All test conditions are at 25°C. The figures are identical for HAE150-12S3P3.

Efficiency versus Output Load

Power dissipation versus Output Load

Efficiency versus Input Voltage

Derating Output Load versus Ambient Temperature and Airflow

Derating Output Load versus Ambient Temperature and Airflow With 0.24" Heat-Sink, Vin(nom)

Derating Output Load versus Ambient Temperature and Airflow With 0.45" Heat-Sink, Vin(nom)
All test conditions are at 25°C. The figures are identical for HAE150-12S3P3.

**Typical Output Ripple and Noise.**
Vin(nom); Full Load

**Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

**Typical Input Start-Up and Output Rise Characteristic**
Vin(nom); Full Load

**Using ON/OFF Voltage Start-Up and Output Rise Characteristic**
Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-12S05.

- Efficiency versus Output Load
- Power dissipation versus Output Load
- Efficiency versus Input Voltage
- Derating Output Load versus Ambient Temperature and Airflow
  - Full Load
  - With 0.24" Heat-Sink, Vin(nom)
  - With 0.45" Heat-Sink, Vin(nom)
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-12S05

**Typical Output Ripple and Noise.**
Vin(nom); Full Load

**Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

**Typical Input Start-Up and Output Rise Characteristic**
Vin(nom); Full Load

**Using ON/OFF Voltage Start-Up and Output Rise Characteristic**
Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-12S12.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-12S12

Typical Output Ripple and Noise.
Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-12S15.

Efficiency versus Output Load

Power dissipation versus Output Load

Efficiency versus Input Voltage

Derating Output Load versus Ambient Temperature and Airflow

Full Load

Vin(nom)

With 0.24" Heat-Sink, Vin(nom)

With 0.45" Heat-Sink, Vin(nom)
All test conditions are at 25°C. The figures are identical for HAE150-12S15.

**Characteristic Curves (Continued)**

- **Typical Output Ripple and Noise.** Vin(nom); Full Load
- **Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**
- **Typical Input Start-Up and Output Rise Characteristic.** Vin(nom); Full Load
- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.** Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-12S24.
All test conditions are at 25°C. The figures are identical for HAE150-12S24.

Typical Output Ripple and Noise. Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic. Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic. Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-12S28.
All test conditions are at 25°C. The figures are identical for HAE150-12S28

Characteristic Curves (Continued)

Typical Output Ripple and Noise.
Vin(nom); Full Load

Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-12S48.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-12S48.

Typical Output Ripple and Noise. Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic. Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic. Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-24S3P3.
All test conditions are at 25°C. The figures are identical for HAE150-24S3P3

Typical Output Ripple and Noise.
 Vin(nom); Full Load

Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic
 Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic
 Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-24S05.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S05.

- **Typical Output Ripple and Noise.**
  - Vin(nom); Full Load

- **Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

- **Typical Input Start-Up and Output Rise Characteristic.**
  - Vin(nom); Full Load

- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.**
  - Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-24S12.

**Efficiency versus Output Load**

**Power dissipation versus Output Load**

**Efficiency versus Input Voltage**

**Derating Output Load versus Ambient Temperature and Airflow**

**Derating Output Load versus Ambient Temperature and Airflow**

With 0.24" Heat-Sink,Vin(nom)

With 0.45" Heat-Sink,Vin(nom)
All test conditions are at 25°C. The figures are identical for HAE150-24S12.

- **Typical Output Ripple and Noise.**
  Vin(nom); Full Load

- **Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

- **Typical Input Start-Up and Output Rise Characteristic.**
  Vin(nom); Full Load

- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.**
  Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S15.

**Efficiency versus Output Load**

- **Vin = 16.5V**
- **Vin = 24V**
- **Vin = 36V**

**Power dissipation versus Output Load**

- **Vin = 16.5V**
- **Vin = 24V**
- **Vin = 36V**

**Efficiency versus Input Voltage**

- Full Load

**Derating Output Load versus Ambient Temperature and Airflow**

- 100LFM
- 200LFM
- 300LFM
- 400LFM
- 500LFM

*Mount on 2U iron base-plate (dimension 19" X 3.5" X 0.063")*

*Terminal block Natural convection (20LFM)*

**Derating Output Load versus Ambient Temperature and Airflow With 0.24" Heat-Sink, Vin(nom)**

**Derating Output Load versus Ambient Temperature and Airflow With 0.45" Heat-Sink, Vin(nom)**
All test conditions are at 25°C. The figures are identical for HAE150-24S15.

**Characteristic Curves (Continued)**

- **Typical Output Ripple and Noise.**
  - Vin(nom); Full Load

- **Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

- **Typical Input Start-Up and Output Rise Characteristic.**
  - Vin(nom); Full Load

- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.**
  - Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S24.
Characteristic Curves (Continued)

All test conditions are at 25℃. The figures are identical for HAE150-24S24.

Typical Output Ripple and Noise.
Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S28

Efficiency versus Output Load

Power dissipation versus Output Load

Efficiency versus Input Voltage Full Load

Derating Output Load versus Ambient Temperature and Airflow Vin(nom)

Derating Output Load versus Ambient Temperature and Airflow With 0.24” Heat-Sink, Vin(nom)

Derating Output Load versus Ambient Temperature and Airflow With 0.45” Heat-Sink, Vin(nom)
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S28

**Typical Output Ripple and Noise.**

Vin(nom); Full Load

**Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

**Typical Input Start-Up and Output Rise Characteristic**

Vin(nom); Full Load

**Using ON/OFF Voltage Start-Up and Output Rise Characteristic**

Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S48.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-24S48

- **Typical Output Ripple and Noise.**
  Vin(nom); Full Load

- **Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

- **Typical Input Start-Up and Output Rise Characteristic.**
  Vin(nom); Full Load

- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.**
  Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-48S3P3.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S3P3

Typical Output Ripple and Noise. Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin(nom); Full Load
All test conditions are at 25 degrees Celsius. The figures are identical for HAE150-48S05.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S05.

- **Typical Output Ripple and Noise.** Vin(nom); Full Load
- **Transient Response to Dynamic Load Change.** 100% to 75% to 100% of Full Load; Vin(nom)
- **Typical Input Start-Up and Output Rise Characteristic.** Vin(nom); Full Load
- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.** Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-48S12.

Efficiency versus Output Load

Power dissipation versus Output Load

Efficiency versus Input Voltage

Derating Output Load versus Ambient Temperature and Airflow

Derating Output Load versus Ambient Temperature and Airflow With 0.24” Heat-Sink, Vin(nom)

Derating Output Load versus Ambient Temperature and Airflow With 0.45” Heat-Sink, Vin(nom)
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S12

- Typical Output Ripple and Noise:
  - Vin(nom); Full Load

- Transient Response to Dynamic Load Change:
  - 100% to 75% to 100% of Full Load; Vin(nom)

- Typical Input Start-Up and Output Rise Characteristic:
  - Vin(nom); Full Load

- Using ON/OFF Voltage Start-Up and Output Rise Characteristic:
  - Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S15.

Efficiency versus Output Load

Power dissipation versus Output Load

Efficiency versus Input Voltage

Derating Output Load versus Ambient Temperature and Airflow

Derating Output Load versus Ambient Temperature and Airflow

With 0.24" Heat-Sink, Vin(nom)

With 0.45" Heat-Sink, Vin(nom)
All test conditions are at 25°C. The figures are identical for HAE150-48S15

Typical Output Ripple and Noise.
Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S24.

Efficiency versus Output Load

Power Dissipation versus Output Load

Efficiency versus Input Voltage

Derating Output Load versus Ambient Temperature and Airflow

Derating Output Load versus Ambient Temperature and Airflow

Vin(nom)
All test conditions are at 25°C. The figures are identical for HAE150-48S24.

**Characteristic Curves (Continued)**

- **Typical Output Ripple and Noise.**
  - Vin(nom); Full Load

- **Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)**

- **Typical Input Start-Up and Output Rise Characteristic.**
  - Vin(nom); Full Load

- **Using ON/OFF Voltage Start-Up and Output Rise Characteristic.**
  - Vin(nom); Full Load
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S28.

Efficiency versus Output Load

Power dissipation versus Output Load

Efficiency versus Input Voltage
Full Load

Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)

Derating Output Load versus Ambient Temperature and Airflow
With 0.24" Heat-Sink, Vin(nom)

Derating Output Load versus Ambient Temperature and Airflow
With 0.45" Heat-Sink, Vin(nom)
All test conditions are at 25°C. The figures are identical for HAE150-48S28

Typical Output Ripple and Noise. Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-48S48.
Characteristic Curves (Continued)

All test conditions are at 25°C. The figures are identical for HAE150-48S48

Typical Output Ripple and Noise. Vin(nom); Full Load

Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)

Typical Input Start-Up and Output Rise Characteristic. Vin(nom); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic. Vin(nom); Full Load
All test conditions are at 25°C. The figures are identical for HAE150-48S53.
All test conditions are at 25°C. The figures are identical for HAE150-48S53

Typical Output Ripple and Noise. 
\( V_{\text{in}}(\text{nom}) \); Full Load

Transient Response to Dynamic Load Change from 
100% to 75% to 100% of Full Load; \( V_{\text{in}}(\text{nom}) \)

Typical Input Start-Up and Output Rise Characteristic 
\( V_{\text{in}}(\text{nom}) \); Full Load

Using ON/OFF Voltage Start-Up and Output Rise Characteristic 
\( V_{\text{in}}(\text{nom}) \); Full Load