

DC1-5 AND DC2-5 SERIES

NIDEC CORP/ PWR GENL DIV 48E D ■ 6610921 0000945 8 ■

B-15-11

5W SINGLE AND DUAL OUTPUT DC-DC CONVERTERS

FEATURES

- Indefinite Short-Circuit Protection
- 500 VDC Input/Output Isolation
- Pi Input Filter
- Tight Line/Load Regulation
- Continuous Shielding, Copper Case
- Compact 2" x 2" x 0.38" Package
- 5-Year Warranty
- **330,000 Hours Minimum MTBF**



APPLICATIONS

- Microprocessor-Based Systems
- Portable/Battery Driven Equipment
- Telecommunications Equipment
- Data Communications Equipment

DC1-5 and DC2-5 models have a copper case with six-sided shielding and are encapsulated with a flame-retardant epoxy.

GENERAL SPECIFICATIONS

DC INPUT VOLTAGE	See voltage/current rating chart.
INPUT CURRENT	See voltage/current rating chart.
REFLECTED RIPPLE CURRENT	40 mA _{pp} , maximum.
EMI FILTER	Pi input filter, standard.
DC OUTPUT	See voltage/current rating chart.
OUTPUT VOLTAGE TOLERANCE	±0.5 percent.
EFFICIENCY	See voltage/current rating chart.
CURRENT LIMIT	Pulsed overload.
NOISE & RIPPLE	30 mV _{pp} , maximum.
LINE/LOAD REGULATION	See voltage/current rating chart.
CROSS-REGULATION	±0.1 percent, maximum (DC2-5).
ISOLATION VOLTAGE	500 VDC, input to output.
ISOLATION CAPACITANCE	100 pF, typical.
TRANSIENT RESPONSE	50 μs, maximum, to within 1 percent of V _{OUT} with 25 percent step load change. (See Note 4.)
FREQUENCY OF OPERATION	45-55 kHz.

ENVIRONMENTAL OPERATING CHARACTERISTICS

TEMPERATURE RANGE	-25°C to +70°C, no derating.
TEMPERATURE COEFFICIENT	±0.02 percent/°C.
COOLING	Free-air convection.
RELATIVE HUMIDITY	0 to 95 percent, non-condensing.
ALTITUDE	0 to 10,000 feet.

STORAGE CHARACTERISTICS

TEMPERATURE RANGE	-40°C to +100°C.
RELATIVE HUMIDITY	0 to 95 percent, non-condensing.

RELIABILITY

MEAN TIME BETWEEN FAILURES	>330,000 hours, per MIL-HDBK 217E Parts Stress Method. (Ground benign, T _A =+25°C.)
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Model Number	DC Input Voltage			Input Current		DC Output Voltage (V)	Output Current (mA)	Max. Output Power (W)	Line Reg. (LL-HL)	Load Reg. (NL-FL)	Efficiency
	Min. (V)	Nom. (V)	Max. (V)	No Load (mA)	Full Load (mA)						
DC1-5-5/5	4.75	5.0	5.5	175	1500	5.0	1000	5.0	0.1%	0.1%	67%
DC1-5-5/9	4.75	5.0	5.5	175	1550	9.0	600	5.4	0.1%	0.1%	70%
DC1-5-5/12	4.75	5.0	5.5	175	1700	12	500	6.0	0.1%	0.1%	71%
DC1-5-5/15	4.75	5.0	5.5	180	1650	15	400	6.0	0.1%	0.1%	73%
DC1-5-12/5	10.8	12	13.2	60	620	5.0	1000	5.0	0.1%	0.1%	68%
DC1-5-12/9	10.8	12	13.2	60	675	9.0	600	5.4	0.1%	0.1%	68%
DC1-5-12/12	10.8	12	13.2	60	715	12	500	6.0	0.1%	0.1%	69%
DC1-5-12/15	10.8	12	13.2	75	705	15	400	6.0	0.1%	0.1%	71%
DC1-5-24/5	21.6	24	26.4	25	315	5.0	1000	5.0	0.1%	0.1%	67%
DC1-5-24/9	21.6	24	26.4	25	310	9.0	600	5.4	0.1%	0.1%	74%
DC1-5-24/12	21.6	24	26.4	30	335	12	500	6.0	0.1%	0.1%	75%
DC1-5-24/15	21.6	24	26.4	30	350	15	400	6.0	0.1%	0.1%	73%
DC1-5-28/5	25.2	28	30.8	25	260	5.0	1000	5.0	0.1%	0.1%	69%
DC1-5-28/9	25.2	28	30.8	28	275	9.0	600	5.4	0.1%	0.1%	73%
DC1-5-28/12	25.2	28	30.8	30	370	12	500	6.0	0.1%	0.1%	71%
DC1-5-28/15	25.2	28	30.8	30	300	15	400	6.0	0.1%	0.1%	73%
DC1-5-48/5	43.2	48	52.8	18	165	5.0	1000	5.0	0.1%	0.1%	63%
DC1-5-48/9	43.2	48	52.8	18	160	9.0	600	5.4	0.1%	0.1%	73%
DC1-5-48/12	43.2	48	52.8	20	175	12	500	6.0	0.1%	0.1%	73%
DC1-5-48/15	43.2	48	52.8	20	170	15	400	6.0	0.1%	0.1%	75%
DC2-5-5/12	4.75	5.0	5.5	200	1850	±12	250	6.0	0.1%	0.1%	65%
DC2-5-5/15	4.75	5.0	5.5	210	1850	±15	200	6.0	0.1%	0.1%	65%
DC2-5-12/12	10.8	12	13.2	65	740	±12	250	6.0	0.1%	0.1%	67%
DC2-5-12/15	10.8	12	13.2	65	730	±15	200	6.0	0.1%	0.1%	69%
DC2-5-24/12	21.6	24	26.4	35	355	±12	250	6.0	0.1%	0.1%	70%
DC2-5-24/15	21.6	24	26.4	35	345	±15	200	6.0	0.1%	0.1%	72%
DC2-5-28/12	25.2	28	30.8	32	305	±12	250	6.0	0.1%	0.1%	71%
DC2-5-28/15	25.2	28	30.8	32	305	±15	200	6.0	0.1%	0.1%	74%
DC2-5-48/12	43.2	48	52.8	18	175	±12	250	6.0	0.1%	0.1%	71%
DC2-5-48/15	43.2	48	52.8	18	175	±15	200	6.0	0.1%	0.1%	72%

Notes:

1. Converters with $\pm 12V$ or $\pm 15V$ output can be used as 24V or 30V supplies.
2. Total output power must not exceed 5 watts.
3. All measurements are at nominal input, full load and $+25^{\circ}C$, unless otherwise specified.
4. Maximum deviation from transient response is 150 mV for DC1-5, 10 mV for DC2-5.
5. Peak-to-peak and RMS metering equipment shall have a 20 MHz response with probes and cables maintaining a frequency response of 20 Hz to 20 MHz. Output ripple and spikes are measured directly at the output terminals of the power supply across a 0.1 μF ceramic capacitor without use of the probe ground.

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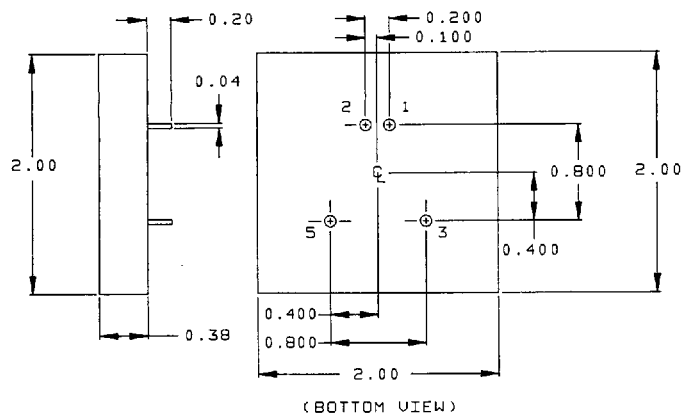
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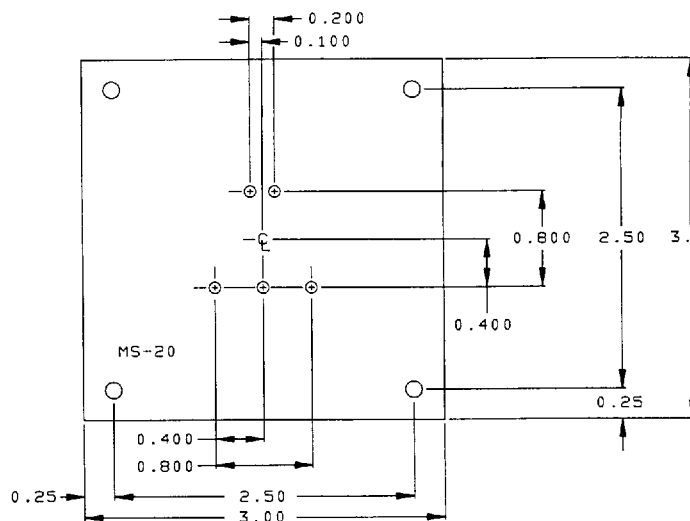
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MECHANICAL OUTLINE AND PIN CONFIGURATION

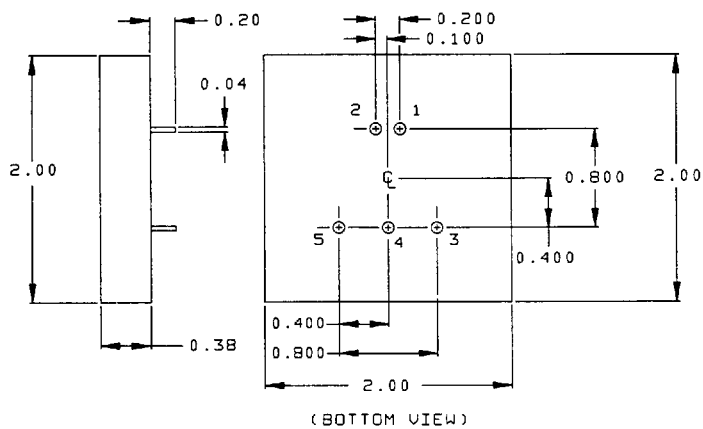
DC1-5 CASE



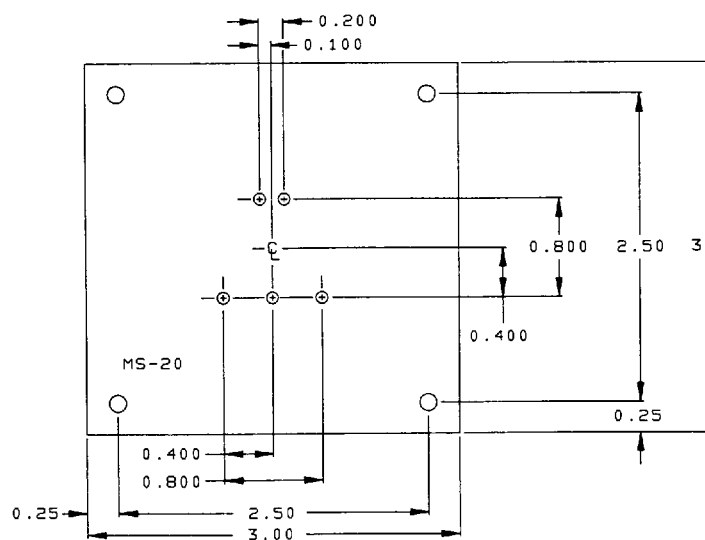
OPTIONAL SOCKET



DC2-5 CASE



OPTIONAL SOCKET



Notes:

1. Dimensions shown are in inches.
2. Tolerance = 0.00 $\pm$ 0.02.
0.000 $\pm$ 0.005.
3. Module weight = 1.6 oz (0.045 kg).

Socket Notes:

1. Socket mounting holes are 0.014" (3.56 mm) in diameter.
2. G10 board thickness is 0.09 inches (2.29 mm).
3. Receptacles extend 0.31 inches (7.87 mm) below surface of socket board.

PIN-OUT

Single Output		Dual Output	
Pin	Designation	Pin	Designation
1	+ V IN	1	+ V IN
2	- V IN	2	- V IN
3	+ V OUT	3	+ V OUT
4	N/A	4	COMMON
5	- V OUT	5	- V OUT