

Series NR

DC to DC Converters

Single, Dual and Triple Output

Wide Input Range up to 72V DC Input
Isolated Regulated up to 30 Watt DC-DC Converters
Single, Dual, and Triple Output Models

This series of high efficiency, wide input range, encapsulated regulators come in 66 different models including 30 Triple Output Models to ease board designs. These units feature a 500 VOLT DC input to output isolation in both single and dual output models. The NR Series will operate over a temperature range of -25° C TO +70° C with no heat sink or electrical derating. These units are excellent for applications where input voltage varies dramatically, yet a high efficiency and output voltage regulation must be maintained

FEATURES

- 30 triple output models
- Voltage regulation over input range of

Unit	Low	High
NRF	10V	30V
NRA	18V	36V
NRB	36V	72V

- Encapsulated semiconductors, conservatively rated for maximum reliability.
- Load regulation (see table for typical variation at different loads)
- Line regulation = Typical values
18-36 V DC = $\pm 0.2\%$
16-36 V DC = $\pm 0.2\%$
36-72 V DC = $\pm 0.2\%$
- High efficiency - up to 87%
- Will operate over an ambient temperature range of -25° C to +70° C with no heat sink or electrical derating
- Short circuit protection
- Current limited
- 6 sided shielding
- Isolation - 100 megohms at 500 volts DC
- Screw inserts for mounting

TYPICAL CHARACTERISTICS:

Test conditions: 25° C ambient

Operating temperature:

-25° C to +70° C ambient

Output voltage tolerance: $\pm 0.5\%$ main outputs

Output voltage temperature coefficient: 0.01% / ° C

Storage temperature: -55° C to 125° C

Short circuit protection: Continuous

Operating frequency: 30Khtz, typical

OPTIONS AVAILABLE

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

SERIES NR - SINGLE OUTPUT

Pico Part Number	Input Voltage Range	Output Voltage DC	Max. Load Current mA	Max. Output Power (watts)	EFF.@ Full Load Typical (%)*	Input Current Full Load Typical (mA)*	Out Volt Ripple @ Full LD. 1-1MHz BW mv p-p	Out Volt Tolerance (± %)*	** V LD. Reg. 10%-100% Load (± %)*	Line Regulation* (± %)	Price (US \$)
NRF3.3S	10-30	3.3	4545	15	76	987	50	0.5	0.5	0.5	356.73
NRF5S	10-30	5	4000	20	78	1068	50	0.5	0.3	0.2	356.73
NRF5.2S	10-30	5.2	3846	20	78	1068	50	0.5	0.3	0.2	356.73
NRF9S	10-30	9	2777	25	80	1302	50	0.5	0.2	0.2	356.73
NRF12S	10-30	12	2083	25	81	1286	50	0.5	0.2	0.2	356.73
NRF15S	10-30	15	1666	25	83	1255	50	0.5	0.2	0.2	356.73
NRF24S	10-30	24	1042	25	84	1240	50	0.5	0.2	0.2	356.73
NRF28S	10-30	28	893	25	85	1225	50	0.5	0.2	0.2	356.73
NRA3.3S	18-36	3.3	4545	15	76	731	50	0.5	0.5	0.5	356.73
NRA5S	18-36	5	4000	20	78	950	50	0.5	0.3	0.2	356.73
NRA5.2S	18-36	5.2	3846	20	78	950	50	0.5	0.3	0.2	356.73
NRA9S	18-36	9	2777	25	80	1155	50	0.5	0.2	0.2	356.73
NRA12S	18-36	12	2083	25	81	1145	50	0.5	0.2	0.2	356.73
NRA15S	18-36	15	1666	25	83	1115	50	0.5	0.2	0.2	356.73
NRA24S	18-36	24	1042	25	84	1100	50	0.5	0.2	0.2	356.73
NRA28S	18-36	28	893	25	85	1090	50	0.5	0.2	0.2	356.73
NRB3.3S	36-72	3.3	6061	20	76	487	50	0.5	0.5	0.5	396.52
NRB5S	36-72	5	4400	22	78	520	50	0.5	0.3	0.2	396.52
NRB5.2S	36-72	5.2	4230	22	78	520	50	0.5	0.3	0.2	396.52
NRB9S	36-72	9	2777	25	83	560	50	0.5	0.2	0.2	396.52
NRB12S	36-72	12	2083	25	83	560	50	0.5	0.3	0.2	396.52
NRB15S	36-72	15	2000	30	85	655	50	0.5	0.3	0.2	396.52
NRB24S	36-72	24	1250	30	86	645	50	0.5	0.3	0.2	396.52
NRB28S	36-72	28	1071	30	87	640	50	0.5	0.3	0.2	396.52

SERIES NR-DUAL OUTPUT

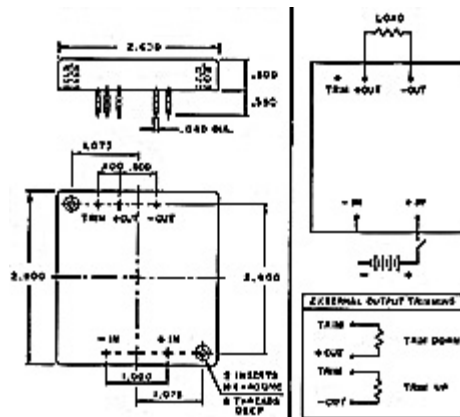
Pico Part Number	Input Voltage Range	Output Voltage DC	Max. Load Current mA	Max. Output Power (watts)	EFF.@ Full Load Typical (%)*	Input Current Full Load Typical (mA)*	Out Volt Ripple @ Full LD. 1-1MHz BW mv p-p	Out Volt Tolerance (± %)*	** V LD. Reg. 25%-100% Load (± %)*	Line Regulation* (± %)	Price (US \$)
NRF5D	10-30	± 5	2000	10.0	78	1068	50	0.5	0.3	0.2	425.33
NRF9D	10-30	± 9	1390	12.5	80	1302	50	0.5	0.2	0.2	425.33
NRF12D	10-30	± 12	1042	12.5	81	1286	50	0.5	0.2	0.2	425.33
NRF15D	10-30	± 15	833	12.5	83	1255	50	0.5	0.2	0.2	425.33
NRA5D	18-36	± 5	2000	10.0	78	950	50	0.5	0.3	0.2	425.33
NRA9D	18-36	± 9	1390	12.5	80	1155	50	0.5	0.2	0.2	425.33
NRA12D	18-36	± 12	1042	12.5	81	1145	50	0.5	0.2	0.2	425.33
NRA15D	18-36	± 15	833	12.5	83	1115	50	0.5	0.2	0.2	425.33
NRB5D	36-72	± 5	2200	11.0	78	520	50	0.5	0.2	0.2	465.12
NRB9D	36-72	± 9	1390	12.5	80	580	50	0.5	0.2	0.2	465.12
NRB12D	36-72	± 12	1042	12.5	82	565	50	0.5	0.2	0.2	465.12
NRB15D	36-72	± 15	833	12.5	84	550	50	0.5	0.2	0.2	465.12

SERIES NR - TRIPLE OUTPUT														
		MAIN OUTPUT VOLTAGE					AUXILIARY OUTPUT VOLTAGE							
PICO PART NUMBER	INPUT VOLT-AGE RANGE	OUT-PUT VOLT-AGE DC OUT-PUT	MAX. LOAD CUR-RENT mA OUTPUT	MAX. OUTPUT POWER (watts)	V LD. REG. 25%-100% LOAD (± %)*	OUTPUT RIPPLE @ FULL LOAD. 1-1MHz BW mv p-p	OUTPUT VOLTAGE DC PER OUTPUT	MAX. LOAD CURRENT mA PER OUTPUT	MAX. OUT-PUT POWER (WATTS) PER OUTPUT	** VOLT LOAD reg. 25%-100% LOAD (± %)*	OUTPUT RIPPLE @ full LOAD 1-1MHz BW mv p-p	EFF.@ full load typical (%)*	Input current full load typical (mA)*	Price (US \$)

NRA5T12	18-36	5	3000	15	0.2	50	± 12	208	2.5	5	50	78	950	493.94
NRA5T15	18-36	5	3000	15	0.2	50	± 15	167	2.5	5	50	78	950	493.94
NRA9T5	18-36	9	2220	20	0.2	50	± 5	500	2.5	5	50	80	1155	493.94
NRA9T12	18-36	9	2220	20	0.2	50	± 12	208	2.5	5	50	80	1155	493.94
NRA9T15	18-36	9	2220	20	0.2	50	± 15	167	2.5	5	50	80	1155	493.94
NRA12T5	18-36	12	1660	20	0.2	50	± 5	500	2.5	5	50	81	1145	493.94
NRA12T15	18-36	12	1660	20	0.2	50	± 15	167	2.5	5	50	81	1145	493.94
NRA15T5	18-36	15	1330	20	0.2	50	± 5	500	2.5	5	50	83	1115	493.94
NRA15T12	18-36	15	1330	20	0.2	50	± 12	208	2.5	5	50	83	1115	493.94
NRA24T5	18-36	24	830	20	0.2	50	± 5	500	2.5	5	50	84	1100	493.94
NRA24T12	18-36	24	830	20	0.2	50	± 12	208	2.5	5	50	84	1100	493.94
NRA24T15	18-36	24	830	20	0.2	50	± 15	167	2.5	5	50	84	1100	493.94
NRA28T5	18-36	28	714	20	0.2	50	± 5	500	2.5	5	50	85	1090	493.94
NRA28T12	18-36	28	714	20	0.2	50	± 12	208	2.5	5	50	85	1090	493.93
NRA28T15	18-36	28	714	20	0.2	50	± 15	167	2.5	5	50	85	1090	493.93
NRB5T12	36-72	5	3400	17	0.2	50	± 12	208	2.5	5	50	78	520	533.73
NRB5T15	36-72	5	3400	17	0.2	50	± 15	167	2.5	5	50	78	520	533.73
NRB9T5	36-72	9	2220	20	0.2	50	± 5	500	2.5	5	50	80	580	533.73
NRB9T12	36-72	9	2220	20	0.2	50	± 12	208	2.5	5	50	80	580	533.73
NRB9T15	36-72	9	2220	20	0.2	50	± 15	167	2.5	5	50	80	580	533.73
NRB12T5	36-72	12	1660	20	0.2	50	± 5	500	2.5	5	50	84	550	533.73
NRB12T15	36-72	12	1660	20	0.2	50	± 15	167	2.5	5	50	84	550	533.73
NRB15T5	36-72	15	1667	25	0.2	50	± 5	500	2.5	5	50	85	655	533.73
NRB15T12	36-72	15	1667	25	0.2	50	± 12	208	2.5	5	50	85	655	533.73
NRB24T5	36-72	24	1042	25	0.2	50	± 5	500	2.5	5	50	86	645	533.73
NRB24T12	36-72	24	1042	25	0.2	50	± 12	208	2.5	5	50	86	645	533.73
NRB24T15	36-72	24	1042	25	0.2	50	± 15	167	2.5	5	50	86	645	533.73
NRB28T5	36-72	28	893	25	0.2	50	± 5	500	2.5	5	50	87	640	533.73
NRB28T12	36-72	28	893	25	0.2	50	± 12	208	2.5	5	50	87	640	533.73
NRB28T15	36-72	28	893	25	0.2	50	± 15	167	2.5	5	50	87	640	533.73
		Common Characteristics Main Output Voltage Tolerance ± 0.5%* Main Line Regulation ± 0.2%*					Common Characteristics Auxiliary Output Voltage Tolerance ± 4%* Auxiliary Line Regulation ± 0.2%*							
*Measurements taken with input voltage set at mid value. **10% minimum load required.														

**Series
NR
Single
Output**

NOTES:
all radii 7/64"
inserts and case common with negative input pin
bottom view

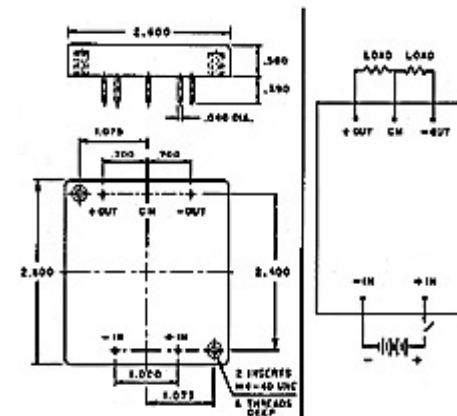


[Larger Size Drawing and Schematic](#)

Typical Weight: 175 Grams

**Series
NR Dual
Output**

NOTES:
all radii 7/64"
inserts and case common with negative input pin
bottom view



[Larger Size Drawing and Schematic](#)

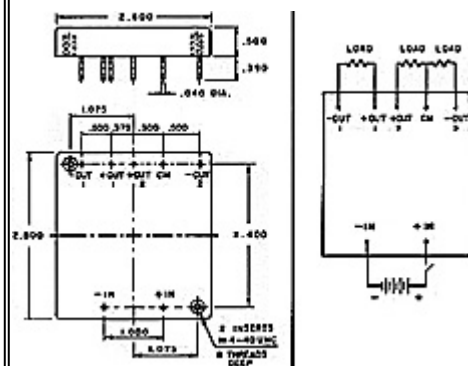
Typical Weight: 175 Grams

Series NR Triple Output

NOTES:

all radii 7/64"

inserts and case common with negative input pin
bottom view



[Larger Size Drawing and Schematic](#)

Typical Weight: 175 Grams

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

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