

Application Test Note 10087

Embedded Power for
Business-Critical Continuity

iVS1-5Q0-5Q0-00-A Efficiency vs Output Current Curves

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AC-DC

High Power

Model #:

iVS1-5Q0-5Q0-00-A

Testing Conditions:

Input Voltage:

- 90-264Vac

Output Voltage:

- 48V (2 x 24V-5Q0 modules connected in series for testing purpose)

Output Current:

- 0 to 54A (each module)

Convection / Forced Air:

- Forced Air

Air Flow:

- Internal Fan

Ambient Temperature:

- 22 DegC

Heatsink:

- None

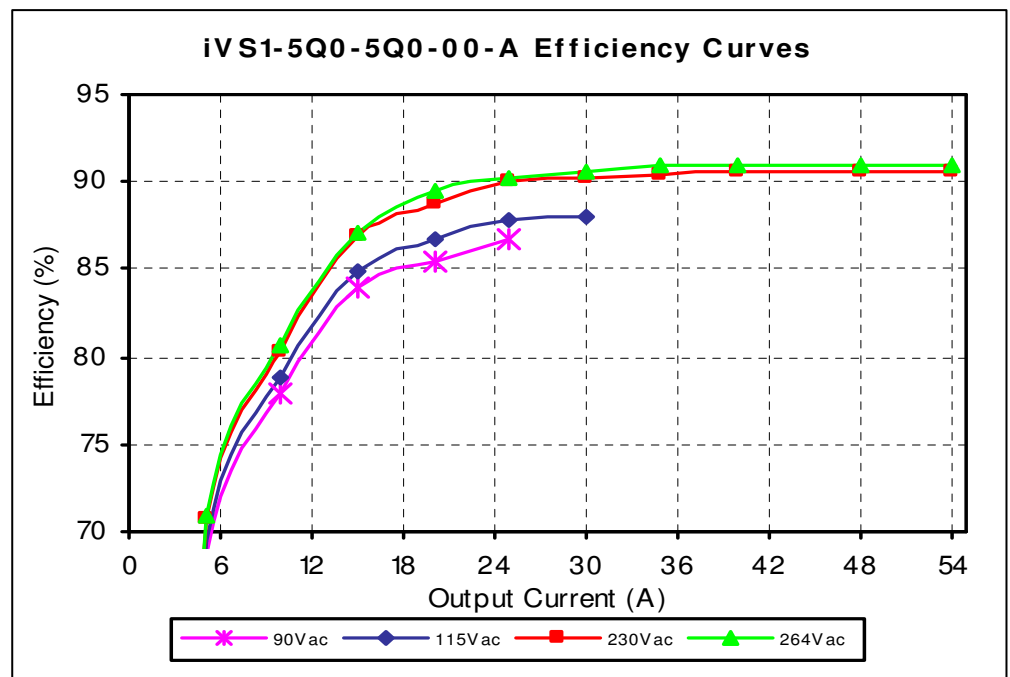
Remote Sensing:

- None



Testing Result Summary*

The iVS1-5Q0-5Q0-00-A efficiency vs output current curves at these testing conditions are below:



* Note: The results contain in this datasheet were obtained with a limited number of samples and should use for reference purpose only. For full specification range, please refer to the actual product datasheet.



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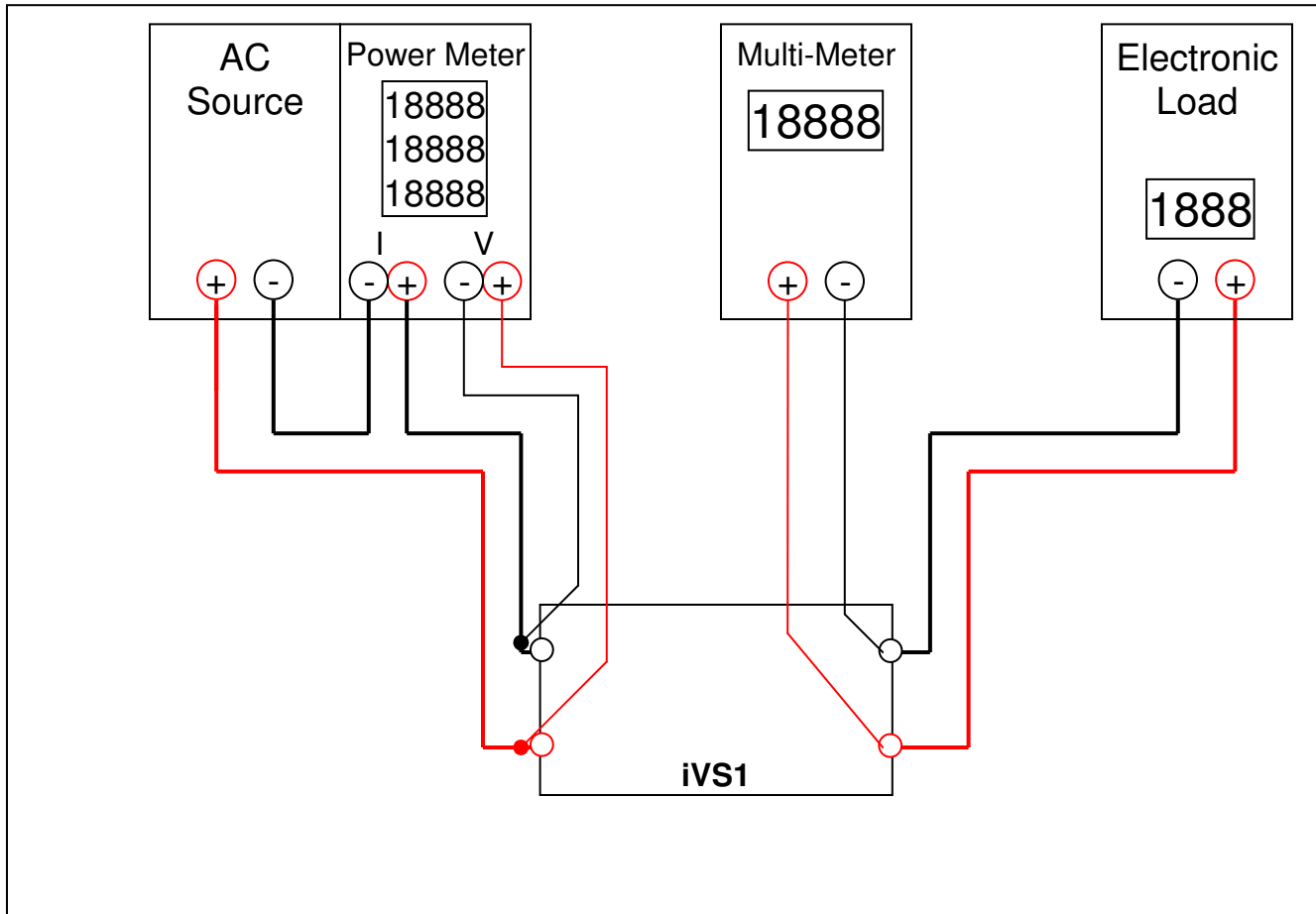
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Test Set Up

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Efficiency measurement test set up layout



Measurement Technique

Efficiency is calculated by the following formula:

$$\text{Efficiency} = P_{\text{out}} / P_{\text{in}}$$

Where: P_{out} = Output power of the power supply ($V_{\text{out}} \times I_{\text{out}}$)

P_{in} = Input power of the power supply including the effect of the power factor and harmonics

Measurement Procedure

Start with lowest input voltage of the measurement points.

Set up the Device Under Test (DUT) at the first measurement point (input voltage, output voltage, output current, air flow, ambient temperature).

Allow the DUT to stabilize for at least 3 min at the measurement point before taking the voltage / current / power readings.

Double check the e-load current reading with DC current meter (take average if readings are different).

Record all voltage / current / power readings

Change to the next measurement point and repeat the above procedures

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Test Equipment List

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The following are test equipment used:

	<u>Manufacturer</u>	<u>Model</u>
AC Source:	Dongfang	TDGC2-3
AC Power Meter	Voltech	PM100
Bench Multi-meter 1	HP	3468B
E-Load	BK Precision	8500
E-Load	BK Precision	8500
E-Load	Prodigit	3301
E-Load	Prodigit	3301
Resister-Load	Emerson	

Test Sample

Sample #1 iVS1-5Q0-5Q0-00-A S/N -

Date Code -



Photo of overall test set up

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Detail Test Results

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Efficiency Test: Efficiency vs Output Current
Module: iVS1-5Q0-5Q0-00-A
Test Condition: Vin=90Vac, Vout=48V (2 x 24V), Ta=22C
Testing Engineer: Berry Wang
Test Date: 09-05-15

Input Voltage (V)	Input Current (A)	PF	Input Power (W)	Output Voltage (V)	Output Current (A)	Output Power (W)	Efficiency (%)
90	0.923	0.97	81.2	48.29	0	0.00	0.00
90.2	3.913	0.994	351.20	48.23	5	241.15	68.66
90.1	6.889	0.996	618.30	48.21	10	482.10	77.97
90.1	9.59	0.997	861.80	48.22	15	723.30	83.93
90.0	12.557	0.998	1128.50	48.21	20	964.20	85.44
89.8	15.36	0.998	1389.00	48.20	25	1205.00	86.75

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Detail Test Results

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Efficiency Test: Efficiency vs Output Current
Module: iVS1-5Q0-5Q0-00-A
Test Condition: Vin=115Vac, Vout=48V (2 x 24V), Ta=22C
Testing Engineer: Berry Wang
Test Date: 09-05-15

Input Voltage (V)	Input Current (A)	PF	Input Power (W)	Output Voltage (V)	Output Current (A)	Output Power (W)	Efficiency (%)
115.0	0.715	0.939	80.27	48.29	0	0.00	0.00
115.0	3.04	0.991	347.20	48.23	5	241.15	69.46
115.2	5.33	0.994	612.00	48.21	10	482.10	78.77
115.2	7.42	0.996	851.70	48.22	15	723.30	84.92
115.2	9.67	0.997	1112.10	48.21	20	964.20	86.70
115.1	11.84	0.997	1372.80	48.20	25	1205.00	87.78
115.3	14.32	0.998	1644.30	48.20	30	1446.00	87.94

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Efficiency Test: Efficiency vs Output Current
Module: iVS1-5Q0-5Q0-00-A
Test Condition: Vin=230Vac, Vout=48V (2 x 24V), Ta=22C
Testing Engineer: Berry Wang
Test Date: 09-05-15

Input Voltage (V)	Input Current (A)	PF	Input Power (W)	Output Voltage (V)	Output Current (A)	Output Power (W)	Efficiency (%)
230.0	0.554	0.626	80.00	48.29	0	0.00	0.00
230.0	1.57	0.939	341.20	48.23	5	241.15	70.68
230.2	2.68	0.973	600.00	48.21	10	482.10	80.35
230.2	3.69	0.982	833.00	48.22	15	723.30	86.83
230.6	4.78	0.986	1087.40	48.21	20	964.20	88.67
231.2	5.83	0.989	1338.00	48.19	25	1204.75	90.04
230.0	7.01	0.99	1603.30	48.19	30	1445.70	90.17
231.0	8.08	0.994	1866.00	48.18	35	1686.30	90.37
231.1	9.23	0.995	2126.00	48.16	40	1926.40	90.61
230.4	11.12	0.996	2550.00	48.14	48	2310.72	90.62
230.8	12.48	0.996	2868.00	48.13	54	2599.02	90.62

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Efficiency Test: Efficiency vs Output Current
Module: iVS1-5Q0-5Q0-00-A
Test Condition: Vin=264Vac, Vout=48V (2 x 24V), Ta=22C
Testing Engineer: Berry Wang
Test Date: 09-05-15

Input Voltage (V)	Input Current (A)	PF	Input Power (W)	Output Voltage (V)	Output Current (A)	Output Power (W)	Efficiency (%)
264.0	0.602	0.495	78.78	48.29	0	0.00	0.00
264.0	1.447	0.892	340.20	48.23	5	241.15	70.88
264.2	2.4	0.95	598.20	48.21	10	482.10	80.59
262.6	3.25	0.971	830.40	48.22	15	723.30	87.10
260.6	4.23	0.981	1077.60	48.21	20	964.20	89.48
256.0	5.22	0.986	1335.00	48.19	25	1204.75	90.24
255.0	6.3	0.989	1594.60	48.18	30	1445.40	90.64
254.1	7.35	0.991	1852.30	48.17	35	1685.95	91.02
252.3	8.44	0.992	2116.00	48.15	40	1926.00	91.02
248.2	10.27	0.995	2538.50	48.14	48	2310.72	91.03
245.7	11.68	0.996	2855.00	48.13	54	2599.02	91.03

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