MINMAX®

MAU100 Series

Electric Characteristic Note

MAU100 Series EC Note

DC-DC CONVERTER 1W, SIP Package

Features

- **Industrial Standard SIP-7 Package**
- **Unregulated Output Voltage**
- **I/O Isolation 1000 VDC**
- **Operating Ambient Temp. Range -40℃ to +85℃**
- **UL/cUL/IEC/EN 60950-1 Safety Approval**

Applications

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

Product Overview

The MINMAX MAU100 series is a range of 1W DC-DC converters in a small SIP Package featuring I/O isolation of 1000VDC.
An excellent efficiency allows an operating temperature range of –40℃ to +85℃. These converters offer an economical solution for many applications where a voltage has to be isolated i.e for noise reduction, ground loop elimination, digital interfaces or for board level power distribution.

Table of contents

Model Selection Guide

Model Number	Input Voltage (Range)	Output Voltage	Output Current	Input Current		Load Regulation	Max. capacitive Load	Efficiency (typ.)
			Max.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA(typ.)	mA(typ.)	% (max.)	μF	%
MAU101	5 (4.5 ~ 5.5)	3.3	260	235	30	10	220	73
MAU102		5	200	281		10		71
MAU103		9	110	260		8		76
MAU104		12	84	258		7		78
MAU105		15	67	258		7		78
MAU106		±5	±100	278		10	100#	72
MAU107		±9	±56	262		8		77
MAU108		±12	±42	258		7		78
MAU109		±15	±34	258		7		79
MAU111	12 (10.8 ~ 13.2)	3.3	260	96	12	8	220	74
MAU112		5	200	114		8		73
MAU113		9	110	106		5		78
MAU114		12	84	105		5		80
MAU115		15	67	104		5		80
MAU116		±5	±100	113		8	100#	74
MAU117		±9	±56	106		5		79
MAU118		±12	±42	104		5		81
MAU119		±15	±34	105		5		81
MAU151	15 (13.5 ~ 16.5)	5	200	93	11	8	220	72
MAU152		12	84	85		5		79
MAU153		15	67	85		5		79
MAU154		±5	±100	93		8	100#	72
MAU155		±12	±42	85		5		80
MAU156		±15	±34	85		5		80
MAU121	24 (21.6 ~ 26.4)	3.3	260	49	7	8	220	73
MAU122		5	200	59		8		71
MAU123		9	110	54		5		76
MAU124		12	84	54		5		78
MAU125		15	67	53		5		79
MAU126		±5	±100	58		8	100#	72
MAU127		±9	±56	55		5		76
MAU128		±12	±42	53		5		79
MAU129		±15	±34	53		5		80

For each output

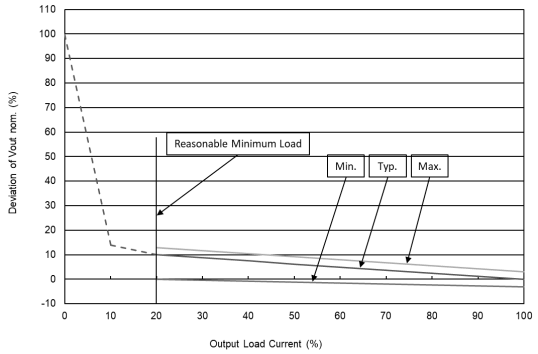
Input Specifications

Parameter	Model	Min.	Typ.	Max.	Unit
Input Voltage Range	5V Input Models	4.5	5	5.5	VDC
	12V Input Models	10.8	12	13.2	
	15V Input Models	13.5	15	16.5	
	24V Input Models	21.6	24	26.4	
Input Surge Voltage (1 sec. max.)	5V Input Models	-0.7	---	9	
	12V Input Models	-0.7	---	18	
	15V Input Models	-0.7	---	18	
	24V Input Models	-0.7	---	30	
Input Filter	All Models	Internal Capacitor			

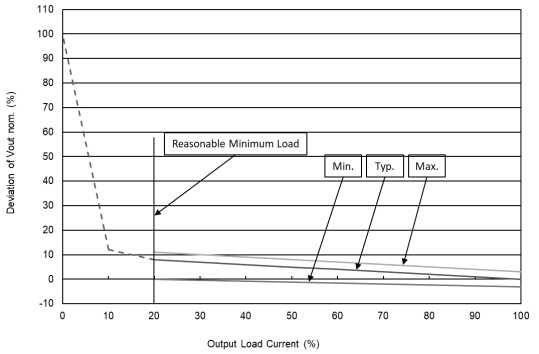
Output Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Setting Accuracy		---	±1.0	±3.0	%Vnom.
Output Voltage Balance	Dual Output, Balanced Loads	---	±0.1	±1.0	%
Line Regulation	For Vin Change of 1%	---	±1.2	±1.5	%
Load Regulation	Io=20% to 100%	See Model Selection Guide (Operation at lower load will not damage the converter, but it may not meet all specifications)			
Ripple & Noise	0-20 MHz Bandwidth	---	50	75	mV_{P-P}
Temperature Coefficient		---	±0.01	±0.02	%/℃
Short Circuit Protection	0.5 Second Max., Automatic Recovery				

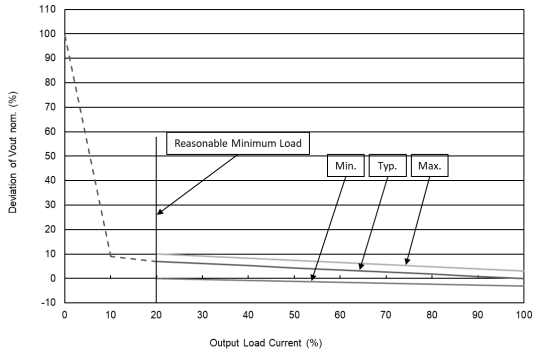
Output Voltage Tolerance



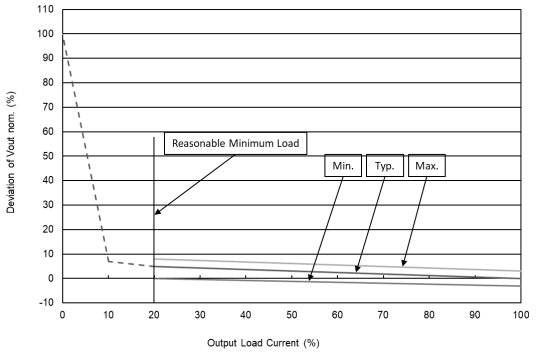
MAU101, MAU102, MAU106 Output Voltage VS Output Load Current



MAU103, MAU107, MAU111, MAU112, MAU116
MAU151, MAU154, MAU121, MAU122, MAU126
Output Voltage VS Output Load Current

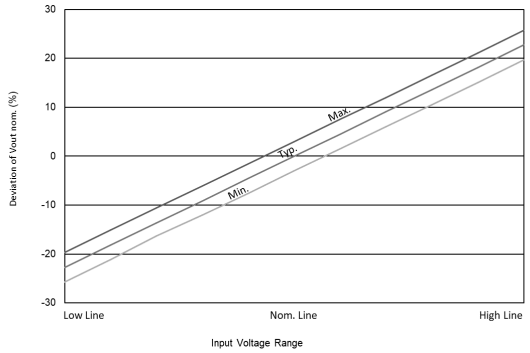


MAU104, MAU105, MAU108, MAU109 Output Voltage VS Output Load Current



MAU113, MAU114, MAU115, MAU117, MAU118
MAU119, MAU152, MAU153, MAU155, MAU156
MAU123, MAU124, MAU125, MAU127, MAU128, MAU129
Output Voltage VS Output Load Current

Output Voltage Tolerance



Output Voltage VS Input Voltage Range

General Specifications

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage	60 Seconds	1000	---	---	VDC
	1 second	1200	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100kHz, 1V	---	60	100	pF
Switching Frequency		70	100	120	kHz
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	2,000,000			Hours
Safety Approvals	UL/cUL 60950-1 recognition (CSA certificate), IEC/EN 60950-1(CB-report)				

Environmental Specifications

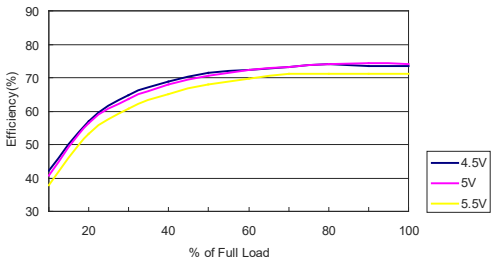
Parameter	Min.	Max.	Unit
Operating Ambient Temperature Range Nominal Vin, Load 100% Inom. (for Power Derating see relative Derating Curves)	-40	+85	°C
Case Temperature	---	+105	°C
Storage Temperature Range	-50	+125	°C
Humidity (non condensing)	---	95	% rel. H
Lead Temperature (1.5mm from case for 10Sec.)	---	260	°C

Notes

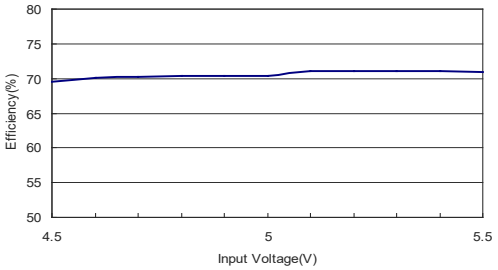
1. Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
2. These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage these modules; however they may not meet all specifications listed.
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. Specifications are subject to change without notice.
6. 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

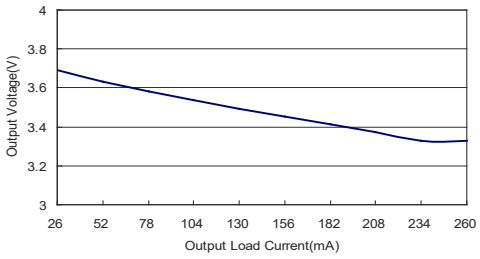
All test conditions are at 25°C The figures are identical for MAU101



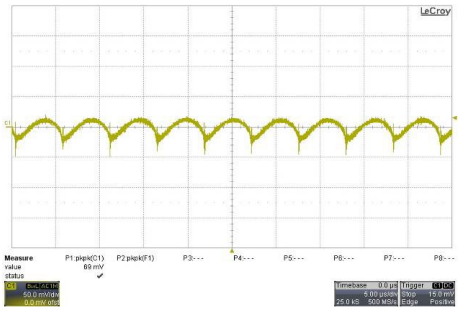
Efficiency Versus Output Current



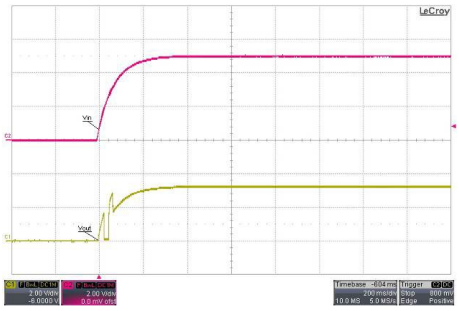
Efficiency Versus Input Voltage
Full Load



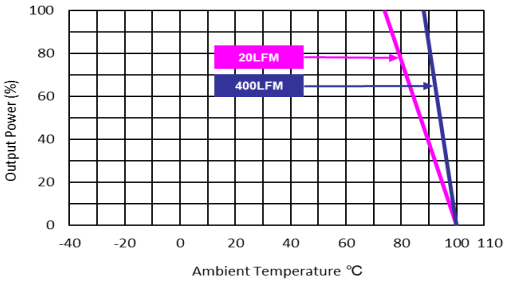
Output Voltage Versus Output Current



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



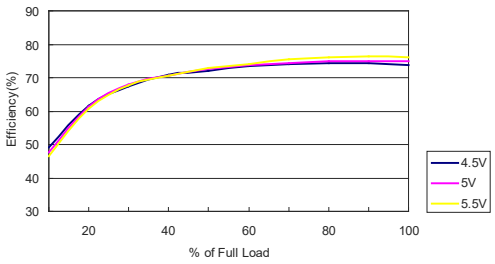
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



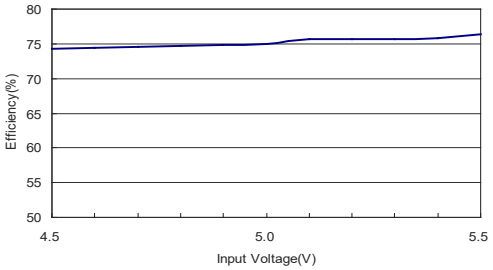
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

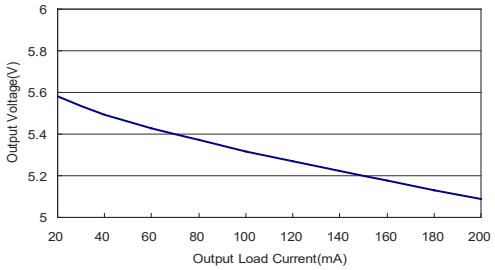
All test conditions are at 25°C The figures are identical for MAU102



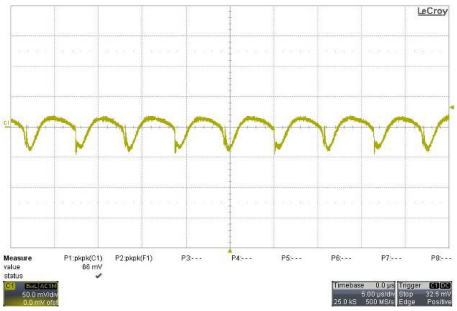
Efficiency Versus Output Current



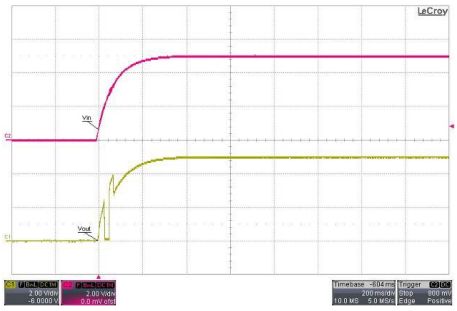
Efficiency Versus Input Voltage
Full Load



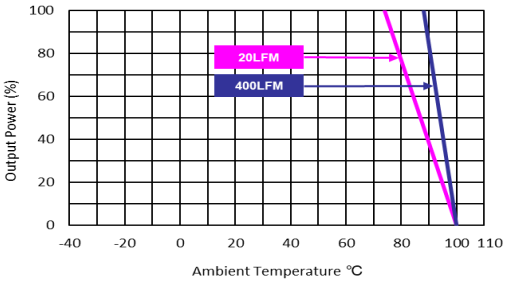
Output Voltage Versus Output Current



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



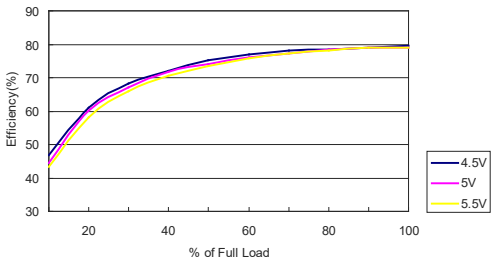
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



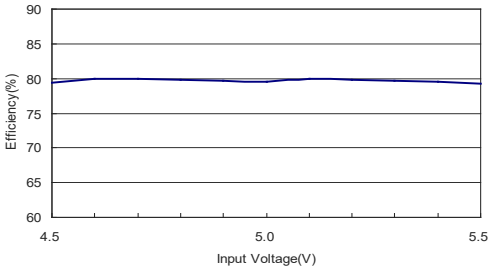
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

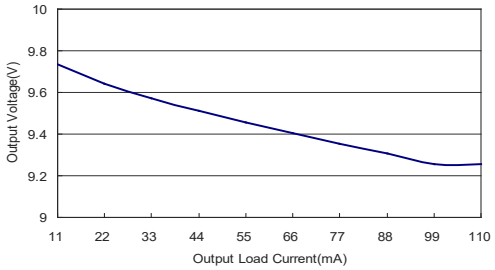
All test conditions are at 25℃ The figures are identical for MAU103



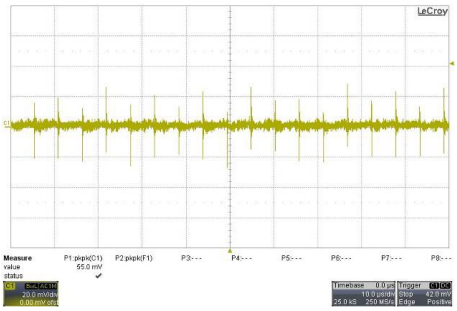
Efficiency Versus Output Current



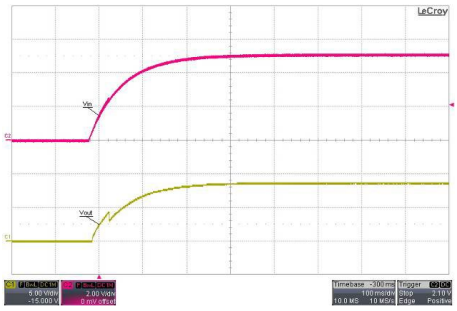
Efficiency Versus Input Voltage
Full Load



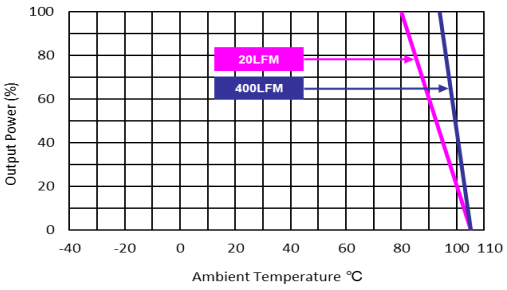
Output Voltage Versus Output Current



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



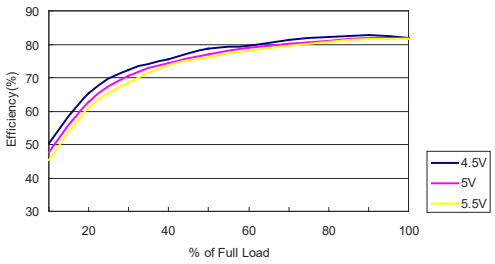
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



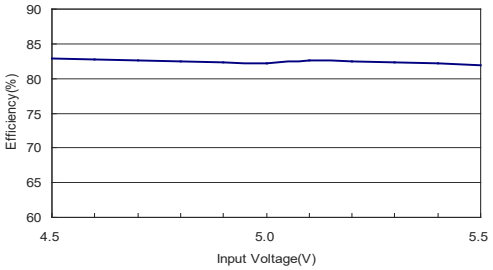
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

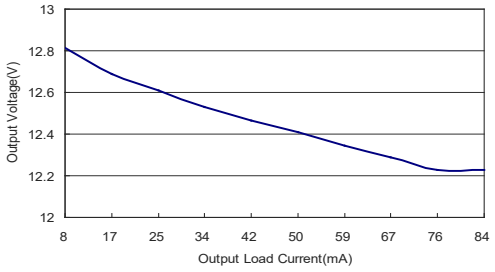
All test conditions are at 25°C The figures are identical for MAU104



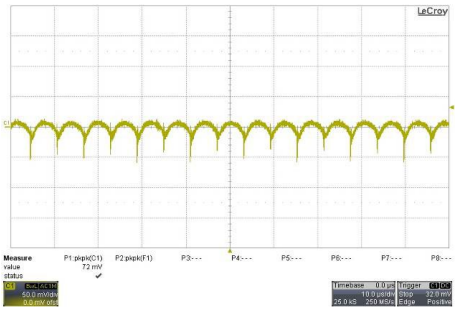
Efficiency Versus Output Current



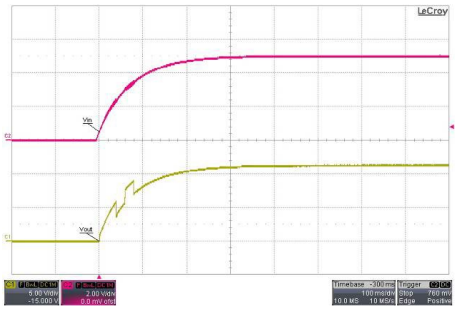
Efficiency Versus Input Voltage
Full Load



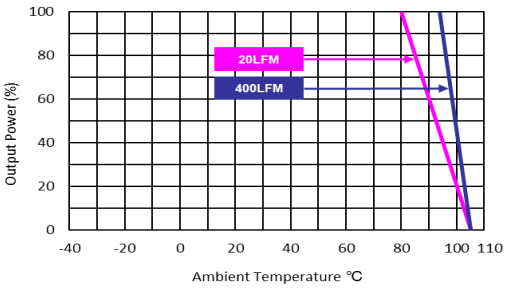
Output Voltage Versus Output Current



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



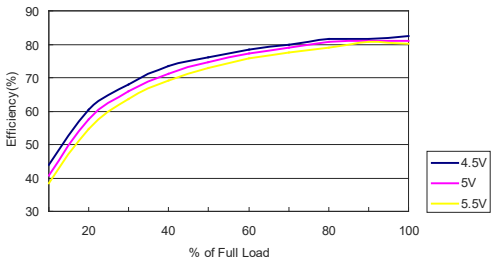
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



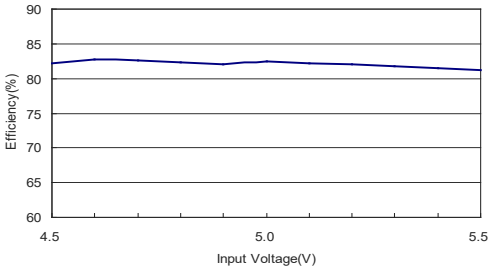
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

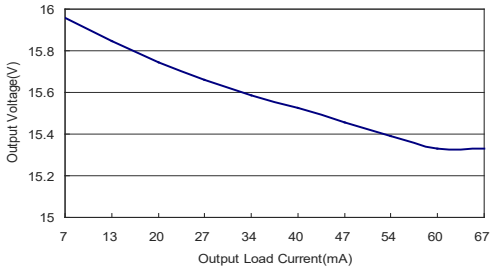
All test conditions are at 25°C The figures are identical for MAU105



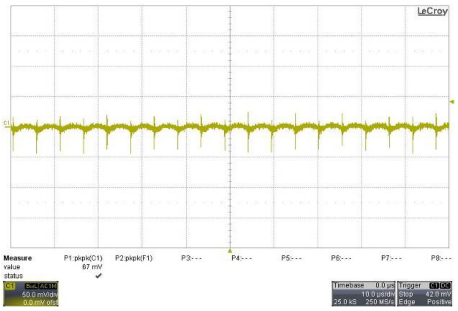
Efficiency Versus Output Current



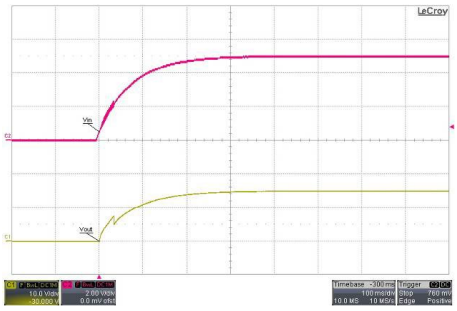
Efficiency Versus Input Voltage
Full Load



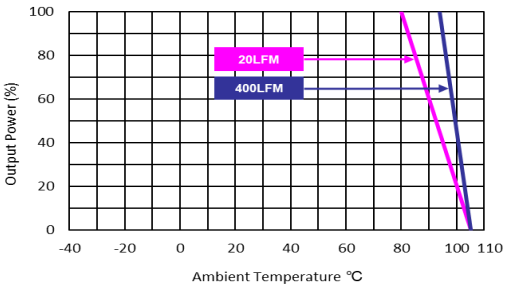
Output Voltage Versus Output Current



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



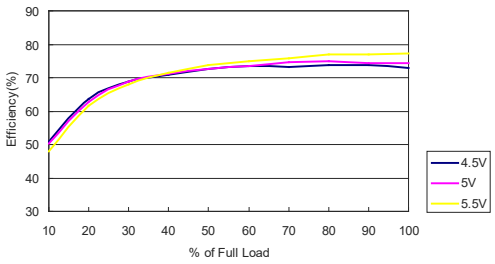
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



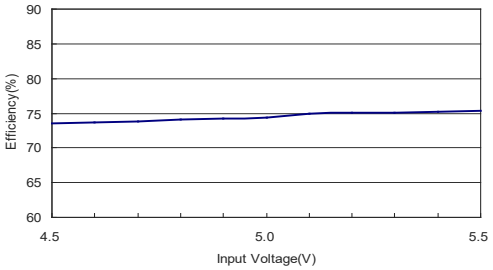
Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Characteristic Curves

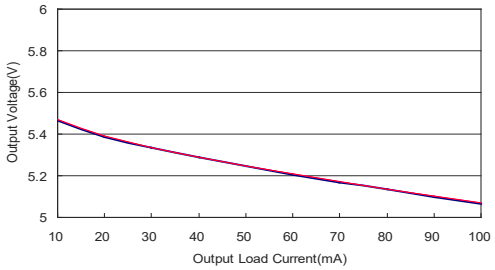
All test conditions are at 25°C The figures are identical for MAU106



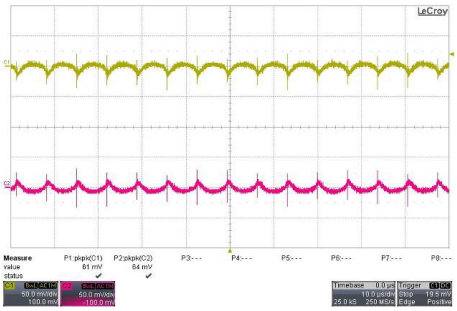
Efficiency Versus Output Current



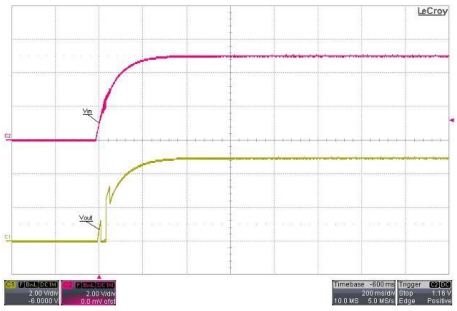
Efficiency Versus Input Voltage
Full Load



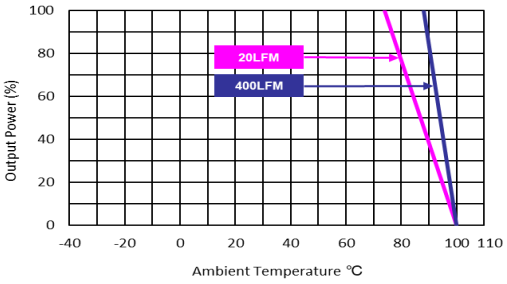
Output Voltage Versus Output Current



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



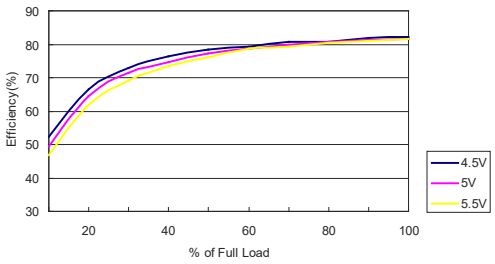
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



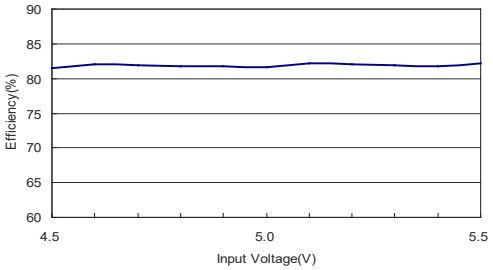
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

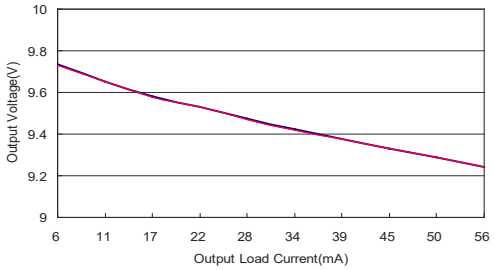
All test conditions are at 25°C The figures are identical for MAU107



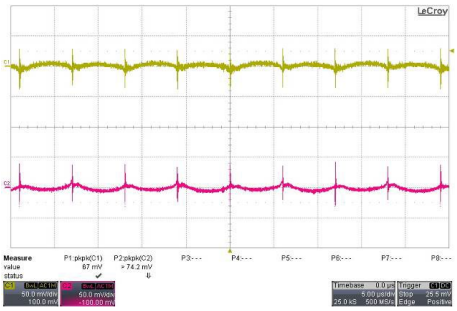
Efficiency Versus Output Current



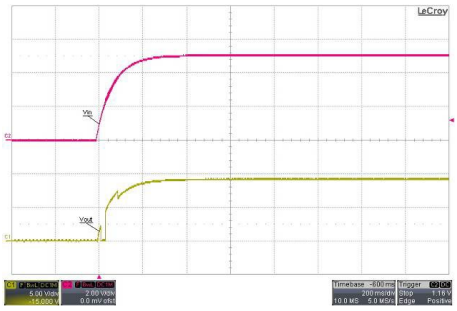
Efficiency Versus Input Voltage
Full Load



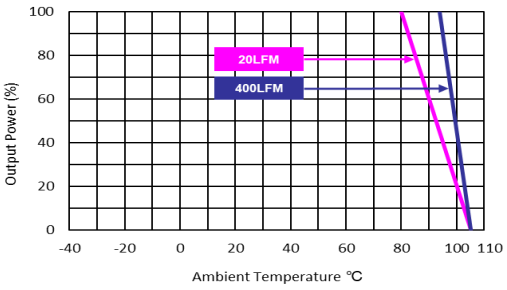
Output Voltage Versus Output Current



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



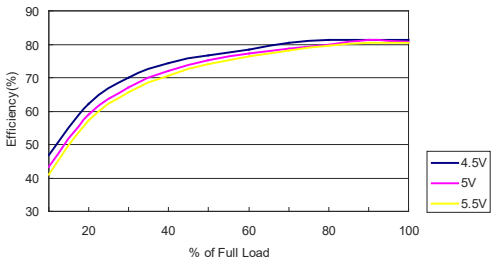
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



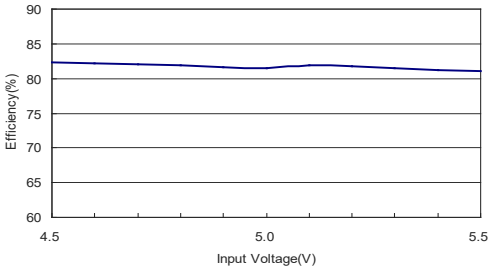
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

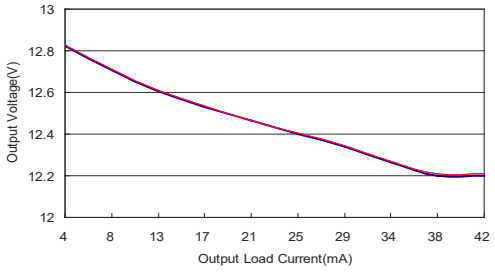
All test conditions are at 25°C The figures are identical for MAU108



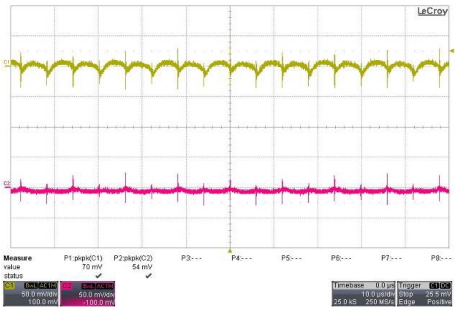
Efficiency Versus Output Current



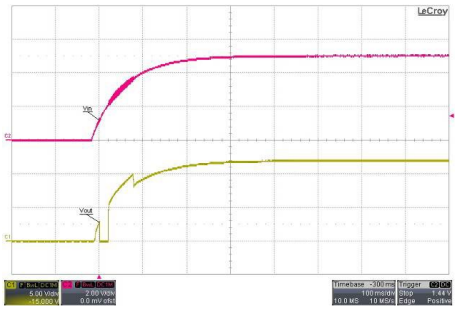
Efficiency Versus Input Voltage
Full Load



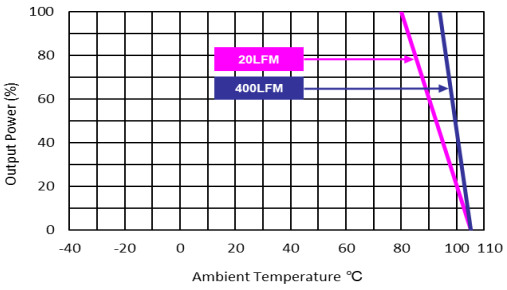
Output Voltage Versus Output Current



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



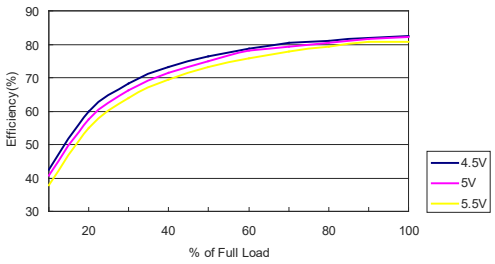
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



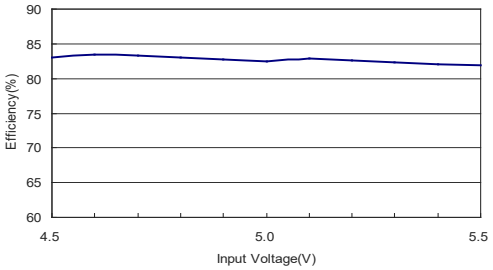
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

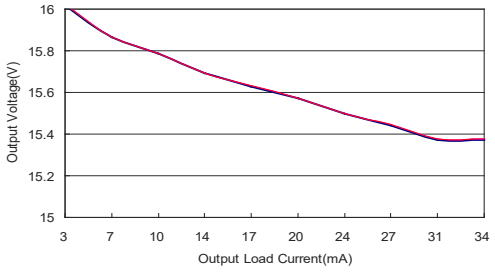
All test conditions are at 25°C The figures are identical for MAU109



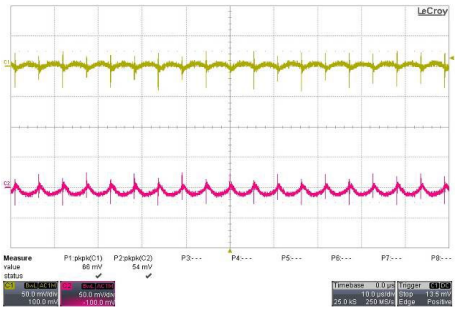
Efficiency Versus Output Current



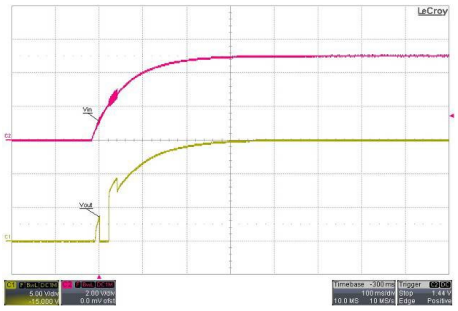
Efficiency Versus Input Voltage
Full Load



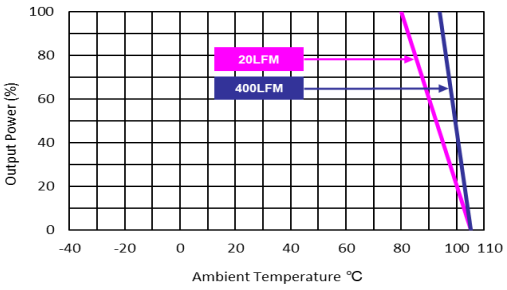
Output Voltage Versus Output Current



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



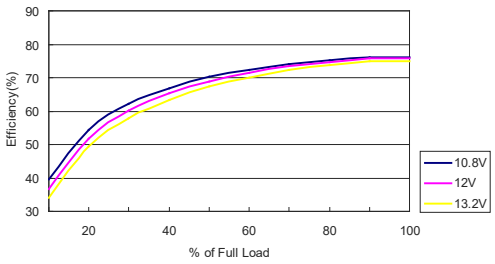
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



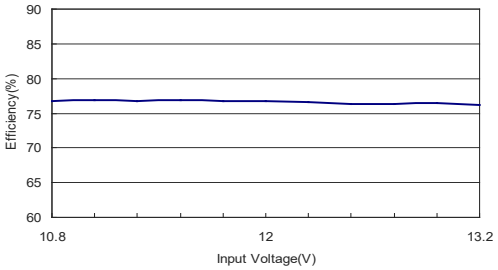
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

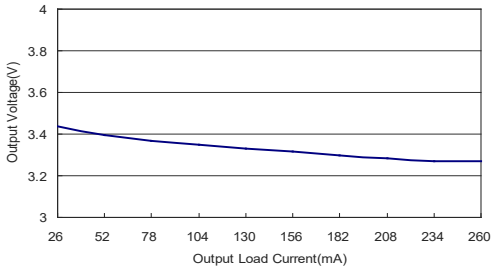
All test conditions are at 25°C The figures are identical for MAU111



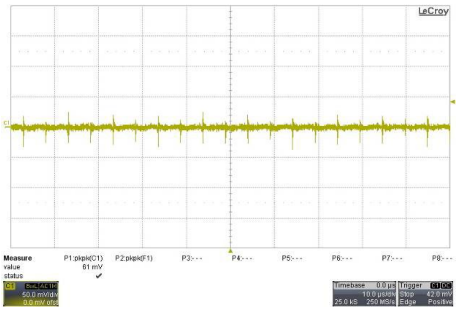
Efficiency Versus Output Current



Efficiency Versus Input Voltage
Full Load

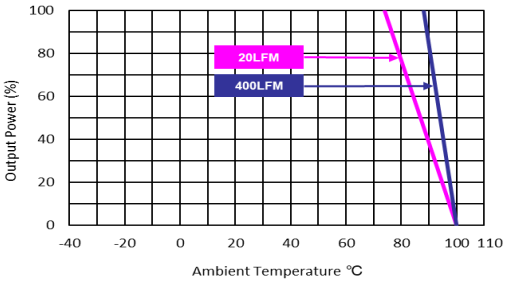


Output Voltage Versus Output Current



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

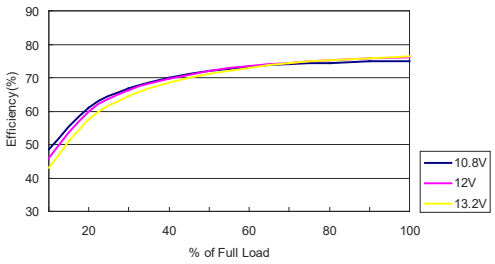
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



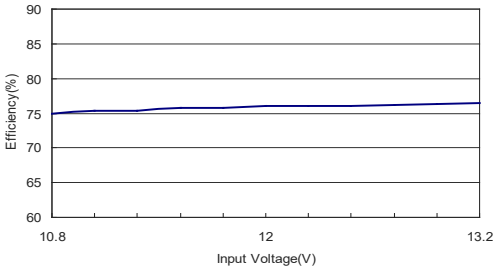
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

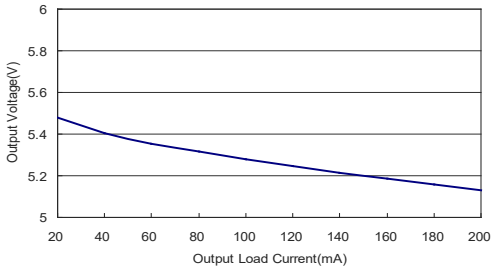
All test conditions are at 25°C The figures are identical for MAU112



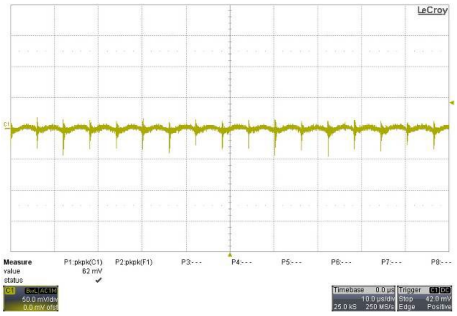
Efficiency Versus Output Current



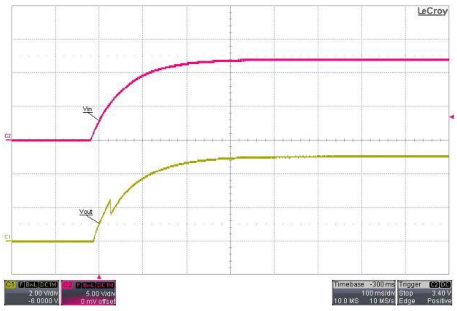
Efficiency Versus Input Voltage
Full Load



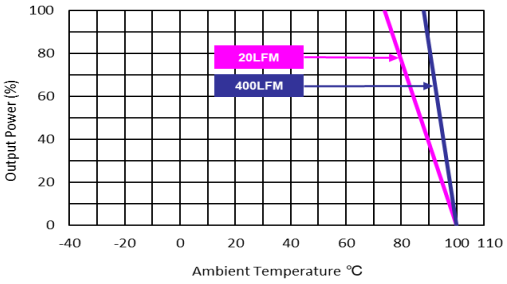
Output Voltage Versus Output Current



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



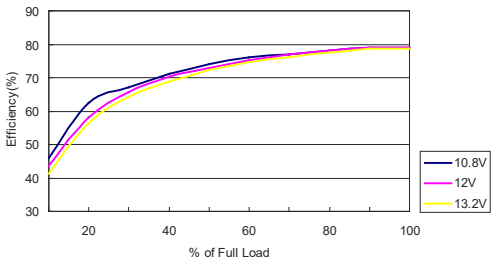
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



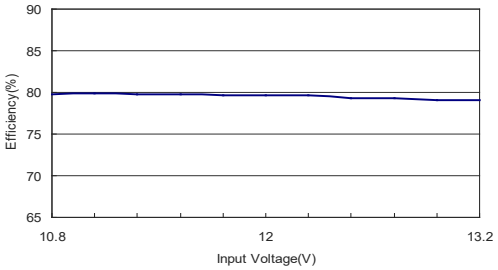
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

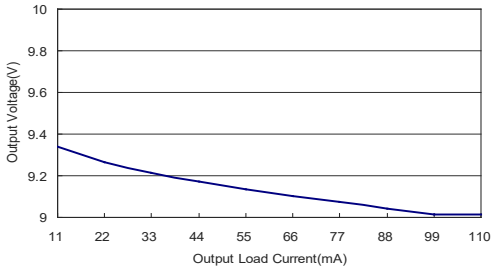
All test conditions are at 25°C The figures are identical for MAU113



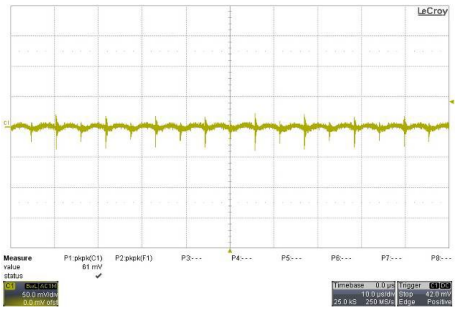
Efficiency Versus Output Current



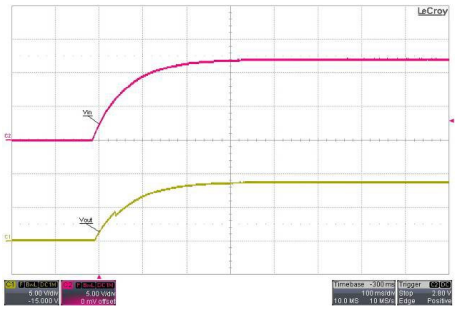
Efficiency Versus Input Voltage
Full Load



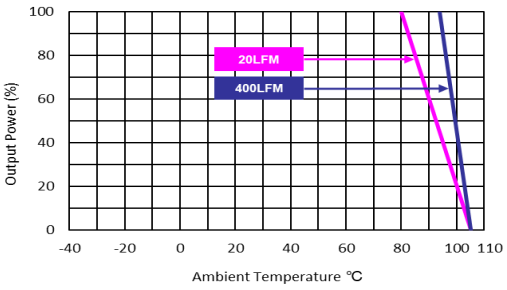
Output Voltage Versus Output Current



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



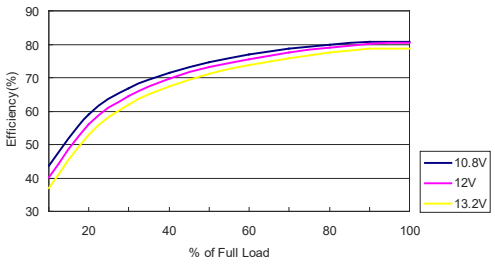
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



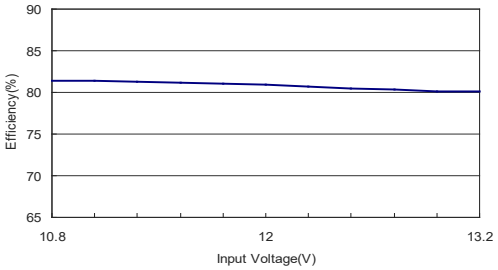
Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Characteristic Curves

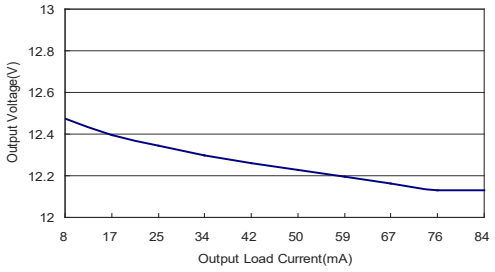
All test conditions are at 25°C The figures are identical for MAU114



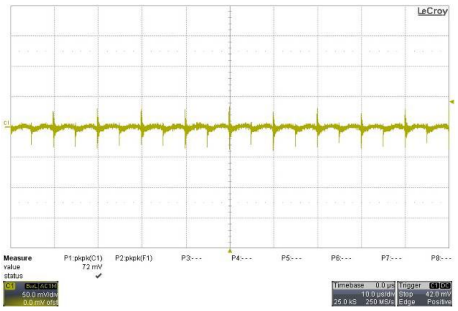
Efficiency Versus Output Current



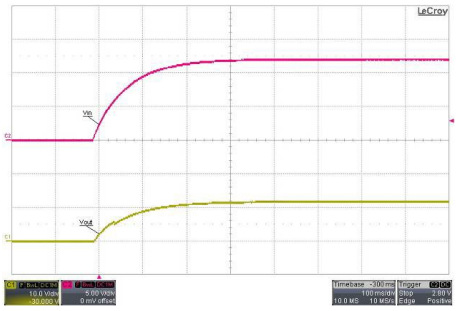
Efficiency Versus Input Voltage
Full Load



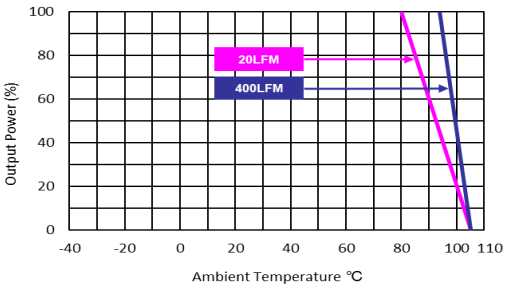
Output Voltage Versus Output Current



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



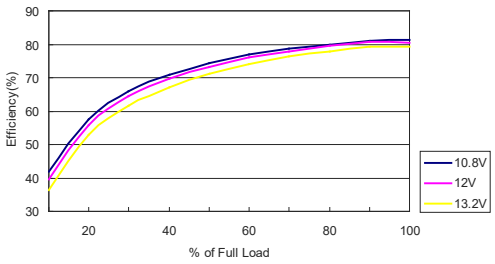
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



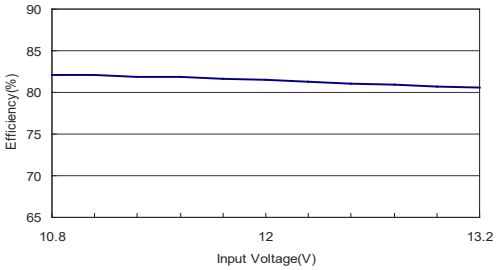
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

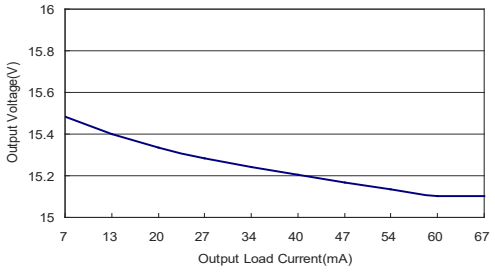
All test conditions are at 25°C The figures are identical for MAU115



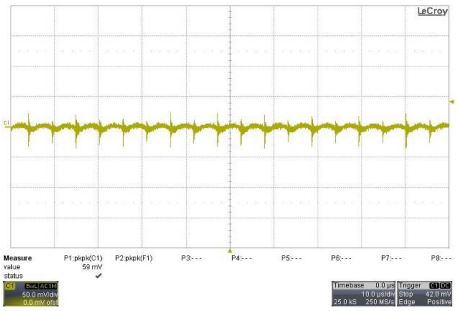
Efficiency Versus Output Current



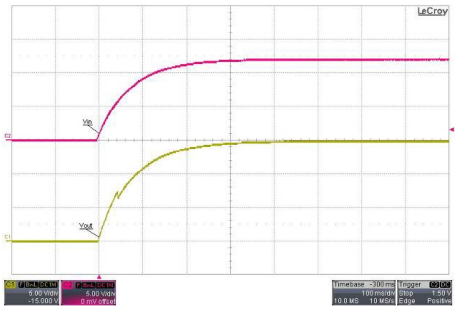
Efficiency Versus Input Voltage
Full Load



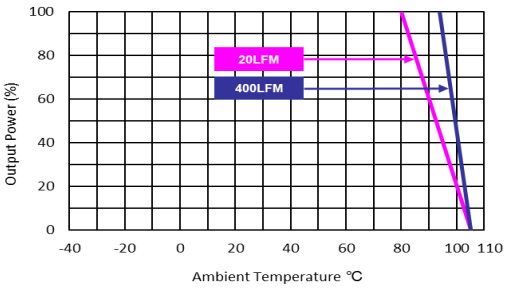
Output Voltage Versus Output Current



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



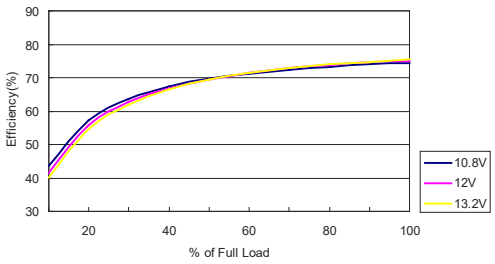
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



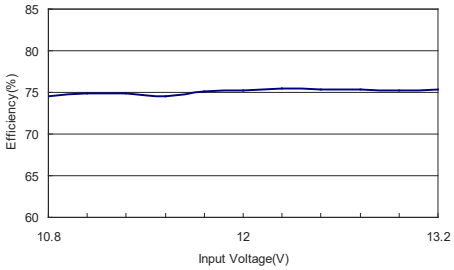
Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Characteristic Curves

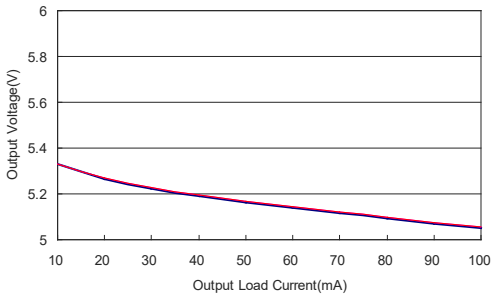
All test conditions are at 25°C The figures are identical for MAU116



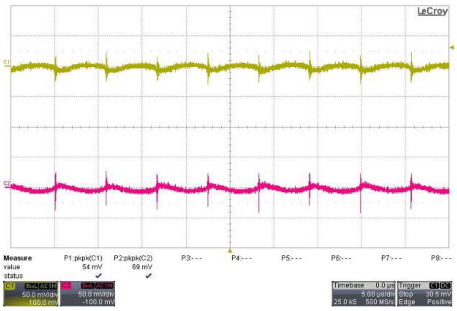
Efficiency Versus Output Current



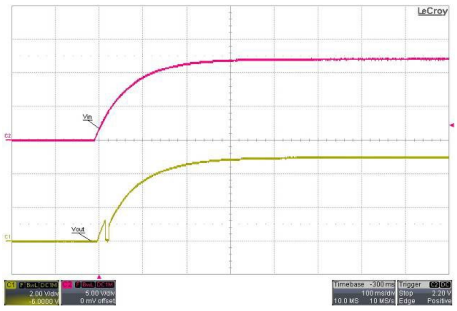
Efficiency Versus Input Voltage
Full Load



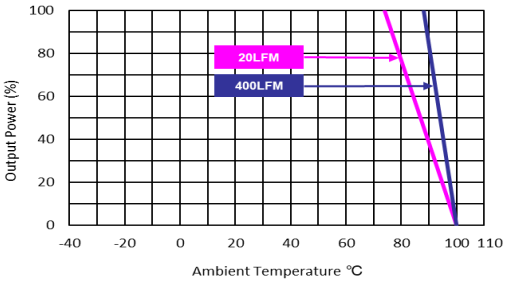
Output Voltage Versus Output Current



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



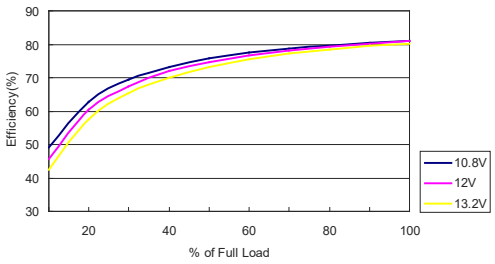
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



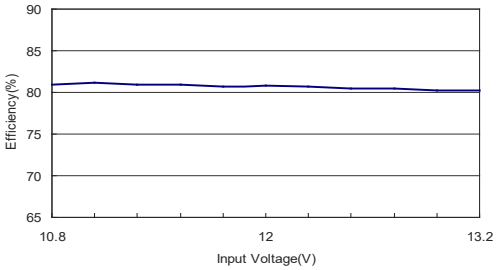
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

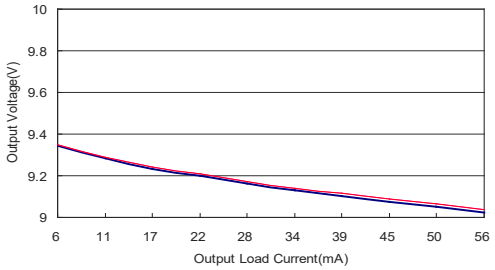
All test conditions are at 25°C The figures are identical for MAU117



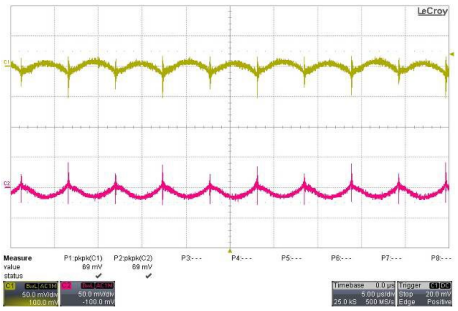
Efficiency Versus Output Current



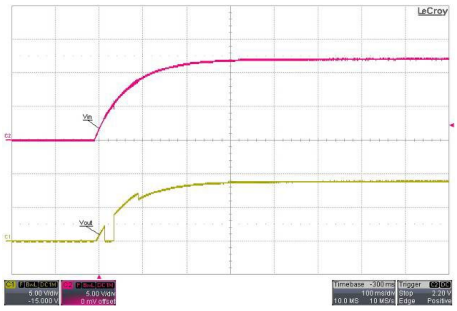
Efficiency Versus Input Voltage
Full Load



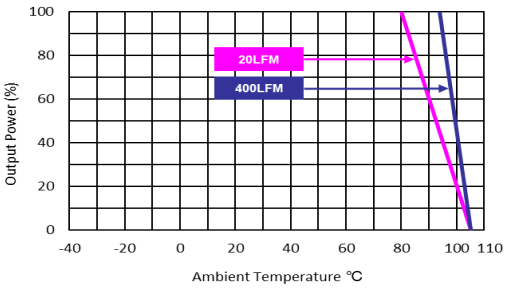
Output Voltage Versus Output Current



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



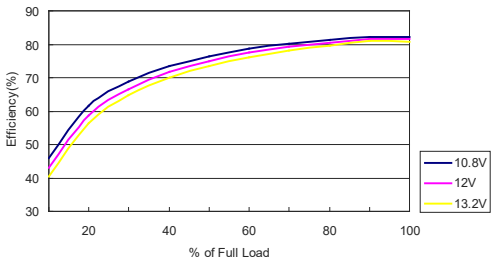
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



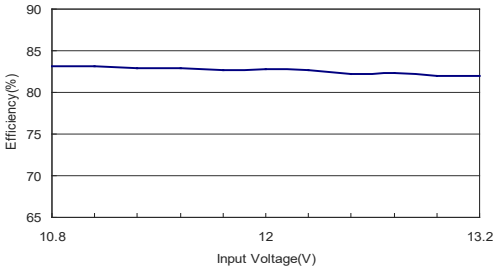
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

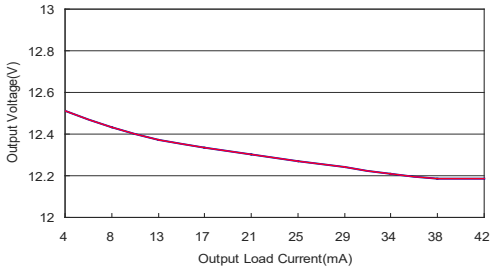
All test conditions are at 25°C The figures are identical for MAU118



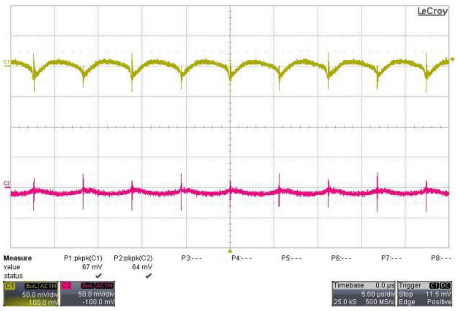
Efficiency Versus Output Current



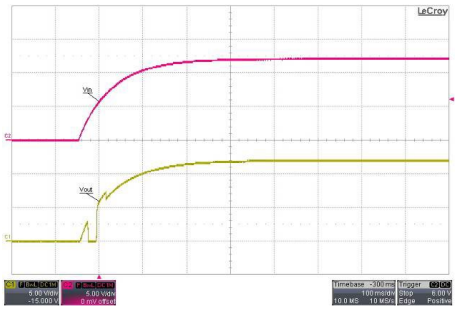
Efficiency Versus Input Voltage
Full Load



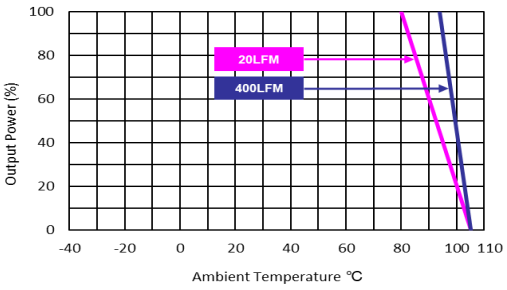
Output Voltage Versus Output Current



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



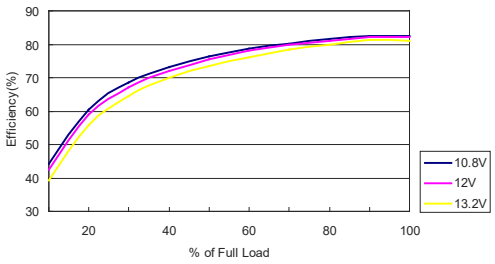
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



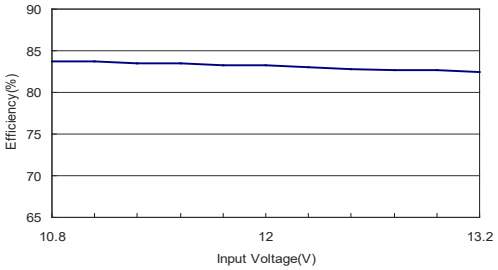
Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Characteristic Curves

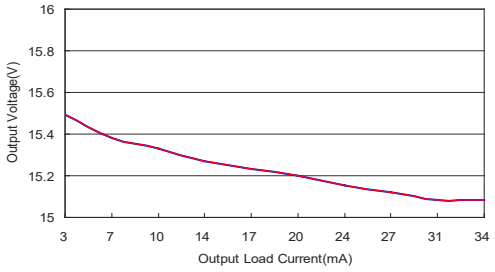
All test conditions are at 25°C The figures are identical for MAU119



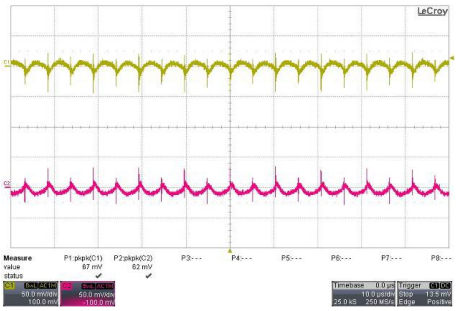
Efficiency Versus Output Current



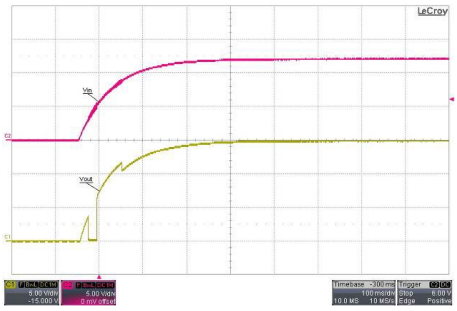
Efficiency Versus Input Voltage
Full Load



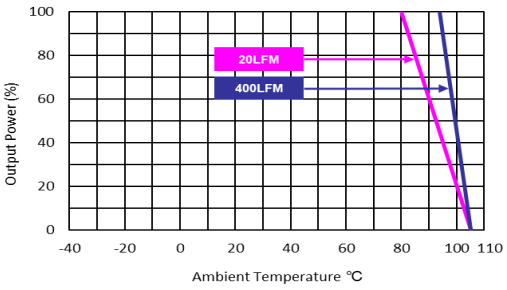
Output Voltage Versus Output Current



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



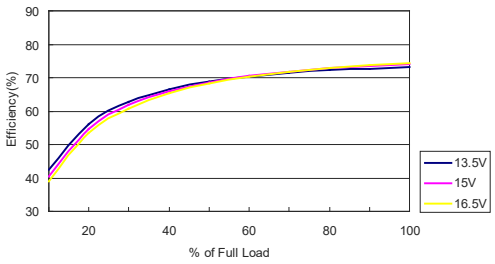
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



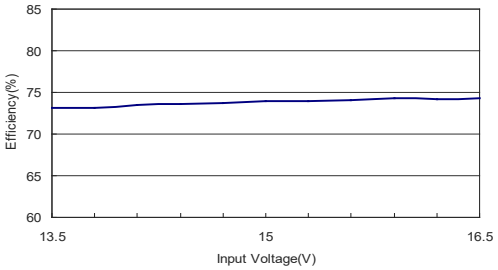
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

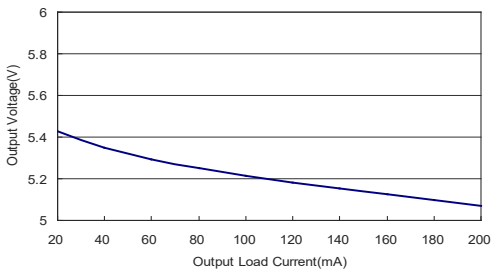
All test conditions are at 25°C The figures are identical for MAU151



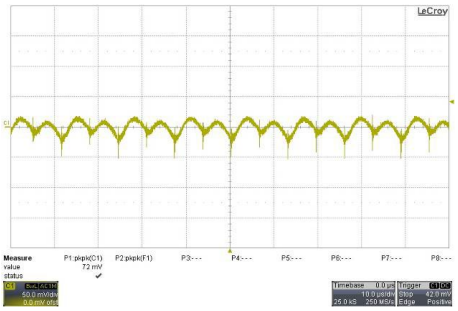
Efficiency Versus Output Current



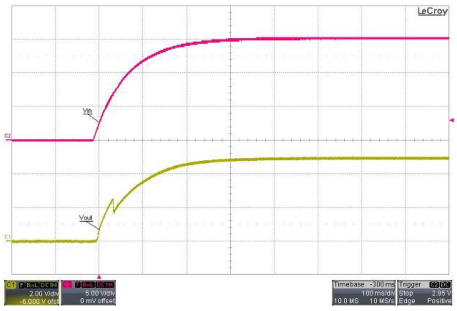
Efficiency Versus Input Voltage
Full Load



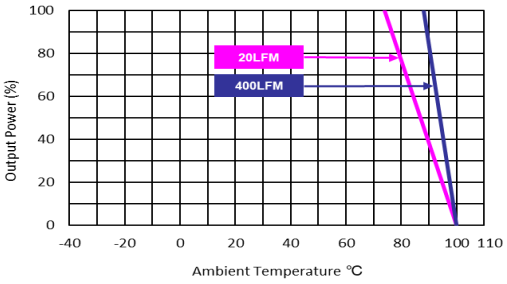
Output Voltage Versus Output Current



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



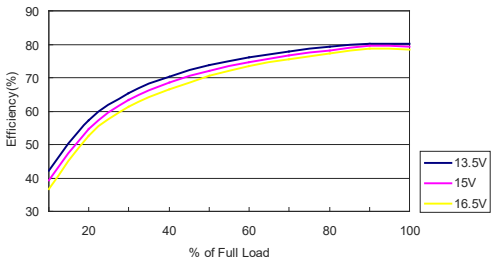
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



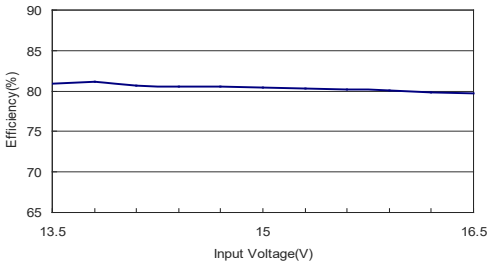
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

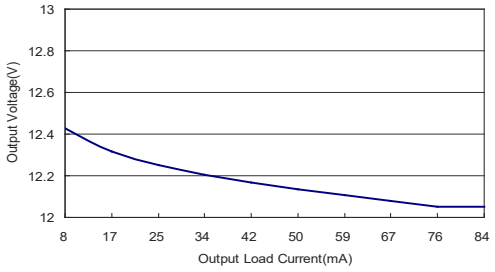
All test conditions are at 25°C The figures are identical for MAU152



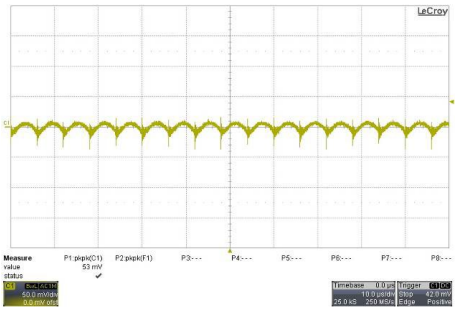
Efficiency Versus Output Current



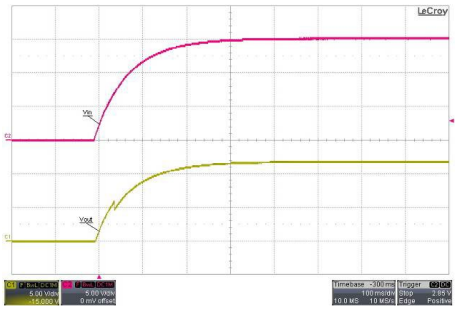
Efficiency Versus Input Voltage
Full Load



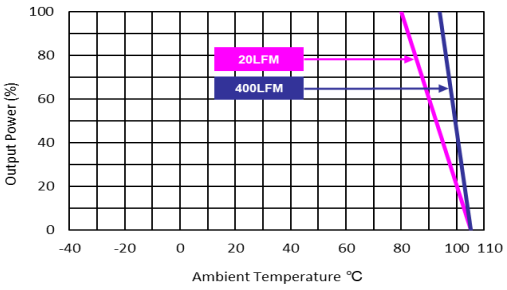
Output Voltage Versus Output Current



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



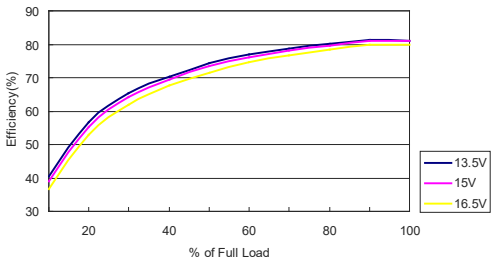
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



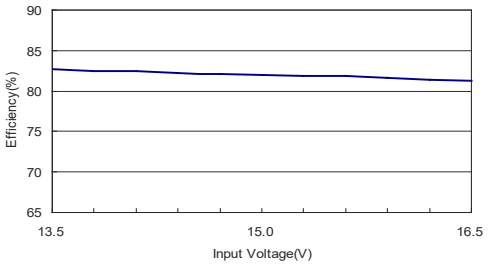
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

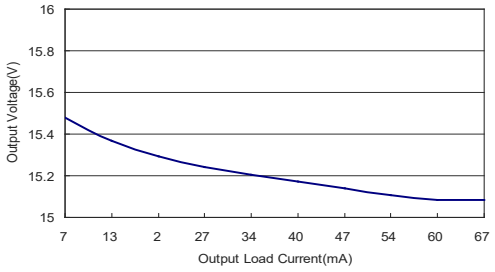
All test conditions are at 25°C The figures are identical for MAU153



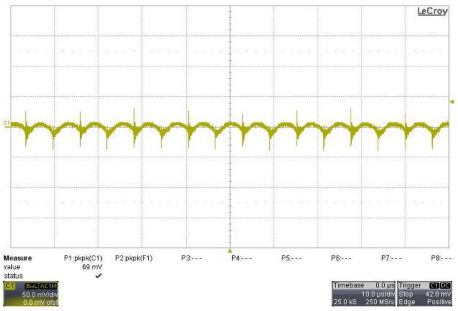
Efficiency Versus Output Current



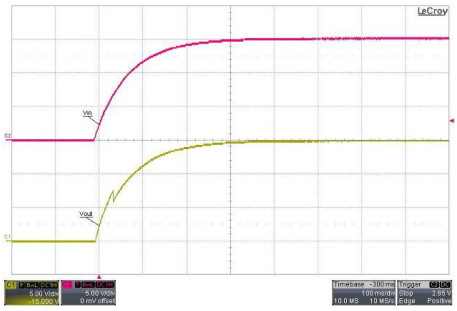
Efficiency Versus Input Voltage
Full Load



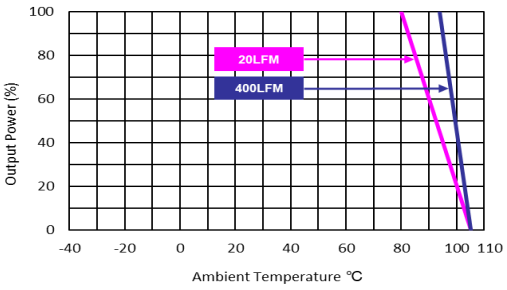
Output Voltage Versus Output Current



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



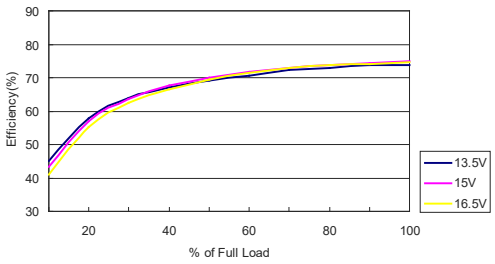
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



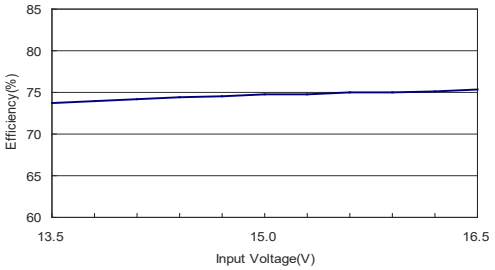
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

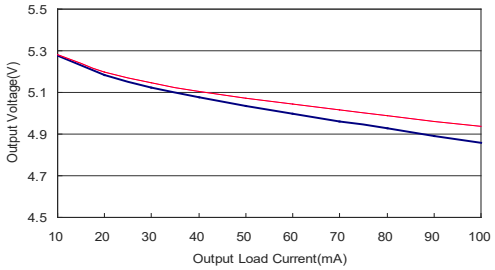
All test conditions are at 25°C The figures are identical for MAU154



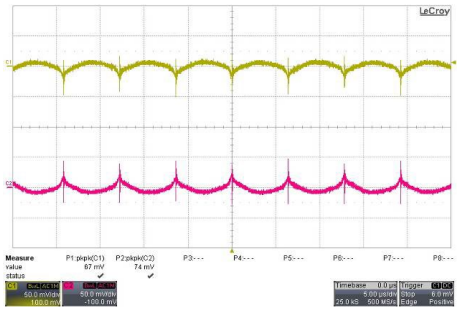
Efficiency Versus Output Current



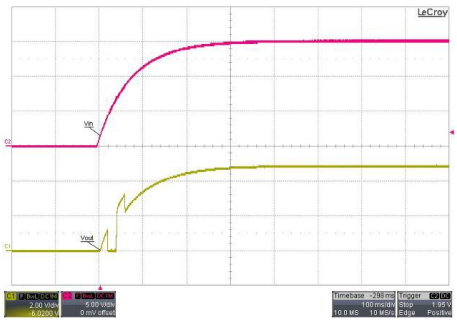
Efficiency Versus Input Voltage
Full Load



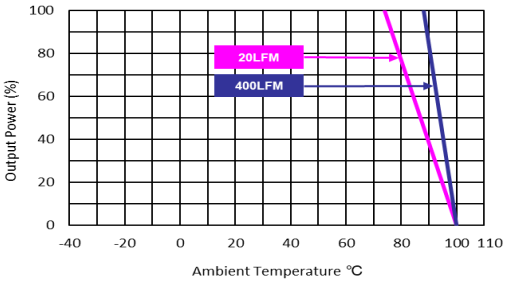
Output Voltage Versus Output Current



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



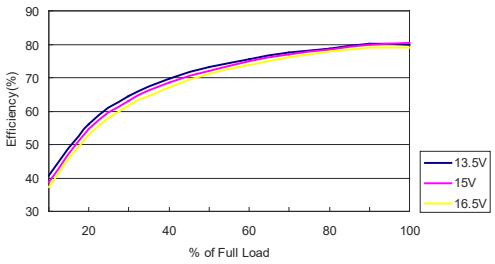
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



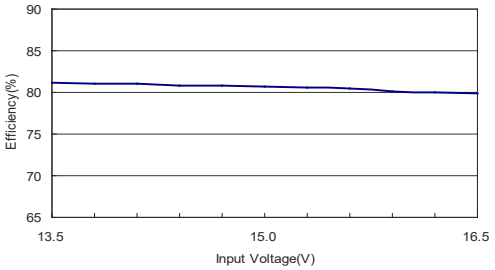
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

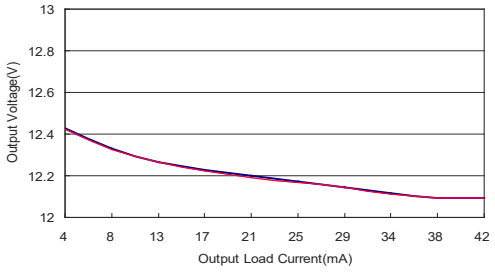
All test conditions are at 25°C The figures are identical for MAU155



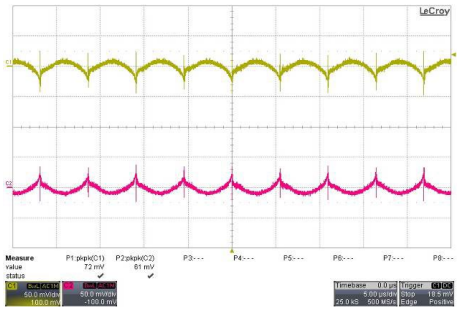
Efficiency Versus Output Current



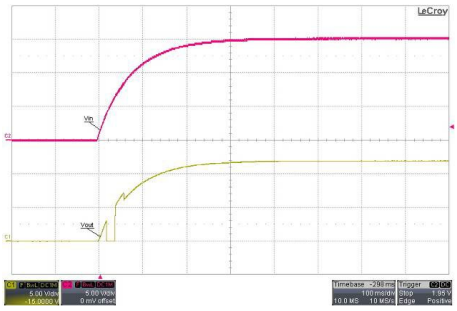
Efficiency Versus Input Voltage
Full Load



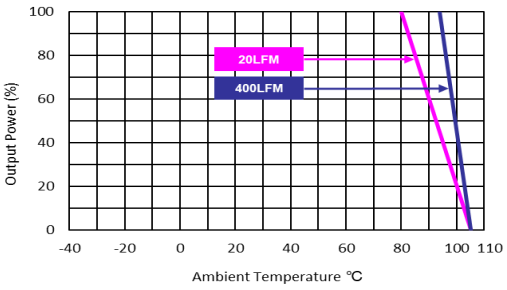
Output Voltage Versus Output Current



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



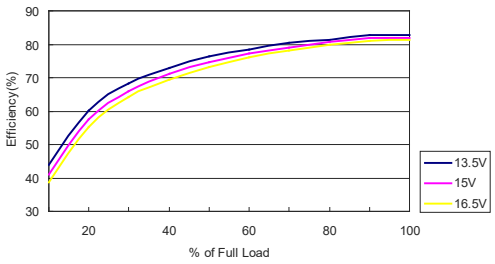
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



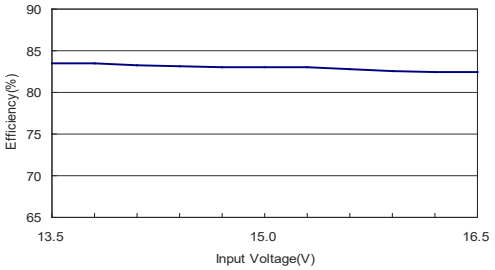
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

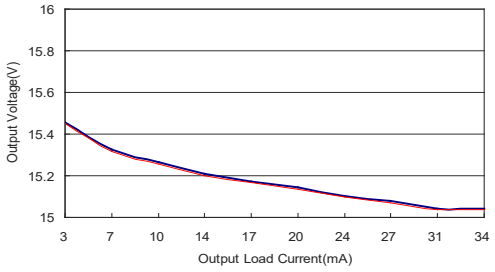
All test conditions are at 25°C The figures are identical for MAU156



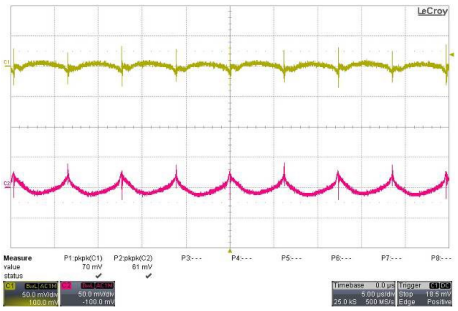
Efficiency Versus Output Current



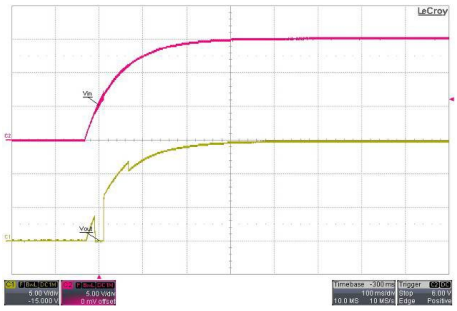
Efficiency Versus Input Voltage
Full Load



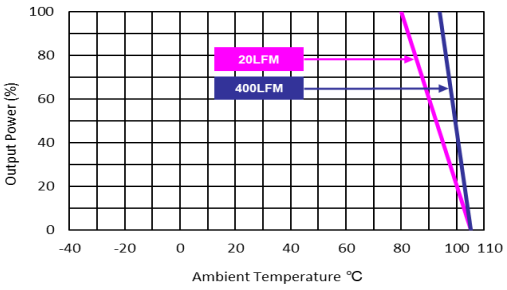
Output Voltage Versus Output Current



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



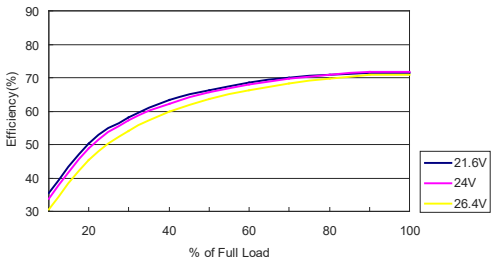
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



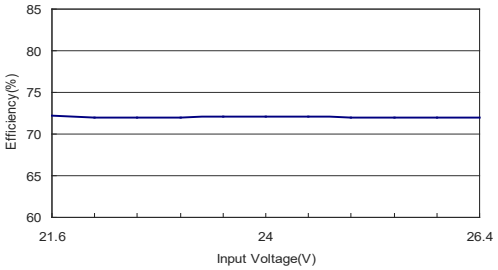
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

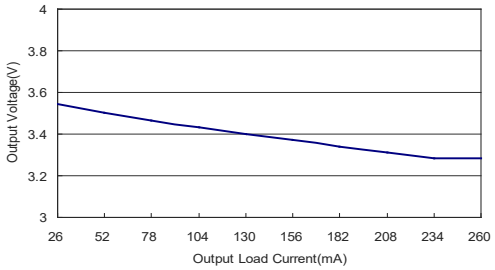
All test conditions are at 25°C The figures are identical for MAU121



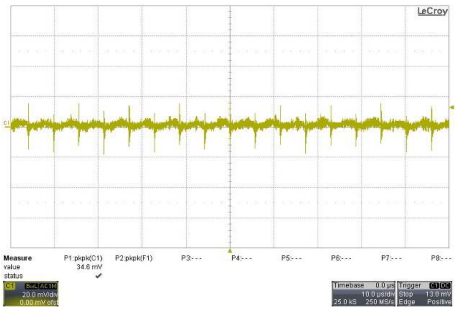
Efficiency Versus Output Current



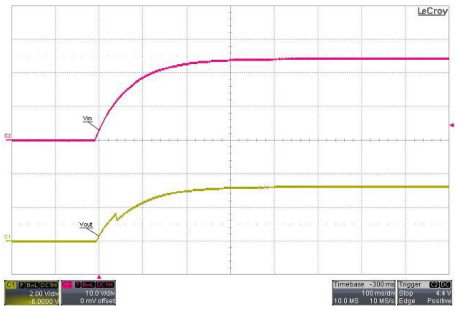
Efficiency Versus Input Voltage
Full Load



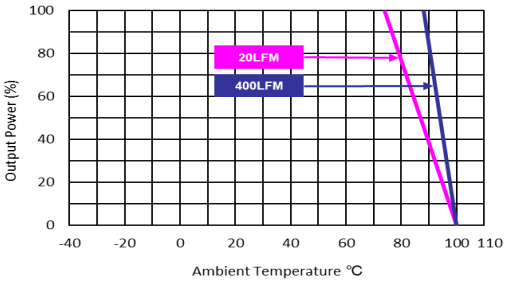
Output Voltage Versus Output Current



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



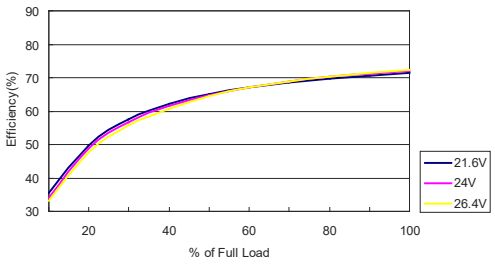
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



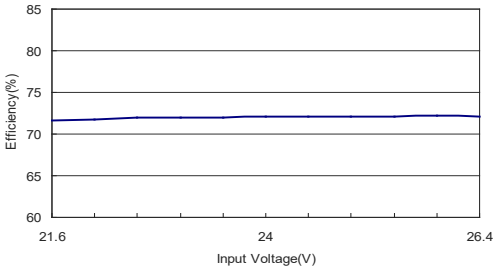
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

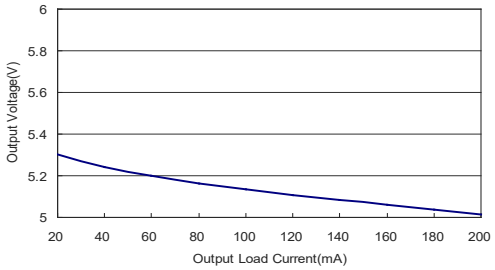
All test conditions are at 25°C The figures are identical for MAU122



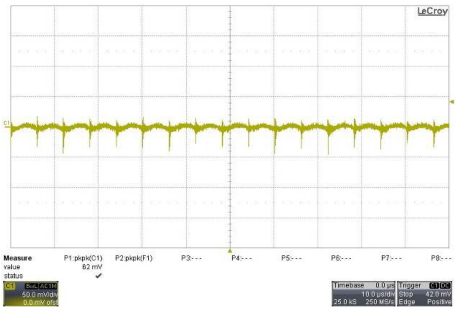
Efficiency Versus Output Current



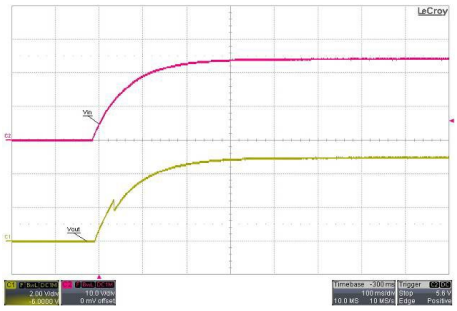
Efficiency Versus Input Voltage
Full Load



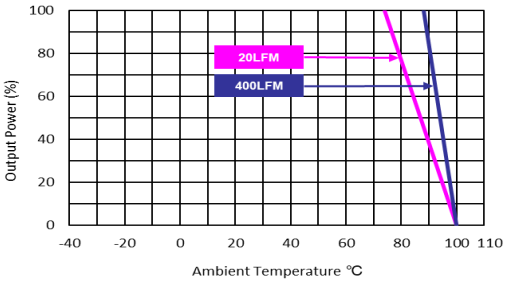
Output Voltage Versus Output Current



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



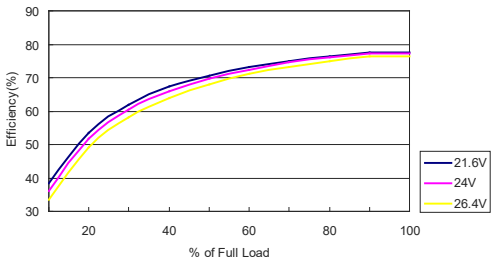
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



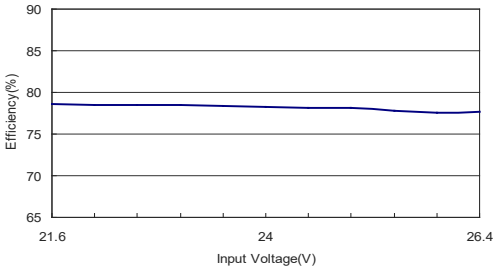
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

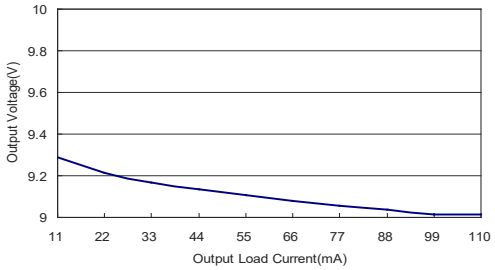
All test conditions are at 25°C The figures are identical for MAU123



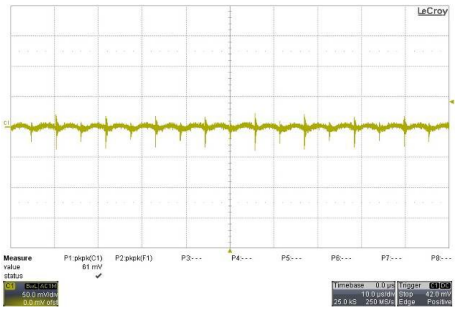
Efficiency Versus Output Current



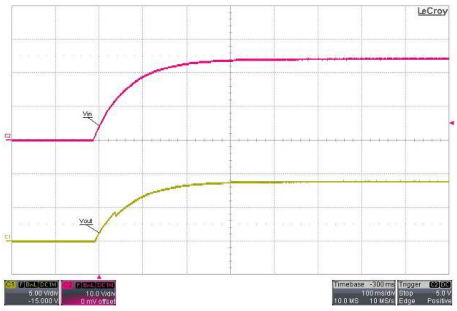
Efficiency Versus Input Voltage
Full Load



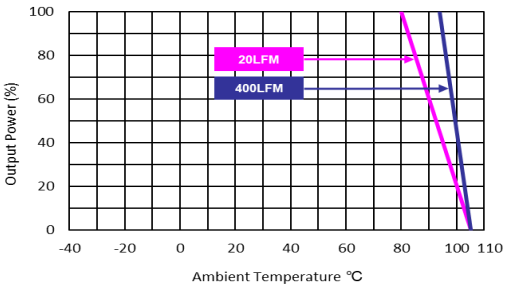
Output Voltage Versus Output Current



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



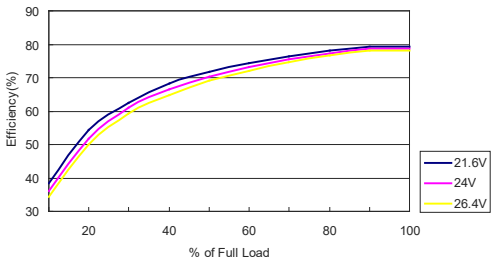
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



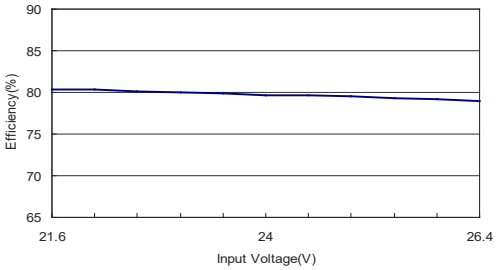
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

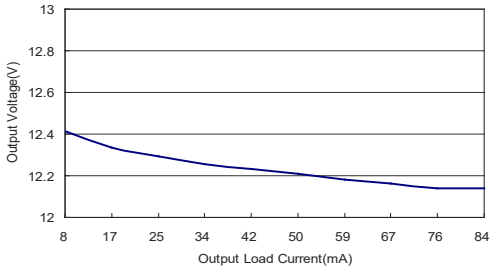
All test conditions are at 25°C The figures are identical for MAU124



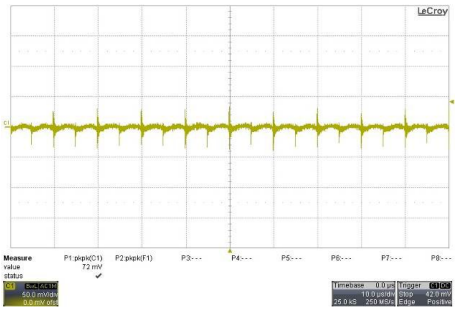
Efficiency Versus Output Current



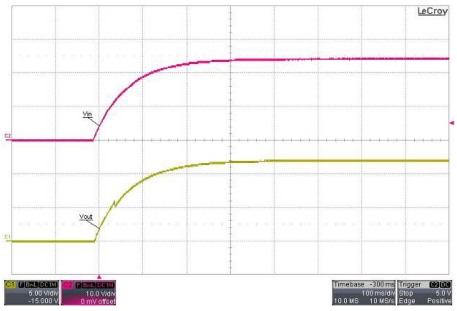
Efficiency Versus Input Voltage
Full Load



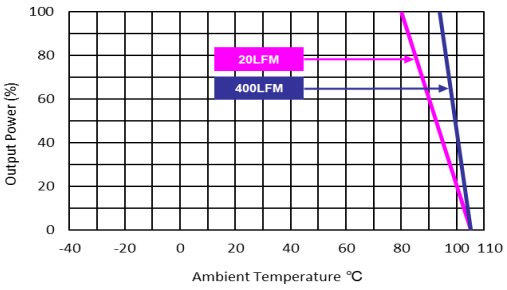
Output Voltage Versus Output Current



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



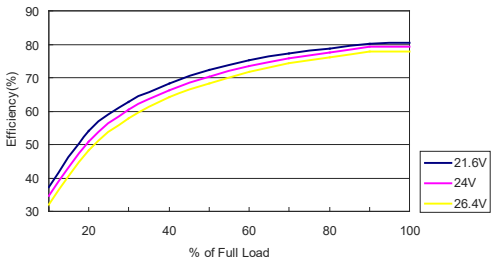
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



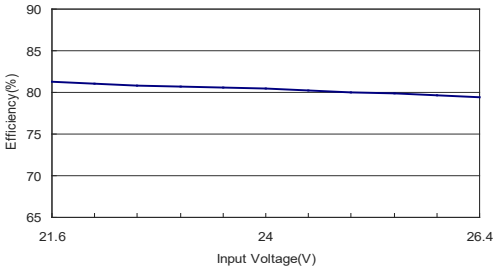
Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Characteristic Curves

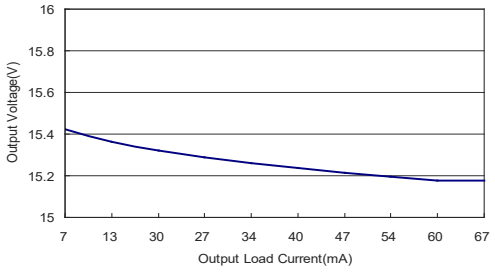
All test conditions are at 25°C The figures are identical for MAU125



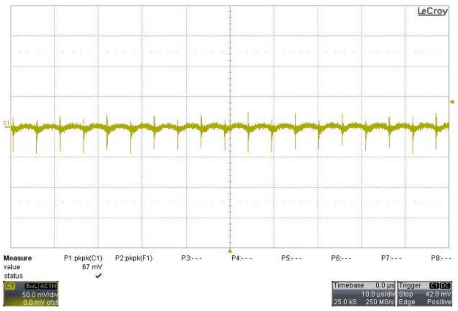
Efficiency Versus Output Current



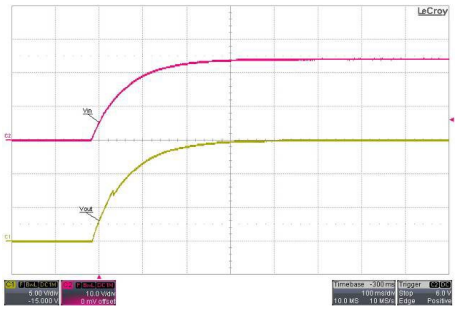
Efficiency Versus Input Voltage
Full Load



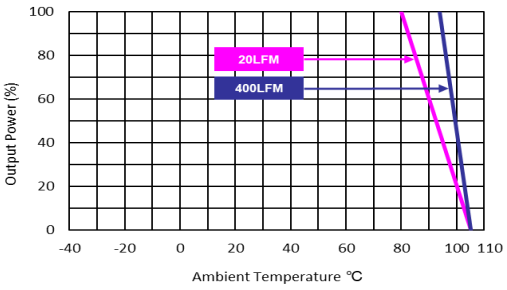
Output Voltage Versus Output Current



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



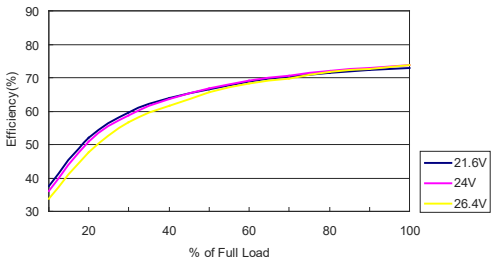
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



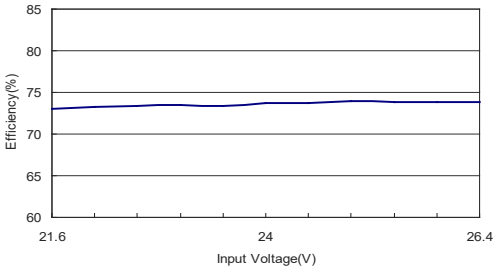
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

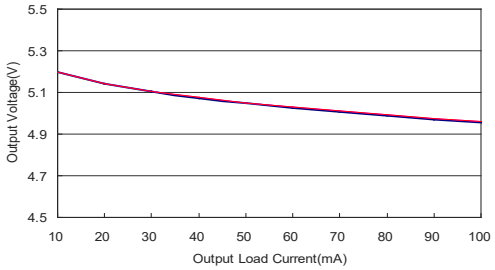
All test conditions are at 25°C The figures are identical for MAU126



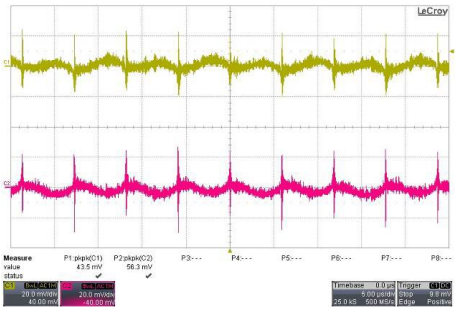
Efficiency Versus Output Current



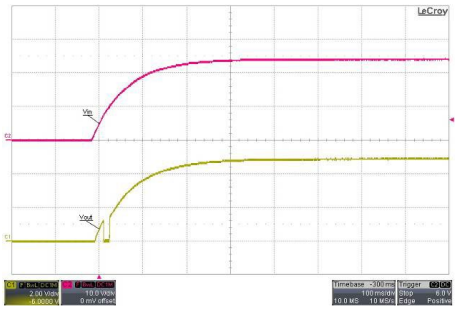
Efficiency Versus Input Voltage
Full Load



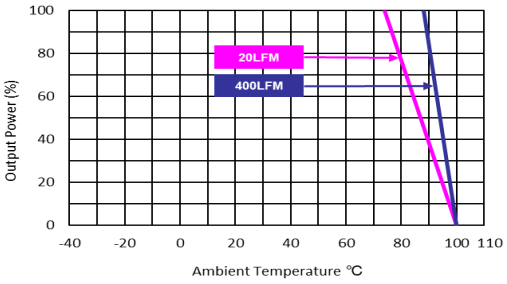
Output Voltage Versus Output Current



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



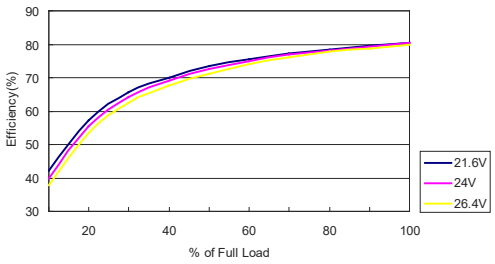
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



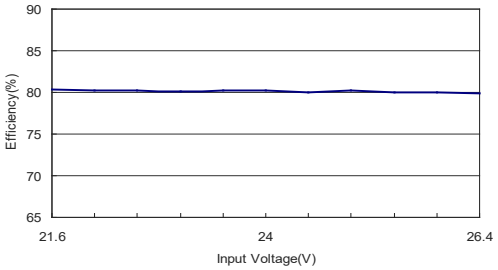
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

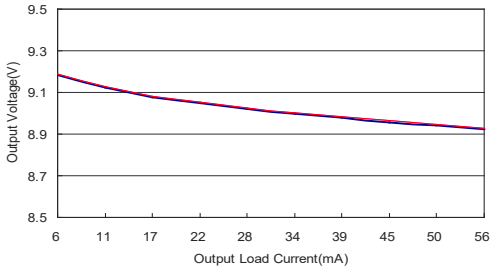
All test conditions are at 25°C The figures are identical for MAU127



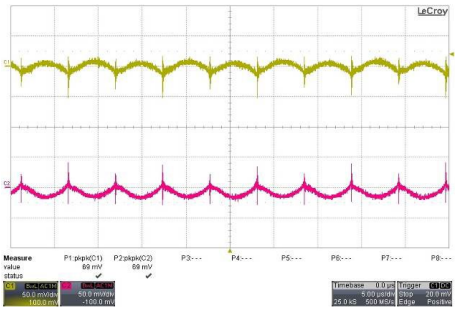
Efficiency Versus Output Current



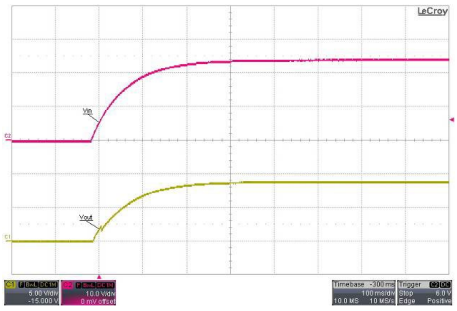
Efficiency Versus Input Voltage
Full Load



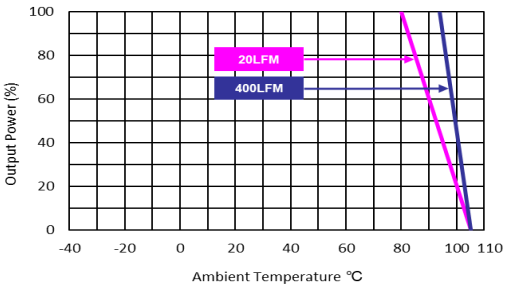
Output Voltage Versus Output Current



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



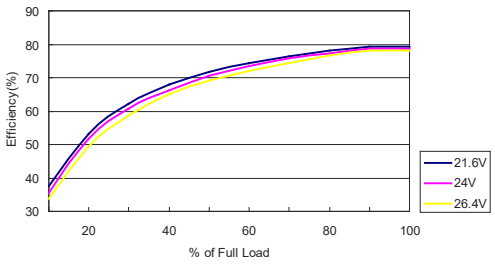
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



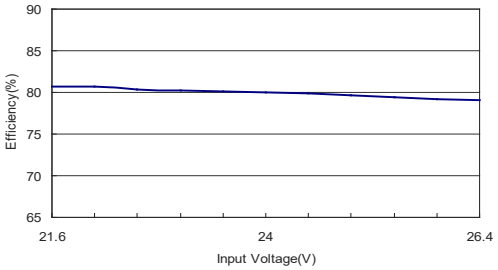
Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Characteristic Curves

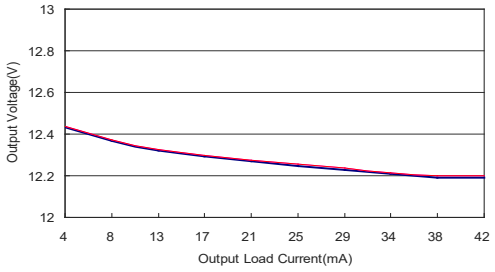
All test conditions are at 25°C The figures are identical for MAU128



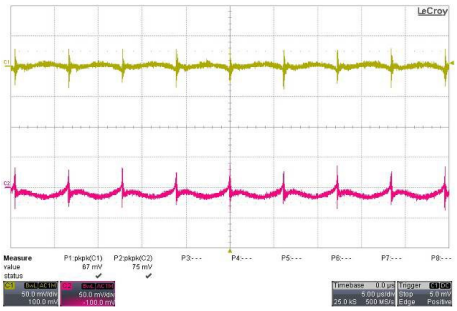
Efficiency Versus Output Current



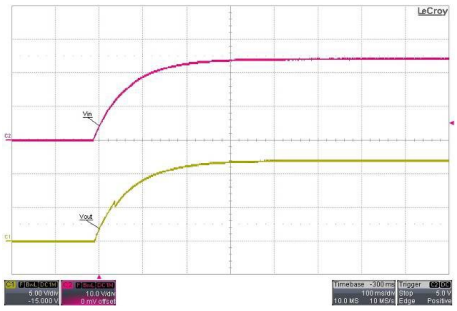
Efficiency Versus Input Voltage
Full Load



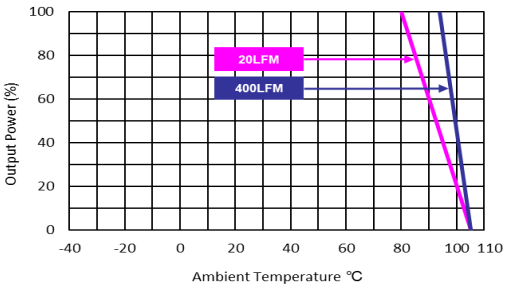
Output Voltage Versus Output Current



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



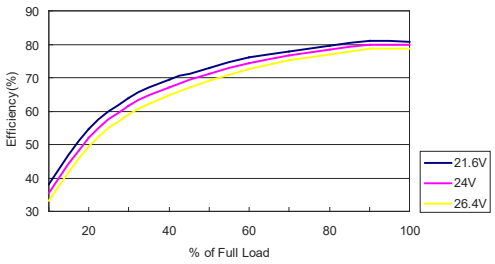
Typical Input Start-Up and Output Rise Characteristic
V_{in}=$V_{in\ nom}$; Full Load



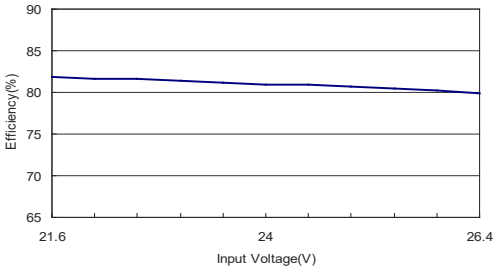
Derating Output Current Versus Ambient Temperature and Airflow
V_{in}=$V_{in\ nom}$

Characteristic Curves

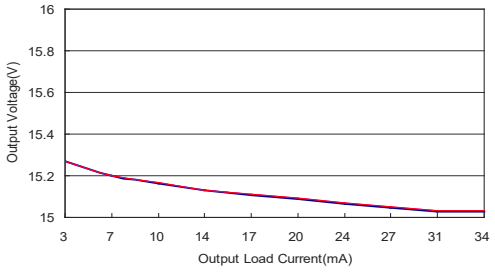
All test conditions are at 25°C The figures are identical for MAU129



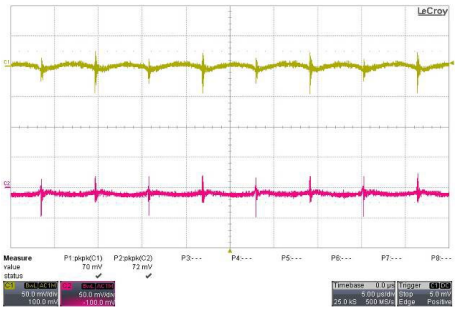
Efficiency Versus Output Current



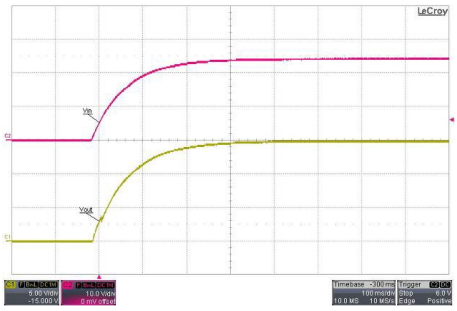
Efficiency Versus Input Voltage
Full Load



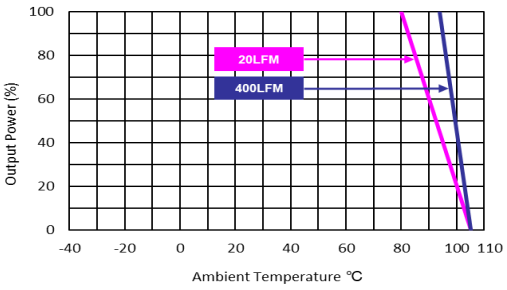
Output Voltage Versus Output Current



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



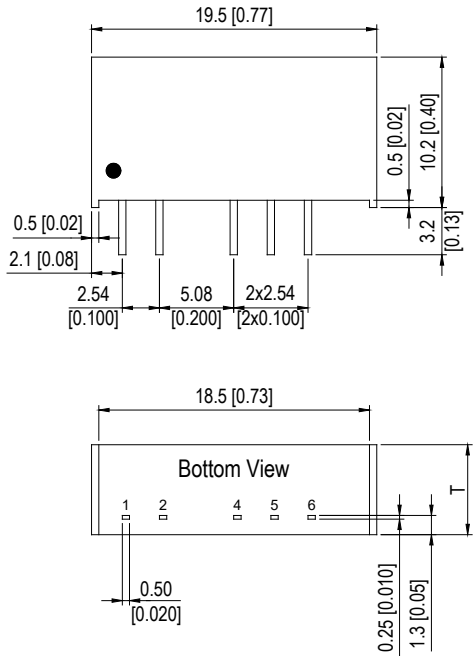
Typical Input Start-Up and Output Rise Characteristic
$V_{in}=V_{in\ nom}$; Full Load



Derating Output Current Versus Ambient Temperature and Airflow
$V_{in}=V_{in\ nom}$

Package Specifications

Mechanical Dimensions



Pin Connections

Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
4	-Vout	-Vout
5	No Pin	Common
6	+Vout	+Vout

T: 6.1mm(0.24 inch) for 5V&12V Input Models

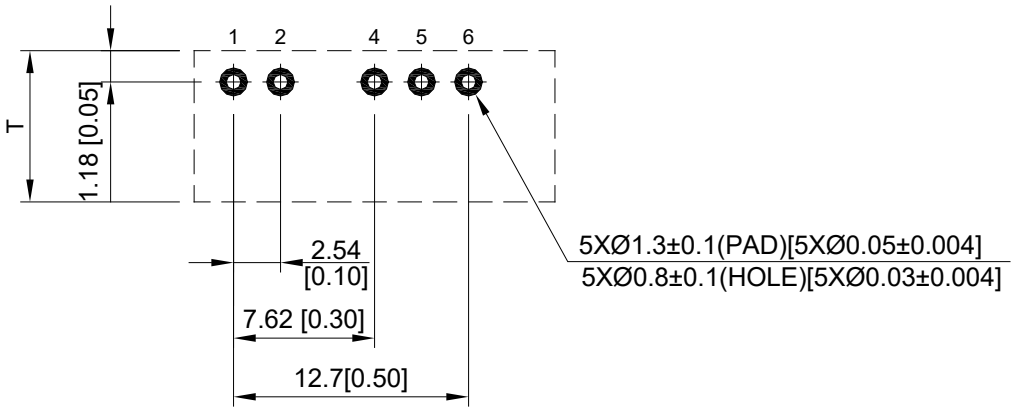
T: 7.1mm(0.28 inch) for 15V&24V Input Models

- All dimensions in mm (inches)
- Tolerance: X.X±0.25 (X.XX±0.01)
  X.XX±0.13 (X.XXX±0.005)
- Pins ±0.05(±0.002)

Physical Characteristics

Case Size (5V&12V Input)	:	19.5x6.1x10.2mm (0.77x0.24x0.40 inches)
Case Size (15V&24V Input)	:	19.5x7.1x10.2mm (0.77x0.28x0.40 inches)
Case Material	:	Plastic resin (flammability to UL 94V-0 rated)
Pin Material	:	Alloy 42
Weight (5V&12V Input)	:	2.2g
Weight (15V&24V Input)	:	2.6g

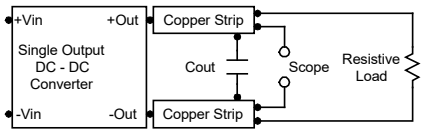
Recommended Pad Layout for Single & Dual Output Converter

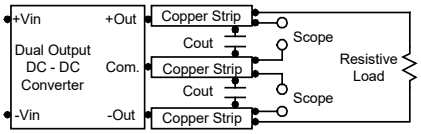


Test Setup

Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.33µF 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.





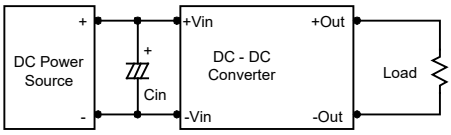
Technical Notes

Maximum Capacitive Load

The MAU100 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. For optimum performance we recommend 100µF maximum capacitive load for dual outputs and 220µF capacitive load for single outputs. The maximum capacitance can be found in the data sheet.

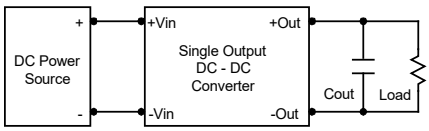
Input Source Impedance

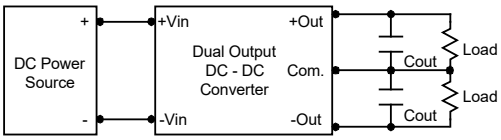
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup. Capacitor mounted close to the power module helps ensure stability of the unit, it is commended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100 kHz) capacitor of a 2.2µF for the 5V input devices, a 1.0µF for the 12V,15V input devices and a 0.47µF for the 24V devices.



Output Ripple Reduction

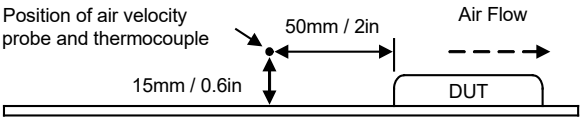
A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 1.0µF capacitors at the output.





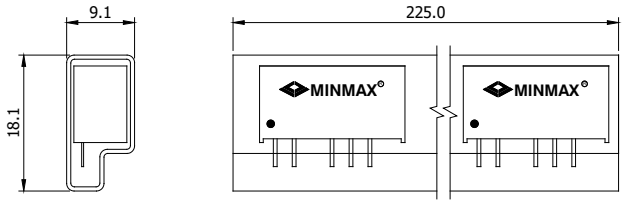
Thermal Considerations

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°C. The derating curves are determined from measurements obtained in a test setup.

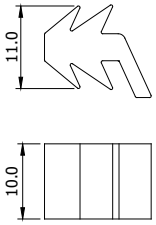


Packaging Information for Tube

Tube



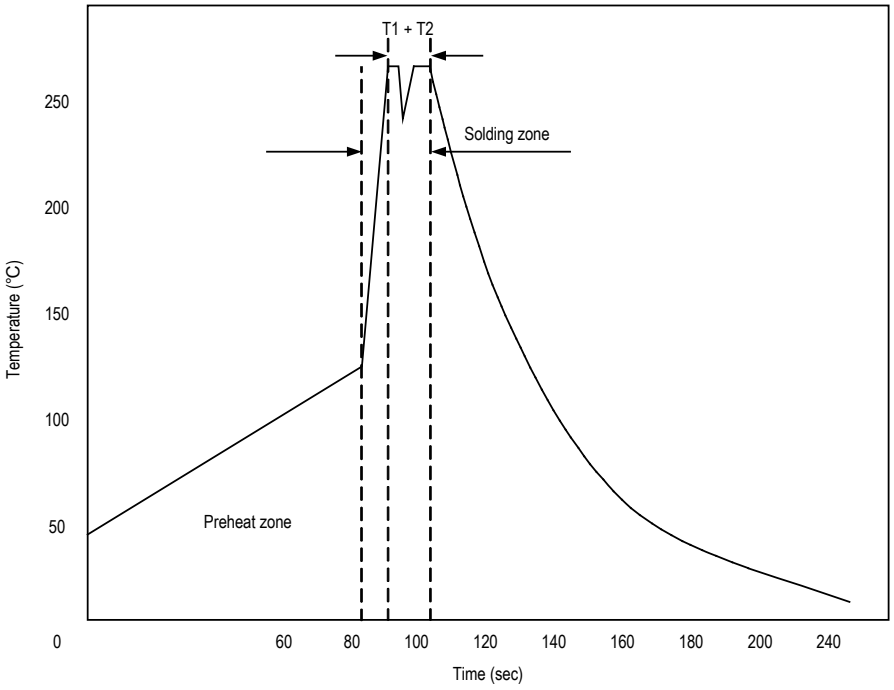
Plug



Unit: mm
10 PCS per TUBE

Wave Soldering Considerations

Lead free wave solder profile



Zone	Reference Parameter
Preheat	Rise temp. speed：3℃/sec max.
zone	Preheat temp.：100~130℃
Actual	Peak temp.：250~260℃
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℃

Part Number Structure

M	A	U	10	1

Package Type
SIP-7

Output Regulation
Unregulated

Input Voltage Range

10:	4.5	~	5.5	VDC
11:	10.8	~	13.2	VDC
12:	21.6	~	26.4	VDC

Output Voltage

1:	3.3	VDC
2:	5	VDC
3:	9	VDC
4:	12	VDC
5:	15	VDC
6:	±5	VDC
7:	±9	VDC
8:	±12	VDC
9:	±15	VDC

Input Voltage Range

15:	13.5	~	16.5	VDC

Output Voltage

1:	5	VDC
2:	12	VDC
3:	15	VDC
4:	±5	VDC
5:	±12	VDC
6:	±15	VDC

MTBF and Reliability

The MTBF of MAU100 series of DC-DC converters has been calculated using

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

Model	MTBF	Unit
MAU101	5,992,510	Hours
MAU102	5,780,347	
MAU103	4,212,743	
MAU104	2,928,258	
MAU105	2,393,776	
MAU106	5,641,749	
MAU107	4,253,057	
MAU108	3,013,182	
MAU109	2,466,852	
MAU111	6,033,182	
MAU112	5,818,182	
MAU113	4,232,804	
MAU114	2,937,936	
MAU115	2,400,240	
MAU116	5,677,786	
MAU117	4,273,504	
MAU118	3,023,431	
MAU119	2,473,717	
MAU151	2,122,579	
MAU152	2,237,762	
MAU153	2,353,634	
MAU154	2,237,762	
MAU155	2,351,558	
MAU156	2,351,558	
MAU121	5,494,506	
MAU122	5,315,614	
MAU123	3,960,396	
MAU124	2,804,066	
MAU125	2,310,136	
MAU126	5,198,181	
MAU127	3,996,004	
MAU128	2,881,844	
MAU129	2,378,122	