POWERBOX Industrial Line
PQAE100W Series
Up to 90W 4:1 Single Output
High Performance DC/DC Converter
Manual

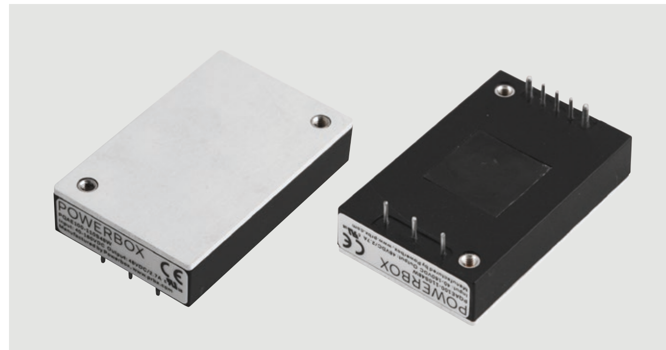


Table of Contents

Line Protection & EMC Considerations

1. Typical Application

- Below shows some blocks connected between power source and DC/DC module. Install the circuit of the block which is required.
- Each block has individual function and should be placed on the corresponding location.

If CEMI is an Aluminum electrolytic capacitor and connected in parallel with CEMS, The capacitance we recommended for meeting EMS requirements could be CEMS pluses CEMI.

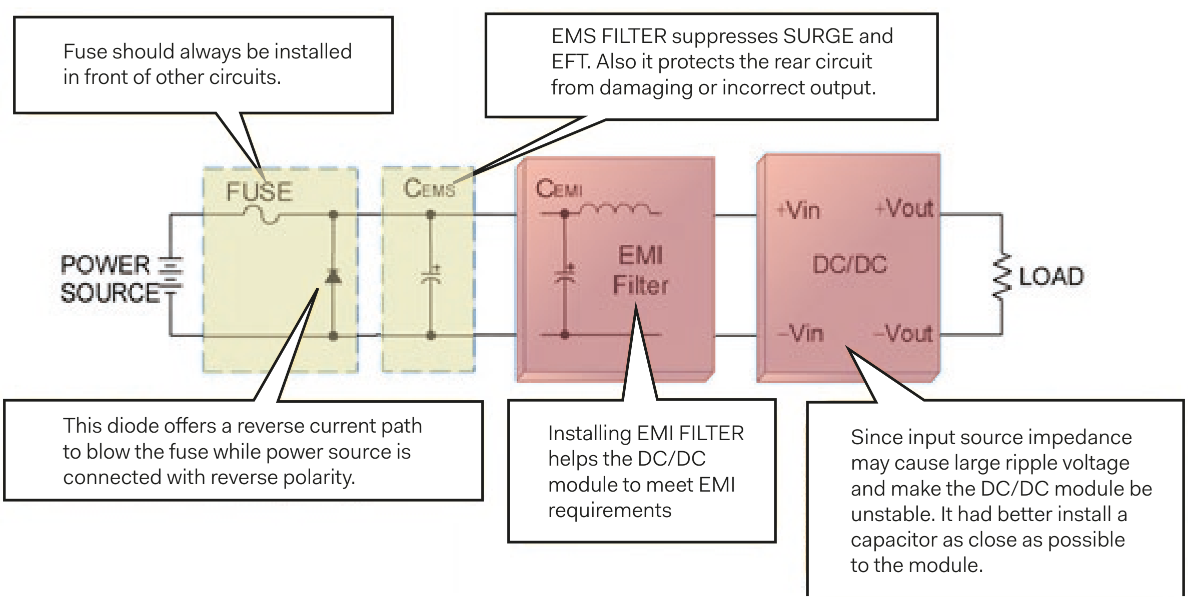


Fig. 1-1 Typical Application

- Input source impedance: The power modules will operate as specifications without external components, assuming that the source voltage has a very low impedance and reasonable input voltage regulation. Highly inductive source impedances can affect the stability of the power module. Since real-world voltage source has finite impedance, performance can be improved by adding external filter capacitor.

The PQAE100-24S□□W and PQAE100-48S□□W recommended Nippon Chemi-con KY series, 100μF/100V.
The PQAE100-110S□□W recommended Ruby-con BXF series, 39μF/200V.

2. Line Protections

Fuse

- The DC/DC converter is not internally fused. An input line fuse must always be used.
- Fuses should be installed in front of each module when multiple DC/DC converters connect to the same power source.

Model	Fuse Rating (A)	Fuse Type
PQAE100-24S□□W	20	Slow-Blow
PQAE100-48S□□W	10	Slow-Blow
PQAE100-110S□□W	4	Slow-Blow

Table 2-1 FUSE selection

- According to actual current value, calculating fuse ratings base on the following equations:

$I_{FUSE} \geq I_{in}$ /(rerating x safety margin)

Melting $I^2t = I^2_{PULSE,act} \cdot t / 0.22$

Where

I_{FUSE} is current rating of fuse.

I_{in} is actual value of input current.

Rerating is percentage of fuse rating base on ambient temperature. Fuse rating is variety under different ambient temperature.

Safety margin is percentage of fuse rating set by user.

Melting I^2t is pulse energy rating of fuse.

$I_{PULSE,act}$ is actual input pulse current.

t is the width of the input pulse current.

Reverse Input Voltage Protection

- Avoid the reverse polarity input voltage; otherwise, it will damage the DC/DC converter.
- It is likely to protect the module from the reverse input voltage by installing an external diode.
- The diode can blow the line fuse to protect DC/DC converter.
- Recommend using Schottky diode for reverse input voltage protection.

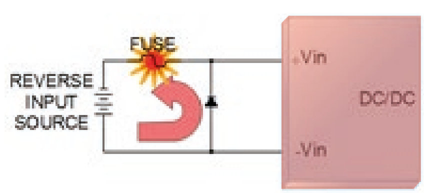


Fig. 2-1 Reverse input voltage protection

Model	Voltage Rating of the Diode	Current Rating of the Diode
PQAE100-24S□□W	60V	1~1.5 x Fuse Rating
PQAE100-48S□□W	100V	1~1.5 x Fuse Rating
PQAE100-110S□□W	200V	1~1.5 x Fuse Rating

Table. 2-2 Reverse protection diode selection

3. EMS Considerations

- The module can meet EMS requirements as below.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.

Parameter	**Conditions**	**Level**	
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV	Perf. Criteria A
Surge	EN61000-4-5	EN55024:±2kV and EN50155:±2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

Table 3-1 EMS requirements

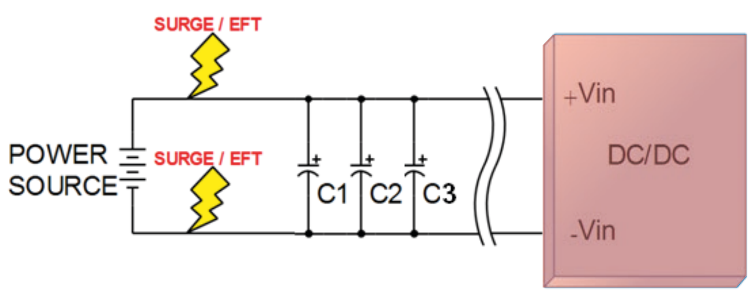


Fig. 3-1 Surge & EFT protections

- It should be noticed that the current path of the PCB trace. Wrong PCB layout reduces ability of suppressing SURGE or EFT.

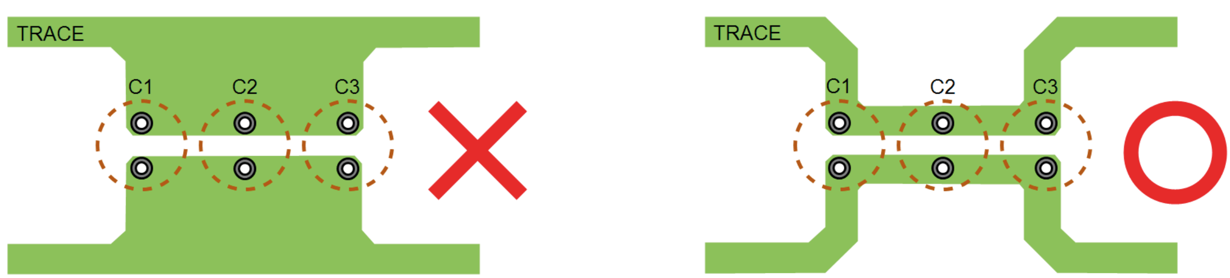


Fig. 3-2 PCB trace

Model	**Component**	**Specification**	**Reference**
PQAE100-24S□□W	C1 , C2	220μF/100V	Nippon Chemi-con KY series
PQAE100-48S□□□W	C1 C2	220μF/100V	Nippon Chemi-con KY series
PQAE100-110S□□□W	C1 , C2, C3	100μF/250V	Ruby-con BXF series

Table 3-2 Surge & EFT filter

4. EMI Considerations

Recommended External EMI Filter for EN55032 Class A

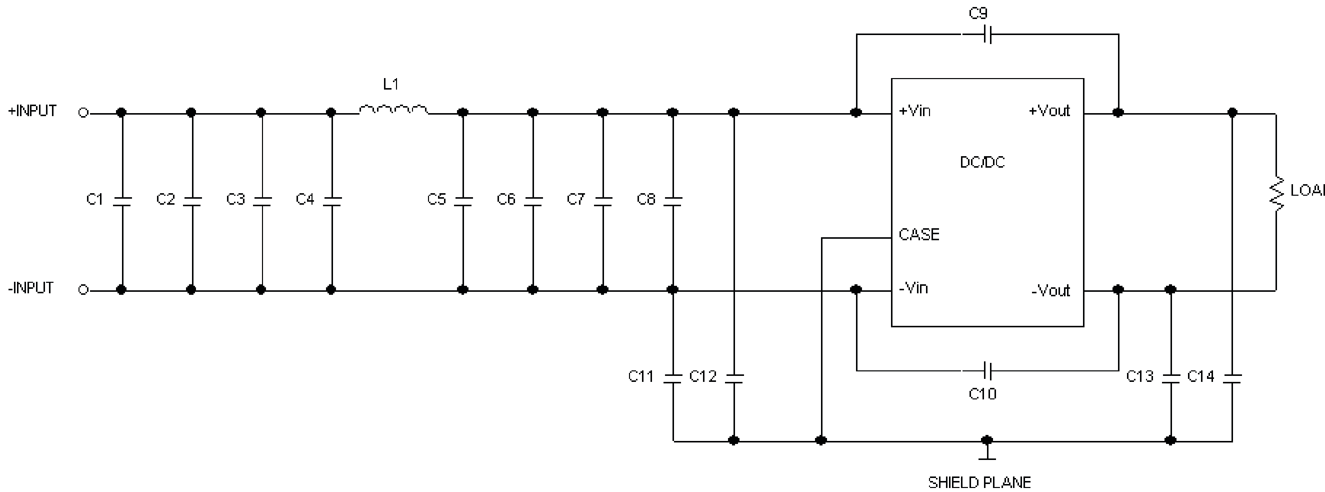
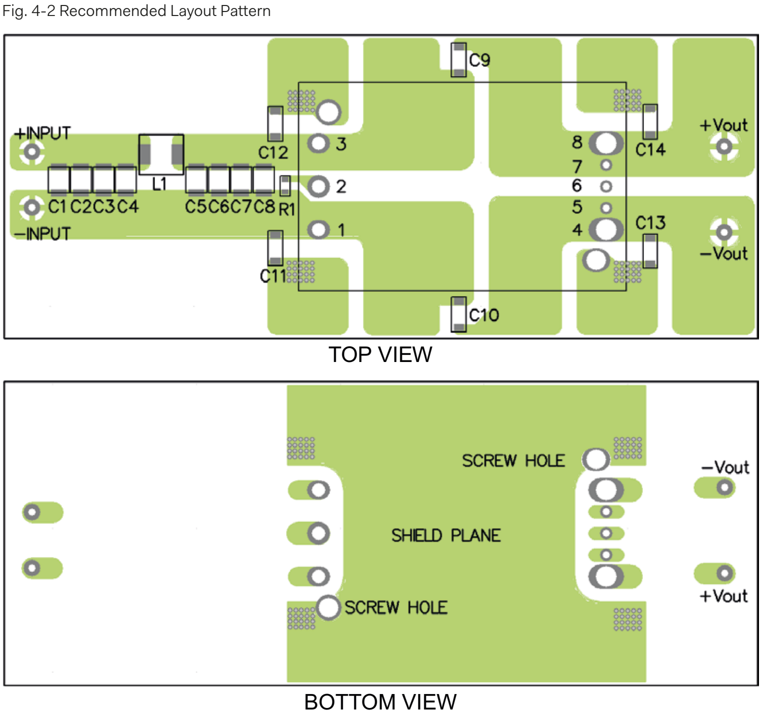


Fig. 4-1 Recommended EMI filter for EN55032 Class A

Model	C1	C2, C3, C4	C5	C6, C7, C8	C9, C10, C11, C12, C13, C14	L1
PQAE100-24S□□W	N/A	6.8μF/50V 1812 MLCC	N/A	6.8μF/50V 1812 MLCC	1000pF/3kV 1808 MLCC	0.68μH; 17A SMD Inductor PMT-114
PQAE100-48S□□W	4.7μF/100V 1812 MLCC	4.7μF/100V 1812 MLCC	4.7μF/100V 1812 MLCC	4.7μF/100V 1812 MLCC	1000pF/3kV 1808 MLCC	3.3μH; 10A SMD Inductor PMT-102

Table 4-1 B.O.M. of external EMI filter

Fig. 4-2 Recommended Layout Pattern



Recommended External EMI Filter for EN55032 Class B

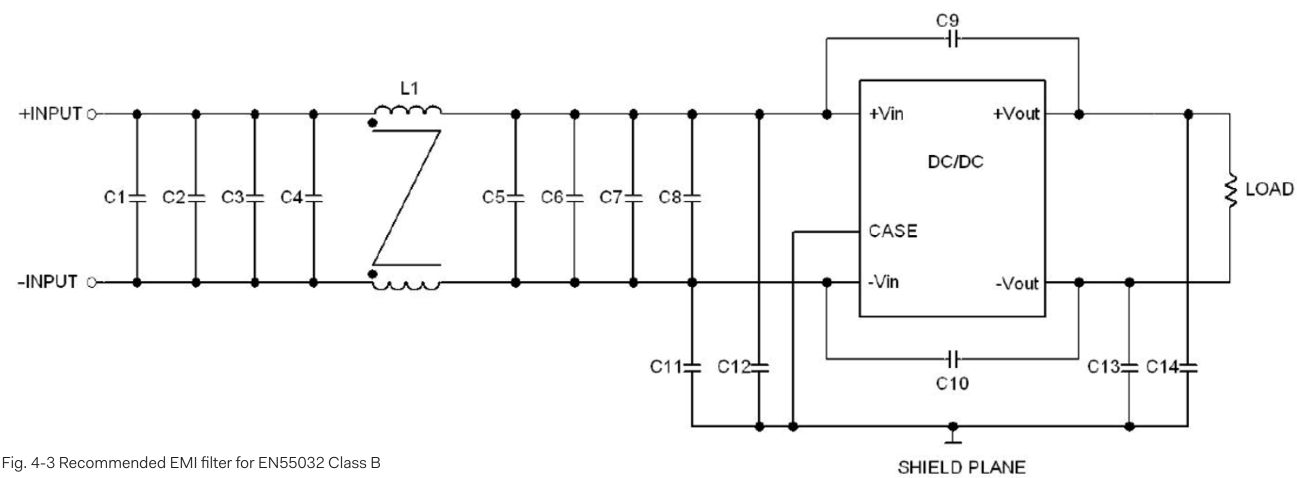
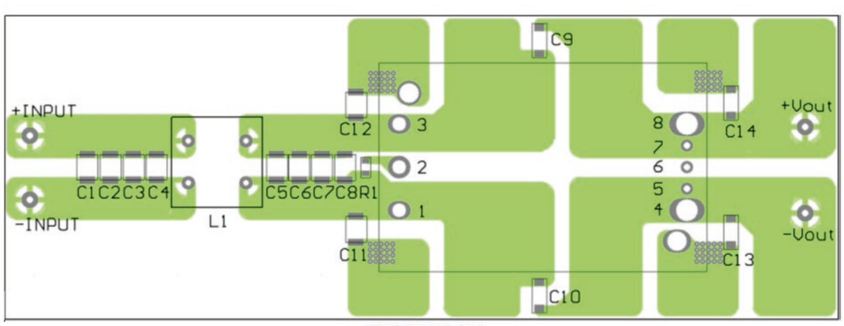


Fig. 4-3 Recommended EMI filter for EN55032 Class B

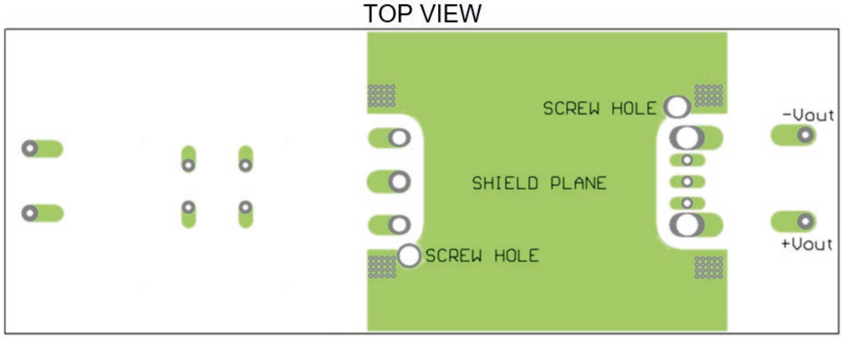
Model	C1, C2, C3, C4, C5, C6, C7, C8	C9, C10, C13, C14	C11, C12	L1
PQAE100-24S□□W	10μF/50V 1812 MLCC	1000pF/3kV 1808 MLCC	2200pF/3kV 1812 MLCC	285μH Common choke PMT-102

Table 4-2 B.O.M. of external EMI filter

Fig. 4-4 Recommended Layout Pattern



TOP VIEW



BOTTOM VIEW

Recommended External EMI Filter for EN55032 Class B

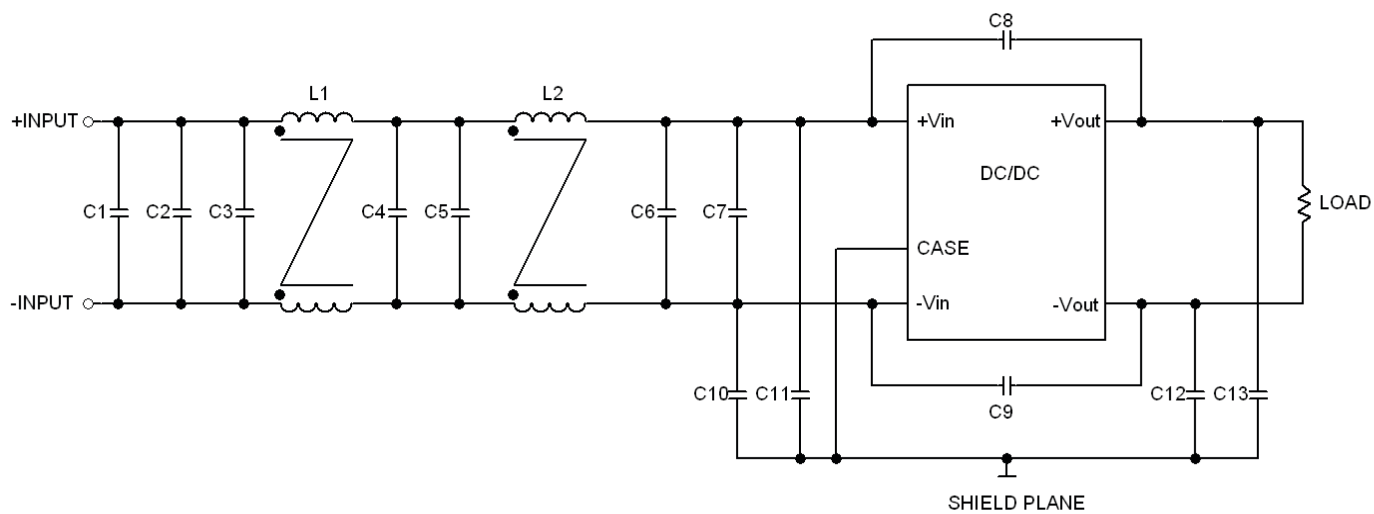


Fig. 4-5 Recommended EMI filter for EN55032 Class B

Model	C1, C2, C3, C4, C5, C6, C7	C5, C6, C7, C8, C9, C10, C13	L1	
PQAE100-48S□□W	4,7µF/100V	1000pF/3kV	620µH	285µH
	1812 MLCC	1808 MLCC	PMT-067	PMT-103

Table 4-3 Recommended EMI Filter for EN55022 Class B

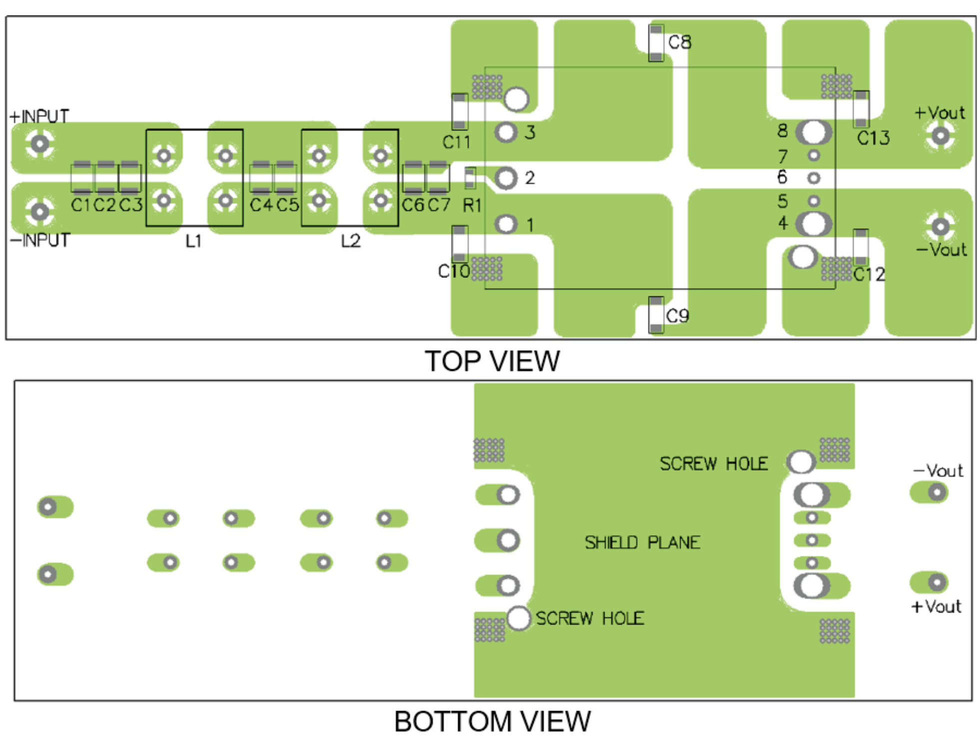
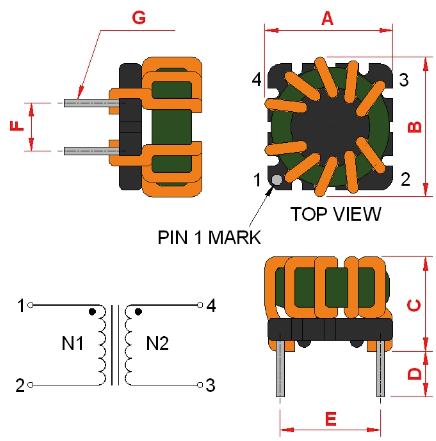


Fig. 4-6 Recommended Layout Pattern

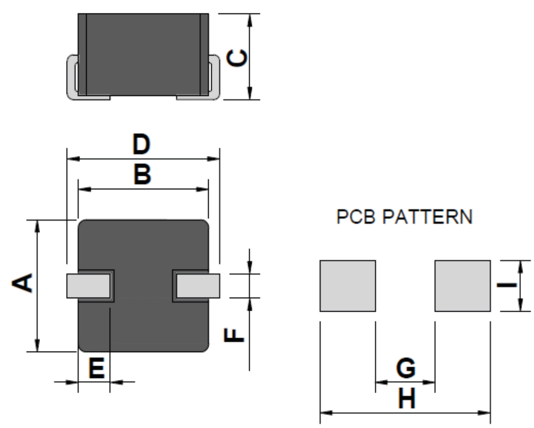
Specifications of Common Mode Choke and Differential Inductor

Part number:	**PMT-067**	
Inductance:	620µH ±35% (100kHz/ 100mV)	
DCR:	25 mΩ	
Rated current:	7.5 A, max.	
Dimensions:	A	16.0, max.
	B	16.0, max.
	C	15.0, max.
	D	4.0 ±0.3
	E	10.0 ±0.3
	F	7.4 ±0.3
	G	ϕ0.8 ±0.1

* Recommended through hole: ϕ1.0 mm

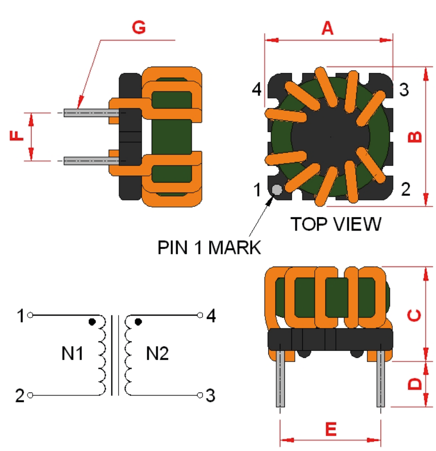


Part number:	**PMT-102**	
Inductance:	3.3µH ±20% (100kHz/ 250mV)	
DCR:	18 mΩ	
Rated current:	10 A, max.	
Dimensions:	A	6.5 ±0.3
	B	6.5 ±0.3
	C	4.2, max.
	D	7.6, max.
	E	1.5 ±0.3
	F	1.2 ±0.3
	G	3.0
	H	8.5
	I	2.5



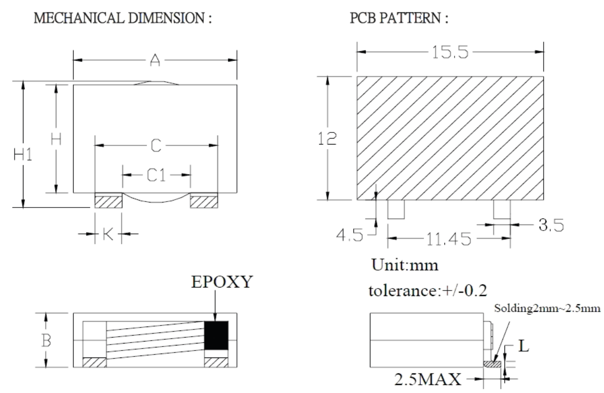
Part number:	**PMT-103**	
Inductance:	285µH ±35% (100kHz/ 100mV)	
DCR:	5.5 mΩ	
Rated current:	16 A, max.	
Dimensions:	A	16.0, max.
	B	16.0, max.
	C	15.0, max.
	D	3.6 ±0.3
	E	10.0 ±0.3
	F	7.4 ±0.3
	G	ϕ0.8 ±0.1

* Recommended through hole: ϕ1.0 mm



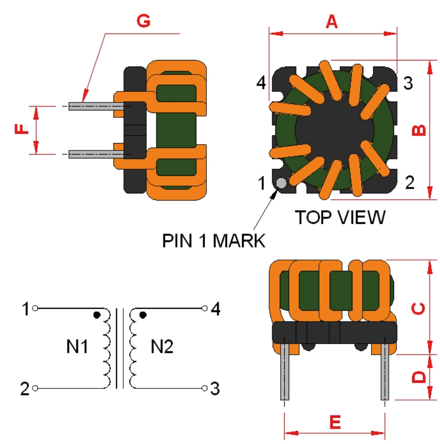
Specifications of Common Mode Choke and Differential Inductor

Part number:	**PMT-104**	
Inductance:	30.1μH ±10% (100kHz/ 100mV)	
DCR:	40 mΩ	
Rated current:	5 A, max.	
Dimensions:	A	13.5, max.
	B	5.8, max.
	C	10.9, max.
	C1	5.2, min.
	H	10.0, max.
	H1	14.3, max.
	K	2.3 ±0.2
	L	0.2 ±0.2

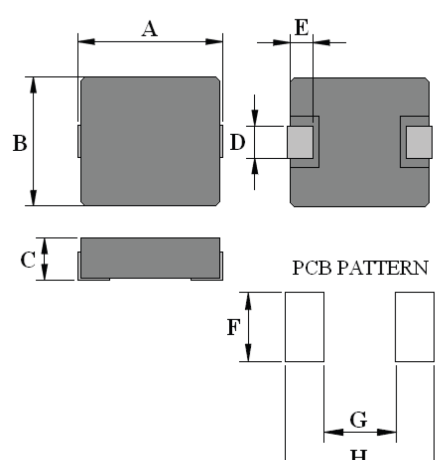


Part number:	**PMT-105**	
Inductance:	735μH ±35% (100kHz/ 100mV)	
DCR:	19 mΩ	
Rated current:	5.6 A, max.	
Dimensions:	A	16.0, max.
	B	16.0, max.
	C	15.0, max.
	D	4.0 ±0.3
	E	10.0 ±0.3
	F	7.4 ±0.3
	G	ϕ0.8 ±0.1

* Recommended through hole: ϕ1.0 mm

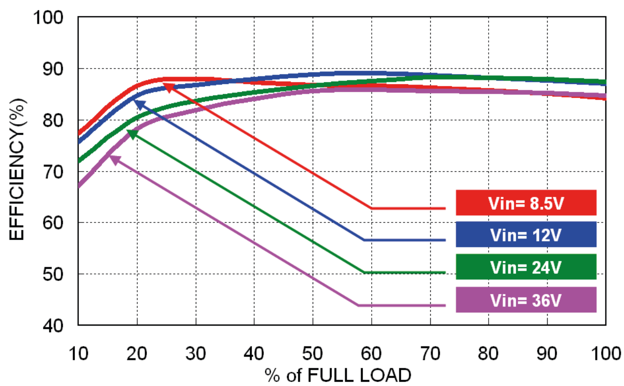


Part number:	**PMT-114**	
Inductance:	0.68μH ±20% (100kHz/250mV)	
DCR:	3.8 mΩ	
Rated current:	17 A, max.	
Dimensions:	A	7.8, max.
	B	7.0, max.
	C	4.2, max.
	D	2.0 ±0.5
	E	1.2 ±0.3
	F	3.5
	G	3.7
	H	8.0

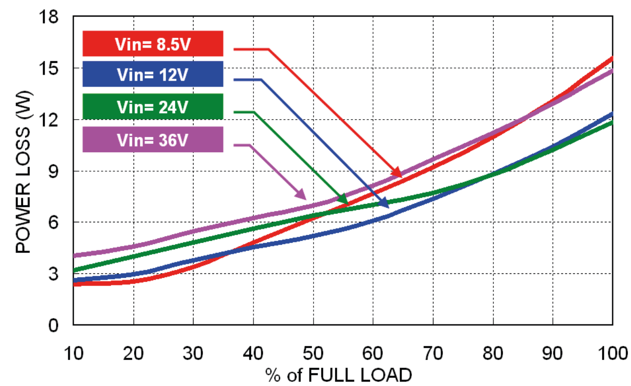


5. Characteristic Curves

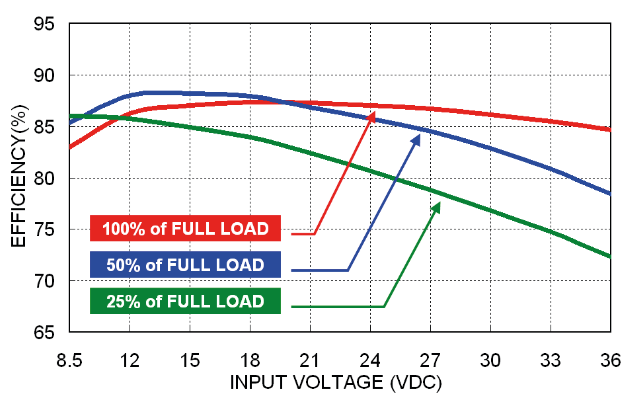
All test conditions are at 25°C.The figures are identical for PQAE100-24S3P3W



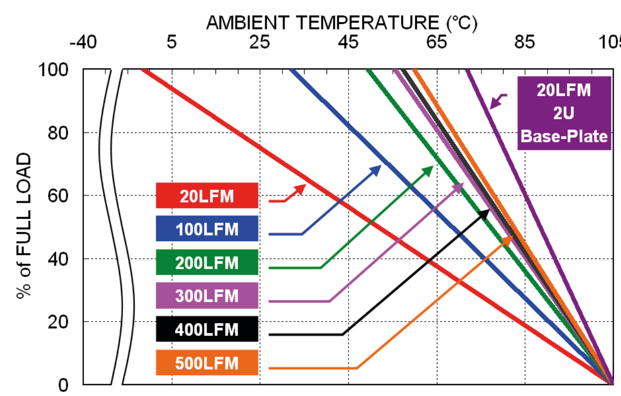
Efficiency versus Output Load



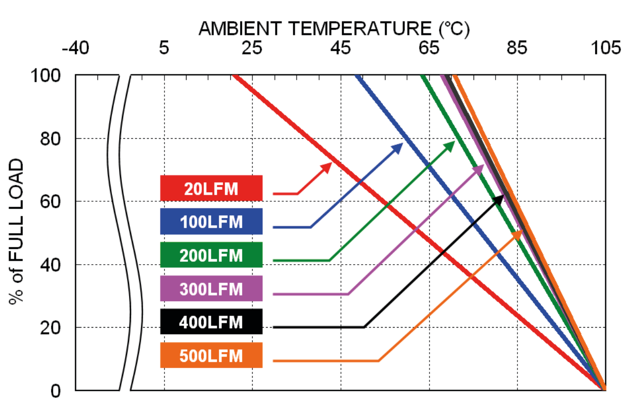
Power dissipation versus Output Load



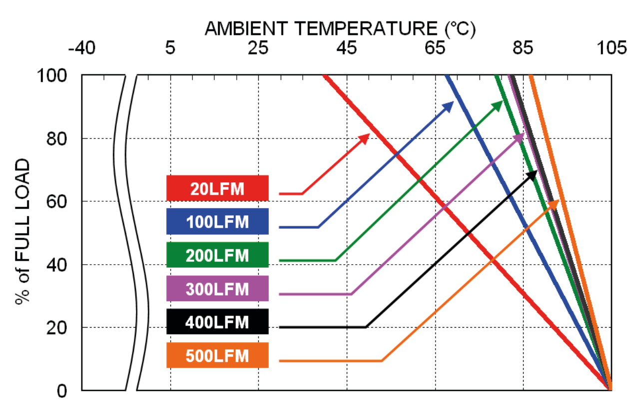
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19" X 3.5" X 0.063"

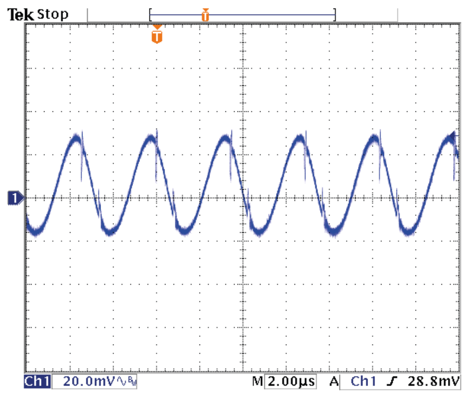


Derating Output Load versus Ambient Temperature and Airflow
With 0.24" Heat-Sink , Vin(nom)

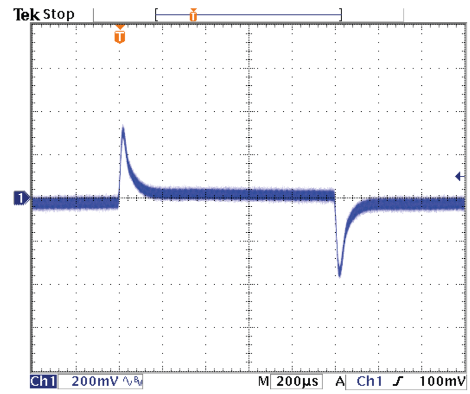


Derating Output Load versus Ambient Temperature and Airflow
With 0.5" Heat-Sink , Vin(nom)

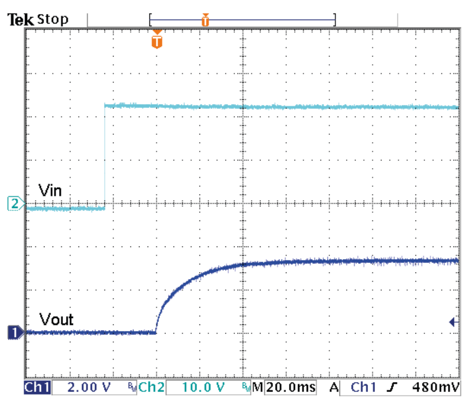
All test conditions are at 25°C.The figures are identical for PQAE100-24S3P3W



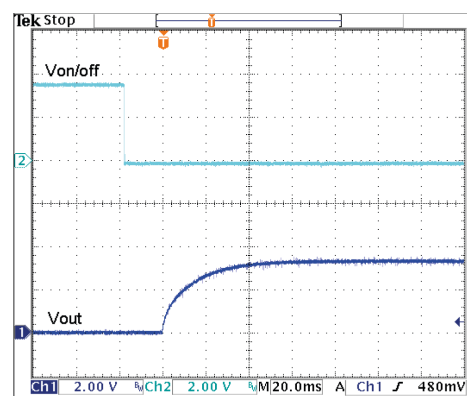
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

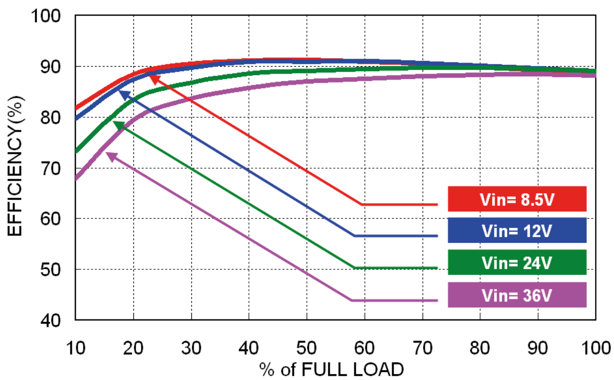


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

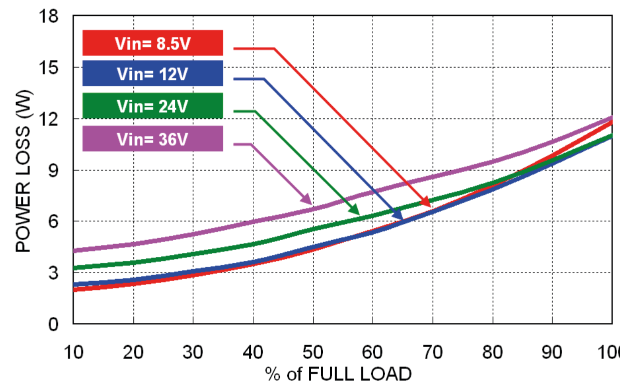


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

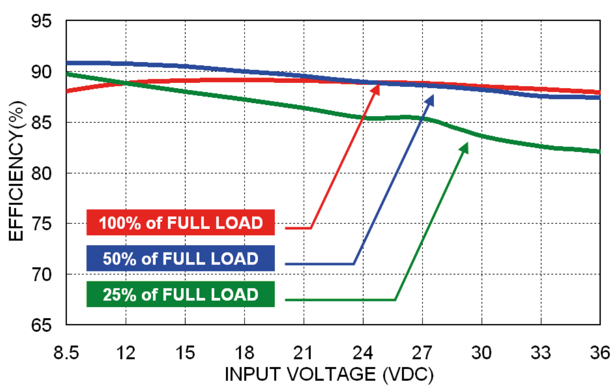
All test conditions are at 25°C.The figures are identical for PQAE100-24S05W



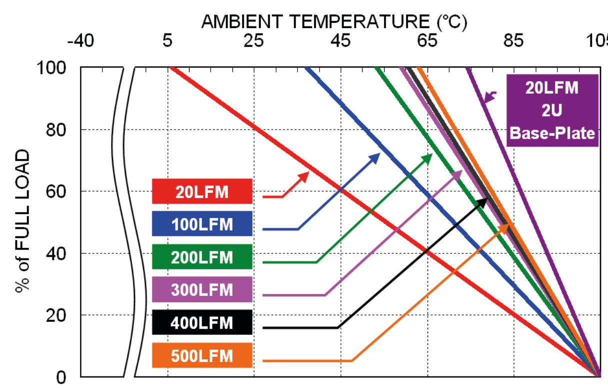
Efficiency versus Output Load



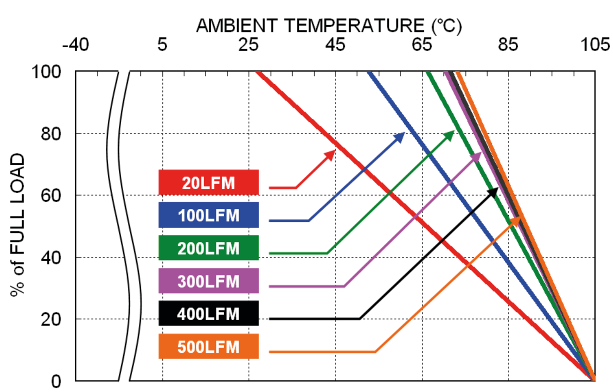
Power dissipation versus Output Load



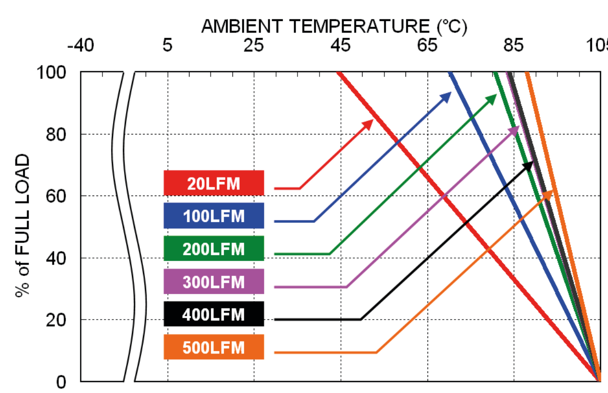
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

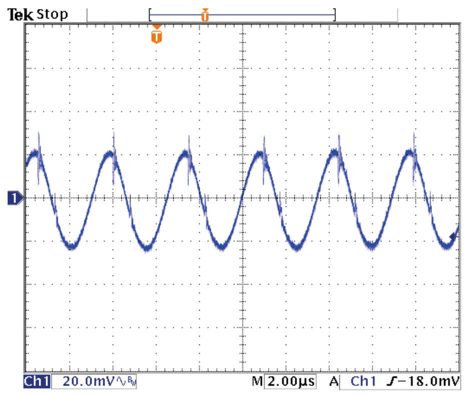


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

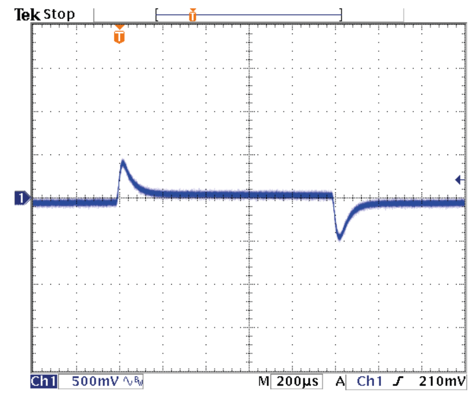


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

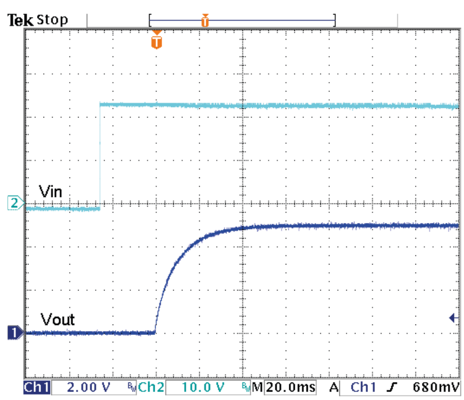
All test conditions are at 25°C.The figures are identical for PQAE100-24S05W



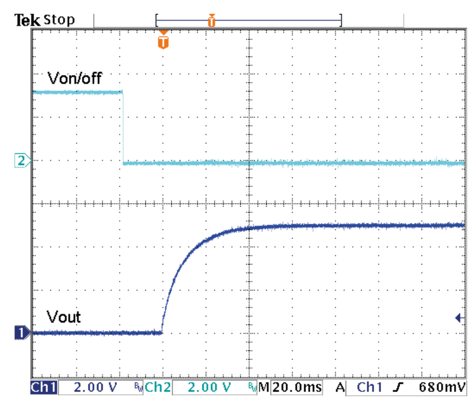
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

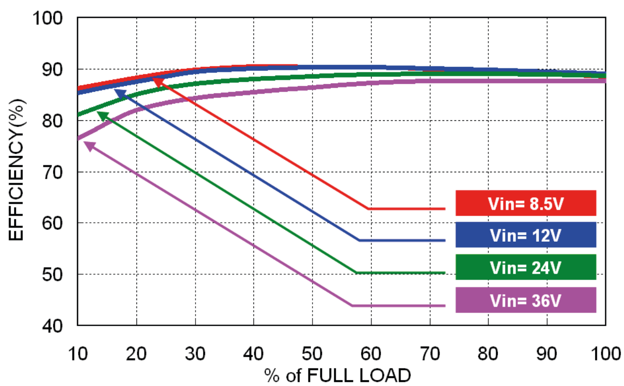


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

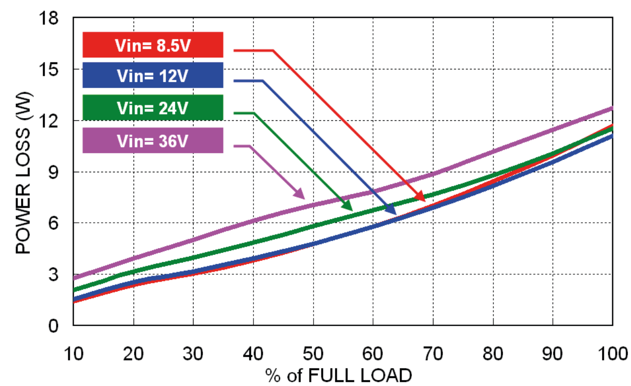


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

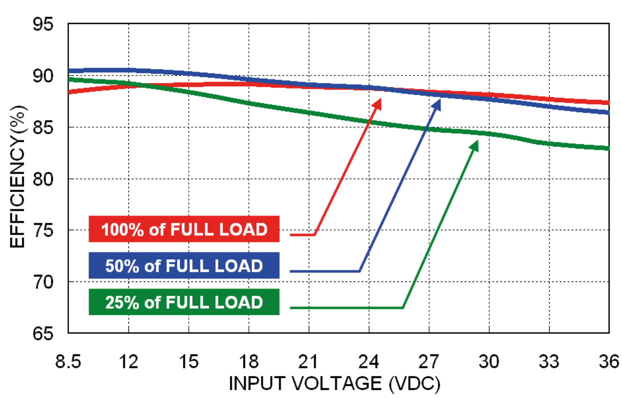
All test conditions are at 25°C.The figures are identical for PQAE100-24S12W



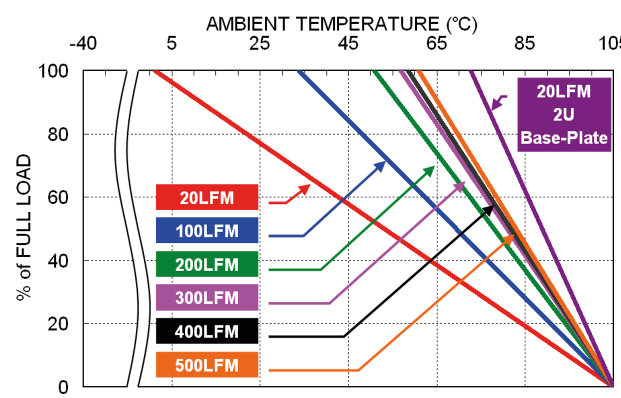
Efficiency versus Output Load



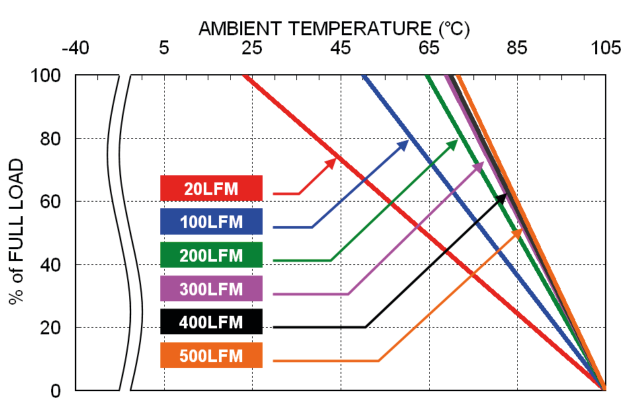
Power dissipation versus Output Load



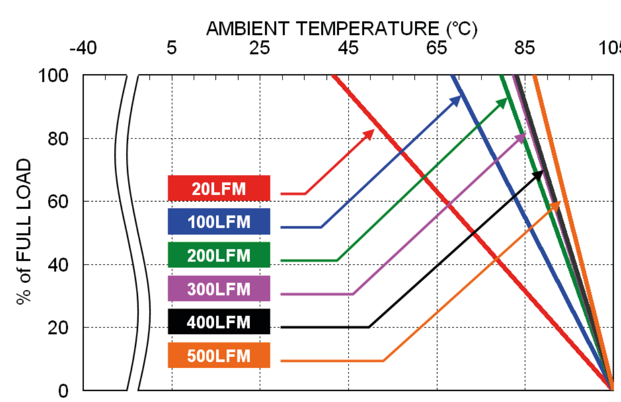
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

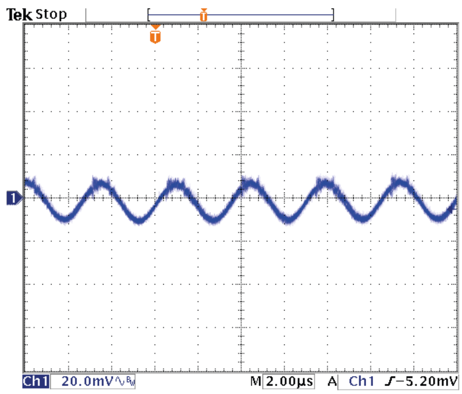


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

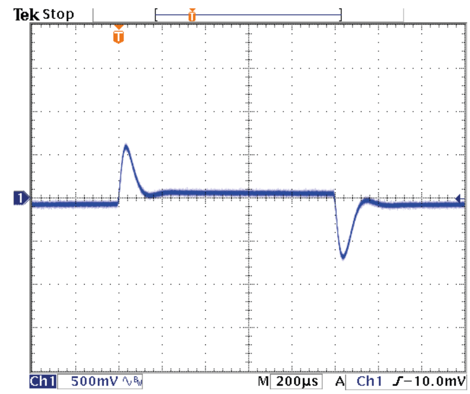


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

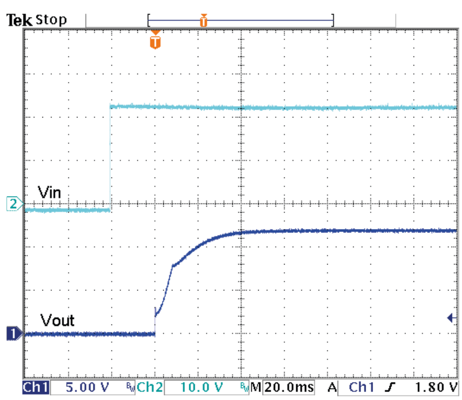
All test conditions are at 25°C.The figures are identical for PQAE100-24S12W



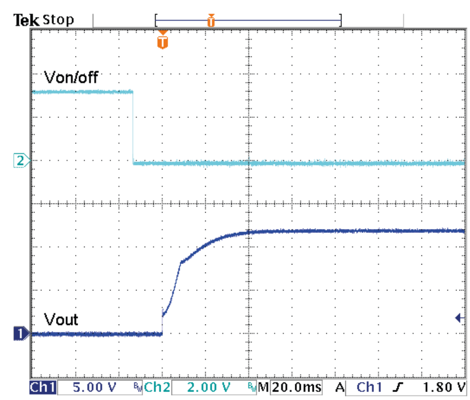
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

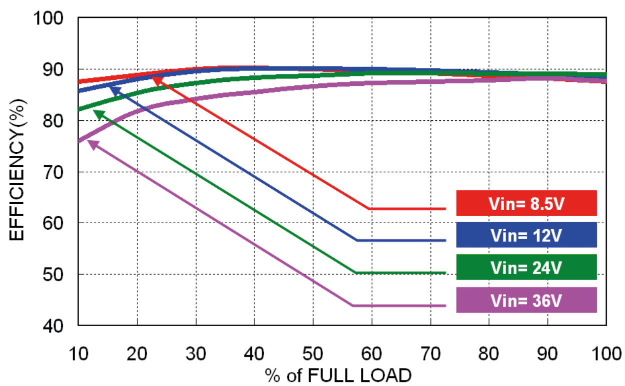


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

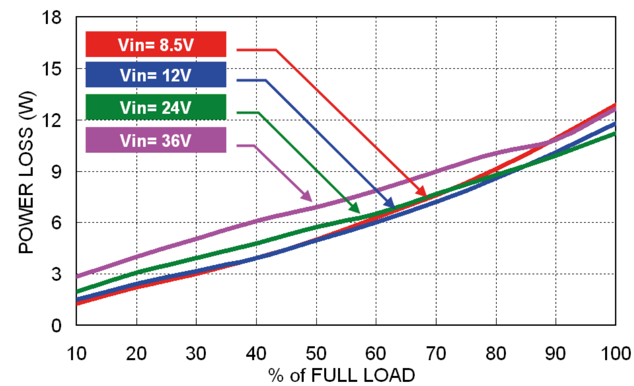


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

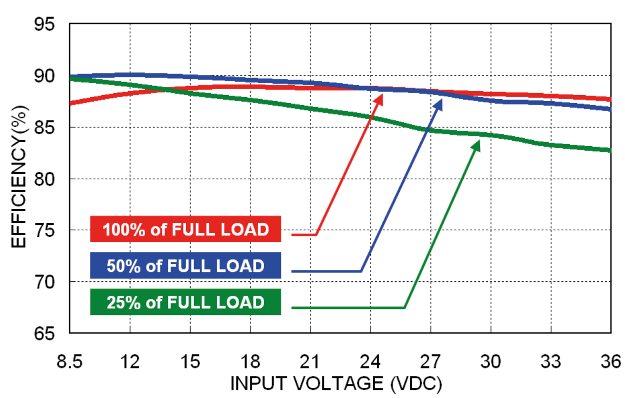
All test conditions are at 25°C.The figures are identical for PQAE100-24S15W



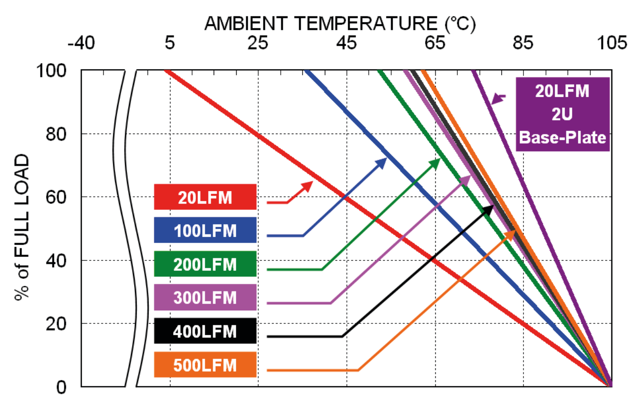
Efficiency versus Output Load



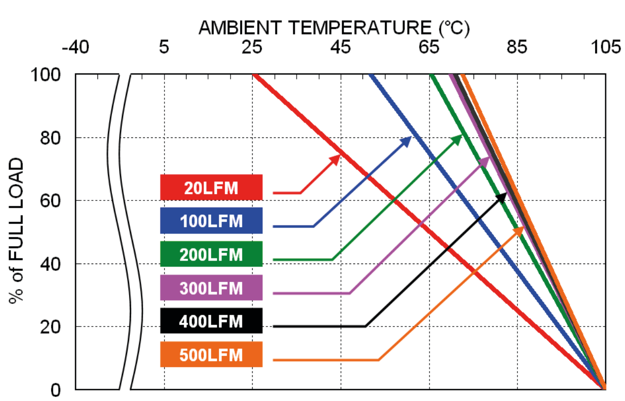
Power dissipation versus Output Load



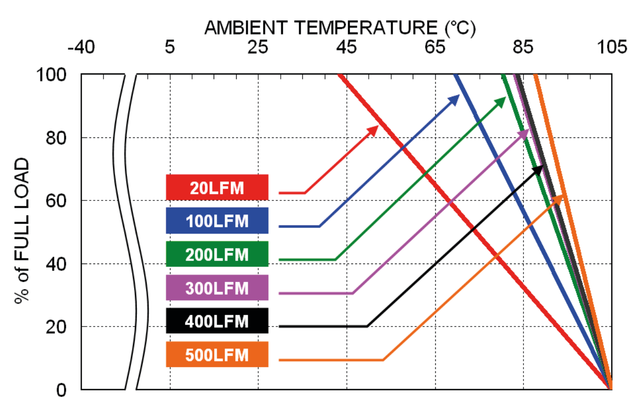
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

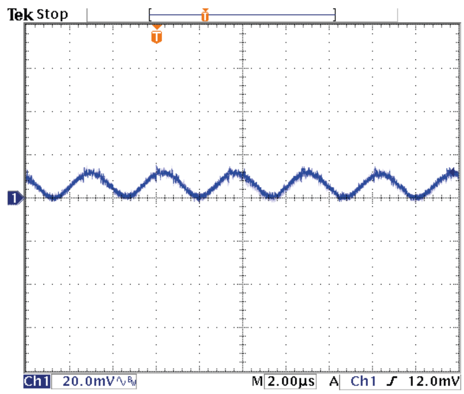


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

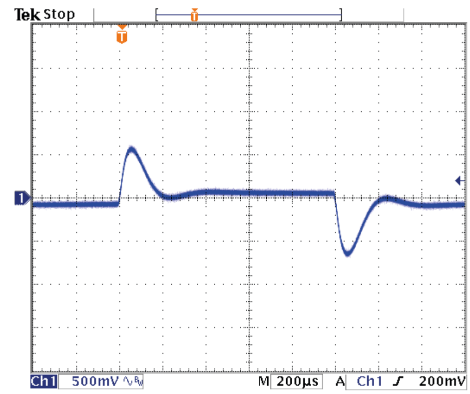


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

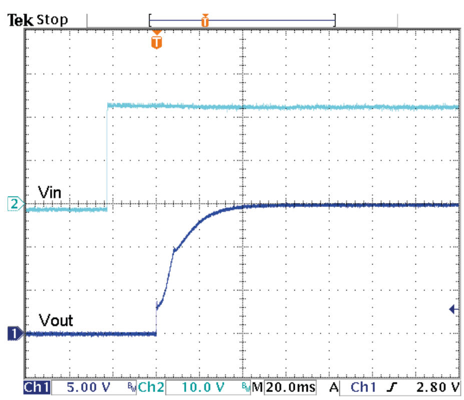
All test conditions are at 25°C.The figures are identical for PQAE100-24S15W



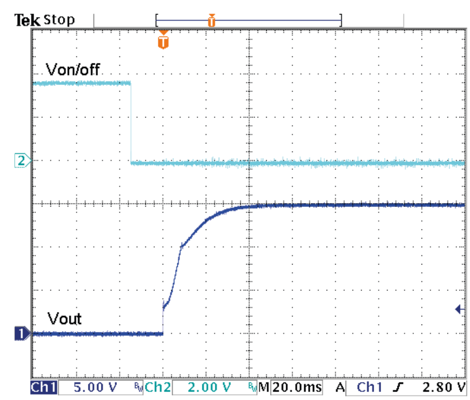
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

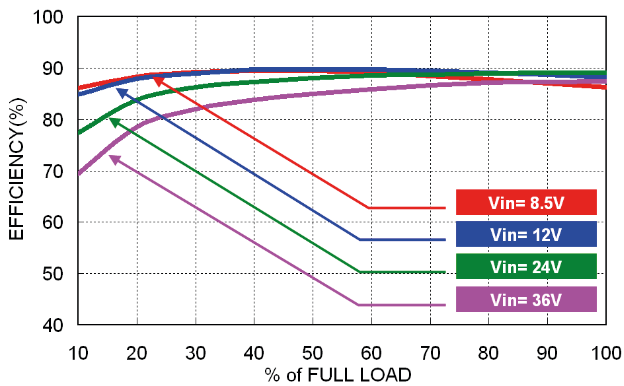


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

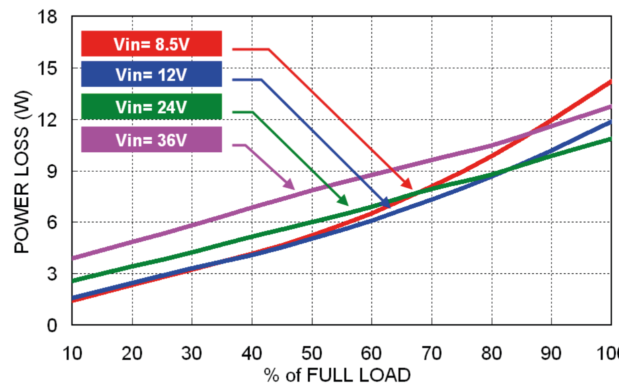


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

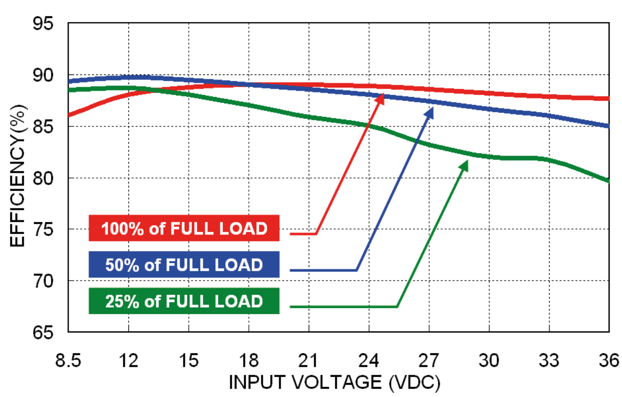
All test conditions are at 25°C.The figures are identical for PQAE100-24S24W



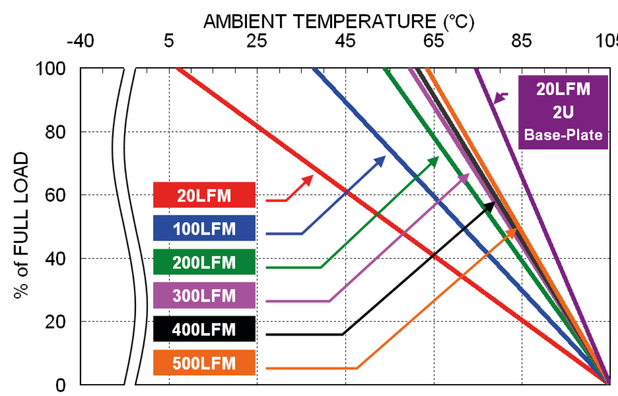
Efficiency versus Output Load



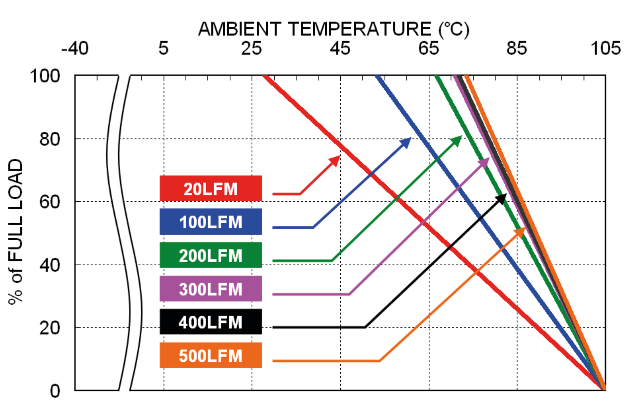
Power dissipation versus Output Load



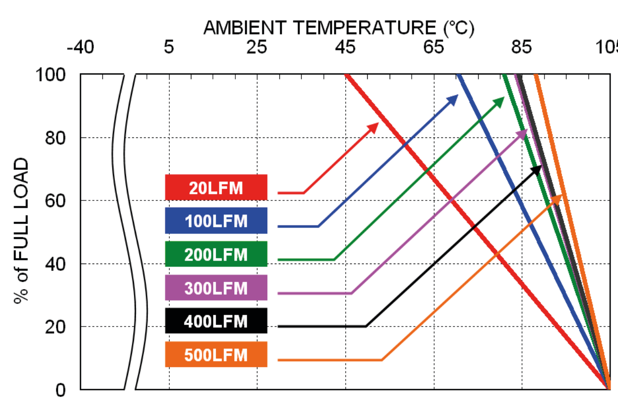
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

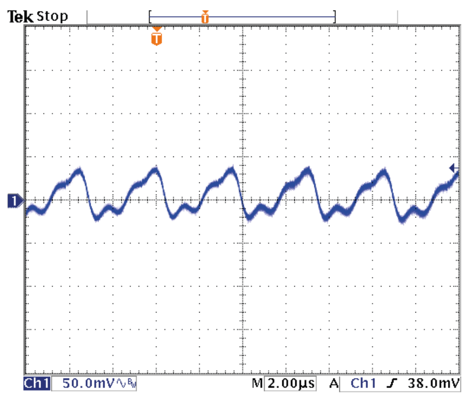


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

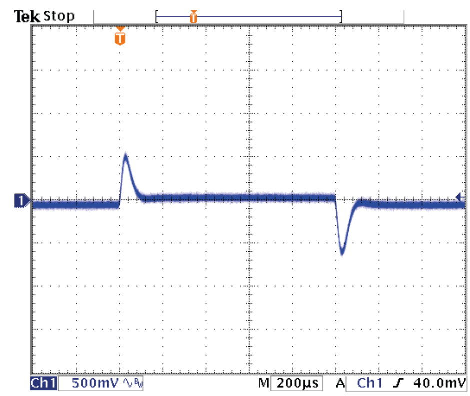


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

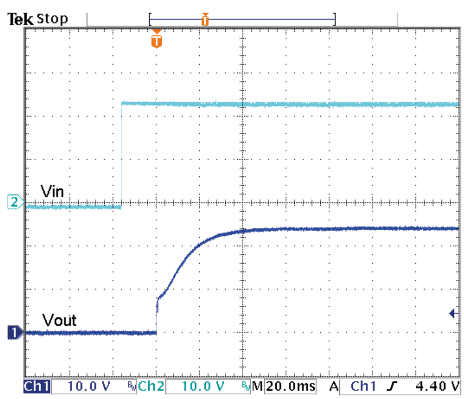
All test conditions are at 25°C.The figures are identical for PQAE100-24S24W



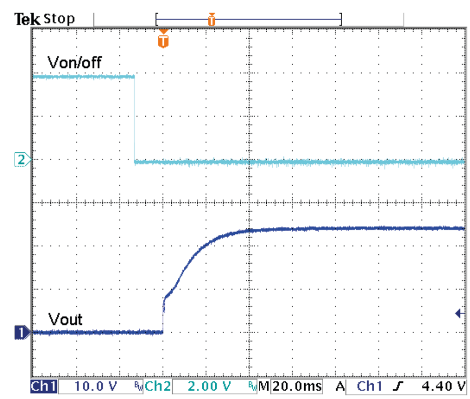
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

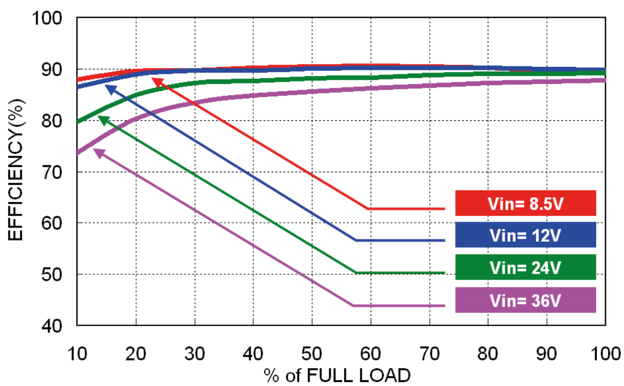


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

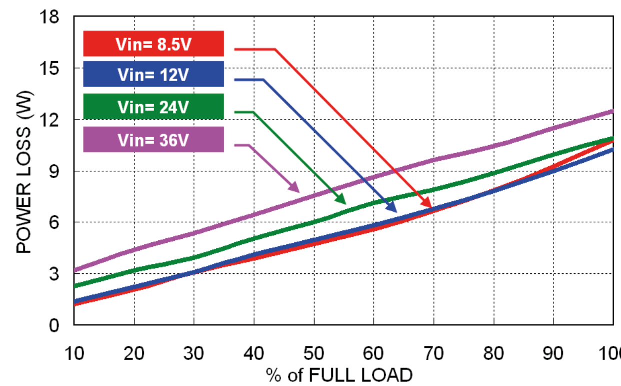


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

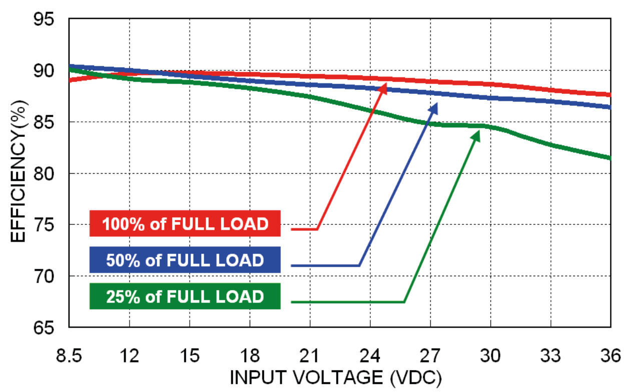
All test conditions are at 25°C.The figures are identical for PQAE100-24S30W



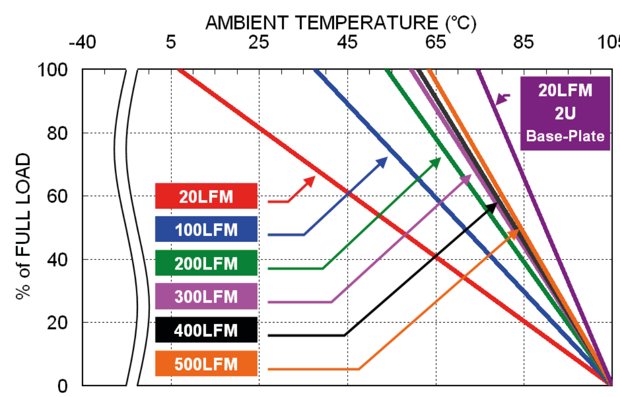
Efficiency versus Output Load



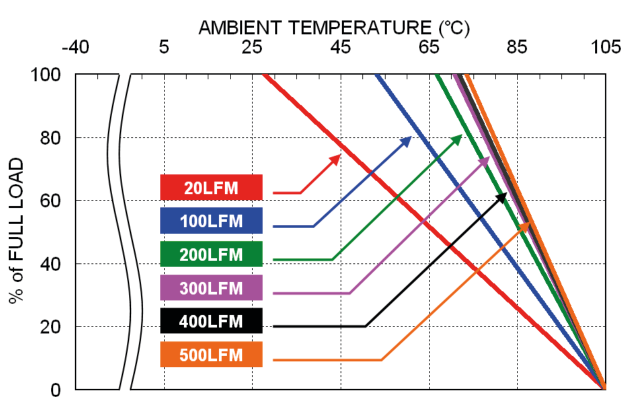
Power dissipation versus Output Load



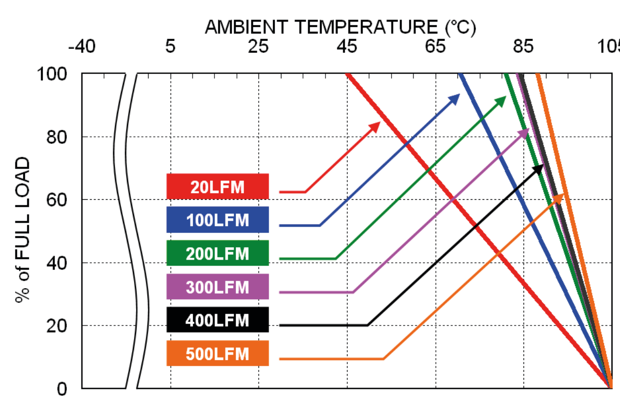
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

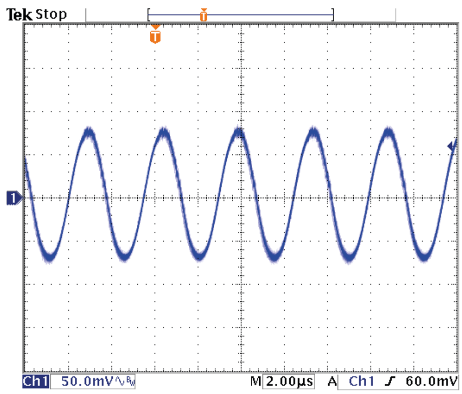


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

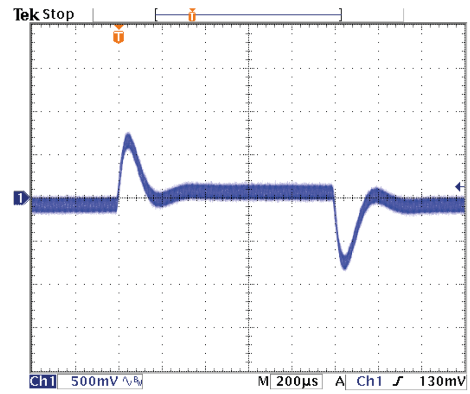


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

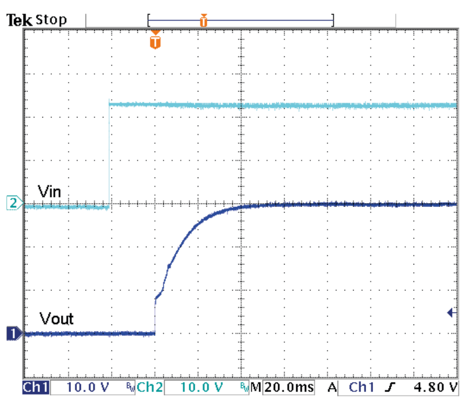
All test conditions are at 25°C.The figures are identical for PQAE100-24S30W



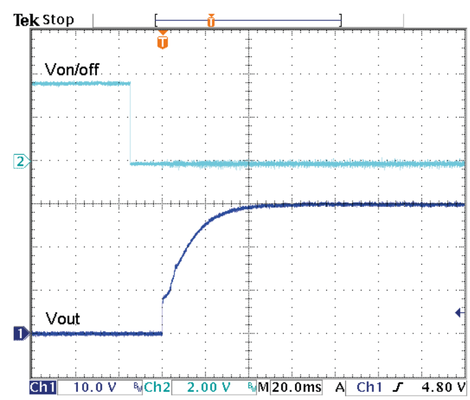
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

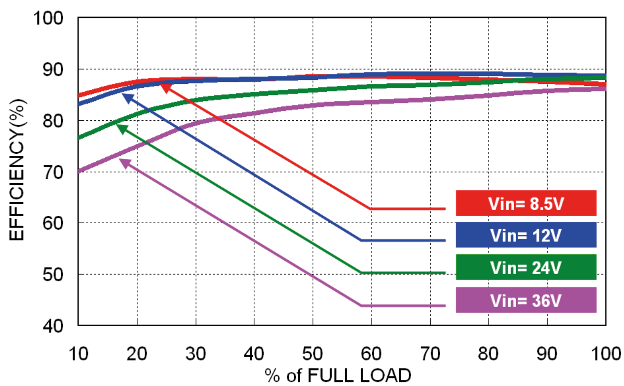


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

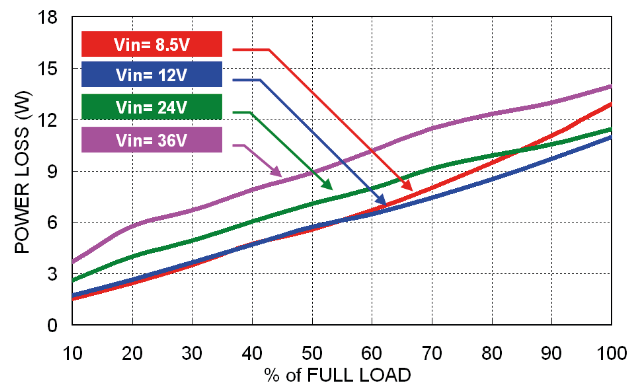


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

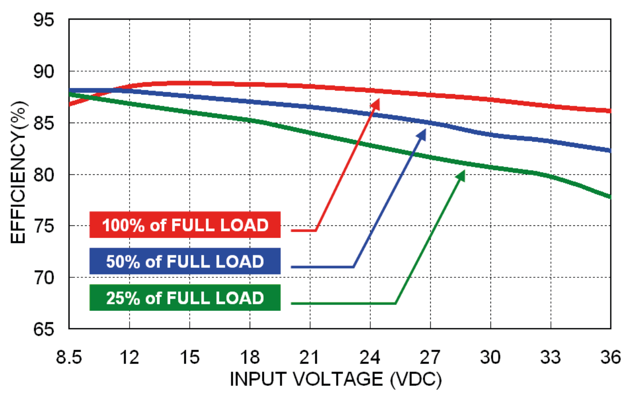
All test conditions are at 25°C.The figures are identical for PQAE100-24S48W



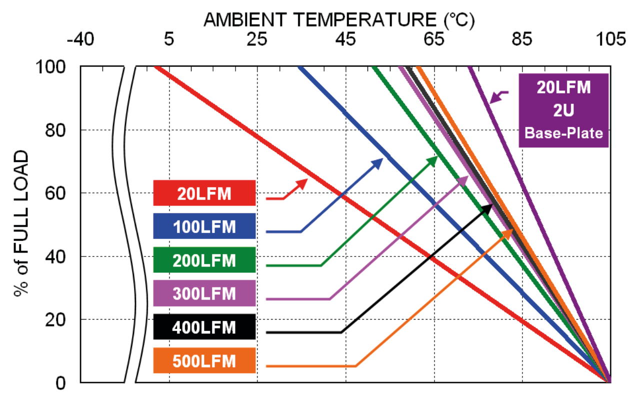
Efficiency versus Output Load



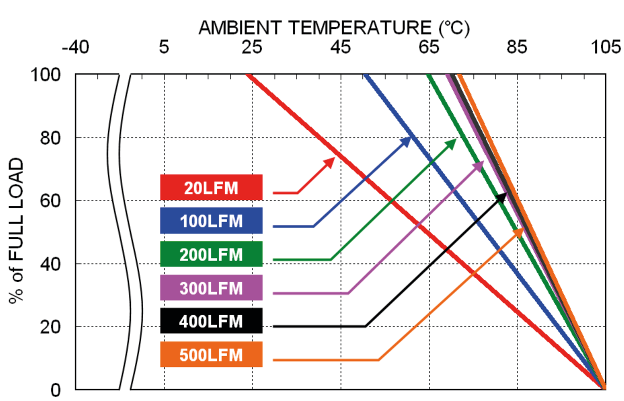
Power dissipation versus Output Load



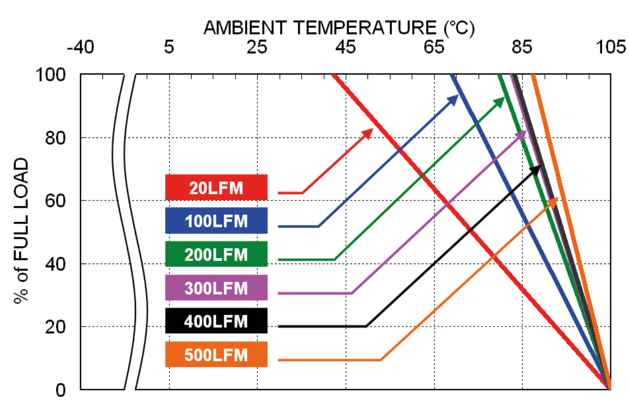
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

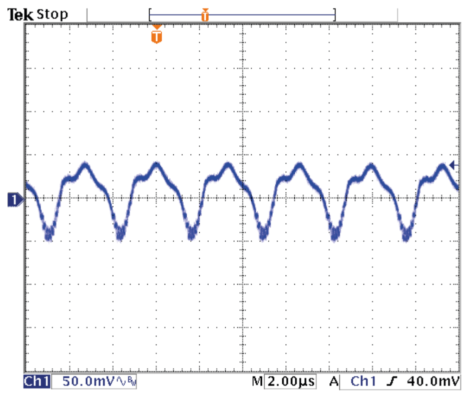


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

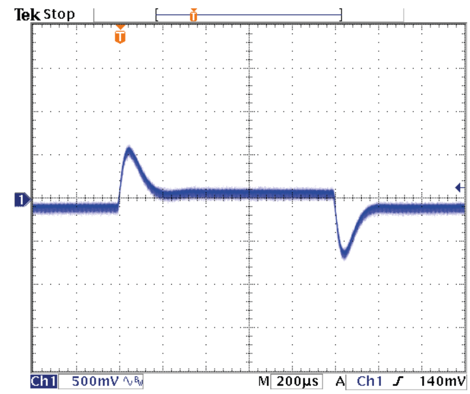


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

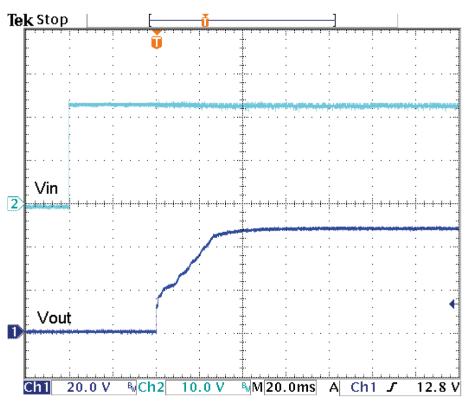
All test conditions are at 25°C.The figures are identical for PQAE100-24S48W



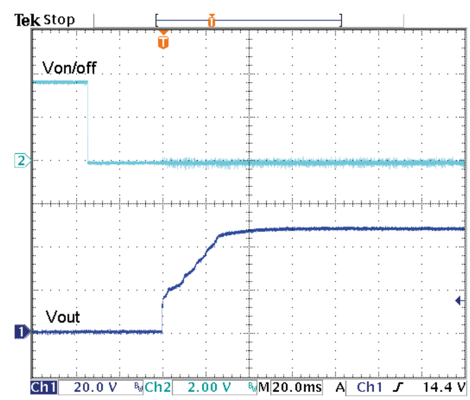
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

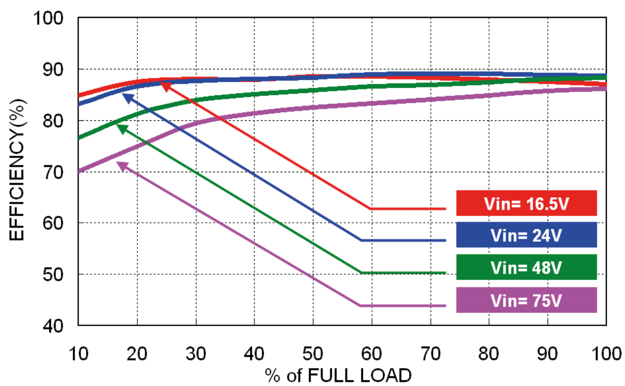


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

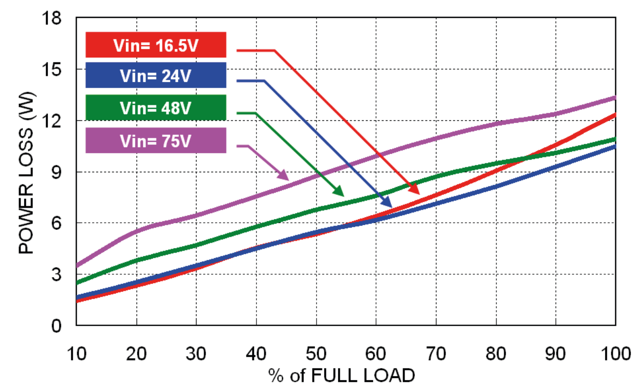


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

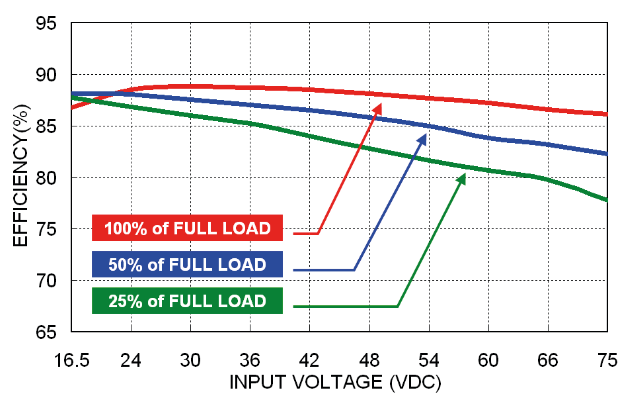
All test conditions are at 25°C.The figures are identical for PQAE100-48S3P3W



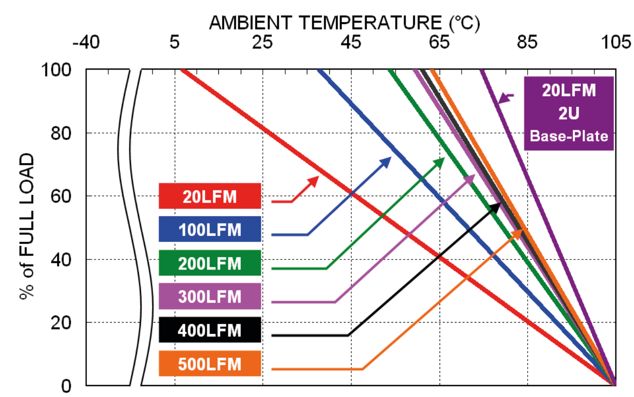
Efficiency versus Output Load



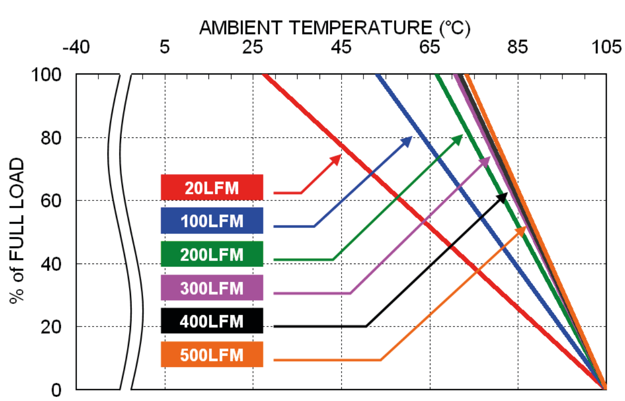
Power dissipation versus Output Load



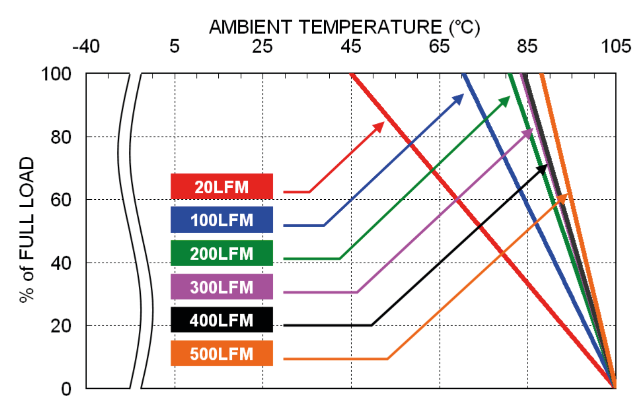
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

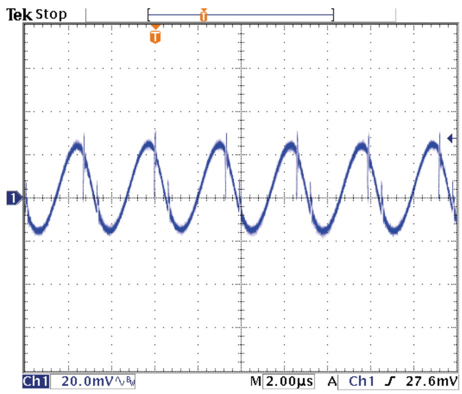


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

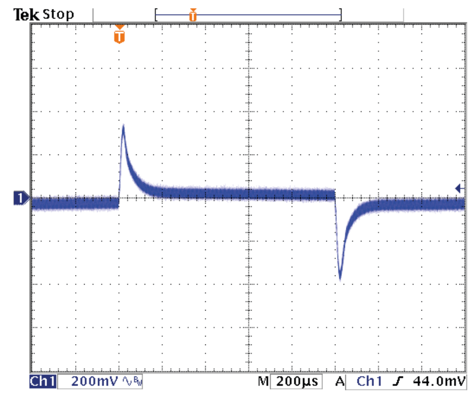


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

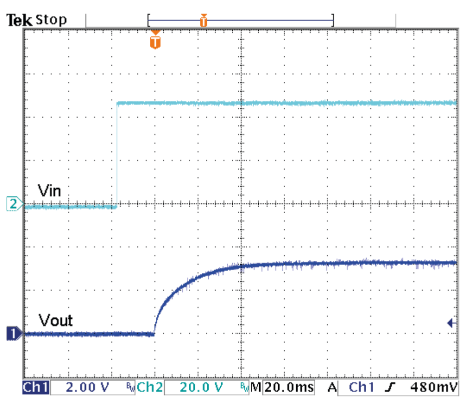
All test conditions are at 25°C.The figures are identical for PQAE100-48S3P3W



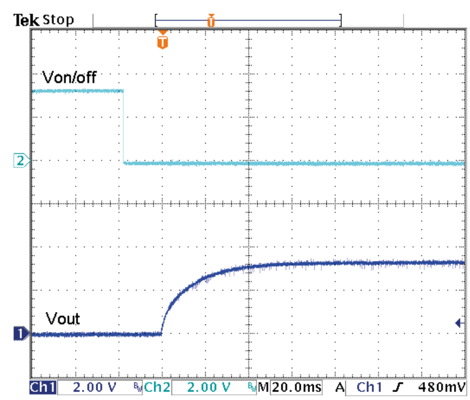
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

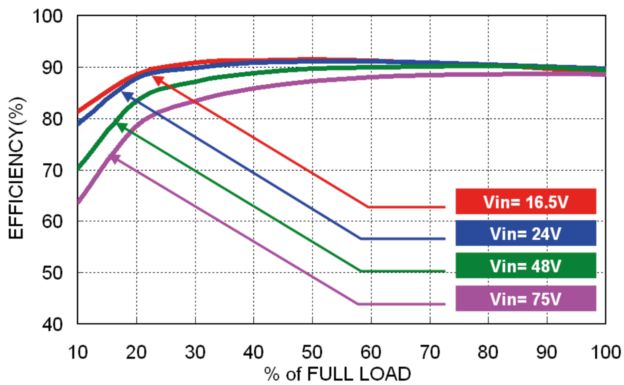


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

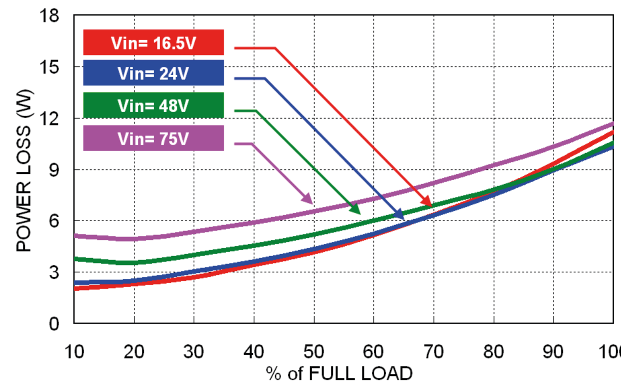


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

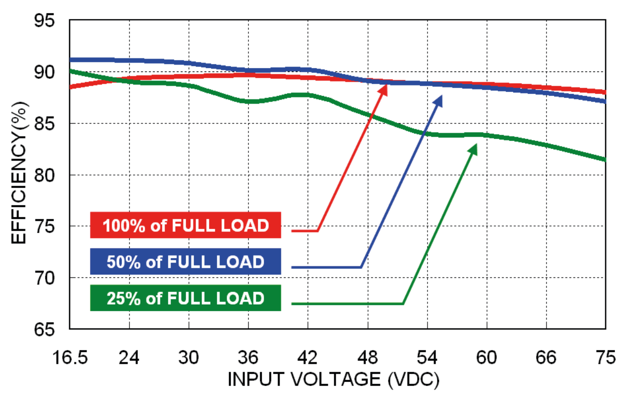
All test conditions are at 25°C.The figures are identical for PQAE100-48S05W



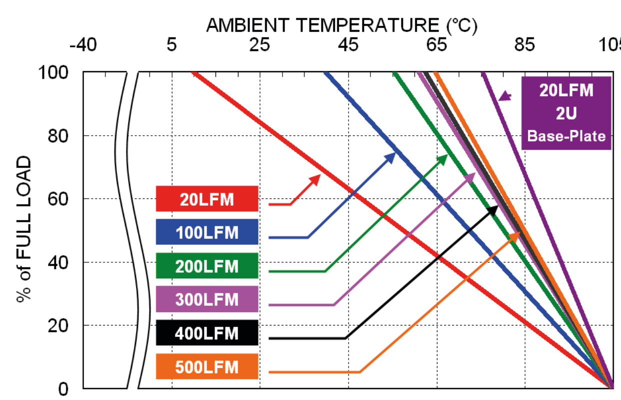
Efficiency versus Output Load



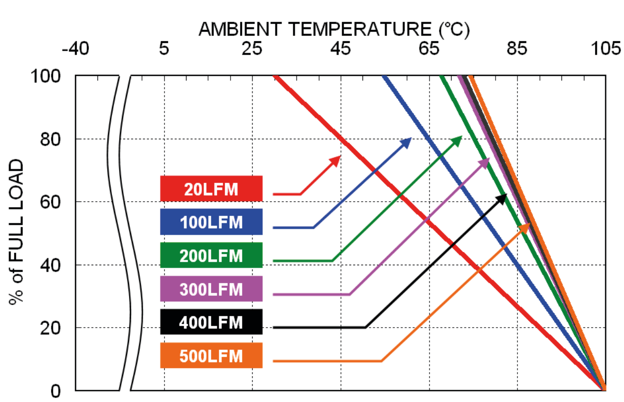
Power dissipation versus Output Load



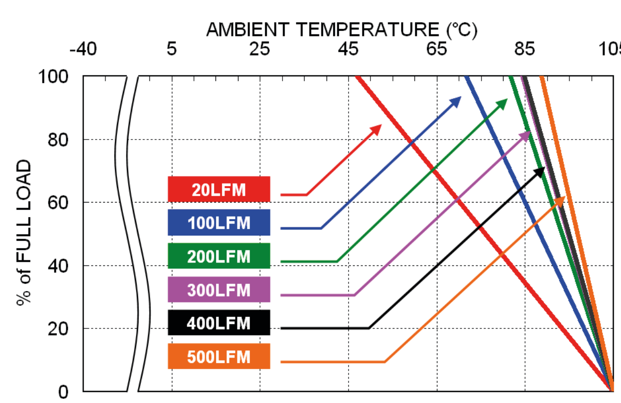
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

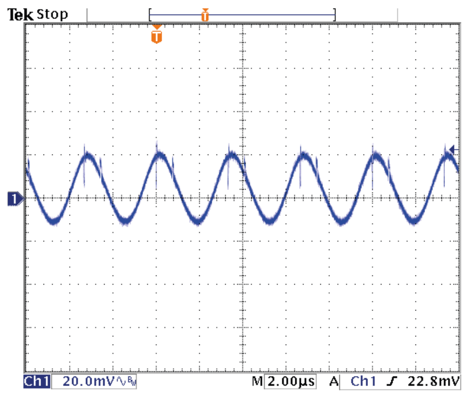


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

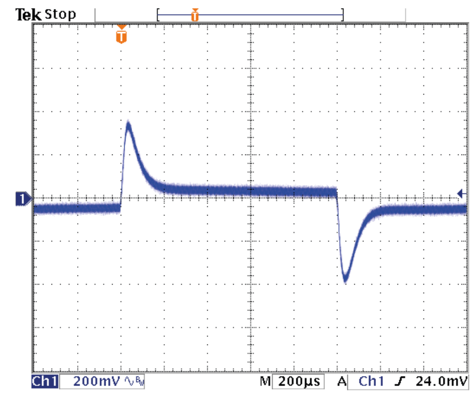


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

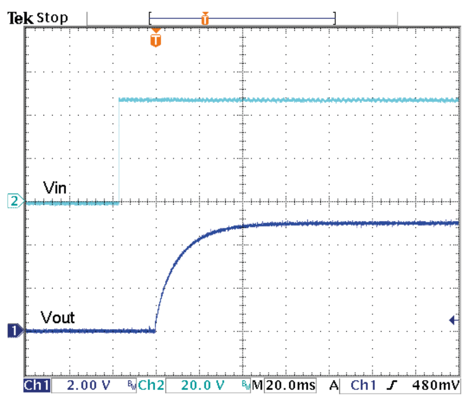
All test conditions are at 25°C.The figures are identical for PQAE100-48S05W



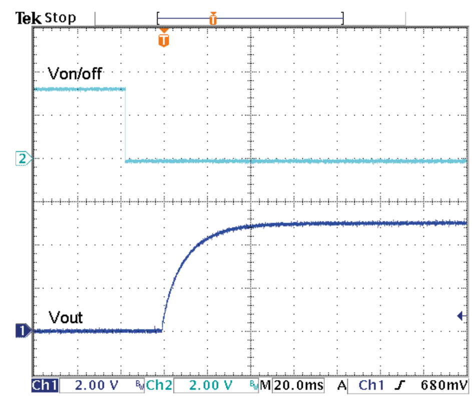
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

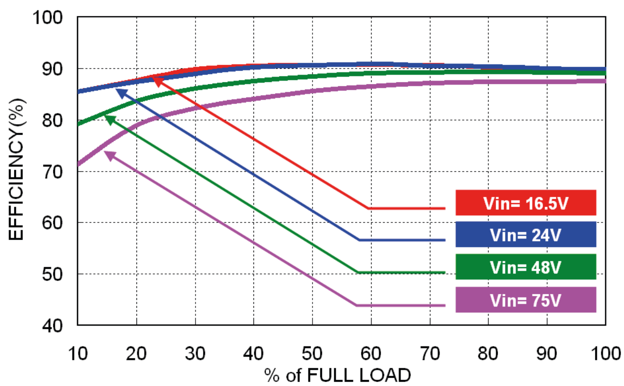


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

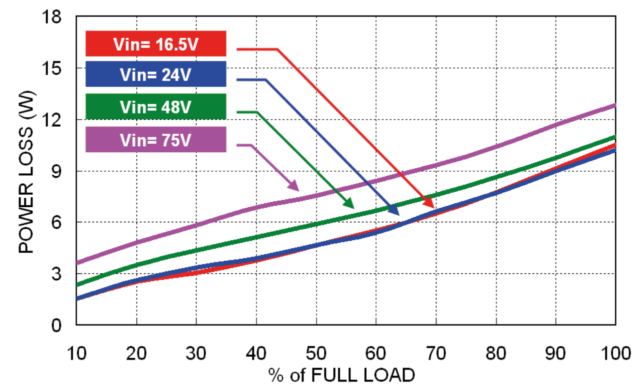


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

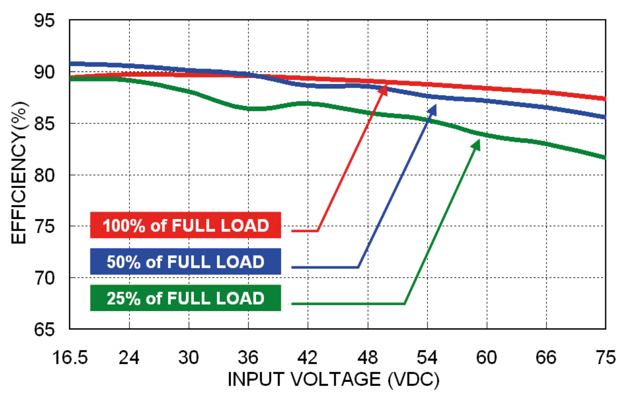
All test conditions are at 25°C.The figures are identical for PQAE100-48S12W



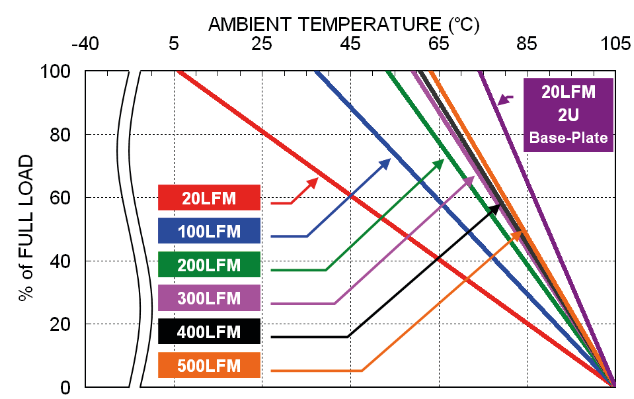
Efficiency versus Output Load



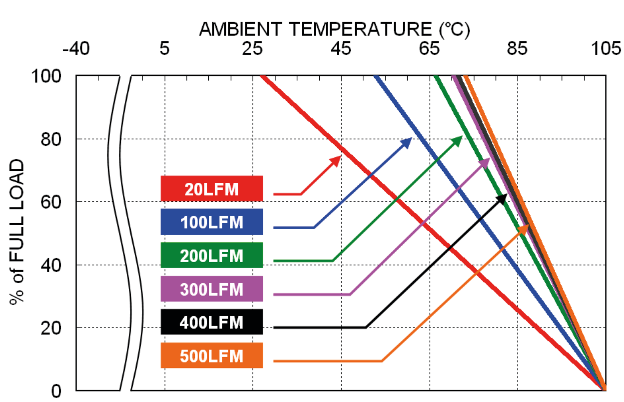
Power dissipation versus Output Load



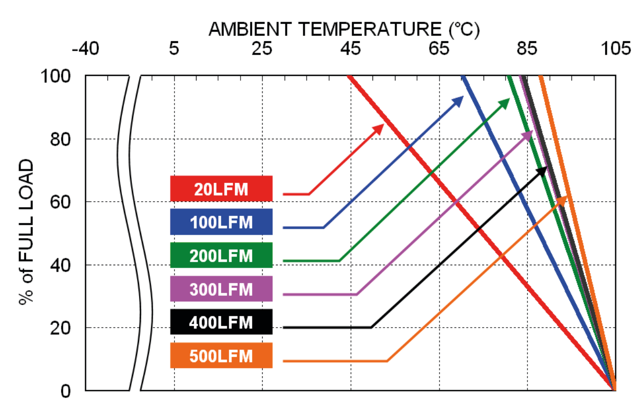
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

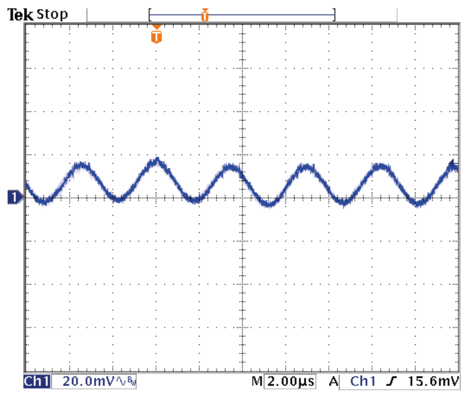


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

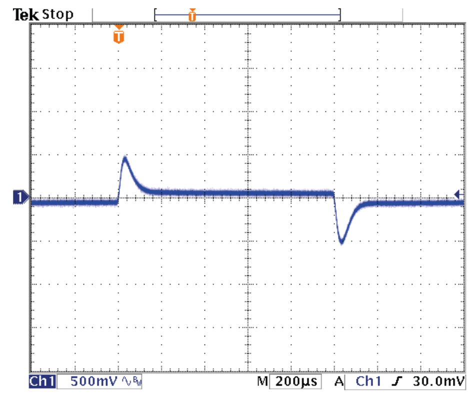


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

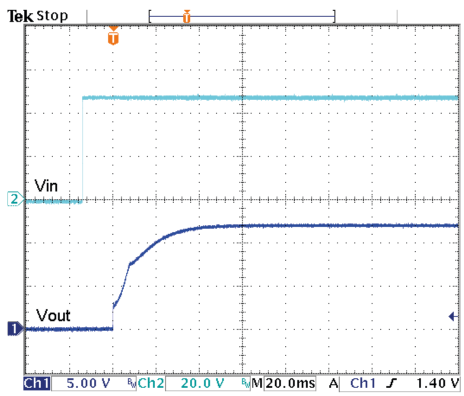
All test conditions are at 25°C.The figures are identical for PQAE100-48S12W



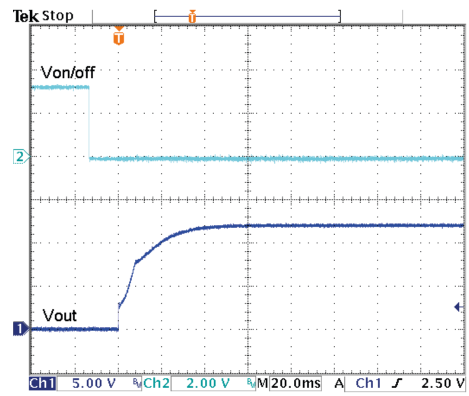
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

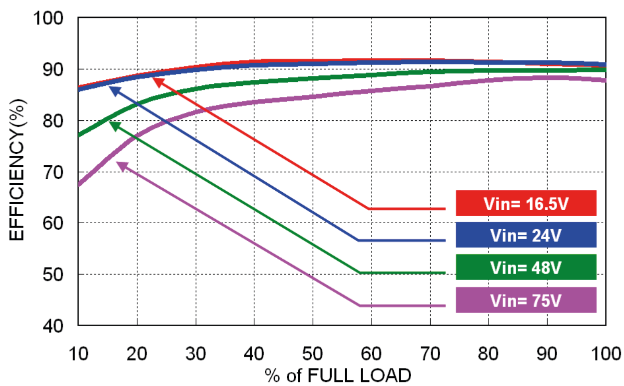


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

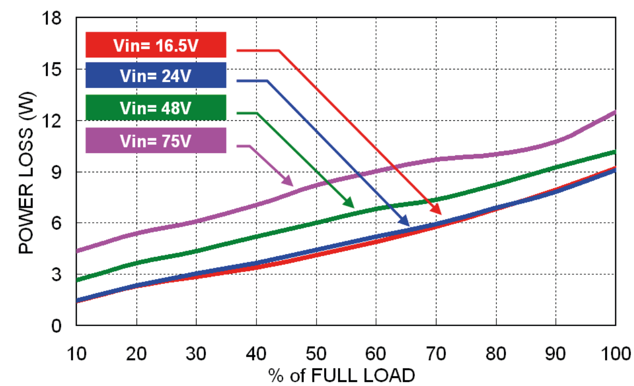


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

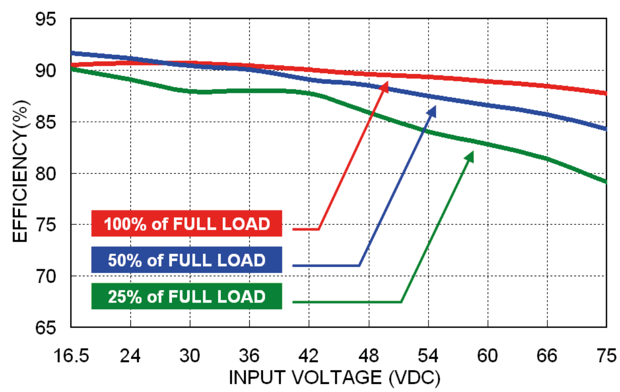
All test conditions are at 25°C.The figures are identical for PQAE100-48S15W



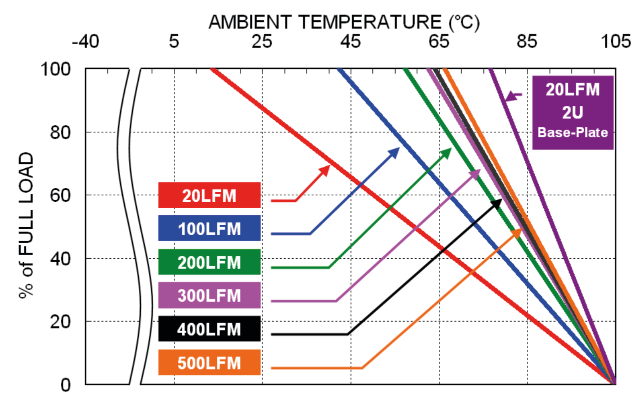
Efficiency versus Output Load



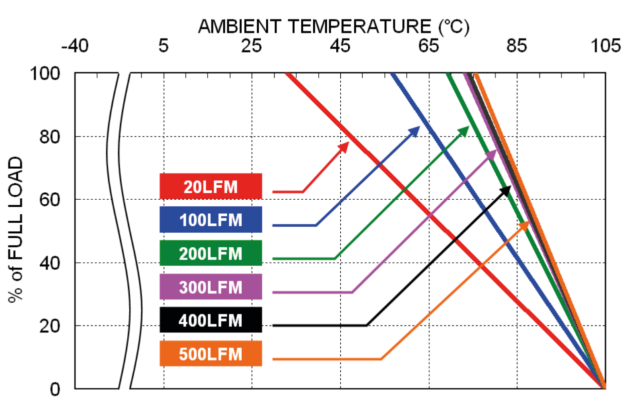
Power dissipation versus Output Load



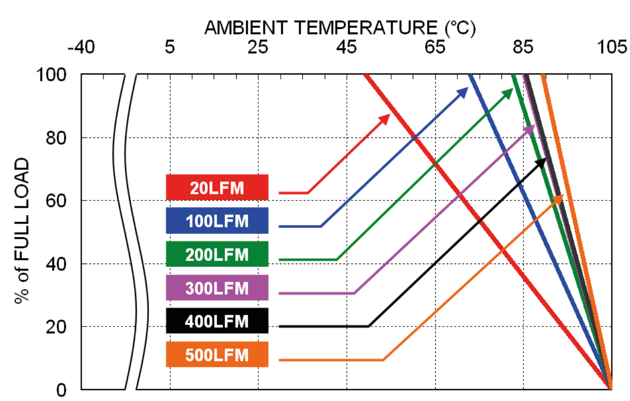
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

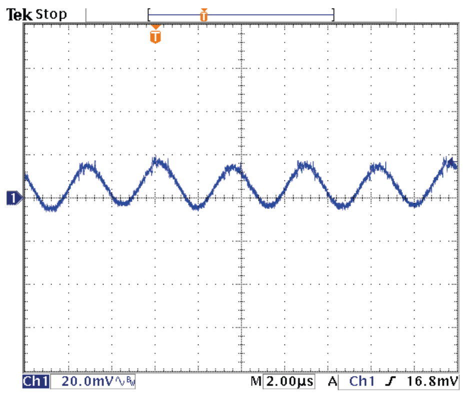


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

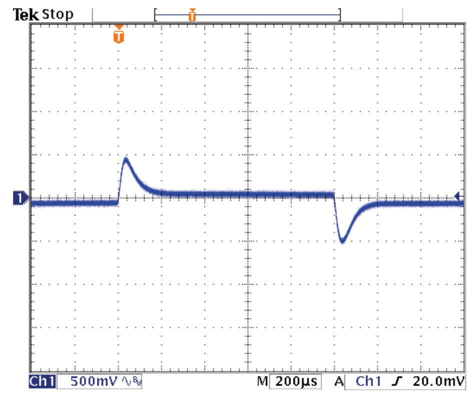


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

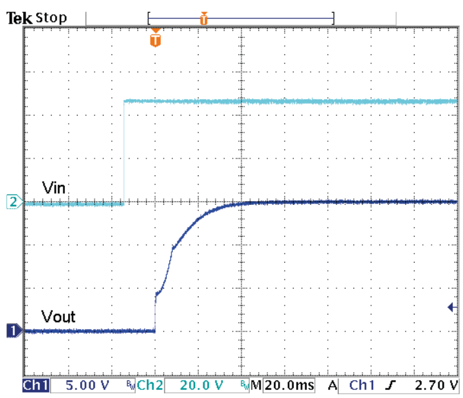
All test conditions are at 25°C.The figures are identical for PQAE100-48S15W



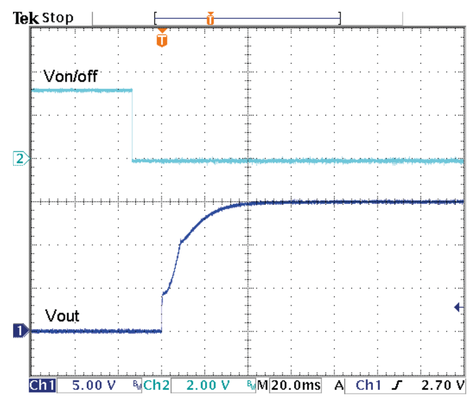
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

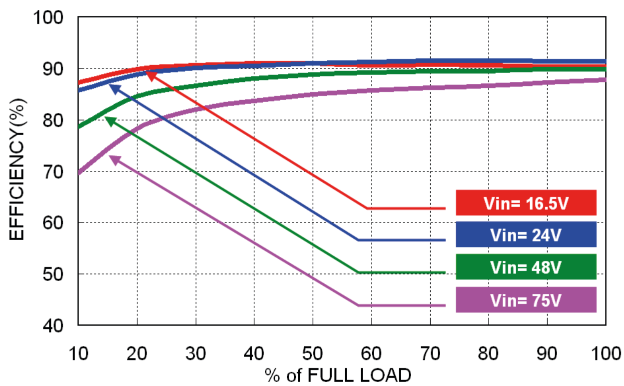


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

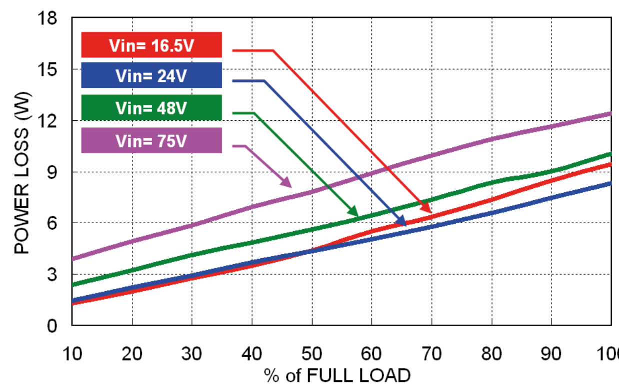


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

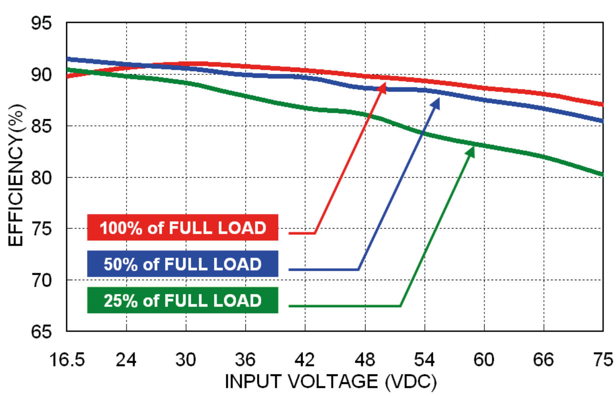
All test conditions are at 25°C.The figures are identical for PQAE100-48S24W



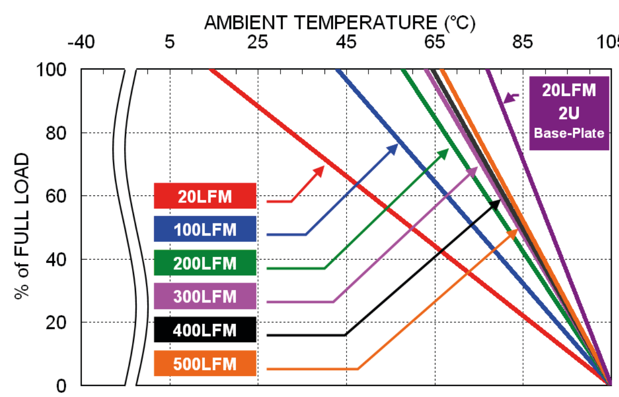
Efficiency versus Output Load



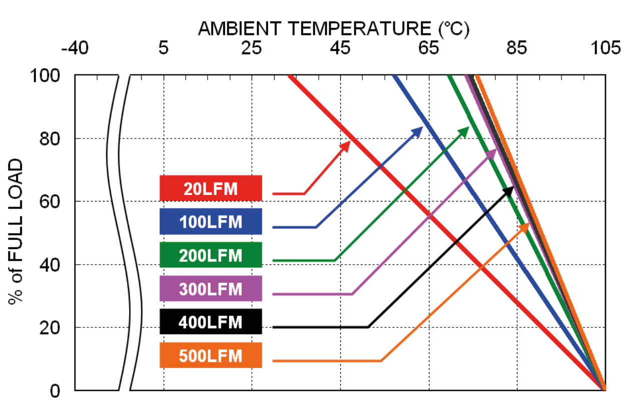
Power dissipation versus Output Load



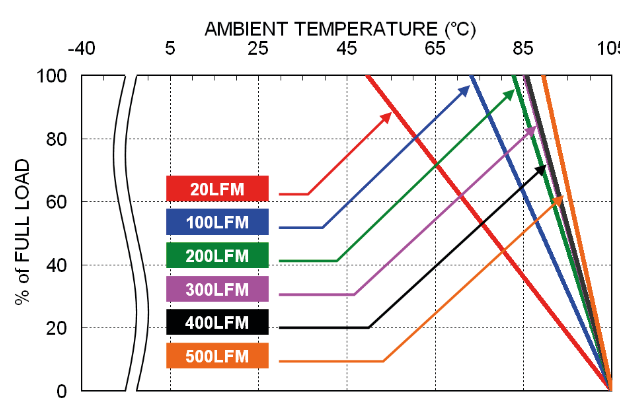
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

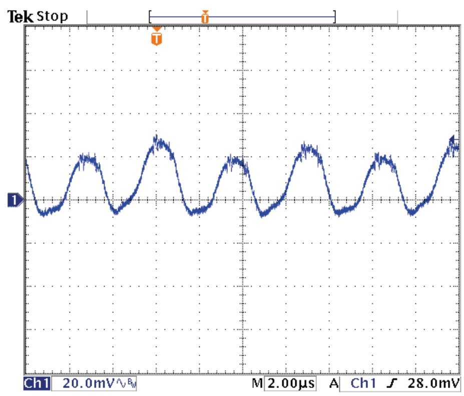


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

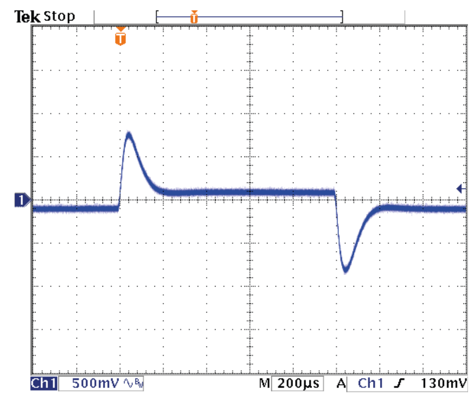


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

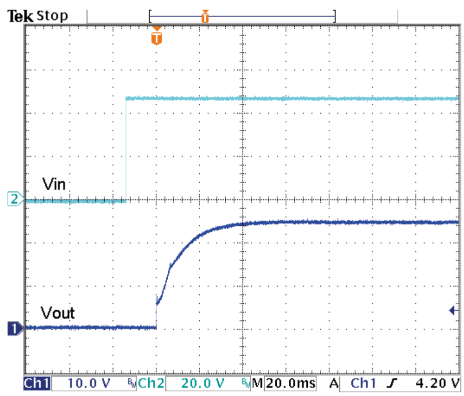
All test conditions are at 25°C.The figures are identical for PQAE100-48S24W



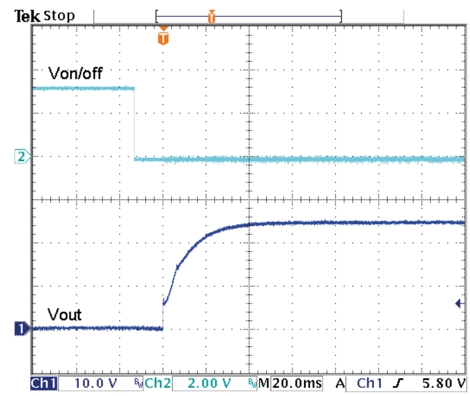
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

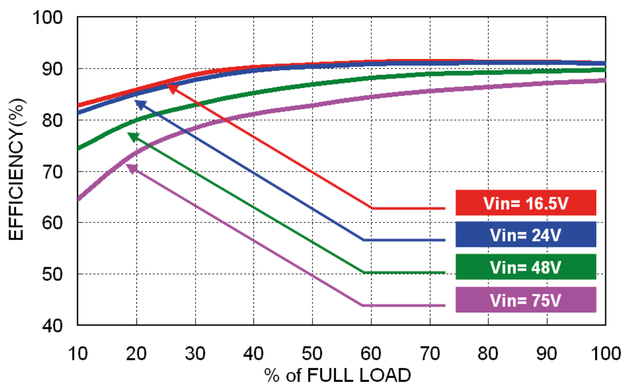


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

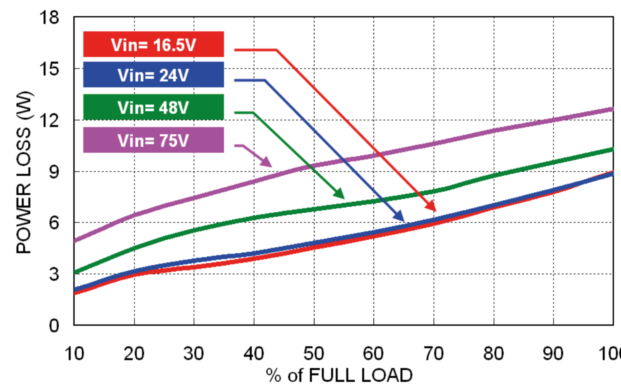


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

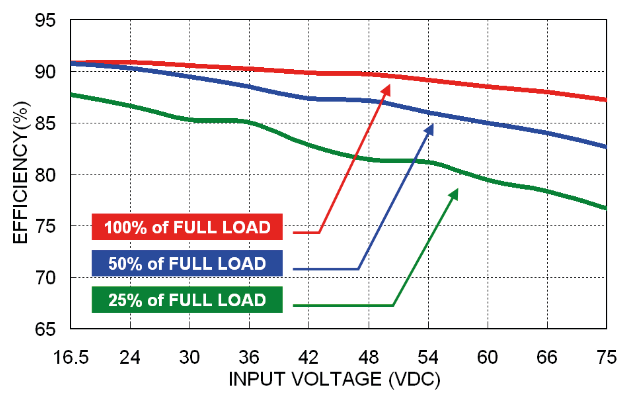
All test conditions are at 25°C.The figures are identical for PQAE100-48S30W



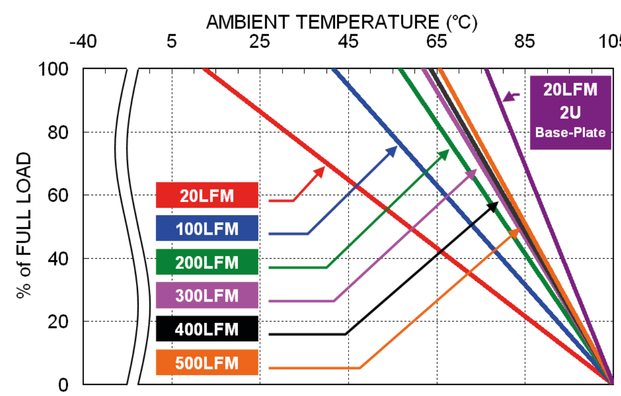
Efficiency versus Output Load



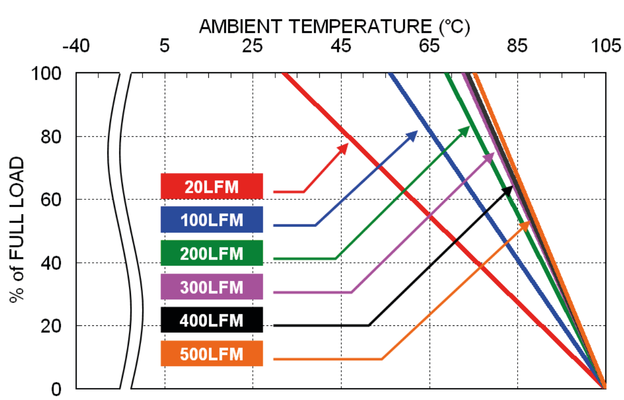
Power dissipation versus Output Load



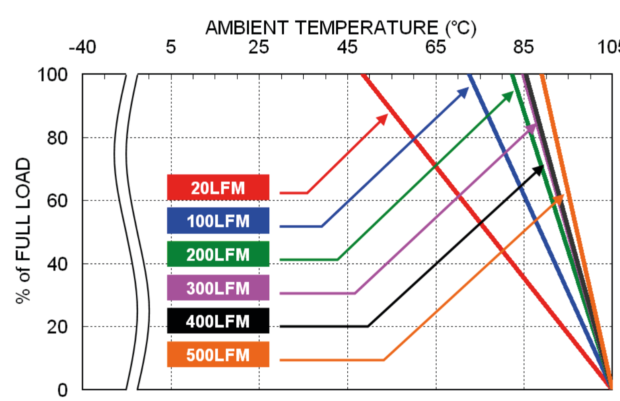
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

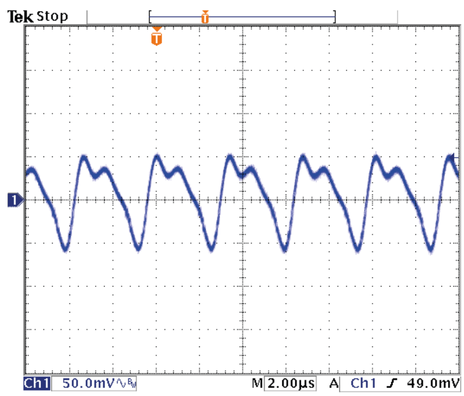


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

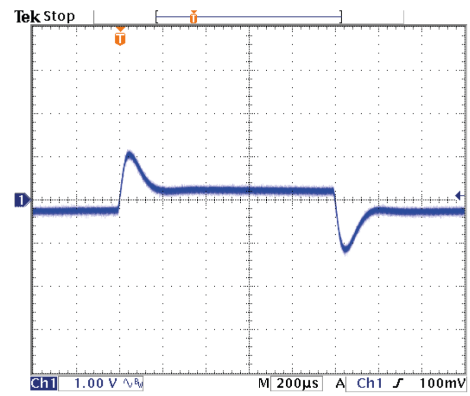


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

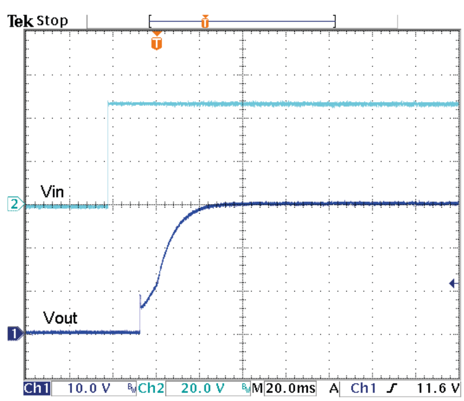
All test conditions are at 25°C.The figures are identical for PQAE100-48S30W



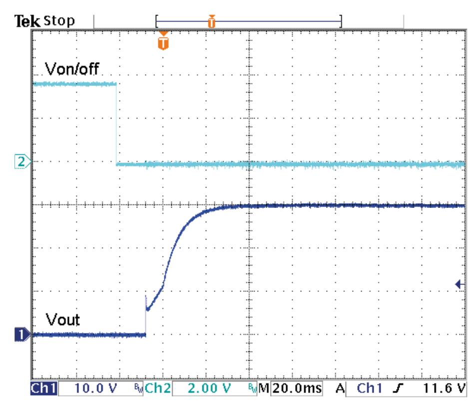
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

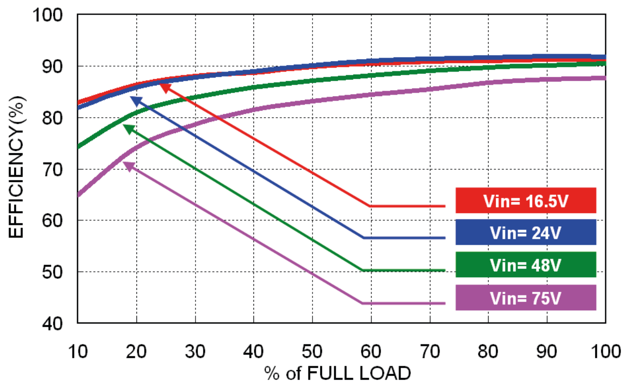


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

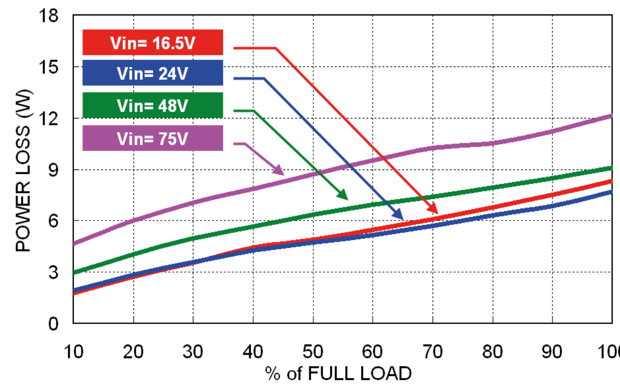


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

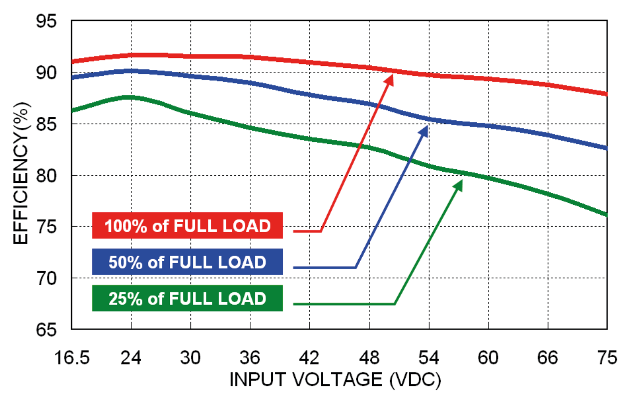
All test conditions are at 25°C.The figures are identical for PQAE100-48S48W



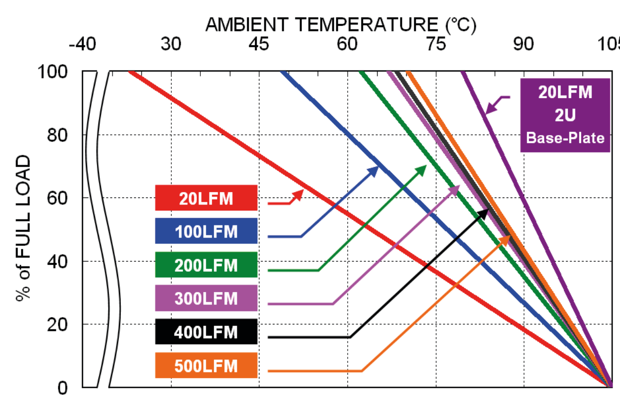
Efficiency versus Output Load



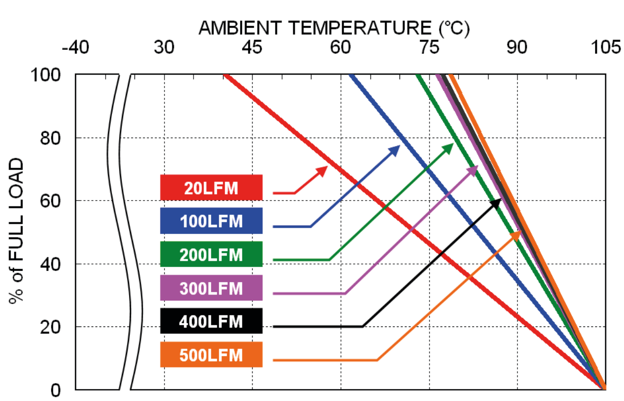
Power dissipation versus Output Load



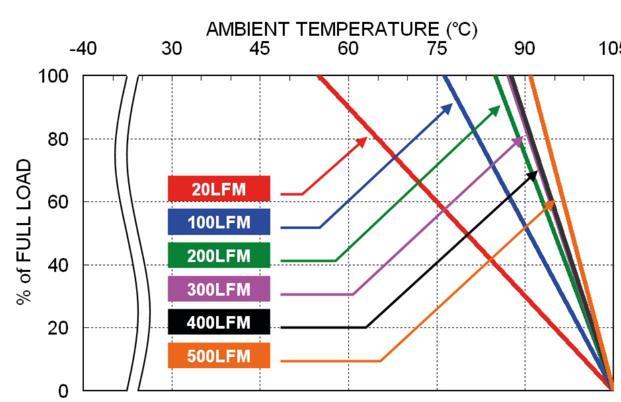
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

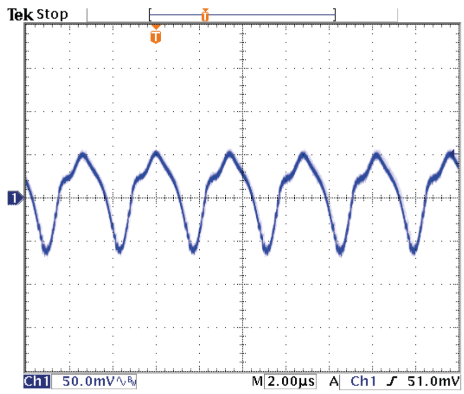


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

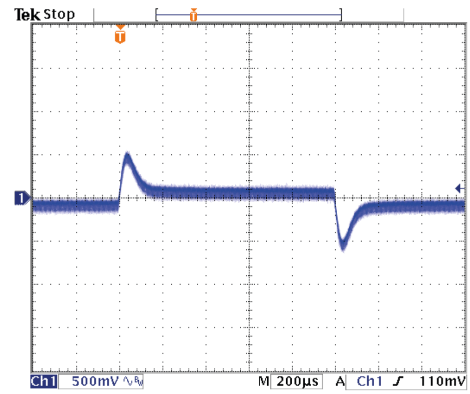


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

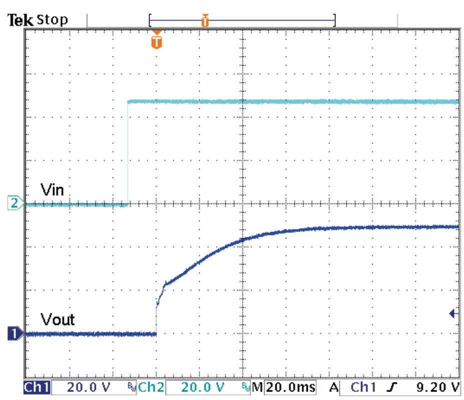
All test conditions are at 25°C.The figures are identical for PQAE100-48S48W



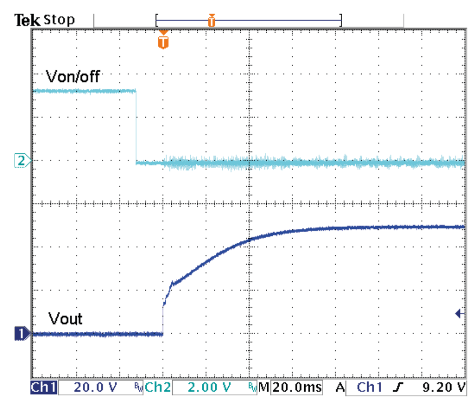
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

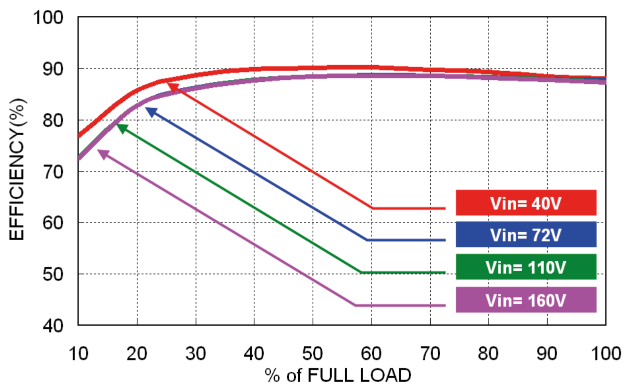


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

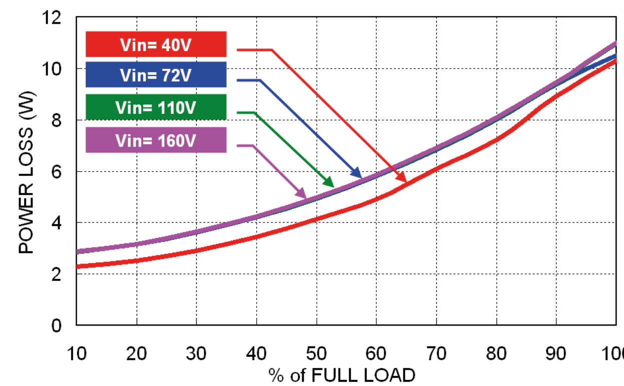


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

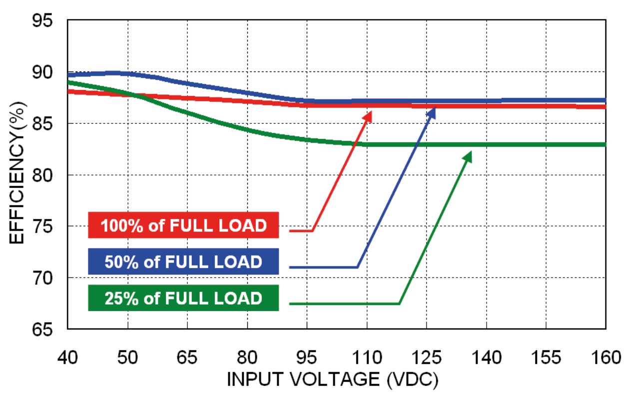
All test conditions are at 25°C.The figures are identical for PQAE100-110S3P3W



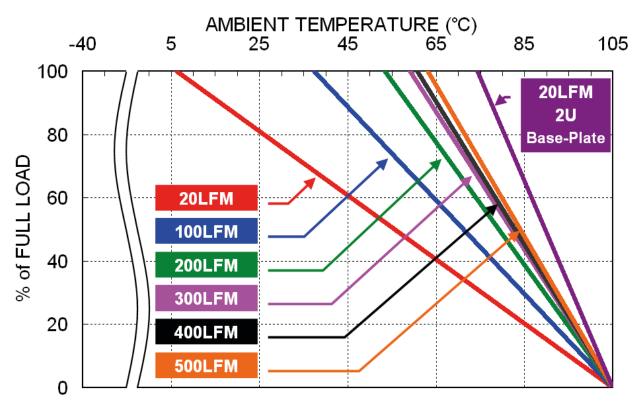
Efficiency versus Output Load



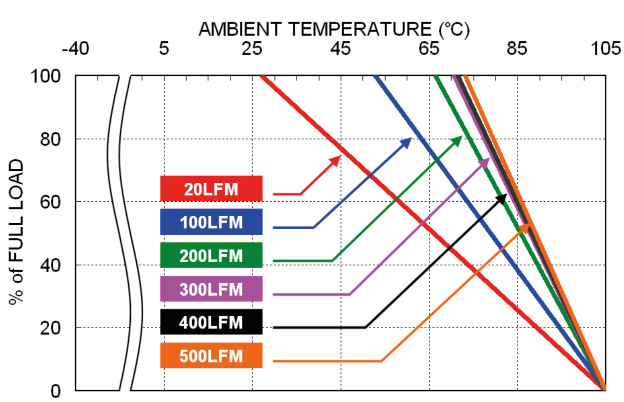
Power dissipation versus Output Load



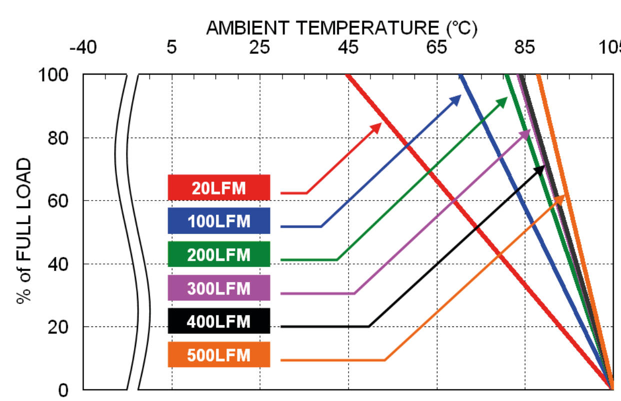
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

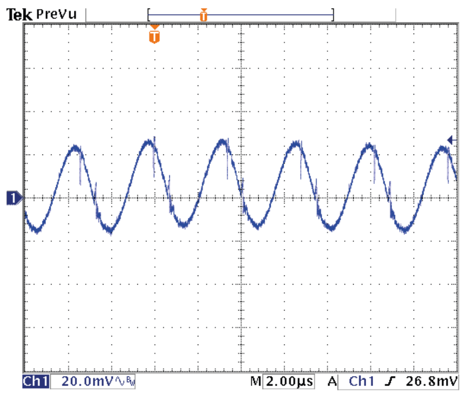


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

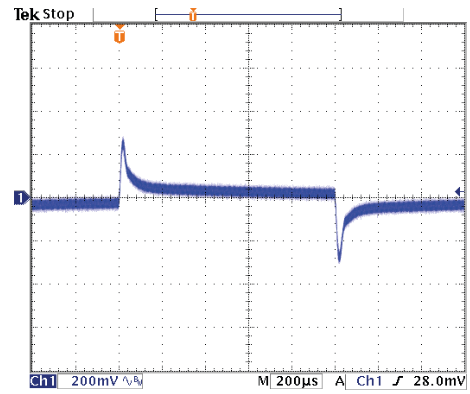


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

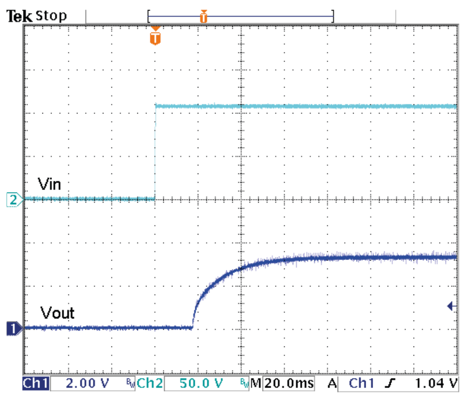
All test conditions are at 25°C.The figures are identical for PQAE100-110S3P3W



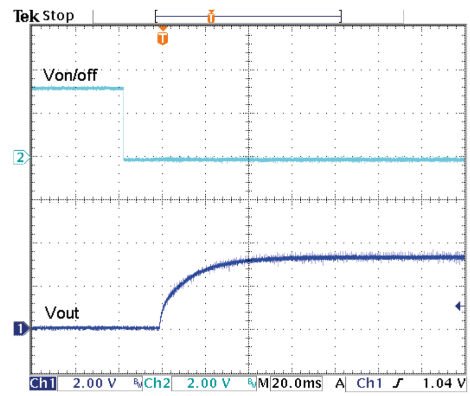
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

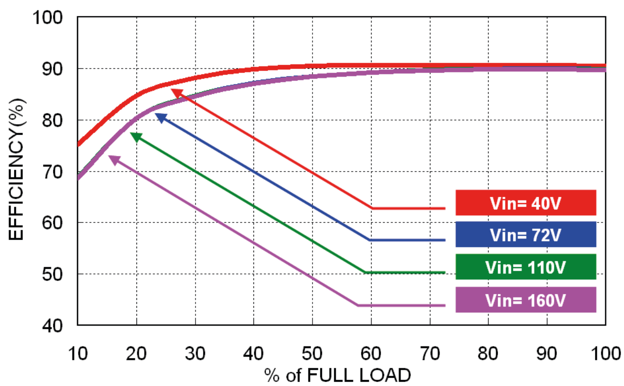


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

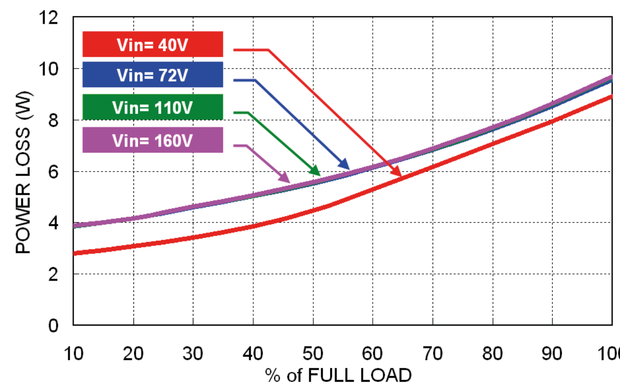


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

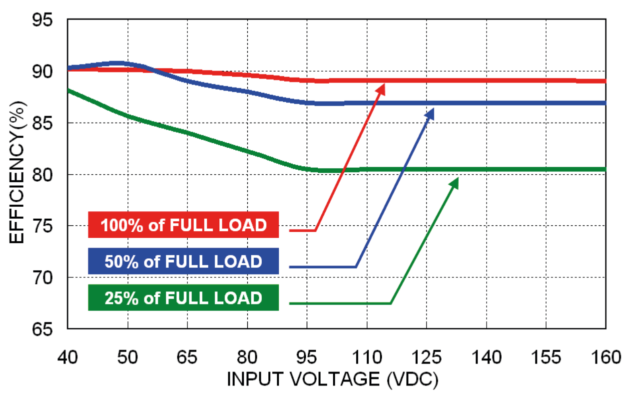
All test conditions are at 25°C.The figures are identical for PQAE100-110S05W



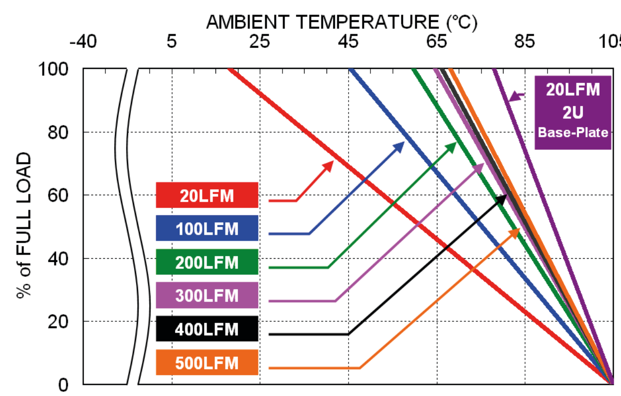
Efficiency versus Output Load



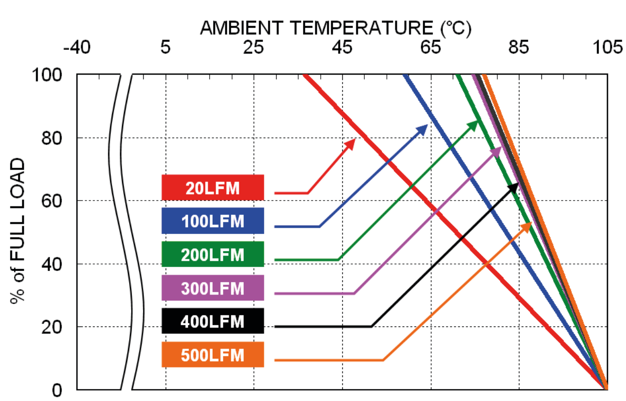
Power dissipation versus Output Load



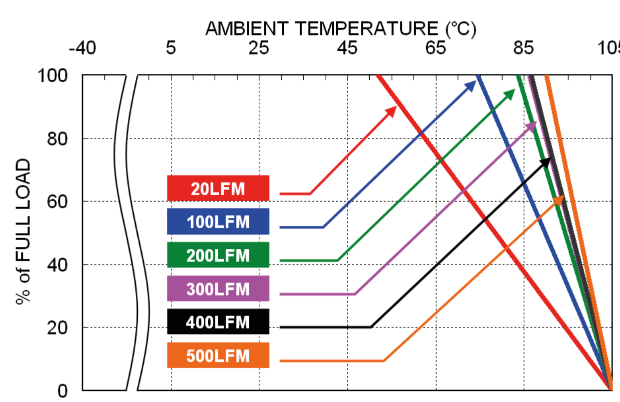
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

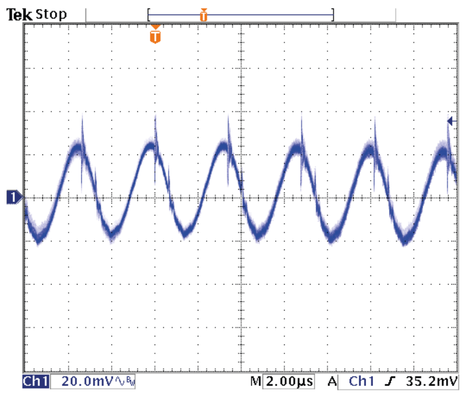


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

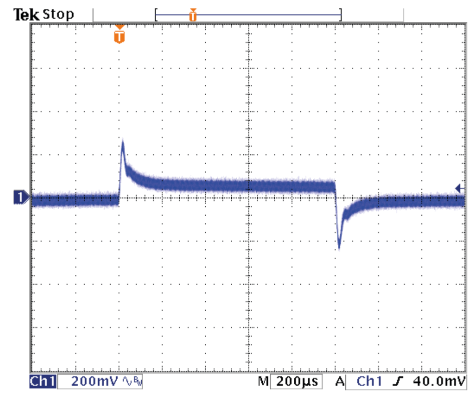


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

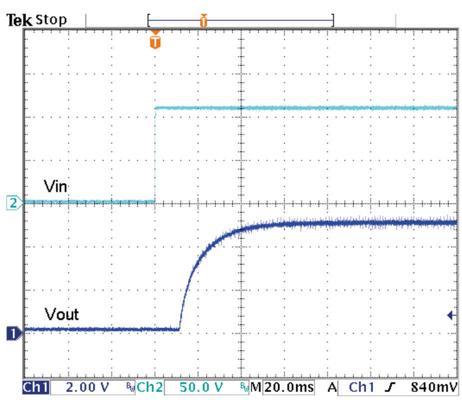
All test conditions are at 25°C.The figures are identical for PQAE100-110S05W



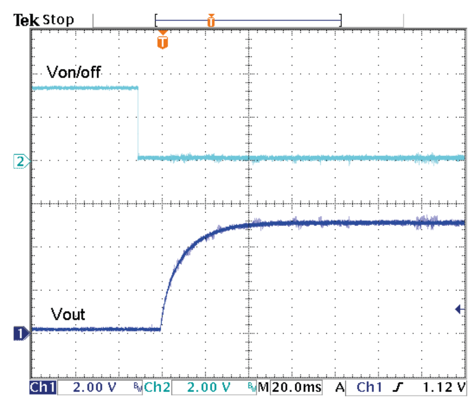
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

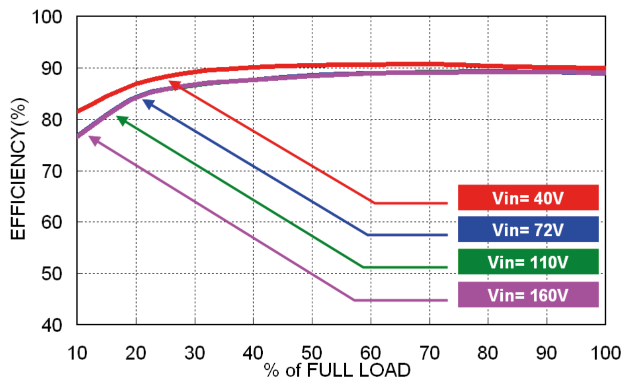


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

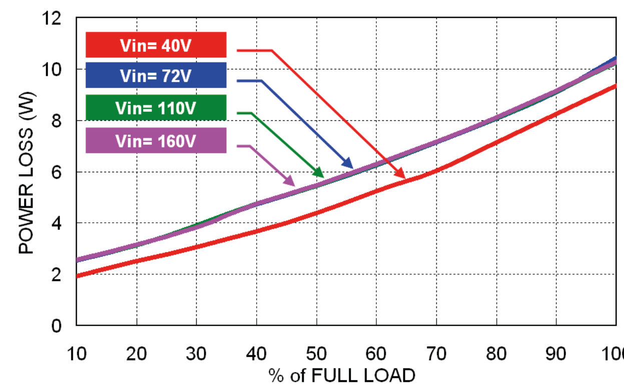


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

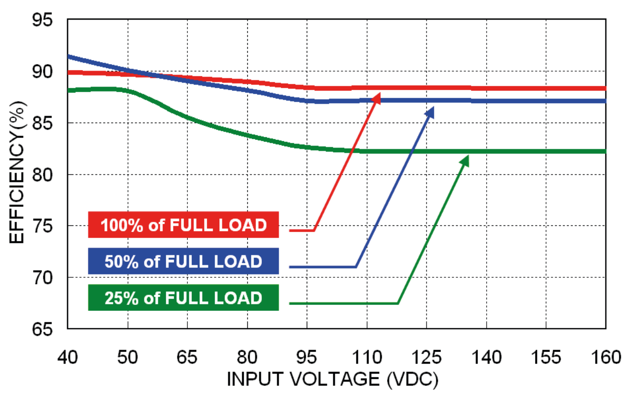
All test conditions are at 25°C.The figures are identical for PQAE100-110S12W



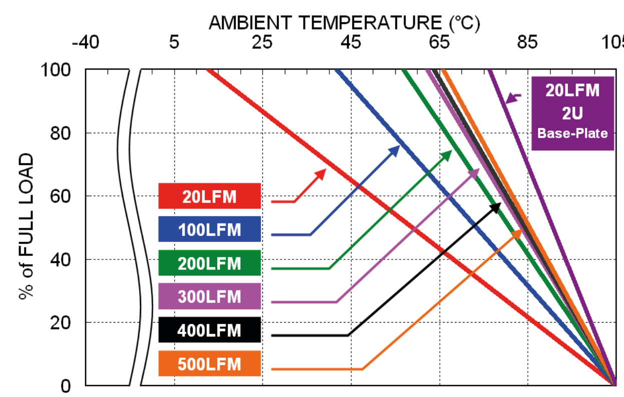
Efficiency versus Output Load



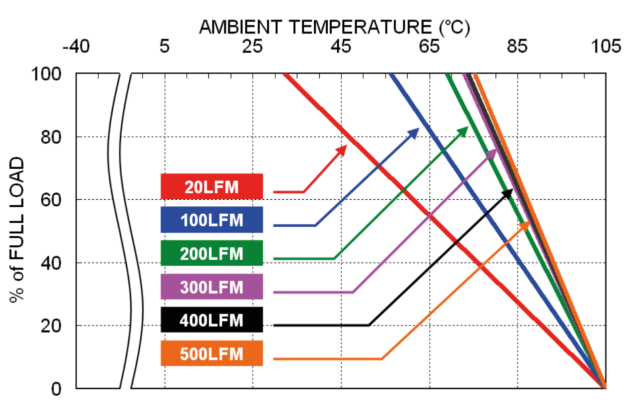
Power dissipation versus Output Load



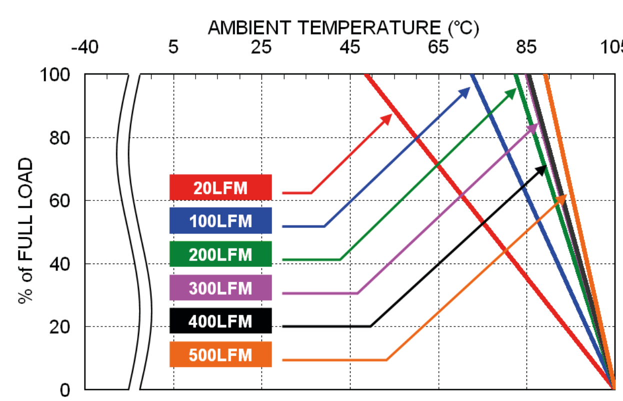
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

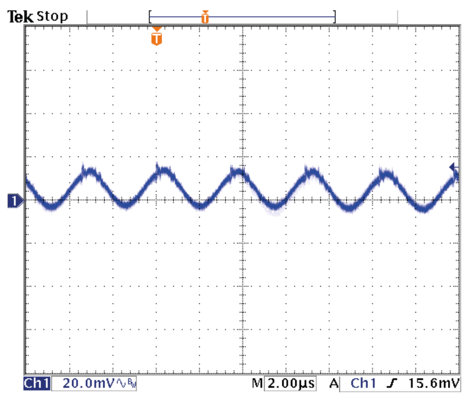


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

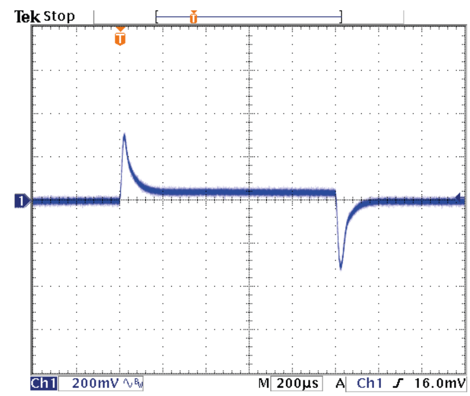


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

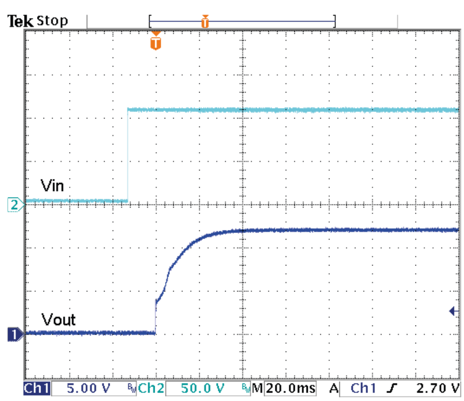
All test conditions are at 25°C.The figures are identical for PQAE100-110S12W



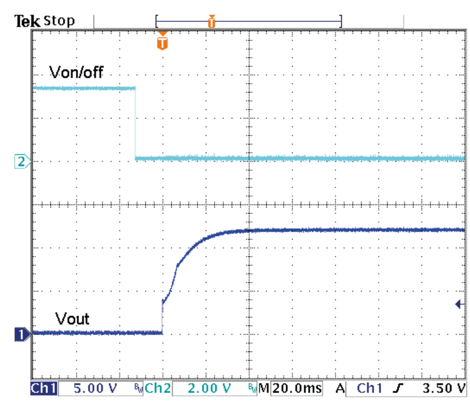
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

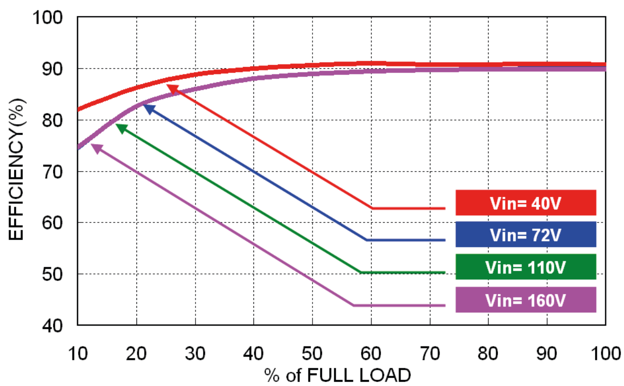


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

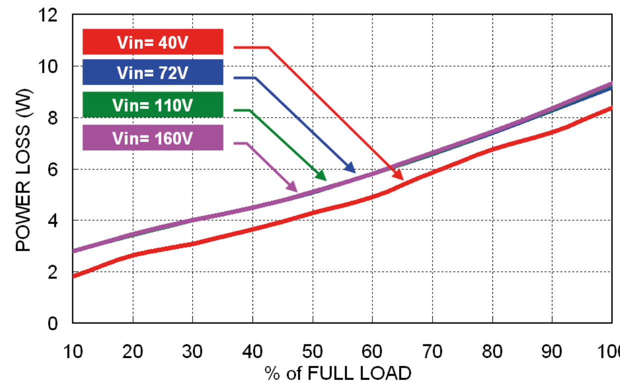


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

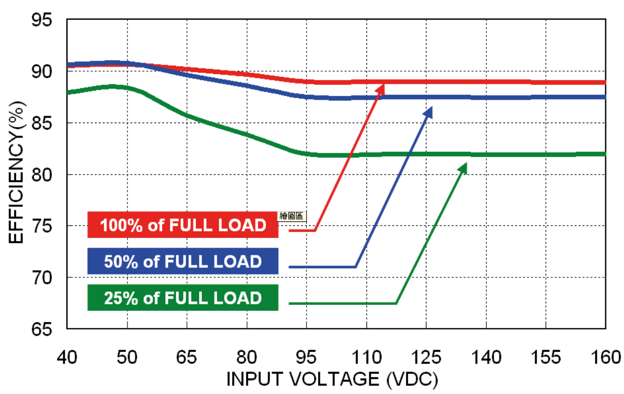
All test conditions are at 25°C.The figures are identical for PQAE100-110S15W



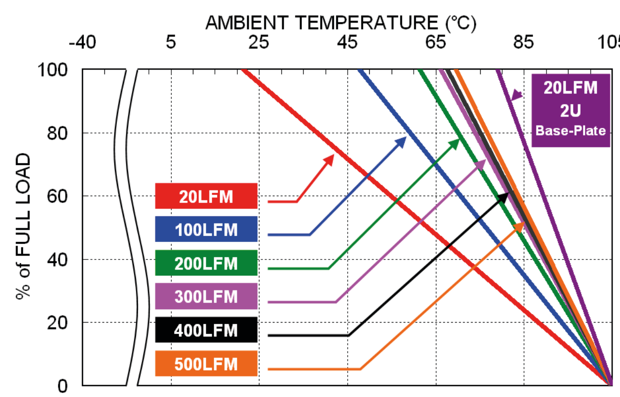
Efficiency versus Output Load



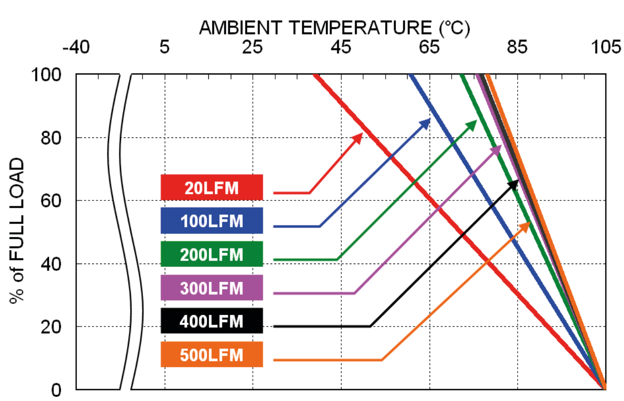
Power dissipation versus Output Load



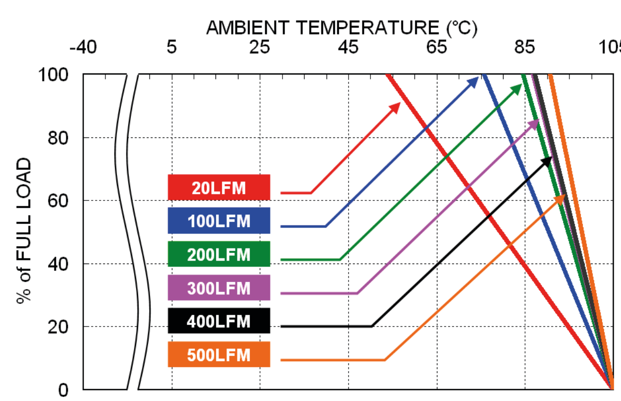
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19" X 3.5" X 0.063"

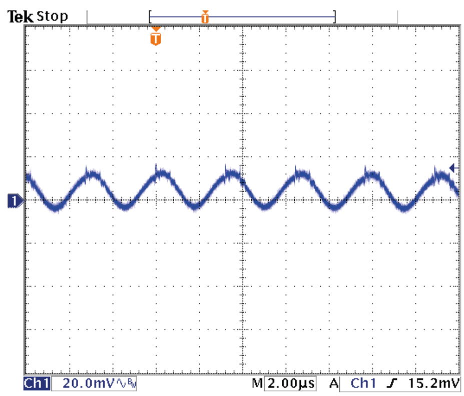


Derating Output Load versus Ambient Temperature and Airflow
With 0.24" Heat-Sink , Vin(nom)

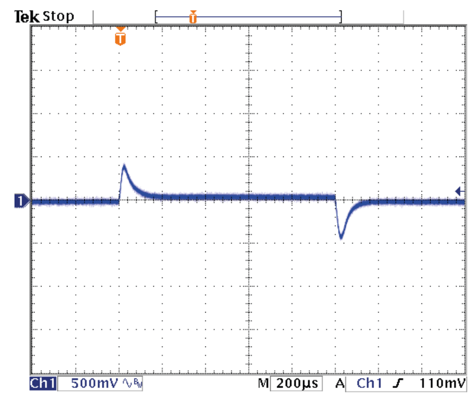


Derating Output Load versus Ambient Temperature and Airflow
With 0.5" Heat-Sink , Vin(nom)

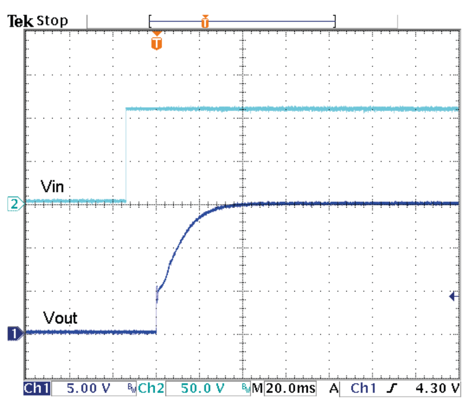
All test conditions are at 25°C.The figures are identical for PQAE100-110S15W



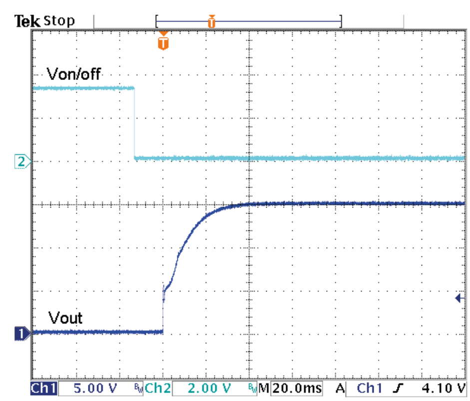
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

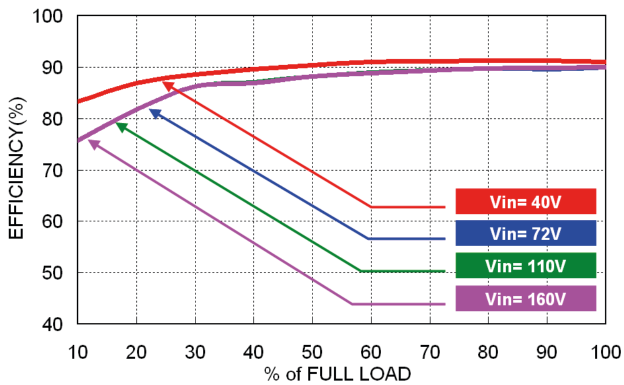


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

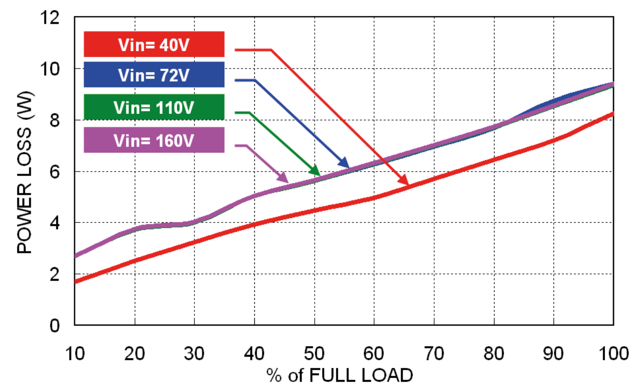


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

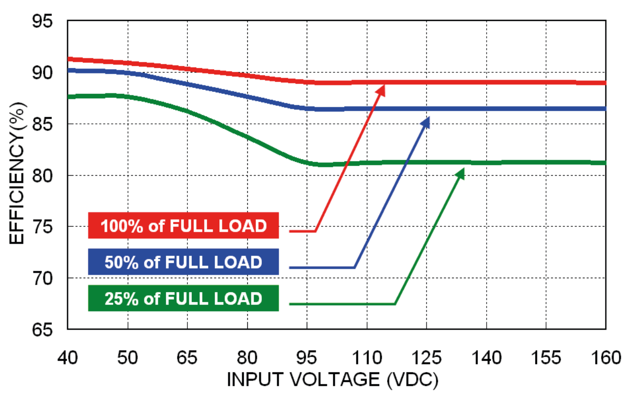
All test conditions are at 25°C.The figures are identical for PQAE100-110S24W



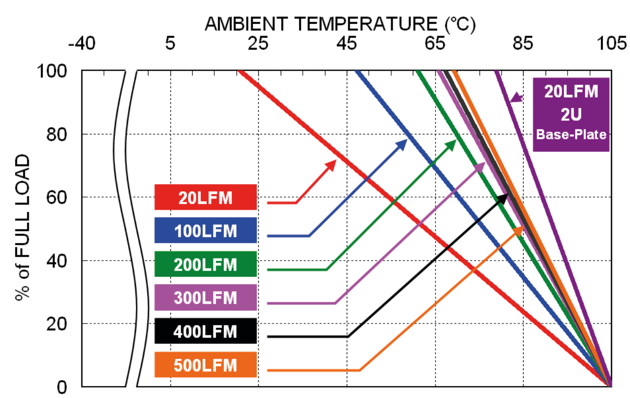
Efficiency versus Output Load



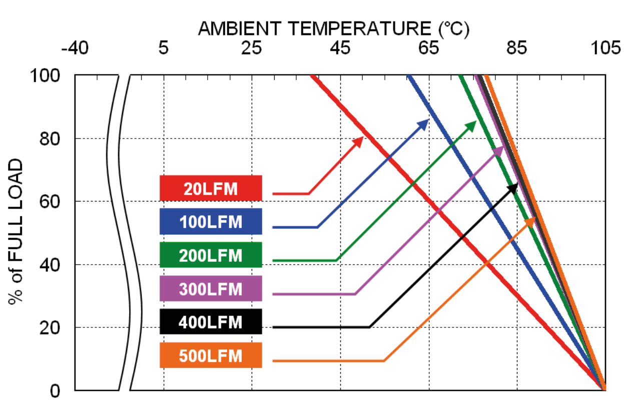
Power dissipation versus Output Load



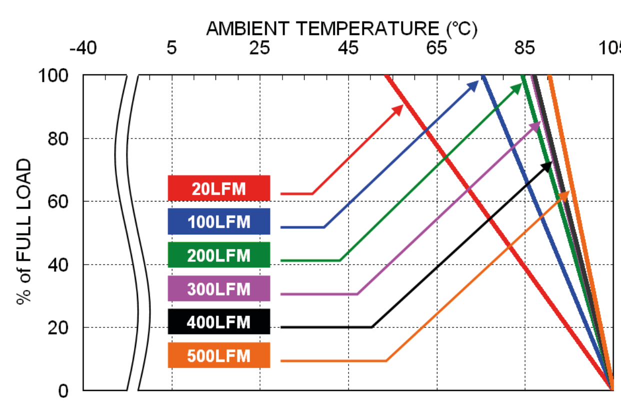
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

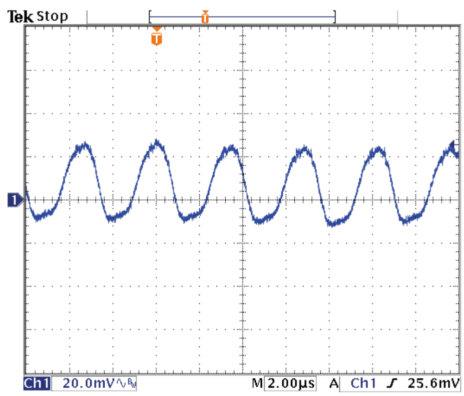


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

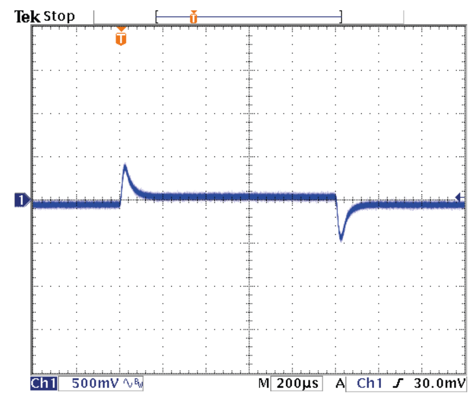


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

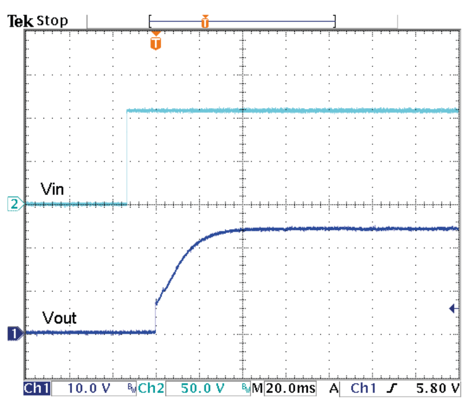
All test conditions are at 25°C.The figures are identical for PQAE100-110S24W



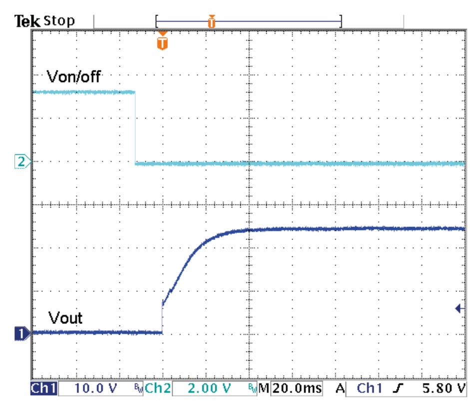
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

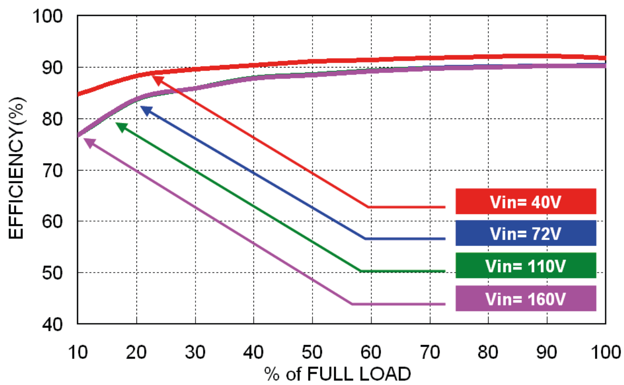


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

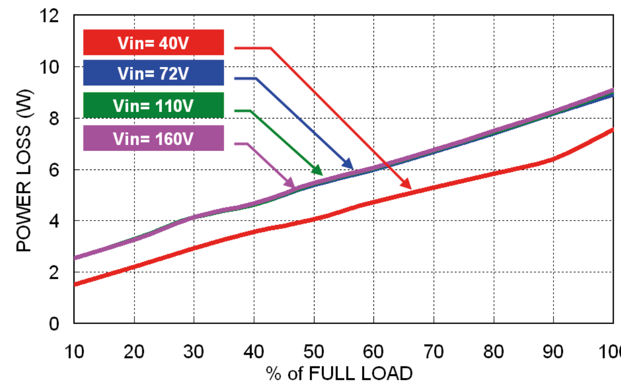


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

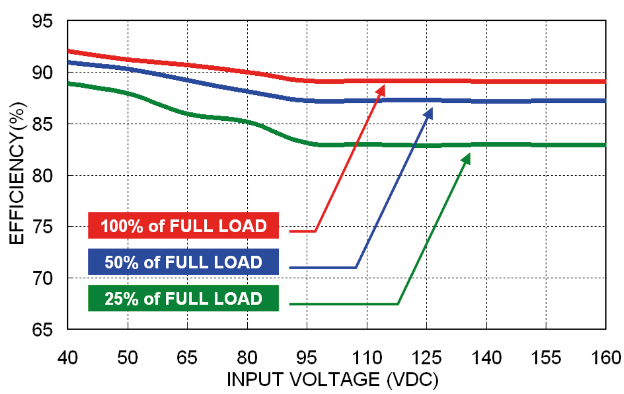
All test conditions are at 25°C.The figures are identical for PQAE100-110S30W



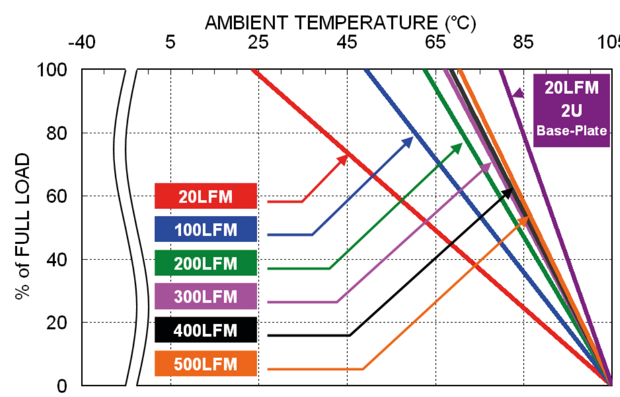
Efficiency versus Output Load



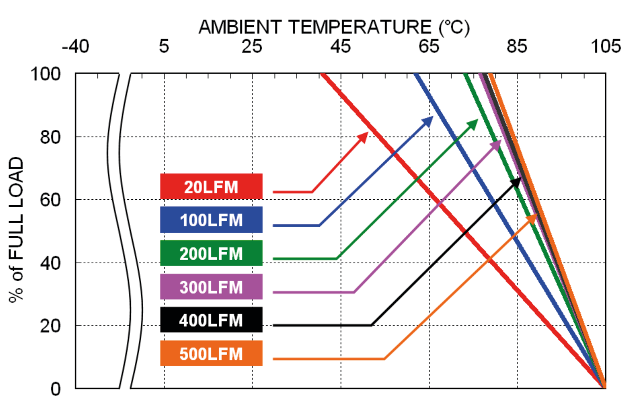
Power dissipation versus Output Load



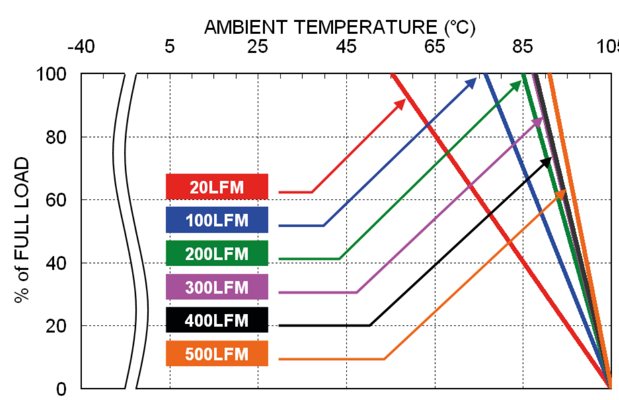
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

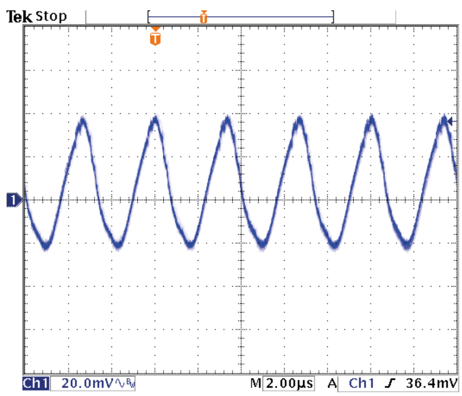


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

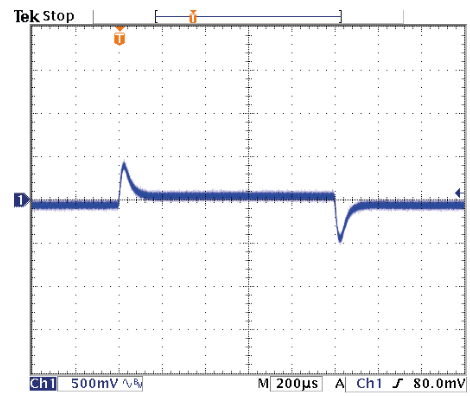


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

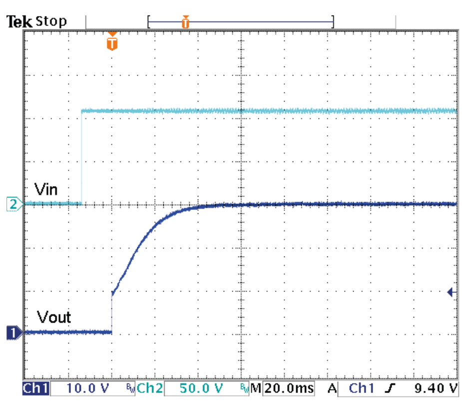
All test conditions are at 25°C.The figures are identical for PQAE100-110S30



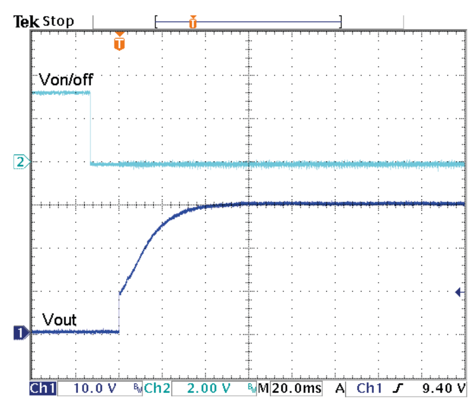
Typical Output Ripple and Noise.
Vin(nom); Full Load



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

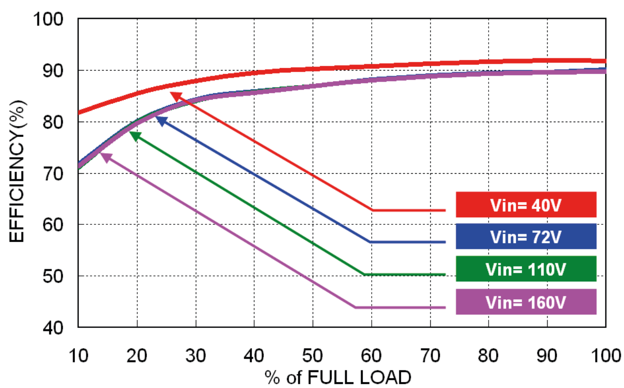


Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

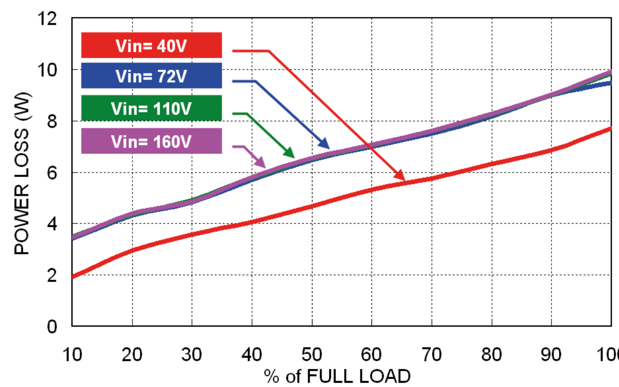


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

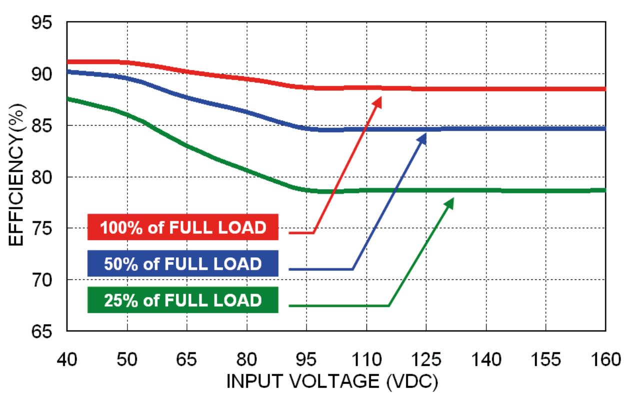
All test conditions are at 25°C.The figures are identical for PQAE100-110S48W



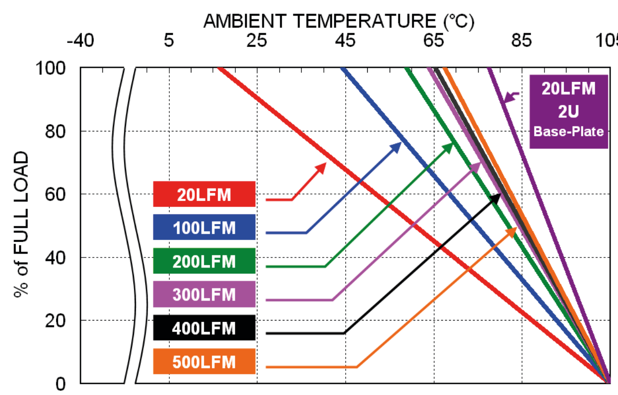
Efficiency versus Output Load



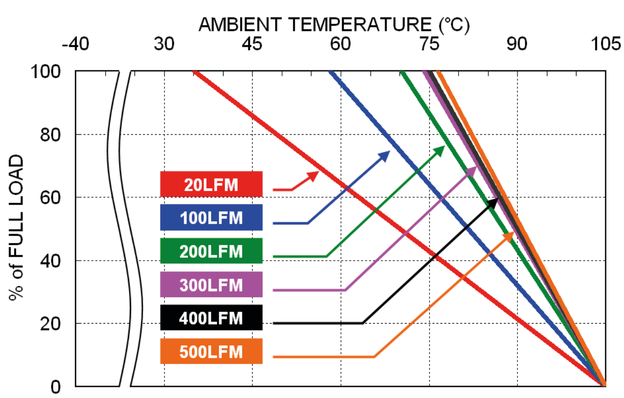
Power dissipation versus Output Load



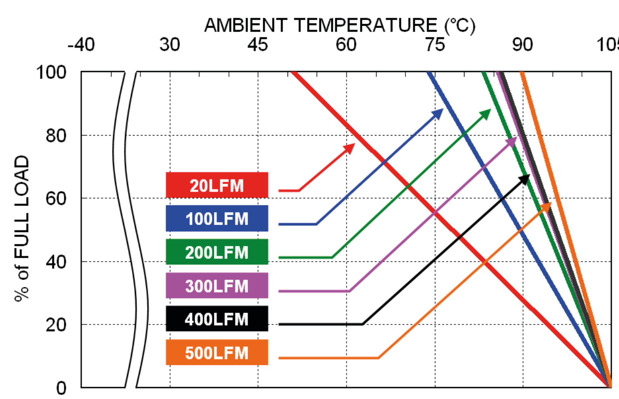
Efficiency versus Input Voltage
Full Load



Derating Output Load versus Ambient Temperature and Airflow
Vin(nom)
* Mount on 2U Iron Base-Plate Dimension is 19” X 3.5” X 0.063”

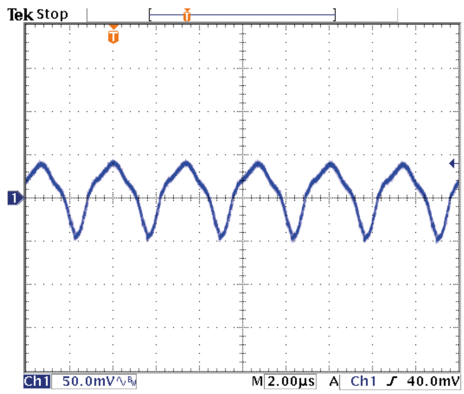


Derating Output Load versus Ambient Temperature and Airflow
With 0.24” Heat-Sink , Vin(nom)

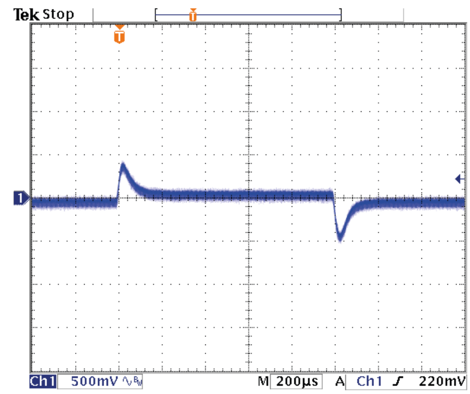


Derating Output Load versus Ambient Temperature and Airflow
With 0.5” Heat-Sink , Vin(nom)

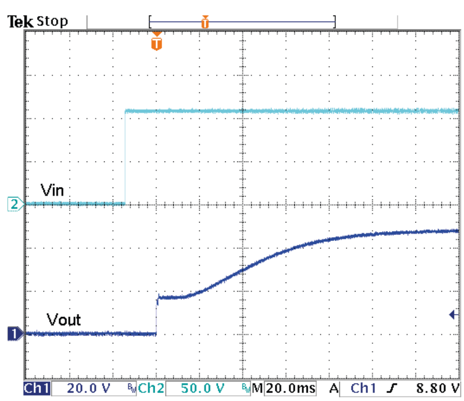
All test conditions are at 25°C.The figures are identical for PQAE100-110S48W



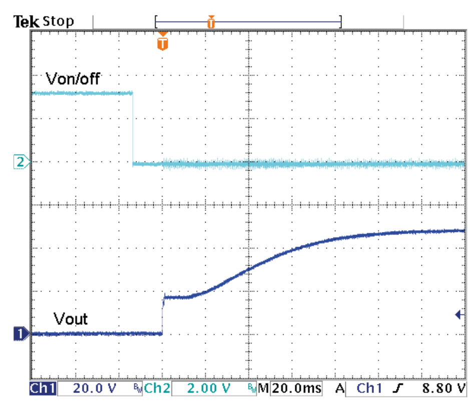
Typical Output Ripple and Noise.
Vin(nom); Full Load



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