

SERIES MR MILITARY DC-DC CONVERTERS

Hi Reliability, Ultra-Miniature, Isolated DC-DC Converters
-55°C +85°C Operating Temperature
Wide Input Range, All Units Shielded

Low Profile .300"

No Heat Sink or Electrical Derating Required

This series of high efficiency wide input range, encapsulated regulators come in 42 different models. Manufactured using high grade military components, this units will operate from -55° C to +85° C with no heat sink or electrical derating required. The 6 sided shielding and 32 pin DIP compatability combined with input/output isolation and the wide input range capabilities will meet your most stringent military requirements.

- **Diodes JAN TX**
- **Transformers Manufactured to MIL-PRF-27, Grade 5, Class S**
- **Capacitors MIL-C 55365/4, MIL-C 39003/03, MIL-C 20/27E, MIL-C 39014/05**
- **Resistors MIL-R-39017, MIL-R-22097**
- **IC Hermetically Sealed**

TYPICAL CHARACTERISTICS:

- **Test conditions:** 25° C ambient.
- **Operating temperature:** -55° C to +85° C ambient.
- **Output voltage tolerance:** $\pm 1\%$ at nominal input voltage
- **Output voltage temperature coefficient:** 0.02%/°C
- **Storage temperature:** -55° C to +125° C
- **Short circuit protection:** Temporary
- **Operating frequency:** 40 Khtz, typ.

OPTIONS AVAILABLE PER MIL-STD-883

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

FEATURES

- Voltage regulation over input range of

Unit	Low	High
MRE	5V	15V
MRF	8V	24V
MRA	18V	36V

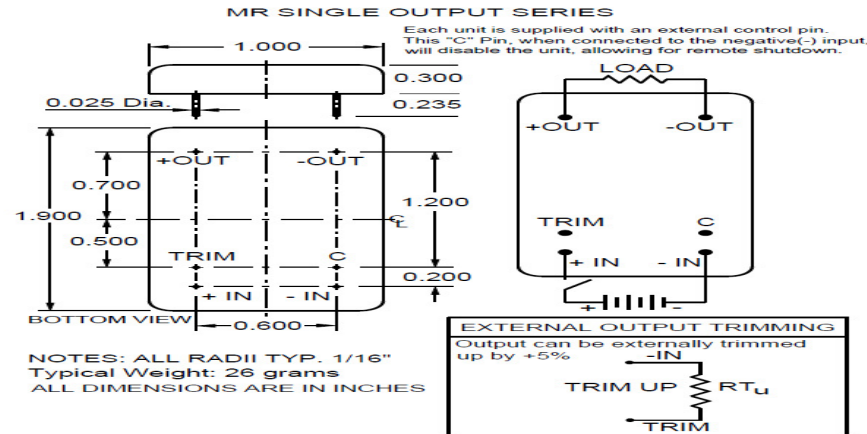
- Load regulation (see table for typical variation at different loads)
- Line regulation = Typical values
- 5-15V DC = $\pm 1.0\%$
- 8-24V DC = $\pm 1.0\%$
- 18-36V DC = $\pm 2.0\%$
- High efficiency - up to 78%
- Will operate over a temperature range of -55° C to +85° C with no heat sink or electrical derating
- 6 sided shielding
- Isolation - 100 megohms at 500 Volts DC
- External output trimming pin standard, +5%
- Single and dual isolated outputs
- Each unit is supplied with an external control pin. This "C" pin, when connected to the negative (-) input, will disable the unit, allowing for remote shutdown.

SERIES MR - SINGLE OUTPUT

PICO Part Number	Input Volt. Range	Output Volt. DC	Max. Load Current (mA)	Max. Output Power (watts)	Eff. @ Full Load Typical (%)*	Input Current Full Load Typical (mA)*	Output Volt. Ripple@ Full LD. 1-1 MHz BW mv p-p	Output Volt. Tolerance ($\pm$ %)*	V LD. Reg. 25%-100% Load ($\pm$ %)*	Line Regulation ($\pm$ %)*	Price (US \$)
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MRE3.3S	5-15	3.3	379	1.25	67	186	200	1.00	2.00	2.0	673.84
MRE5S	5-15	5	300	1.5	70	214	200	0.75	1.75	1.75	673.84
MRE5.2S	5-15	5.2	288	1.5	70	214	200	0.75	1.75	1.75	673.84
MRE9S	5-15	9	167	1.5	75	200	150	0.50	1.25	1.50	673.84
MRE12S	5-15	12	125	1.5	75	200	150	0.50	1.00	1.25	673.84
MRE15S	5-15	15	100	1.5	76	197	150	0.50	1.00	1.25	673.84
MRE24S	5-15	24	63	1.5	77	195	150	0.50	0.75	1.00	673.84
MRE28S	5-15	28	54	1.5	78	192	200	0.50	0.75	0.75	673.84
MRF3.3S	8-24	3.3	530	1.75	67	163	200	1.00	2.00	1.75	673.84
MRF5S	8-24	5	400	2.0	70	179	200	0.75	1.75	1.50	673.84
MRF5.2S	8-24	5.2	384	2.0	70	179	200	0.75	1.75	1.50	673.84
MRF9S	8-24	9	222	2.0	75	167	150	0.50	1.25	1.25	673.84
MRF12S	8-24	12	167	2.0	75	167	150	0.50	1.00	1.00	673.84
MRF15S	8-24	15	133	2.0	76	164	150	0.50	1.00	1.00	673.84
MRF24S	8-24	24	83	2.0	77	162	150	0.50	0.75	1.00	673.84
MRF28S	8-24	28	71	2.0	78	160	200	0.50	0.75	0.75	673.84
MRA3.3S	18-36	3.3	530	1.75	67	97	200	1.00	2.00	1.25	673.84
MRA5S	18-36	5	400	2.0	70	106	200	0.75	1.75	1.00	673.84
MRA5.2S	18-36	5.2	384	2.0	70	106	200	0.75	1.75	1.00	673.84
MRA9S	18-36	9	278	2.5	75	123	150	0.50	1.25	0.75	673.84
MRA12S	18-36	12	208	2.5	75	123	150	0.50	1.00	0.75	673.84
MRA15S	18-36	15	167	2.5	76	122	150	0.50	1.00	0.75	673.84
MRA24S	18-36	24	104	2.5	77	120	150	0.50	0.75	0.75	673.84
MRA28S	18-36	28	89	2.5	78	119	200	0.50	0.75	0.50	673.84

10% minimum load required.



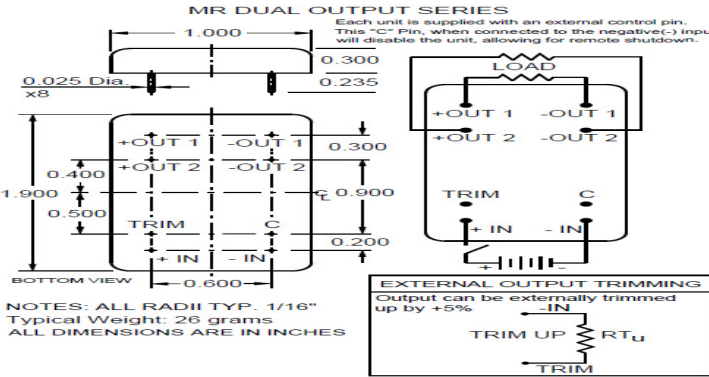
[Larger Size Drawing](#)

SERIES MR - DUAL OUTPUT

PICO Part Number	Input Volt. Range	Output Volt. DC Per Output	Max. Load Current (mA) Per Output	Max. Output Power (watts) Per Output	Eff. @ Full Load Typical (%)*	Input Current Full Load Typical (mA)*	Output Volt. Ripple@ Full LD. 1-1 MHz BW mv p-p	Output Volt. Tolerance ($\pm$ %)*	V LD. Reg. 25%-100% Load ($\pm$ %)*	Line Regulation ($\pm$ %)*	Price (US \$)
MRE5D	5-15	5	150	0.75	70	214	200	0.75	1.75	1.75	762.96
MRE9D	5-15	9	84	0.75	75	200	150	0.50	1.25	1.50	762.96
MRE12D	5-15	12	63	0.75	75	200	150	0.50	1.00	1.25	762.96
MRE15D	5-15	15	50	0.75	76	197	150	0.50	1.00	1.25	762.96
MRE24D	5-15	24	32	0.75	77	195	150	0.50	0.75	1.00	762.96
MRE28D	5-15	28	27	0.75	78	192	200	0.50	0.75	0.75	762.96

MRF5D	8-24	5	200	1.00	70	179	200	0.75	1.75	1.50	762.96
MRF9D	8-24	9	111	1.00	75	167	150	0.50	1.25	1.25	762.96
MRF12D	8-24	12	84	1.00	75	167	150	0.50	1.00	1.00	762.96
MRF15D	8-24	15	67	1.00	76	164	150	0.50	1.00	1.00	762.96
MRF24D	8-24	24	42	1.00	77	162	150	0.50	0.75	1.00	762.96
MRF28D	8-24	28	36	1.00	78	160	200	0.50	0.75	0.75	762.96
MRA5D	18-36	5	200	1.00	70	106	200	0.75	1.75	1.00	762.96
MRA9D	18-36	9	139	1.25	75	123	150	0.50	1.25	0.75	762.96
MRA12D	18-36	12	104	1.25	75	123	150	0.50	1.00	0.75	762.96
MRA15D	18-36	15	84	1.25	76	122	150	0.50	1.00	0.75	762.96
MRA24D	18-36	24	52	1.25	77	120	150	0.50	0.75	0.75	762.96
MRA28D	18-36	28	45	1.25	78	119	200	0.50	0.75	0.50	762.96

* Measurements taken with input voltage set at mid value.
10% minimum load required.



[Larger Size Drawing](#)

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

Tel: 914-738-1400 or Fax: 914-738-8225