



SERIES A/SM SURFACE MOUNT and PLUG-IN

Hi Reliability and Ultra-Miniature

ERIES A: Low Profile 0.5" x 0.5" x 0.3" Height! ...up to 1.25 Watts
ERIES SM: Low Profile 0.5" x 0.5" x 0.340" Height! ...up to 1.25 Watts
LSO: New Series AT/DT 0.200 height - up to 0.75 Watts. (See table of contents)

This series of unregulated DC-DC converters are produced in an ultra-miniature encapsulated package. 178 different models are available. The units feature single and dual outputs. They will operate over the temperature range of -25° C to +70° C. No heat sink is required.

FEATURES

- Up to 1.25 watt output at 70° C ambient
- Encapsulated semiconductors, conservatively rated for maximum reliability
- Ultra-miniature size (0.3" Height)
- 5 input voltage ranges 5, 12, 24, 28 and 48V DC
- 100 megohm @ 500V DC isolation
- Input/output isolation
- Single and dual output
- No heat sink required
- Up to 250V Output

Options Available

- Per Mil Std. 883
- Expanded operating temp (-55° C to +85° C)
- Stabilization Bake (125° C ambient)
- Temperature Cycle (-55° C to +125° C)
- Hi Temp, full power burn in (100% power, 125° C case temp)

TYPICAL CHARACTERISTICS:

Test conditions: 25° C ambient and input voltage at nominal value unless otherwise specified.

LINE REGULATION: OUTPUT IS DIRECTLY PROPORTIONAL TO THE INPUT.

Input voltage range:

5V models 4 to 6.5V DC
 12V models 9 to 15V DC
 24V models 17 to 28V DC
 28V models 21 to 32V DC
 48V models 25 to 50V DC

Output Voltage Tolerance at Full Load:

5V models ± 0.25V
 9V models ± 0.3V
 12V & 15V models ± 0.4V
 24V & 28V models ± 0.5V
 48V models ± 0.7V
 100V, 150V, 200V & 250V models ± 3.0V

Converter frequency: 20 - 40 KHz

Output temperature coefficient:

0.05%/°C for 5V output
 0.04%/°C for 12V & 15V output
 0.02%/°C for 24, 28, 48, 100, 150, 200 and 250 volt outputs

Operating temperature: -25° C to +70° C ambient. No heat sink is required.

Storage temperature: -55° C to +125° C

Isolation: 100 megohms min. @ 500V DC

SERIES A/SM - SINGLE OUTPUT

PICO Plug-In Part Number	PICO Surface Mount Part Number	Input Volt. (V DC)	Output Volt. (V DC)	Max. Load Current (mA)	Max. Output Power (watts)	Eff. @ Full Load Typical (%)	Input Current Full Load Typical (mA)	Output Voltage Ripple @ Full Load* (Vp-p max)	No Load Current Typical (mA)	Full Load Output Voltage Tolerance (V DC)	Price 1-24
5A3.3S	5SM3.3S	5	3.3	303	1.00	60	333	0.20	80	±0.2	56.55
5A5S	5SM5S	5	5	200	1.00	66	303	0.20	65	±0.25	56.55
5A5.2S	5SM5.2S	5	5.2	192	1.00	66	303	0.20	65	±0.25	56.55
5A9S	5SM9S	5	9	139	1.25	73	342	0.15	80	±0.3	56.55
5A12S	5SM12S	5	12	104	1.25	73	342	0.15	80	±0.4	56.55
5A15S	5SM15S	5	15	83	1.25	75	333	0.12	90	±0.4	56.55
5A24S	5SM24S	5	24	52	1.25	75	333	0.10	90	±0.5	56.55
5A28S	5SM28S	5	28	45	1.25	74	338	0.10	90	±0.5	56.55
5A48S	5SM48S	5	48	26	1.25	77	325	0.10	90	±0.7	56.55
5A100S	5SM100S†	5	100	12.5	1.25	78	321	0.90	**	±3.0	80.12
5A150S	5SM150S†	5	150	8.3	1.25	76	329	0.90	**	±4.5	80.12
5A200S	5SM200S†	5	200	6.25	1.25	75	333	0.90	**	±6.0	80.12
5A250S	5SM250S†	5	250	5	1.25	75	333	0.90	**	±7.5	80.12
12A3.3S	12SM3.3S	12	3.3	303	1.00	60	139	0.20	26	±0.2	56.55
12A5S	12SM5S	12	5	200	1.00	66	126	0.20	24	±0.25	56.55
12A5.2S	12SM5.2S	12	5.2	192	1.00	66	126	0.20	24	±0.25	56.55
12A9S	12SM9S	12	9	139	1.25	74	141	0.15	26	±0.3	56.55
12A12S	12SM12S	12	12	104	1.25	76	137	0.15	26	±0.4	56.55
12A15S	12SM15S	12	15	83	1.25	78	134	0.15	26	±0.4	56.55
12A24S	12SM24S	12	24	52	1.25	78	134	0.15	26	±0.5	56.55
12A28S	12SM28S	12	28	45	1.25	77	135	0.15	26	±0.5	56.55
12A48S	12SM48S	12	48	26	1.25	80	130	0.20	26	±0.7	56.55
12A100S	12SM100S†	12	100	12.5	1.25	80	130	0.90	**	±3.0	80.12
12A150S	12SM150S†	12	150	8.3	1.25	79	132	0.90	**	±4.5	80.12
12A200S	12SM200S†	12	200	6.25	1.25	78	134	0.90	**	±6.0	80.12
12A250S	12SM250S†	12	250	5	1.25	75	139	0.90	**	±7.5	80.12
15A3.3S	15SM3.3S	15	3.3	303	1.00	60	111	0.20	22	±0.2	56.55

15A5S	15SM5S	15	5	200	1.00	66	101	0.20	20	±0.25	56.55
15A5.2S	15SM5.2S	15	5.2	192	1.00	66	101	0.20	20	±0.25	56.55
15A9S	15SM9S	15	9	139	1.25	74	113	0.15	20	±0.3	56.55
15A12S	15SM12S	15	12	104	1.25	76	110	0.15	20	±0.4	56.55
15A15S	15SM15S	15	15	83	1.25	78	107	0.15	20	±0.4	56.55
15A24S	15SM24S	15	24	52	1.25	78	107	0.15	20	±0.5	56.55
15A28S	15SM28S	15	28	45	1.25	77	108	0.15	20	±0.5	56.55
15A48S	15SM48S	15	48	26	1.25	80	104	0.20	20	±0.7	56.55
15A100S	15SM100S†	15	100	12.5	1.25	80	104	0.90	**	±3.0	80.12
15A150S	15SM150S†	15	150	8.3	1.25	79	105	0.90	**	±3.0	80.12
15A200S	15SM200S†	15	200	6.25	1.25	78	107	0.90	**	±3.0	80.12
15A250S	15SM250S†	15	250	5	1.25	75	111	0.90	**	±3.0	80.12
24A3.3S	24SM3.3S	24	3.3	303	1.00	60	69	0.20	16	±0.2	56.55
24A5S	24SM5S	24	5	200	1.00	66	43	0.20	13	±0.25	56.55
24A5.2S	24SM5.2S	24	5.2	192	1.00	66	43	0.20	13	±0.25	56.55
24A9S	24SM9S	24	9	139	1.25	72	72	0.20	15	±0.3	56.55
24A12S	24SM12S	24	12	104	1.25	75	69	0.20	15	±0.4	56.55
24A15S	24SM15S	24	15	83	1.25	75	69	0.20	15	±0.4	56.55
24A24S	24SM24S	24	24	52	1.25	78	67	0.20	15	±0.5	56.55
24A28S	24SM28S	24	28	45	1.25	77	68	0.20	15	±0.5	56.55
24A48S	24SM48S	24	48	26	1.25	78	67	0.25	16	±0.7	56.55
24A100S	24SM100S†	24	100	12.5	1.25	76	69	0.90	**	±3.0	80.12
24A150S	24SM150S†	24	150	8.3	1.25	73	71	0.90	**	±4.5	80.12
24A200S	24SM200S†	24	200	6.25	1.25	73	71	0.90	**	±6.0	80.12
24A250S	24SM250S†	24	250	5	1.25	70	74	0.90	**	±7.5	80.12
28A3.3S	28SM3.3S	28	3.3	303	1.00	60	59	0.20	15	±0.2	56.55
28A5S	28SM5S	28	5	200	1.00	66	54	0.20	12	±0.25	56.55
28A5.2S	28SM5.2S	28	5.2	192	1.00	66	54	0.20	12	±0.25	56.55
28A9S	28SM9S	28	9	139	1.25	72	62	0.20	14	±0.3	56.55
28A12S	28SM12S	28	12	104	1.25	72	62	0.20	14	±0.4	56.55
28A15S	28SM15S	28	15	83	1.25	73	61	0.20	14	±0.4	56.55
28A24S	28SM24S	28	24	52	1.25	76	59	0.20	14	±0.5	56.55
28A28S	28SM28S	28	28	45	1.25	76	59	0.20	14	±0.5	56.55
28A48S	28SM48S	28	48	26	1.25	77	58	0.25	15	±0.7	56.55
28A100S	28SM100S†	28	100	12.5	1.25	75	60	0.90	**	±3.0	80.12
28A150S	28SM150S†	28	150	8.3	1.25	76	59	0.90	**	±4.5	80.12
28A200S	28SM200S†	28	200	6.25	1.25	75	60	0.90	**	±6.0	80.12
28A250S	28SM250S†	28	250	5	1.25	70	64	0.90	**	±7.5	80.12
48A3.3S	48SM3.3S	48	3.3	303	1.00	60	35	0.20	5	±0.2	60.70
48A5S	48SM5S	48	5	200	1.00	66	32	0.25	6	±0.25	60.70
48A5.2S	48SM5.2S	48	5.2	192	1.00	66	32	0.25	6	±0.25	60.70
48A9S	48SM9S	48	9	139	1.25	72	36	0.25	8	±0.3	60.70
48A12S	48SM12S	48	12	104	1.25	73	36	0.25	8	±0.4	60.70
48A15S	48SM15S	48	15	83	1.25	72	36	0.25	8	±0.4	60.70
48A24S	48SM24S	48	24	52	1.25	76	34	0.25	9	±0.5	60.70
48A28S	48SM28S	48	28	45	1.25	76	34	0.25	9	±0.5	60.70

For units with output voltages up to 48 volts, ripple is measured with 10µF, 75 volt high quality tantalum capacitor which is required across the output.

For units with output voltage of 100-250 volts use a 0.1µF, 500 volt capacitor which is required across output, and maintain at least 10% of rated load to prevent a voltage surge.

† Maintain minimum 10% of rated load to prevent a voltage surge

SERIES A/SM - DUAL OUTPUT

PICO Plug-In Part Number	PICO Surface Mount Part Number	Input Volt. (V DC)	Output Volt. (V DC)	Max. Load Current (mA)	Max. Output Power (watts)	Eff. @ Full Load Typical (%)	Input Current Full Load Typical (mA)	Output Voltage Ripple @ Full Load* (Vp-p max)	No Load Current Typical (mA)	Full Load Output Voltage Tolerance (V DC)	Price 1-24
5A5D	5SM5D	5	±5	100	0.5	66	303	0.20	65	±0.25	63.93
5A9D	5SM9D	5	±9	69	0.625	73	342	0.15	80	±0.3	63.93
5A12D	5SM12D	5	±12	52	0.625	73	342	0.15	80	±0.4	63.93
5A15D	5SM15D	5	±15	42	0.625	75	333	0.12	90	±0.4	63.93
5A24D	5SM24D	5	±24	26	0.625	75	333	0.10	90	±0.5	63.93
5A28D	5SM28D	5	±28	22	0.625	74	338	0.10	90	±0.5	63.93
5A48D	5SM48D	5	±48	13	0.625	77	325	0.10	90	±0.7	63.93
12A5D	12SM5D	12	±5	100	0.5	66	126	0.20	24	±0.25	63.93
12A9D	12SM9D	12	±9	69	0.625	74	141	0.15	26	±0.3	63.93
12A12D	12SM12D	12	±12	52	0.625	76	137	0.15	26	±0.4	63.93
12A15D	12SM15D	12	±15	42	0.625	78	134	0.15	26	±0.4	63.93
12A24D	12SM24D	12	±24	26	0.625	78	134	0.15	26	±0.5	63.93
12A28D	12SM28D	12	±28	22	0.625	77	135	0.15	26	±0.5	63.93
12A48D	12SM48D	12	±48	13	0.625	80	130	0.20	26	±0.7	63.93
15A5D	15SM5D	15	±5	100	0.5	66	101	0.20	20	±0.25	63.93
15A9D	15SM9D	15	±9	69	0.625	74	113	0.15	20	±0.3	63.93
15A12D	15SM12D	15	±12	52	0.625	76	110	0.15	20	±0.4	63.93
15A15D	15SM15D	15	±15	42	0.625	78	107	0.15	20	±0.4	63.93
15A24D	15SM24D	15	±24	26	0.625	78	107	0.15	20	±0.5	63.93
15A28D	15SM28D	15	±28	22	0.625	77	108	0.15	20	±0.5	63.93
15A48D	15SM48D	15	±48	13	0.625	80	104	0.20	20	±0.7	63.93
24A5D	24SM5D	24	±5	100	0.5	66	63	0.20	13	±0.25	63.93
24A9D	24SM9D	24	±9	69	0.625	72	72	0.20	15	±0.3	63.93
24A12D	24SM12D	24	±12	52	0.625	75	69	0.20	15	±0.4	63.93
24A15D	24SM15D	24	±15	42	0.625	75	69	0.20	15	±0.4	63.93
24A24D	24SM24D	24	±24	26	0.625	78	67	0.20	15	±0.5	63.93
24A28D	24SM28D	24	±28	22	0.625	77	68	0.20	15	±0.5	63.93
24A48D	24SM48D	24	±48	13	0.625	78	67	0.25	16	±0.7	63.93
28A5D	28SM5D	28	±5	100	0.5	66	54	0.20	12	±0.25	63.93
28A9D	28SM9D	28	±9	69	0.625	72	62	0.20	14	±0.3	63.93
28A12D	28SM12D	28	±12	52	0.625	72	62	0.20	14	±0.4	63.93
28A15D	28SM15D	28	±15	42	0.625	73	61	0.20	14	±0.4	63.93
28A24D	28SM24D	28	±24	26	0.625	76	59	0.20	14	±0.5	63.93
28A28D	28SM28D	28	±28	22	0.625	76	59	0.20	14	±0.5	63.93
28A48D	28SM48D	28	±48	13	0.625	77	58	0.25	15	±0.7	63.93
48A5D	48SM5D	48	±5	100	0.5	66	32	0.25	6	±0.25	68.63

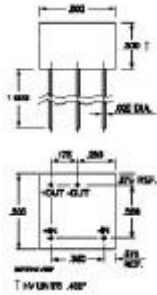
48A9D	48SM9D	48	±9	69	0.625	72	36	0.25	8	±0.3	68.63
48A12D	48SM12D	48	±12	52	0.625	73	36	0.25	8	±0.4	68.63
48A15D	48SM15D	48	±15	42	0.625	72	36	0.25	8	±0.4	68.63
48A24D	48SM24D	48	±24	26	0.625	76	34	0.25	9	±0.5	68.63
48A28D	48SM28D	48	±28	22	0.625	76	34	0.25	9	±0.5	68.63

For units with output voltages up to 48 volts, ripple is measured with 10µF, 75 volt high quality tantalum capacitor which is required across each output.

Ordering Instructions: No minimum. Net 30 days F.O.B. Pelham, New York
 Delivery--stock to one week for sample orders.

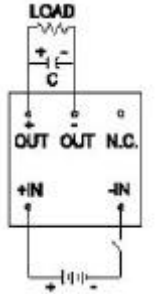
Series A/SM Single Output

Series A Single Output



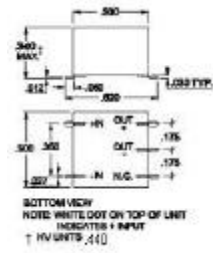
Larger Size Drawing

Typical Weight: 3.5 Grams



Larger Size Schematic

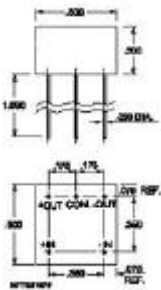
Series SM Single Output



Larger Size Drawing

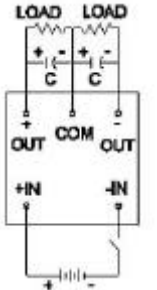
Series A/SM Dual Output

Series A Dual Output



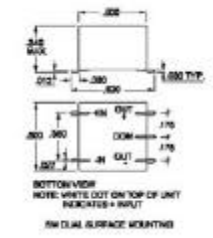
Larger Size Drawing

Typical Weight: 3.5 Grams



Larger Size Schematic

Series SM Dual Output



Larger Size Drawing

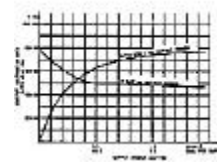
Note: White Dot on top unit indicates + input.

SINGLE & DUAL 12V - 5V



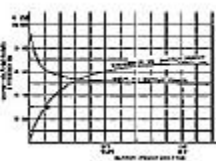
Larger Size Graph

SINGLE & DUAL 5V - 48V



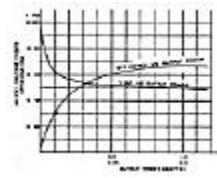
Larger Size Graph

SINGLE & DUAL 5V - 5V



Larger Size Graph

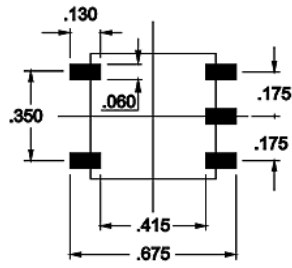
SINGLE & DUAL 12V - 48V



Larger Size Graph

**RECOMMENDED LAND PATTERN DIMENSIONS
 SERIES SM**

PICO SM SERIES.



For immediate engineering assistance or to place an order:
Call Toll Free: 800-431-1064

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