T-73-41

TRANSMAGNETICS

SERIES 1504

Revised October 1982

14 BIT DIGITAL VECTOR GENERATORS

INPUTS: DIGITAL θ AND ANALOG R
OUTPUTS: R SIN θ AND R COS θ

FEATURES:

- 0.05% max. magnitude variation
- 14 Bit resolution and ±4 arc minutes accuracy
- 25µs slewing speed
- Reference (R) will accept any waveform, including sawtooth for PPI displays
- Short circuit protected output
- No calibration, adjustments or warmup
- Low power TTL inputs eliminate the need for special precautions against static electricity
- Reverse polarity protected
- Available for either 0°C to +70°C or -55°C to +105°C operation
- Hermetically sealed units on request
- Meets MIL-STD-202D, Methods 101C, 105B, 106C, 107C, 202D, 204B and 205D
- High reliability 883B or MIL-M-38510 upon request
- Output is essentially free of glitches

DESCRIPTION:

These high speed multiplying trigonometric D/A modules convert either a 14 bit or a 12 bit digital angle input into two output signals that are proportional to the sine and cosine of the indicated input angle. The magnitudes of these output voltages are directly proportional to the externally applied scaling (R) voltage, yet are insensitive to power supply changes. The 0.05% transformation ratio and exact 90° phase shift between sine and cosine outputs assure a distortion free display on either a PPI or X, Y plotter.

APPLICATIONS:

1. To display polar patterns on an X, Y plotter
2. PPI radar system where the angle corresponds to bearing and the distance from the center corresponds to range
3. Low frequency quadrature outputs
4. Coordinate rotation

SPECIFICATIONS:

	Code A	Code B
Resolution:	14 BITS (1 LSB = 1.3 arc minutes)	12 BITS (1 LSB = 5.3 arc minutes)
Accuracy*:	±4 arc minutes	±8.5 arc minutes
Magnitude (DC Outputs:)	±0.05%	±0.05%

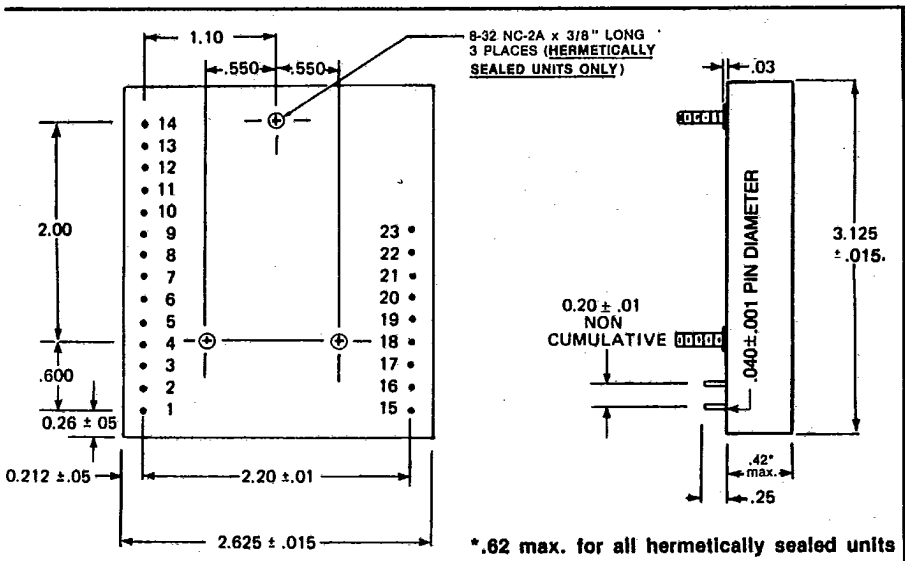
*Angle accuracy is determined by the ratio of $\frac{\text{Sin Out}}{\text{Cos Out}}$

*Accuracy and magnitude apply over indicated temperature range and ±5% power supply variations
*Accuracy varies inversely with R

Logic, Input: Parallel, positive logic, TTL levels, binary coded angle.
Fan In: 1 Low power TTL Load
Output: R sin θ and R cos θ
θ = 0° to 360°
Drive Capability: 5mA maximum for rated accuracy. Output is short circuit proof.
Output Load: 2K minimum
R In: ±10 V max. DC to 2.5KHz with full accuracy, to 15KHz with reduced accuracy. Reference will accept any waveform including sawtooth for PPI displays.
Input Z: 7K min.
Slewing Speed: Output will settle within 25µs of a 10 VDC step input
Full Power Output: 15Khz min.
Noise: 2 mV RMS maximum
Offset: 3 mV maximum
Settling Time (to 1 LSB): 20µs with resistive load
Grounds: Logic and analog grounds are common at pin #20. A separate logic ground can be supplied to minimize potential ground loop problems. See part number designation.

Power Requirements: ±15VDC ±5% at 50 mA maximum [1]
+5VDC ±5% at 50 mA maximum [2]
[1] ±12VDC OPERATION AVAILABLE. See part number designation
[2] +5VDC supply may be eliminated on special order (-1)

Operating Temperature: Model C: 0°C to +70°C
Model M: -55°C to +105°C
Storage Temperature: -65°C to +125°C
Potting: All units are potted
Weight: 3.0 oz.



All dimensions in inches.

*.62 max. for all hermetically sealed units

NOTE: Ground unused input bits to logic ground

PIN ASSIGNMENTS

1 MSB (180°)	15 R
2	16 N/C
3	17 +5VDC
4	18 −15VDC
5	19 Logic ground (when specified)
6	20 Analog ground
7 Binary	21 +15VDC
8 Inputs	22 R sin θ
9	23 R cos θ
10	
11	
12	
13	
14 LSB (.02197°)	

PART NUMBER DESIGNATION

1504*-*****
- Add 883 for Hi Rel
- Add D for separate logic ground
- Add H for Hermetic Seal
- Add 12 for ±12VDC operation
- Accuracy: (A=4 minutes; B=8.5 minutes)
- Temperature Range: (C or M)

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