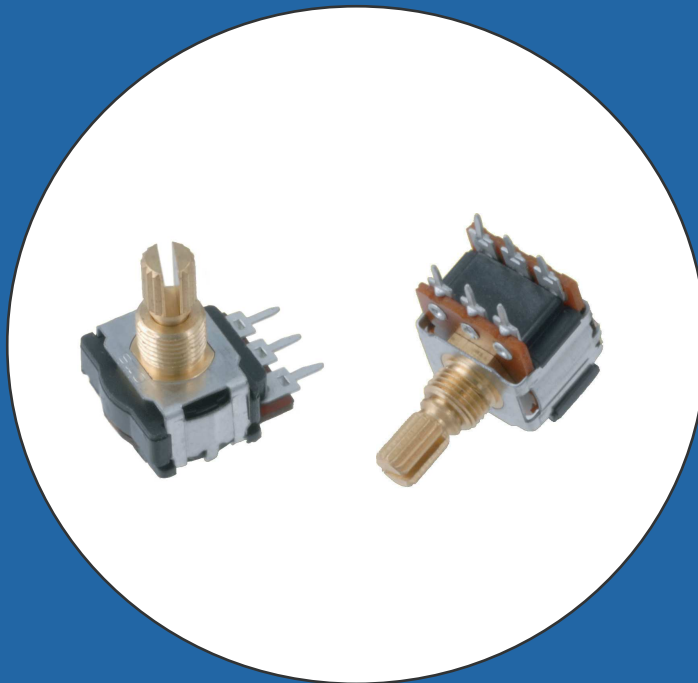


### Commercial Miniature 16mm Size Rotary Encoder

#### Features

- Robust Construction
- 2-bit Incremental or 4-bit Absolute Encoder
- Optional Momentary Switch
- Available with 16 Detents
- Continuous Rotation
- Bushing Mount
- Solder Lug or PCB Terminals
- RoHS Compliant



### Electrical and Mechanical Specifications

#### Encoder:

**Contact Resistance**

500Ω maximum

**Voltage Rating**

5 VDC @ 0.5mA maximum

**Detent Points**

16 detents available

**Rotational Life**

50,000 cycles

**Resolution**

2-bit: 4, 6, 8, 10 or 12 pulses in 360°

4-bit: 16 combinations in 360°

**Insulation Resistance**

10MΩ minimum at 50 VDC

**Temperature Range**

Operating: -25°C to +100°C

Storage: -30°C to +100°C

**Rotational Torque**

No Detent: 36 - 216 gf.cm

With Detent: 100 - 500 gf.cm

**Solder Heat Resistance**

260°C for 5 seconds

**Push-Pull Strength of Shaft**

8 kg minimum for 10 seconds

**Special**

Consult CTS for customized or features not listed, including other detent points, resolution, torque and mounting style.

# Electrical and Mechanical Specifications (continued)

## Optional Momentary Switch:

### Switch Contact Resistance

Initial: 100mΩ maximum  
After Life Cycles: 200mΩ maximum

### Switch Rating

16 VDC @ 20mA maximum

### Switch Bounce

5 milliseconds maximum

### Switch Operating Force

350 ± 150 g (12.3 ± 5.3 oz.)

### Switch Life

15,000 operations

### Switch Travel

0.5mm (.020")

## Truth Table

### 2 BIT BINARY CODE

DENOTES CONTACT CLOSURE TO COMMON	B	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
A	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
POS. NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	

0	1	1
1	1	0

46 47 48

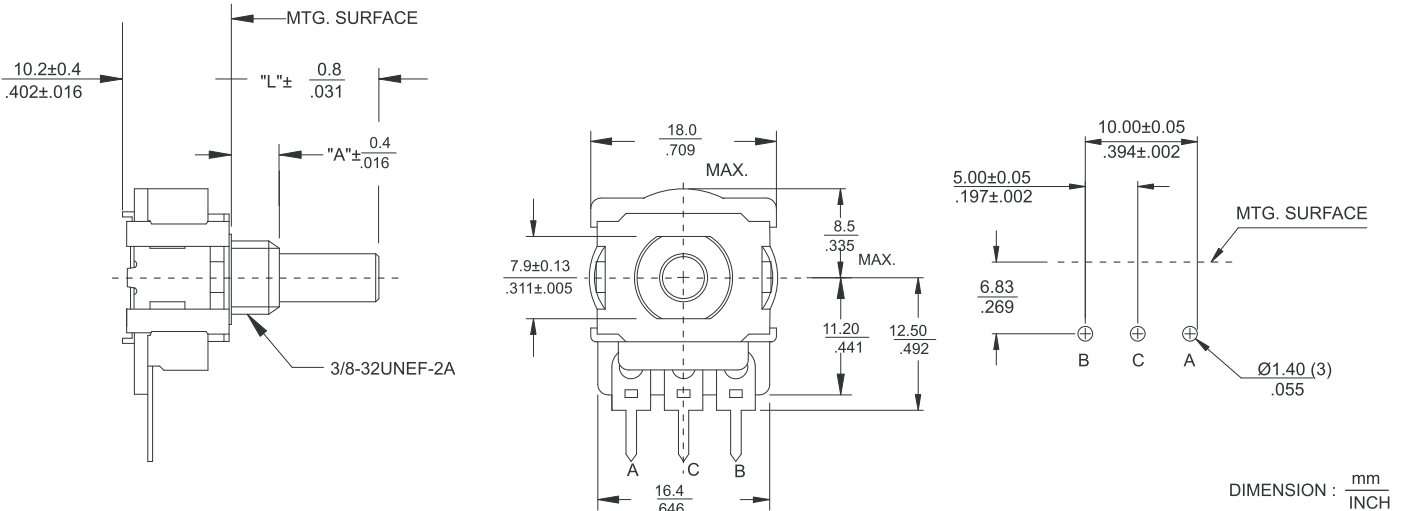
### 4 BIT GRAY CODE

POS. NO.	DENOTES CONTACT CLOSURE TO COMMON							
	A	B	E	F				
1	0	0	0	0				
2	0	0	0	1				
3	0	0	1	1				
4	0	0	1	0				
5	1	0	1	0				
6	1	0	1	1				
7	1	1	1	1				
8	1	1	1	0				
9	0	1	1	0				
10	0	1	1	1				
11	0	1	0	1				
12	0	1	0	0				
13	1	1	0	0				
14	1	1	0	1				
15	1	0	0	1				
16	1	0	0	0				

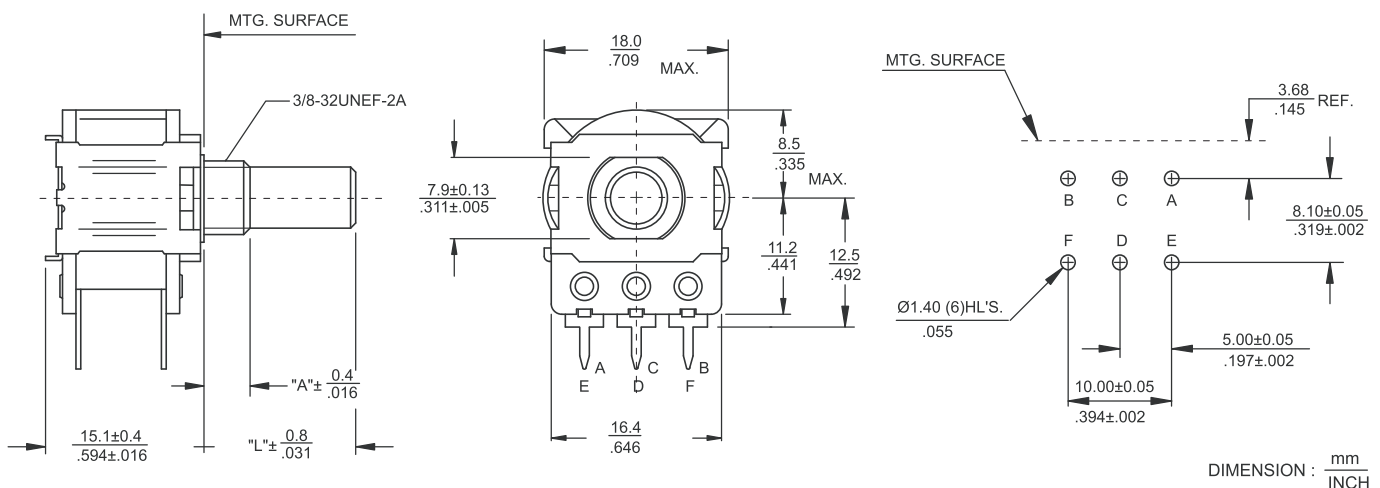
### 4 BIT HEXADECIMAL CODE

POS. NO.	DENOTES CONTACT CLOSURE TO COMMON							
	A	B	E	F				
1	0	0	0	0				
2	0	1	0	0				
3	1	0	0	0				
4	1	1	0	0				
5	0	0	0	1				
6	0	1	0	1				
7	1	0	0	1				
8	1	1	0	1				
9	0	0	1	0				
10	0	1	1	0				
11	1	0	1	0				
12	1	1	1	0				
13	0	0	1	1				
14	0	1	1	1				
15	1	0	1	1				
16	1	1	1	1				

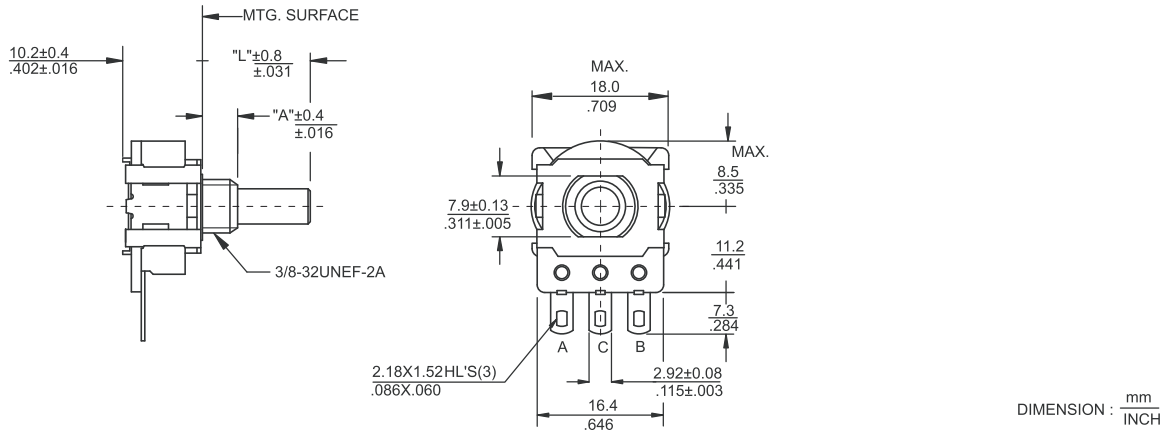
### 288X Typical 2-bit Encoder parallel to P.C. Board



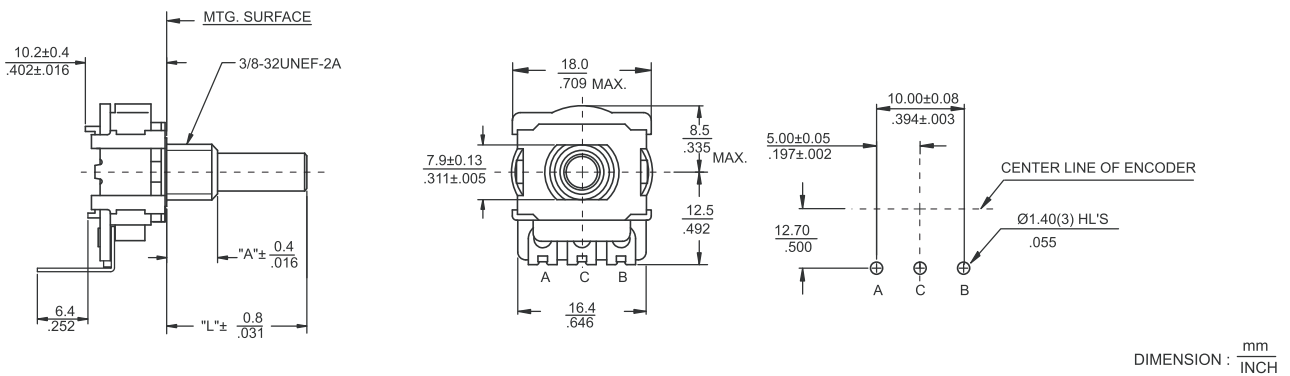
### 2-288X Typical 4-bit Encoder parallel to P.C. Board



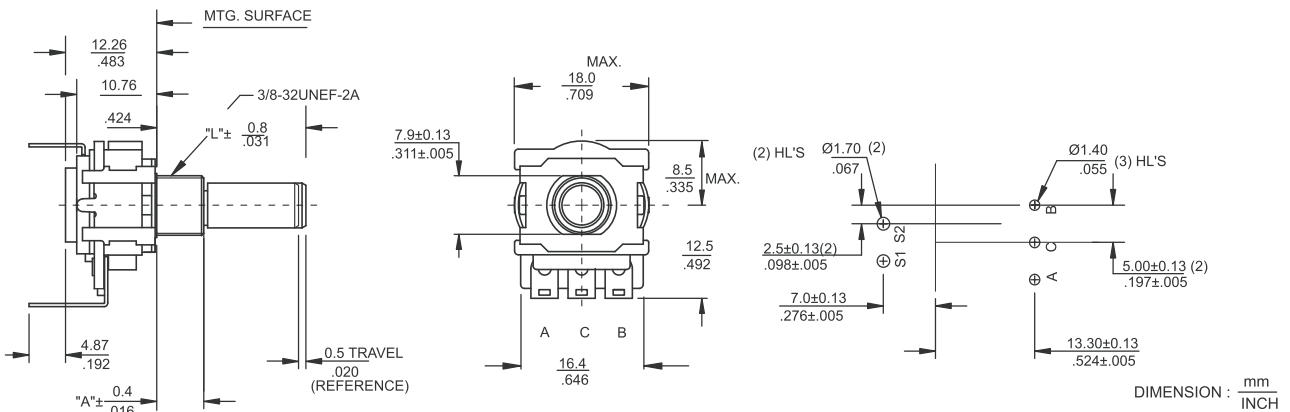
**288T** Typical 2-bit Encoder With Solder Lug Terminals



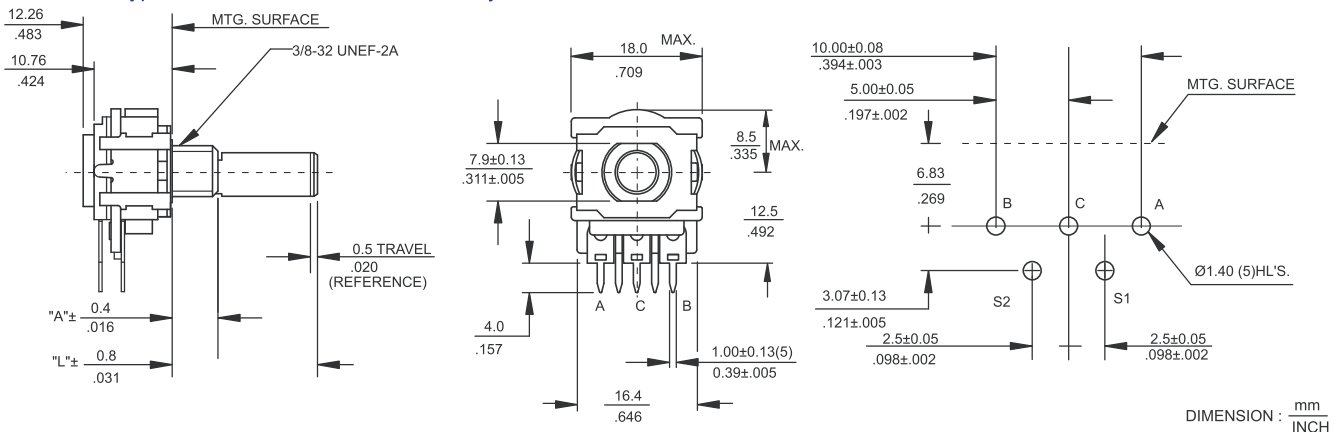
**288V** Typical 2-bit Perpendicular to P.C. Board



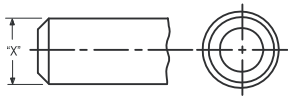
**MC-288V** Typical 2-bit Encoder With Momentary Switch Perpendicular to P.C. Board



**MC-288X** Typical 2-bit Encoder With Momentary Switch Parallel to P.C. Board

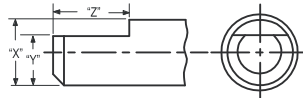


# Shaft Trim



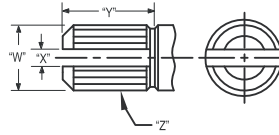
R - ROUND

	X
Imperial Shaft	.250"
Metric Shaft	6.00



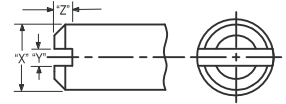
F - FLATTED

	X	Y	Z
Imperial Shaft	.250"	.156"	.375"
Metric Shaft	6.00	4.50	7.00



K - KNURLED & SLOTTED

	W	X	Y	Z
Imperial Shaft	.236"	.062"	.344"	24 TEETH
Metric Shaft	6.00	1.57	7.0	18 TEETH



S - SLOTTED

	X	Y	Z
Imperial Shaft	.250"	.046"	.062"
Metric Shaft	6.00	1.17	1.57

DIMENSION:  $\frac{\text{inch}}{\text{mm}}$

## Ordering Information

**288**

**T**

**B**

**24**

**F**

**40**

**2**

**A**

**1**

**TERMINAL STYLE**

- \*T - SOLDER LUG
- X - PC
- \*\*V - PC FORMED TO REAR
- \*Not available in switch construction.
- \*\*Not available with 4 bit code

**"A" BUSHING LENGTH**

mm	inch
A=5.0mm	2=.250"
B=6.35mm	3=.375"
C=7.0mm	8=1.000"
D=9.53mm	
ALL	ALL
M8X.75P	3/8-32 UNEF-2A

**SHAFT TRIM**

- R - ROUND
- F - FLATTED
- K - KNURLED & SLOTTED
- S - SLOTTED

**"L" SHAFT LENGTH**

mm	inch
A0=10mm	20=.625"
A5=15mm	24=.750"
B0=20mm	28=.875"
B5=25mm	32=1.000"
C0=30mm	
C5=35mm	
ALL	ALL
6.0mm Dia.	.250" Dia.

**ENCODER CODE**

- 1 - 2 BIT BINARY
- \*2 - 4 BIT GRAY
- \*3 - 4 BIT HEXADECIMAL
- \* 16 COMBINATION ONLY

**COMBINATION (RESOLUTION)**

- 16 - 16 COM (4 PULSES - 2 bit)
- 16 COM (1 PULSE - 4 bit)
- 24 - 24 COM (6 PULSES)
- 32 - 32 COM (8 PULSES)
- 40 - 40 COM (10 PULSES)
- 48 - 48 COM (12 PULSES)

**DETENT**

- 1 - NONE
- 2 - 16 DETENTS

**SWITCH**

- A - NONE
- \*B - MOMENTARY SWITCH
- \* 2 BIT MODELS ONLY

Please consult CTS for customized or features not listed.

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