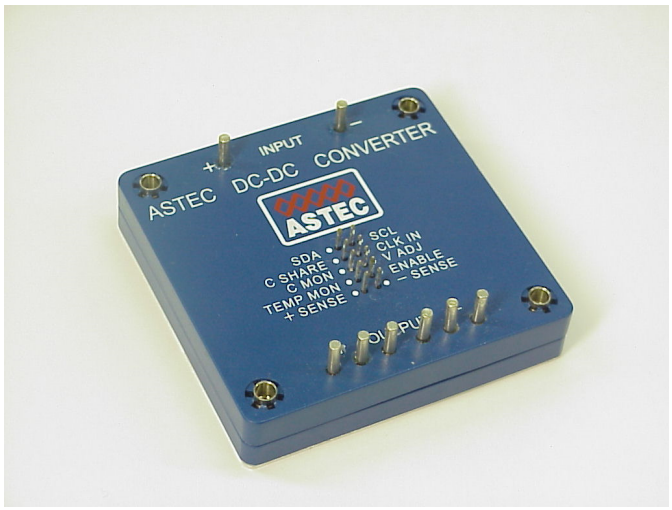
AIH 300 Vin

250 Watts

Half Brick DC-DC Converter

Total Power: 250 Watts
Input Voltage: 250-420 Vdc
# of Outputs: Single



RoHS 6/6 COMPLIANT

Special Features

- 250W continuous power at 100°C baseplate temperature
- High efficiency - 5V@88%, 12V@86%
- Low output ripple and noise
- Positive and Negative Enable Function
- Excellent transient response
- OVP, OCP, V Adj control with ALP™ analog mode linear control, or through I^2C bus for digital mode control.
- Paralleable with accurate current sharing
- Adjustable output voltage
- Regulation to zero load
- Temperature monitor output
- Switching Frequency 400KHz

Safety

UL cUL	60950 Recognized
TUV	EN60950 Licensed
CE Mark	

Product Descriptions

The AIH 300 Vin is an isolated, single output DC to DC converter module, providing up to 250W output with a maximum baseplate operating temperature of 100°C with no derating.

ARTESYN™
An Advanced Energy Company

Model Numbers

Standard	Output Voltage	Minimum Load	Maximum Load	Maximum Power
AIH50Y300-L	1.8Vdc	0A	50A	250W
AIH50F300-L	3.3Vdc	0A	50A	250W
AIH40A300-L	5Vdc	0A	40A	250W
AIH20B300-L	12Vdc	0A	20A	250W
AIH16C300-L	15Vdc	0A	16A	250W
AIH10H300-L	24Vdc	0A	10A	250W

Part Number Scheme

AIH	Output Current	Output Voltage	Vin	Enable	-	Suffix	Suffix
	XX	X	300	N or No suffix		NT	-L or L
"AIH" = Artesyn Integrated Half Brick Series	50=50A 50=50A 40=40A 20=20.8A 16=16.6A 10=10.4A	Y=1.8V F=3.3V A=5.0V B=12V C=15V H=24V	300Vdc	"N" = Negative Logic Enable; No suffix = Positive Logic Enable		"-NT" = Non-thread mounting hole	"-L" or "L" = RoHS Compliance

Options

None

Electrical Specifications

Absolute Maximum Ratings

Stress in excess of those listed in the “Absolute Maximum Ratings” can cause permanent damage to the power supply. These are stress ratings only and functional operation of the unit is not implied at these or any other conditions above those given in the operational sections of this TRN. Exposure to any absolute maximum rated condition for extended periods can adversely affect the power supply’s reliability.

Table 1. Absolute Maximum Ratings:

Parameter	Model	Symbol	Min	Typ	Max	Unit
Input Voltage						
DC Continuous operation	All models	$V_{IN,DC}$	250	300	420	Vdc
DC Transient (100ms)	All models	$V_{IN,trans}$	-	-	450	Vdc
Maximum Output Power	All models	$P_{O,max}$	-	-	250	W
Isolation Voltage						
Input to output	All models		2700	-	-	Vdc
Operating Baseplate Temperature	All models	TC	-20	-	+100	^{O}C
Start up Baseplate Temperature	All models		-40	-	+100	^{O}C
Storage Temperature	All models	T_{STG}	-55	-	+125	^{O}C
Operating Humidity (non-condensing)	All models		15	-	95	%
MTBF	All models		0.3	-	-	10^{6} Hr
Altitude						
Operating	All models		-	-	10,000	feet
Storage	All models		-	-	30,000	feet

Input Specifications

Table 2. Input Specifications:

Parameter		Conditions	Symbol	Min	Typ	Max	Unit
Continuous Operating Input Voltage		All	$V_{IN,DC}$	250	300	420	Vdc
Transient (100ms) Input Voltage		All	$V_{IN,\ trans}$	-	-	450	Vdc
Input Under Voltage Power On Power Off		 All All	 $V_{IN,DC}$ $V_{IN,DC}$	 228 213	 - -	 246 231	 Vdc Vdc
Input Voltage Rise Time		All	Tr	1	-	-	mS
Input Current[1]	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	$I_{IN,max}$	-	0.5 0.9 1.1 1.3 1.3 1.3	0.7 1.1 1.4 1.7 1.7 1.7	A A A A A A
Break Regulation		All		-	215	245	V
CLK IN Frequency Voltage Level		 All Internal AC coupled		 760 3.3	 - -	 840 5.5	 KHz V_{PK-PK}
Enable Positive Logic Low Logic - Module Off High Logic - Module On		 Without suffix "N"	 V_{EN} V_{EN}	 0 2	 - -	 0.7 5	 V V
Enable Negative Logic Low Logic - Module On High Logic - Module Off		 With suffix "N"	 V_{EN} V_{EN}	 0 2	 - -	 0.7 5	 V V
Enable Low Sourced Current		V_{enable} = 0.7V		-	-	150	uA
Turn-On Delay		All		-	-	30	mS
No load Input Power		All		-	-	5	W
Turn-On Time		$I_O = I_{O,max}$ V_O within 1%; No external output capacitance		-	-	100	mS
Efficiency @25^{O}C	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	$V_{IN} = V_{IN,nom}$, $I_O = I_{O,max}$ V_O=5V	η	79 81 86 85 86 86	80 82 88 86 87 87	- - - - - -	% % % % % %
Input Capacitance		All		-	0.2	0.27	uF

Note 1 - An input line fuse is recommended for use (e.g. Littelfuse type, 10A 250V FB). An input capacitor of 120uF/450Vmin is required.

Output Specifications

Table 3. Output Specifications:

Parameter		Condition	Symbol	Min	Typ	Max	Unit
Output Voltage Setpoint	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	$V_{IN,min}$ to $V_{IN,max}$: $I_O = I_{O,max}$; $T_{amb} = 25^oC$	$V_{O,set}$	1.782 3.267 4.950 11.88 14.85 23.76	- - - - - -	1.818 3.333 5.050 12.12 15.15 24.24	V V V V V V
Output Line Regulation	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	$V_{O,line}$	- - - - - -	- - - - - -	10 10 0.2 0.2 0.2 0.2	mV mV % % % %
Output Load Regulation	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	$V_{O,load}$	- - - - - -	- - - - - -	10 10 0.2 0.2 0.2 0.2	mV mV % % % %
Output Voltage Adjust	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	-Vadj	49 49 72.5 78.4 78.4 78.4	50 50 74 80 80 80	51 51 75.5 81.6 81.6 81.6	$\%V_O$ $\%V_O$ $\%V_O$ $\%V_O$ $\%V_O$ $\%V_O$
Output Voltage Adjust	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	+Vadj	107.8 112.7 117.6 117.6 117.6 117.6	110 115 120 120 120 120	112.2 117.3 122.4 122.4 122.4 122.4	$\%V_O$ $\%V_O$ $\%V_O$ $\%V_O$ $\%V_O$ $\%V_O$
Output Ripple and Noise	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	5 Hz to 20MHz	V_O	- - - - - -	- - - - - -	120 120 120 240 300 480	mV_{PK-PK} mV_{PK-PK} mV_{PK-PK} mV_{PK-PK} mV_{PK-PK} mV_{PK-PK}
External Load Capacitance	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	C_O	- - - - - -	- - - - - -	18000 18000 10000 140000 140000 140000	uF uF uF uF uF uF

Output Specifications

Table 3. Output Specifications, con't:

Parameter		Condition	Symbol	Min	Typ	Max	Unit
Switching Frequency		All	f	340	400	440	KHz
Output Power	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	Po	- - - - - -	- - - - - -	99 180 240 250 250 250	W W W W W W
Output Current	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	I_O	0 0 0 0 0 0	- - - - - -	50 50 40 20.8 16.6 10.4	A A A A A A
Current Share Accuracy		Cshare connected together, $I_O \geq 80\%I_{O,max}$		-	± 5	± 10	$\%I_O$
Number of Parallel Unit[5]		All		-	-	10	
Over Current Protection (Constant Current)		V_O = 97% V_{O,set_nom}	Io	105	110	120	$\%I_{O,max}$
Short Circuit Current (Hiccup Mode)		All		-	-	150	$\%I_{O,max}$
Over Voltage Protection Level (Latch Mode)	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	All	$\%V_O$	120 125 125 120 120 120	125 130 130 125 125 125	130 135 135 130 130 130	%
Over Temperature Protection	Trip Point	All		105	-	120	^OC
Output Current Monitor C_{mon} at $I_{O,max}$ C_{mon} at $20\%I_{O,max}$ Monitored I_O Range C_{mon} Open-circuit Voltage		 All All All All		 0.9 0.1 20 -	 1.0 0.2 - -	 1.1 0.3 100 10	 mA mA $\%I_{O,max}$ Vdc
Internal Temperature Monitor Tmon@27degC baseplate Temperature Coefficient Source Impedance		 All All All		 2.97 9.8 -	 3.0 10.0 1	 3.03 10.2 -	 V $mV/^OC$ Kohm
Temperature Coefficient		T_C = -40^{O}C to 100^{O}C		-	-	0.02	$\%V_O/^OC$

Output Specifications

Table 3. Output Specifications, con't:

Parameter		Condition	Symbol	Min	Typ	Max	Unit
V_O Dynamic Response	AIH50Y300 AIH50F300 AIH40A300 AIH20B300 AIH16C300 AIH10H300	25% to 75% load change @ 1A/uS recovery to 1%V_O $V_{IN} = V_{IN,nom}$ $T_{amb} = 25^OC$	V_O	- - - - - -	- - - - - -	200 200 300 600 750 1200	mV mV mV mV mV mV
Settling Time		25% to 75% load change @ 1A/uS $V_{IN=}V_{IN,nom}$ $T_A = 25^OC$	T_S	-	-	250	uS
Turn-on Output Voltage Overshoot[3]		$I_O = I_{O,max}$ $T_A = 25^OC$	$\%V_O$	-	3	5	%

Note 2 - For AIH20B300 only, external capacitance of 470uF should be added. Refer to Figures31, and 32.
Note 3 - No external output capacitor

AIH50Y300 Performance Curves

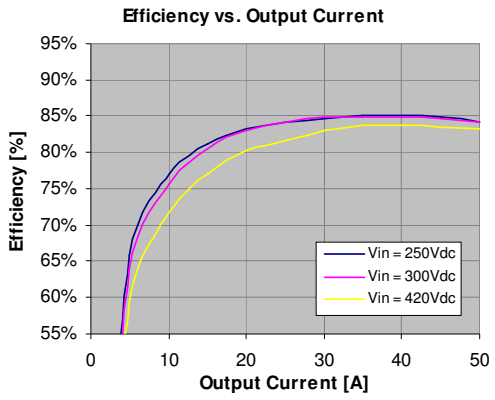


Figure 1: AIH50Y300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 50A
Ambient Temperature (T_{amb}) = 25°C

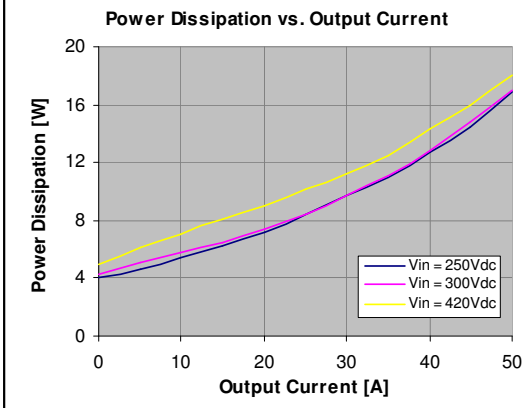


Figure 2: AIH50Y300 Power Dissipation Curves vs Load Current
Io = 10% increment to 50A
Ambient Temperature (T_{amb}) = 25°C

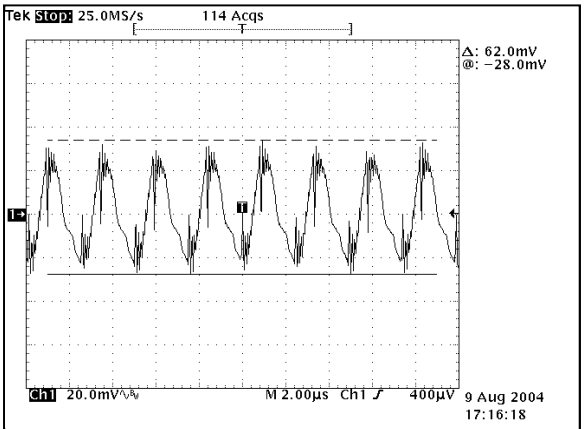


Figure 3: AIH50Y300 Output Ripple Waveform - Vin = 300Vdc
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

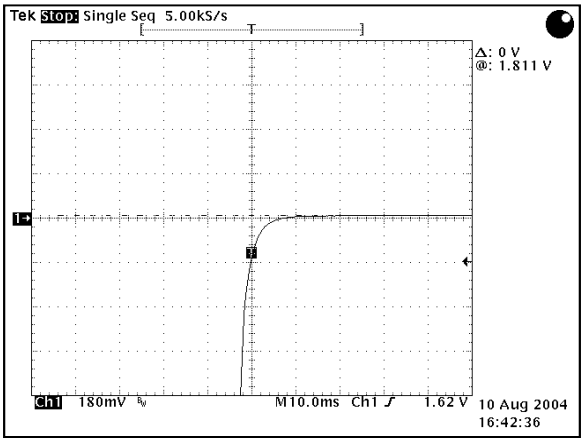


Figure 4: AIH50Y300 Overshoot Waveform - Vin = 300Vdc
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

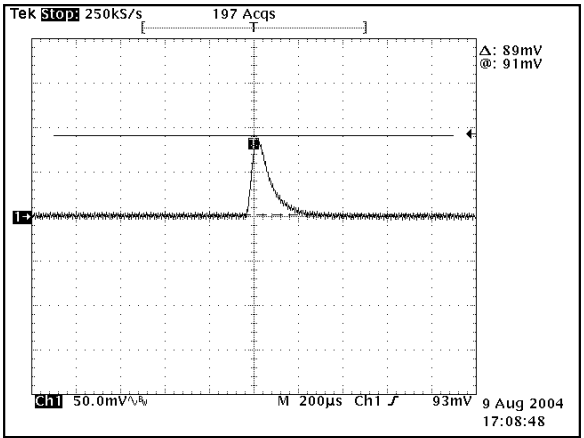


Figure 5: AIH50Y300 Transient Response - Vo Deviation (high to low)
75%-50% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

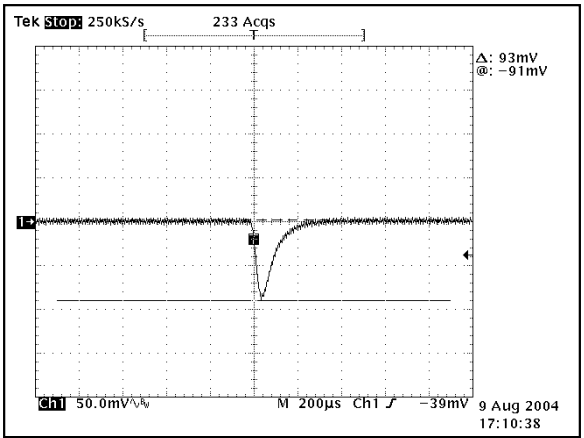


Figure 6: AIH50Y30 Transient Response - Vo Deviation (low to high)
50%-75% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

AIH50Y300 Performance Curves

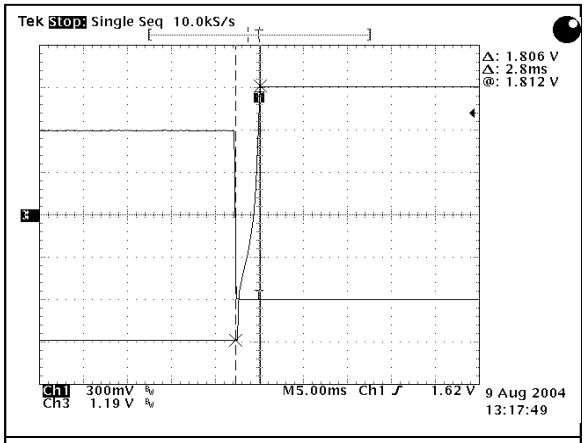


Figure 7: AIH50Y300 Turn-on Time (Enable to Output)
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: V_enable Ch 1: Vo

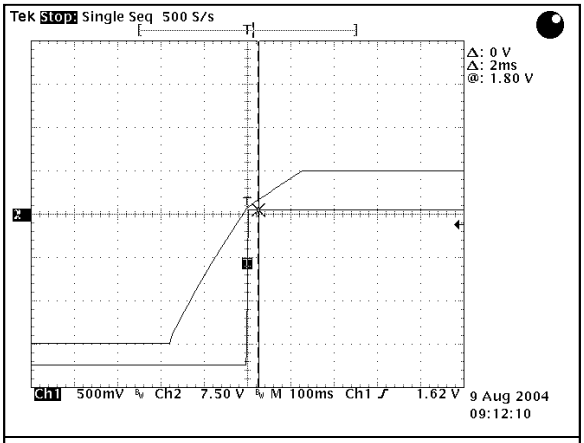


Figure 8: AIH50Y300 Turn-on Time (Input to Output)
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 2: Vin Ch 1: Vo

AIH50F300 Performance Curves

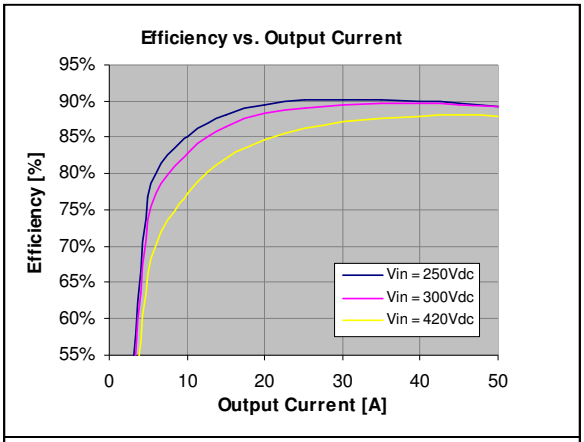


Figure 9: AIH50Y300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 50A
Ambient Temperature (T_{amb}) = 25°C

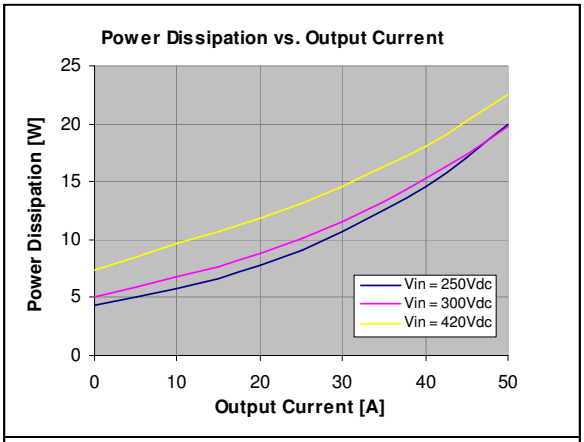


Figure 10: AIH50Y300 Power Dissipation Curves vs Load Current
Io = 10% increment to 50A
Ambient Temperature (T_{amb}) = 25°C

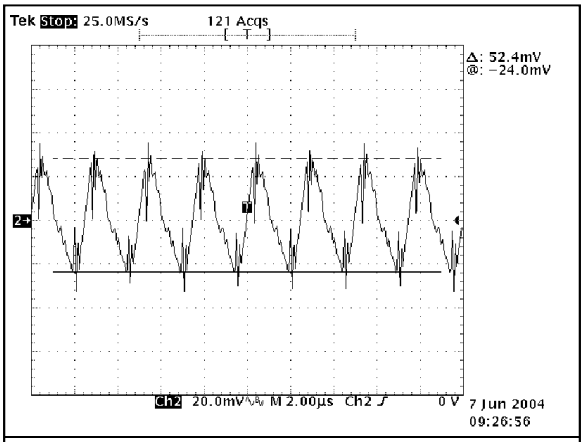


Figure 11: AIH50F300 Output Ripple Waveform - Vin = 300Vdc
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

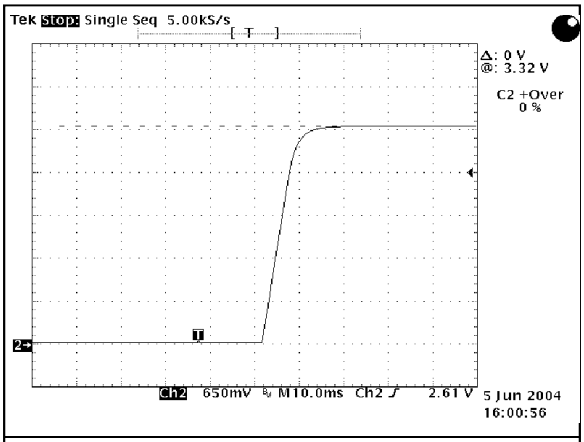


Figure 12: AIH50F300 Overshoot Waveform - Vin = 300Vdc
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: CLK OUT

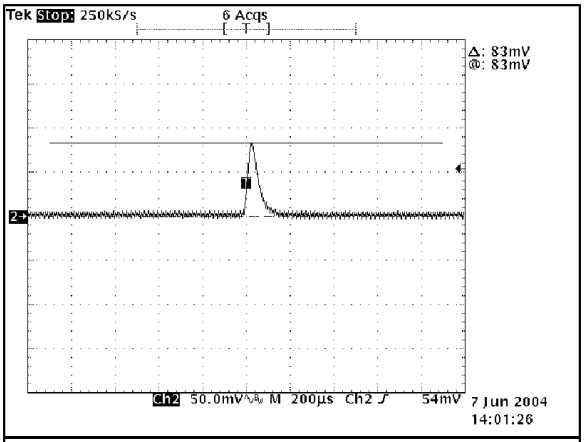


Figure 13: AIH50F300 Transient Response - Vo Deviation (high to low)
75%-50% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

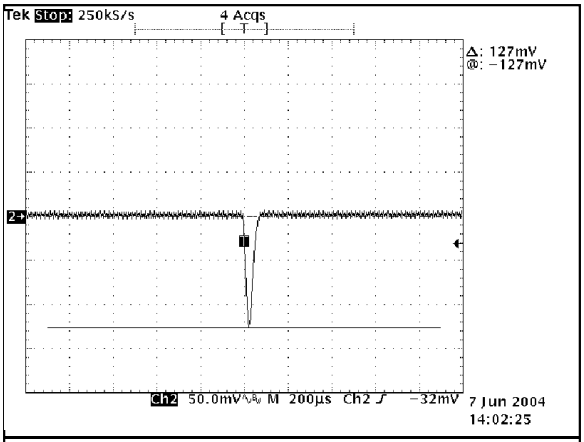


Figure 14: AIH50F300 Transient Response - Vo Deviation (low to high)
50%-75% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

AIH50F300 Performance Curves

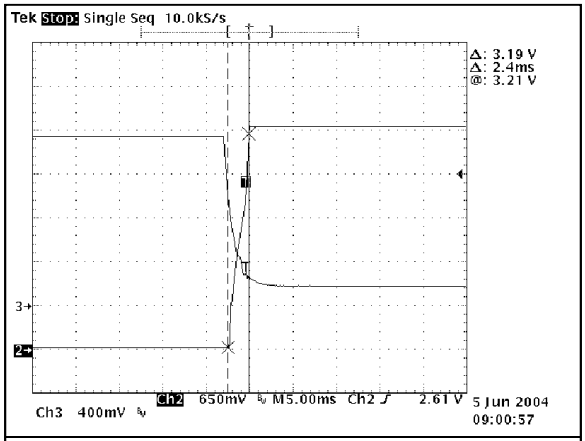


Figure 15: AIH50F300 Turn-on Time (Enable to Output)
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: V_enable Ch 2: Vo

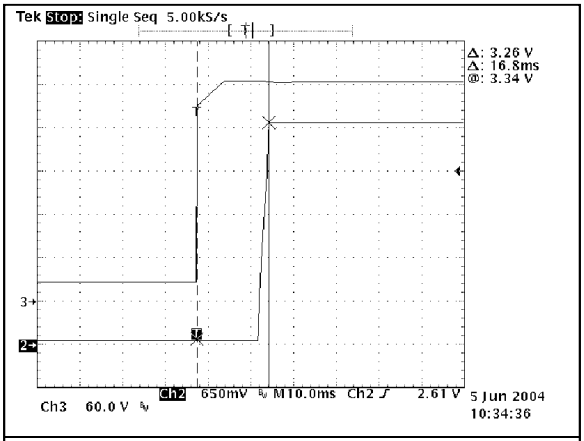


Figure 16: AIH50F300 Turn-on Time (Input to Output)
Full Load: Io = 50A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: Vin Ch 2: Vo

AIH40A300 Performance Curves

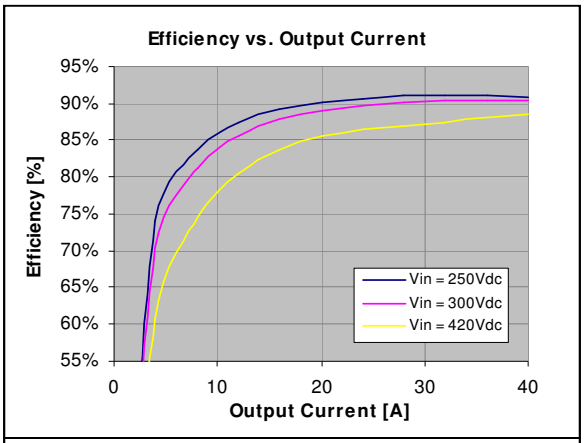


Figure 17: AIH40A300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 40A
Ambient Temperature (T_{amb}) = 25°C

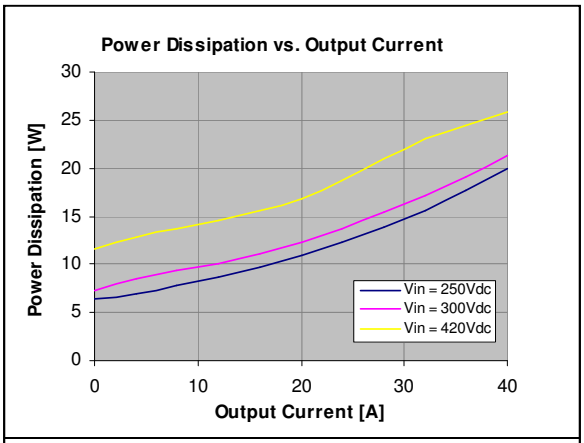


Figure 18: AIH40A300 Power Dissipation Curves vs Load Current
Io = 10% increment to 50A
Ambient Temperature (T_{amb}) = 25°C

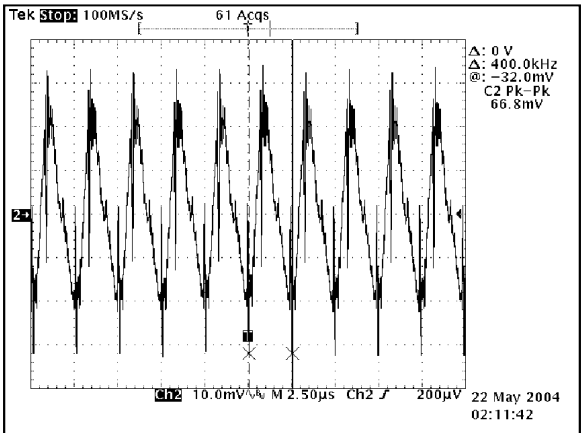


Figure 19: AIH40A300 Output Ripple Waveform - Vin = 300Vdc
Full Load: Io = 40A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

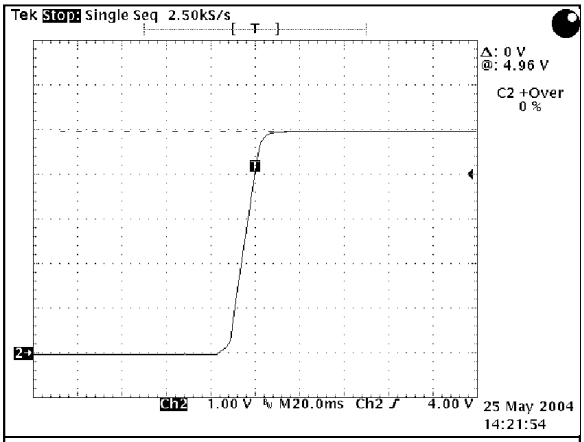


Figure 20: AIH40A300 Overshoot Waveform - Vin = 300Vdc
Full Load: Io = 40A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: CLK OUT

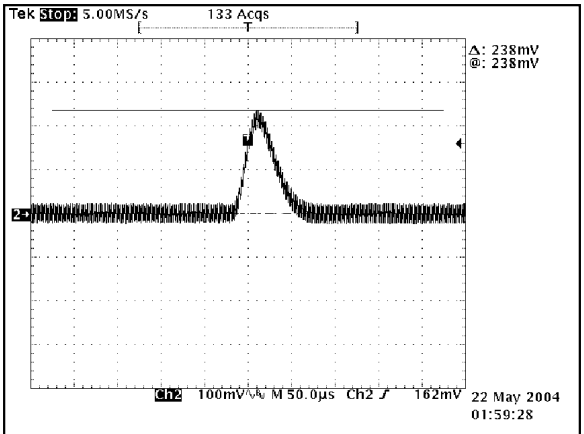


Figure 21: AIH40A300 Transient Response - Vo Deviation (high to low)
75%-50% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

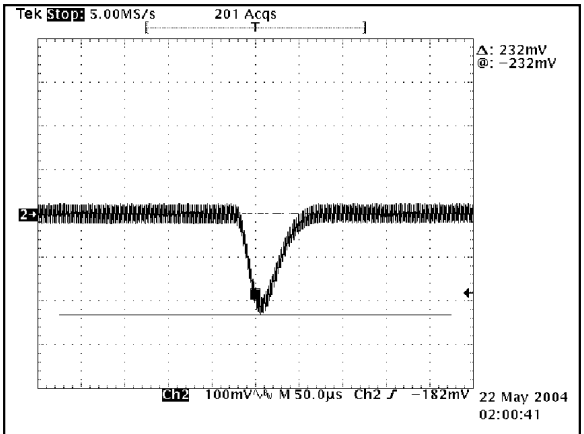


Figure 22: AIH40A300 Transient Response - Vo Deviation (low to high)
50%-75% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

AIH40A300 Performance Curves

TBD

Figure 23: AIH40A300 Turn-on Time (Enable to Output)
Full Load: Io = 40A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: V_enable Ch 2: Vo

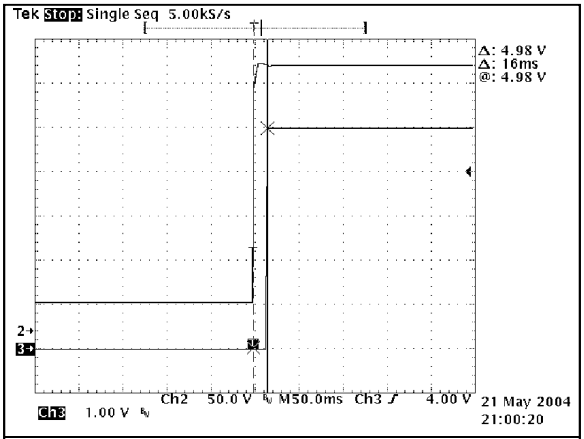


Figure 24: AIH40A300 Turn-on Time (Input to Output)
Full Load: Io = 40A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: Vin Ch 2: Vo

AIH20B300 Performance Curves

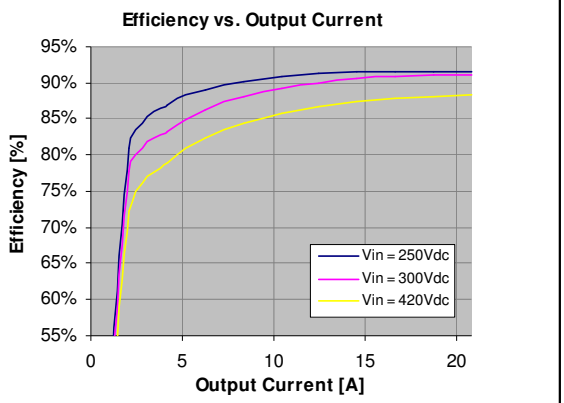


Figure 25: AIH20B300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 20A
Ambient Temperature (T_{amb}) = 25°C

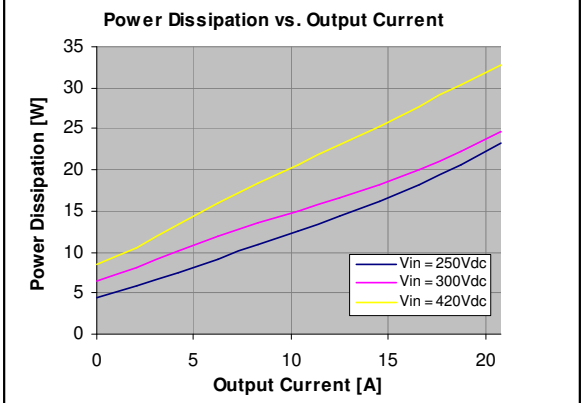


Figure 26: AIH20B300 Power Dissipation Curves vs Load Current
Io = 10% increment to 20A
Ambient Temperature (T_{amb}) = 25°C

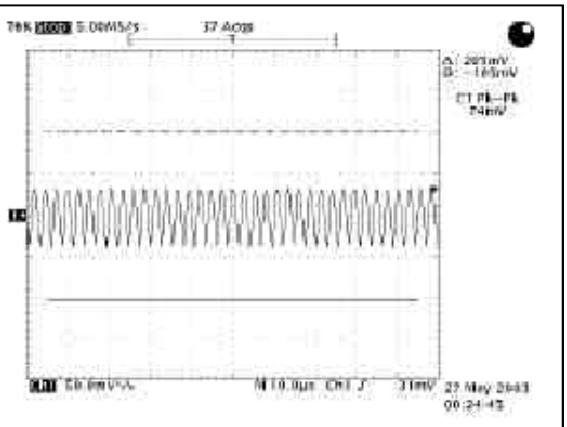


Figure 27: AIH20B300 Output Ripple Waveform - Vin = 300Vdc
Full Load: Io = 20A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

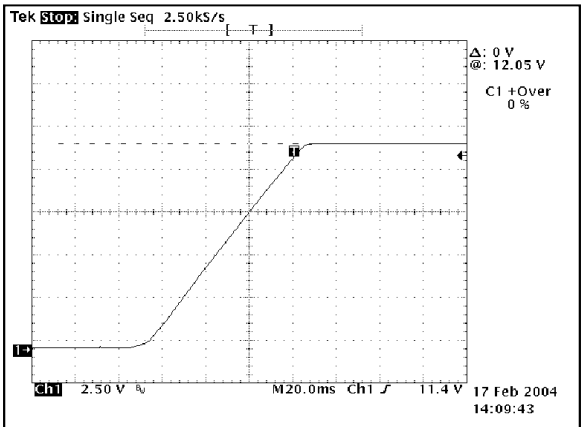


Figure 28: AIH20B300 Overshoot Waveform - Vin = 300Vdc
Full Load: Io = 20A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: CLK OUT

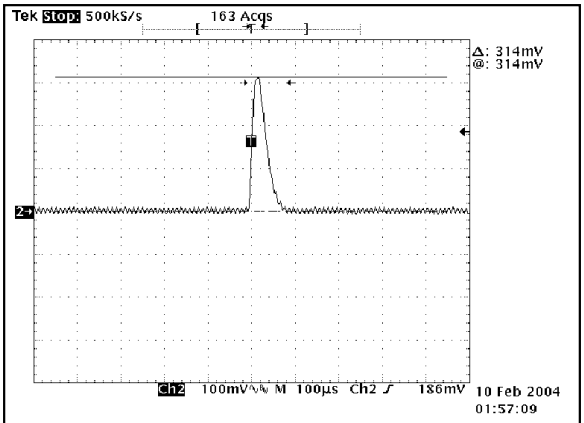


Figure 29: AIH20B300 Transient Response - Vo Deviation (high to low)
75%-50% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

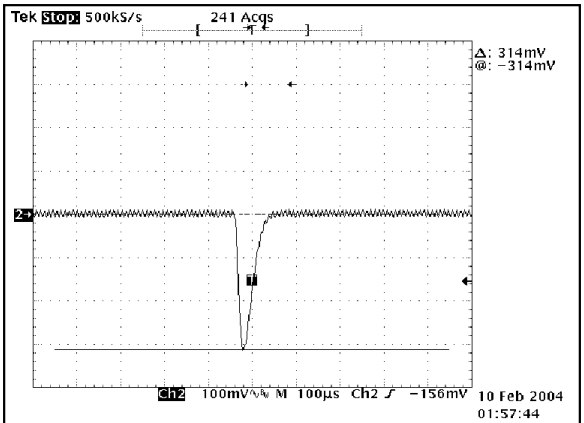


Figure 30: AIH20B300 Transient Response - Vo Deviation (low to high)
50%-75% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

AIH20B300 Performance Curves

TBD

Figure 31: AIH20B300 Turn-on Time (Enable to Output)
Full Load: Io = 20A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: V_enable Ch 2: Vo

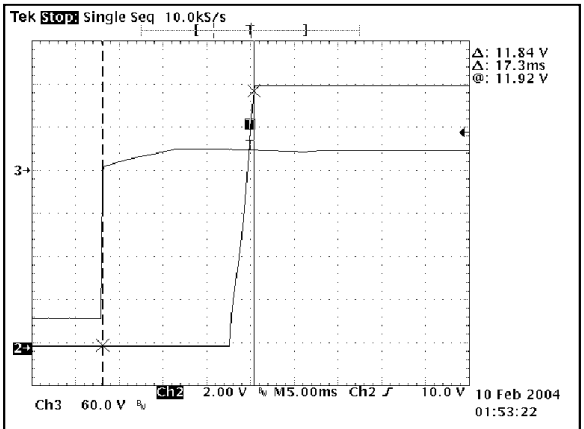


Figure 32: AIH20B300 Turn-on Time (Input to Output)
Full Load: Io = 20A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: Vin Ch 2: Vo

AIH16C300 Performance Curves

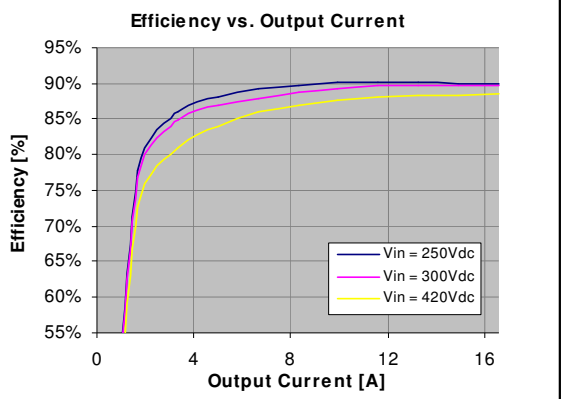


Figure 33: AIH16C300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 16A
Ambient Temperature (T_{amb}) = 25°C

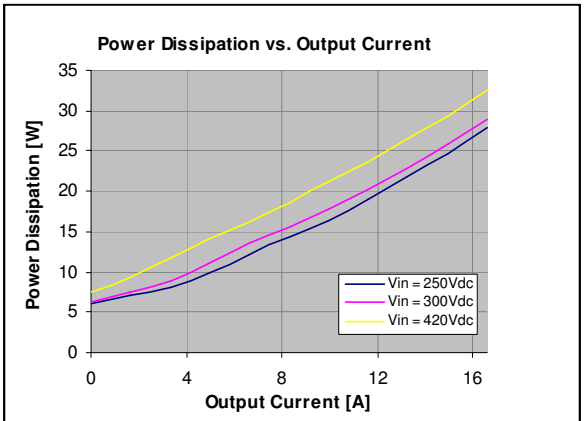


Figure 34: AIH16C300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 16A
Ambient Temperature (T_{amb}) = 25°C

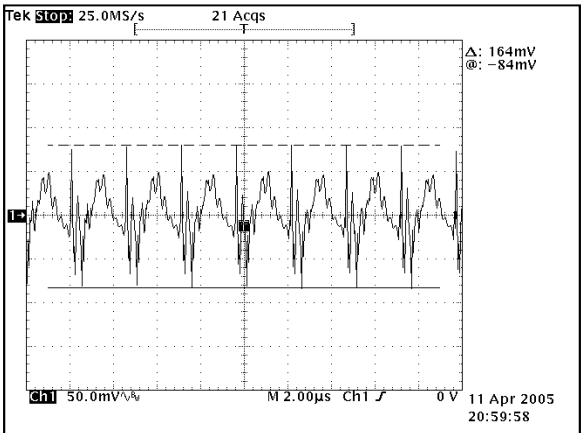


Figure 35: AIH16C300 Output Ripple Waveform - Vin = 300Vdc
Full Load: Io = 16A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

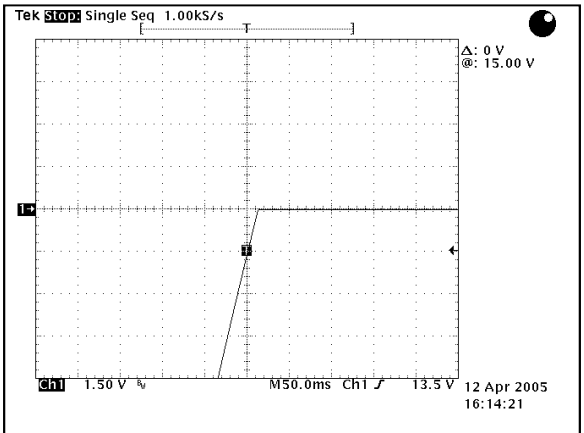


Figure 36: AIH16C300 Overshoot Waveform - Vin = 300Vdc
Full Load: Io = 16A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: CLK OUT

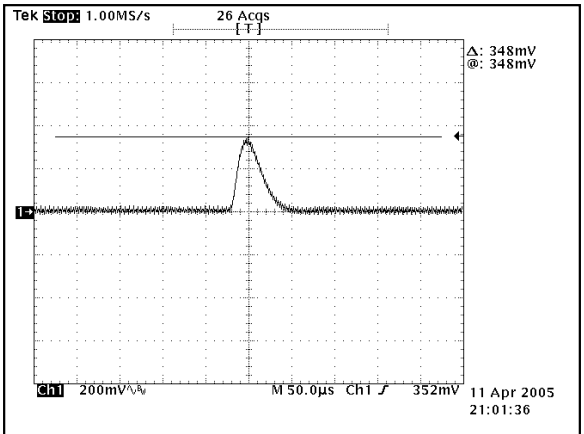


Figure 37: AIH16C300 Transient Response - Vo Deviation (high to low)
75%-50% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

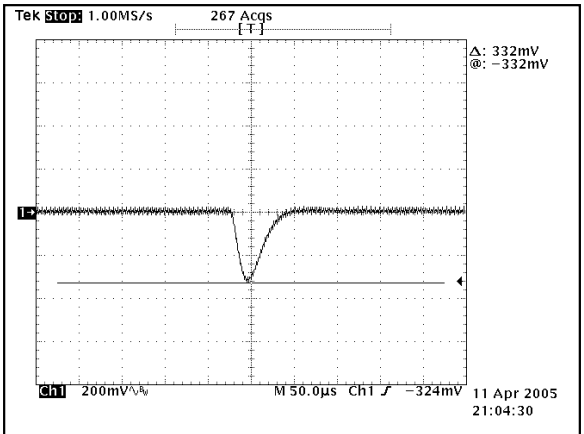


Figure 38: AIH16C300 Transient Response - Vo Deviation (low to high)
50%-75% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

AIH16C300 Performance Curves

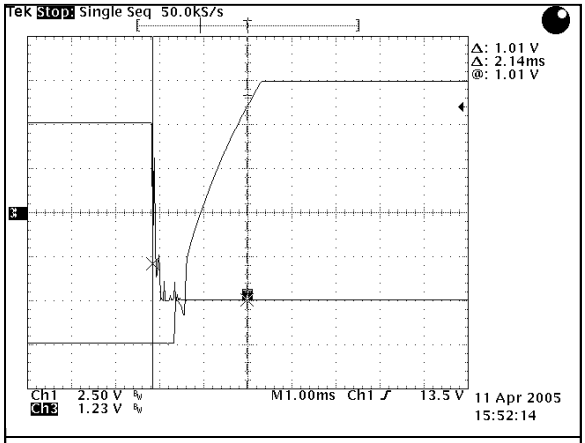


Figure 39: AIH16C300 Turn-on Time (Enable to Output)
Full Load: Io = 16A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: V_enable Ch 2: Vo

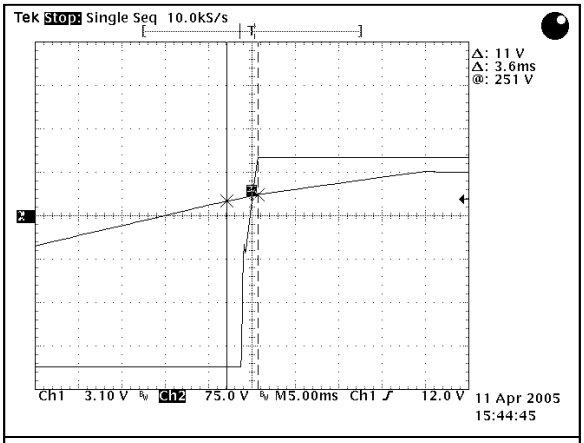


Figure 40: AIH16C300 Turn-on Time (Input to Output)
Full Load: Io = 16A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: Vin Ch 2: Vo

AIH10H300 Performance Curves

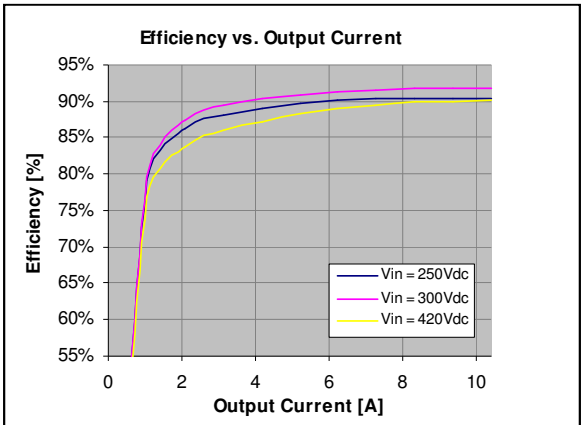


Figure 41: AIH10H300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 10A
Ambient Temperature (T_{amb}) = 25°C

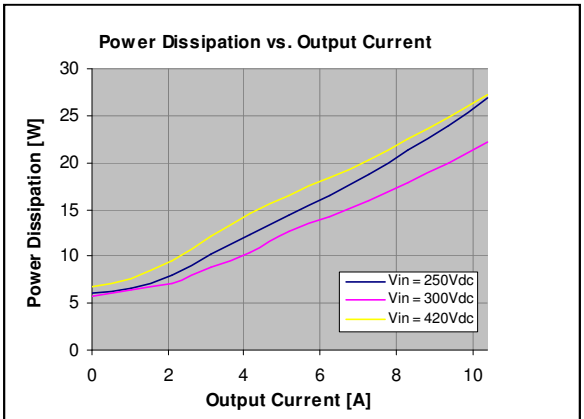


Figure 42: AIH10H300 Efficiency Curves vs Load Current at Ambient
Io = 10% increment to 10A
Ambient Temperature (T_{amb}) = 25°C

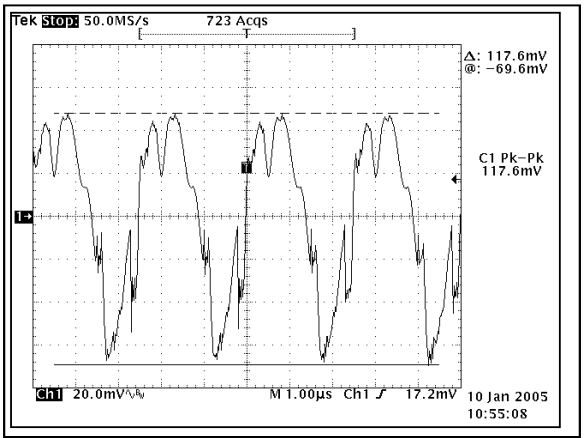


Figure 43: AIH10H300 Output Ripple Waveform - Vin = 300Vdc
Full Load: Io = 10A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: Vo

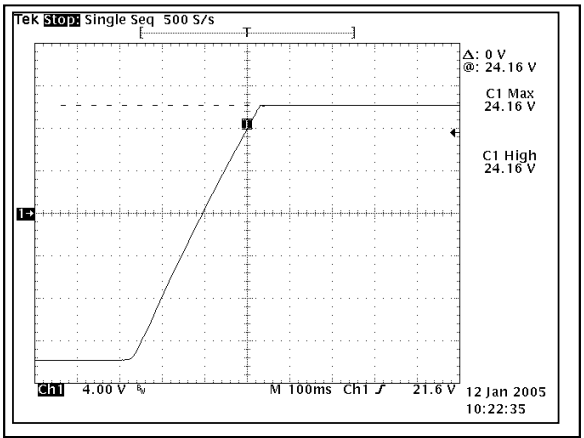


Figure 44: AIH10H300 Overshoot Waveform - Vin = 300Vdc
Full Load: Io = 10A, Ambient Temperature (T_{amb}) = 25°C
Ch 1: CLK OUT

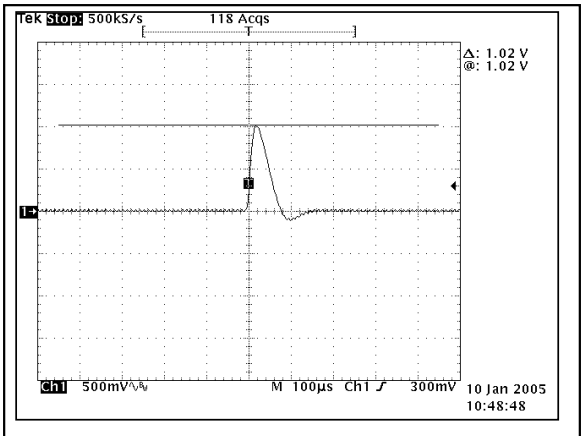


Figure 45: AIH10H300 Transient Response - Vo Deviation (high to low)
75%-50% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

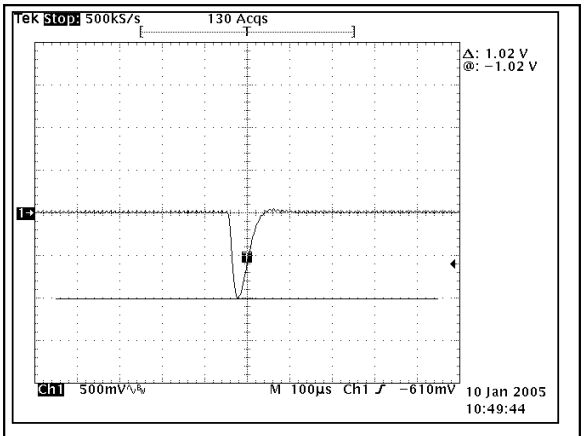


Figure 46: AIH10H300 Transient Response - Vo Deviation (low to high)
50%-75% load change, 0.1A/uS slew rate, Vin = 390Vdc
Ch 1: Vo

AIH10H300 Performance Curves

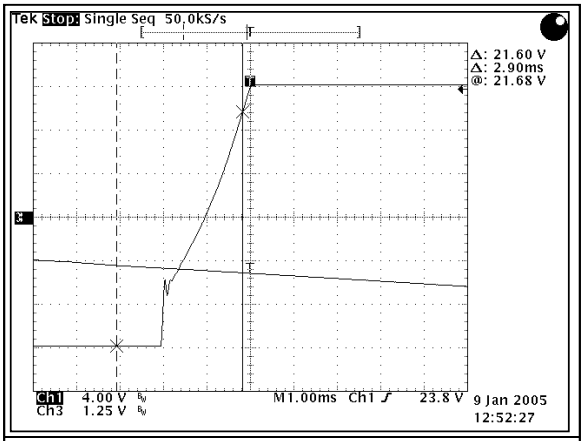


Figure 47: AIH16C300 Turn-on Time (Enable to Output)
Full Load: Io = 10A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: V_enable Ch 2: Vo

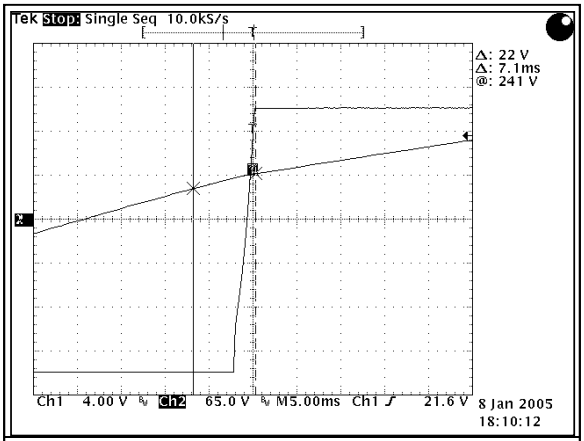
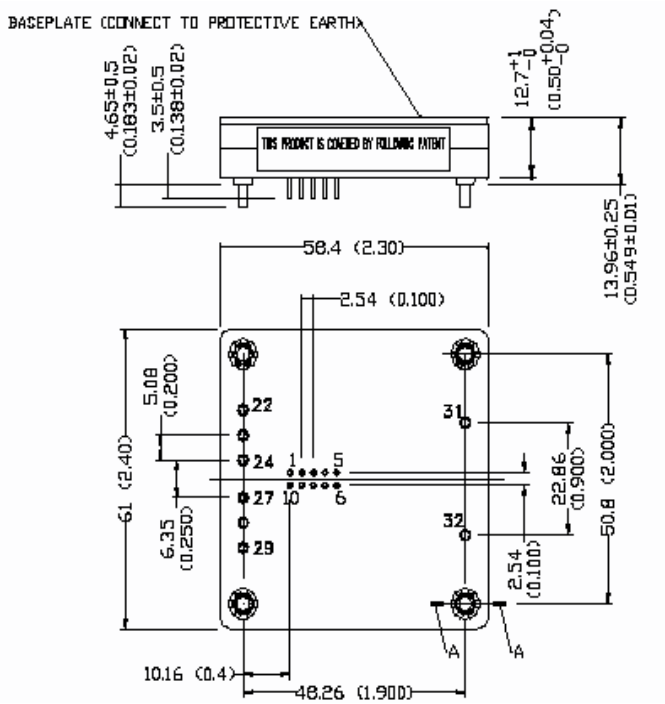


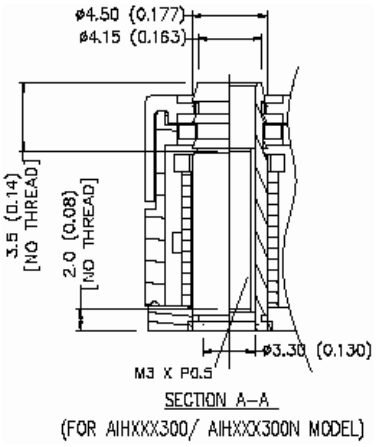
Figure 48: AIH16C300 Turn-on Time (Input to Output)
Full Load: Io = 10A, Ambient Temperature (T_{amb}) = 25°C
Ch 3: Vin Ch 2: Vo

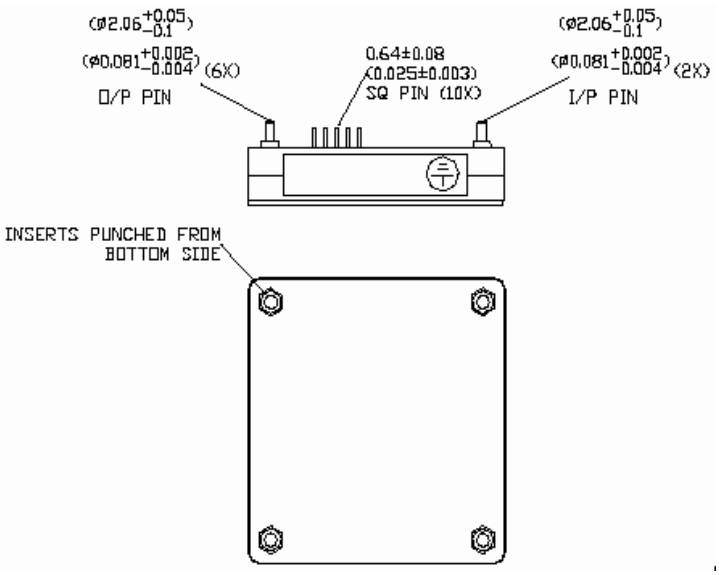
Mechanical Specifications

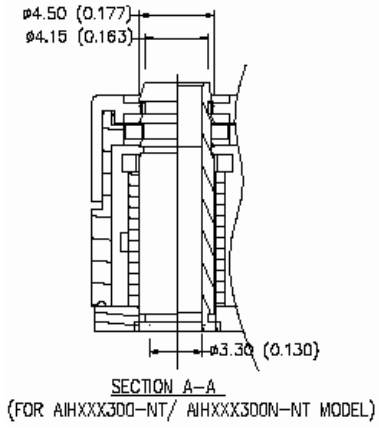
Unit: mm (inch)

Mechanical Outlines









Connector Definitions

Parameter	Device	Symbol	Min	Typ	Max	Unit
Dimension	All	L	-	2.30 58.4]	-	in [mm]
		W	-	2.40 [61.0]	-	in [mm]
		H	-	0.50 [12.7]	-	in [mm]

Pin Assignments		
Input	**Output**	**Control Pins**
31. Positive	22. Positive	1. +SENSE
32. Negative	23. Positive	2. TEMP MON
	24. Positive	3. C MON
	27. Negative	4. C SHARE
	28. Negative	5. SDA
	29. Negative	6. SCL
		7. CLK IN
		8. V ADJ
		9. ENABLE
		10. - SENSE

Weight

The AIH 300 Vin series weight is 0.35lbs/160g typically.

Environmental Specifications

EMI Emissions

The AIH300 Vin has been designed to comply with the Class A limits of EMI requirements of EN55022 (FCC Part 15) and CISPR 22 for emissions and relevant sections of EN61000 (IEC 61000) for immunity. This is a system test and not a component level test. An additional input filter is needed in order to pass this test. Also the unit is enclosed inside a metal box, tested at 600W using resistive load with cooling fan.

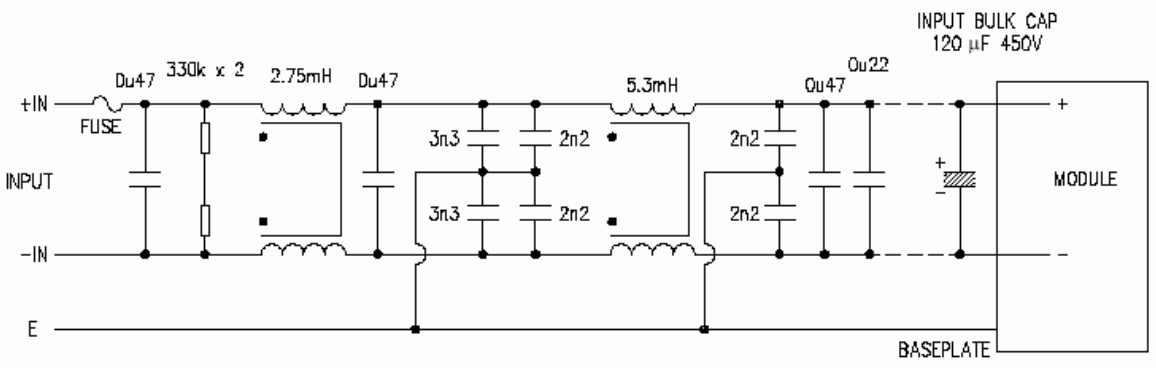
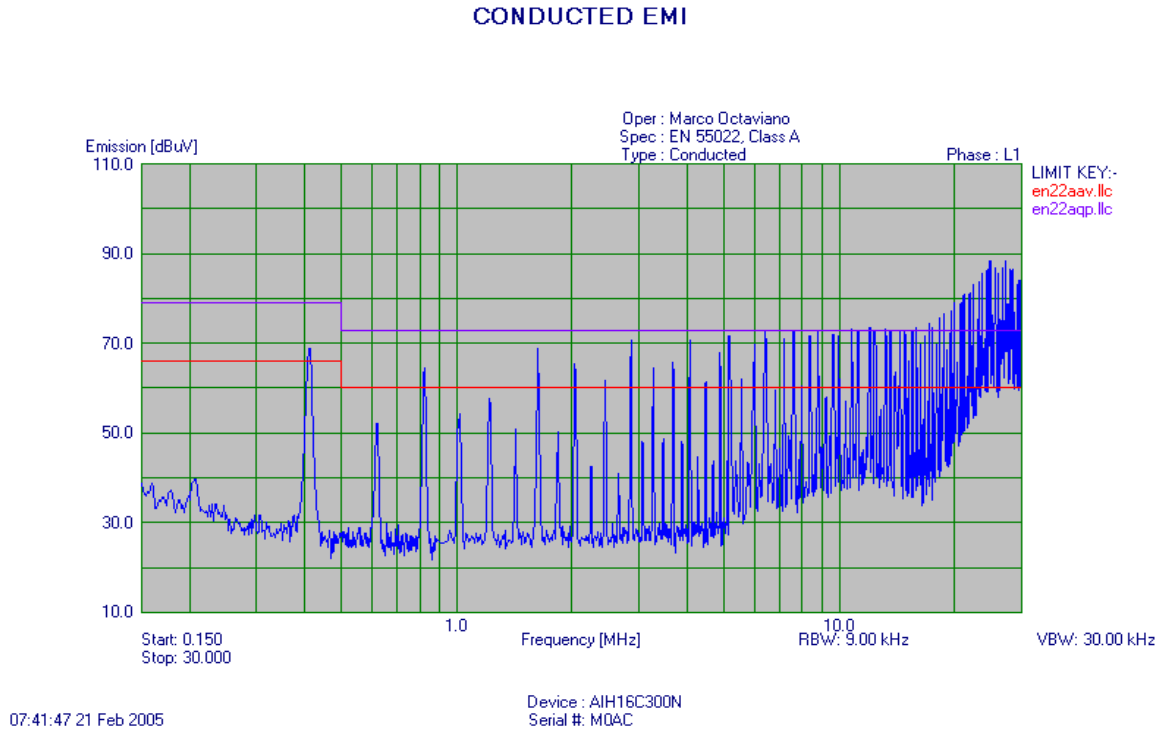


Figure 49. EMI Filter Schematic

NOTE: FCC Part 15 Sub-part B Class A and CISPR22 Third Edition 1997-11 Class A. This is a system test and not a component level test.

Conducted Emissions



Isolation Specifications

Parameter	Device	Symbol	Min	Typ	Max	Unit
Isolation Capacitance	All		-	800	-	PF
Isolation Resistance	All		10	-	-	Mohm

Insulation Specifications

Parameter	Min	Typ	Max	Unit
Input to Output @ 500VDC	10	-	-	Mohm
Input to Baseplate @ 500VDC	10	-	-	Mohm
Output to Baseplate @ 500VDC	10	-	-	Mohm
Input to Output Capacitance	-	800	-	Mohm

General Specification

Parameter	Min	Typ	Max	Unit
Predicted MTBF Based on Telcodia SR-332, Method 1, Case 3 (Part Stress)	0.3	-	-	Mohm
Demonstrated MTBF (Vin nominal; Vo nominal; $I_{O,max}$; $T_{baseplate}$ = 40^{O}C	1	-	-	Mohm

EEPROM

The module is equipped with a 256 byte EEPROM, 24LC2BT-E/ST or equivalent. This device will be programmed during the manufacturing process. The EEPROM content will include the following information:
- Manufacturer name string “ASTEC”
- Product name and product number
- Serial number assigned by manufacturer
- Maximum output power

Safety Certifications

The AIH 300 Vin power supply is intended for inclusion in other equipment and the installer must ensure that it is in compliance with all the requirements of the end application. This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.

Safety Certifications for AIH50Y300-L power supply system:

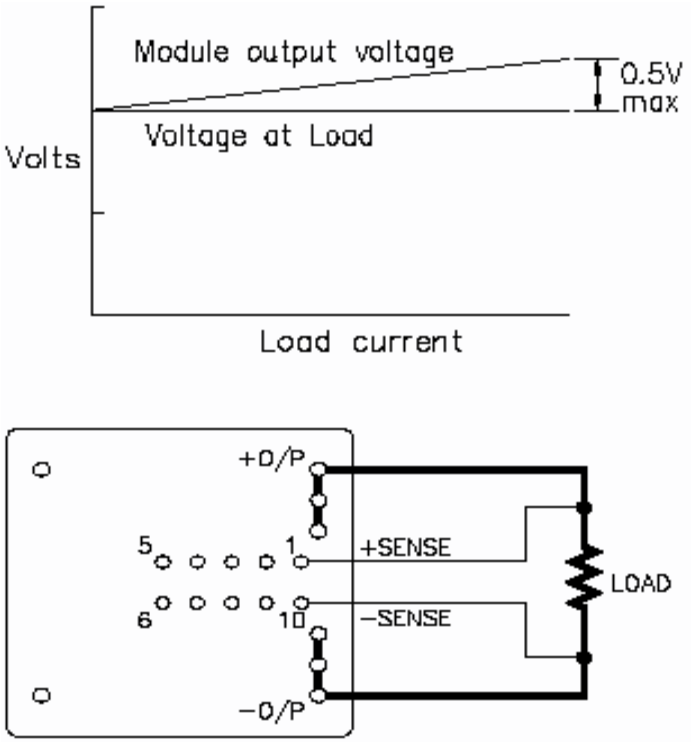
Agency	Standard	Cert. No.
CE(LVD+RoHS)	EN 60950-1:2006/A2:2013	16067
TUV-SUD	EN 60950-1/A2:2013	B 14 04 51485 01348
UL+CUL	UL60950-1 2nd Ed; CSA C22.2 No. 60950-1-07, 2nd Ed	E186249 V1 S192

Power and Control Signal Descriptions

Remote Sense (+SEMSE, -SENSE) - (pin1, pin 10)

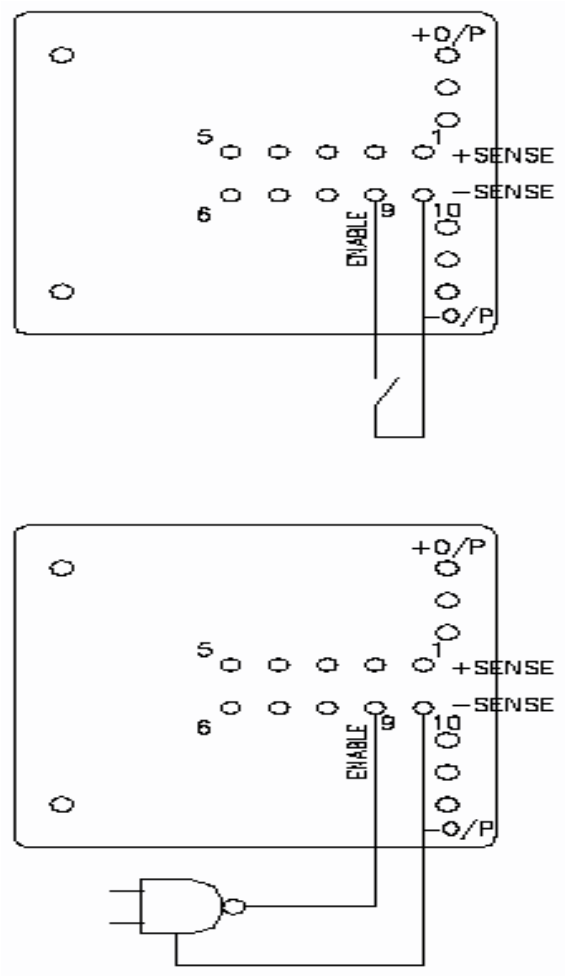
Connect the +SENSE and –SENSE pins of the module directly to the load to allow the module to compensate for the voltage drop across the conductors carrying the load current. If remote sensing is not required (for example if the load is close to the module) the sense pins should be connected directly to the module's output pins to ensure accurate regulation.

Note: If the sense leads fail open circuit, the module will revert to local sense at the output pins. Incorrect connection of sense leads may damage the module. Remote Sense compensation at nominal V_O only.



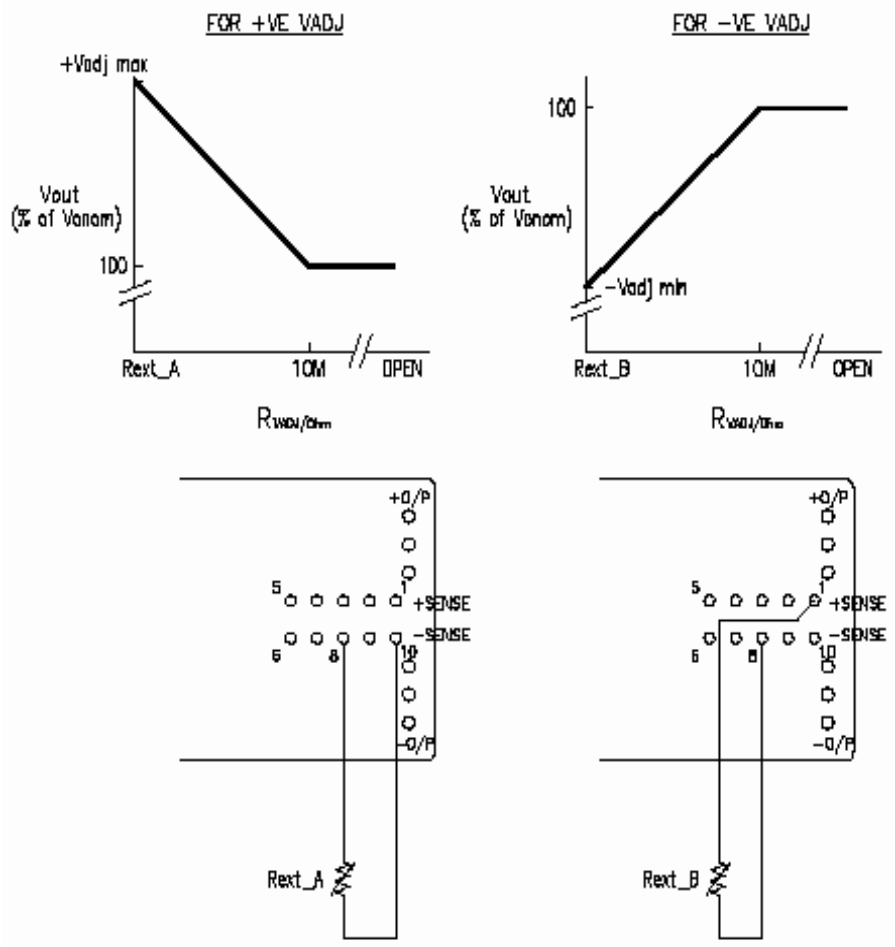
Enable Control (ENABLE) - (pin 9)

The enable pin is a TTL compatible input used to turn the output of the module on or off. For models without suffix “N”, the output is enabled when the ENABLE pin open or driven to a logic high >2V, and disabled when the ENABLE pin is connected to –SENSE or driven to a logic low of < 0.7V. For models with suffix “N”, the output is enabled when the ENABLE pin is connected to –SENSE or driven to a logic low of < 0.7V, and disabled when the ENABLE pin is open or driven to a logic high > 2V.



Output Voltage Adjustment (V ADJ) - (pin 8)

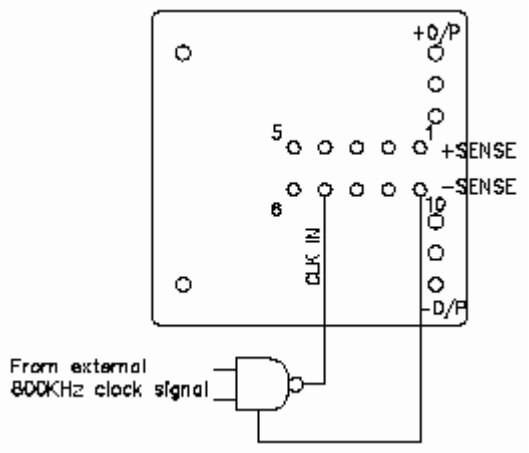
The output voltage of the module can be accurately adjusted from 80% to 120% of the nominal factory set output. Adjustment is carried out using either an external voltage source (0 to 2V, capable of sinking 1mA) or resistor (0 to 2 Kohm) connected between V ADJ and –SENSE.



Model Number	+ Vadj max / % of V_O nom	- Vadj max / % of V_O nom	Rext_A / Ohm	Rext_B / Ohm
AIH50Y300-L	110	50	0	0
AIH50F300-L	115	50	0	0
AIH40A300-L	120	74	1.2K	7.24K(8.2K/62K)
AIH20B300-L	120	80	13.5K(27K/27K)	82.5K(110K/330K)
AIH16C300-L	120	80	0	15K
AIH10H300-L	120	80	0	15K

Clock Signals (CLK IN) - (pin 7)

The module's internal clock is accurate and stable over its full operating range and synchronization is not normally required, but it can reduce noise in paralleled systems. An external clock signal of 5V pk-pk at 800 KHz ±5% can be connected to the CLK IN pins of AIH300V modules. If the clock input to any modules fails, the module will automatically switch back to its internal clock and will continues to operate normally.

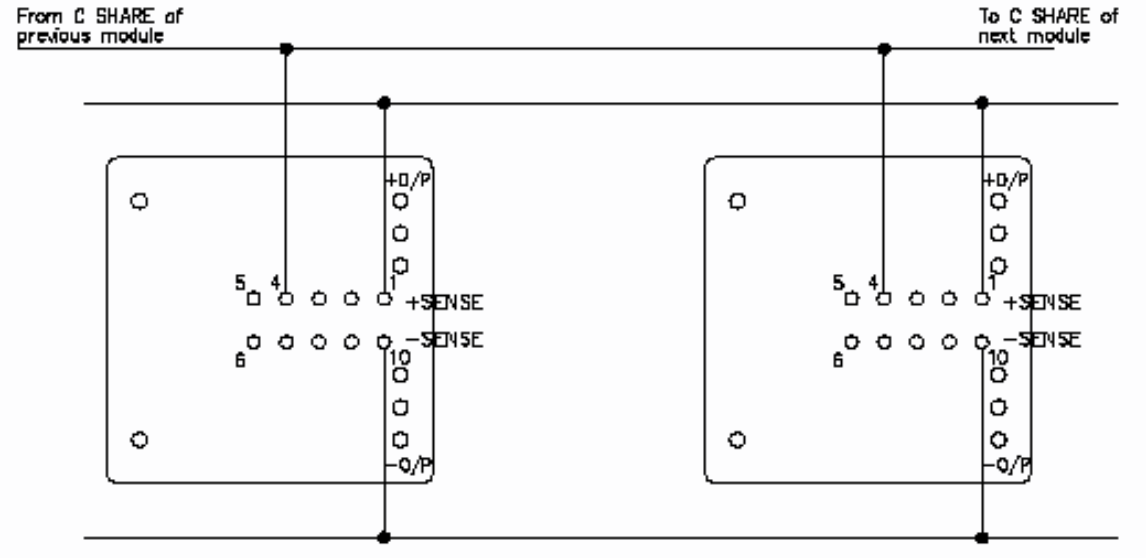


Current Share (C SHARE) - (pin 4)

To ensure that all modules in a parallel system accurately share current, the C SHARE pins on each module should be connected together.

The voltage on the C SHARE pins represents the average load current per module. Each module compares this average with its own current and adjusts its output voltage to correct the error. In this way the module maintains accurate current sharing.

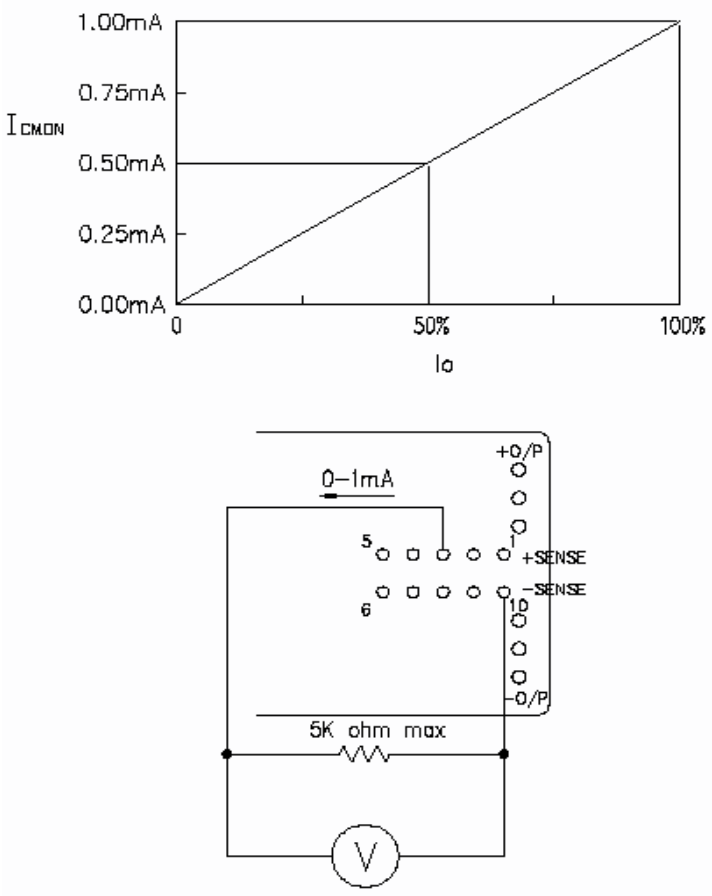
Note: The -SENSE pins of each module must also be connected together to ensure accurate current sharing.



Current Monitoring (C MON) - (pin 3)

The C MON pin provides an indication of the amount of current supplied by the module. The output of the C MON pin is a current source proportional to the output current of the module, where 0.2 mA to 1 mA is 20% to 100% $I_{o,rated}$.

The C MON output can be paralleled with C MON outputs from other modules to indicate the total current supplied in a paralleled system.

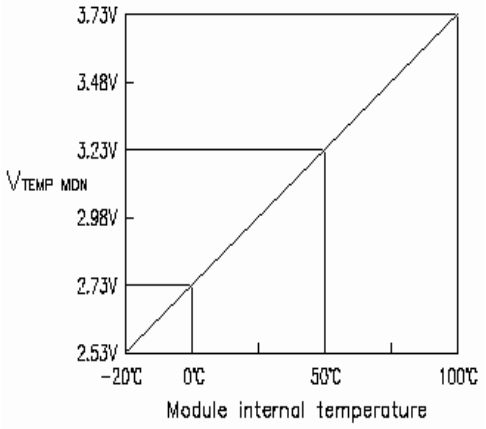


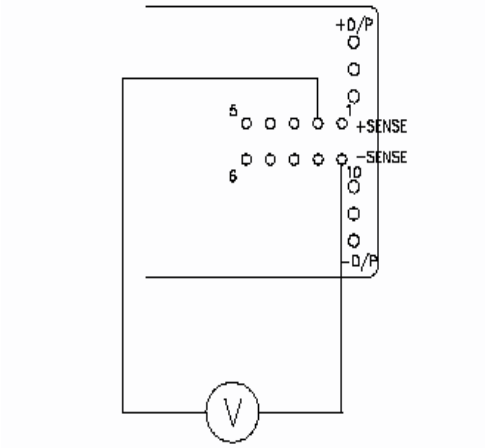
Temperature Monitoring (TEMP MON) - (pin 2)

The TEMP MON pin provides an indication of the module's internal temperature. The voltage at the TEMP MON pin is proportional to the temperature of the module baseplate at 10mV per °C, where:

Module temperature (°C) = (Vtemp mon X 100) – 273

The temperature monitor signal can be used by thermal management systems (e.g. to control a variable speed fan). It can also be used for over temperature warning circuits and for thermal design verification of prototype power supplies and heatsink.





Application Note

Basic Operation and Features

Over Current Protection(OCP)

A constant current limiting circuit protects the module under overload or short circuit conditions. Module will operate back normally once the overload/fault is removed.

Overvoltage Protection (OVP)

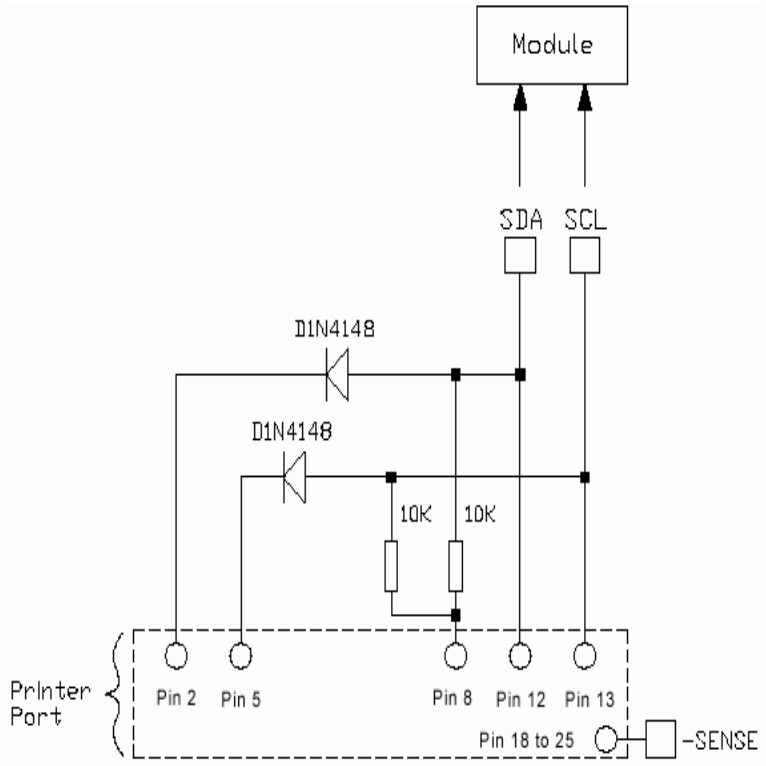
An independent overvoltage circuit monitors the module's output pins and will shut the module down in the event of an internal or external fault which causes the output voltage to rise above the preset limit. The module is reset by removing and re-applying the input power or toggle the ENABLE OFF/ON.

Over temperature Protection (OTP)

If the module's baseplate temperature exceeds 110°C, the module will be shut down. The module is reset by baseplate temperature drop between 100°C and re-applying the input power or toggle the ENABLE OFF/ON

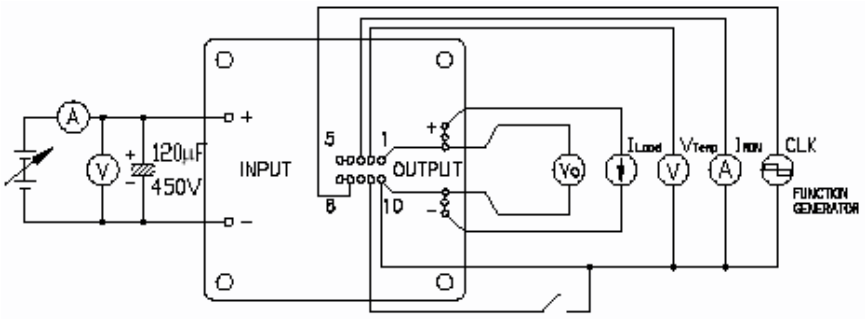
I²C EEPROM Content Programming (SDA, SCL)

This function is provided for product information storage, template as per customer define. Connect RS232 (Printer Port) from PC to Test unit at 300Vdc in and test with Read/Write capability of the I²C EEPROM.

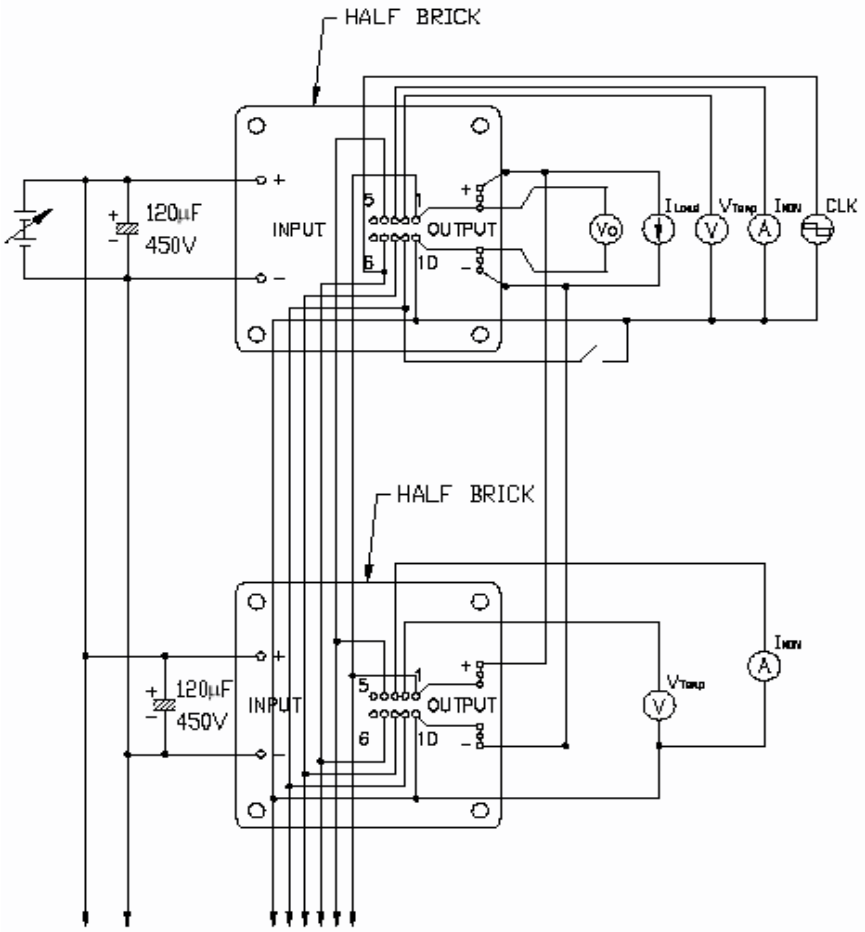


Basic Operation and Features

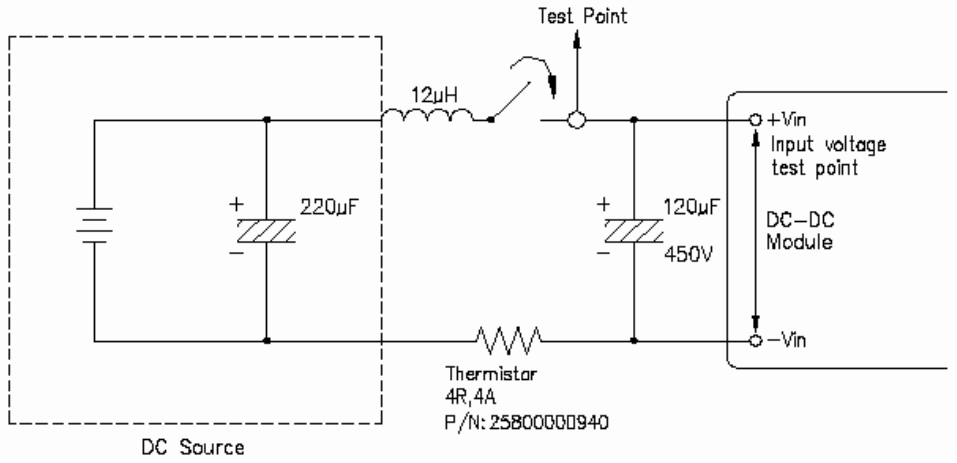
Module Connection for Single Operation



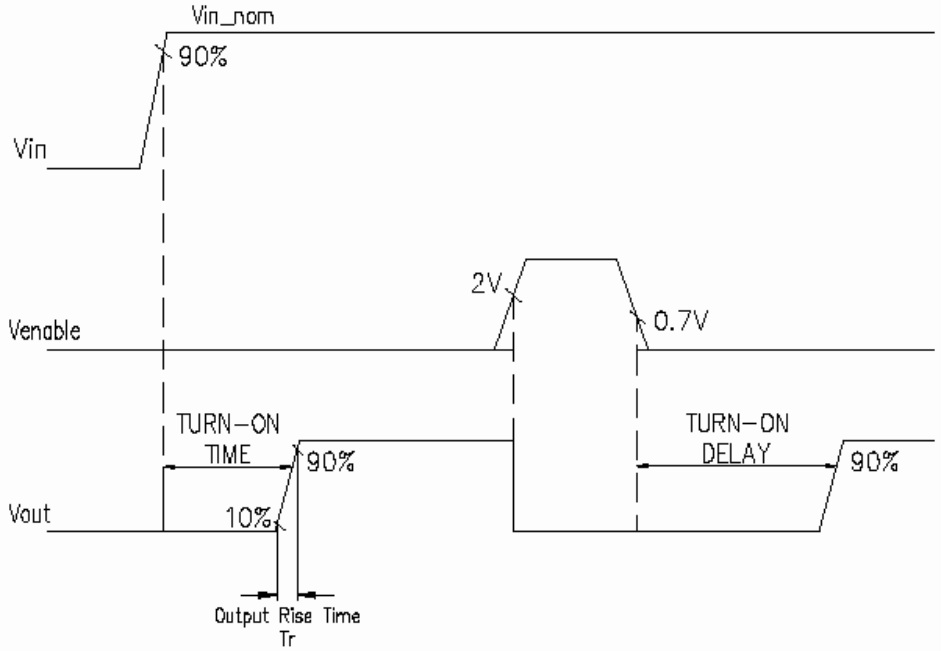
Modules Connection for Parallel Operation (View from baseplate).



Measure input voltage rise time with a simulated source inductance of 12uH

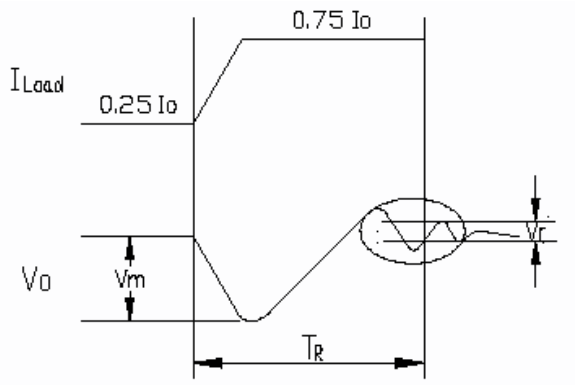


Input Voltage Rise Time



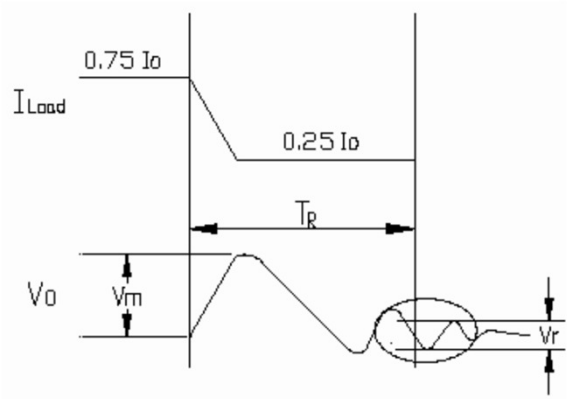
Output Response to Positive Load Step

T_R = minimum time to allow the output voltage, Vo, to settle to within the specified limits, measured from the time the load current starts to rise.
V_r = final output value tolerance band
V_m = maximum excursion (deviation)



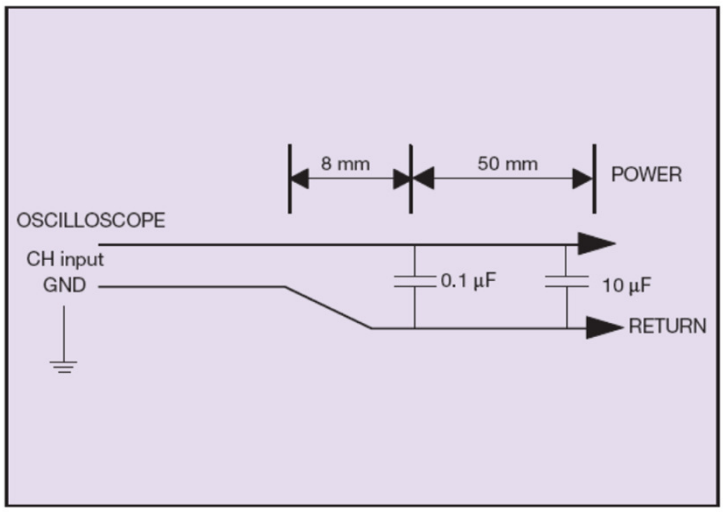
Output Response to Negative Load Step

T_R = minimum time to allow the output voltage, Vo, to settle to within the specified limits, measured from the time the load current starts to rise.
V_r = final output value tolerance band
V_m = maximum excursion (deviation)



Output Ripple and Noise Measurement

The setup outlined in the diagram below has been used for output voltage ripple and noise measurements on the AIH 300 Vin Series. When measuring output ripple and noise, a scope jack in parallel with a 0.1 uF ceramic chip capacitor, and a 10 uF aluminum electrolytic capacitor should be used. Oscilloscope should be set to 20 MHz bandwidth for this measurement.



Record of Revision and Changes

Issue	Date	Description	Originators
1.0	2016.12.30	First Issue	K. Wang
1.1	2018.09.28	Update a typo error for note 1 of page 4	K. Wang

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