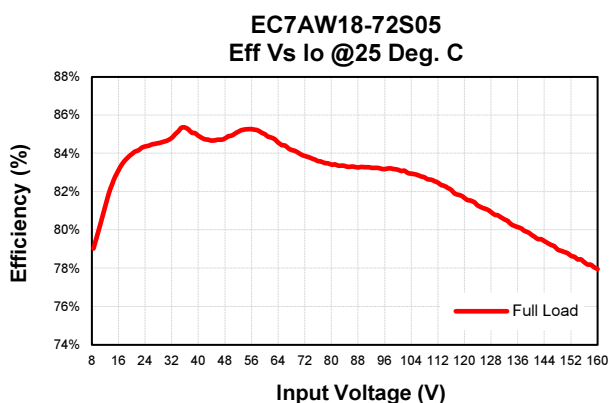
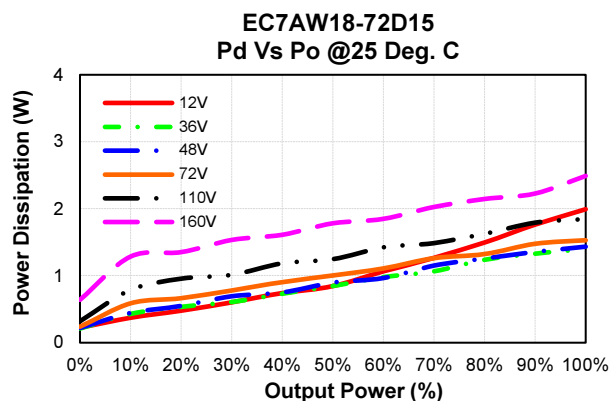
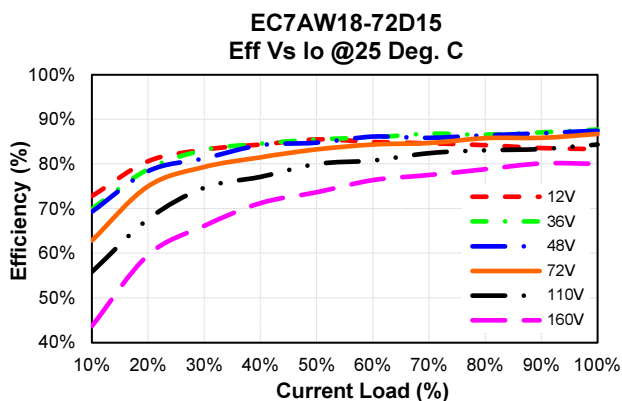


**EC7AW18-72D12**  
Pd Vs Po @25 Deg. C





# EC7AW18 Series

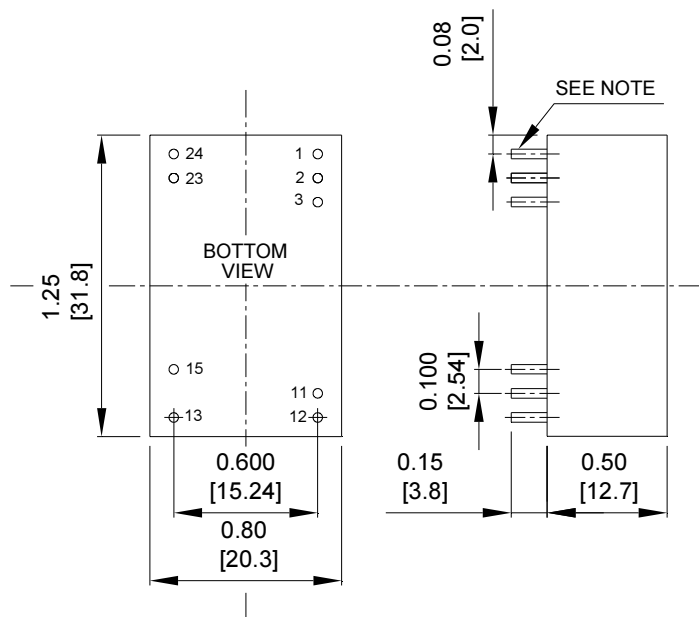


Note: 8.5Vin Efficiency at 80% Full Load



# EC7AW18 Series

## MECHANICAL SPECIFICATION



### CASE A

NOTE: Pin Size is 0.02±0.002 Inch (0.5±0.05mm) DIA  
All Dimensions In Inches (mm)

Tolerances Inches: X.XX= ±0.02 , X.XXX= ±0.010  
Millimeters: X.X= ±0.5 , X.XX=±0.25

| PIN CONNECTION |               |               |
|----------------|---------------|---------------|
| Pin            | Single Output | Dual Output   |
| 1              | +V Input      | +V Input      |
| 2              | +V Input      | +V Input      |
| 3              | Remote On/Off | Remote On/Off |
| 11             | NP            | Common        |
| 12             | -V Output     | NP            |
| 13             | +V Output     | -V Output     |
| 15             | NP            | +V Output     |
| 23             | -V Input      | -V Input      |
| 24             | -V Input      | -V Input      |

\* NC-NO CONNECTION WITH PIN

\* NP-NO PIN



# Mouser Electronics

Authorized Distributor

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