Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

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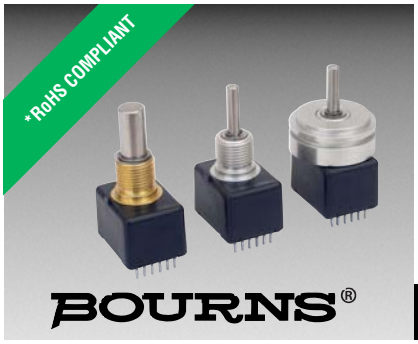


Features

- 3.3 and 5 VDC voltage supply option
- Quadrature output
- Bushing or servo mount
- Non-contacting magnetic technology
- Small size
- CMOS and TTL compatible
- Resolution from 32-256 PPR
- Long life
- High operating speed
- Highly repeatable
- Sealed option
- Magnetic technology

EMS22Q - Non-Contacting Incremental Encoder

Electrical Characteristics

Resolution ..... 32 to 256 PPR
Insulation Resistance (500 VDC) ..... 1,000 megohms
Electrical Travel ..... Continuous
Supply Voltage ..... 5.0 VDC ±10 %, 3.3 VDC ±10 %
Supply Current ..... 20 mA maximum
Output Voltage
  Low Output Level ..... Vss+0.4 V maximum
  High Output Level ..... Vdd-0.5 V minimum
Output Current
  With 4.5 VDC Supply Voltage ..... 4 mA maximum
  With 3.0 VDC Supply Voltage ..... 2 mA maximum
Rise/Fall Time (Incremental Output) ..... 500 ns maximum
Shaft RPM (Ball Bearing) ..... 10,000 rpm maximum
Hysteresis ..... 0.7 °
Accuracy
  Nominal ..... ±0.7 ° or better
  Worst Case ..... ±1.4 °
Output Transition Noise ..... 0.12 ° RMS max.

Environmental Characteristics

Operating Temperature Range ..... -40 °C to +125 °C (-40 °F to +257 °F)
Storage Temperature Range ..... -55 °C to +125 °C (-67 °F to +257 °F)
Humidity ..... MIL-STD-202, Method 103B, Condition B
Vibration ..... 15 G
Shock ..... 50 G
Rotational Life
  S Bushing (@1,000 rpm) ..... 100,000,000 revolutions
  T & W Bushings (@1,000 rpm with 250 g side load) ..... 50,000,000 revolutions
IP Rating ..... IP 65

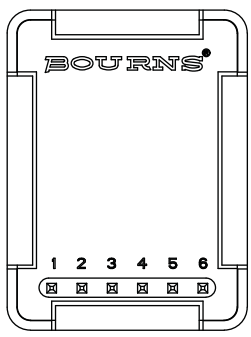
Mechanical Characteristics

Mechanical Angle ..... 360 ° Continuous
Torque
  Starting ..... 43 ±21 g-cm (0.6 ±0.3 oz-in.)
  Running ..... 29 ±14 g-cm (0.4 ±0.2 oz-in.)
Mounting Torque ..... 203 N-cm (18 lb.-in.)
Shaft End Play ..... 0.30 mm (0.012 ") T.I.R. maximum
Shaft Radial Play ..... 0.12 mm (0.005 ") T.I.R. maximum
Weight ..... 11 gms. (0.4 oz.)
Terminals ..... Axial, radial or ribbon cable
Soldering Condition
  Manual Soldering ..... 96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire
    370 °C (700 °F) max. for 3 seconds
  Wave Soldering ..... 96.5Sn/3.0Ag/0.5Cu solder with no-clean flux
    260 °C (500 °F) max. for 10 seconds
  Wash processes ..... Not recommended
Marking ..... Manufacturer's trademark, name, part number, and date code.
Hardware ..... One lockwasher and one mounting nut supplied with each encoder, except on servo mount versions.

Pin Configuration

Output Type	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
A/B Quadrature	A	B	GND	Index	VCC*	CS**

* Can be 5 or 3.3 VDC depending on the version.
** Active low chip select pin; if not used connect pin 6 to GND.



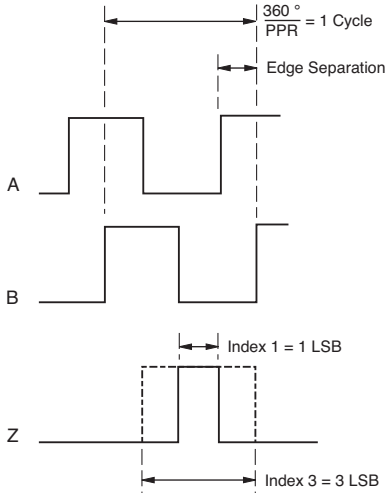
*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.
Specifications are subject to change without notice.
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
Users should verify actual device performance in their specific applications.

Applications

- Material handling equipment
- Brushless DC motor commutation
- Robotics
- Automotive
- Industrial automation
- Petroleum refinery
- Medical
- Office equipment
- Audio and broadcast equipment

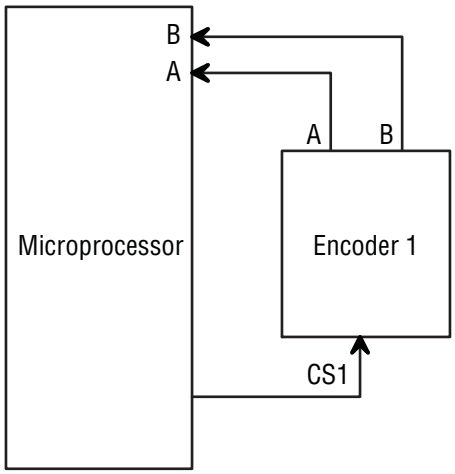
Output Type Waveform and Variant Table

Quadrature Output



Minimum edge separation = 20*256/PPR (no missing pulses)

PPR	3.3 Vcc	5.0 Vcc	Index 1	Index 3
256	X		X	
256	X			X
256		X	X	
256		X		X
128	X		X	
128	X			X
128		X	X	
128		X		X
64	X		X	
64	X			X
64		X	X	
64		X		X
32	X		X	
32	X			X
32		X	X	
32		X		X



Chip Select Hardware Sample

Consult factory for options not shown, including:

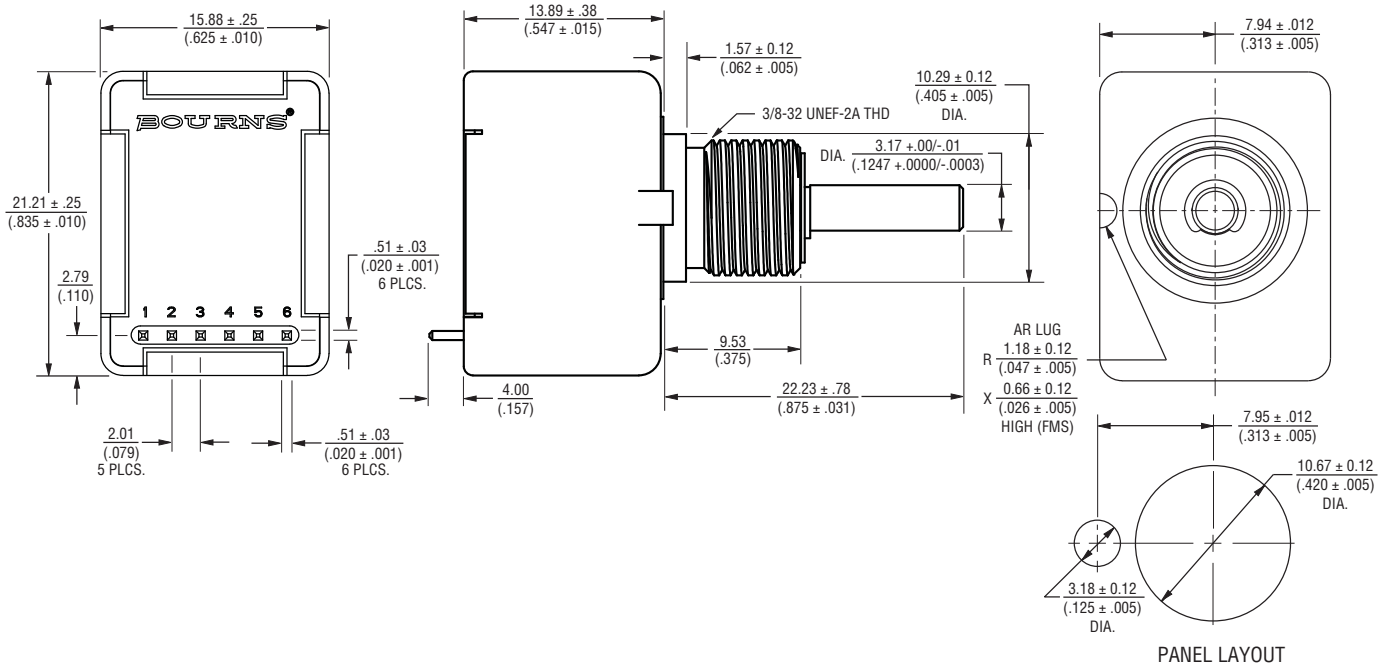
- Wire lead or cable options
- Connectors
- Non-standard resolutions
- Special shaft/bushing sizes and features
- Special performance characteristics
- PCB mounting bracket

EMS22Q - Non-Contacting Incremental Encoder

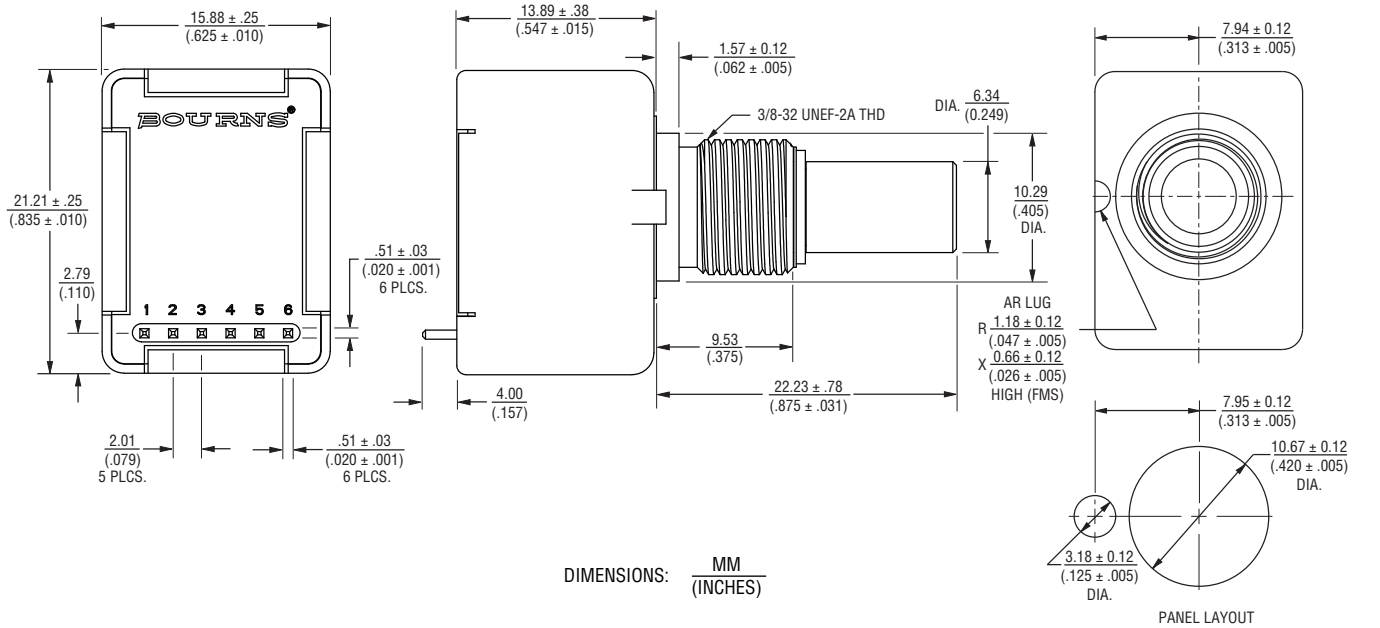
BOURNS®

Dimensional Drawings

Shaft Style D (Bushing T)



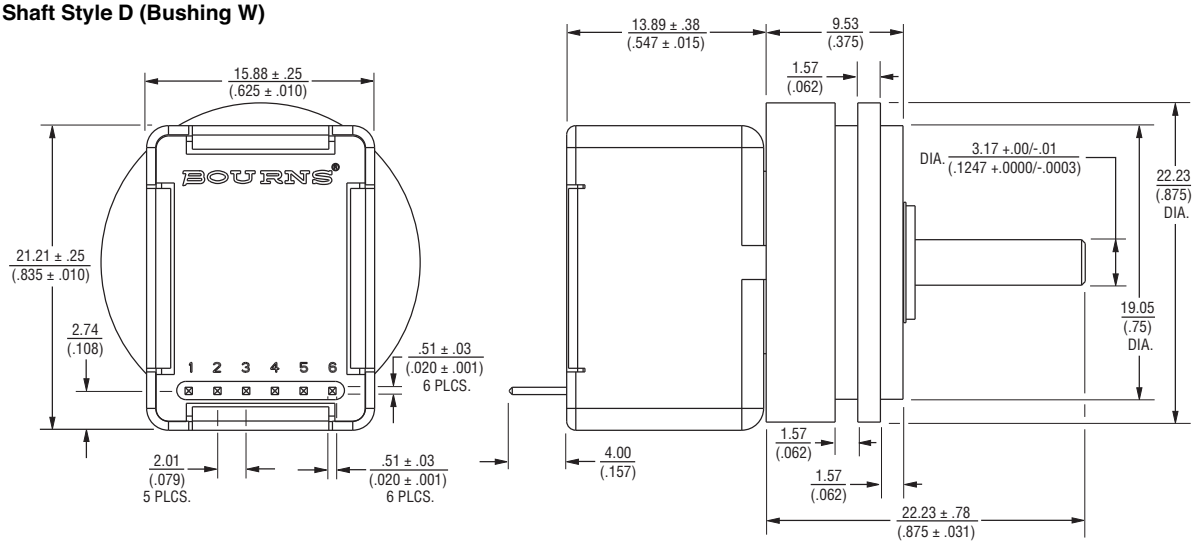
Shaft Style B (Bushing S)



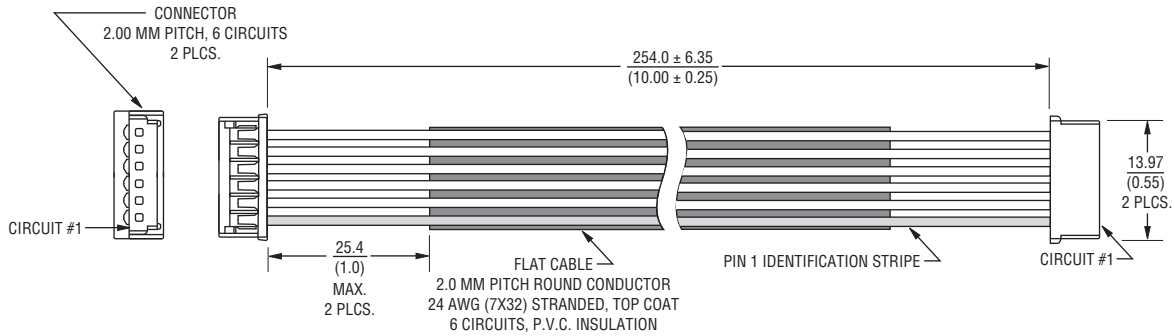
DIMENSIONS: MM / (INCHES)

Product Dimensions (Continued)

Shaft Style D (Bushing W)



Cable Assembly



DIMENSIONS: MM / (INCHES)

How To Order

BOURNS EMS22 22 MM NON-CONTACTING INCREMENTAL ENCODER

E	M	S	2	2	Q	5	1	-	B	2	8	-	L	S	4

OUTPUT TYPE	
Code	**Description**
Q	**Quadrature**

INDEX CHANNEL	
Code	**Description**
1	**1 LSB**
3	3 LSB

VOLTAGE SUPPLY	
Code	**Description**
3	3.3 VDC
5	**5 VDC**

SHAFT STYLE		
Code	**Description**	**Available With Bushings (Code)**
B	**1/4 " Dia., Plain End**	**S**
C	1/4 " Dia., Flatted End	S
D	1/8 " Dia., Plain End	T, W
R	6 mm Dia., Slotted End	D
M	6 mm Dia., Flatted End	D

SHAFT LENGTH DESIGNATOR*	
Code	**Description**
16	1/2 " Long
20	5/8 " Long
28	**7/8 " Long**
25	25 mm Long (Available with D Bushing Only)

TERMINAL CONFIGURATION**	
Code	**Description**
L	**Axial, Multi-Purpose Pin**
M	Rear Ribbons Cable with Connector
W	Rear Ribbons Cable - No Connector

RESOLUTION	
Code	**PPR**
1	32
2	64
3	128
4	**256**

BUSHING DESIGNATOR	
Code	**Description**
S	**3/8 " D X 3/8 " L Threaded (Single Ball Bearing)**
T	3/8 " D X 3/8 " L Threaded (Dual Ball Bearing)
W	Servo Mount 7/8 " D (Dual Ball Bearing)
D	9 mm D X 7.94 mm L Threaded (Single Ball Bearing)

* Shaft length measured from mounting surface.
** Standard ribbon cable is 10 inches long. Consult factory for other lengths.