

# SERIES SM NEW SURFACE MOUNT DESIGN SERIES SM SINGLE OUTPUT

- OPTIONS AVAILABLE**
- 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)

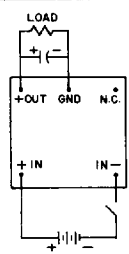
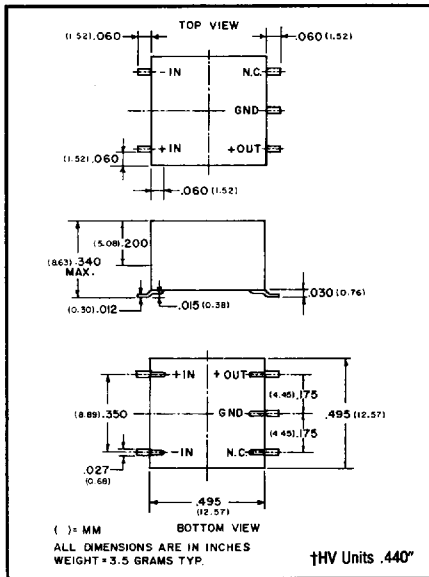
## Hi Reliability Ultra-Miniature DC-DC Converters



**FEATURES:**

- New surface mount construction
- Up to 1.25 watt output at 70°C ambient
- Encapsulated semiconductors, conservatively rated for maximum reliability
- Ultra-miniature size (.340" 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

This series of unregulated DC-DC converters are produced in an ultra-miniature encapsulated package, now compatible with your surface mount assembly. 84 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.



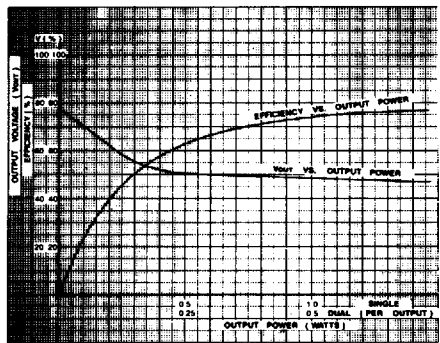
PICO PART NUMBER	INPUT VOLTAGE (V DC)	OUTPUT VOLTAGE (V DC)	MAX. LOAD CURRENT (mA)	MAX. OUTPUT POWER (watts)	EFF. @ FULL LOAD TYPICAL (%)	INPUT CURRENT FULL LOAD TYPICAL (mA)	OUTPUT VOLTAGE RIPPLE @ FULL LOAD* (Vp-p max)	NO LOAD CURRENT TYPICAL (mA)	FULL LOAD OUTPUT VOLTAGE TOLERANCE (V DC)	PRICE 1-24
5SM5S	5	5	200	1	66	303	0.20	65	±0.25	56.55
5SM9S	5	9	139	1.25	73	342	0.15	80	±0.3	56.55
5SM12S	5	12	104	1.25	73	342	0.15	80	±0.4	56.55
5SM15S	5	15	83	1.25	75	333	0.12	90	±0.4	56.55
5SM24S	5	24	52	1.25	75	333	0.10	90	±0.5	56.55
5SM28S	5	28	45	1.25	74	338	0.10	90	±0.5	56.55
5SM48S	5	48	26	1.25	77	325	0.10	90	±0.7	56.55
5SM100S	5	100	12.5	1.25	78	321	0.90	90	±3.0	80.12 †
5SM150S	5	150	8.3	1.25	76	329	0.90	100	±3.0	80.12 †
5SM200S	5	200	6.25	1.25	75	333	0.90	100	±3.0	80.12 †
5SM250S	5	250	5	1.25	75	333	0.90	100	±3.0	80.12 †
12SM5S	12	5	200	1	66	126	0.20	24	±0.25	56.55
12SM9S	12	9	139	1.25	74	141	0.15	26	±0.3	56.55
12SM12S	12	12	104	1.25	76	137	0.15	26	±0.4	56.55
12SM15S	12	15	83	1.25	78	134	0.15	26	±0.4	56.55
12SM24S	12	24	52	1.25	78	134	0.15	26	±0.5	56.55
12SM28S	12	28	45	1.25	77	135	0.15	26	±0.5	56.55
12SM48S	12	48	26	1.25	80	130	0.20	26	±0.7	56.55
12SM100S	12	100	12.5	1.25	80	130	0.90	30	±3.0	80.12 †
12SM150S	12	150	8.3	1.25	79	132	0.90	35	±3.0	80.12 †
12SM200S	12	200	6.25	1.25	78	134	0.90	35	±3.0	80.12 †
12SM250S	12	250	5	1.25	75	139	0.90	40	±3.0	80.12 †
24SM5S	24	5	200	1	66	63	0.20	13	±0.25	56.55
24SM9S	24	9	139	1.25	72	72	0.20	15	±0.3	56.55
24SM12S	24	12	104	1.25	75	69	0.20	15	±0.4	56.55
24SM15S	24	15	83	1.25	75	69	0.20	15	±0.4	56.55
24SM24S	24	24	52	1.25	78	67	0.20	15	±0.5	56.55
24SM28S	24	28	45	1.25	77	68	0.20	15	±0.5	56.55
24SM48S	24	48	26	1.25	78	67	0.25	16	±0.7	56.55
24SM100S	24	100	12.5	1.25	76	69	0.90	20	±3.0	80.12 †
24SM150S	24	150	8.3	1.25	73	71	0.90	25	±3.0	80.12 †
24SM200S	24	200	6.25	1.25	73	71	0.90	25	±3.0	80.12 †
24SM250S	24	250	5	1.25	70	74	0.90	25	±3.0	80.12 †
28SM5S	28	5	200	1	66	54	0.20	12	±0.25	56.55
28SM9S	28	9	139	1.25	72	62	0.20	14	±0.3	56.55
28SM12S	28	12	104	1.25	72	62	0.20	14	±0.4	56.55
28SM15S	28	15	83	1.25	73	61	0.20	14	±0.4	56.55
28SM24S	28	24	52	1.25	76	59	0.20	14	±0.5	56.55
28SM28S	28	28	45	1.25	76	59	0.20	14	±0.5	56.55
28SM48S	28	48	26	1.25	77	58	0.25	15	±0.7	56.55
28SM100S	28	100	12.5	1.25	75	60	0.90	20	±3.0	80.12 †
28SM150S	28	150	8.3	1.25	76	59	0.90	25	±3.0	80.12 †
28SM200S	28	200	6.25	1.25	75	60	0.90	25	±3.0	80.12 †
28SM250S	28	250	5	1.25	70	64	0.90	25	±3.0	80.12 †
48SM5S	48	5	200	1	66	32	0.25	6	±0.25	60.70
48SM9S	48	9	139	1.25	72	36	0.25	8	±0.3	60.70
48SM12S	48	12	104	1.25	73	36	0.25	8	±0.4	60.70
48SM15S	48	15	83	1.25	72	36	0.25	8	±0.4	60.70
48SM24S	48	24	52	1.25	76	34	0.25	9	±0.5	60.70
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, 300 volt capacitor which is required across output, and maintain at least 10% of rated load to prevent a voltage surge.  
†HV Units .440"

**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 12 & 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 SM SINGLE & DUAL 5V-48V**



**Delivery— stock to one week**

For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064 • FAX 914-699-5565

**SERIES SM**

**Low Profile .5" x .5" x .340" Height  
...up to 1.25 Watts**

**No Heat Sink  
or Electrical  
Derating Required**



**NEW SURFACE MOUNT DESIGN**

**SERIES SM DUAL OUTPUT**

PICO PART NUMBER	INPUT VOLTAGE (V DC)	DUAL OUTPUT VOLTAGE (V DC)	MAX. LOAD CURRENT PER OUTPUT (mA)	MAX. OUTPUT POWER PER OUTPUT (watts)	EFF. @ FULL LOAD TYPICAL (%)	INPUT CURRENT FULL LOAD TYPICAL (mA)	OUTPUT VOLTAGE RIPPLE @ FULL LOAD* (V <sub>p-p</sub> max)	NO LOAD CURRENT TYPICAL (mA)	FULL LOAD OUTPUT VOLTAGE TOLERANCE (V DC)	PRICE 1-24
5SM5D	5	±5	100	0.5	66	303	0.20	65	±0.25	63.93
5SM9D	5	±9	69	0.625	73	342	0.15	80	±0.3	63.93
5SM12D	5	±12	52	0.625	73	342	0.15	80	±0.4	63.93
5SM15D	5	±15	42	0.625	75	333	0.12	90	±0.4	63.93
5SM24D	5	±24	26	0.625	75	333	0.10	90	±0.5	63.93
5SM28D	5	±28	22	0.625	74	338	0.10	90	±0.5	63.93
5SM48D	5	±48	13	0.625	77	325	0.10	90	±0.7	63.93
12SM5D	12	±5	100	0.5	66	126	0.20	24	±0.25	63.93
12SM9D	12	±9	69	0.625	74	141	0.15	26	±0.3	63.93
12SM12D	12	±12	52	0.625	76	137	0.15	26	±0.4	63.93
12SM15D	12	±15	42	0.625	78	134	0.15	26	±0.4	63.93
12SM24D	12	±24	26	0.625	78	134	0.15	26	±0.5	63.93
12SM28D	12	±28	22	0.625	77	135	0.15	26	±0.5	63.93
12SM48D	12	±48	13	0.625	80	130	0.20	26	±0.7	63.93
24SM5D	24	±5	100	0.5	66	63	0.20	13	±0.25	63.93
24SM9D	24	±9	69	0.625	72	72	0.20	15	±0.3	63.93
24SM12D	24	±12	52	0.625	75	69	0.20	15	±0.4	63.93
24SM15D	24	±15	42	0.625	75	69	0.20	15	±0.4	63.93
24SM24D	24	±24	26	0.625	78	67	0.20	15	±0.5	63.93
24SM28D	24	±28	22	0.625	77	68	0.20	15	±0.5	63.93
24SM48D	24	±48	13	0.625	78	67	0.25	16	±0.7	63.93
28SM5D	28	±5	100	0.5	66	54	0.20	12	±0.25	63.93
28SM9D	28	±9	69	0.625	72	62	0.20	14	±0.3	63.93
28SM12D	28	±12	52	0.625	72	62	0.20	14	±0.4	63.93
28SM15D	28	±15	42	0.625	73	61	0.20	14	±0.4	63.93
28SM24D	28	±24	26	0.625	76	59	0.20	14	±0.5	63.93
28SM28D	28	±28	22	0.625	76	59	0.20	14	±0.5	63.93
28SM48D	28	±48	13	0.625	77	58	0.25	15	±0.7	63.93
48SM5D	48	±5	100	0.5	66	32	0.25	6	±0.25	68.63
48SM9D	48	±9	69	0.625	72	36	0.25	8	±0.3	68.63
48SM12D	48	±12	52	0.625	73	36	0.25	8	±0.4	68.63
48SM15D	48	±15	42	0.625	72	36	0.25	8	±0.4	68.63
48SM24D	48	±24	26	0.625	76	34	0.25	9	±0.5	68.63
48SM28D	48	±28	22	0.625	76	34	0.25	9	±0.5	68.63

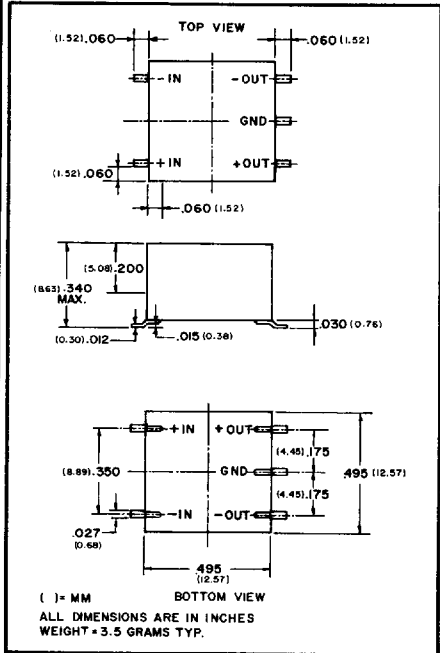
\*For units with output voltages up to 48 volts, ripple is measured with 10µF, 75 volt high quality tantalum capacitor which is required across each output.

Ordering Instructions: No minimum. Net 30 days F.O.B. Mt. Vernon, New York.

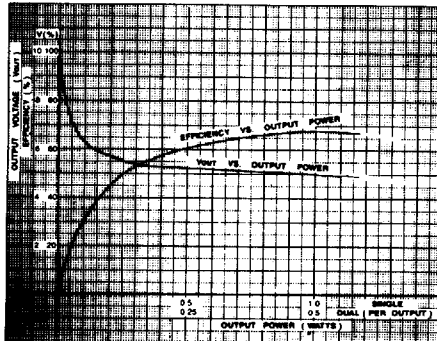


**SURFACE MOUNT**

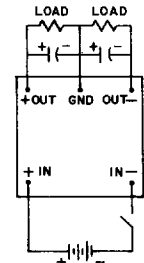
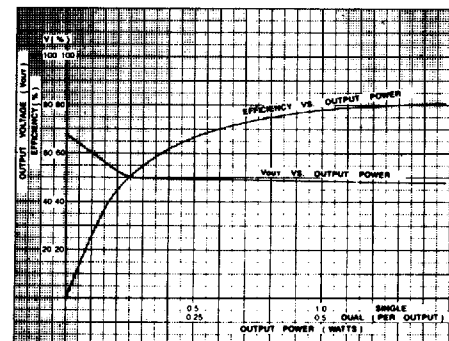
PICO surface mount units utilize materials and methods to withstand extreme temperature (220°C) of vapor phase, I.R., and other reflow procedures without degradation of electrical or mechanical characteristics.



**SERIES SM SINGLE & DUAL 5V-5V**



**SERIES SM SINGLE & DUAL 12V-48V**



**PICO Electronics, Inc.**

453 North Mac Questen Pkwy.  
Mt. Vernon, New York 10552

**Delivery—  
stock to one week**

For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064 • 914-699-5514 • FAX 914-699-5565