



SERIES M and MV MILITARY DC-DC CONVERTERS

**All Military Components
Hi Reliability - Ultra-Miniature
Isolated DC-DC Converters
-55°C +85°C Ambient Operating Temperature**

**Up to 500V DC Output Now Available
Low Profile 1.250" x 0.5" x 0.3" ht. up to 1.25 Watts
Selected MIL-STD-883 environmental screening available**

This series of unregulated DC-DC converters are encapsulated in an ultra-miniature 5 sided shielding package. 125 different models are available. The units feature single and dual outputs. They will operate over the temperature range of -55° C to +85° C. No heat sink is required.

- **Diodes JAN TX**
- **Transformers manufactured to MIL-PRF-27, GRADE 5, CLASS S**
- **Capacitors MIL-C-39003, S Level, MIL-C-55681, S Level**
- **Resistors MIL-R-39008, S Level, MIL-PRF-39017, S LEVEL**
- **Transistors Hermetically Sealed, Screened per MIL-S-19500, Table II, JAN TXV**

TYPICAL CHARACTERISTICS:

FEATURES

- All MIL components
- Up to 500V DC Output
- -55° C to +85° C ambient operating temp.
- Up to 1.25 watts output at 85° C ambient
- Ultra-miniature size (0.3" Height)
- **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

- 5 input voltage ranges 5, 12, 15, 24 and 28V DC
Series M: 100 megohm @ 500V DC
Series MV: 100 Megohms @ 1K V DC

24V models: 17 to 28V DC
28V models: 21 to 32V DC

- Input/output isolation
- Single and dual output
- No heat sink required
- Shielded
- 24 Pin Dip compatible

OPTIONS AVAILABLE PER MIL-STD-883

- Stabilization Bake
- Temperature Cycle
- Hi Temperature Burn In 160 Hours at Full Power

- **Output voltage tolerance at full load:**

5V models: $\pm 0.25V$
9V models: $\pm 0.3V$
12V & 15V models: $\pm 0.4V$
24V & 28V models: $\pm 0.5V$
48V models: $\pm 0.7V$

- **Converter frequency:** 20 to 40 KHz

- **Output temperature coefficient:** 0.05%/°C for 5V and 9V outputs.
0.02%/°C for 12, 15, 24, 28, 48V outputs.

- **Operating temperature:** -55° C to +85° C ambient. No heat sink is required.
No electrical derating required.

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

- **Isolation:**

Series M: 100 megohms min. @ 500V DC
Series MV: 100 Megohms @ 1K V DC

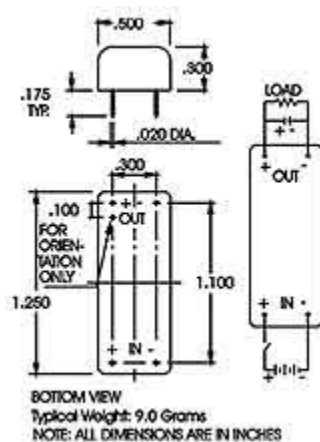
SERIES M - SINGLE OUTPUT										
PICO Part Number	Input Volt. (V DC)	Output Volt. (V DC)	Max. Load Current (mA)	Max. Output Power (watts)	Eff. @ Full Load Typical (%)	Input Current Full Load Typical (mA)	Output Volt. Ripple @ Full Load* (Vp-p max)	No Load Current Typical (mA)	Full Load Output Voltage Tolerance (V DC)	Price
5M3.3S	5	3.3	303	1.00	60	333	0.20	80	± 0.2	337.75
5M5S	5	5	200	1.00	65	308	0.20	65	± 0.25	337.75
5M5.2S	5	5.2	192	1.00	65	308	0.20	65	± 0.25	335.75
5M9S	5	9	139	1.25	71	352	0.15	80	± 0.3	337.75
5M12S	5	12	104	1.25	74	338	0.15	80	± 0.4	337.75
5M15S	5	15	83	1.25	74	338	0.12	90	± 0.4	337.75
5M24S	5	24	52	1.25	77	325	0.10	90	± 0.5	337.75
5M28S	5	28	45	1.25	76	329	0.10	90	± 0.5	337.75
5M48S	5	48	26	1.25	77	325	0.10	90	± 0.7	337.75
12M3.3S	12	3.3	303	1.00	60	139	0.20	26	± 0.2	337.75
12M5S	12	5	200	1.00	67	124	0.15	40	± 0.25	337.75
12M5.2S	12	5.2	192	1.00	67	124	0.15	40	± 0.25	337.75
12M9S	12	9	139	1.25	74	141	0.15	40	± 0.3	337.75
12M12S	12	12	104	1.25	76	137	0.12	40	± 0.4	337.75
12M15S	12	15	83	1.25	76	137	0.12	40	± 0.4	337.75

12M24S	12	24	52	1.25	78	134	0.08	40	±0.5	337.75
12M28S	12	28	45	1.25	80	130	0.08	40	±0.5	337.75
12M48S	12	48	26	1.25	80	130	0.08	40	±0.7	337.75
15M3.3S	15	3.3	303	1.0	60	111	0.20	25	±0.2	337.75
15M5S	15	5	200	1.0	67	100	0.15	35	±0.25	337.75
15M5.2S	15	5.2	192	1.0	67	100	0.15	35	±0.25	337.75
15M9S	15	9	139	1.25	74	113	0.15	35	±0.3	337.75
15M12S	15	12	104	1.25	76	110	0.12	35	±0.4	337.75
15M15S	15	15	83	1.25	76	110	0.12	35	±0.4	337.75
15M24S	15	24	52	1.25	78	107	0.08	35	±0.5	337.75
15M28S	15	28	45	1.25	80	104	0.08	35	±0.5	337.75
15M48S	15	48	26	1.25	80	104	0.08	35	±0.7	337.75
24M3.3S	24	3.3	303	1.00	60	69	0.20	16	±0.2	337.75
24M5S	24	5	200	1.00	67	62	0.15	13	±0.25	337.75
24M5.2S	24	5.2	192	1.00	67	62	0.15	13	±0.25	337.75
24M9S	24	9	139	1.25	74	70	0.15	15	±0.3	337.75
24M12S	24	12	104	1.25	75	69	0.10	15	±0.4	337.75
24M15S	24	15	83	1.25	78	67	0.10	15	±0.4	337.75
24M24S	24	24	52	1.25	82	64	0.10	15	±0.5	337.75
24M28S	24	28	45	1.25	79	66	0.10	15	±0.5	337.75
24M48S	24	48	26	1.25	80	65	0.07	16	±0.7	337.75
28M3.3S	28	3.3	303	1.00	60	59	0.20	15	±0.2	337.75
28M5S	28	5	200	1.00	68	53	0.15	12	±0.25	337.75
28M5.2S	28	5.2	192	1.00	68	53	0.15	12	±0.25	337.75
28M9S	28	9	139	1.25	76	59	0.15	14	±0.3	337.75
28M12S	28	12	104	1.25	78	57	0.12	14	±0.4	337.75
28M15S	28	15	83	1.25	79	57	0.10	14	±0.4	337.75
28M24S	28	24	52	1.25	81	55	0.09	14	±0.5	337.75
28M28S	28	28	45	1.25	81	55	0.09	14	±0.5	337.75
28M48S	28	48	26	1.25	80	56	0.09	15	±0.7	337.75

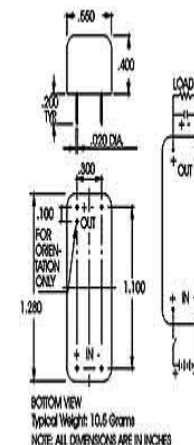
* The ripple is measured with 10 μ F, 75 volt high quality tantalum capacitor which is required across each output.

M SINGLE SERIES

MV SINGLE SERIES



Larger Size Drawing



Larger Size Schematic

SERIES MV - High Voltage to 500VDC

PICO 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)	Full Load** Output Voltage Tolerance (V DC)	Price
5MV100	5	100	12.50	1.25	78	321	0.90	±3	422.18
5MV150	5	150	8.30	1.25	76	329	0.90	±3	422.18
5MV200	5	200	6.25	1.25	75	333	0.90	±3	422.18
5MV250	5	250	5.00	1.25	75	333	0.90	±3	422.18
5MV300	5	300	4.16	1.25	70	357	1.20	±3	506.62
5MV350	5	350	3.57	1.25	70	357	1.20	±3	506.62
5MV400	5	400	3.12	1.25	70	357	1.20	±3	506.62
5MV450	5	450	2.77	1.25	70	357	1.50	±3	506.62
5MV500	5	500	2.50	1.25	70	357	1.50	±3	506.62
12MV100	12	100	12.50	1.25	80	130	0.90	±3	422.18
12MV150	12	150	8.30	1.25	79	132	0.90	±3	422.18
12MV200	12	200	6.25	1.25	78	134	0.90	±3	422.18
12MV250	12	250	5.00	1.25	75	139	0.90	±3	422.18
12MV300	12	300	4.16	1.25	75	139	1.20	±3	506.62
12MV350	12	350	3.57	1.25	75	139	1.20	±3	506.62
12MV400	12	400	3.12	1.25	75	139	1.20	±3	506.62
12MV450	12	450	2.77	1.25	75	139	1.50	±3	506.62

12MV500	12	500	2.50	1.25	75	139	1.50	±3	506.62
15MV100	15	100	12.50	1.25	80	104	0.90	±3	422.18
15MV150	15	150	8.30	1.25	79	105	0.90	±3	422.18
15MV200	15	200	6.25	1.25	78	107	0.90	±3	422.18
15MV250	15	250	5.00	1.25	75	111	0.90	±3	422.18
15MV300	15	300	4.16	1.25	75	111	1.20	±3	506.62
15MV350	15	350	3.57	1.25	75	111	1.20	±3	506.62
15MV400	15	400	3.12	1.25	75	111	1.20	±3	506.62
15MV450	15	450	2.77	1.25	75	111	1.50	±3	506.62
15MV500	15	500	2.50	1.25	75	111	1.50	±3	506.62
24MV100	24	100	12.50	1.25	76	69	0.90	±3	422.18
24MV150	24	150	8.30	1.25	73	71	0.90	±3	422.18
24MV200	24	200	6.25	1.25	73	71	0.90	±3	422.18
24MV250	24	250	5.00	1.25	70	74	0.90	±3	422.18
24MV300	24	300	4.16	1.25	73	71	1.20	±3	506.62
24MV350	24	350	3.57	1.25	73	71	1.20	±3	506.62
24MV400	24	400	3.12	1.25	73	71	1.20	±3	506.62
24MV450	24	450	2.77	1.25	73	71	1.50	±3	506.62
24MV500	24	500	2.50	1.25	73	71	1.50	±3	506.62
28MV100	28	100	12.50	1.25	75	60	0.90	±3	422.18
28MV150	28	150	8.30	1.25	76	59	0.90	±3	422.18
28MV200	28	200	6.25	1.25	75	60	0.90	±3	422.18
28MV250	28	250	5.00	1.25	70	64	0.90	±3	422.18
28MV300	28	300	4.16	1.25	73	61	1.20	±3	506.62
28MV350	28	350	3.57	1.25	73	61	1.20	±3	506.62
28MV400	28	400	3.12	1.25	73	61	1.20	±3	506.62
28MV450	28	450	2.77	1.25	73	61	1.50	±3	506.62
28MV500	28	500	2.50	1.25	73	61	1.50	±3	506.62

* The ripple is measured with 0.1μF, 1000 volt DC capacitor which is required across the output and maintain at least 10% of load at all times to prevent voltage surge.

**For tighter tolerances, consult factory

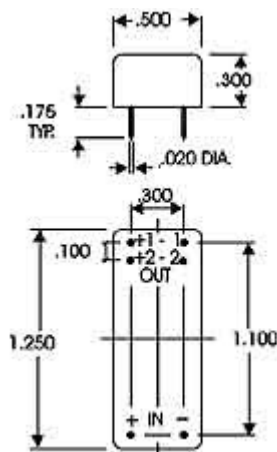
SERIES M - DUAL OUTPUT

PICO Part Number	Input Volt. (V DC)	Dual 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
5M5D	5	5	100	0.5	65	308	0.20	65	±0.25	399.57
5M9D	5	9	69	0.625	71	352	0.15	80	±0.3	399.57
5M12D	5	12	52	0.625	74	338	0.15	80	±0.4	399.57
5M15D	5	15	42	0.625	74	338	0.12	90	±0.4	399.57

5M24D	5	24	26	0.625	77	325	0.10	90	±0.5	399.57
5M28D	5	28	22	0.625	76	329	0.10	90	±0.5	399.57
5M48D	5	48	13	0.625	77	325	0.10	90	±0.7	399.57
12M5D	12	5	100	0.5	67	124	0.15	40	±0.25	399.57
12M9D	12	9	69	0.625	74	141	0.15	40	±0.3	399.57
12M12D	12	12	52	0.625	76	137	0.12	40	±0.4	399.57
12M15D	12	15	42	0.625	76	137	0.12	40	±0.4	399.57
12M24D	12	24	26	0.625	78	134	0.08	40	±0.5	399.57
12M28D	12	28	22	0.625	80	130	0.08	40	±0.5	399.57
12M48D	12	48	13	0.625	80	130	0.05	40	±0.7	399.57
15M5D	15	5	100	0.5	67	100	0.15	35	±0.25	399.57
15M9D	15	9	69	0.625	74	113	0.15	35	±0.3	399.57
15M12D	15	12	52	0.625	76	110	0.12	35	±0.4	399.57
15M15D	15	15	42	0.625	76	110	0.12	35	±0.4	399.57
15M24D	15	24	26	0.625	78	107	0.08	35	±0.5	399.57
15M28D	15	28	22	0.625	80	104	0.08	35	±0.5	399.57
15M48D	15	48	13	0.625	80	104	0.05	35	±0.7	399.57
24M5D	24	5	100	0.5	67	62	0.15	13	±0.25	399.57
24M9D	24	9	69	0.625	74	70	0.15	15	±0.3	399.57
24M12D	24	12	52	0.625	75	69	0.10	15	±0.4	399.57
24M15D	24	15	42	0.625	78	67	0.10	15	±0.4	399.57
24M24D	24	24	26	0.625	82	64	0.10	15	±0.5	399.57
24M28D	24	28	22	0.625	79	66	0.10	15	±0.5	399.57
24M48D	24	48	13	0.625	80	65	0.07	16	±0.7	399.57
28M5D	28	5	100	0.5	68	53	0.15	12	±0.25	399.57
28M9D	28	9	69	0.625	76	59	0.15	14	±0.3	399.57
28M12D	28	12	52	0.625	78	57	0.12	14	±0.4	399.57
28M15D	28	15	42	0.625	79	57	0.10	14	±0.4	399.57
28M24D	28	24	26	0.625	81	55	0.09	14	±0.5	399.57
28M28D	28	28	22	0.625	81	55	0.09	14	±0.5	399.57
28M48D	28	48	13	0.625	80	56	0.09	15	±0.7	399.57

* The ripple is measured with 10 μ F, 75 volt high quality tantalum capacitor which is required across each output.

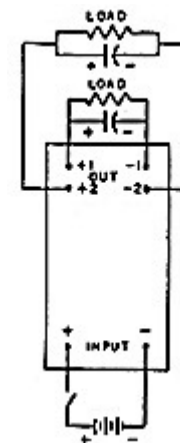
M DUAL SERIES



Bottom View

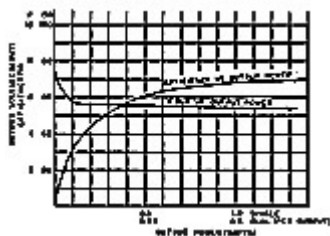
Typical Weight: 9 grams

[Larger Size Drawing](#)



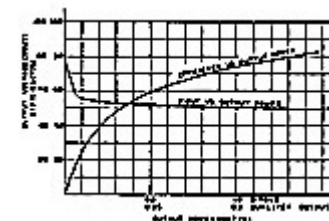
[Larger Size Schematic](#)

SERIES M SINGLE & DUAL 24V - 5V



[Larger Size Graph](#)

SERIES M SINGLE & DUAL 28V - 48V



[Larger Size Graph](#)

For immediate engineering assistance or to place an order:
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