

## SERIES E/SE SURFACE MOUNT and PLUG-IN

Hi Reliability  
Miniature  
Isolated DC-DC Converters  
Up to 7 Watts

Low Profile 0.4" Height! Up to 7 Watts  
No External Capacitors Required  
No Heat Sink or Electrical Derating Required

This series of unregulated DC-DC converters are produced in an ultra-miniaturized encapsulated package. 190 different models are available. The units feature single and isolated dual outputs. They will operate over the temperature range of -25° C to +70° C. No heat sink is required.

### FEATURES

- Up to 7 watts output at 70° C ambient
- Encapsulated semiconductors, conservatively rated for maximum reliability 6 input voltage ranges 5, 12, 15, 24, 28 and 48V DC 100 megohm @ 500V DC Single and dual isolated output No heat sink required
- Output filter included (No external capacitors required)

### 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, burn in

### 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  
15V models: 12 to 18V 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

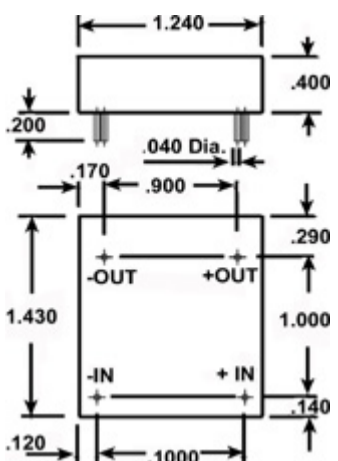
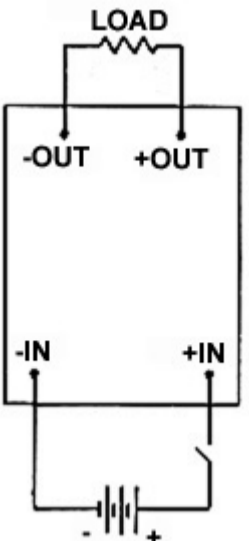
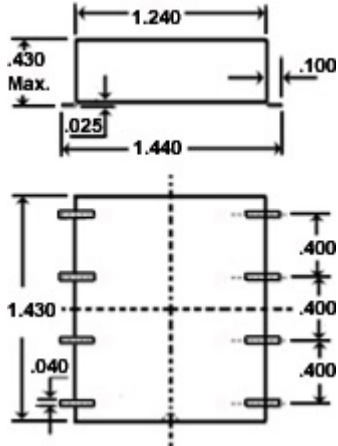
- **Converter frequency:** 20 to 40 KHz
- **Output temperature coefficient:** 0.02%/°C
- **Operating temperature:** -25° C to +70° C ambient. No heat sink is required.
- **Storage temperature:** -55° C to +125° C
- **Isolation:** 100 megohms min. @ 500V DC
- **Short circuit protection:** Temporary

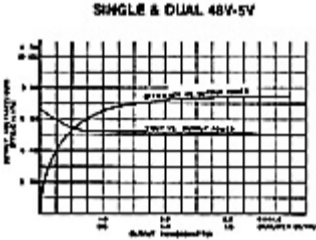
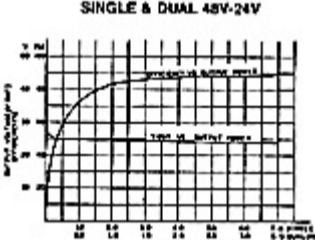
### SERIES E/SE - SINGLE OUTPUT

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 Volt. Ripple @ Full Load* (Vp-p max)	No Load Current Typical (mA)	Full Load Output Voltage Tolerance (V DC)	Price (US \$)
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5E3.3S	5SE3.3S	5	3.3	1061	3.5	60	1167	0.30	150	±0.2	109.79
5E5S	5SE5S	5	5	800	4.0	68	1176	0.30	140	±0.25	109.79
5E5.2S	5SE5.2S	5	5.2	769	4.0	68	1176	0.30	140	±0.25	109.79
5E9S	5SE9S	5	9	500	4.5	73	1233	0.30	200	±0.3	109.79
5E12S	5SE12S	5	12	375	4.5	75	1200	0.25	200	±0.4	109.79
5E15S	5SE15S	5	15	300	4.5	78	1154	0.25	190	±0.4	109.79
5E24S	5SE24S	5	24	187	4.5	80	1125	0.25	190	±0.5	109.79
5E28S	5SE28S	5	28	161	4.5	79	1139	0.25	190	±0.5	109.79
5E48S	5SE48S	5	48	93	4.5	80	1125	0.25	190	±0.7	109.79
12E3.3S	12SE3.3S	12	3.3	1061	3.5	65	449	0.30	40	±0.2	109.79
12E5S	12SE5S	12	5	800	4.0	73	456	0.30	40	±0.25	109.79
12E5.2S	12SE5.2S	12	5.2	769	4.0	73	456	0.30	40	±0.25	109.79
12E9S	12SE9S	12	9	666	6.0	80	625	0.30	45	±0.3	109.79
12E12S	12SE12S	12	12	541	6.5	82	660	0.25	45	±0.4	109.79
12E15S	12SE15S	12	15	433	6.5	83	652	0.25	40	±0.4	109.79
12E24S	12SE24S	12	24	281	6.75	86	654	0.25	40	±0.5	109.79
12E28S	12SE28S	12	28	241	6.75	86	654	0.25	40	±0.5	109.79
12E48S	12SE48S	12	48	141	6.75	86	654	0.25	40	±0.7	109.79
15E3.3S	15SE3.3S	15	3.3	1061	3.5	65	359	0.30	35	±0.2	109.79
15E5S	15SE5S	15	5	800	4.0	73	365	0.30	35	±0.25	109.79
15E5.2S	15SE5.2S	15	5.2	769	4.0	73	365	0.30	35	±0.25	109.79
15E9S	15SE9S	15	9	666	6.0	80	500	0.30	38	±0.3	109.79
15E12S	15SE12S	15	12	541	6.5	82	528	0.25	38	±0.4	109.79
15E15S	15SE15S	15	15	433	6.5	83	522	0.25	35	±0.4	109.79
15E24S	15SE24S	15	24	281	6.75	86	523	0.25	35	±0.5	109.79
15E28S	15SE28S	15	28	241	6.75	86	523	0.25	35	±0.5	109.79
15E48S	15SE48S	15	48	141	6.75	86	523	0.25	35	±0.7	109.79
24E3.3S	24SE3.3S	24	3.3	1061	3.5	61	239	0.30	22	±0.2	109.79
24E5S	24SE5S	24	5	800	4.0	69	241	0.30	22	±0.25	109.79
24E5.2S	24SE5.2S	24	5.2	769	4.0	69	214	0.30	22	±0.25	109.79
24E9S	24SE9S	24	9	666	6.0	79	316	0.30	22	±0.3	109.79
24E12S	24SE12S	24	12	541	6.5	81	334	0.25	22	±0.4	109.79
24E15S	24SE15S	24	15	433	6.5	82	330	0.25	22	±0.4	109.79
24E24S	24SE24S	24	24	291	7.0	88	331	0.25	17	±0.5	109.79
24E28S	24SE28S	24	28	250	7.0	88	331	0.25	17	±0.5	109.79
24E48S	24SE48S	24	48	146	7.0	88	331	0.25	17	±0.7	109.79
28E3.3S	28SE3.3S	28	3.3	1061	3.5	61	205	0.30	22	±0.2	109.79
28E5S	28SE5S	28	5	800	4.0	69	207	0.30	22	±0.25	109.79
28E5.2S	28SE5.2S	28	5.2	769	4.0	69	207	0.30	22	±0.25	109.79
28E9S	28SE9S	28	9	666	6.0	80	268	0.30	22	±0.3	109.79
28E12S	28SE12S	28	12	540	6.5	80	290	0.25	22	±0.4	109.79
28E15S	28SE15S	28	15	433	6.5	82	283	0.25	22	±0.4	109.79
28E24S	28SE24S	28	24	291	7.0	88	284	0.25	22	±0.5	109.79
28E28S	28SE28S	28	28	250	7.0	88	284	0.25	20	±0.5	109.79
28E48S	28SE48S	28	48	146	7.0	88	284	0.25	20	±0.7	109.79
48E3.3S	48SE3.3S	48	3.3	1061	3.5	67	109	0.30	6	±0.2	118.16
48E5S	48SE5S	48	5	800	4.0	75	111	0.30	6	±0.25	118.16
48E5.2S	48SE5.2S	48	5.2	769	4.0	75	111	0.30	6	±0.25	118.16
48E9S	48SE9S	48	9	666	6.0	80	156	0.30	6	±0.3	118.16
48E12S	48SE12S	48	12	541	6.5	84	161	0.30	6	±0.4	118.16
48E15S	48SE15S	48	15	433	6.5	84	161	0.30	6	±0.4	118.16
48E24S	48SE24S	48	24	291	7.0	89	164	0.30	6	±0.5	118.16
48E28S	48SE28S	48	28	250	7.0	89	164	0.30	6	±0.5	118.16

**Series E/SE Single Output**

<p style="text-align: center;"><b>E Single</b></p>  <p style="text-align: center;">BOTTOM VIEW</p> <p style="text-align: center;">Typical Weight: 25 Grams All dimensions are in inches</p> <p style="text-align: center;"><a href="#">Larger Size Drawing</a> [1]</p>	<p style="text-align: center;">Typical Weight: 25 Grams</p>  <p style="text-align: center;"><a href="#">Larger Size Schematic</a> [2]</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Pin no.</th> <th style="text-align: center;">Single</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">1</td><td style="text-align: center;">-INP</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">N/C</td></tr> <tr><td style="text-align: center;">3</td><td style="text-align: center;">N/C</td></tr> <tr><td style="text-align: center;">4</td><td style="text-align: center;">+INP</td></tr> <tr><td style="text-align: center;">5</td><td style="text-align: center;">+OUT</td></tr> <tr><td style="text-align: center;">6</td><td style="text-align: center;">-OUT</td></tr> <tr><td style="text-align: center;">7</td><td style="text-align: center;">N/C</td></tr> <tr><td style="text-align: center;">8</td><td style="text-align: center;">N/C</td></tr> </tbody> </table>	Pin no.	Single	1	-INP	2	N/C	3	N/C	4	+INP	5	+OUT	6	-OUT	7	N/C	8	N/C	<p style="text-align: center;"><b>SE Single</b></p>  <p style="text-align: center;">BOTTOM VIEW</p> <p style="text-align: center;">Typical Weight: 25 Grams All dimensions are in inches</p> <p style="text-align: center;"><a href="#">Larger Size Drawing</a> [3]</p>
Pin no.	Single																				
1	-INP																				
2	N/C																				
3	N/C																				
4	+INP																				
5	+OUT																				
6	-OUT																				
7	N/C																				
8	N/C																				

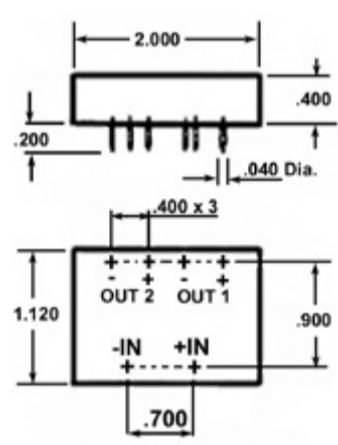
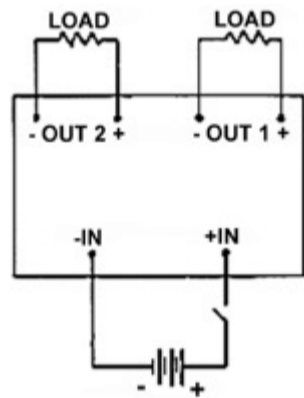
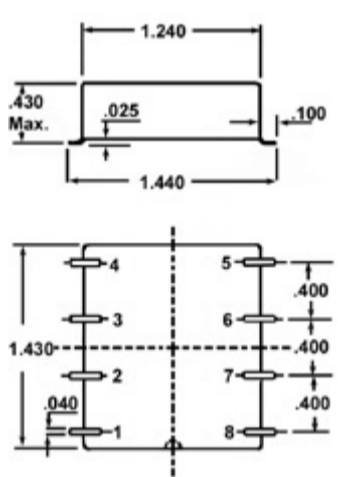
<p style="text-align: center;"><b>SINGLE &amp; DUAL 48V - 5V</b></p>  <p style="text-align: center;"><a href="#">Larger Size Graph</a> [4]</p>	<p style="text-align: center;"><b>SINGLE &amp; DUAL 48V - 24V</b></p>  <p style="text-align: center;"><a href="#">Larger Size Graph</a> [5]</p>
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**SERIES E/SE - DUAL OUTPUT**

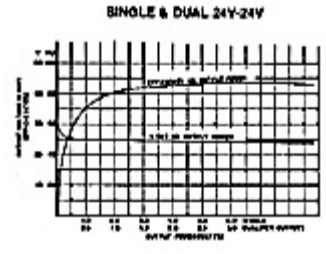
PICO Plug-In Part Number	PICO Surface Mount Part Number	Input Volt. (V DC)	Output Volt. (V DC)	Max. Load Current per Output (mA)	Max. Output Power per Output (watts)	Eff. @ Full Load Typical (%)	Input Current Full Load Typical (mA)	Output Volt. Ripple @ Full Load* (Vp-p max)	No Load Current Typical (mA)	Full Load Output Voltage Tolerance (V DC)	Price (US \$)
5E5D	5SE5D	5	5	400	2.0	68	1176	0.3	200	±0.25	119.94
5E9D	5SE9D	5	9	250	2.25	74	1216	0.3	200	±0.3	119.94
5E12D	5SE12D	5	12	187	2.25	77	1168	0.25	220	±0.4	119.94
5E15D	5SE15D	5	15	150	2.25	79	1139	0.25	200	±0.4	119.94
5E24D	5SE24D	5	24	93	2.25	80	1125	0.25	200	±0.5	119.94
5E28D	5SE28D	5	28	80	2.25	80	1139	0.25	200	±0.5	119.94
5E48D	5SE48D	5	48	46	2.25	80	1125	0.25	200	±0.7	119.94
12E5D	12SE5D	12	5	400	2.0	75	444	0.3	40	±0.25	119.94
12E9D	12SE9D	12	9	333	3.0	80	625	0.3	40	±0.3	119.94
12E12D	12SE12D	12	12	270	3.25	83	652	0.25	40	±0.4	119.94
12E15D	12SE15D	12	15	217	3.25	85	637	0.25	40	±0.4	119.94
12E24D	12SE24D	12	24	140	3.375	86	654	0.25	40	±0.5	119.94
12E28D	12SE28D	12	28	121	3.375	86	654	0.25	40	±0.5	119.94
12E48D	12SE48D	12	48	70	3.375	88	654	0.25	40	±0.7	119.94
15E5D	15SE5D	15	5	400	2.0	75	356	0.3	35	±0.25	119.94
15E9D	15SE9D	15	9	333	3.0	80	500	0.3	35	±0.3	119.94
15E12D	15SE12D	15	12	270	3.25	83	528	0.25	35	±0.4	119.94
15E15D	15SE15D	15	15	217	3.25	85	522	0.25	35	±0.4	119.94
15E24D	15SE24D	15	24	140	3.375	86	523	0.25	35	±0.5	119.94
15E28E	15SE28D	15	28	121	3.375	86	523	0.25	35	±0.5	119.94
15E48D	15SE48D	15	48	70	3.375	86	523	0.25	35	±0.7	119.94

24E5D	24SE5D	24	5	400	2.0	72	231	0.3	22	±0.25	119.94
24E9D	24SE9D	24	9	333	3.0	79	316	0.3	22	±0.3	119.94
24E12D	24SE12D	24	12	270	3.25	82	330	0.25	22	±0.4	119.94
24E15D	24SE15D	24	15	217	3.25	85	318	0.25	22	±0.4	119.94
24E24D	24SE24D	24	24	145	3.5	88	331	0.25	18	±0.5	119.94
24E28D	24SE28D	24	28	125	3.5	88	331	0.25	18	±0.5	119.94
24E48D	24SE48D	24	48	73	3.5	88	331	0.25	18	±0.7	119.94
28E5D	28SE5D	28	5	400	2.0	69	207	0.3	25	±0.25	119.94
28E9D	28SE9D	28	9	333	3.0	80	268	0.3	25	±0.3	119.94
28E12D	28SE12D	28	12	270	3.25	80	290	0.25	22	±0.4	119.94
28E15D	28SE15D	28	15	217	3.25	82	283	0.25	22	±0.4	119.94
28E24D	28SE24D	28	24	145	3.5	88	284	0.25	20	±0.5	119.94
28E28D	28SE28D	28	28	125	3.5	88	284	0.25	20	±0.5	119.94
28E48D	28SE48D	28	48	73	3.5	88	284	0.25	20	±0.7	119.94
48E5D	48SE5D	48	5	400	2.0	74	113	0.3	6	±0.25	128.29
48E9D	48SE9D	48	9	333	3.0	80	156	0.3	6	±0.3	128.29
48E12D	48SE12D	48	12	270	3.25	85	160	0.3	6	±0.4	128.29
48E15D	48SE15D	48	15	217	3.25	85	160	0.3	6	±0.4	128.29
48E24D	48SE24D	48	24	145	3.5	88	166	0.3	6	±0.5	128.29
48E28D	48SE28D	48	28	125	3.5	89	164	0.3	6	±0.5	128.29

### Series E/SE Dual Output

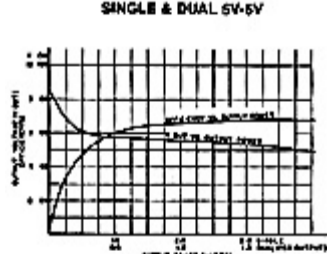
<p><b>E Dual</b></p>  <p><b>BOTTOM VIEW</b></p> <p>Typical Weight: 33 Grams All dimensions are in inches</p> <p><a href="#">Larger Size Drawing [6]</a></p>	<p>Typical Weight: 33 Grams</p>  <p><a href="#">Larger Size Schematic [7]</a></p>	<table border="1"> <thead> <tr> <th>Pin no.</th> <th>Dual</th> </tr> </thead> <tbody> <tr><td>1</td><td>-INP</td></tr> <tr><td>2</td><td>N/C</td></tr> <tr><td>3</td><td>N/C</td></tr> <tr><td>4</td><td>+INP</td></tr> <tr><td>5</td><td>+OUT1</td></tr> <tr><td>6</td><td>-OUT1</td></tr> <tr><td>7</td><td>+OUT2</td></tr> <tr><td>8</td><td>-OUT2</td></tr> </tbody> </table>	Pin no.	Dual	1	-INP	2	N/C	3	N/C	4	+INP	5	+OUT1	6	-OUT1	7	+OUT2	8	-OUT2	<p><b>SE Dual</b></p>  <p><b>BOTTOM VIEW</b></p> <p>Typical Weight: 33 Grams All dimensions are in inches</p> <p><a href="#">Larger Size Drawing [8]</a></p>
Pin no.	Dual																				
1	-INP																				
2	N/C																				
3	N/C																				
4	+INP																				
5	+OUT1																				
6	-OUT1																				
7	+OUT2																				
8	-OUT2																				

**SINGLE & DUAL 24V - 24V**



[Larger Size Graph \[9\]](#)

**SINGLE & DUAL 5V - 5V**



[Larger Size Graph \[10\]](#)

**Ordering Instructions:**

No minimum.  
Net 30 days F.O.B. Pelham, NY

**Delivery--stock to one week for sample orders.**

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

**PICO Electronics, Inc.**

143 Sparks Ave. Pelham, NY 10803-1810  
Tel: 914-738-1400 or Fax: 914-738-8225

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