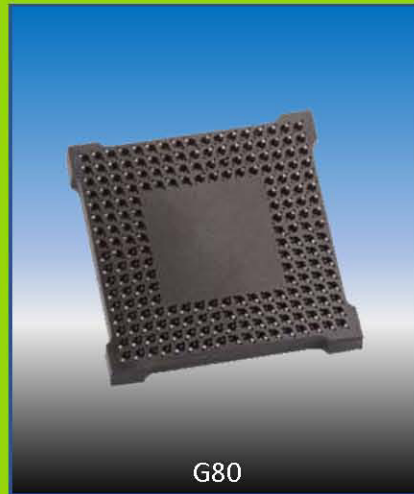
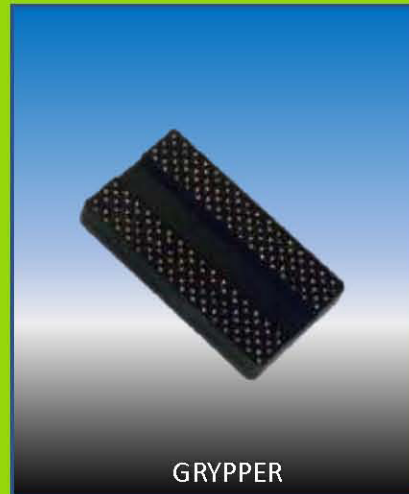




G40



G80



GRYPPER

## PRODUCT CATALOG

*True-Zero and Near-Zero Footprint  
Test Sockets – Grypper, Grypper Y,  
& SMT Spring Pin*

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# INTRODUCTION

## Welcome to Ironwood Electronics!

As a premier manufacturer of precision test sockets, adapters, and modules, Ironwood offers more than 6000 standard products. This catalog highlights the Ironwood Grypper line of true Zero-Footprint and Near-Zero-Footprint Socket products. Since 1986, there are very few challenges we have not come across - we welcome your next challenge!

## Mission Statement

We are committed to developing new technologies to provide superior products and services to meet our customer's requirements. We strive to offer the most comprehensive line of high performance test sockets, adapters, and custom modules in the industry, and maintain a deep understanding of the technologies involved. We will provide continuous and open communication with our suppliers and customers to ensure top quality materials and on-time delivery. We are dedicated to quality in the services we provide and the parts we manufacture.

Catalog G1

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# GRYPPER TEST SOCKETS

Ironwood Electronics Grypper test sockets are like not having a socket at all. With superior electrical performance, Grypper test sockets allow BGA devices to fit into the exact end-use location on actual boards, promoting test, trouble-shooting, failure analysis, and product development, where space is limited to only the IC package itself. The BGA package simply snaps directly into the Grypper socket.

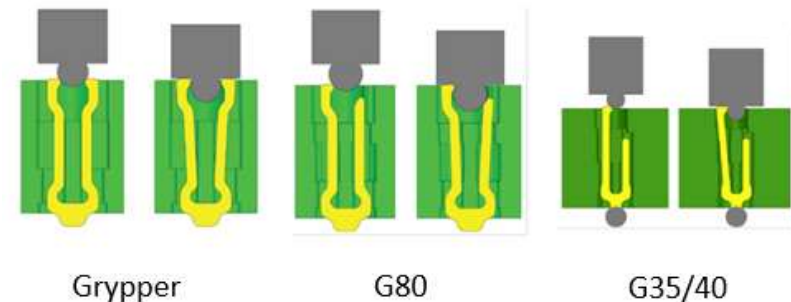
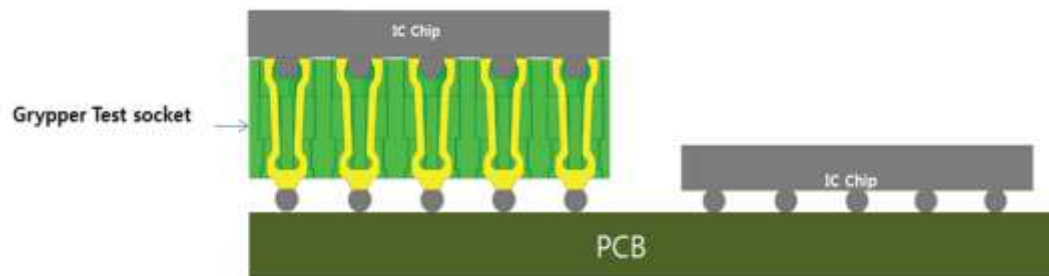
Grypper sockets have 3 series of contact designs that are specific to pitch and I/O count:

- Grypper (standard) is used for 0.65 – 1.0 mm pitch, up to 200 I/O
- Grypper G80 is used for 0.65 to 1.0 mm pitch, 200-300 I/O
- Grypper G80 LIF is used for 0.65 to 1.0 mm pitch, 300+ I/O
- Grypper G35/G40 is used for 0.35 to 0.50 mm pitch

## Grypper Zero Footprint Sockets



- No lid required
- Socket same size as device
- device simply snaps in for test
- Allows test on platform boards







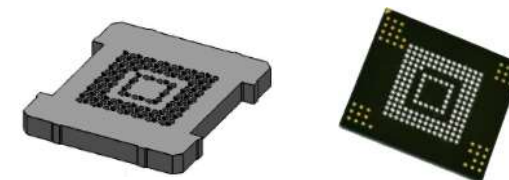
Having the same dimensions as the original device, Grypper sockets mount in the same location, utilize the same footprint, and attach using the same SMT process.

# GRYPPER STANDARD MEMORY SOCKETS - eMMC / UFS

This section includes Zero Footprint Grypper sockets that have been designed for most common industry standard memory devices, including; eMMC / UFS, NAND (ONFi), DDR, GDDR and LPDDR.

## eMMC / UFS Sockets

	Ball Count-Socket Size- Pitch	Device Ball Diameter +/- 0.05 mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
	<b>153 - 11.5 x 13.0 - 0.5</b>	0.30	<b>107250-0026</b>	<b>108387-0026</b>	<b>107248-0026</b>
	Alignment Frame		108639-0003		
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 153 - 11.5 x 13.0		N/R	N/R	104553-0220
	<b>153 - 11.5 x 13.0 - 0.5</b>	0.30	<b>107250-0065</b>	<b>108387-0064</b>	<b>108519-0064</b>
	<b>153 - with built in alignment feature</b>				
Alignment frame not required - use press and stencil from above					
	<b>169 - 12.0 x 16.0 - 0.5</b>	0.30	<b>107250-0009</b>	<b>108387-0009</b>	<b>107248-0009</b>
	Alignment Frame		106083-0021		
	Device Press - 12.0 x 16.0		103864-0080		
	Stencil - 169 - 12.0 x 16.0		N/R	N/R	104553-0166
	<b>169 - 14.0 x 18.0 - 0.5</b>	0.30	<b>107250-0012</b>	<b>108387-0066</b>	<b>107248-0012</b>
	Alignment Frame		106083-0028		
	Device Press - 14.0 x 18.0		103864-0116		
	Stencil - 169 - 14.0 x 18.0		N/R	N/R	104553-0175



Accessory Items used with Grypper sockets



**Alignment Frame**

Used for positioning the BGA device into the socket (G35/G40)



**Device Press**

Recommended to ensure even pressure across the top of the device when inserting device into socket



**Extraction Tool**







105900-0004 – Used for device removal

Actual device measurements should be reviewed to ensure proper fit with socket contacts

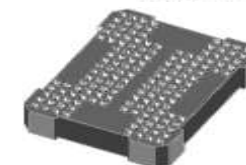
Other configurations / socket outline sizes

## GRYPPER STANDARD MEMORY SOCKETS – ONFi/NAND

## ONFi / NAND Grypper Sockets

Typical Applications	Ball Count - Socket size - Pitch - Product	Device Ball Diameter +/- 0.05 mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
	<b>63</b> - 9.0 x 11.0 - 0.8 - Grypper	0.45	<b>105526-0097</b>	<b>105526-0090</b>	<b>105526-0082</b>
	Device Press – 9.0 x 11.0		103864-0048		
	Stencil MOQ (10)		N/R	N/R	104553-0083
	<b>100</b> - 12.0 x 18.0 - 1.0 - Grypper	0.45	<b>105526-0089</b>	<b>105526-0088</b>	<b>105526-0057</b>
	Device Press - 12.0 x 18.0		103864-0083		
	Stencil – 100 – 12.0 x 18.0		N/R	N/R	104553-0133
	<b>132</b> - 12.0 x 18.0 - 1.0 - Grypper	0.50	<b>104670-0040</b>	<b>104670-0043</b>	<b>104670-0032</b>
	Device Press- 12.0 x 18.0		103864-0083		
	Stencil - 132 - 12.0 x 18.0		N/R	N/R	104553-0217
	<b>152</b> - 14.0 x 18.0 - 1.0 - Grypper	0.50	<b>104670-0041</b>	<b>108656-0036</b>	<b>104670-0036</b>
	Device Press - 14.0 x 18.0		103864-0116		
	Stencil - 152 - 14.0 x 18.0		N/R	N/R	104553-0248
	<b>272</b> - 14.0 x 18.0 - 0.8 - Grypper/G80	0.55	<b>107206-0052</b>	<b>107206-0016</b>	<b>107206-0013</b>
	Device Press - 14.0 x 18.0		103864-0116		
	Stencil - 272 – 14.0 x 18.0		N/R	N/R	104553-0354
	<b>316</b> - 14.0 x 18.0 - 0.8 - Grypper/G80	0.50	<b>107088-0011</b>	<b>107088-0012</b>	<b>107088-0010</b>
	Device Press - 14.0 x 18.0		103864-0116		
	Stencil - 316 – 14.0 x 18.0				104553-0289

**ONFi**  
OPEN NAND  
FLASH INTERFACE

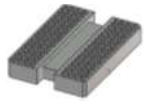
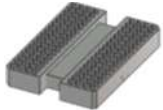

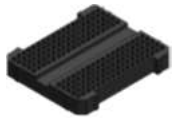


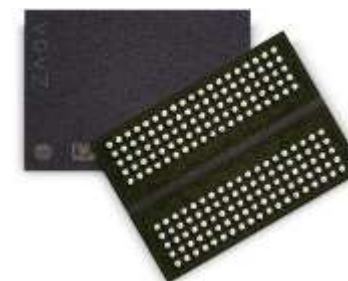
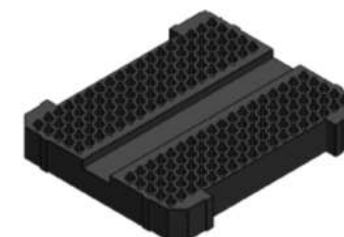
## GRYPPER STANDARD MEMORY SOCKETS – DDR

	Ball Count - Socket Size - Pitch - Product	Device Ball Diameter +/-0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
<b>DDR2</b>					
	<b>60</b> - 8.0 x 11.4 - 0.8 - Grypper	0.45	<b>105526-0099</b>	<b>105526-0098</b>	<b>105526-0068</b>
	Device Press - 8.0 x 11.4		103864-0108		
	Stencil - 60 - 8.0 x 11.4		N/R	N/R	104553-0169
	<b>84</b> - 7.6 x 12.5 - 0.8 - Grypper	0.45	<b>105526-0101</b>	<b>105526-0100</b>	<b>105526-0037</b>
	Device Press - 8.0 x 12.5		103864-0075		
	Stencil - 84 - 8.0 x 12.0		N/R	N/R	104553-0108
<b>DDR3</b>					
	<b>82</b> - 9.4 x 11.1 - 0.8 - Grypper	0.45	<b>105526-0091</b>	<b>105526-0092</b>	<b>105526-0056</b>
	Device Press - 9.4 x 11.1		103864-0088		
	Stencil - 82 - 9.4 x 11.1		N/R	N/R	104553-0129
<b>DDR3/4</b>					
 X4/X8	<b>78</b> - 7.5 x 10.6 - 0.8 - Grypper	0.45	<b>108493-0009</b>	<b>107022-0048</b>	<b>107022-0038</b>
	Device Press - 7.5 x 10.6		103864-0119		
	Stencil - 78 - 7.5 x 10.6		N/R	N/R	107030-0038
	<b>78</b> - 7.5 x 10.6 - 0.8 - Grypper	0.50	<b>111015-0002</b>	<b>111015-0001</b>	<b>111015-0003</b>
	Device Press - 7.5 x 10.6		103864-0119		
	Stencil - 78 - 7.5 x 10.6		N/R	N/R	104553-0441
 X16	<b>96</b> - 7.5 x 13.1 - 0.8 - Grypper	0.45	<b>108493-0014</b>	<b>108493-0015</b>	<b>105526-0015</b>
	Device Press - 7.5 x 13.1		103864-0060		
	Stencil - 96 - 7.5 x 13.1		N/R	N/R	104553-0071
	<b>96</b> - 7.5 x 13.1 - 0.8 - Grypper	0.50	<b>111017-0002</b>	<b>111017-0001</b>	<b>111017-0003</b>
	Device Press - 7.5 x 13.1		103864-0060		
	Stencil - 96 - 7.5 x 13.1		N/R	N/R	104553-0449





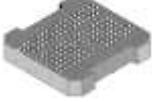


## GRYPPER STANDARD MEMORY SOCKETS – GDDR

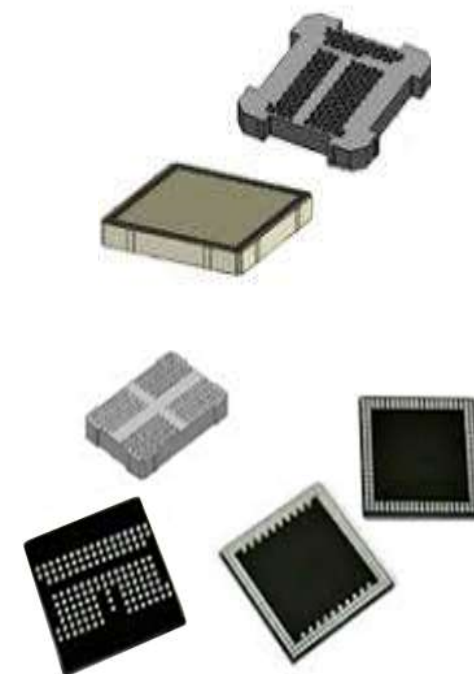
	Ball Count - Socket Size - Pitch - Product	Device Ball Diameter +/-0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
<b>GDDR3</b>					
	<b>136 - 10.0 x 14.0 - 0.8 - Grypper</b>	0.45	<b>107022-0052</b>	<b>107022-0051</b>	<b>107022-0026</b>
	Device Press - 10.0 x 14.0		103864-0109		
	Stencil - 136 - 10.0 x 14.0		N/R	N/R	107030-0026
<b>GDDR5</b>					
	<b>170 - 12.0 x 14.0 - 0.8 - Grypper</b>	0.45	<b>105526-0103</b>	<b>105526-0102</b>	<b>105526-0070</b>
	Device Press - 12.0 x 14.0		103864-0111		
	Stencil - 170 - 12.0 x 14.0		N/R	N/R	107030-0027
<b>GDDR5 -x</b>					
	<b>190 - 10.0 x 14.0 - 0.65 - Grypper</b>	0.40	<b>111008-0002</b>	<b>111008-0001</b>	<b>111008-0003</b>
	Device Press - 10.0 x 14.0		103864-0109		
	Stencil - 190 - 10.0 x 14.0		N/R	N/R	104553-0396
<b>GDDR6</b>					
	<b>180 - 12.0 x 14.0 - 0.75 - Grypper</b>	0.45	<b>111024-0002</b>	<b>111024-0001</b>	<b>111024-0003</b>
	Device Press - 12.0 x 14.0		103864-0066		
	Stencil - 180 - 12.0 x 14.0		N/R	N/R	104553-0455
	<b>180 - 12.0 x 14.0 - 0.75 - Grypper</b>	0.50	<b>111027-0002</b>	<b>111027-0001</b>	<b>111027-0003</b>
	Device Press - 12.0 x 14.0		103864-0066		
	Stencil - 180 - 12.0 x 14.0		N/R	N/R	104553-0465









## GRYPPER STANDARD MEMORY SOCKETS – LPDDR


	Ball Count - Socket Size - Pitch - Product -	Device Ball Diameter +/-0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
<b>LPDDR</b>					
	<b>60</b> - 7.5 x 8.5 - 0.8 - Grypper	0.45	<b>111014-0002</b>	<b>111014-0001</b>	<b>111014-0003</b>
	Device Press - 7.5 x 7.5		103864-0132		
	Stencil - 60 - 10.0 x 11.5		N/R	N/R	104553-0437
	<b>90</b> - 7.5 x 12.3 - 0.8 - Grypper	0.45	<b>104670-0044</b>	<b>108493-0018</b>	<b>104670-0007</b>
	Device Press - 8.0 x 12.0		103864-0038		
	Stencil - 90 - 8.0 x 12.0		N/R	N/R	104553-0034
<b>LPDDR2</b>					
 many other sizes available - contact Ironwood Electronics	<b>134</b> - 11.0 x 11.5 - 0.65 - Grypper	0.40	<b>106918-0015</b>	<b>106918-0014</b>	<b>106918-0012</b>
	<b>134</b> - 11.0 x 11.5 - 0.65 - Grypper	0.35	<b>104946-0015</b>	<b>104946-0014</b>	<b>104946-0010</b>
	Device Press - 11.0 x 11.5	103864-0061			
	Stencil - 134 - 11.0 x 11.5	N/R	N/R	104553-0196	
	<b>162</b> - 11.5 x 13.0 - 0.5 - G40	0.30	<b>107250-0023</b>	<b>108387-0080</b>	<b>107248-0023</b>
	Alignment Frame		108639-0003		
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 134 - 11.5 x 13.0		N/R	N/R	104553-0206
	<b>162</b> - 11.5 x 13.0 - 0.5 - G40 w/ built in Alignment Feature	0.30	<b>109023-0002</b>	<b>109023-0001</b>	<b>109023-0003</b>
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 134 - 11.5 x 13.0		N/R	N/R	104553-0206








## GRYPHER STANDARD MEMORY SOCKETS – LPDDR

	Ball Count - Socket Size - Pitch - Product -	Device Ball Diameter +/-0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
<b>LPDDR2 Sockets - continued</b>					
	<b>162</b> - 8.0 x 10.5 - 0.5 - G40	0.30	<b>109054-0002</b>	<b>109054-0001</b>	<b>109054-0003</b>
	Alignment Frame			108639-0065	
	Device Press - 5.5 x 10.5			103864-0031	
	Stencil - 162 - 5.5 x 10.5		N/R	N/R	104553-0404
	<b>162</b> - 5.5 x 10.5 - 0.5 - G40	0.30	<b>107250-0071</b>	<b>108387-0024</b>	<b>107250-0024</b>
	Alignment Frame		108639-0013		
	Device Press - 5.5 x 10.5		103864-0170		
	Stencil - 162 - 5.5 x 10.5		N/R	N/R	104553-0210
	<b>216</b> - 12.0 x 12.0 - 0.4 (PoP relief) - G40	0.25	<b>107140-0059</b>	<b>108388-0004</b>	<b>107022-0043</b>
	<b>216</b> - 12.0 x 12.0 - 0.4 - G40	0.25	<b>107140-0018</b>	<b>108388-0018</b>	<b>107620-0004</b>
	Alignment Frame		108639-0006		
	Device Press - 12.0 x 12.0		103864-0002		
	Stencil - 216 - 12.0 x 12.0		N/R	N/R	104553-0186
	<b>240</b> - 14.0 x 14.0 - 0.5 (PoP relief) - G40	0.30	<b>107250-0013</b>	<b>108387-0071</b>	<b>107022-0041</b>
	Alignment Frame		108639-0002		
	Device Press - 14.0 x 14.0		103864-0004		
	Stencil - 240 - 14.0 x 14.0		N/R	N/R	107030-0041







## GRYPPER STANDARD MEMORY SOCKETS – LPDDR

LPDDR2-3					
	<b>168</b> - 12.0 x 12.0 - 0.5	0.30	<b>107250-0001</b>	<b>108387-0072</b>	<b>107248-0001</b>
	<b>168</b> - 12.0 x 12.0 - 0.5 (PoP relief) - G40	0.30	<b>107250-0066</b>	<b>108387-0073</b>	<b>107022-0042</b>
	Alignment Frame		108639-0006		
	Device Press - 12.0 x 12.0		103864-0002		
	Stencil - 168 - 12.0 x 12.0		N/R	N/R	107030-0042
	<b>216</b> - 15.0 x 15.0 - 0.5 (PoP relief) - G40	0.30	<b>107250-0067</b>	<b>108387-0065</b>	<b>107610-0007</b>
	<b>216</b> - 15.0 x 15.0 - 0.5 (PoP relief) - G40	0.35	<b>107268-0010</b>	<b>108387-0074</b>	<b>107269-0010</b>
	Alignment Frame		108639-0005		
	Device Press - 15.0 x 15.0		103864-0005		
	Stencil - 216 - 15.0 x 15.0		N/R	N/R	104553-0245
LPDDR3					
	<b>178</b> - 11.0 x 11.5 - 0.65 x 0.8 - Grypper	0.30	<b>104802-0008</b>	<b>104802-0009</b>	<b>104802-0006</b>
	Device Press - 11.0 x 11.5		103864-0061		
	Stencil - 178 - 11.0 x 11.5		N/R	N/R	104553-0262
	<b>178</b> - 11.5 x 13.0 - 0.65 x 0.8 - Grypper	0.40	<b>107022-0050</b>	<b>107022-0049</b>	<b>107022-0047</b>
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 178 - 11.5 x 13.0		N/R	N/R	104553-0244
	<b>178</b> - 11.0 x 11.5 - 0.65 x 0.8 - G40	0.25	<b>107140-0035</b>		<b>107140-0037</b>
	Alignment Frame		106083-0058		
	Device Press - 11.0 x 11.5		103864-0061		
	Stencil - 178 - 11.0 x 11.5		N/R	N/R	104553-0260
	<b>178</b> - 11.5 x 13.0 - 0.65 x 0.8 - G40	0.30	<b>107250-0039</b>	<b>108387-0075</b>	<b>107248-0039</b>
	Alignment Frame		108639-0003		
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 178 - 11.5 x 13.0		N/R	N/R	104553-0244




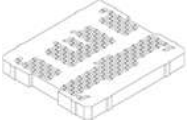
## GRYPPER STANDARD MEMORY SOCKETS – LPDDR

	Ball Count - Socket Size - Pitch - Product - Contact Type (G40, G80 or Standard Grypper)	Device Ball Diameter +/- 0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
	<b>178 - 11.0 x 11.5 - 0.65 x 0.8 - G40</b>	0.30	<b>109025-0002</b>	<b>109025-0001</b>	<b>109025-0003</b>
	Alignment Frame		108639-0045		
	Device Press - 11.0 x 11.5		103864-0061		
	Stencil - 178 - 11.0 x 11.5		N/R	N/R	104553-0369
 Grypper design that allows use of an alignment frame	<b>178 - 11.0 x 11.5 - 0.65 x 0.8 - Grypper</b>	0.30	<b>111006-0002</b>	<b>111006-0001</b>	<b>111006-0003</b>
	Alignment Frame		108639-0052		
	Device Press - 11.0 x 11.5		103864-0061		
	Stencil - 178 - 11.0 x 11.5		N/R	N/R	104553-0262
	<b>221 - 11.5x 13.0 - 0.5 - G40</b>	0.30	<b>107250-0064</b>	<b>108387-0076</b>	<b>107248-0061</b>
	Alignment Frame		108639-0007		
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 221 - 11.5 x 13.0		N/R	N/R	104553-0297
	<b>221 - 11.5 x 13.0 - 0.5 - G40 w/built in Alignment Feature</b>	0.30	<b>107250-0063</b>	<b>108387-0077</b>	<b>108519-0063</b>
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 221 - 11.5 x 13.0		N/R	N/R	104553-0297
	<b>221 - 10.0 x 12.0 - 0.5 - G40</b>	0.30	<b>109001-0002</b>	<b>109001-0001</b>	<b>109001-0003</b>
	Alignment Frame		108639-0014		
	Device Press - 10.0 x 11.0		103864-0054		
	Stencil - 221 - 11.0 x 11.5		N/R	N/R	104553-0338


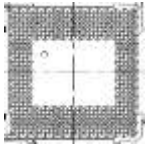
## GRYPPER STANDARD MEMORY SOCKETS – LPDDR

	Ball Count - Socket Size - Pitch - Product - Contact Type (G40, G80 or Standard Grypper)	Device Ball Diameter +/- 0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)	
	<b>253</b> - 12.5 x 12.5-0.5 - G40	0.30	<b>107250-0068</b>	<b>108387-0078</b>	<b>107610-0010</b>	
	Alignment Frame		108639-0012			
	<b>253</b> - 12.5 x 12.5-0.5 - G40 w/built in Alignment Feature	0.30	<b>107250-0069</b>	<b>108387-0079</b>	<b>107610-0009</b>	
	Device Press - 12.5 x 12.5		103864-0144			
	Stencil - 253 - 12.5 x 12.5		N/R	N/R	104553-0243	
		<b>253</b> - 10.5 x 10.5-0.5 - G40	0.30	<b>107250-0070</b>	<b>108387-0081</b>	<b>107610-0011</b>
		Alignment Frame		108639-0011		
		Device Press - 10.5 x 10.5		103864-0073		
Stencil - 253 - 10.5 x 10.5		N/R	N/R	104553-0313		
	<b>256</b> - 14.0 x 14.0 - 0.4 (PoP design w/relief) - G40	0.25	<b>107140-0060</b>	<b>108388-0005</b>	<b>107620-0008</b>	
	<b>256</b> - 14.0 x 14.0 - 0.4	0.25	<b>107140-0061</b>	<b>108388-0006</b>	<b>107620-0012</b>	
	Alignment Frame		108639-0002			
	Device Press - 14.0 x 14.0		103864-0004			
	Stencil - 256 - 14.0 x 14.0		N/R	N/R	107030-0047	
<b>LPDDR4</b>						
	<b>272</b> - 15.0 x 15.0 - 0.4 - G40		<b>109000-0002</b>	<b>109000-0001</b>	<b>109000-0003</b>	
	Alignment Frame	0.25	108639-0005			
	Device Press - 15.0 x 15.0		103864-0005			
	Stencil - 272 - 15.0 x 15.0		N/R	N/R	104553-0336	
	<b>366</b> - 15.0 x 15.0 - 0.5 - G40	0.30	<b>109002-0002</b>	<b>109002-0001</b>	<b>109002-0003</b>	
	Alignment Frame		108639-0005			
	Device Press - 15.0 x 15.0		103864-0005			
	Stencil - 366 - 15.0 x 15.0		N/R	N/R	104553-0339	

## GRYPPER STANDARD MEMORY SOCKETS – LPDDR

	Ball Count - Socket Size - Pitch - Product - Contact Type (G40, G80 or Standard Grypper)	Device Ball Diameter +/-0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
	<b>366</b> - 12.0 x 12.7 - 0.4 - G40 (PoP)	0.25	<b>109077-0002</b>	<b>109077-0001</b>	<b>109077-0003</b>
	Alignment Frame		108639-0079		
	Device Press - 12.0 x 12.0		103864-0002		
	Stencil - 366 - 12.0 x 12.7		N/R	N/R	104553-0438
	<b>200</b> - 10.0 x 15.0 - 0.65 x 0.80 - Grypper	0.35	<b>111004-0002</b>	<b>111004-0001</b>	<b>111004-0003</b>
	Alignment Frame		108639-0048		
	Device Press - 10.0 x 15.0		103864-0025		
	Stencil - 200 - 10.0 x 15.0		N/R	N/R	104553-0380
	<b>200</b> - 10.0 x 15.0 - 0.65 x 0.80 - Grypper	0.40	<b>111020-0002</b>	<b>111020-0001</b>	<b>111020-0003</b>
	Alignment Frame		108639-0048		
	Device Press - 10.0 x 15.0		103864-0025		
	Stencil - 200 - 10.0 x 15.0		NR	N/R	104553-0380
	<b>432</b> - 15.0 x 15.0 – 0.5 - G40	0.30	<b>109072-0002</b>	<b>109072-0001</b>	<b>109072-0003</b>
	Alignment Frame		108639-0005		
	Device Press - 15.0 x 15.0		103864-0005		
	Stencil - 432 - 15.0 x 15.0				104553-0435
	<b>254</b> – 11.5 x 13.0 - 0.5 – G40	0.30	<b>109081-0002</b>	<b>109081-0001</b>	<b>109081-0003</b>
	Alignment Frame		108639-0003		
	Device Press – 11.5 x 13.0		103864-0128		
	Stencil - 254 - 11.5 x 13.0		N/R	N/R	104553-0424
	<b>254</b> - 11.5 x 13.0 - 0.5 – G40	0.35	<b>109064-0002</b>	<b>109064-0001</b>	<b>109064-0003</b>
	Alignment Frame		108639-0003		
	Device Press - 11.5 x 13.0		103864-0128		
	Stencil - 254 - 11.5 x 13.0		NR	N/R	104553-0424

## GRYPPER STANDARD MEMORY SOCKETS – LPDDR

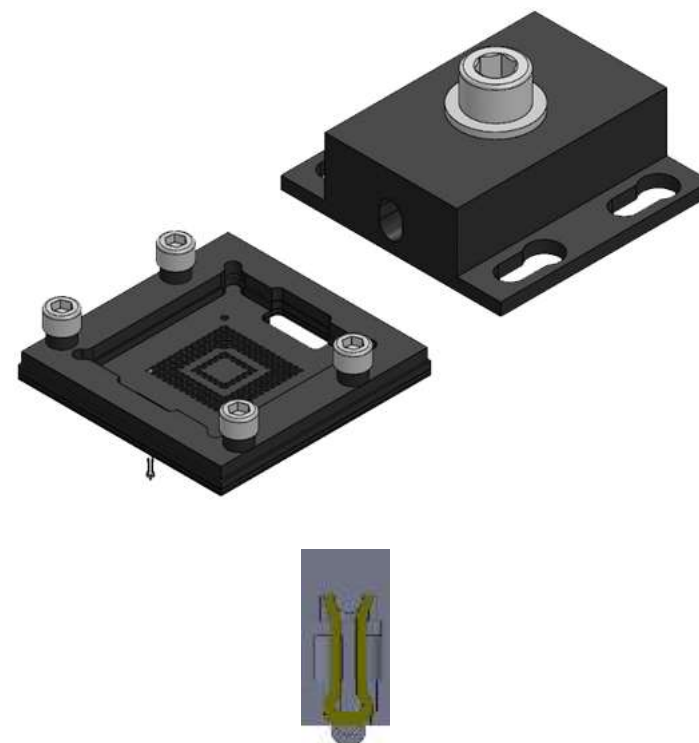
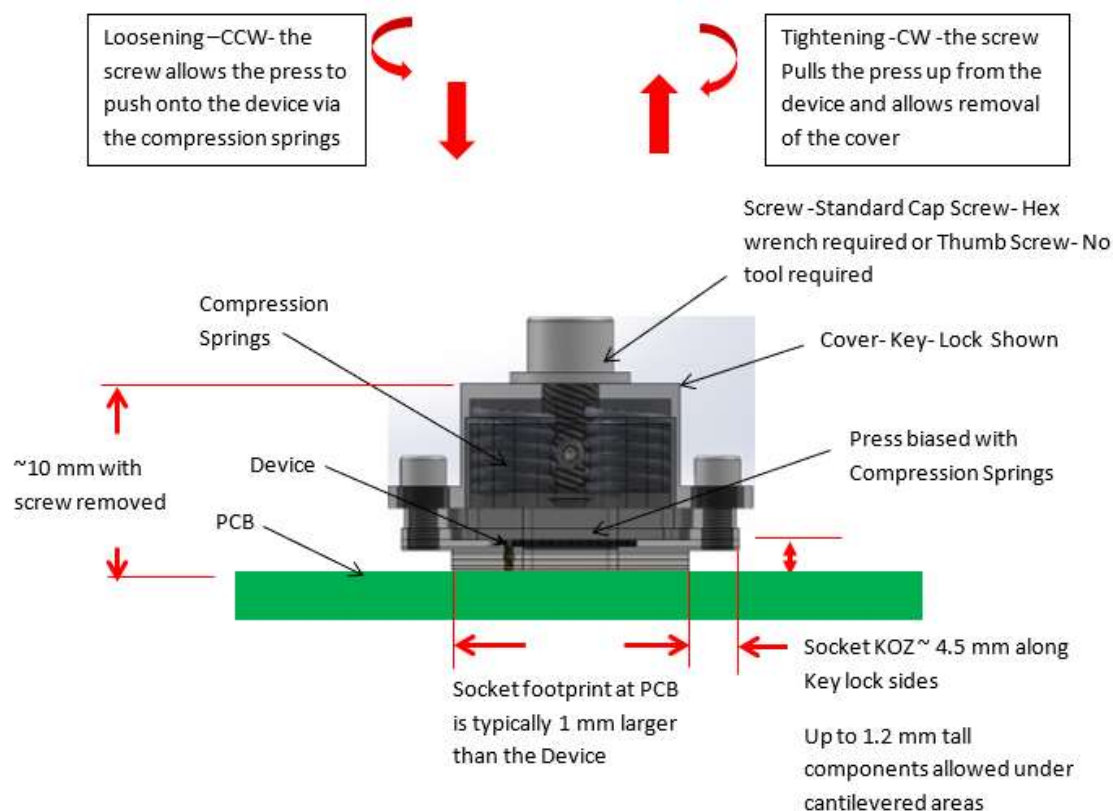
	Ball Count - Socket Size - Pitch - Product - Contact Type (G40, G80 or Standard Grypper)	Device Ball Diameter +/-0.05mm	SAC 305 Solder Balls	SnPb Solder Balls	No Solder Balls (standard)
<b>LPDDR4X</b>					
	<b>376</b> – 14.0 x 14.0 - 0.4 – G40 (PoP)	0.25	<b>109071-0002</b>	<b>109071-0001</b>	<b>109071-0003</b>
	Alignment Frame		108639-0075		
	Device Press – 14.0 x 14.0		103864-0004		
	Stencil - 376 – 14.0 x 14.0		NR	N/R	104553-0432
	<b>556</b> – 12.4 x 12.4 - 0.4 – G40 (PoP)	0.25	<b>109093-0002</b>	<b>109093-0001</b>	<b>109093-0003</b>
	Alignment Frame		108639-0093		
	Device Press – 12.0 x 12.0		103864-0002		
	Stencil - 556 – 12.0 x 12.0		NR	N/R	104553-0470

Reference LPDDR JEDEC Specifications; JEDEC 209 for LPDDR1, JEDEC 209-2F for LPDDR2, JEDEC 209-3B for LPDDR3 and JEDEC 209-4A for LPDDR4, which list standard device pin configurations.

## GRYPPER Y TEST SOCKETS

Near-Zero Footprint Grypper Y sockets work with BGA devices where the solder balls/bumps have either no equator or small exposure, where the standard Grypper cannot reliably hold onto the solder ball. The Y shape, working with the lid, allows reliable contact and ensures device retention in high vibration applications. Lower forces (< 25 grams) make insertion easier and less aggressive contacting allows 20-40 insertions of the same device. The Y contact covers BGA devices from 0.40 mm pitch and larger, while the short electrical length has superior electrical performance. Lids can also be configured to include heat sinking.

The Grypper Y uses a Key Lock Lid that presses and holds the device into the socket. Other Lid Options are also available – bolt down clamshell, or No Lid option using the customer's press, which eliminates the cantilevered areas.

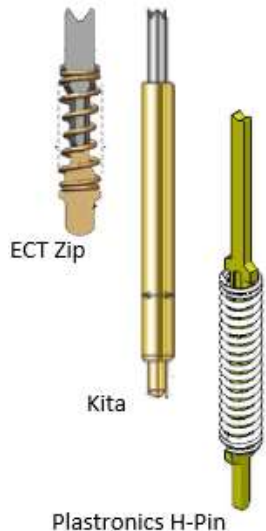
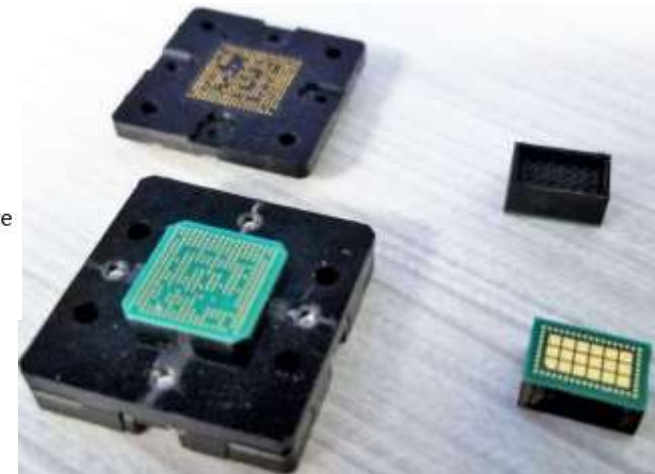
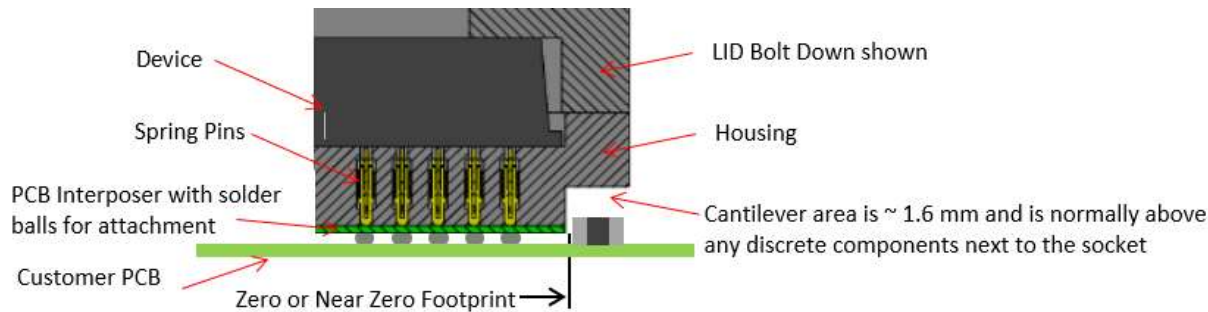




# GRYPHER SMT SPRING PIN TEST SOCKETS

Near-Zero footprint SMT Spring Pin sockets utilize industry standard high-performance spring pins in a surface mount socket which is zero or near-zero footprint, i.e., where the socket is either the same size or just slightly larger than the device itself. Ironwood can design a socket to work with any type of IC packages – BGA, LGA, QFN, DFN -, even leaded devices where you need to fit a socket in place of your device to allow fast, easy testing and development. Depending on the electrical needs, we can design using various spring pins to match to your requirements

The SMT Spring Pin socket will typically use a Key Lock Lid to press and hold the device into the socket. Other lid options are also available, such as bolt down, clamshell, or a no-lid option when used with an external press to eliminate the cantilevered areas.



Manufacture	Relative Cost	Electrical BW*	Pin Length @ Test Height (mm)
ECT – Z0 “Zip pin”	\$\$\$\$	40 Ghz	1.5
ECT – Z “Zip Pin”	\$\$\$	30 Ghz	2.7
Kita – Standard Pitch	\$\$	20 Ghz	2.7-2.8
Plastronics – “H-Pin”	\$	10 Ghz	2.5-3.0
Other	S-\$\$\$\$		

The above list shows spring pins we have designed into our sockets – any spring pin you are familiar with can also be designed into our compression mount socket. \*Electrical Bandwidth approx. for each type pin.



Key-Lock Lid Option

# GRYPPER

## Typical applications for Grypper and Grypper Y sockets



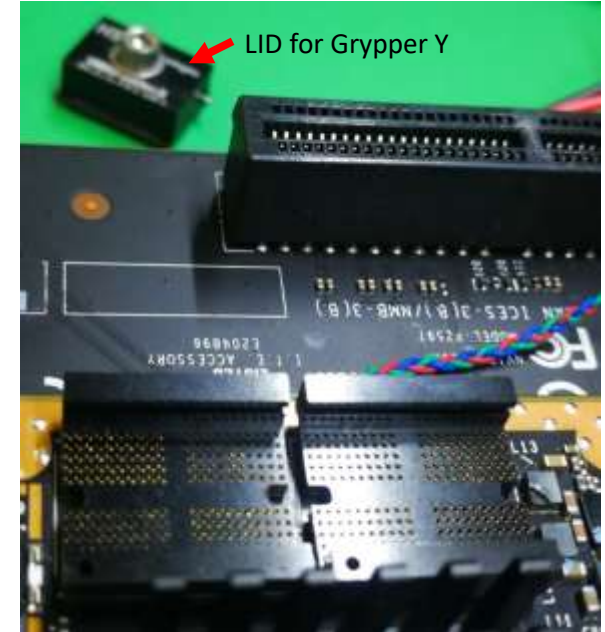
Above Snoop Board application - Grypper used as a Riser for the snoop



Above Grypper installed into a phone – Grypper socket is the same size as the device so it fits into the exact space as the device



Above Grypper on a validation PCB for GDDR5 Device



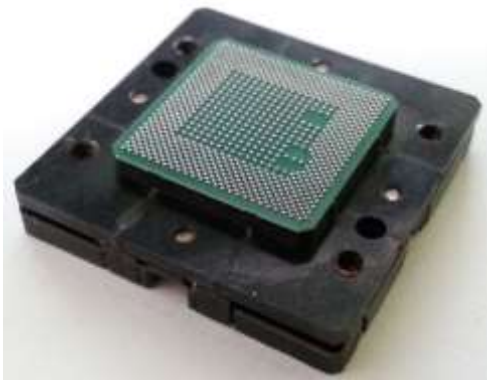
Above Grypper Y on a validation PCB for LPDDR4 – lower insertion and removal force required and 200+ insertions

# NEAR ZERO FOOTPRINT SMT

## NZF SMT Socket Applications



Above Near Zero Footprint Spring Pin Socket mounted to an evaluation board

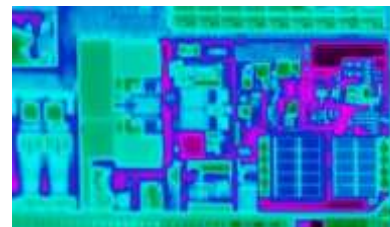
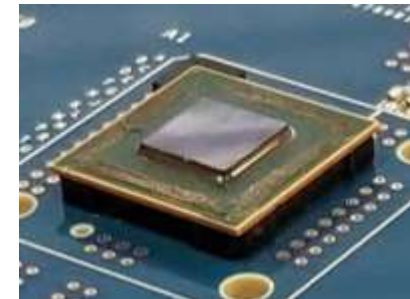


Bottom of the socket is solder balled allowing reflow attachment to the same space as the device. The outer perimeter is cantilevered over any close/ adjacent components next to the device

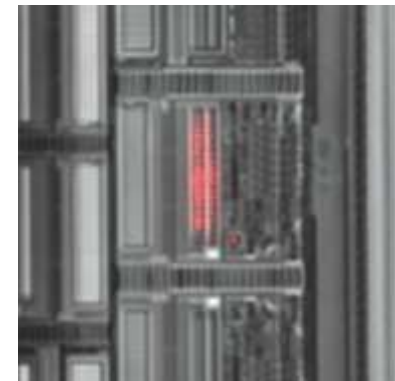
## SIL LENS Application

SIL Lens used with a Grypper Test socket allowing the top of the thinned device totally open - NO LID above the device / die allowing the SIL lens to scan across the entire die area

This application has a Grypper as the device carrier working with the lower Spring Pin socket



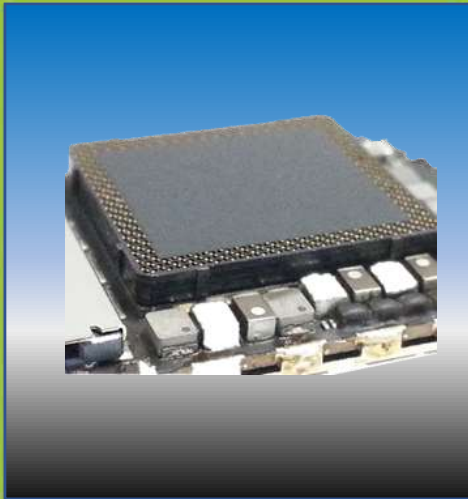
Thermal Image of Die



Area showing ESD

## ISO 9001 Certified Design Process

We will be pleased to quote your custom socket, adapter, or module in 1-2 business days. Just give us a call!



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