MINMAX®

MDW08 Series

Electric Characteristic Note

MDW08 Series EC Note

DC-DC CONVERTER 8W, Regulated Output, DIP Package

Features

- **Smallest Encapsulated 8W Converter**
- **Industrial Standard DIP-16 Package**
- **Wide 2:1 Input Voltage Range**
- **Fully Regulated Output Voltage**
- **I/O Isolation 1500 VDC**
- **Operating Ambient Temp. Range -40℃ to +80℃**
- **Low No Load Power Consumption**
- **No Min. Load Requirement**
- **Under-voltage, Overload and Short Circuit Protection**
- **Shielded Metal Case with Insulated Baseplate**
- **Conducted EMI EN 55032 Class A Approved**
- **UL/cUL/IEC/EN 62368-1(60950-1) Safety Approval & CE Marking**

Applications

- Distributed power architectures
- Workstations
- Computer equipment
- Communications equipment

Product Overview

The MDW08 series is an industrial-grade 8W isolated DC-DC power converter designed in the international standard DIP-16 package. Through continuous efforts by MINMAX, the MDW08 series has successfully reduced its volume by 75% and lightened its weight by 79% compared to the previous generation, achieving a power density of up to 50W/in^3. This advancement assists equipment manufacturers dealing with limited design space in solving critical application challenges. With a 2:1 wide input voltage range, it is suitable for various application scenarios, offering 21 output voltage models including 3.3V, 5V, 12V, 15V, 24V, ±12V, and ±15V. The fully regulated output ensures stable and reliable long-term operation.

The MDW08 series stands out not only for its compact design but also for its features such as a 1500VDC isolation voltage, a broad operating temperature range from -40℃ to +80℃, making it suitable for diverse climates and industrial environments. Excellent electrical characteristics are maintained in the miniaturization of the MDW08 series, with low standby power con sumption, no minimum load requirement, high conversion efficiency, and outstanding transient load capability. Additionally, the series includes multiple protection mechanisms, such as input undervoltage, output overcurrent, and output short-circuit protection, ensuring safe operation under various conditions.

To further enhance performance, the MDW08 series adopts a shielded metal enclosure and insulated substrate, incorporating a conductive electromagnetic interference (EMI) filtering circuit. It has obtained EN55032 Class A certification, effectively suppressing noise and interference. The MDW08 series finds extensive applications in semiconductor processing equipment, power supplies, intelligent inspection robots, charging stations, motion controllers, power regulators, energy storage systems, among other fields. It has rapidly become one of MINMAX's popular product series, boasting high repurchase rates and customer satisfaction.

The MDW08 series is certified under international standards UL/cUL/IEC/EN 62368-1, and bears the CE mark. Whether in industrial automation, communication equipment, or other application domains, the MDW08 series is an ideal choice, providing a reliable and compliant power solution for your systems.

Table of contents

Model Selection Guide

Model Number	Input Voltage (Range)	Output Voltage	Output Current	Input Current		Max. capacitive Load	Efficiency (typ.)
			Max.	@Max. Load	@No Load		@Max. Load
	VDC	VDC	mA	mA(typ.)	mA(typ.)	µF	%
MDW08-12S033	12 (9 ~ 18)	3.3	1600	564	10	680	78
MDW08-12S05		5	1600	823		680	81
MDW08-12S12		12	665	792		330	84
MDW08-12S15		15	535	796		330	84
MDW08-12S24		24	335	788		150	85
MDW08-12D12		±12	±335	788		150#	85
MDW08-12D15		±15	±265	789		150#	84
MDW08-24S033	24 (18 ~ 36)	3.3	1600	282	10	680	78
MDW08-24S05		5	1600	407		680	82
MDW08-24S12		12	665	391		330	85
MDW08-24S15		15	535	393		330	85
MDW08-24S24		24	335	390		150	86
MDW08-24D12		±12	±335	394		150#	85
MDW08-24D15		±15	±265	385		150#	86
MDW08-48S033	48 (36 ~ 75)	3.3	1600	141	8	680	78
MDW08-48S05		5	1600	206		680	81
MDW08-48S12		12	665	196		330	85
MDW08-48S15		15	535	197		330	85
MDW08-48S24		24	335	195		150	86
MDW08-48D12		±12	±335	195		150#	86
MDW08-48D15		±15	±265	193		150#	86

For each output

Input Specifications

Parameter	Model	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	12V Input Models	-0.7	---	25	VDC
	24V Input Models	-0.7	---	50	
	48V Input Models	-0.7	---	100	
Start-Up Threshold Voltage	12V Input Models	---	---	9	
	24V Input Models	---	---	18	
	48V Input Models	---	---	36	
Under Voltage Shutdown	12V Input Models	---	8	---	
	24V Input Models	---	16	---	
	48V Input Models	---	34	---	
Input Filter	All Models	Internal Pi Type			

Output Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Setting Accuracy		---	---	±2.0	%Vom.
Output Voltage Balance	Dual Output, Balanced Loads	---	±1.0	±2.0	%
Line Regulation	Vin=Min. to Max. @Full Load	---	±0.2	±0.8	%
Load Regulation	Io=0% to 100%	---	±0.5	±1.0	%
Minimum Load	No minimum Load Requirement				
Ripple & Noise	0-20 MHz Bandwidth	---	---	55	mV P-P
Transient Recovery Time	25% Load Step Change	---	---	500	µsec
Transient Response Deviation		---	±3	±5	%
Temperature Coefficient		---	±0.01	±0.02	%/℃
Over Load Protection	Hiccup	---	150	---	%
Short Circuit Protection	Continuous, Automatic Recovery (Hiccup Mode 0.3Hz typ.)				

General Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage	60 Seconds	1500	---	---	VDC
	1 Second	1800	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100kHz, 1V	---	500	---	pF
Switching Frequency		---	370	---	kHz
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign	1,062,864	---	---	Hours
Safety Approvals	UL/cUL 60950-1 recognition (UL certificate), IEC/EN 60950-1 (CB-report)				
	UL/cUL 62368-1 recognition (UL certificate), IEC/EN 62368-1 (CB-report)				

EMC Specifications

Parameter	Standards & Level			Performance
EMI(5)	Conduction	EN 55032	Without external components	Class A
	Radiation		With external components	
EMS(5)	EN 55035			
	ESD	EN 61000-4-2 Air ± 8kV , Contact ± 6kV		A
	Radiated immunity	EN 61000-4-3 20V/m		A
	Fast transient	EN 61000-4-4 ±2kV		A
	Surge	EN 61000-4-5 ±1kV		A
	Conducted immunity	EN 61000-4-6 10Vrms		A
	PFMF	EN 61000-4-8 100A/m		A

Environmental Specifications

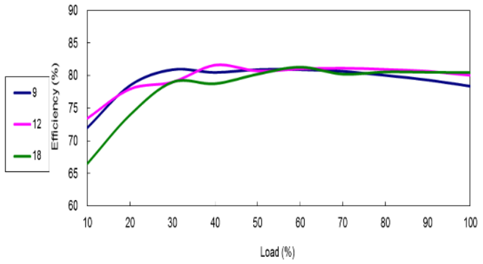
Parameter	Min.	Max.	Unit
Operating Ambient Temperature Range (See Power Derating Curve)	-40	+80	℃
Case Temperature	---	+105	℃
Storage Temperature Range	-50	+125	℃
Humidity (non condensing)	---	95	% rel. H
Lead Temperature (1.5mm from case for 10Sec.)	---	260	℃

Notes

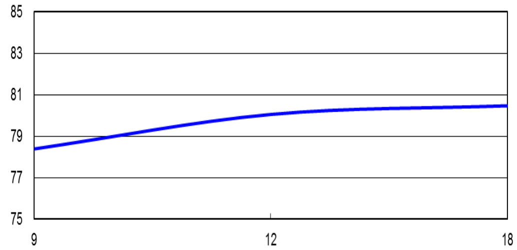
1. Specifications typical at Ta=+25℃, resistive load, nominal input voltage and rated output current unless otherwise noted.
2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
3. We recommend to protect the converter by a slow blow fuse in the input supply line.
4. Other input and output voltage may be available, please contact MINMAX.
5. The external components might be required to meet EMI/EMS standard for some of test items. Please contact MINMAX for the solution in detail.
6. Specifications are subject to change without notice.
7. The repeated high voltage isolation testing of the converter can degrade isolation capability, to a lesser or greater degree depending on materials, construction, environment and reflow solder process. Any material is susceptible to eventual chemical degradation when subject to very high applied voltages thus implying that the number of tests should be strictly limited. We therefore strongly advise against repeated high voltage isolation testing, but if it is absolutely required, that the voltage be reduced by 20% from specified test voltage. Furthermore, the high voltage isolation capability after reflow solder process should be evaluated as it is applied on system.

Characteristic Curves

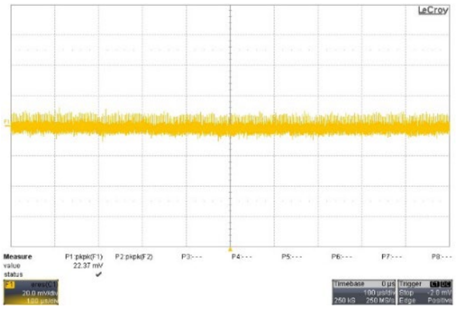
All test conditions are at 25℃ The figures are identical for MDW08-12S033



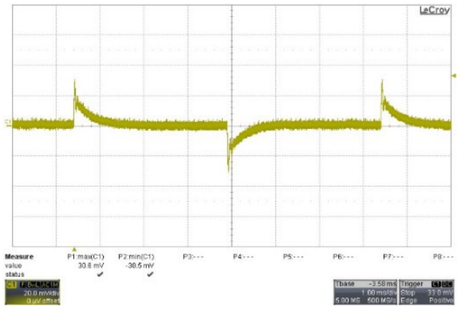
Efficiency Versus Output Current



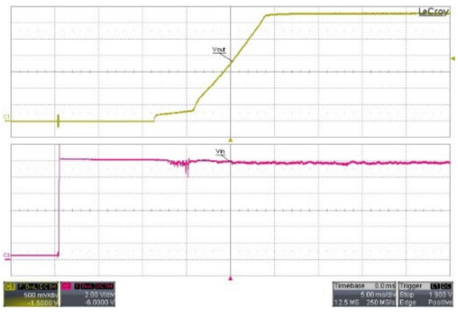
Efficiency Versus Input Voltage
Full Load



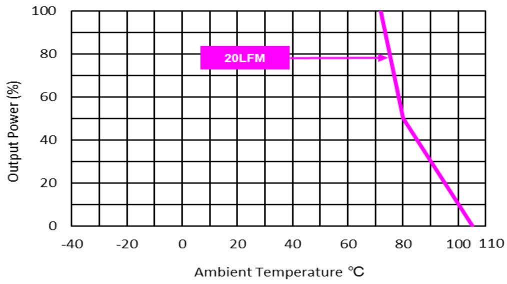
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



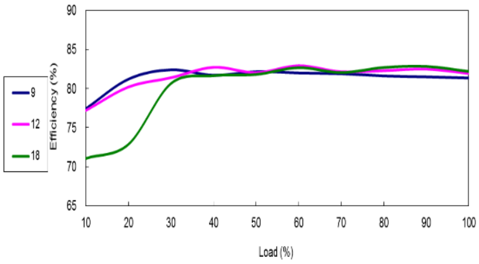
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



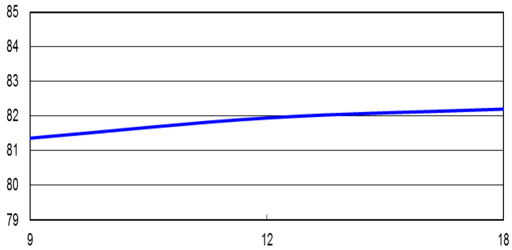
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

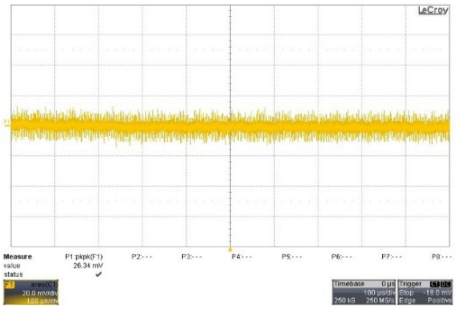
All test conditions are at 25℃ The figures are identical for MDW08-12S05



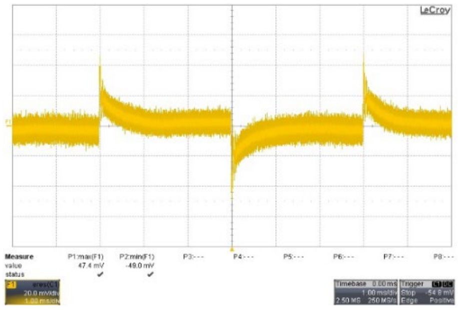
Efficiency Versus Output Current



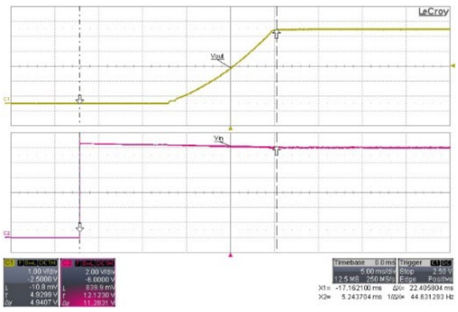
Efficiency Versus Input Voltage
Full Load



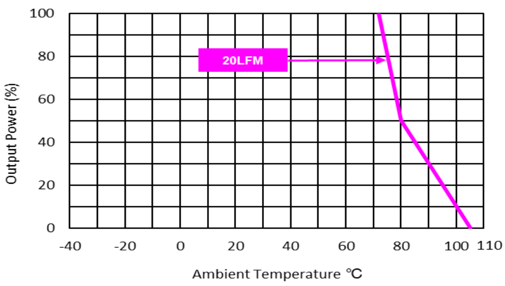
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



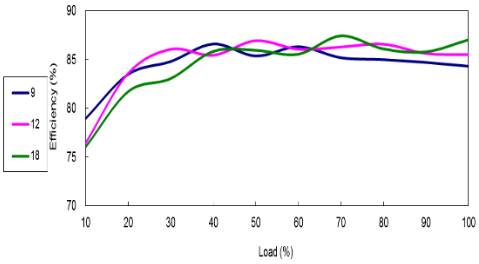
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



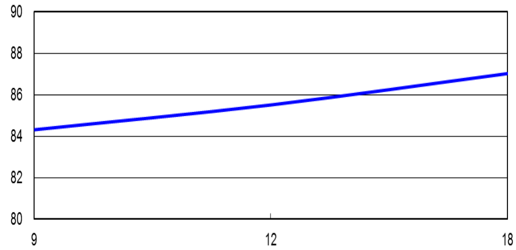
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

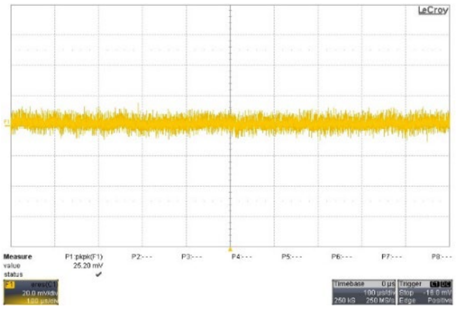
All test conditions are at 25℃ The figures are identical for MDW08-12S12



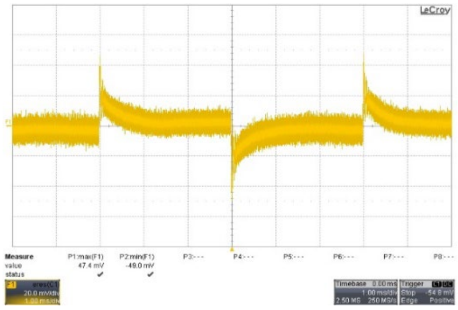
Efficiency Versus Output Current



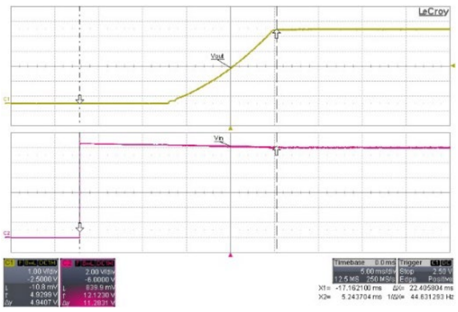
Efficiency Versus Input Voltage
Full Load



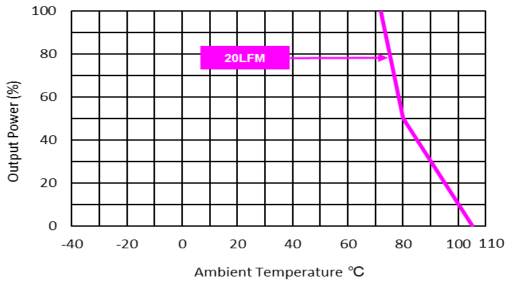
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



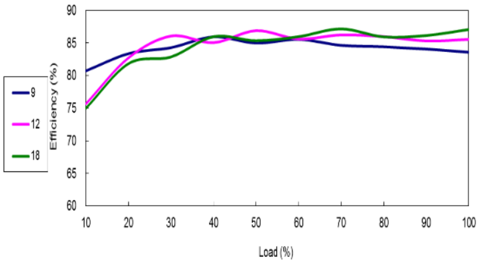
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



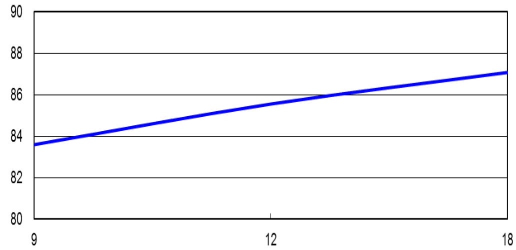
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

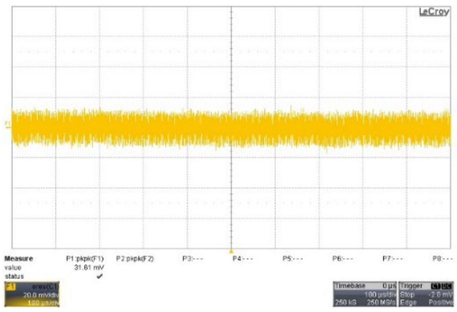
All test conditions are at 25℃ The figures are identical for MDW08-12S15



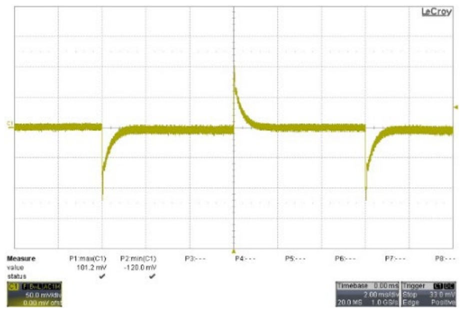
Efficiency Versus Output Current



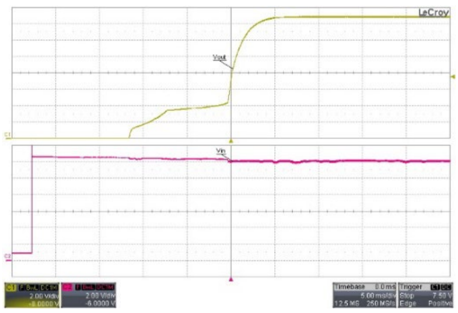
Efficiency Versus Input Voltage
Full Load



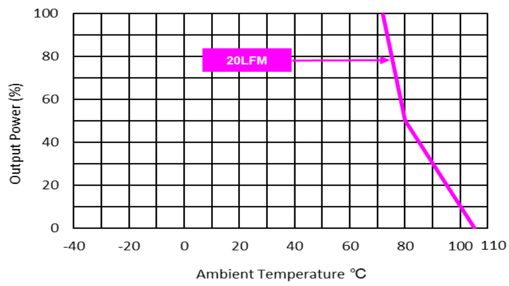
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



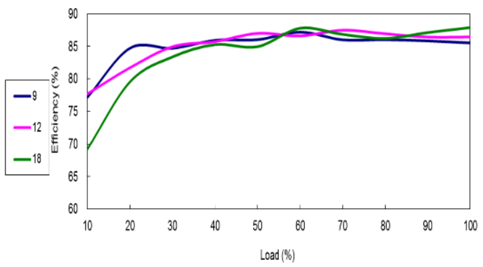
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



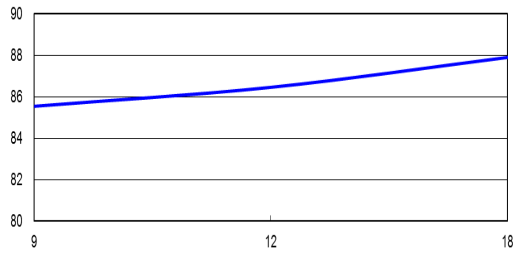
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

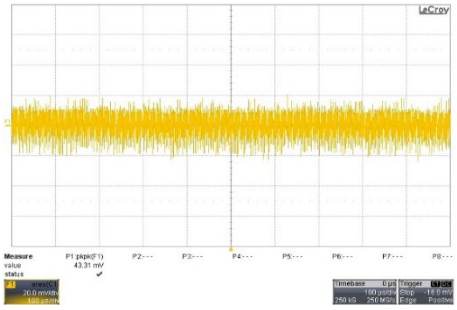
All test conditions are at 25℃ The figures are identical for MDW08-12S24



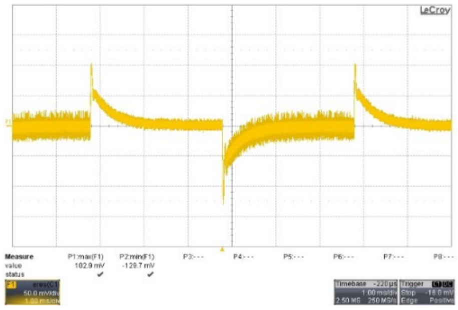
Efficiency Versus Output Current



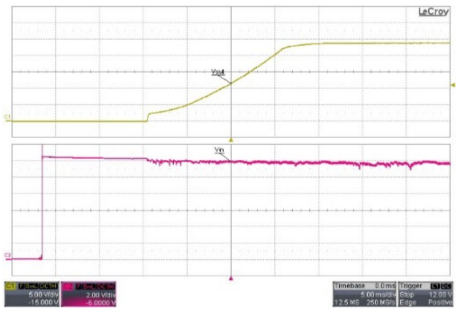
Efficiency Versus Input Voltage
Full Load



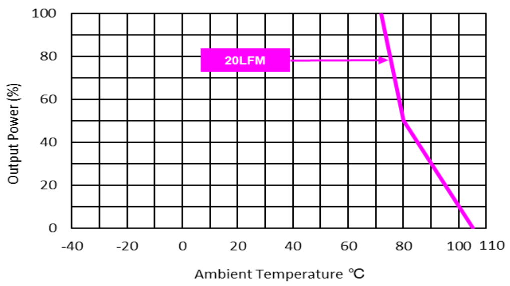
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



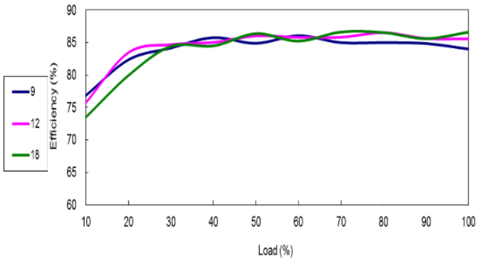
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



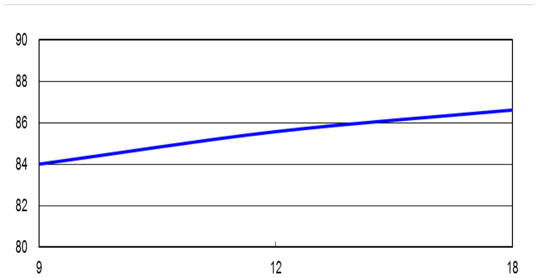
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

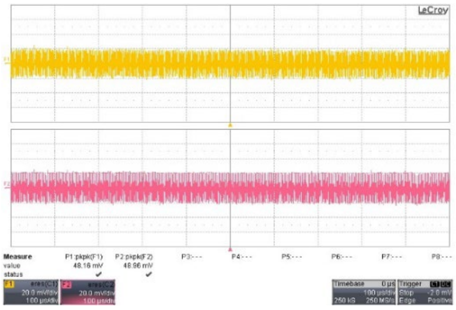
All test conditions are at 25℃ The figures are identical for MDW08-12D12



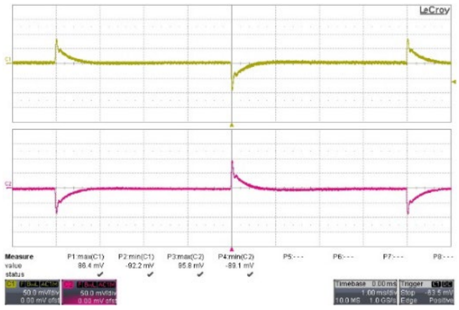
Efficiency Versus Output Current



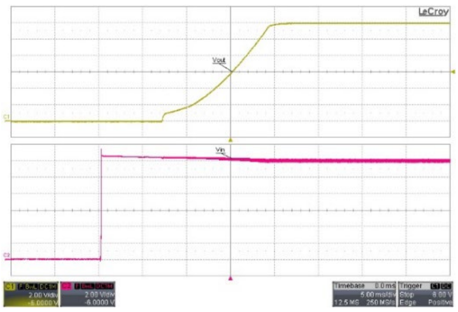
Efficiency Versus Input Voltage
Full Load



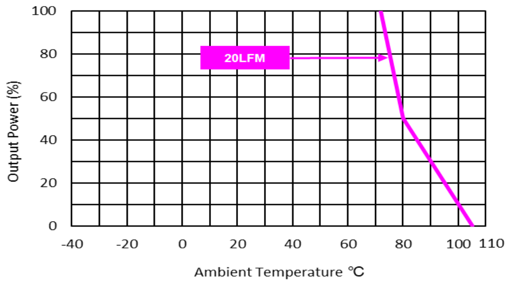
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



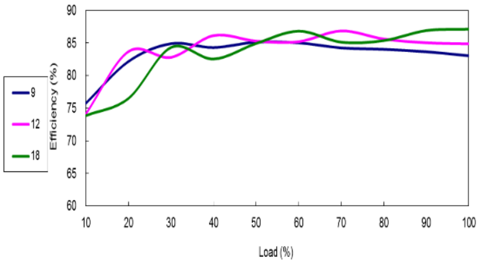
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



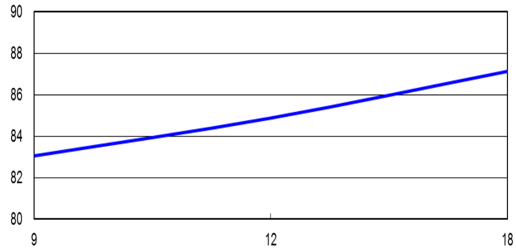
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

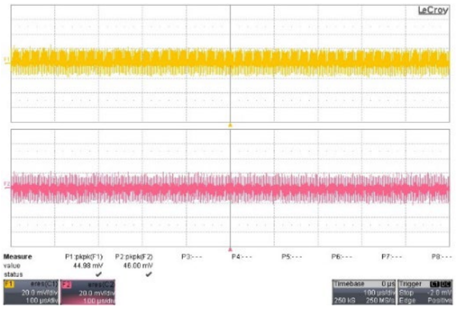
All test conditions are at 25℃ The figures are identical for MDW08-12D15



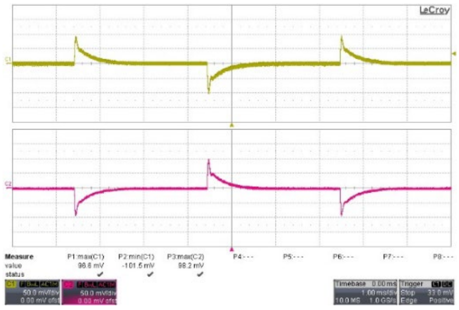
Efficiency Versus Output Current



Efficiency Versus Input Voltage
Full Load

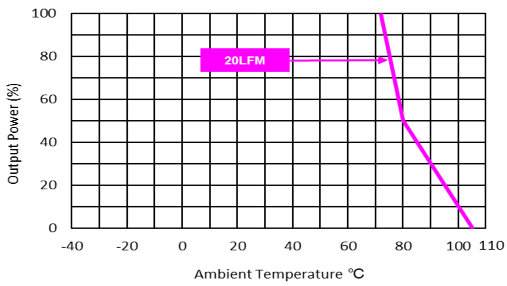


Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$

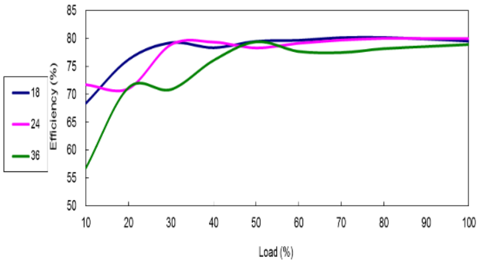
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



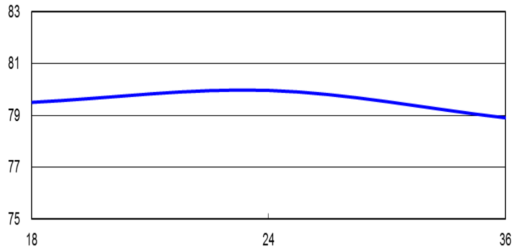
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

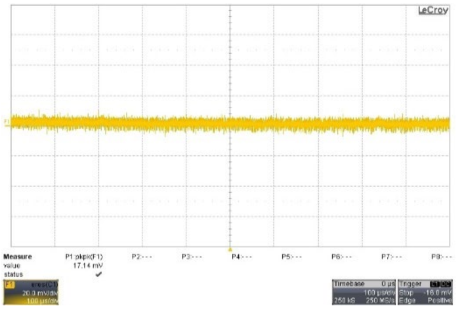
All test conditions are at 25℃ The figures are identical for MDW08-24S033



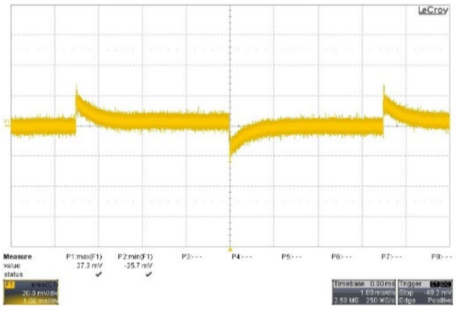
Efficiency Versus Output Current



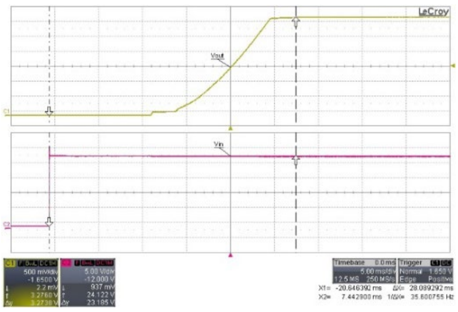
Efficiency Versus Input Voltage
Full Load



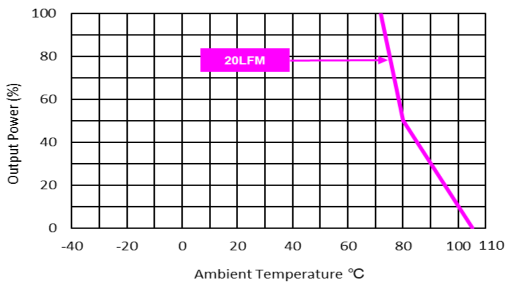
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



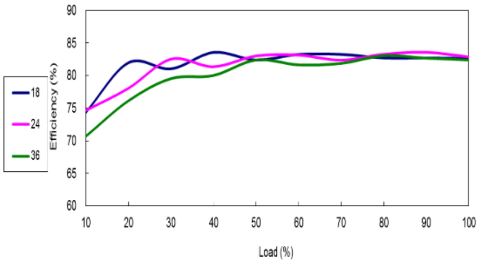
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



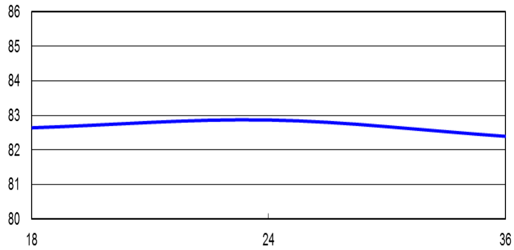
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

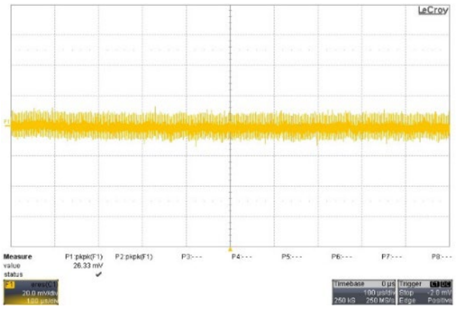
All test conditions are at 25℃ The figures are identical for MDW08-24S05



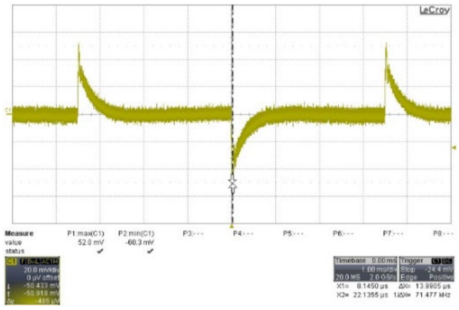
Efficiency Versus Output Current



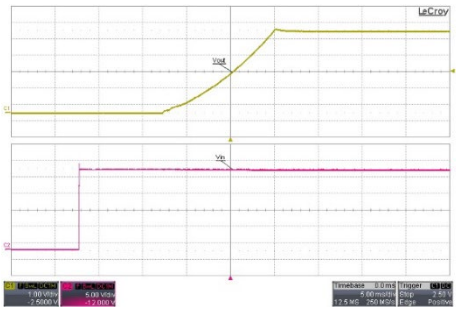
Efficiency Versus Input Voltage
Full Load



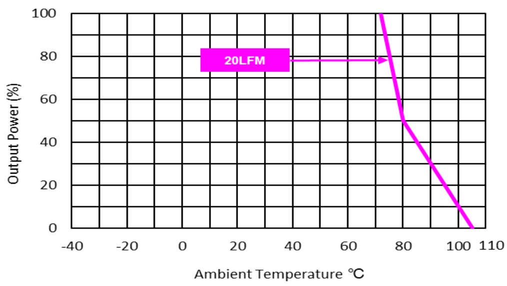
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



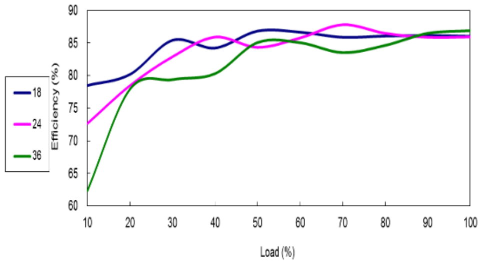
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



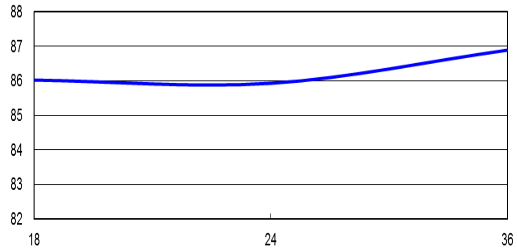
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

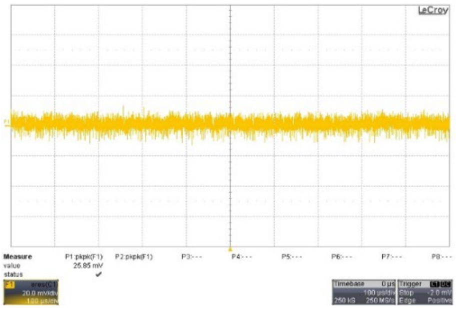
All test conditions are at 25℃ The figures are identical for MDW08-24S12



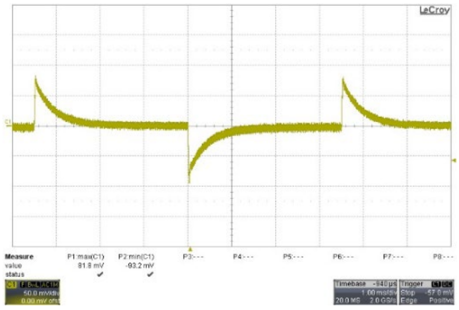
Efficiency Versus Output Current



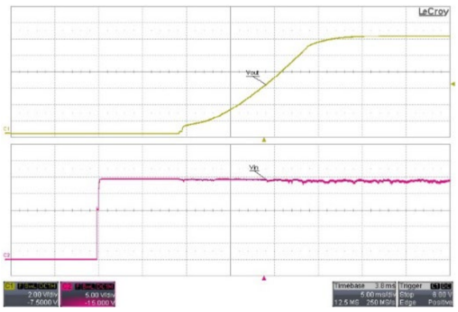
Efficiency Versus Input Voltage
Full Load



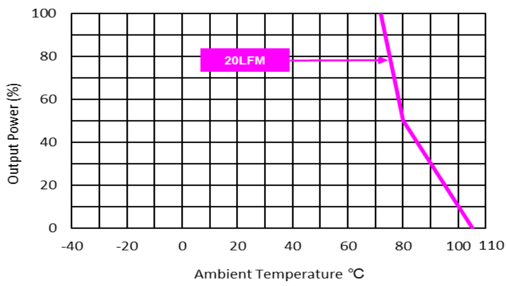
Typical Output Ripple and Noise
V_{in}=$V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; V_{in}=$V_{in\ nom}$



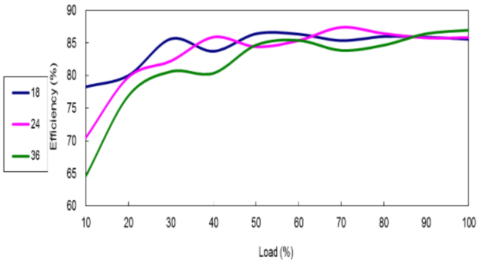
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



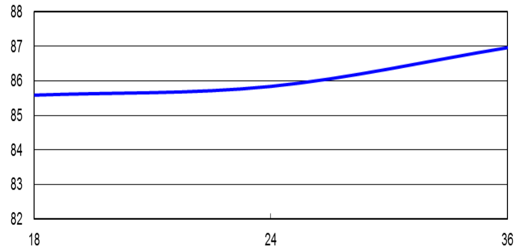
Derating Output Power Versus Ambient Temperature
V_{in}=$V_{in\ nom}$

Characteristic Curves

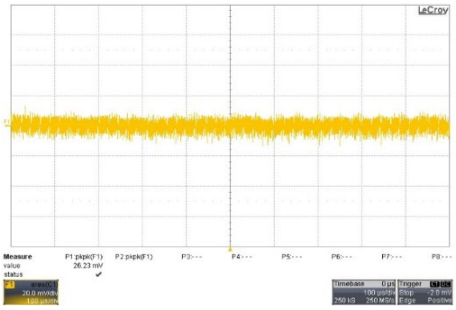
All test conditions are at 25℃ The figures are identical for MDW08-24S15



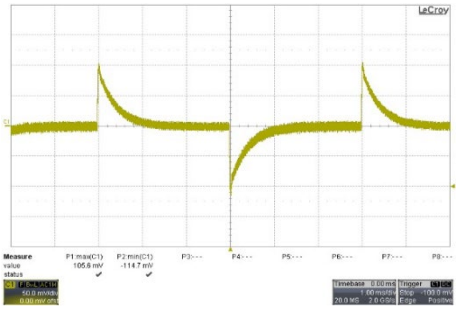
Efficiency Versus Output Current



Efficiency Versus Input Voltage
Full Load

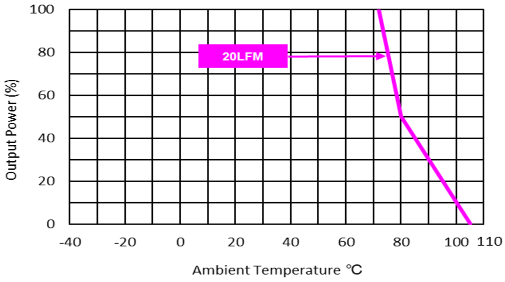


Typical Output Ripple and Noise
V_{in}=$V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; V_{in}=$V_{in\ nom}$

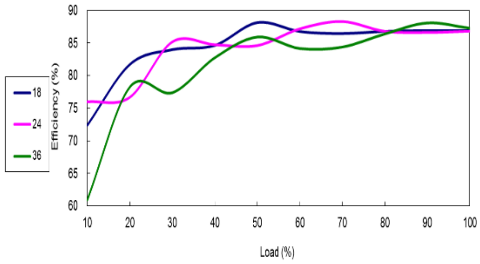
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



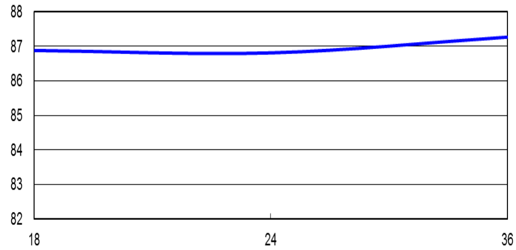
Derating Output Power Versus Ambient Temperature
V_{in}=$V_{in\ nom}$

Characteristic Curves

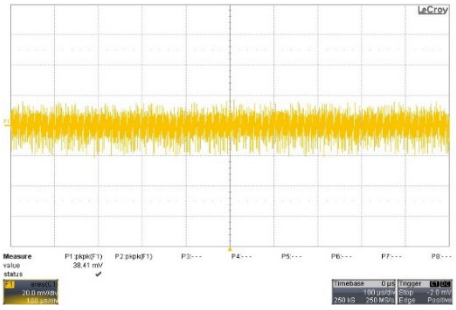
All test conditions are at 25℃ The figures are identical for MDW08-24S24



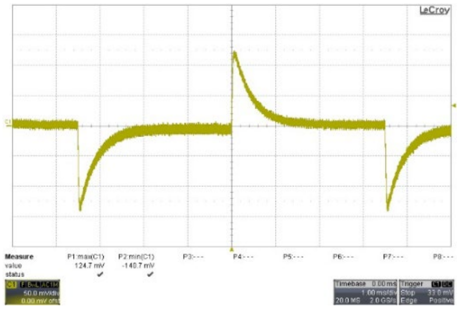
Efficiency Versus Output Current



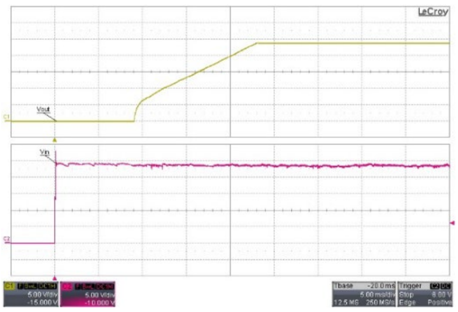
Efficiency Versus Input Voltage
Full Load



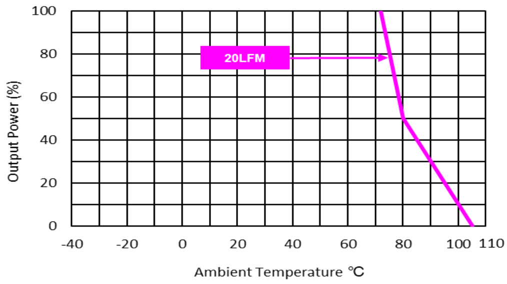
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



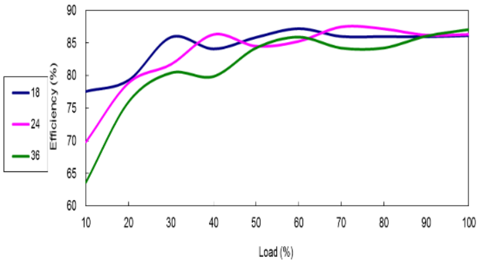
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



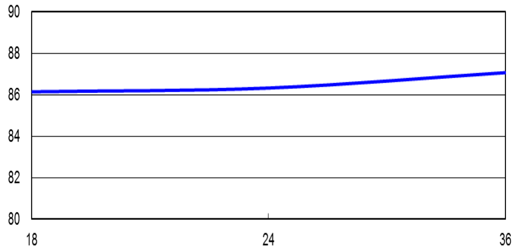
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

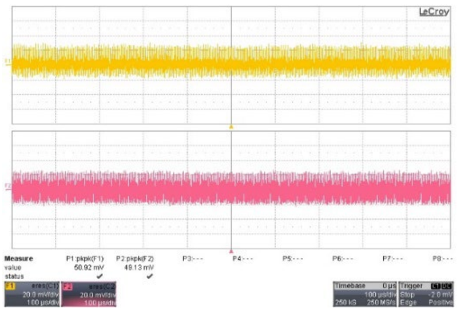
All test conditions are at 25℃ The figures are identical for MDW08-24D12



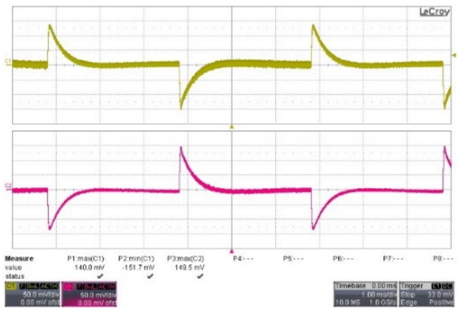
Efficiency Versus Output Current



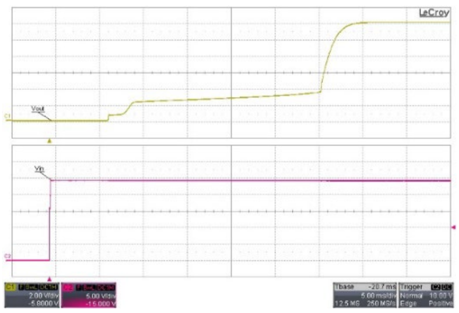
Efficiency Versus Input Voltage
Full Load



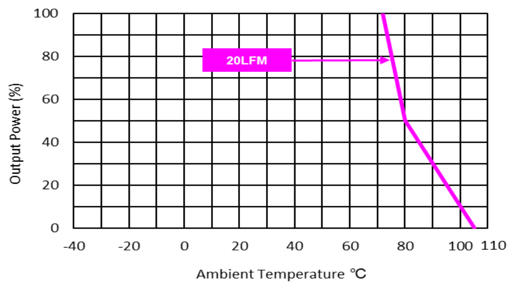
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



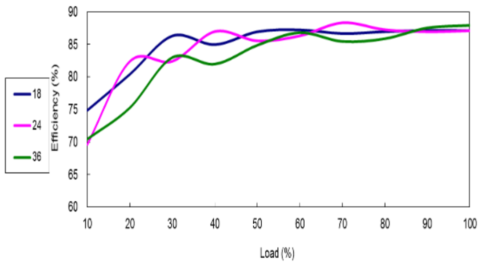
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



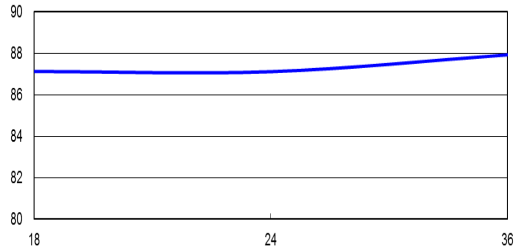
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

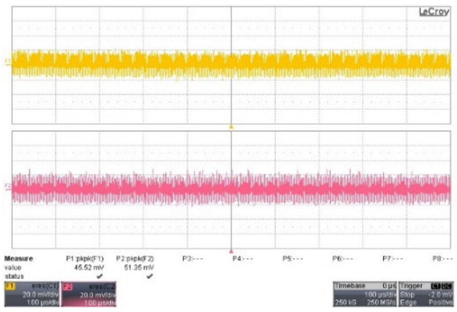
All test conditions are at 25℃ The figures are identical for MDW08-24D15

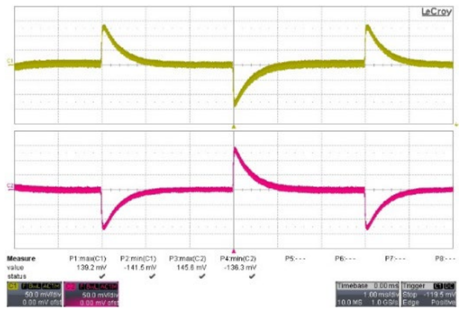


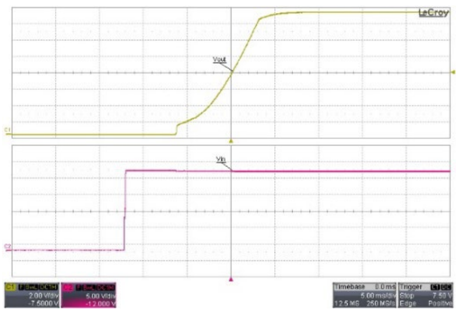
Efficiency Versus Output Current

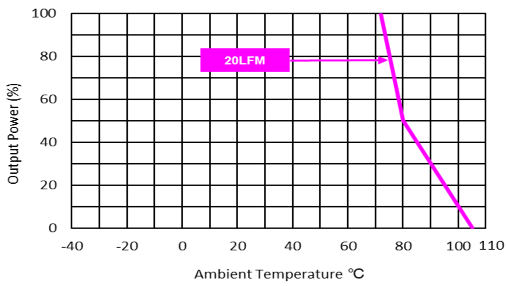


Efficiency Versus Input Voltage
Full Load


Typical Output Ripple and Noise
V_{in}=$V_{in\ nom}$; Full Load


Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; V_{in}=$V_{in\ nom}$

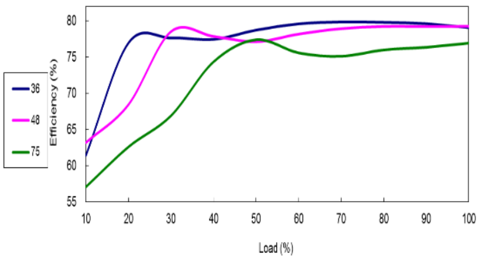

Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



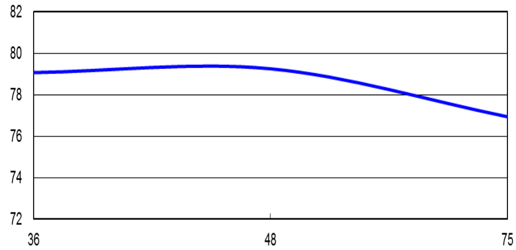
Derating Output Power Versus Ambient Temperature
V_{in}=$V_{in\ nom}$

Characteristic Curves

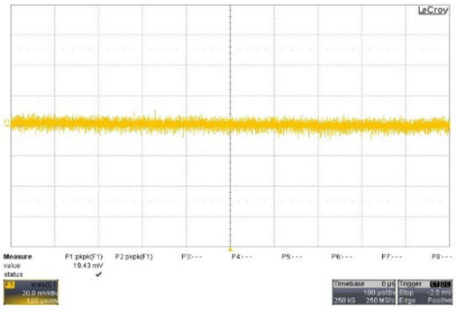
All test conditions are at 25℃ The figures are identical for MDW08-48S033



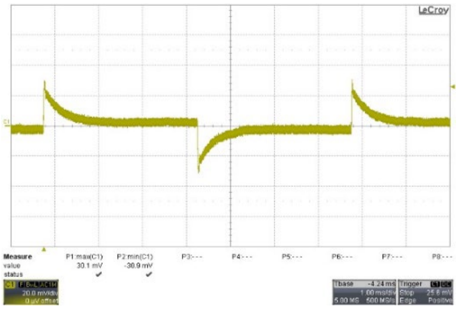
Efficiency Versus Output Current



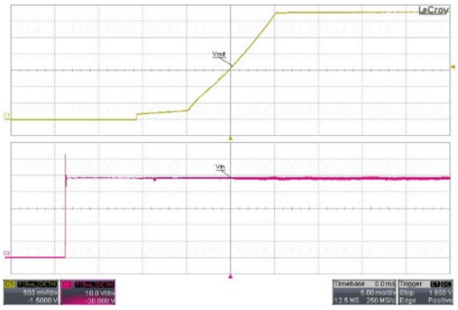
Efficiency Versus Input Voltage
Full Load



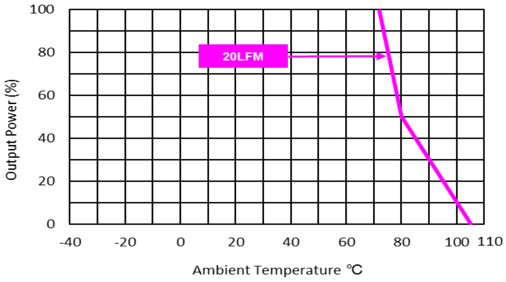
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



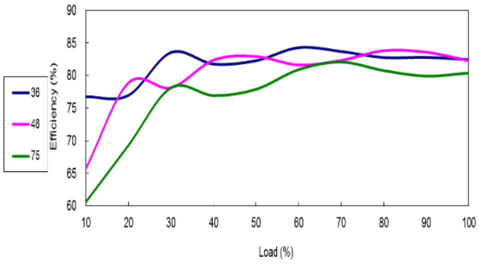
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



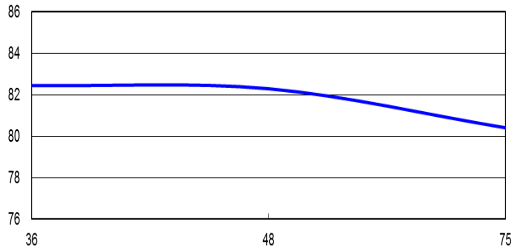
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

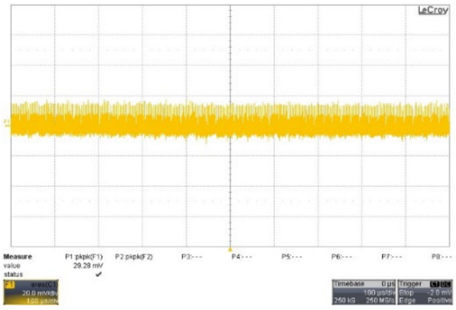
All test conditions are at 25℃ The figures are identical for MDW08-48S05



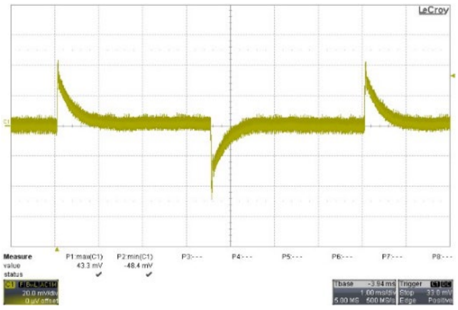
Efficiency Versus Output Current



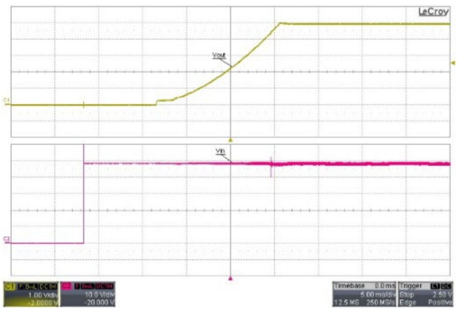
Efficiency Versus Input Voltage
Full Load



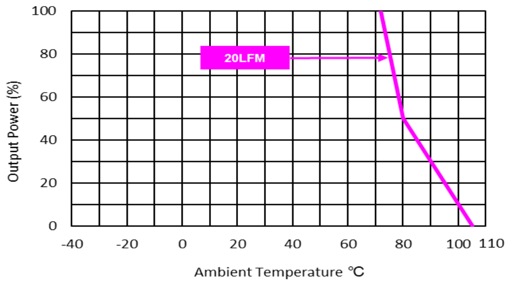
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



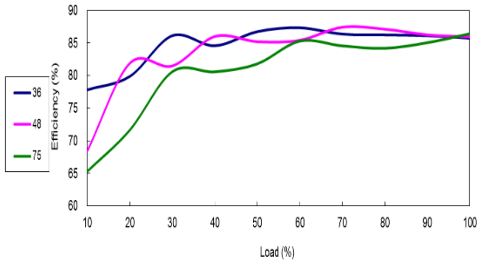
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



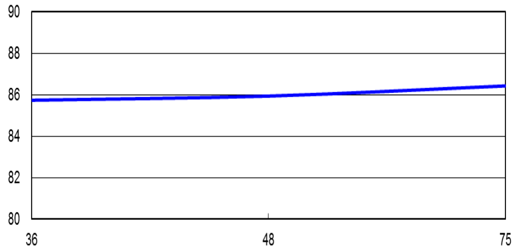
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

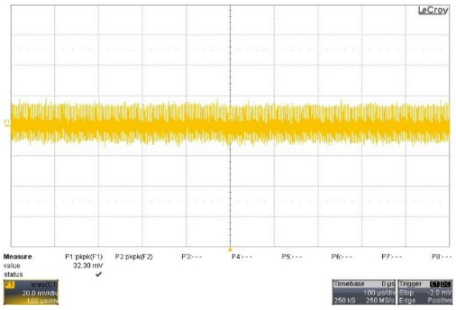
All test conditions are at 25℃ The figures are identical for MDW08-48S12



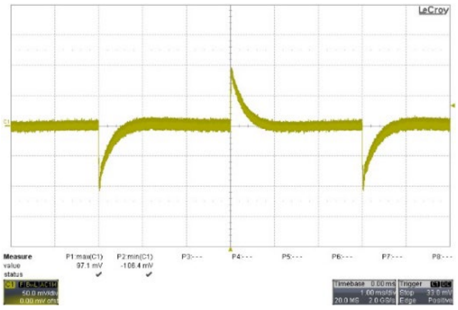
Efficiency Versus Output Current



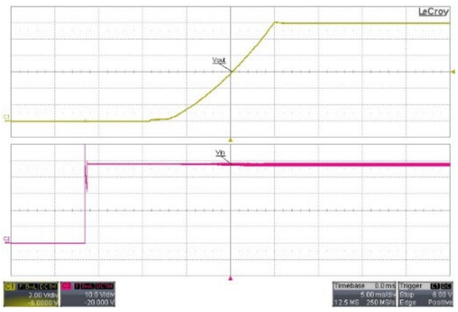
Efficiency Versus Input Voltage
Full Load



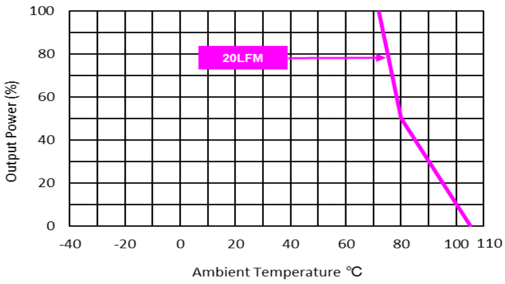
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



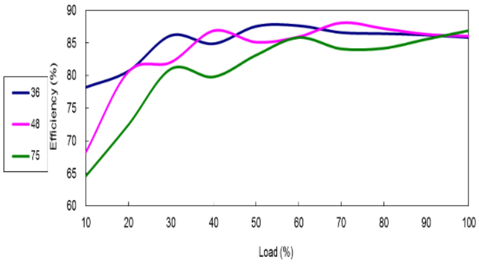
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



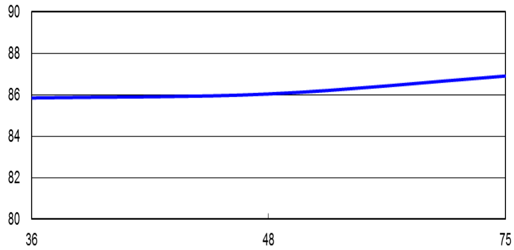
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

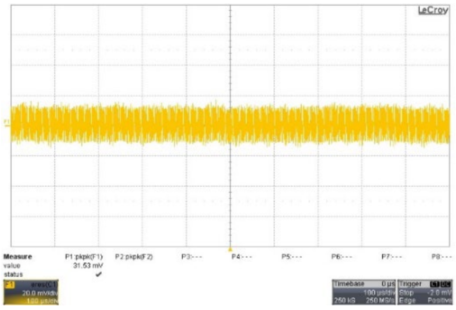
All test conditions are at 25℃ The figures are identical for MDW08-48S15



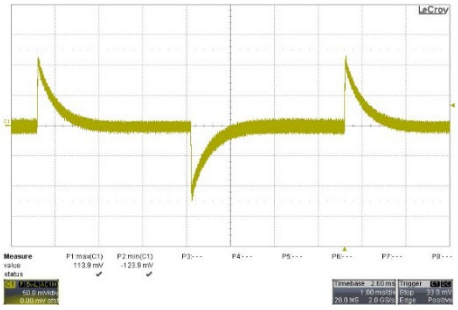
Efficiency Versus Output Current



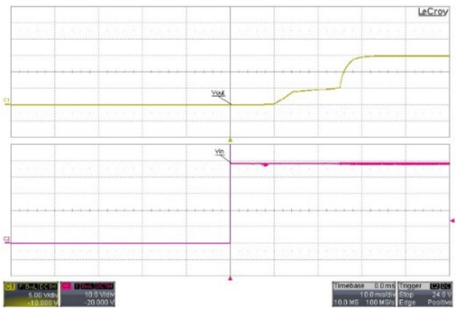
Efficiency Versus Input Voltage
Full Load



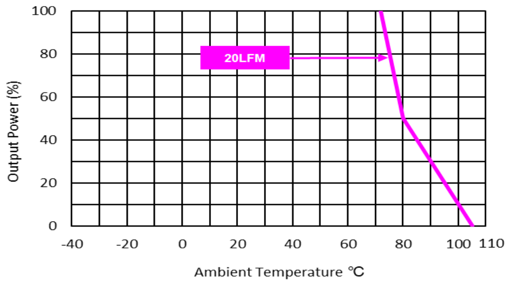
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



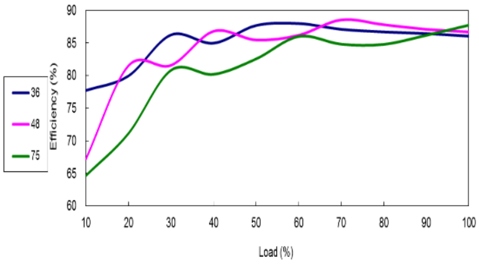
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



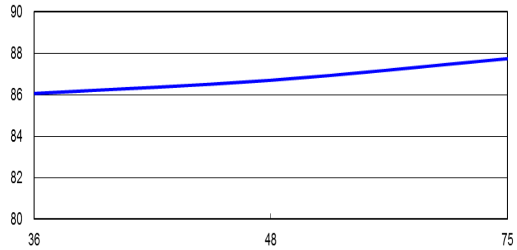
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

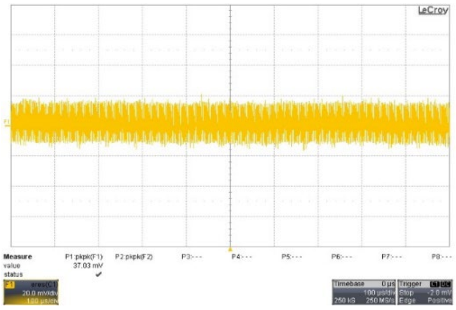
All test conditions are at 25℃ The figures are identical for MDW08-48S24



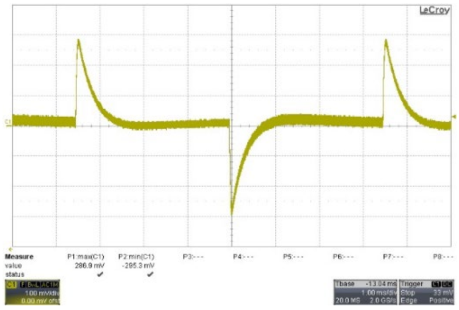
Efficiency Versus Output Current



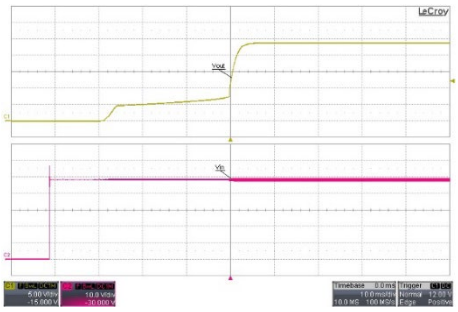
Efficiency Versus Input Voltage
Full Load



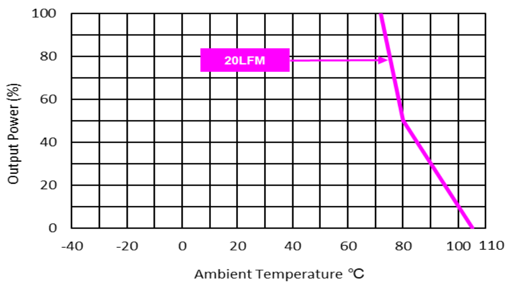
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



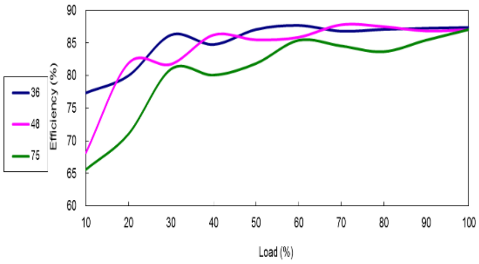
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



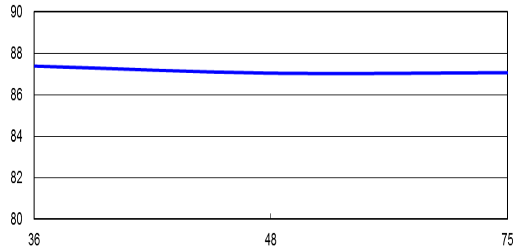
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

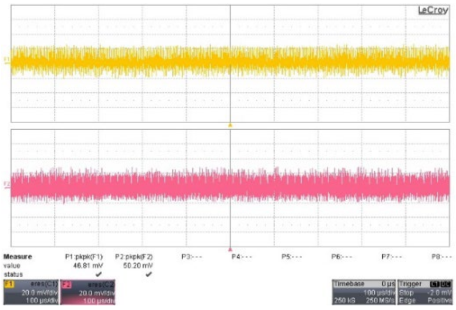
All test conditions are at 25℃ The figures are identical for MDW08-48D12



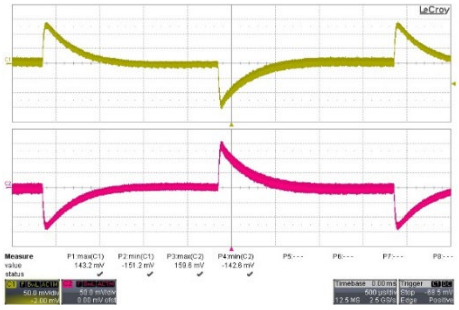
Efficiency Versus Output Current



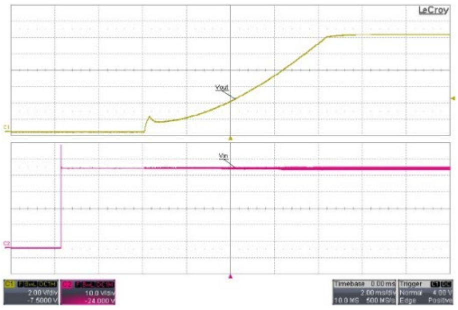
Efficiency Versus Input Voltage
Full Load



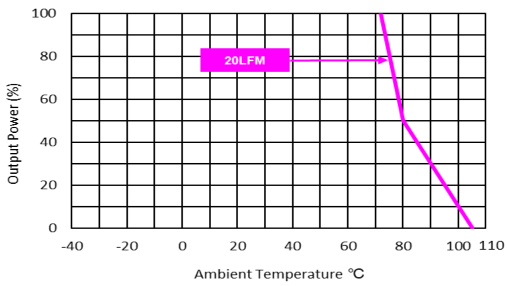
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



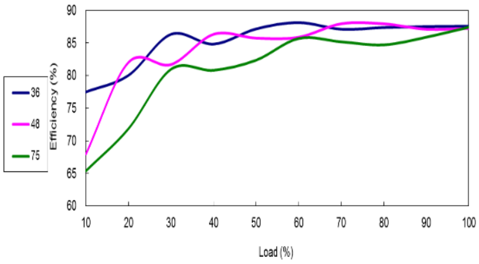
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



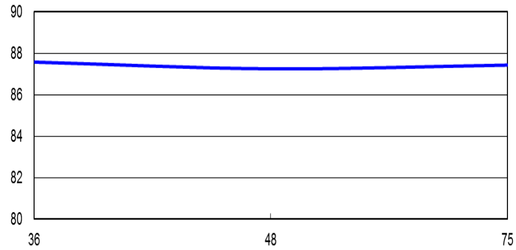
Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Characteristic Curves

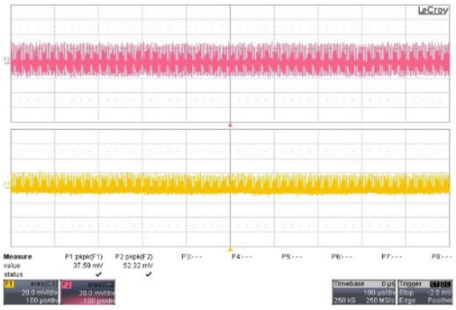
All test conditions are at 25℃ The figures are identical for MDW08-48D15



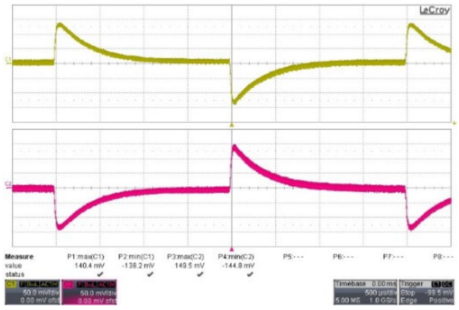
Efficiency Versus Output Current



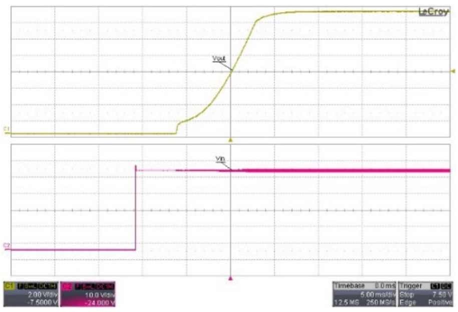
Efficiency Versus Input Voltage
Full Load



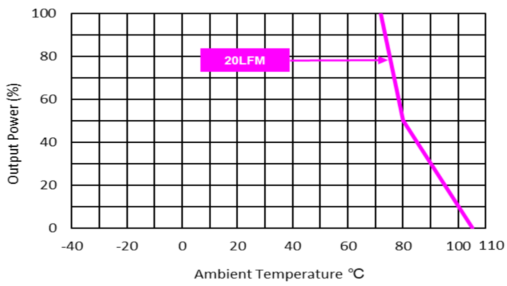
Typical Output Ripple and Noise
$V_{in}=V_{in\ nom}$; Full Load



Transient Response to Dynamic Load Change
from 100% to 75% of Full Load ; $V_{in}=V_{in\ nom}$



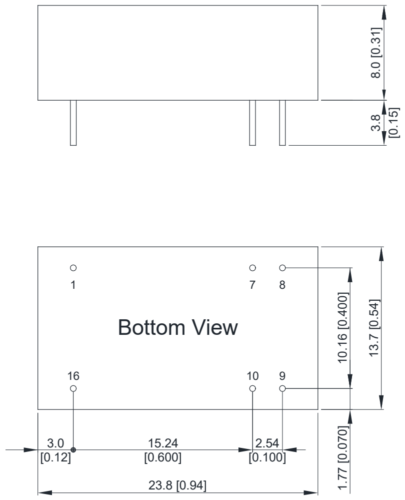
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



Derating Output Power Versus Ambient Temperature
$V_{in}=V_{in\ nom}$

Package Specifications

Mechanical Dimensions



Pin Connections

Pin	Single Output	Dual Output	Diameter mm (inches)
1	-Vin	-Vin	Ø 0.5 [0.02]
7	NC	NC	Ø 0.5 [0.02]
8	NC	Common	Ø 0.5 [0.02]
9	+Vout	+Vout	Ø 0.5 [0.02]
10	-Vout	-Vout	Ø 0.5 [0.02]
16	+Vin	+Vin	Ø 0.5 [0.02]

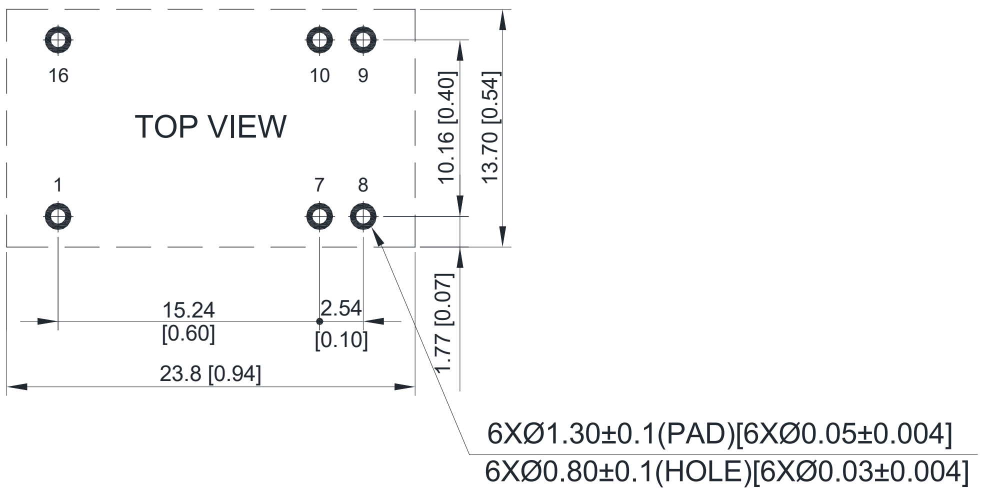
NC: No Connection

- All dimensions in mm (inches)
- Tolerance: X.X±0.5 (X.XX±0.02)
  X.XX±0.25 (X.XXX±0.01)
- Pin diameter tolerance: X.X±0.05 (X.XX±0.002)

Physical Characteristics

Case Size	:	23.8x13.7x8.0 mm (0.94x0.54x0.31 inches)
Case Material	:	Metal With Non-Conductive Baseplate
Pin Material	:	Copper Alloy
Weight	:	6.1g

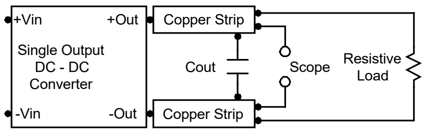
Recommended Pad Layout for Single & Dual Output Converter

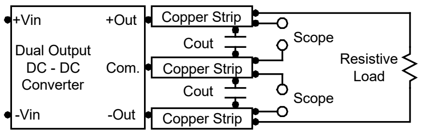


Test Setup

Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.47μF ceramic capacitor. Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20 MHz. Position the load between 50 mm and 75 mm from the DC-DC Converter.





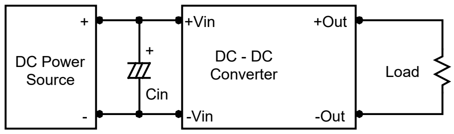
Technical Notes

Overload Protection

To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once the output current is brought back into its specified range.

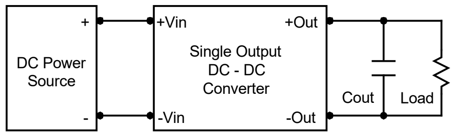
Input Source Impedance

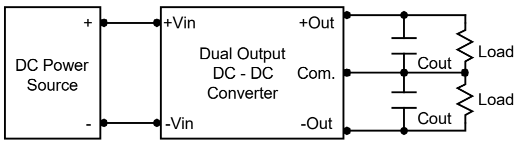
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module.
In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.
Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100 kHz) capacitor of a 3.3μF for the 12V input devices and a 2.2μF for the 24V and 48V devices.



Output Ripple Reduction

A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 3.3μF capacitors at the output.



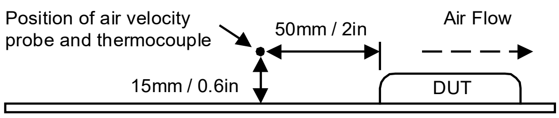


Maximum Capacitive Load

The MDW08 series has limitation of maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time. The maximum capacitance can be found in the data sheet.

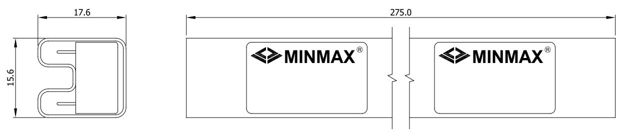
Thermal Considerations

Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 105℃.
The derating curves are determined from measurements obtained in a test setup.

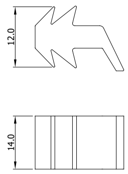


Packaging Information for Tube

Tube



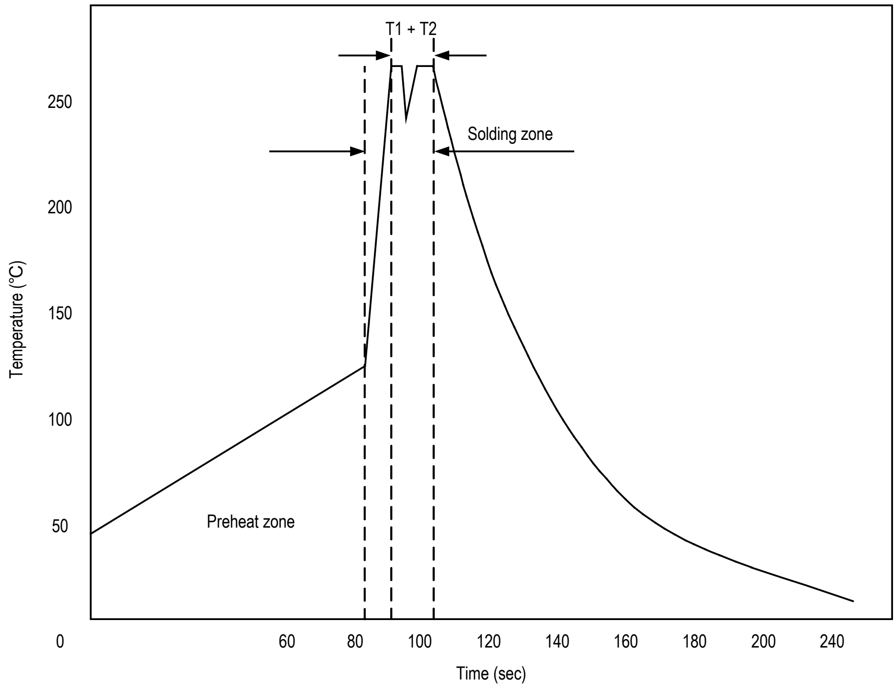
Plug



Unit: mm
10 PCS per TUBE

Wave Soldering Considerations

Lead free wave solder profile



Zone	Reference Parameter
Preheat	Rise temp. speed：3°C/sec max.
zone	Preheat temp.：100~130°C
Actual	Peak temp.：250~260°C
heating	Peak time(T1+T2)：4~6 sec

Hand Welding Parameter

Reference Solder: Sn-Ag-Cu：Sn-Cu：Sn-Ag

Hand Welding: Soldering iron：Power 60W

Welding Time: 2~4 sec

Temp.: 380~400°C

Part Number Structure

M	D	W	08	-	12	S	033
	Package Type DIP-16	Wide 2:1 Input Voltage Range	Output Power 8 Watt		Input Voltage Range 12: 9 ~ 18 VDC 24: 18 ~ 36 VDC 48: 36 ~ 75 VDC	Output Quantity S: Single D: Dual	Output Voltage 033: 3.3 VDC 05: 5 VDC 12: 12 VDC 15: 15 VDC 24: 24 VDC

MTBF and Reliability

The MTBF of MDW08 series of DC-DC converters has been calculated using

MIL-HDBK 217F NOTICE2, Operating Temperature 25℃, Ground Benign.

Model	MTBF	Unit
MDW08-12S033	2,978,998	Hours
MDW08-12S05	2,086,679	
MDW08-12S12	2,934,195	
MDW08-12S15	2,917,639	
MDW08-12S24	3,079,766	
MDW08-12D12	3,017,274	
MDW08-12D15	2,911,573	
MDW08-24S033	2,982,206	
MDW08-24S05	2,103,958	
MDW08-24S12	3,104,663	
MDW08-24S15	3,026,233	
MDW08-24S24	3,213,210	
MDW08-24D12	3,151,681	
MDW08-24D15	3,123,088	
MDW08-48S033	2,861,835	
MDW08-48S05	2,109,995	
MDW08-48S12	3,280,703	
MDW08-48S15	3,221,562	
MDW08-48S24	3,424,041	
MDW08-48D12	3,289,403	
MDW08-48D15	3,281,566	