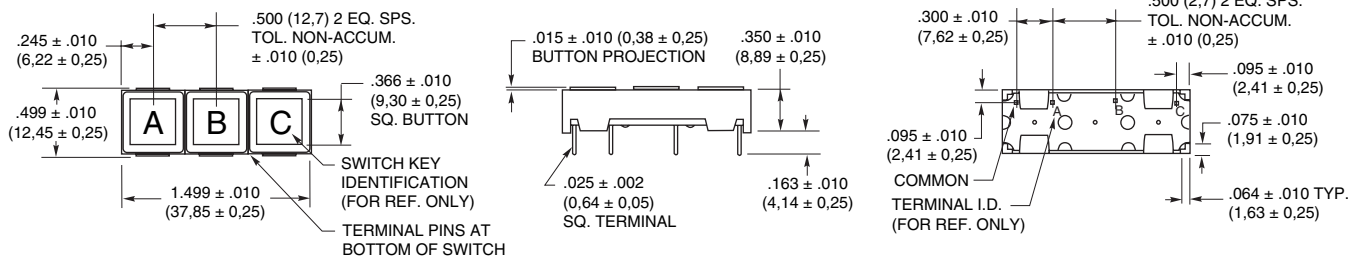
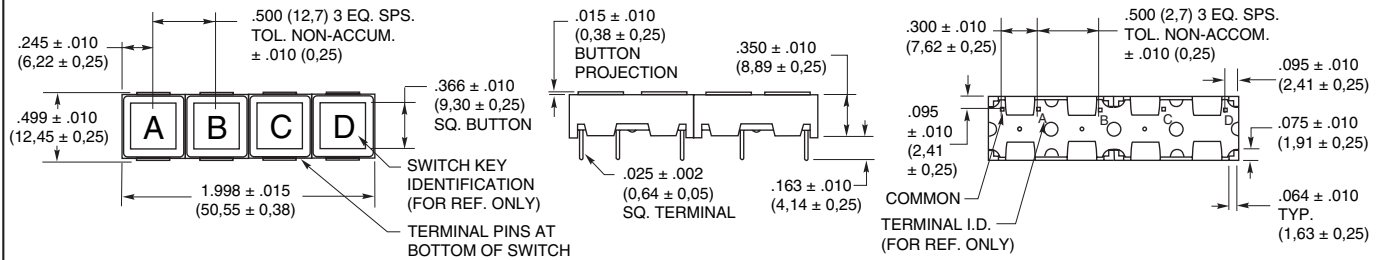
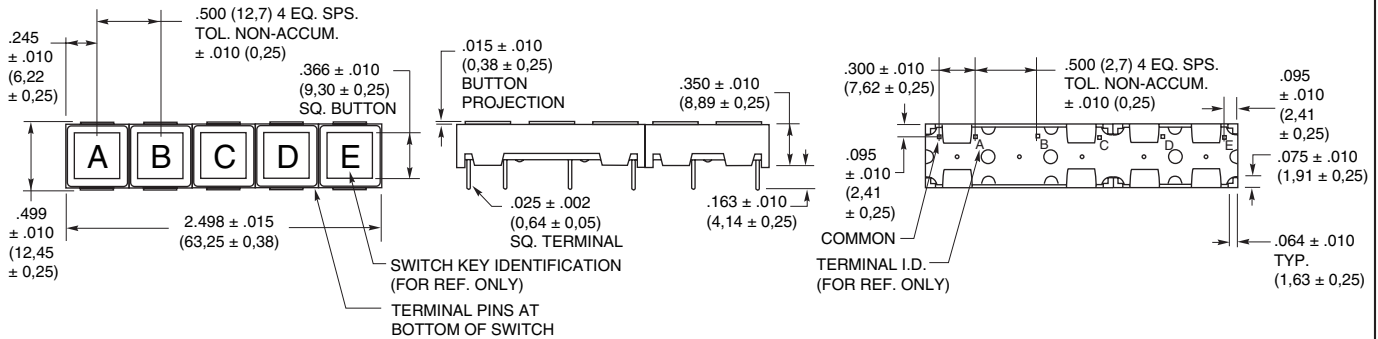
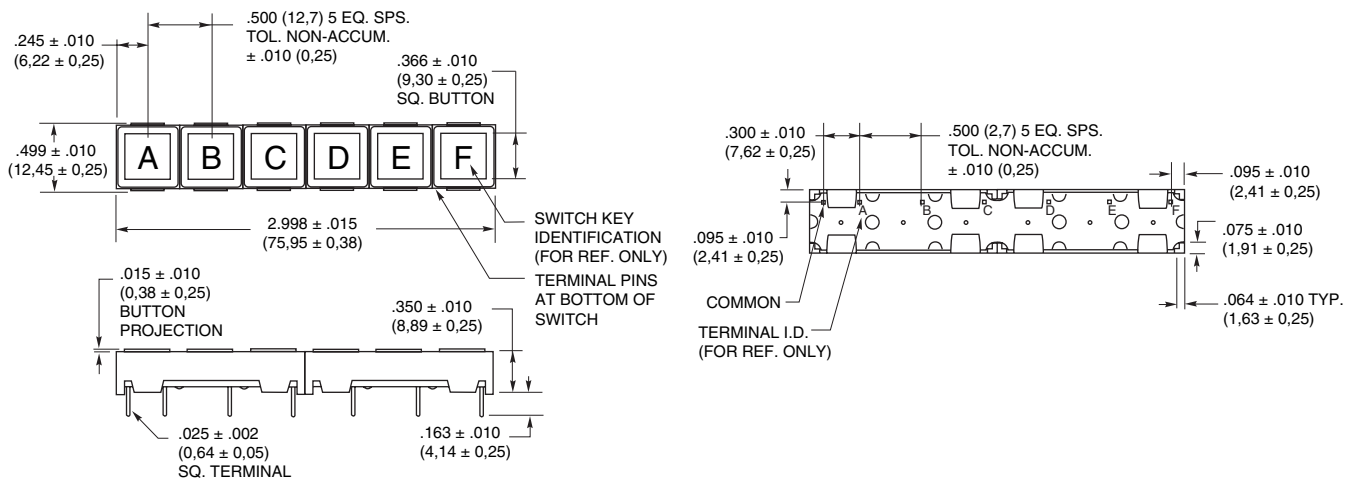
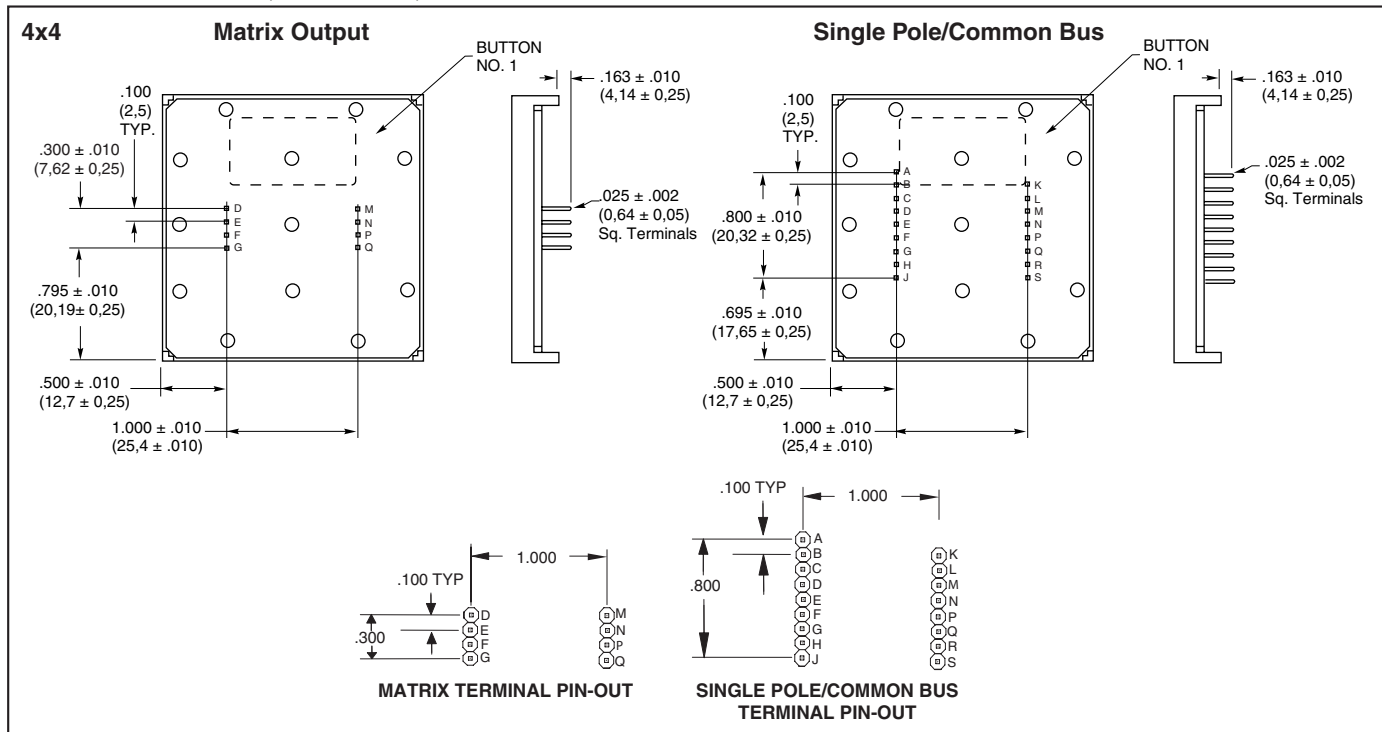


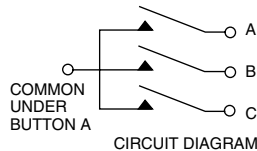
DIMENSIONS in inches (and millimeters)**Three Button Module****Four Button Module****Five Button Module****Six Button Module**

3x4 Keyboard



Termination in inches (and millimeters)**CIRCUITRY, CODE AND TRUTH TABLES****Circuitry for Module Strips**

The one-button thru six-button modules have single pole/common bus circuitry as shown in the circuit diagram. The common is located under button A; it is not marked on the actual product.

**Code and Truth Table**

Dots in the chart indicate connected terminals when switch is closed. Terminals are identified on the keyboard.

3x4		CODES																			
		Matrix										Single Pole/Common Bus									
BUTTON LOCATION	1	•			•																•
	2		•																		•
	3			•																	•
	4	•								•											•
	5										•										•
	6			•								•									•
	7	•																			•
	8																				•
	9				•																•
	10	•																			•
	11			•																	•
	12				•																•
		K	D	E	B	C	L	M	K	H	A	J	C	B	M	E	F	L	N	G	D
		TERMINAL LOCATION																			

4x4		CODES																										
		Matrix													Single Pole/Common Bus													
BUTTON LOCATION	1	•												•													•	
	2		•												•													•
	3			•												•												•
	4				•												•											•
	5	•															•											•
	6		•															•										•
	7			•															•									•
	8				•															•								•
	9	•																			•							•
	10		•																			•						•
	11			•																			•					•
	12				•																			•				•
	13	•				•																			•			•
	14		•																							•		•
	15			•																							•	•
	16				•																							•
		M	N	G	F	D	E	P	Q	K	N	B	A	L	M	D	C	Q	P	F	G	S	R	E	H	J		
		TERMINAL LOCATION																										

SPECIFICATIONS**Rating**

Rating at 24 Vdc: 10 milliamps, resistive

Contact Resistance: MOS, CMOS, TTL, DTL compatible (10 ohms maximum)

Voltage Breakdown: 250 Vac between mutually insulated parts

Insulation Resistance: 1,000 megohms min.

Life Expectancy: 3,000,000 operations per button

Contact Bounce: Less than 4 milliseconds at make, 10 milliseconds at break

Materials and Finishes

Housing: ABS polycarbonate, black

Buttons: ABS plastic, white. Legends are black.

Snap-On-Cap: Clear polycarbonate

Contact Dome: Stainless steel, selectively gold-plated

Terminals: Phosphor bronze

Operating Features

Button Travel: 0.011" (0,28) nominal, total travel

Operating Temperature: -40°C to +80°C

Typical Operating Force: 300 grams

Mounting: Mounts to 1/32" to 1/8" thick PC board



Standard Keycaps

STANDARD LEGENDS

Insertable Style Modules

For prototypes and small quantities

Standard insertable legend modules are an economical way to create your own keyboard legend. Just remove the clear button cap, add any legend, and replace the snap-on cap.

Legend Inserts

For insertable legend modules

Give your keyboard modules the appearance of being printed without the cost. Self-adhesive, printed legend inserts are die cut to fit the buttons. Legend sheet includes commonly used symbols, terms, alpha characters A-Z, and numeric characters 0-99 in News Gothic Condensed typestyle, printed in black on clear backing. Legend sheets also include blank inserts for dry transfer lettering.

87 Series Legend Sheet **Part No. 87AC2046**

SPECIAL LEGENDS

Printed Legends

For medium volume or short runs

Virtually any character symbol or pattern which can be photographed can be printed on the button. Grayhill uses epoxy ink which bonds to the surface of the button.

The legend can be printed on either of two surfaces: the top surface of a one-piece button, or the internal surface on the snap-on cap style for maximum wear.

The typestyle chart shows the style and the approximate limitations of Grayhill's standard type. However, limitations differ with the surface to be printed and the actual characters to be used. If your legend exceeds the chart limits, contact Grayhill for more information. Unless specified, black legends are printed on white buttons.

Additional Ink Color: White ink is stocked for use on dark colored buttons.

Additional Button Colors: For a molding charge, we can provide buttons from other colors which we may have in stock, such as black, red, green, blue, or yellow. Non-stock button/ink colors may require minimum material purchase. To order, or to check currently stocked colors, contact Grayhill.

Molded-in Legends

For high volume production

For legends that will stand up to abuse and constant wear for the life of your keyboard, use molded-in legends. The two-shot molding process molds the legend and button together. Your special legend can be made from existing Grayhill molds or we can tool special ones.

Buttons are available with black legends molded in white or other light backgrounds, or with white legends molded into dark backgrounds. See Printed Buttons, Additional Button Colors. To order, contact Grayhill.

Type No. and Typical Height	Sample Style and Typical Sizes	Sub Surface Character and Line Limitations	Top Surface Character and Line Limitations
4GH088 .083"	ABCDEFGH	4 Characters 2 Lines END DATA	4 Characters 2 Lines END DATA
1GH125 .138"	ABCDE	3 Characters 1 Line LAD	3 Characters 1 Line LAD
3GH187 .207"	ABCD	2 Characters 1 Line ON	2 Characters 1 Line ON
2GH250 .276"	ABC	N/A N/A	2 Characters 1 Line 15

ORDERING INFORMATION

Type of Module or Legend	Part Number	Special Legends	5. Button Types.
1 Button	87CC3-201	To order non-standard modules, information is required for the areas listed below.	Flat or concave buttons are available for molded legends; flat, concave, and snap-on cap styles are available for printed legends.
2 Button	87DC3-201	Your special order will be assigned a part number for future identification. This number is sequentially assigned and is non-descriptive.	6. Button Color. Standard buttons for molded and printed legends are white with black legend. Other colors available include white legends with red, green, dark blue, dark gray and black buttons, or black legends with yellow, blue, light gray, beige and white buttons. Additional legend colors such as red are also available.
3 Button	87EC3-201		7. Legend Style. Two-shot molded or printed. Printed legends may be top or sub-surface printed.
4 Button	87FC3-201		8. Actual Legend. Specify for each button using the button identification on drawings.
5 Button	87GC3-201		Price—Contact Grayhill.
6 Button	87HC3-201		
12 Button—Matrix	87AB3-201	1. Type of Module. 1, 2, 3, 4, 5, 6, 12 or 16 button.	
12 Button—SP/Com Bus	87AC3-201	2. Mounting Orientation. Horizontal or vertical.	
16 Button—Matrix	87BB3-201	3. Circuitry. Single pole/common bus is standard for all single row modules. For 12 or 16 button keyboard, specify single pole/common bus or matrix.	
16 Button—SP/Com Bus	87BC3-201	4. Housing Color. Standard housing is black. Optional stock colors include beige and gray.	
Insertable Legend Card	87AC2046		

