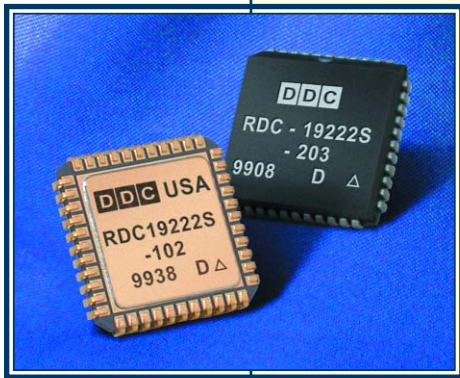


# 16-BIT MONOLITHIC TRACKING RESOLVER (LVDT)-TO-DIGITAL CONVERTER SERIES

Model RDC-19220/2, RDC-19220/2S, RDC-19229S Series



## FEATURES

- Accuracy to 1.3 Arc Minutes
- Internal Synthesized Reference Option (S Version)
  - Up to 45 Degree Phase Shift Correction
- +5 Volt Only Option
- Programmable:
  - Resolution 10, 12, 14 or 16 bit
  - Bandwidth to 1200 Hz
  - Tracking to 2300 RPS
- Standard Class K and MIL-PRF Selections Available
- -55° to +125° C Operation Temperature Option
- 16.5mm<sup>2</sup> J Lead and DDIP Packages Available

## DESCRIPTION

The RDC-19220/2, RDC-19220/2S, RDC-19229S Series are 16 bit monolithic tracking resolver to digital converters. These converter selections offer low cost off-the-shelf solutions for today's motion feedback applications. Class K and Mil-PRF-38534 processing options are also available. This single chip converter features programmable resolution of 10, 12, 14 or 16 bits with accuracies to 1.3 min. This converter can be configured for operation with a single +5VDC power supply. Programmable bandwidth and a velocity output used to replace tachometers can be scaled to your application needs. The velocity scale factor / tracking rate is programmed with a single resistor. The optional internal synthesized reference feature will eliminate errors due to quadrature voltage and ensure operation with a rotor-to-stator phase shift of up to 45 degrees.

## APPLICATIONS

These converters offer versatile performance at low cost for use in industrial control systems. Standard selections for Class K and MIL-PRF processing reduce lead time costs and no NRE or lot charges are necessary. This part is an ideal choice for space and military applications.

## BENEFIT

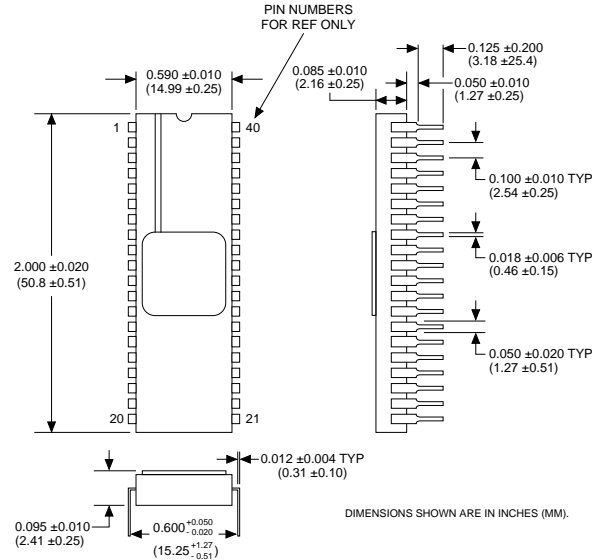
Reduce in-house risk solutions and resources with faster time to market using these off the shelf solutions.

Make Sure the next  
Card you purchase  
has...

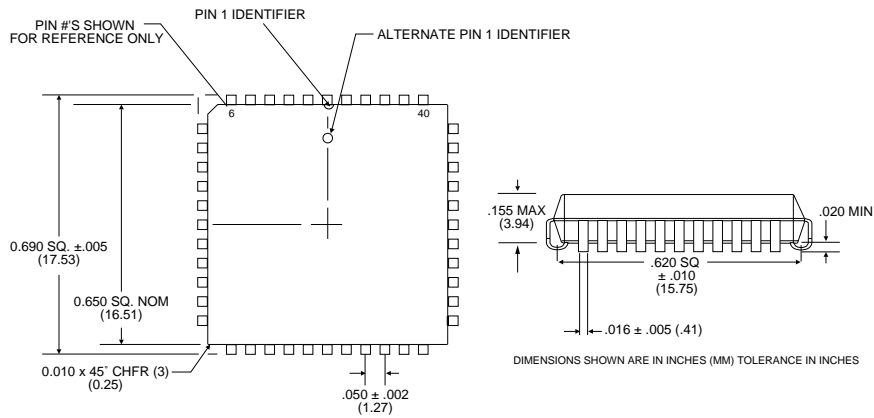


# RDC-19220/2 and RDC-19220/2S Mechanical Drawings

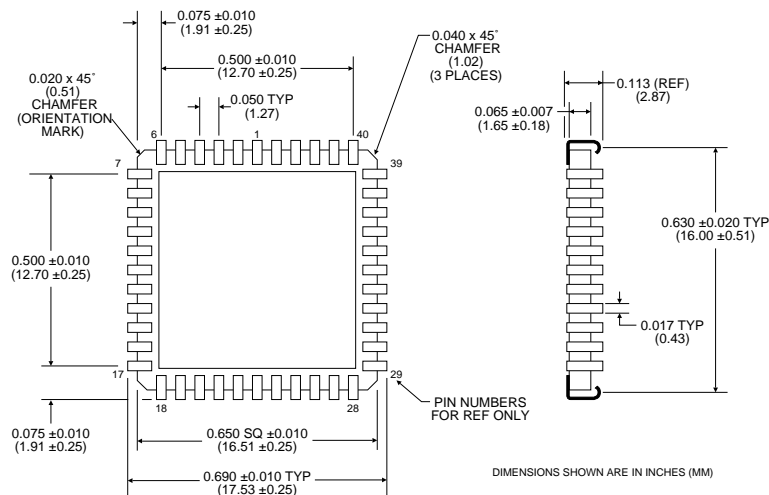
Figure 1



## RDC-19220 (40-PIN DDIP) CERAMIC PACKAGE



## RDC-19222 (44-PIN PLASTIC J-LEAD)



## RDC-19222 (44-PIN CERAMIC J-LEAD)

## RDC-19220/2S Specifications

PARAMETER	UNIT	VALUE		
<b>FREQUENCY RANGE</b>	Hz	47-1k	1k-4k	4k-10k
<b>ACCURACY -XX2</b>	Min	4+1 LSB	4+1 LSB	5+1 LSB
-XX3 (note 1)	Min	2+1 LSB	2+1 LSB	3+1 LSB
Repeatability	LSB	± 1	± 1	± 2
Differential Linearity	LSB	± 1	± 1	± 2
<b>FREQUENCY RANGE</b>	Hz	47-1k (note 4)	1k-5k	
<b>ACCURACY -XX5</b> (note 1 & 4)	Min	1+1 LSB	1+1 LSB	
Repeatability	LSB	± 1	± 1	
Differential Linearity	LSB	± 1	± 1	
<b>REFERENCE</b>		(+Ref, -Ref)		
Type		Differential		
Voltage: differential	V	± 10 max		
single ended	V	± 5 max		
overload	V	± 25 continuous 100 transient		
Frequency	Hz	DC to 10,000		
Input Impedance	Ohm	10M min //20 pf		
±Sig/Ref Phase Shift	deg	45 max from 400 Hz to 10 kHz (note 3)		
<b>SIGNAL INPUT</b>		(+S, -S, SIN, +C, -C, COS)		
Type		Resolver, differential, groundbased		
Voltage: operating	Vrms	2 ± 15%		
overload	V	± 25 continuous		
Input Impedance	Ohm	10M min //10 pf		
<b>POWER SUPPLIES</b> (note 5)				
Nominal Voltage	V	+5	-5	
Voltage Range	%	±5	±5	
Max Volt. w/o Damage	V	+7	-7	
Current	mA	14 typ, 22 max (each)		

## RDC-19220/2 Specifications

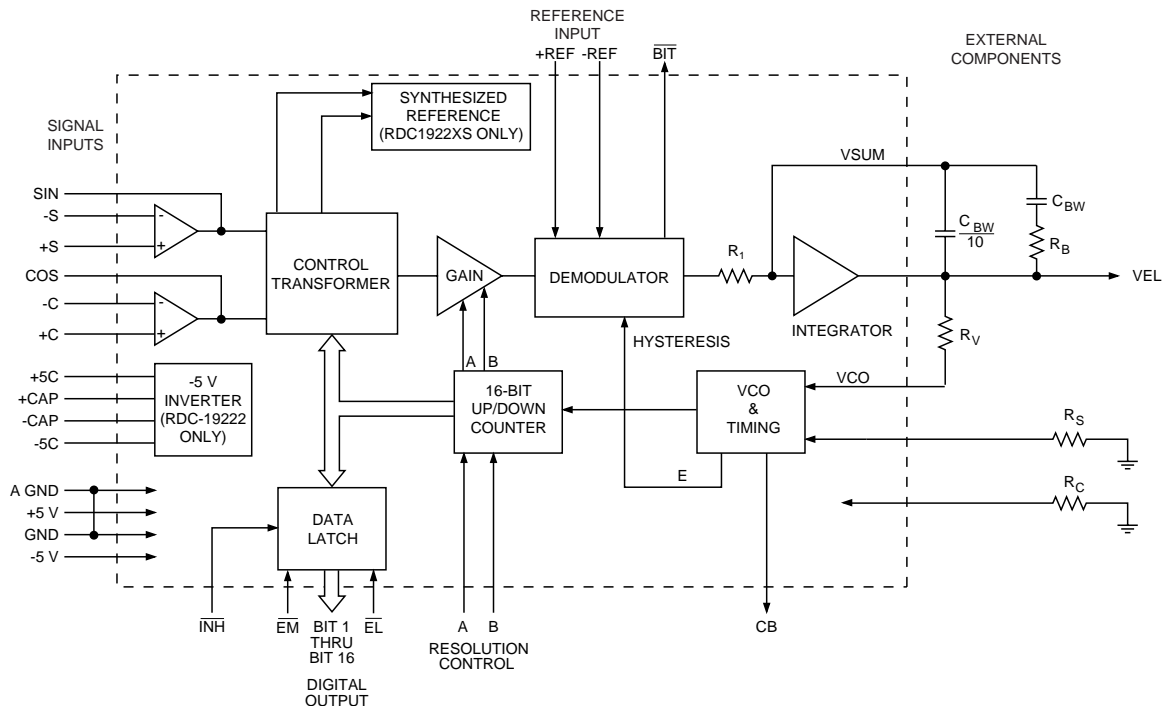
PARAMETER	UNIT	VALUE		
<b>FREQUENCY RANGE</b>	Hz	47-1k	1k-4k	4k-10k
<b>ACCURACY -XX2</b>	Min	4+1 LSB	4+1 LSB	5+1 LSB
-XX3 (note 1)	Min	2+1 LSB	2+1 LSB	3+1 LSB
Repeatability	LSB	± 1	± 1	± 2
Differential Linearity	LSB	± 1	± 1	± 2
<b>REFERENCE</b>		(+Ref, -Ref)		
Type		Differential		
Voltage: differential	V	± 10 max		
single ended	V	± 5 max		
overload	V	± 25 continuous 100 transient		
Frequency	Hz	DC to 40 kHz		
Input Impedance	Ohm	10M min //20 pf		
±Sig/Ref Phase Shift	deg	6 max		
<b>SIGNAL INPUT</b>		(+S, -S, SIN, +C, -C, COS)		
Type		Resolver, differential, groundbased		
Voltage: operating	Vrms	2 ± 15%		
overload	V	± 25 continuous		
Input Impedance	Ohm	10M min //10 pf		
<b>POWER SUPPLIES</b> (note 5)				
Nominal Voltage	V	+5	-5	
Voltage Range	%	±5	±5	
Max Volt. w/o Damage	V	+7	-7	
Current	mA	14 typ, 22 max (each)		

### Notes:

- Accuracy in LVDT mode is 0.15% + 1 LSB of full scale.
- If the frequency is between 47Hz and 1kHz, then there may be 1 LSB of jitter at quadrant boundaries.
- The maximum phase shift tolerance will degrade linearly from 45 degrees at 400 Hz to 30 degrees at 60 Hz.
- XX5 accuracy is 1minute + 1 LSB up to 5 kHz max.
- See full datasheet for +5V only option details.

## RDC-19220/2 and RDC-19220/2S Block Diagram

Figure 2



# Ordering Information

RDC-19222 -XXXX  
RDC-19222S-XXXX

(Plastic Package: 44-pin J-Lead)

**Supplemental Process Requirements:**

T = Tape and Reel  
Blank = None of the Above

**Accuracy:**

2 = 4 minutes + 1 LSB  
3 = 2 minutes + 1 LSB  
5 = 1 minute + 1 LSB (maximum reference frequency = 5kHz) - **Only S version**

**Process Requirements:**

0 = No Burn-In  
9 = Solder Dip, without Burn-In

**Temperature Grade:**

2 = -40 to +85°C  
3 = 0 to +70°C  
A = -40 to +125°C - **Only non S version**

RDC-1922X -XXXX  
RDC-1922XS-XXXX

(Ceramic Package)

**Supplemental Process Requirements:**

T = Tape and Reel (Not available in 40-pin DDIP package)  
S = Pre-Cap Source Inspection  
L = 100% Pull Test  
Q = Pre-Cap Source and 100% Pull Test  
K = One Lot Date Code  
W = One Lot Date Code and Pre-Cap Source Inspection  
Y = One Lot Date Code and 100% Pull Test  
Z = One Lot Date Code, Pre-Cap Source Inspection and 100% Pull Test  
Blank = None of the Above

**Accuracy:**

3 = 2 minutes + 1 LSB

**Process Requirements:**

0 = Standard DDC Processing, without Burn-In  
1 = MIL-PRF-38534 Compliant  
2 = Standard DDC Processing, with Burn-In  
3 = MIL-PRF-38534 Compliant, with PIND testing  
4 = MIL-PRF-38534 Compliant, with Solder Dip  
5 = MIL-PRF-38534 Compliant, with PIND testing, and Solder Dip  
6 = Standard DDC Processing, with PIND testing, and Burn-In  
7 = Standard DDC Processing, with Solder Dip, and Burn-In  
9 = Standard DDC Processing, with Solder Dip, without Burn-In

**Temperature Grade / Data Requirements:**

1 = -55 to +125°C  
4 = -55 to +125°C, with Variables Test Data

**Package:**

0 = 40-Pin DDIP, (" +5 volt only" power supply feature - not available)  
2 = 44-Pin J-Lead

RDC-19229S - 4XXX (Class K Processed Part Ordering Information)

**Mandatory Process Requirements Selection: (One of the following must be selected):**

L = 100% Pull Test  
Q = Pre-Cap Source and 100% Pull Test (Contact factory for availability)  
Y = One Lot Date Code and 100% Pull Test  
Z = One Lot Date Code, Pre-Cap Source Inspection and 100% Pull Test (Contact factory for availability)

**Accuracy:**

3 = 2 minutes + 1 LSB

**Process Requirements: (Burn-In is in accordance with MIL-STD-883 Class K)**

6 = 320 hour Burn-In at +125°C, with PIND testing  
8 = 320 hour Burn-In at +125°C, with PIND testing and Solder Dip

**Temperature Grade / Data Requirements:**

4 = -55 to +125°C, with Variables Test Data

**Package:**

9 = Screened to Class K, 44-Pin J-Lead ceramic package



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105 Wilbur Place, Bohemia, New York, U.S.A. 11716-2482

**For Technical Support - 1-800-DDC-5757 ext. 7382**

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DATA DEVICE CORPORATION  
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