1 SCOPE

This specification defines the performance, test, quality and reliability requirements of the PCI Express M.2 Connectors.

2 APPLICABLE DOCUMENTS

EIA-364: Electronics Industries Association

3 REQUIREMENTS

3.1 Design and Construction

3.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.

3.1.2 All materials conform to RoHS.

3.2 Materials and Finish

3.2.1 Contact: High performance copper alloy.

Finish: (a) Contact Area: Refer to product drawing.

(b) Under plate: Refer to product drawing.

(c) Solder area: Refer to product drawing.

3.2.2 Housing: High Temp. Thermoplastic, UL94V-0.

3.2.3 Hold Down: High performance copper alloy.

Finish: (a) Under plate: Refer to product drawing.

(b) Solder area: Refer to product drawing.

3.3 Ratings

3.3.1 Working Voltage less than 36 Volts AC (per pin).

3.3.2 Voltage: 50 Volts AC (per pin).

3.3.3 Current: 0.5 Amperes (per pin).

3.3.4 Operating Temperature: -40℃ to +80℃.

4 PERFORMANCE

4.1 Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Item	**Requirement**	**Standard**
Low Level Contact Resistance	Initial: 55 mΩ max. per contact After test: 20 mΩ max. change allowed	Mate connectors, measure by dry circuit, 20mV max., 100mA max. (EIA-364-23)
Insulation Resistance	500 MΩ Min.	Unmated connectors, apply 500 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	300 V AC min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature Rise	0.5A / power contact with 30℃ Max. change allowed	Mate connectors: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25 ℃ (EIA-364-70, Method2)
MECHANICAL		
Item	**Requirement**	**Standard**
Durability	60 mate/unmate cycles for 15u" & 30u" Au plating; 25 mate/unmate cycles for gold flash plating;	The sample should be mounted in the tester and fully mated and unmated the number of cycles (EIA-364-09)
Durability (precondition)	Perform 5 mate/unmate cycles	No evidence of physical damage (EIA-364-09)

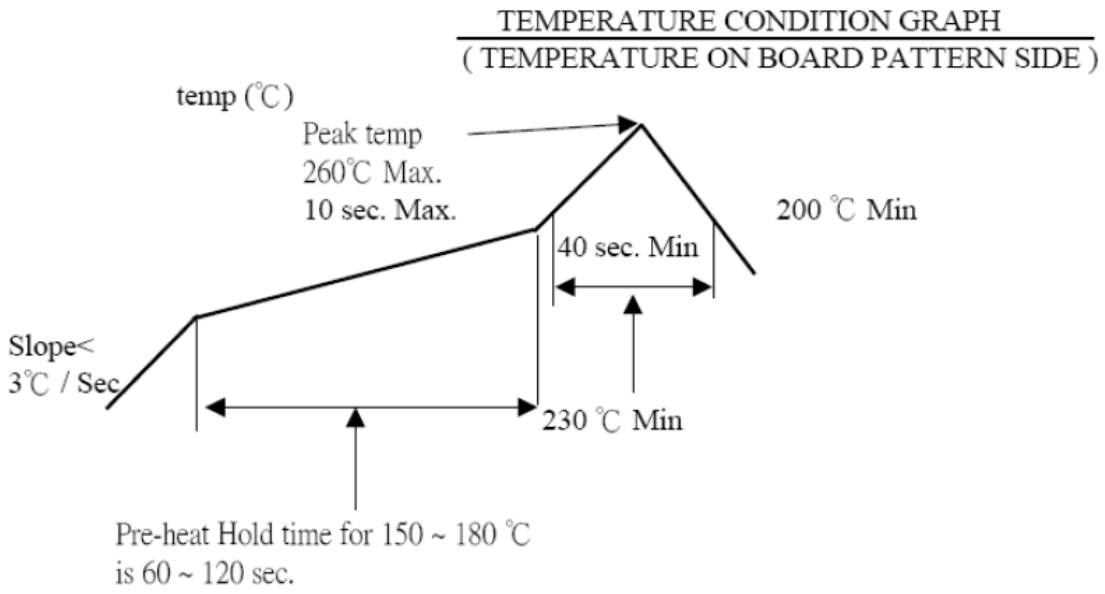
Mating Forces	Mating Force: 2.55 Kgf Max.	Measure the force required to mate/unmate connector. (EIA-364-13, Method A)
Vibration	1 microsecond Max.	15 minutes in each of 3mutually perpendicular directions. Both mating halves should be rigidly fixed so as not to contribute to the relative motion of one contact against another. (EIA-364-28 Condition VII Condition letter D)
Shock (Mechanical)	1 microsecond Max.	Mate connectors to 250 G (Ultrabook) and 285 G (Tablet) at 2 milliseconds half sine on all six axis.
Reseating	Appearance: No damage	Manually mated/unmated the connector or socket perform 3 cycles.
ENVIRONMENTAL		
Item	**Requirement**	**Standard**
Resistance to Reflow Soldering Heat	See Product Qualification and Test Sequence Group 11 (Lead Free)	Pre Heat: 150~180 ℃, 60~120 sec. Heat: 230 ℃ Min., 40 sec. Min. Peak Temp.: 260 ℃ Max., 10 sec. Max. Perform 2 reflow cycles
Thermal Shock	See Product Qualification and Test Sequence Group 2	Mate module and subject to follow condition for 10 cycles. 1 cycles: -55 +0/-3 ℃, 30 minutes. +85 +3/-0 ℃, 30 minutes. (EIA-364-32, method A test condition I)

Cyclic Temperature & Humidity	See Product Qualification and Test Sequence Group 2	Cycle the connector or socket between 25 ± 3 ℃ at 80 ± 3% RH and 65 ± 3 ℃ at 50 ± 3% RH. Ramp times should be 0.5 hours and dwell times should be 1.0 hours. Dwell times start when the temperature and humidity have stabilized within the specified levels. Perform 24 such cycles. (EIA-364-31, Method III)
Temperature Life	See Product Qualification and Test Sequence Group 1	Subject mated connectors to temperature life at 105 ℃ for 120 hours. (EIA-364-17, method A)
Temperature Life (precondition)	No physical damage	Subject mated connectors to temperature life at 105 ℃ for 72 hours. (EIA-364-17, method A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 8	Subject mated connectors to 5% salt-solution concentration, 35℃ (I) Gold flash for 8 hours (II) Gold plating 5u" for 96 hours. (EIA-364-26)
Solderability	Tin plating: Solder able area shall have min. of 95% solder coverage. Gold plating: Solder able area shall have min. of 75% solder coverage	Add then into solder bath, Temperature at 245 ±5 ℃, for 4-5 sec. (EIA-364-52)
Hand Soldering Temperature Resistance	Appearance: No damage	T≧ 350 ℃, 3 sec. at least.

Thermal Disturbance	See Product Qualification and Test Sequence Group 10	Cycle the mated connector between 15 ± 3 ℃ and 85 ± 3 ℃, as measured on the part. Ramps should be a minimum of 2 ℃ per minute, and dwell times should insure that the contacts reach the temperature extremes (a minimum of 5 minutes). Humidity is not controlled. Perform 10 such cycles.

Note. Flowing Mixed Gas shell be conduct by customer request.

5 REFLOW CONDITION



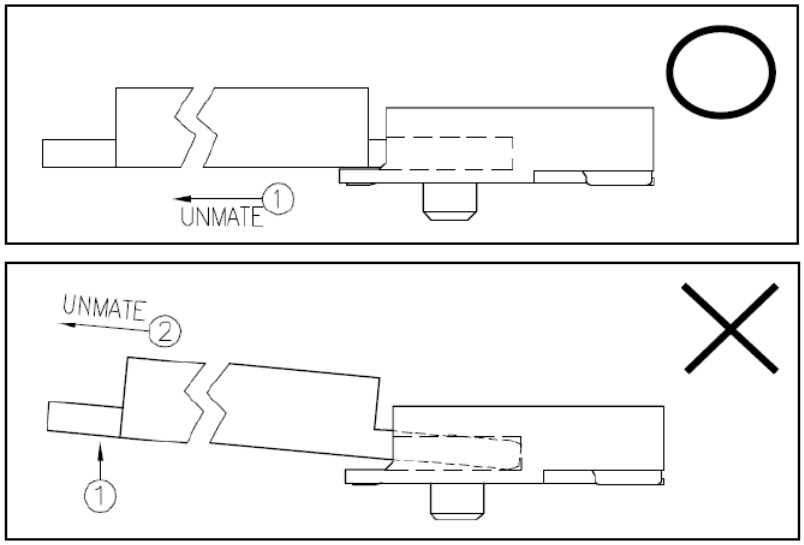
6 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test of Examination	Test Group										
	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence										
Examination of Product	1, 6, 9	1, 6, 9, 12	1, 6, 9	1, 7	1, 4	1, 3	1, 7	1, 5	1, 3	1, 5	1, 3
Low Level Contact Resistance	2, 5, 8	2, 5, 8, 11	2, 5, 8	2, 6			2, 4, 6	2, 4		2, 4	
Insulation Resistance					2						
Dielectric Withstanding Voltage					3						
Mating / Unmating Forces				3, 5							
Durability				4							
Durability (precondition)	3	3	3				3				
Temperature Rise						2					
Vibration			7								
Shock (Mechanical)							5				
Reseating	7	10									
Thermal Shock		4									
Cyclic Temperature & Humidity		7									
Temperature Life	4										
Temperature Life (precondition)			4								
Salt Spray								3			
Solderability									2		
Thermal Disturbance										3	
Resistance to Soldering Heat											2
Sample Quantity	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**

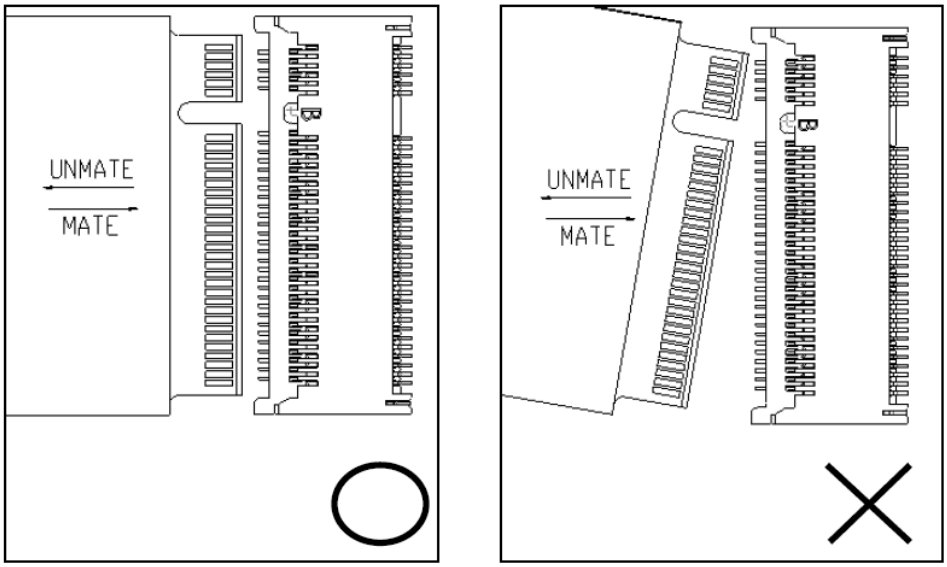
7 MODULE CARD OPERATION

Exercise care when handling connectors. Follow recommendations given below.

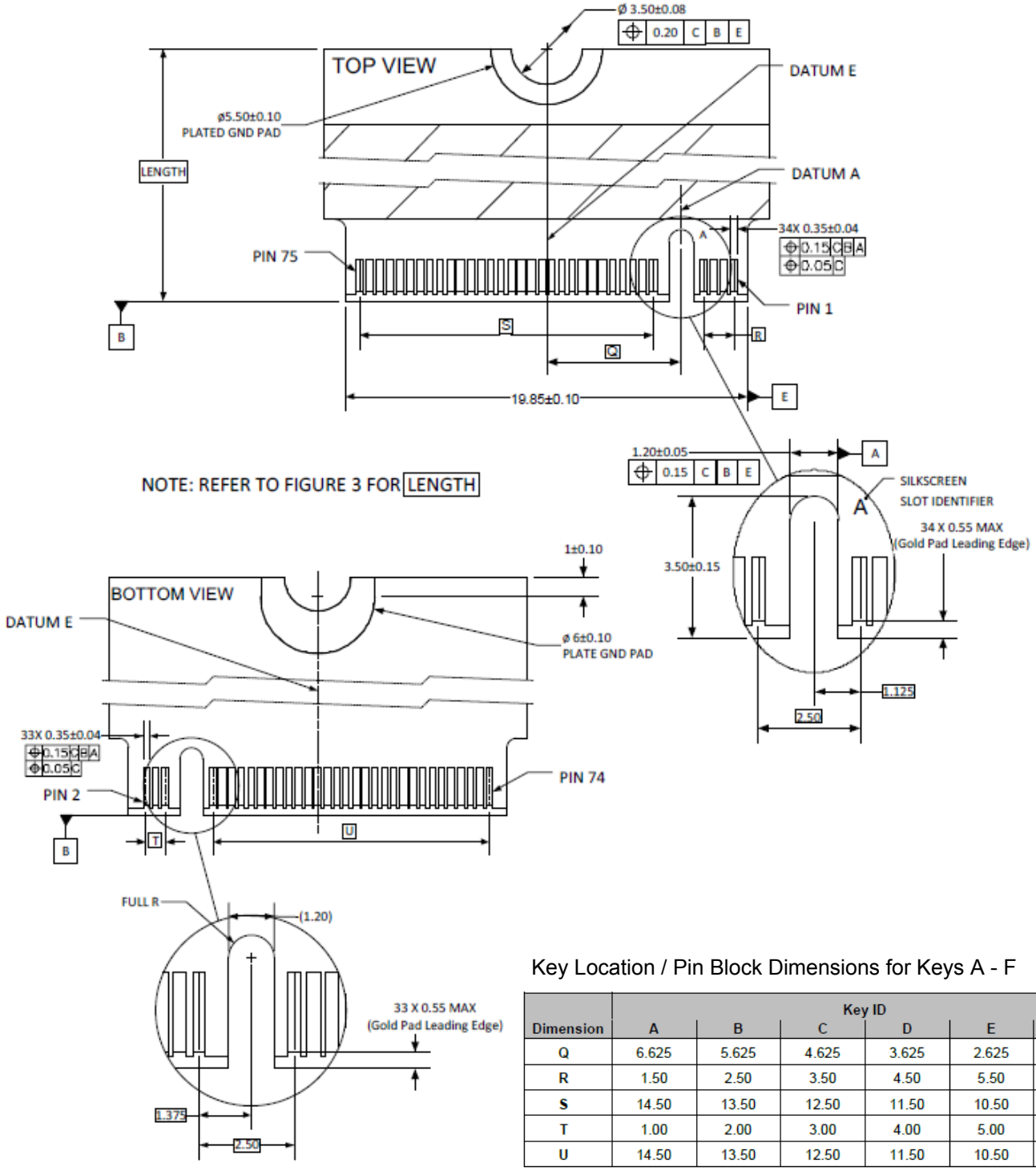
7-1 Prohibition with angles unmates the module card.



7-2 Prohibition with angles mate/unmates the module card.

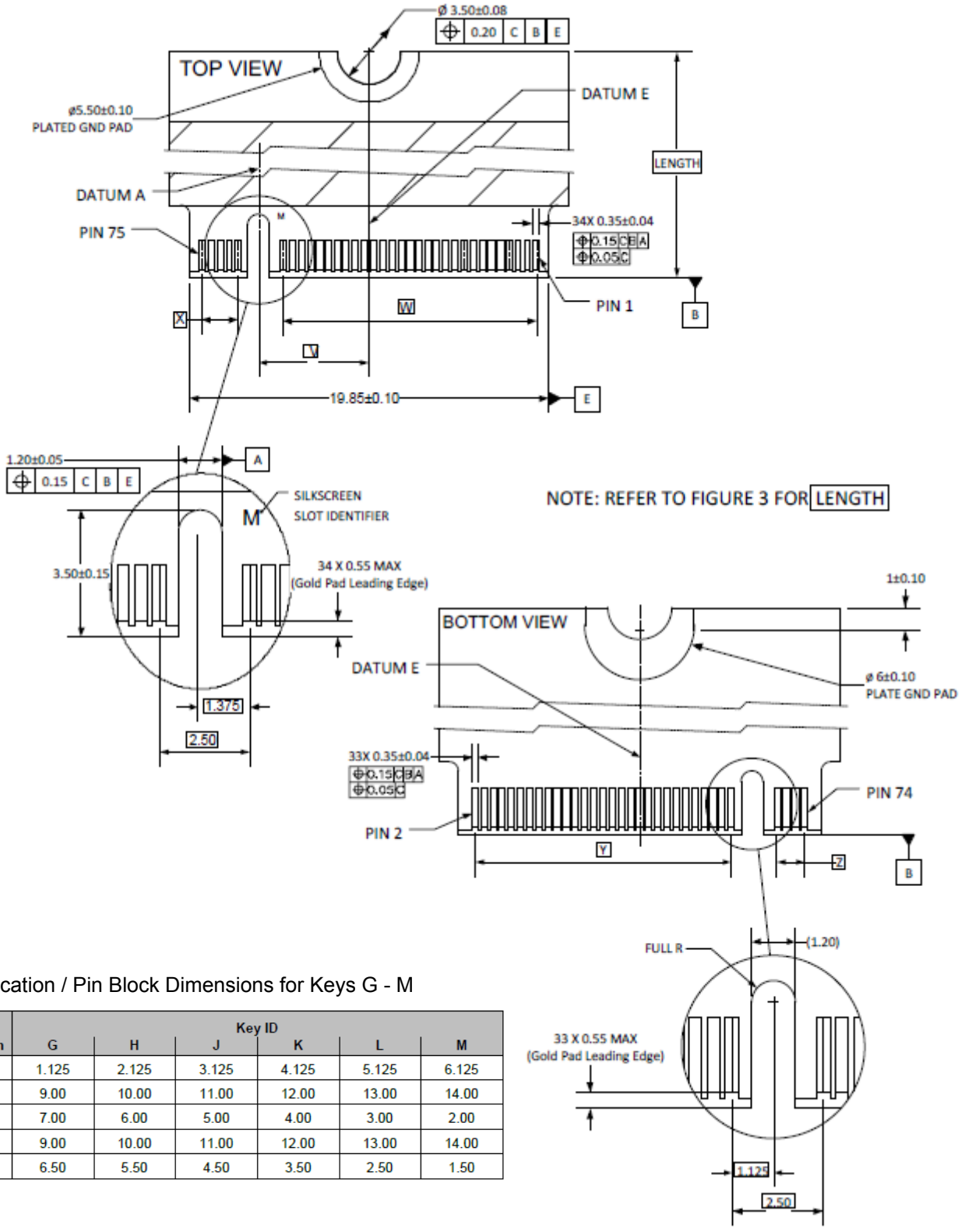


8 RECOMMEND MODULE CARD



Key Location / Pin Block Dimensions for Keys A - F

Dimension	Key ID A	B	C	D	E	F
Q	6.625	5.625	4.625	3.625	2.625	1.625
R	1.50	2.50	3.50	4.50	5.50	6.50
S	14.50	13.50	12.50	11.50	10.50	9.50
T	1.00	2.00	3.00	4.00	5.00	6.00
U	14.50	13.50	12.50	11.50	10.50	9.50



Key Location / Pin Block Dimensions for Keys G - M

Dimension	Key ID					
	G	H	J	K	L	M
V	1.125	2.125	3.125	4.125	5.125	6.125
W	9.00	10.00	11.00	12.00	13.00	14.00
X	7.00	6.00	5.00	4.00	3.00	2.00
Y	9.00	10.00	11.00	12.00	13.00	14.00
Z	6.50	5.50	4.50	3.50	2.50	1.50

REVISION RECORD

Rev	Page	Description	EC#	Date
A	ALL	NEW RELEASE		2014/7/24
B	ALL	CHANGE DURABILITY CYCLES	ELX-T-18734	2014/9/3