

**PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION**

**Part Number:** [0878980456](#)  
**Status:** **Active**  
**Overview:** [kk](#)  
**Description:** 2.54mm (.100") Pitch KK® Header, Surface Mount, Breakaway, Vertical, 4 Circuits, Tin (Sn) Overall Plating, Embossed Tape on Reel Packaging, with Cap, Lead-free

**Documents:**

[Drawing \(PDF\)](#) [RoHS Certificate of Compliance \(PDF\)](#)

**General**

Product Family	PCB Headers
Series	<a href="#">87898</a>
Application	Board-to-Board, Wire-to-Board
Overview	<a href="#">kk</a>
Product Name	KK®

**Physical**

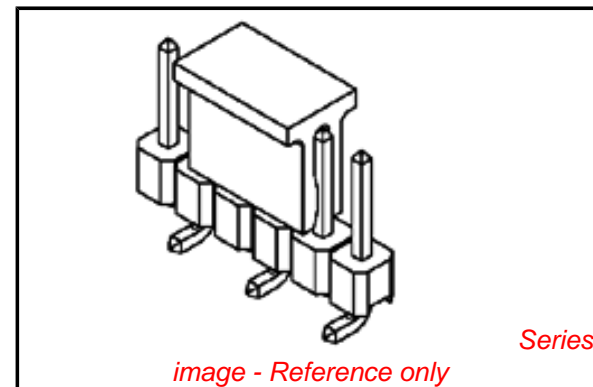
Breakaway	Yes
Circuits (Loaded)	4
Circuits (maximum)	4
Color - Resin	Black
First Mate / Last Break	No
Glow-Wire Compliant	No
Guide to Mating Part	No
Keying to Mating Part	None
Lock to Mating Part	None
Material - Metal	Copper Alloy
Material - Plating Mating	Tin
Material - Plating Termination	Tin
Material - Resin	Nylon
Number of Rows	1
Orientation	Vertical
PCB Locator	No
PCB Retention	None
Packaging Type	Embossed Tape on Reel
Pitch - Mating Interface (in)	0.100 In
Pitch - Mating Interface (mm)	2.54 mm
Pitch - Term. Interface (in)	0.100 In
Pitch - Term. Interface (mm)	2.54 mm
Polarized to Mating Part	No
Polarized to PCB	No
Robotic Placement	Pick and Place Cap
Shrouded	No
Stackable	No
Temperature Range - Operating	-55°C to +105°C
Termination Interface: Style	Surface Mount

**Electrical**

Current - Maximum per Contact	3A
Voltage - Maximum	250V

**Solder Process Data**

Duration at Max. Process Temperature (seconds)	10
Lead-free Process Capability	Reflow Capable (SMT only)
Max. Cycles at Max. Process Temperature	3
Process Temperature max. C	260



**EU RoHS**

**ELV and RoHS Compliant**  
**REACH SVHC**  
 Not Reviewed  
**Halogen-Free**  
**Status**  
**Not Reviewed**

**China RoHS**



**Need more information on product environmental compliance?**

Email [productcompliance@molex.com](mailto:productcompliance@molex.com)  
 For a multiple part number RoHS Certificate of Compliance, [click here](#)

Please visit the [Contact Us](#) section for any non-product compliance questions.

**Search Parts in this Series**

[87898Series](#)

**Mates With**

KK® PCB Receptacles [4455](#). SL™ IDT Housings [70430](#) , [7720](#), [70400](#). C-Grid® PCB Receptacles [90147](#), [90148](#)

**Material Info**

**Reference - Drawing Numbers**

Packaging Specification

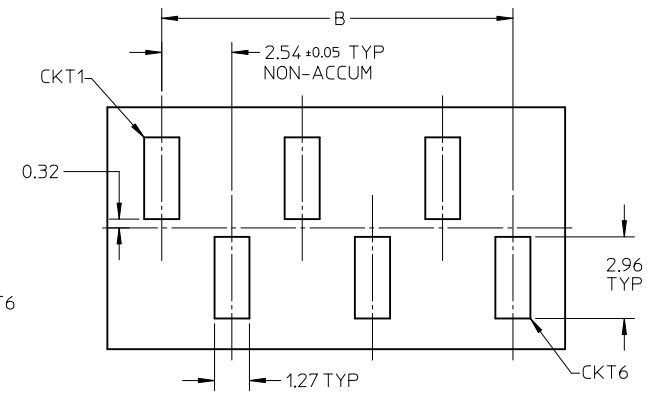
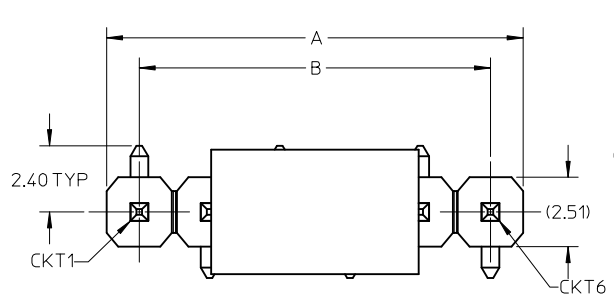
PK-89990-486

Sales Drawing

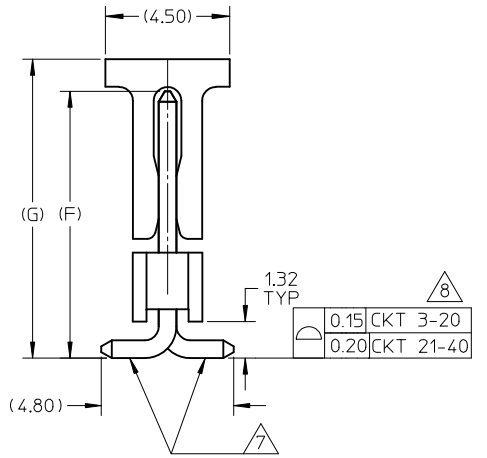
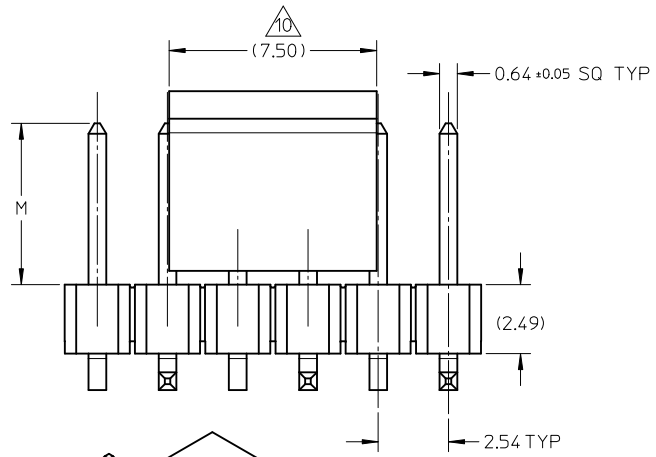
SD-87898-001

This document was generated on 05/25/2010

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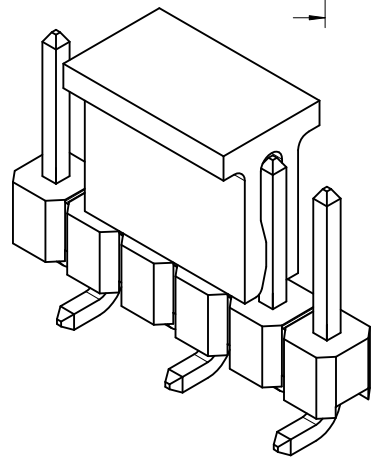


**RECOMMENDED PCB LAYOUT: COMPONENT SIDE**



**NOTES:**

1. MATERIAL:
  - HSG: NYLON, GLASS-FILLED, UL94V-0, COLOR: BLACK
  - CAP: NYLON, GLASS-FILLED, UL94V-0, COLOR: BLACK
  - PIN: 0.64MM SQ, COPPER ALLOY
2. PLATING TYPE:
  - (1) GOLD FLASH OVER  
1.25µm MIN. NICKEL OVERALL.
  - (2) GOLD FLASH ON CONTACT AND  
2.50µm MIN. TIN ON SOLDER TAIL OVER  
1.25µm MIN. NICKEL OVERALL.
  - (4) 0.38µm MIN. GOLD PLATE ON CONTACT AND  
2.00µm MIN. TIN ON SOLDER TAIL OVER  
1.25µm MIN. NICKEL OVERALL.
  - (5) 0.75µm MIN. GOLD PLATE ON CONTACT AND  
2.00µm MIN. TIN ON SOLDER TAIL OVER  
1.25µm MIN. NICKEL OVERALL.
  - (6) 2.50µm MIN. TIN OVERALL  
1.25µm MIN. NICKEL OVERALL
3. PRODUCT SPECIFICATION: PS-87920-019
4. PACKAGING TYPE: SEE TABLE
5. PACKAGING SPEC:
  - TUBE WITH CAP VERSION: PK-89990-558
  - TUBE W/O CAP VERSION: PK-89990-545
  - EMBOSS TAPE WITH CAP: PK-89990-486
6. WAFER TO BE FLAT WITHIN 0.003 mm/mm
7. BEND DEPRESSION IS ACCEPTED SO LONG AS IT DOES NOT AFFECT THE OVERALL COPLANARITY OF TAIL
8. COPLANARITY IS TO BE MEASURED BY RESTING THE SOLDER TAIL ON A FLAT SURFACE
9. IRREGULAR CIRCUIT CUTOFF WITHIN BREAKAWAY SECTION IS PERMISSIBLE. CUTTING OR CHIPPING OF THE MAIN BODY IS NOT ACCEPTABLE
10. CAP LOCATION IS CENTERED ALONG THE MATING ENDS AS SHOWN. TOP SURFACE OF CAP TO BE FLAT FOR THE PURPOSE OF PICK & PLACE BY VACUUM SUCTION NOZZLE
11. RECOMMENDED PCB THICKNESS IS 1.60mm±0.10
12. THE ABOVE CKT 6 IS FOR ILLUSTRATION PURPOSE ONLY
13. TUBE LENGTH AS PER STANDARD 560mm



EWR#1228, +0209 EC NO: S2010-0966 DRWN:ATSEE 2010/05/20 CHK:DP LLM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $F_{\Delta} = 0$ $F_{\Delta} = 0$ $F_{\Delta} = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION			
		4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± ---	mm INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER					
		ANGULAR ± 3 °		CHECKED BY PTLIM	DATE 2005/03/29	MOLEX INCORPORATED					
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		APPROVED BY MLONG	DATE 2010/03/10	MATERIAL NO. SEE TABLE	DOCUMENT NO. SD-87898-001	SHEET NO. 1 OF 20			

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
87898-0204	-----	-----	-----	-----	-----	2	----	4	5.08	2.54	10.81	9.65	5.84
87898-0207	-----	-----	-----	-----	-----	2	----	5	5.08	2.54	10.81	9.65	5.84
-----	-----	-----	89990-0208	-----	87898-0209	2	----	6	5.08	2.54	10.81	9.65	5.84
87898-0301	-----	-----	-----	-----	-----	3	----	1	7.62	5.08	10.81	9.65	5.84
87898-0302	-----	-----	-----	-----	-----	3	----	2	7.62	5.08	10.81	9.65	5.84
87898-0304	-----	-----	-----	-----	-----	3	----	4	7.62	5.08	10.81	9.65	5.84
87898-0305	-----	-----	-----	-----	-----	3	----	5	7.62	5.08	10.81	9.65	5.84
87898-0306	-----	-----	-----	-----	-----	3	----	6	7.62	5.08	10.81	9.65	5.84

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CHKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	DESCRIPTION <b>B3</b>	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE	SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION
		$F_A = 0$ $F_G = 0$ $F_P = 0$	mm    INCH	MM ONLY	NTS	METRIC	TITLE <b>CUSTOM HEADER          2.54MM PITCH SINGLE ROW          SINGLE WAFER SMT HEADER</b>
		4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± --- ANGULAR ± 3 °	DRAWN BY: YLQIAO    DATE: 2005/03/14 CHECKED BY: PTLIM    DATE: 2005/03/29 APPROVED BY: MLONG    DATE: 2010/03/10	MATERIAL NO. <b>SEE TABLE</b>	DOCUMENT NO. <b>SD-87898-001</b>	SHEET NO. <b>2 OF 20</b>	
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION			

10 9 8 7 6 5 4 3 2 1

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-0421	87898-0431	-----	87898-0451	4	-----	1	10.16	7.62	10.81	9.65	5.84
-----	-----	87898-0422	87898-0432	-----	87898-0452	4	-----	2	10.16	7.62	10.81	9.65	5.84
-----	-----	87898-0424	87898-0434	-----	87898-0454	4	-----	4	10.16	7.62	10.81	9.65	5.84
-----	-----	87898-0425	87898-0435	-----	87898-0455	4	-----	5	10.16	7.62	10.81	9.65	5.84
-----	-----	87898-0426	87898-0436	-----	87898-0456	4	-----	6	10.16	7.62	10.81	9.65	5.84
-----	-----	87898-0521	87898-0531	-----	87898-0551	5	-----	1	12.70	10.16	10.81	9.65	5.84
-----	-----	87898-0522	87898-0532	-----	87898-0552	5	-----	2	12.70	10.16	10.81	9.65	5.84
-----	-----	87898-0524	87898-0534	-----	87898-0554	5	-----	4	12.70	10.16	10.81	9.65	5.84
-----	-----	87898-0525	87898-0535	-----	87898-0555	5	-----	5	12.70	10.16	10.81	9.65	5.84
-----	-----	87898-0526	87898-0536	-----	87898-0556	5	-----	6	12.70	10.16	10.81	9.65	5.84
-----	-----	87898-0621	87898-0631	-----	87898-0651	6	-----	1	15.24	12.70	10.81	9.65	5.84
-----	-----	87898-0622	87898-0632	-----	87898-0652	6	-----	2	15.24	12.70	10.81	9.65	5.84
-----	-----	87898-0624	87898-0634	-----	87898-0654	6	-----	4	15.24	12.70	10.81	9.65	5.84
-----	-----	87898-0625	87898-0635	-----	87898-0655	6	-----	5	15.24	12.70	10.81	9.65	5.84
-----	-----	87898-0626	87898-0636	-----	87898-0656	6	-----	6	15.24	12.70	10.81	9.65	5.84

B

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CHKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $\nabla_A = 0$ $\nabla_B = 0$ $\nabla_C = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION			
		4 PLACES $\pm$ --- $\pm$ --- 3 PLACES $\pm$ --- $\pm$ --- 2 PLACES $\pm$ 0.2 $\pm$ --- 1 PLACE $\pm$ --- $\pm$ ---	mm      INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER					
		ANGULAR $\pm$ 3 °		CHECKED BY PTLIM	DATE 2005/03/29	MOLEX INCORPORATED					
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		APPROVED BY MLONG	DATE 2010/03/10	MATERIAL NO. SEE TABLE		DOCUMENT NO. SD-87898-001	SHEET NO. 3 OF 20		

A

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-0721	87898-0731	-----	87898-0751	7	-----	1	17.78	15.24	10.81	9.65	5.84
-----	-----	87898-0722	87898-0732	-----	87898-0752	7	-----	2	17.78	15.24	10.81	9.65	5.84
-----	-----	87898-0724	87898-0734	-----	87898-0754	7	-----	4	17.78	15.24	10.81	9.65	5.84
-----	-----	87898-0725	87898-0735	-----	87898-0755	7	-----	5	17.78	15.24	10.81	9.65	5.84
-----	-----	87898-0726	87898-0736	-----	87898-0756	7	-----	6	17.78	15.24	10.81	9.65	5.84
-----	-----	87898-0821	87898-0831	-----	87898-0851	8	-----	1	20.32	17.78	10.81	9.65	5.84
-----	-----	87898-0822	87898-0832	-----	87898-0852	8	-----	2	20.32	17.78	10.81	9.65	5.84
-----	-----	87898-0824	87898-0834	-----	87898-0854	8	-----	4	20.32	17.78	10.81	9.65	5.84
-----	-----	87898-0825	87898-0835	-----	87898-0855	8	-----	5	20.32	17.78	10.81	9.65	5.84
-----	-----	87898-0826	87898-0836	-----	87898-0856	8	-----	6	20.32	17.78	10.81	9.65	5.84
-----	-----	87898-0921	87898-0931	-----	87898-0951	9	-----	1	22.86	20.32	10.81	9.65	5.84
-----	-----	87898-0922	87898-0932	-----	87898-0952	9	-----	2	22.86	20.32	10.81	9.65	5.84
-----	-----	87898-0924	87898-0934	-----	87898-0954	9	-----	4	22.86	20.32	10.81	9.65	5.84
-----	-----	87898-0925	87898-0935	-----	87898-0955	9	-----	5	22.86	20.32	10.81	9.65	5.84
-----	-----	87898-0926	87898-0936	-----	87898-0956	9	-----	6	22.86	20.32	10.81	9.65	5.84

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CHKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $F_A=0$ $F_G=0$ $F_P=0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE <b>NTS</b>	DESIGN UNITS <b>METRIC</b>	THIRD ANGLE PROJECTION			
		4 PLACES $\pm$ --- $\pm$ --- 3 PLACES $\pm$ --- $\pm$ --- 2 PLACES $\pm$ 0.2 $\pm$ --- 1 PLACE $\pm$ --- $\pm$ ---	mm      INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE <b>CUSTOM HEADER          2.54MM PITCH SINGLE ROW          SINGLE WAFER SMT HEADER</b>					
		ANGULAR $\pm$ 3 °		CHECKED BY PTLIM	DATE 2005/03/29	APPROVED BY MLONG					
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		SEE TABLE		MATERIAL NO. 2010/03/10		<b>MOLEX INCORPORATED</b>		DOCUMENT NO. <b>SD-87898-001</b>	
<b>B3</b>		SIZE <b>A3</b>		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION						SHEET NO. <b>4 OF 20</b>	

PACKAGING OPTION PART NO.										DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP	CKT SIZE	VOID POSITION	PLATING TYPE	A	B	G	F	M	
-----	-----	87898-1021	87898-1031	-----	87898-1051	10	-----	1	25.40	22.86	10.81	9.65	5.84	
-----	-----	87898-1022	87898-1032	-----	87898-1052	10	-----	2	25.40	22.86	10.81	9.65	5.84	
-----	-----	87898-1024	87898-1034	-----	87898-1054	10	-----	4	25.40	22.86	10.81	9.65	5.84	
-----	-----	87898-1025	87898-1035	-----	87898-1055	10	-----	5	25.40	22.86	10.81	9.65	5.84	
-----	-----	87898-1026	87898-1036	-----	87898-1056	10	-----	6	25.40	22.86	10.81	9.65	5.84	
-----	-----	87898-1121	87898-1131	-----	87898-1151	11	-----	1	27.94	25.40	10.81	9.65	5.84	
-----	-----	87898-1122	87898-1132	-----	87898-1152	11	-----	2	27.94	25.40	10.81	9.65	5.84	
-----	-----	87898-1124	87898-1134	-----	87898-1154	11	-----	4	27.94	25.40	10.81	9.65	5.84	
-----	-----	87898-1125	87898-1135	-----	87898-1155	11	-----	5	27.94	25.40	10.81	9.65	5.84	
-----	-----	87898-1126	87898-1136	-----	87898-1156	11	-----	6	27.94	25.40	10.81	9.65	5.84	
-----	-----	87898-1221	87898-1231	-----	87898-1251	12	-----	1	30.48	27.94	10.81	9.65	5.84	
-----	-----	87898-1222	87898-1232	-----	87898-1252	12	-----	2	30.48	27.94	10.81	9.65	5.84	
-----	-----	87898-1224	87898-1234	-----	87898-1254	12	-----	4	30.48	27.94	10.81	9.65	5.84	
-----	-----	87898-1225	87898-1235	-----	87898-1255	12	-----	5	30.48	27.94	10.81	9.65	5.84	
-----	-----	87898-1226	87898-1236	-----	87898-1256	12	-----	6	30.48	27.94	10.81	9.65	5.84	


B

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CH:KDPTLIM 2005/03/29 APPR:MLONG 2010/06/08	DESCRIPTION <b>B3</b>	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE	SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION		
		$\nabla_A = 0$ $\nabla_B = 0$ $\nabla_C = 0$	mm    INCH 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± --- ANGULAR ± 3 °	MM ONLY DRAWN BY: YLQIAO    DATE: 2005/03/14 CHECKED BY: PTLIM    DATE: 2005/03/29 APPROVED BY: MLONG    DATE: 2010/03/10	NTS	METRIC	TITLE <b>CUSTOM HEADER          2.54MM PITCH SINGLE ROW          SINGLE WAFER SMT HEADER</b>  <b>MOLEX INCORPORATED</b>		
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS	MATERIAL NO. <b>SEE TABLE</b>	DOCUMENT NO. <b>SD-87898-001</b>	SHEET NO. <b>5 OF 20</b>				
		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION							

10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-1321	87898-1331	-----	87898-1351	13	-----	1	33.02	30.48	10.81	9.65	5.84
-----	-----	87898-1322	87898-1332	-----	87898-1352	13	-----	2	33.02	30.48	10.81	9.65	5.84
-----	-----	87898-1324	87898-1334	-----	87898-1354	13	-----	4	33.02	30.48	10.81	9.65	5.84
-----	-----	87898-1325	87898-1335	-----	87898-1355	13	-----	5	33.02	30.48	10.81	9.65	5.84
-----	-----	87898-1326	87898-1336	-----	87898-1356	13	-----	6	33.02	30.48	10.81	9.65	5.84
-----	-----	87898-1421	87898-1431	-----	87898-1451	14	-----	1	35.56	33.02	10.81	9.65	5.84
-----	-----	87898-1422	87898-1432	-----	87898-1452	14	-----	2	35.56	33.02	10.81	9.65	5.84
-----	-----	87898-1424	87898-1434	-----	87898-1454	14	-----	4	35.56	33.02	10.81	9.65	5.84
-----	-----	87898-1425	87898-1435	-----	87898-1455	14	-----	5	35.56	33.02	10.81	9.65	5.84
-----	-----	87898-1426	87898-1436	-----	87898-1456	14	-----	6	35.56	33.02	10.81	9.65	5.84
-----	-----	87898-1521	87898-1531	-----	87898-1551	15	-----	1	38.10	35.56	10.81	9.65	5.84
-----	-----	87898-1522	87898-1532	-----	87898-1552	15	-----	2	38.10	35.56	10.81	9.65	5.84
-----	-----	87898-1524	87898-1534	-----	87898-1554	15	-----	4	38.10	35.56	10.81	9.65	5.84
-----	-----	87898-1525	87898-1535	-----	87898-1555	15	-----	5	38.10	35.56	10.81	9.65	5.84
-----	-----	87898-1526	87898-1536	-----	87898-1556	15	-----	6	38.10	35.56	10.81	9.65	5.84

B

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRWN:ATSEE 2010/05/20 CH'KD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $\nabla_A = 0$ $\nabla_B = 0$ $\nabla_C = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION			
				mm	INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE <b>CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER</b>			
				4 PLACES ± ---	± ---	CHECKED BY PTLIM	DATE 2005/03/29				
				3 PLACES ± ---	± ---	APPROVED BY MLONG	DATE 2010/03/10	 <b>MOLEX INCORPORATED</b> DOCUMENT NO. SD-87898-001   SHEET NO. 6 OF 20			
		2 PLACES ± 0.2	± ---	MATERIAL NO. <b>SEE TABLE</b>							
		1 PLACE ± ---	± ---	DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION					
		ANGULAR ± 3 °									

A

ib\_frame\_A3\_P\_AM\_T Rev. F 2009/06/18 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1



PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-1621	87898-1631	-----	87898-1651	16	-----	1	40.64	38.10	10.81	9.65	5.84
-----	-----	87898-1622	87898-1632	-----	87898-1652	16	-----	2	40.64	38.10	10.81	9.65	5.84
-----	-----	87898-1624	87898-1634	-----	87898-1654	16	-----	4	40.64	38.10	10.81	9.65	5.84
-----	-----	87898-1625	87898-1635	-----	87898-1655	16	-----	5	40.64	38.10	10.81	9.65	5.84
-----	-----	87898-1626	87898-1636	-----	87898-1656	16	-----	6	40.64	38.10	10.81	9.65	5.84
-----	-----	87898-1721	87898-1731	-----	87898-1751	17	-----	1	43.18	40.64	10.81	9.65	5.84
-----	-----	87898-1722	87898-1732	-----	87898-1752	17	-----	2	43.18	40.64	10.81	9.65	5.84
-----	-----	87898-1724	87898-1734	-----	87898-1754	17	-----	4	43.18	40.64	10.81	9.65	5.84
-----	-----	87898-1725	87898-1735	-----	87898-1755	17	-----	5	43.18	40.64	10.81	9.65	5.84
-----	-----	87898-1726	87898-1736	-----	87898-1756	17	-----	6	43.18	40.64	10.81	9.65	5.84
-----	-----	87898-1821	87898-1831	-----	87898-1851	18	-----	1	45.72	43.18	10.81	9.65	5.84
-----	-----	87898-1822	87898-1832	-----	87898-1852	18	-----	2	45.72	43.18	10.81	9.65	5.84
-----	-----	87898-1824	87898-1834	-----	87898-1854	18	-----	4	45.72	43.18	10.81	9.65	5.84
-----	-----	87898-1825	87898-1835	-----	87898-1855	18	-----	5	45.72	43.18	10.81	9.65	5.84
-----	-----	87898-1826	87898-1836	-----	87898-1856	18	-----	6	45.72	43.18	10.81	9.65	5.84

--	--	--	--	--	--	--	--	--	--

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:NATSEE 2010/05/20 CHK:DPILIM 2005/03/29 APPR:MLONG 2010/06/08	DESCRIPTION <b>B3</b>	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE	SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION
		$\nabla_A = 0$ $\nabla_G = 0$ $\nabla_P = 0$	mm    INCH	MM ONLY	NTS	METRIC	
		4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± --- ANGULAR ± 3 °	DRAWN BY: YLQIAO    DATE: 2005/03/14 CHECKED BY: PTLIM    DATE: 2005/03/29 APPROVED BY: MLONG    DATE: 2010/03/10	TITLE <b>CUSTOM HEADER          2.54MM PITCH SINGLE ROW          SINGLE WAFER SMT HEADER</b>			
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS	MATERIAL NO. <b>SEE TABLE</b>	<b>MOLEX INCORPORATED</b>	DOCUMENT NO. <b>SD-87898-001</b>	SHEET NO. <b>7 OF 20</b>	

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-1921	87898-1931	-----	87898-1951	19	----	1	48.26	45.72	10.81	9.65	5.84
-----	-----	87898-1922	87898-1932	-----	87898-1952	19	----	2	48.26	45.72	10.81	9.65	5.84
-----	-----	87898-1924	87898-1934	-----	87898-1954	19	----	4	48.26	45.72	10.81	9.65	5.84
-----	-----	87898-1925	87898-1935	-----	87898-1955	19	----	5	48.26	45.72	10.81	9.65	5.84
-----	-----	87898-1926	87898-1936	-----	87898-1956	19	----	6	48.26	45.72	10.81	9.65	5.84
-----	-----	87898-2021	87898-2031	-----	87898-2051	20	----	1	50.80	48.26	10.81	9.65	5.84
-----	-----	87898-2022	87898-2032	-----	87898-2052	20	----	2	50.80	48.26	10.81	9.65	5.84
-----	-----	87898-2024	87898-2034	-----	87898-2054	20	----	4	50.80	48.26	10.81	9.65	5.84
-----	-----	87898-2025	87898-2035	-----	87898-2055	20	----	5	50.80	48.26	10.81	9.65	5.84
-----	-----	87898-2026	87898-2036	-----	87898-2056	20	----	6	50.80	48.26	10.81	9.65	5.84
-----	-----	87898-2121	87898-2131	-----	87898-2151	21	----	1	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2122	87898-2132	-----	87898-2152	21	----	2	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2124	87898-2134	-----	87898-2154	21	----	4	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2125	87898-2135	-----	87898-2155	21	----	5	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2126	87898-2136	-----	87898-2156	21	----	6	53.34	50.80	10.81	9.65	5.84

-----	-----	87898-2121	87898-2131	-----	87898-2151	21	----	1	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2122	87898-2132	-----	87898-2152	21	----	2	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2124	87898-2134	-----	87898-2154	21	----	4	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2125	87898-2135	-----	87898-2155	21	----	5	53.34	50.80	10.81	9.65	5.84
-----	-----	87898-2126	87898-2136	-----	87898-2156	21	----	6	53.34	50.80	10.81	9.65	5.84

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRWN:ATSEE 2010/05/20 CH'KD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $\nabla_A = 0$ $\nabla_F = 0$ $\nabla_P = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION			
		4 PLACES $\pm$ --- $\pm$ --- 3 PLACES $\pm$ --- $\pm$ --- 2 PLACES $\pm$ 0.2 $\pm$ --- 1 PLACE $\pm$ --- $\pm$ ---	mm      INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER					
		ANGULAR $\pm$ 3 °		CHECKED BY PTLIM	DATE 2005/03/29	MOLEX INCORPORATED					
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		APPROVED BY MLONG	DATE 2010/03/10	MATERIAL NO. <b>SEE TABLE</b>		DOCUMENT NO. SD-87898-001	SHEET NO. 8 OF 20		

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-2221	87898-2231	-----	-----	22	----	1	55.88	53.34	10.81	9.65	5.84
-----	-----	87898-2222	87898-2232	-----	-----	22	----	2	55.88	53.34	10.81	9.65	5.84
-----	-----	87898-2224	87898-2234	-----	-----	22	----	4	55.88	53.34	10.81	9.65	5.84
-----	-----	87898-2225	87898-2235	-----	-----	22	----	5	55.88	53.34	10.81	9.65	5.84
-----	-----	87898-2226	87898-2236	-----	-----	22	----	6	55.88	53.34	10.81	9.65	5.84
-----	-----												
-----	-----	87898-2321	87898-2331	-----	-----	23	----	1	58.42	55.88	10.81	9.65	5.84
-----	-----	87898-2322	87898-2332	-----	-----	23	----	2	58.42	55.88	10.81	9.65	5.84
-----	-----	87898-2324	87898-2334	-----	-----	23	----	4	58.42	55.88	10.81	9.65	5.84
-----	-----	87898-2325	87898-2335	-----	-----	23	----	5	58.42	55.88	10.81	9.65	5.84
-----	-----	87898-2326	87898-2336	-----	-----	23	----	6	58.42	55.88	10.81	9.65	5.84
-----	-----												
-----	-----	87898-2421	87898-2431	-----	-----	24	----	1	60.96	58.42	10.81	9.65	5.84
-----	-----	87898-2422	87898-2432	-----	-----	24	----	2	60.96	58.42	10.81	9.65	5.84
-----	-----	87898-2424	87898-2434	-----	-----	24	----	4	60.96	58.42	10.81	9.65	5.84
-----	-----	87898-2425	87898-2435	-----	-----	24	----	5	60.96	58.42	10.81	9.65	5.84
-----	-----	87898-2426	87898-2436	-----	-----	24	----	6	60.96	58.42	10.81	9.65	5.84

EWR#1228, +0209		EC NO: S2010-0966		2010/05/20		2010/05/20		2010/03/29		2010/06/08		QUALITY SYMBOLS		GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE		SCALE		DESIGN UNITS		THIRD ANGLE PROJECTION																									
DRW:ATSEE		CHKD:PTLIM		APPR:MLONG		F <sub>A</sub> =0		F <sub>B</sub> =0		F <sub>C</sub> =0		4 PLACES ± --- ± ---		3 PLACES ± --- ± ---		2 PLACES ± 0.2 ± ---		1 PLACE ± --- ± ---		ANGULAR ± 3 °		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		MM ONLY		NTS		METRIC		DRAWN BY		DATE		CHECKED BY		DATE		APPROVED BY		DATE		MATERIAL NO.		DOCUMENT NO.		SHEET NO.	
YLOIAO		2005/03/14		PTLIM		2005/03/29		MLONG		2010/03/10		SEE TABLE		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION		CUSTOM HEADER		2.54MM PITCH SINGLE ROW		SINGLE WAFER SMT HEADER		MOLEX INCORPORATED		SD-87898-001		9 OF 20																					

EWR#1228, +0209		EC NO: S2010-0966		2010/05/20		2010/05/20		2010/03/29		2010/06/08		QUALITY SYMBOLS		GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE		SCALE		DESIGN UNITS		THIRD ANGLE PROJECTION																									
DRW:ATSEE		CHKD:PTLIM		APPR:MLONG		F <sub>A</sub> =0		F <sub>B</sub> =0		F <sub>C</sub> =0		4 PLACES ± --- ± ---		3 PLACES ± --- ± ---		2 PLACES ± 0.2 ± ---		1 PLACE ± --- ± ---		ANGULAR ± 3 °		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		MM ONLY		NTS		METRIC		DRAWN BY		DATE		CHECKED BY		DATE		APPROVED BY		DATE		MATERIAL NO.		DOCUMENT NO.		SHEET NO.	
YLOIAO		2005/03/14		PTLIM		2005/03/29		MLONG		2010/03/10		SEE TABLE		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION		CUSTOM HEADER		2.54MM PITCH SINGLE ROW		SINGLE WAFER SMT HEADER		MOLEX INCORPORATED		SD-87898-001		9 OF 20																					

10 9 8 7 6 5 4 3 2 1

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-2521	87898-2531	-----	-----	25	----	1	63.50	60.96	10.81	9.65	5.84
-----	-----	87898-2522	87898-2532	-----	-----	25	----	2	63.50	60.96	10.81	9.65	5.84
-----	-----	87898-2524	87898-2534	-----	-----	25	----	4	63.50	60.96	10.81	9.65	5.84
-----	-----	87898-2525	87898-2535	-----	-----	25	----	5	63.50	60.96	10.81	9.65	5.84
-----	-----	87898-2526	87898-2536	-----	-----	25	----	6	63.50	60.96	10.81	9.65	5.84
-----	-----	87898-2621	87898-2631	-----	-----	26	----	1	66.04	63.50	10.81	9.65	5.84
-----	-----	87898-2622	87898-2632	-----	-----	26	----	2	66.04	63.50	10.81	9.65	5.84
-----	-----	87898-2624	87898-2634	-----	-----	26	----	4	66.04	63.50	10.81	9.65	5.84
-----	-----	87898-2625	87898-2635	-----	-----	26	----	5	66.04	63.50	10.81	9.65	5.84
-----	-----	87898-2626	87898-2636	-----	-----	26	----	6	66.04	63.50	10.81	9.65	5.84
-----	-----	87898-2721	87898-2731	-----	-----	27	----	1	68.58	66.04	10.81	9.65	5.84
-----	-----	87898-2722	87898-2732	-----	-----	27	----	2	68.58	66.04	10.81	9.65	5.84
-----	-----	87898-2724	87898-2734	-----	-----	27	----	4	68.58	66.04	10.81	9.65	5.84
-----	-----	87898-2725	87898-2735	-----	-----	27	----	5	68.58	66.04	10.81	9.65	5.84
-----	-----	87898-2726	87898-2736	-----	-----	27	----	6	68.58	66.04	10.81	9.65	5.84

B

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:NATSEE 2010/05/20 CHK:DPTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $\nabla_A = 0$ $\nabla_B = 0$ $\nabla_F = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION			
		4 PLACES $\pm$ --- $\pm$ --- 3 PLACES $\pm$ --- $\pm$ --- 2 PLACES $\pm$ 0.2 $\pm$ --- 1 PLACE $\pm$ --- $\pm$ ---	mm      INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE <b>CUSTOM HEADER                  2.54MM PITCH SINGLE ROW                  SINGLE WAFER SMT HEADER</b>					
		ANGULAR $\pm$ 3 °		CHECKED BY PTLIM	DATE 2005/03/29	MOLEX INCORPORATED					
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		APPROVED BY MLONG	DATE 2010/03/10	MATERIAL NO. <b>SEE TABLE</b>				DOCUMENT NO. SD-87898-001	SHEET NO. 10 OF 20

A

PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-2821	87898-2831	-----	-----	28	----	1	71.12	68.58	10.81	9.65	5.84
-----	-----	87898-2822	87898-2832	-----	-----	28	----	2	71.12	68.58	10.81	9.65	5.84
-----	-----	87898-2824	87898-2834	-----	-----	28	----	4	71.12	68.58	10.81	9.65	5.84
-----	-----	87898-2825	87898-2835	-----	-----	28	----	5	71.12	68.58	10.81	9.65	5.84
-----	-----	87898-2826	87898-2836	-----	-----	28	----	6	71.12	68.58	10.81	9.65	5.84
-----	-----	87898-2921	87898-2931	-----	-----	29	----	1	73.66	71.12	10.81	9.65	5.84
-----	-----	87898-2922	87898-2932	-----	-----	29	----	2	73.66	71.12	10.81	9.65	5.84
-----	-----	87898-2924	87898-2934	-----	-----	29	----	4	73.66	71.12	10.81	9.65	5.84
-----	-----	87898-2925	87898-2935	-----	-----	29	----	5	73.66	71.12	10.81	9.65	5.84
-----	-----	87898-2926	87898-2936	-----	-----	29	----	6	73.66	71.12	10.81	9.65	5.84
-----	-----	87898-3021	87898-3031	-----	-----	30	----	1	76.20	73.66	10.81	9.65	5.84
-----	-----	87898-3022	87898-3032	-----	-----	30	----	2	76.20	73.66	10.81	9.65	5.84
-----	-----	87898-3024	87898-3034	-----	-----	30	----	4	76.20	73.66	10.81	9.65	5.84
-----	-----	87898-3025	87898-3035	-----	-----	30	----	5	76.20	73.66	10.81	9.65	5.84
-----	-----	87898-3026	87898-3036	-----	-----	30	----	6	76.20	73.66	10.81	9.65	5.84

-----	-----	87898-3201	87898-3231	-----	-----	32	----	1	79.20	76.66	10.81	9.65	5.84
-----	-----	87898-3202	87898-3232	-----	-----	32	----	2	79.20	76.66	10.81	9.65	5.84
-----	-----	87898-3204	87898-3234	-----	-----	32	----	4	79.20	76.66	10.81	9.65	5.84
-----	-----	87898-3205	87898-3235	-----	-----	32	----	5	79.20	76.66	10.81	9.65	5.84
-----	-----	87898-3206	87898-3236	-----	-----	32	----	6	79.20	76.66	10.81	9.65	5.84

EWR#1228, +0209 EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CHKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	REV DESCRIPTION B3	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE MM ONLY		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION
		$\nabla_A = 0$ $\nabla_G = 0$ $\nabla_P = 0$	mm    INCH 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± --- ANGULAR ± 3 °	DRAWN BY YLQIAO CHECKED BY PTLIM APPROVED BY MLONG MATERIAL NO. SEE TABLE	DATE 2005/03/14 DATE 2005/03/29 DATE 2010/03/10	TITLE	DOCUMENT NO.	SHEET NO.
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION		CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER MOLEX INCORPORATED SD-87898-001	11 OF 20	

PACKAGING OPTION PART NO.

F

E

D

C

B

A

F

E

D

C

B

A

TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP	CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
									A	B	G	F	M
-----	-----	87898-3121	87898-3131	-----	-----	31	----	1	78.74	76.20	10.81	9.65	5.84
-----	-----	87898-3122	87898-3132	-----	-----	31	----	2	78.74	76.20	10.81	9.65	5.84
-----	-----	87898-3124	87898-3134	-----	-----	31	----	4	78.74	76.20	10.81	9.65	5.84
-----	-----	87898-3125	87898-3135	-----	-----	31	----	5	78.74	76.20	10.81	9.65	5.84
-----	-----	87898-3126	87898-3136	-----	-----	31	----	6	78.74	76.20	10.81	9.65	5.84
-----	-----	87898-3221	87898-3231	-----	-----	32	----	1	81.28	78.74	10.81	9.65	5.84
-----	-----	87898-3222	87898-3232	-----	-----	32	----	2	81.28	78.74	10.81	9.65	5.84
-----	-----	87898-3224	87898-3234	-----	-----	32	----	4	81.28	78.74	10.81	9.65	5.84
-----	-----	87898-3225	87898-3235	-----	-----	32	----	5	81.28	78.74	10.81	9.65	5.84
-----	-----	87898-3226	87898-3236	-----	-----	32	----	6	81.28	78.74	10.81	9.65	5.84
-----	-----	87898-3321	87898-3331	-----	-----	33	----	1	83.82	81.28	10.81	9.65	5.84
-----	-----	87898-3322	87898-3332	-----	-----	33	----	2	83.82	81.28	10.81	9.65	5.84
-----	-----	87898-3324	87898-3334	-----	-----	33	----	4	83.82	81.28	10.81	9.65	5.84
-----	-----	87898-3325	87898-3335	-----	-----	33	----	5	83.82	81.28	10.81	9.65	5.84
-----	-----	87898-3326	87898-3336	-----	-----	33	----	6	83.82	81.28	10.81	9.65	5.84

EWR#1228, +0209 EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CH:KD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $\nabla_A = 0$ $\nabla_C = 0$ $\nabla_P = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE MM ONLY		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION				
				mm	INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER				
				4 PLACES	± ---	± ---	CHECKED BY PTLIM	DATE 2005/03/29	APPROVED BY MLONG			
				3 PLACES	± ---	± ---	DATE 2010/03/10		MATERIAL NO. SD-87898-001			
				2 PLACES	± 0.2	± ---	DATE 2010/03/10		DOCUMENT NO. SD-87898-001			
		1 PLACE	± ---	± ---	DATE 2010/03/10		SHEET NO. 12 OF 20					
		ANGULAR ± 3 °		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		SEE TABLE		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION				

PACKAGING OPTION PART NO.										DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP	CKT SIZE	VOID POSITION	PLATING TYPE	A	B	G	F	M	
-----	-----	87898-3421	87898-3431	-----	-----	34	-----	1	86.36	83.82	10.81	9.65	5.84	
-----	-----	87898-3422	87898-3432	-----	-----	34	-----	2	86.36	83.82	10.81	9.65	5.84	
-----	-----	87898-3424	87898-3434	-----	-----	34	-----	4	86.36	83.82	10.81	9.65	5.84	
-----	-----	87898-3425	87898-3435	-----	-----	34	-----	5	86.36	83.82	10.81	9.65	5.84	
-----	-----	87898-3426	87898-3436	-----	-----	34	-----	6	86.36	83.82	10.81	9.65	5.84	
-----	-----	87898-3521	87898-3531	-----	-----	35	-----	1	88.90	86.36	10.81	9.65	5.84	
-----	-----	87898-3522	87898-3532	-----	-----	35	-----	2	88.90	86.36	10.81	9.65	5.84	
-----	-----	87898-3524	87898-3534	-----	-----	35	-----	4	88.90	86.36	10.81	9.65	5.84	
-----	-----	87898-3525	87898-3535	-----	-----	35	-----	5	88.90	86.36	10.81	9.65	5.84	
-----	-----	87898-3526	87898-3536	-----	-----	35	-----	6	88.90	86.36	10.81	9.65	5.84	
-----	-----	87898-3621	87898-3631	-----	-----	36	-----	1	91.44	88.90	10.81	9.65	5.84	
-----	-----	87898-3622	87898-3632	-----	-----	36	-----	2	91.44	88.90	10.81	9.65	5.84	
-----	-----	87898-3624	87898-3634	-----	-----	36	-----	4	91.44	88.90	10.81	9.65	5.84	
-----	-----	87898-3625	87898-3635	-----	-----	36	-----	5	91.44	88.90	10.81	9.65	5.84	
-----	-----	87898-3626	87898-3636	-----	-----	36	-----	6	91.44	88.90	10.81	9.65	5.84	

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRWN:ATSEE 2010/05/20 CH'KD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $\nabla_A = 0$ $\nabla_B = 0$ $\nabla_C = 0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE <b>NTS</b>	DESIGN UNITS <b>METRIC</b>	THIRD ANGLE PROJECTION			
		4 PLACES $\pm$ --- $\pm$ --- 3 PLACES $\pm$ --- $\pm$ --- 2 PLACES $\pm$ 0.2 $\pm$ --- 1 PLACE $\pm$ --- $\pm$ ---	mm      INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE <b>CUSTOM HEADER          2.54MM PITCH SINGLE ROW          SINGLE WAFER SMT HEADER</b>					
		ANGULAR $\pm$ 3 °		CHECKED BY PTLIM	DATE 2005/03/29	APPROVED BY MLONG					
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		SEE TABLE		MATERIAL NO.	MOLEX INCORPORATED DOCUMENT NO. SD-87898-001				
<b>B3</b>				SIZE <b>A3</b>	THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION						

PACKAGING OPTION PART NO.

F

E

D

C

B

A

F

E

D

C

B

A

TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP	CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
									A	B	G	F	M
-----	-----	87898-3721	87898-3731	-----	-----	37	----	1	93.98	91.44	10.81	9.65	5.84
-----	-----	87898-3722	87898-3732	-----	-----	37	----	2	93.98	91.44	10.81	9.65	5.84
-----	-----	87898-3724	87898-3734	-----	-----	37	----	4	93.98	91.44	10.81	9.65	5.84
-----	-----	87898-3725	87898-3735	-----	-----	37	----	5	93.98	91.44	10.81	9.65	5.84
-----	-----	87898-3726	87898-3736	-----	-----	37	----	6	93.98	91.44	10.81	9.65	5.84
-----	-----	87898-3821	87898-3831	-----	-----	38	----	1	96.52	93.98	10.81	9.65	5.84
-----	-----	87898-3822	87898-3832	-----	-----	38	----	2	96.52	93.98	10.81	9.65	5.84
-----	-----	87898-3824	87898-3834	-----	-----	38	----	4	96.52	93.98	10.81	9.65	5.84
-----	-----	87898-3825	87898-3835	-----	-----	38	----	5	96.52	93.98	10.81	9.65	5.84
-----	-----	87898-3826	87898-3836	-----	-----	38	----	6	96.52	93.98	10.81	9.65	5.84
-----	-----	87898-3921	87898-3931	-----	-----	39	----	1	99.06	96.52	10.81	9.65	5.84
-----	-----	87898-3922	87898-3932	-----	-----	39	----	2	99.06	96.52	10.81	9.65	5.84
-----	-----	87898-3924	87898-3934	-----	-----	39	----	4	99.06	96.52	10.81	9.65	5.84
-----	-----	87898-3925	87898-3935	-----	-----	39	----	5	99.06	96.52	10.81	9.65	5.84
-----	-----	87898-3926	87898-3936	-----	-----	39	----	6	99.06	96.52	10.81	9.65	5.84

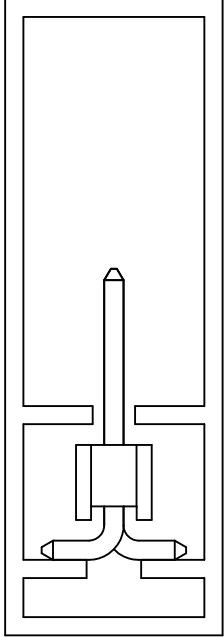
<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:ATSEE 2010/05/20 CHKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $F_A=0$ $F_G=0$ $F_P=0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION			
				mm	INCH	DRAWN BY YLQIAO	DATE 2005/03/14	TITLE CUSTOM HEADER			
		4 PLACES		± ---	± ---	CHECKED BY PTLIM	DATE 2005/03/29	2.54MM PITCH SINGLE ROW			
		3 PLACES		± ---	± ---	APPROVED BY MLONG	DATE 2010/03/10	SINGLE WAFER SMT HEADER			
		2 PLACES		± 0.2	± ---	MATERIAL NO.		MOLEX INCORPORATED			
1 PLACE		± ---	± ---	SEE TABLE		SD-87898-001					
ANGULAR ± 3 °		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		SIZE A3		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION					



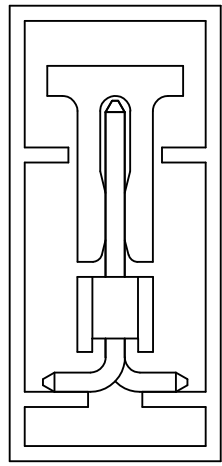
PACKAGING OPTION PART NO.						CKT SIZE	VOID POSITION	PLATING TYPE	DIMENSION				
TRAY WITHOUT CAP	TRAY WITH CAP	TUBE WITHOUT CAP	TUBE WITH CAP	TAPE & REEL WITHOUT CAP	TAPE & REEL WITH CAP				A	B	G	F	M
-----	-----	87898-4021	87898-4031	-----	-----	40	----	1	101.6	99.06	10.81	9.65	5.84
-----	-----	87898-4022	87898-4032	-----	-----	40	----	2	101.6	99.06	10.81	9.65	5.84
-----	-----	87898-4024	87898-4034	-----	-----	40	----	4	101.6	99.06	10.81	9.65	5.84
-----	-----	87898-4025	87898-4035	-----	-----	40	----	5	101.6	99.06	10.81	9.65	5.84
-----	-----	87898-4026	87898-4036	-----	-----	40	----	6	101.6	99.06	10.81	9.65	5.84

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRWN:ATSEE 2010/05/20 CHKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION	
	$\nabla_A = 0$	4 PLACES	mm	INCH	DRAWN BY	DATE	TITLE		
	$\nabla_C = 0$	3 PLACES	± ---	± ---	YLOIAO	2005/03/14	CUSTOM HEADER		
	$\nabla_P = 0$	2 PLACES	± 0.2	± ---	CHECKED BY	DATE	2.54MM PITCH SINGLE ROW		
		1 PLACE	± ---	± ---	PTLIM	2005/03/29	SINGLE WAFER SMT HEADER		
	ANGULAR ± 3 °				APPROVED BY	DATE	MOLEX MOLEX INCORPORATED		
	DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		SEE TABLE		MLONG	2010/03/10	DOCUMENT NO.		SHEET NO.
					MATERIAL NO.		SD-87898-001		15 OF 20
					THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION				

**PART WITHOUT CAP  
IN TUBE ORIENTATION**



**PART WITH CAP  
IN TUBE ORIENTATION**

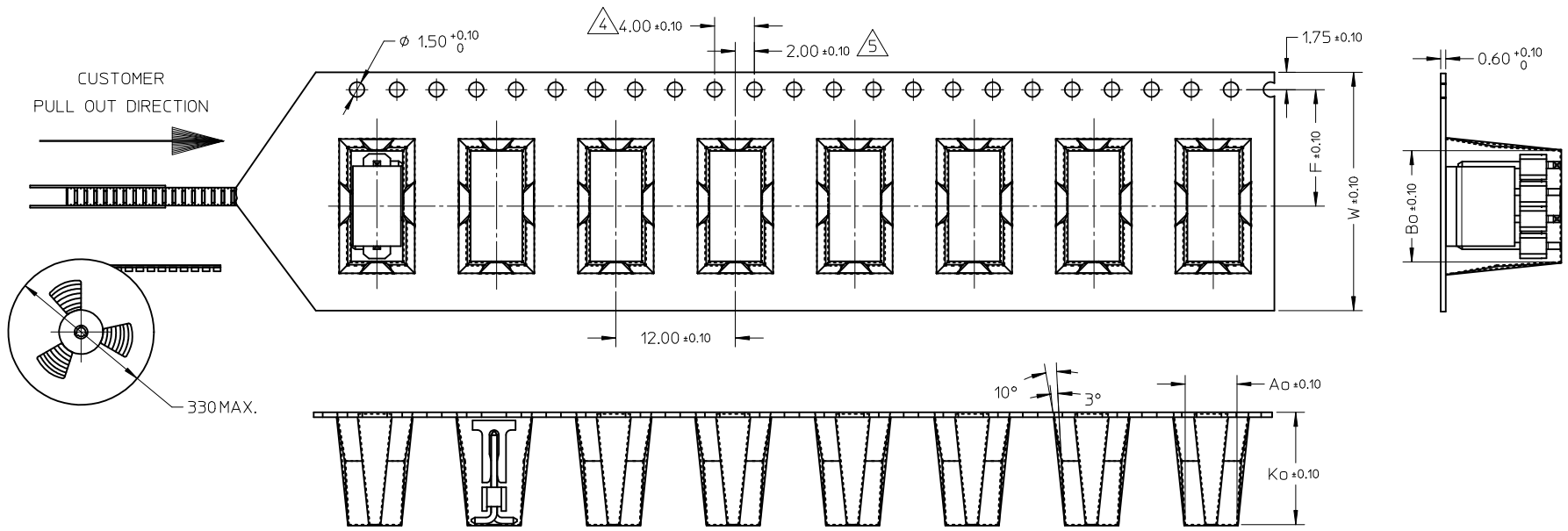


EWR#1228, +0209 IEC NO: S2010-0966 DRWN:ATSEE 2010/05/20 CHYKD:PTLIM 2005/03/29 APPR:MLONG 2010/06/08	B3	DESCRIPTION REV	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE	SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION		
			$\nabla_F = 0$ $\nabla_E = 0$ $\nabla_B = 0$	mm      INCH 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± --- ANGULAR ± 3 °	MM ONLY	NTS	METRIC	DRAWN BY: YLQ1AO      DATE: 2005/03/14 CHECKED BY: PTLIM      DATE: 2005/03/29 APPROVED BY: MLONG      DATE: 2010/03/10	TITLE	CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER
			DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS			SEE TABLE	MATERIAL NO.	DOCUMENT NO.	SHEET NO.	
						SIZE A3	THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION			

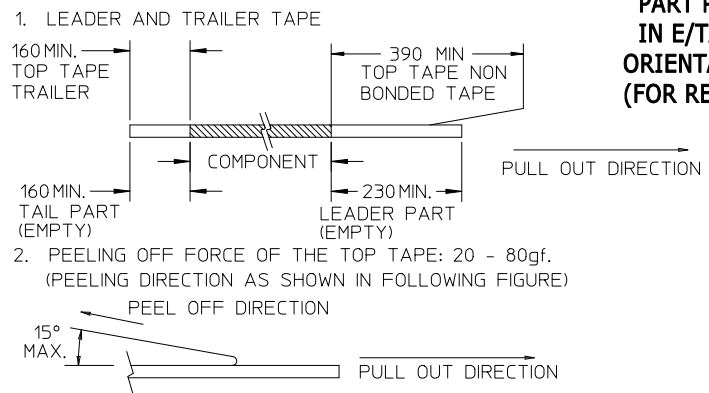
10 9 8 7 6 5 4 3 2 1

CKT	DIMENSION				
	Bo	Ao	Ko	F	W
2	8.02	5.20	13.60	11.50	24.00
4	10.55	5.20	11.30	11.50	24.00

### EMBOSSED CARRIER TYPE 'A'



**NOTES:**



**PART PACK  
IN E/TAPE  
ORIENTATION  
(FOR REF USE)**

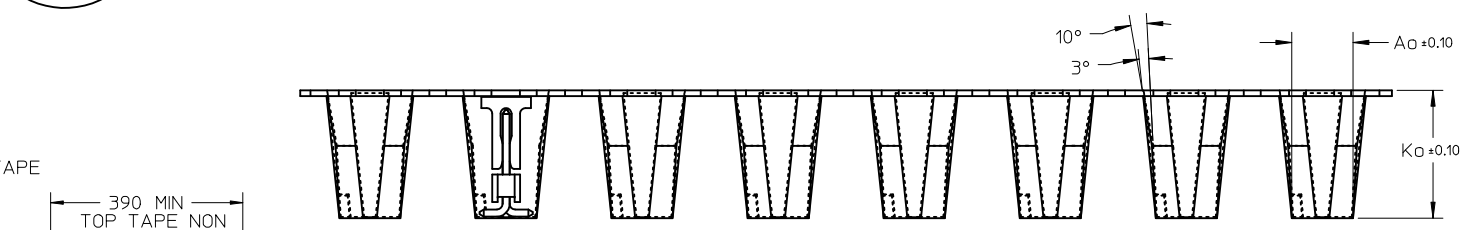
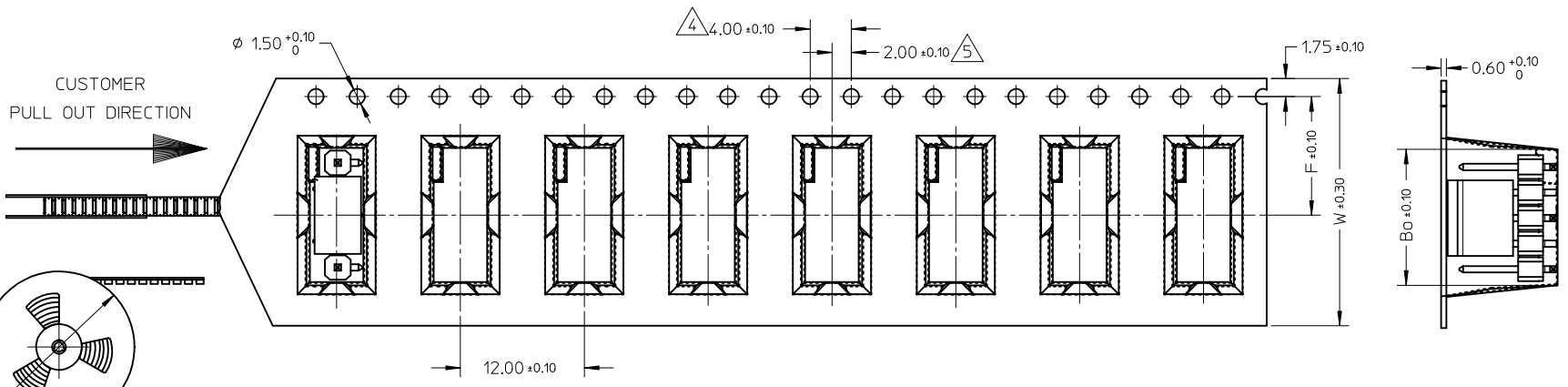
3. MATERIAL: BLACK P.S CONDUCTIVE, BLACK
4. MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF SPOCKET
5. CUMULATIVE TOLERANCE OF 10 SPROCKET HOLE IS ±0.20mm
6. A0 AND B0 ARE MEASURED FROM ABOVE POCKET BASE 0.30mm
7. TAPE AND REEL SPECIFICATION IS AS PER EIA-481.
8. TAPE AND REEL QUANTITY : 440PCS/REEL
9. THE TAPE IS TREATED FOR ANTI-STATIC.
10. ALL RADIUS ARE 0.30MM UNLESS SPECIFY
11. SURFACE RESISTIVITY 10<sup>3</sup> TO 10 OHMS.

<b>EWR#1228, +0209</b> EC NO: S2010-0966 DRW:NATSEE 2010/05/20 CHK:DPTLM 2005/03/29 APPR:MLONG 2010/06/08	QUALITY SYMBOLS $F_A=0$ $F_G=0$ $F_B=0$	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE <b>MM ONLY</b>		SCALE NTS	DESIGN UNITS METRIC	THIRD ANGLE PROJECTION	
		4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± ---	mm INCH	DRAWN BY YLQ1A0	DATE 2005/03/14	TITLE <b>CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER</b>			
		ANGULAR ± 3 °		CHECKED BY PTLIM	DATE 2005/03/29	MOLEX INCORPORATED			
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		APPROVED BY MLONG	DATE 2010/03/10	MATERIAL NO. SEE TABLE	DOCUMENT NO. SD-87898-001	SHEET NO. 17 OF 20	

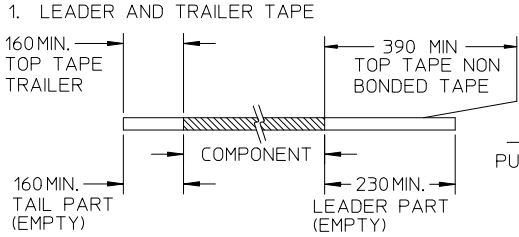
9 8 7 6 5 4 3 2 1

10 9 8 7 6 5 4 3 2 1

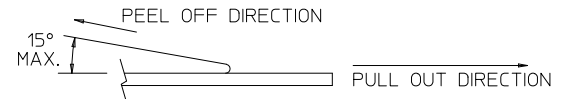
CKT	DIMENSION				
	Bo	Ao	Ko	F	W
5	13.10	5.20	11.30	11.50	24.00



NOTES:



2. PEELING OFF FORCE OF THE TOP TAPE: 20 - 80gf.  
(PEELING DIRECTION AS SHOWN IN FOLLOWING FIGURE)



- 3. MATERIAL: BLACK P.S CONDUCTIVE, BLACK
- 4. MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF SPOCKET
- 5. CUMULATIVE TOLERANCE OF 10 SPROCKET HOLE IS +0.20mm
- 6. A0 AND B0 ARE MEASURE FROM ABOVE POCKET BASE 0.30mm
- 7. TAPE AND REEL SPECIFICATION IS AS PER EIA-481.
- 8. TAPE AND REEL QUANTITY : 440PCS/REEL
- 9. THE TAPE IS TREATED FOR ANTI-STATIC.
- 10. ALL RADIUS ARE 0.30MM UNLESS SPECIFY
- 11. SURFACE RESISTIVITY 10<sup>3</sup> TO 10 OHMS.

**PART PACK  
IN E/TAPE  
ORIENTATION  
(FOR REF USE)**

EWR#1228, +0209 EC NO: S2010-0966 DRWN:ATSEE CHKD:PTLIM APPR:MLONG	2010/05/20	DESCRIPTION
	2005/03/29	
	2010/06/08	
	B3	

QUALITY SYMBOLS	$\nabla F=0$
	$\nabla F=0$
	$\nabla F=0$

GENERAL TOLERANCES (UNLESS SPECIFIED)	
	mm INCH
4 PLACES	± --- ± ---
3 PLACES	± --- ± ---
2 PLACES	± 0.2 ± ---
1 PLACE	± --- ± ---
ANGULAR ± 3 °	
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS	

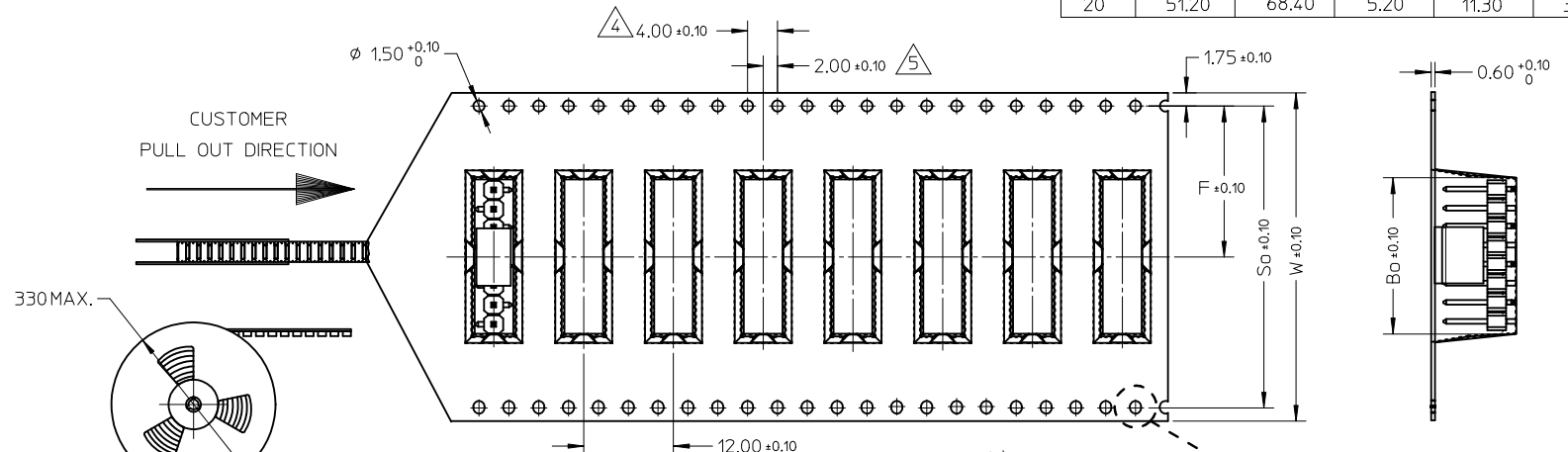
DIMENSION STYLE		SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION
MM ONLY		NTS	METRIC	
DRAWN BY	DATE	TITLE		
YLO1A0	2005/03/14	CUSTOM HEADER		
CHECKED BY	DATE	2.54MM PITCH SINGLE ROW		
PTLIM	2005/03/29	SINGLE WAFER SMT HEADER		
APPROVED BY	DATE	MOLEX INCORPORATED		
MLONG	2010/03/10	MOLEX INCORPORATED		
MATERIAL NO.	DOCUMENT NO.	SHEET NO.		
SEE TABLE	SD-87898-001	18 OF 20		

DRAWN BY		DATE	TITLE	
YLO1A0		2005/03/14	CUSTOM HEADER	
CHECKED BY		DATE	2.54MM PITCH SINGLE ROW	
PTLIM		2005/03/29	SINGLE WAFER SMT HEADER	
APPROVED BY		DATE	MOLEX INCORPORATED	
MLONG		2010/03/10	MOLEX INCORPORATED	
MATERIAL NO.	DOCUMENT NO.	SHEET NO.		
SEE TABLE	SD-87898-001	18 OF 20		

9 8 7 6 5 4 3 2 1

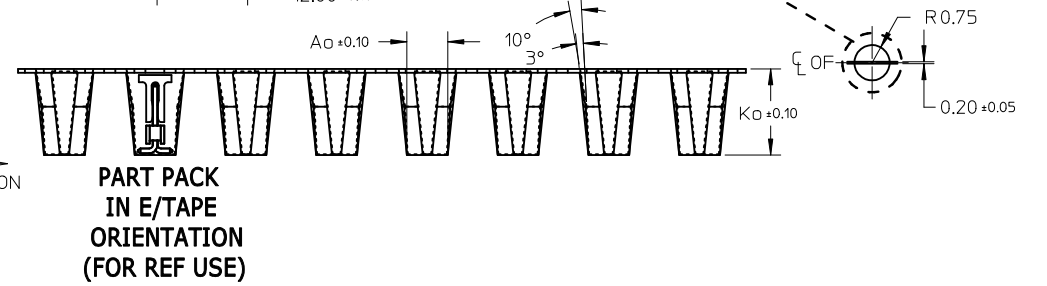
10 9 8 7 6 5 4 3 2 1

CKT	DIMENSION					
	Bo	So	Ao	Ko	F	W
6	15.65	28.40	5.20	11.30	14.20	32.00
8	20.70	40.40	5.20	11.30	20.20	44.00
10	25.80	40.40	5.20	11.30	20.20	44.00
12	30.90	52.40	5.20	11.30	26.20	56.00
14	35.95	52.40	5.20	11.30	26.20	56.00
16	41.05	52.40	5.20	11.30	26.20	56.00
18	46.20	68.40	5.20	11.30	34.20	72.00
20	51.20	68.40	5.20	11.30	34.20	72.00



- NOTES:
- LEADER AND TRAILER TAPE  
 160 MIN. TOP TAPE TRAILER  
 390 MIN. TOP TAPE NON BONDED TAPE  
 160 MIN. TAIL PART (EMPTY)  
 230 MIN. LEADER PART (EMPTY)  
 PULL OUT DIRECTION
  - PEELING OFF FORCE OF THE TOP TAPE: 20 - 80gf.  
 (PEELING DIRECTION AS SHOWN IN FOLLOWING FIGURE)  
 PEEL OFF DIRECTION  
 15° MAX.  
 PULL OUT DIRECTION
  - MATERIAL: BLACK P.S CONDUCTIVE, BLACK

- MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF SPOCKET
- CUMULATIVE TOLERANCE OF 10 SPROCKET HOLE IS ±0.20mm
- A0 AND B0 ARE MEASURED FROM ABOVE POCKET BASE 0.30mm
- TAPE AND REEL SPECIFICATION IS AS PER EIA-481.
- TAPE AND REEL QUANTITY : 440PCS/REEL
- THE TAPE IS TREATED FOR ANTI-STATIC.
- ALL RADIUS ARE 0.30MM UNLESS SPECIFY
- SURFACE RESISTIVITY 10<sup>3</sup> TO 10 OHMS.

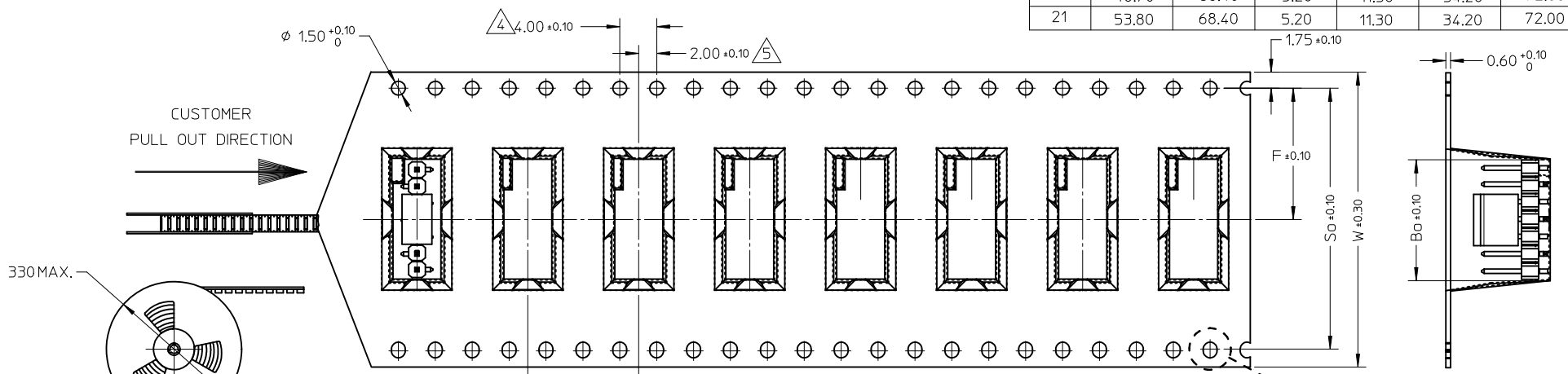


EWR#1228, +0209 EC NO: S2010-0966 DRWNA:SEE 2010/05/20 CHKD:PTLM 2005/03/29 APPR:MLONG 2010/06/08 B3	QUALITY SYMBOLS	GENERAL TOLERANCES (UNLESS SPECIFIED)	DIMENSION STYLE	SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION	
	$\nabla F=0$ $\nabla F=0$ $\nabla F=0$	mm    INCH 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.2 ± --- 1 PLACE ± --- ± --- ANGULAR ± 3°	MM ONLY	NTS	METRIC		
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS	DRAWN BY: YLQ1A0    DATE: 2005/03/14 CHECKED BY: PTLIM    DATE: 2005/03/29 APPROVED BY: MLONG    DATE: 2010/03/10	TITLE	CUSTOM HEADER 2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER		
			SEE TABLE	MATERIAL NO. DOCUMENT NO.	MOLEX INCORPORATED SD-87898-001		
			SIZE: A3 THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION	SHEET NO. 19 OF 20			

9 8 7 6 5 4 3 2 1

10 9 8 7 6 5 4 3 2 1

CKT	DIMENSION					
	Bo	So	Ao	Ko	F	W
7	18.20	40.40	5.20	11.30	20.20	44.00
9	23.25	40.40	5.20	11.30	20.20	44.00
11	28.35	40.40	5.20	11.30	20.20	44.00
13	33.40	52.40	5.20	11.30	26.20	56.00
15	38.50	52.40	5.20	11.30	26.20	56.00
17	43.60	68.40	5.20	11.30	34.20	72.00
19	48.70	68.40	5.20	11.30	34.20	72.00
21	53.80	68.40	5.20	11.30	34.20	72.00



NOTES:

- LEADER AND TRAILER TAPE  
 160MIN. TOP TAPE TRAILER  
 160MIN. TAIL PART (EMPTY)  
 390 MIN TOP TAPE NON BONDED TAPE  
 230MIN. LEADER PART (EMPTY)  
 PEEL OFF DIRECTION  
 15° MAX.
- PEELING OFF FORCE OF THE TOP TAPE: 20 - 80gf.  
 (PEELING DIRECTION AS SHOWN IN FOLLOWING FIGURE)  
 PEEL OFF DIRECTION

**PART PACK  
 IN E/TAPE  
 ORIENTATION  
 (FOR REF USE)**

- MATERIAL: BLACK P.S CONDUCTIVE, BLACK MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF SPOCKET
- CUMULATIVE TOLERANCE OF 10 SPROCKET HOLE IS ±0.20mm
- A0 AND B0 ARE MEASURE FROM ABOVE POCKET BASE 0.30mm
- TAPE AND REEL SPECIFICATION IS AS PER EIA-481.
- TAPE AND REEL QUANTITY : 440PCS/REEL
- THE TAPE IS TREATED FOR ANTI-STATIC.
- ALL RADIUS ARE 0.30MM UNLESS SPECIFY
- SURFACE RESISTIVITY 10<sup>3</sup> TO 10 OHMS.

EWR#1228, +0209 EC NO: S2010-0966 DRW/NAT/SEE 2010/05/20 CHK/DPT/LIM 2005/03/29 APPR./M/ONG 2010/06/08	QUALITY SYMBOLS F=0 E=0 E=0	GENERAL TOLERANCES (UNLESS SPECIFIED)		DIMENSION STYLE		SCALE	DESIGN UNITS	THIRD ANGLE PROJECTION		
				MM ONLY		NTS	METRIC			
				ANGULAR ± 3°		TITLE			CUSTOM HEADER	
		DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		SEE TABLE		2.54MM PITCH SINGLE ROW SINGLE WAFER SMT HEADER			MOLEX INCORPORATED	
B3	REV	MATERIAL NO.		DATE		DOCUMENT NO.	SHEET NO.			
		MLONG 2010/03/10		2010/03/10		SD-87898-001	20 OF 20			
THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION										

9 8 7 6 5 4 3 2 1