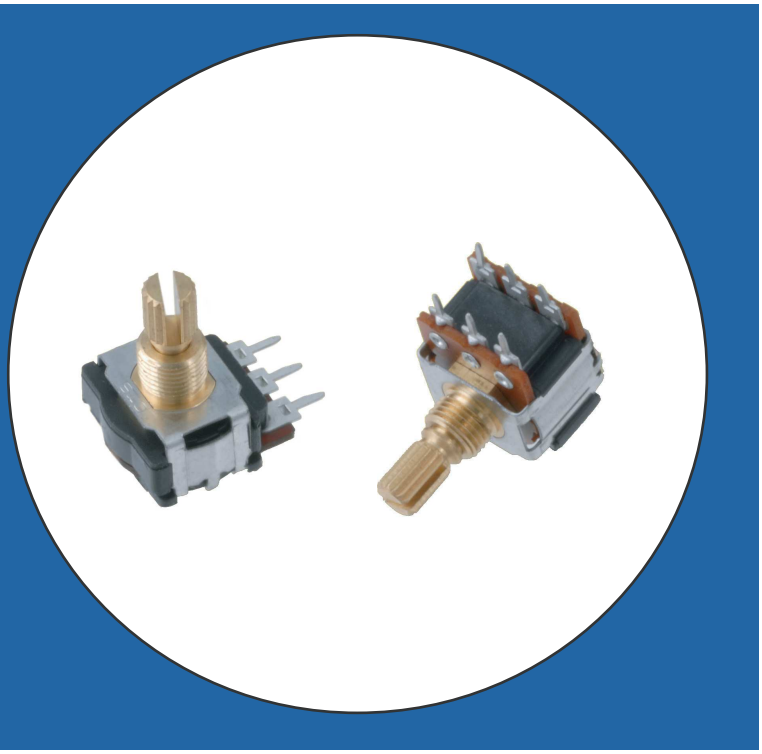
Series 288 Data Sheet
Rotary Encoder

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	0	1	1
	A	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	1	1	0
POS. NO.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	46	47	48

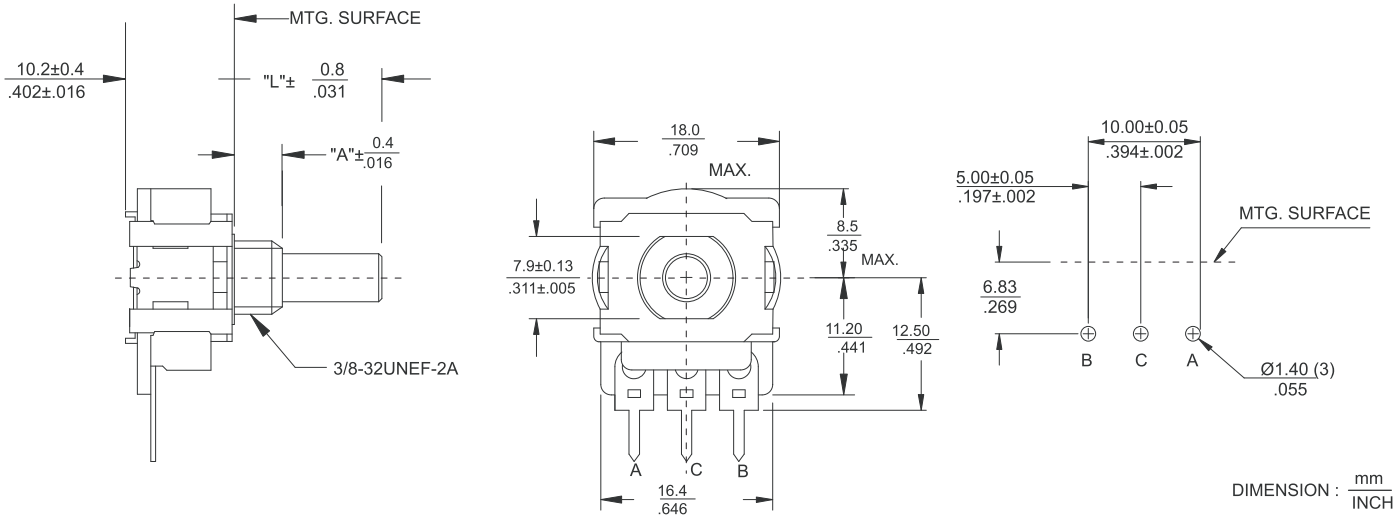
4 BIT GRAY CODE

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			

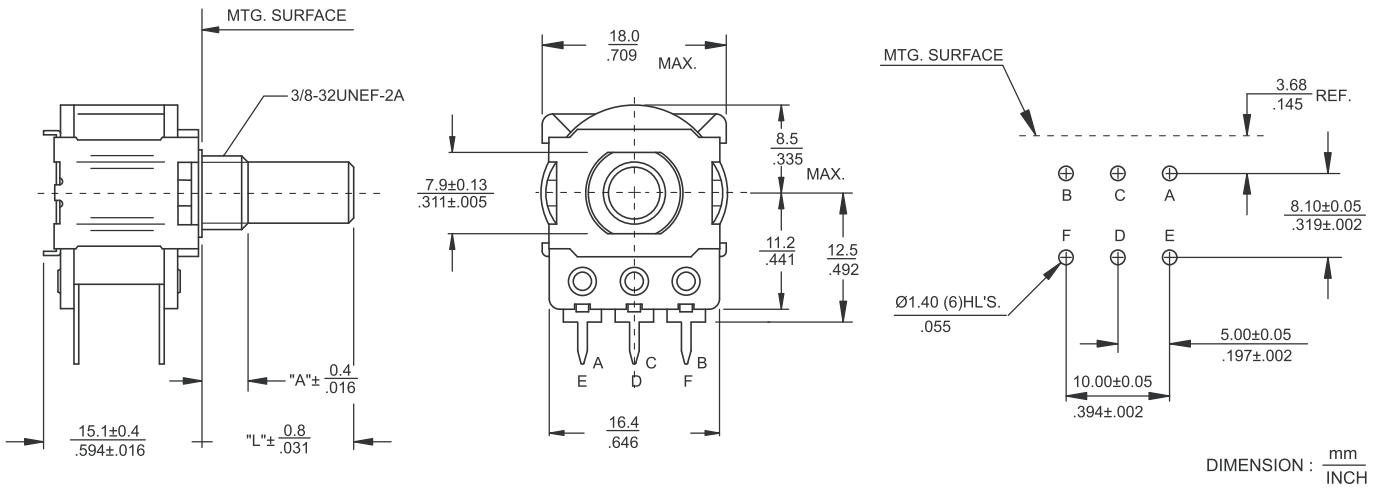
4 BIT HEXADECIMAL CODE

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			

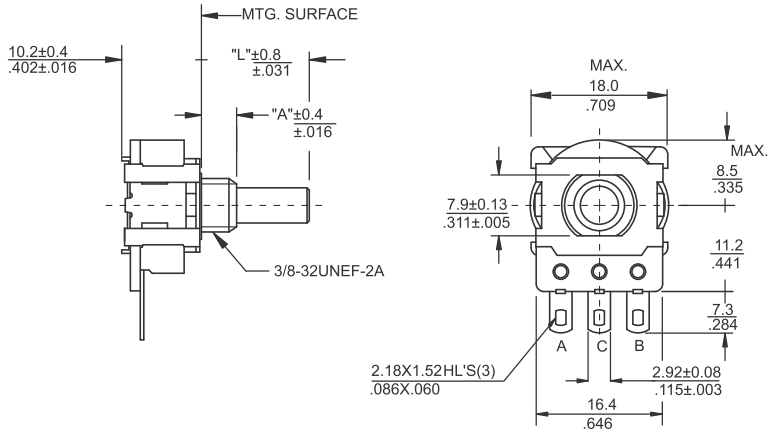
288X Typical 2-bit Encoder parallel to P.C. Board



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

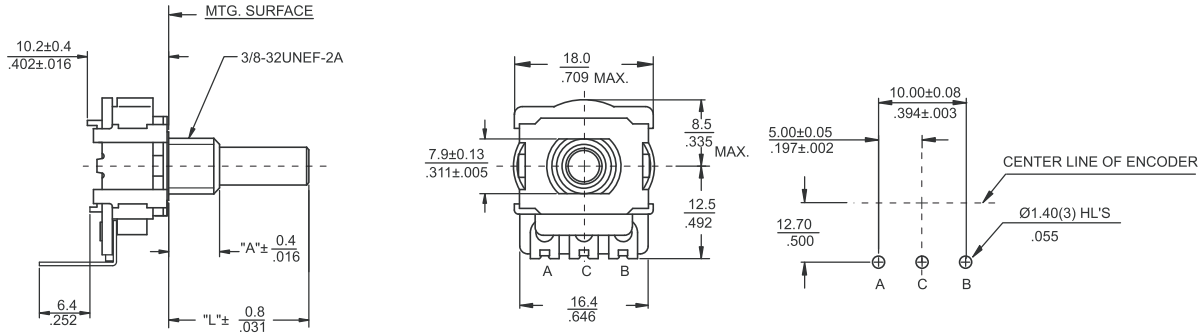


288T Typical 2-bit Encoder With Solder Lug Terminals



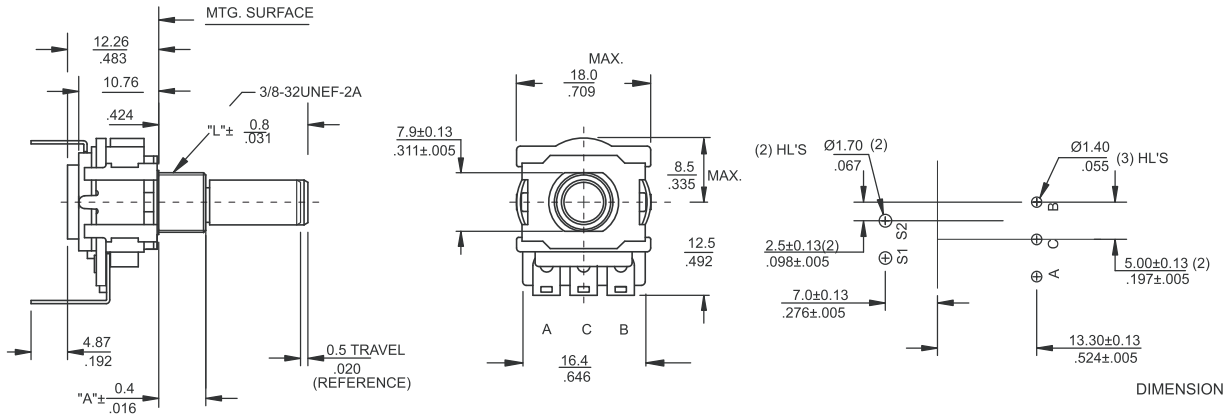
DIMENSION : mm / INCH

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



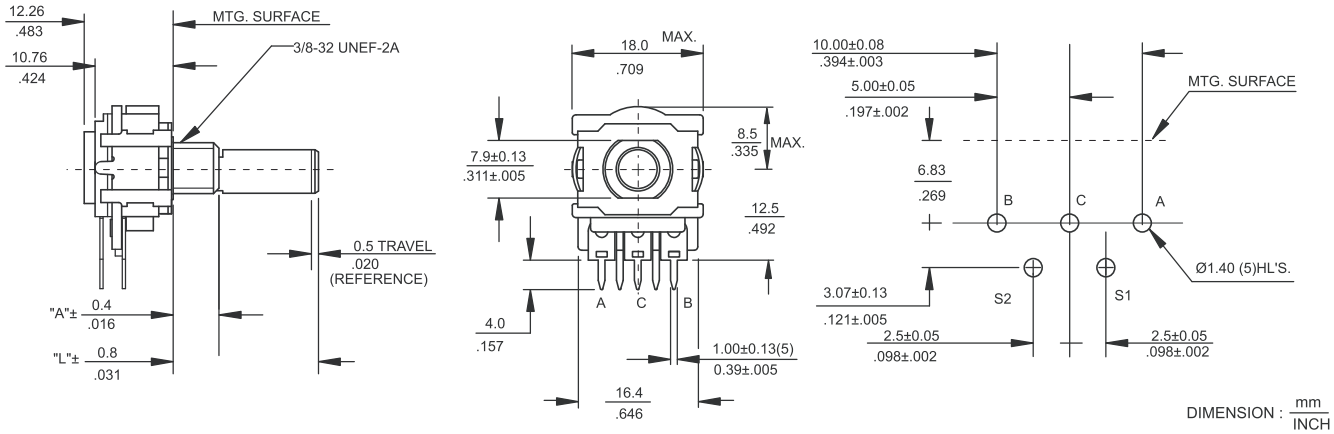
DIMENSION : mm / INCH

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



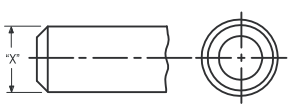
DIMENSION : mm / INCH

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



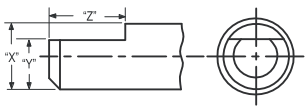
DIMENSION : mm / INCH

Shaft Trim



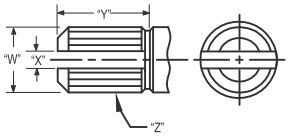
R - ROUND

	X
Imperial Shaft	.250"
Metric Shaft	6.00



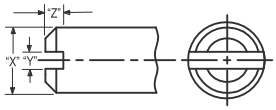
F - FLATTED

	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: inch / 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.

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)

ENCODER CODE
- **1** – 2 BIT BINARY
- ∗**2** – 4 BIT GRAY
- ∗**3** – 4 BIT HEXADECIMAL

∗ 16 COMBINATION ONLY

SWITCH
- **A** – NONE
- ∗**B** – MOMENTARY SWITCH

∗ 2 BIT MODELS ONLY

DETENT
- **1** – NONE
- **2** – 16 DETENTS

Please consult CTS for customized or features not listed.

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