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PRODUCT SPECIFICATION

.093 SERIES PLUG AND RECEPTACLE POWER CONNECTORS

1.0 SCOPE

This Product Specification covers the 5.03 mm (.198 inch) centerline connector series using pin and socket terminals terminated with 14 to 24 AWG wire using crimp technology with tin plating.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

<u>PRODUCT NAME</u>	<u>SERIES NUMBER</u>
Plug Housing, 1-circuit	1619-1P
Receptacle Housing, 1-circuit	1619-1R
Plug Housing, 2-circuit	1545-P*
Receptacle Housing, 2-circuit	1545-R*
Plug Housing, 3-circuit	1396-P*
Receptacle Housing, 3-circuit	1396-R*
Plug Housing, 4-circuit (in-line)	1490-P*
Receptacle Housing, 4-circuit (in-line)	1490-R*
Plug Housing, 4-circuit (2 x 2)	2163-P*
Receptacle Housing, 4-circuit (2 x 2)	2163-R*
Plug Housing, 5-circuit	1653-P*
Receptacle Housing, 5-circuit	1653-R*
Plug Housing, 6-circuit	1261-P*
Receptacle Housing, 6-circuit	1261-R*
Plug Housing, 9-circuit	1292-P*
Receptacle Housing, 9-circuit	1292-R*
Plug Housing, 12-circuit	1360-P*
Receptacle Housing, 12-circuit	1360-R*
Socket Terminal, 14-18 AWG	1189
Pin Terminal, 14-18 AWG	1190
Socket Terminal, 18-22 AWG	1380
Pin Terminal, 18-22 AWG	1381
Socket Terminal, 22-24 AWG	2870
Pin Terminal, 22-24 AWG	2871
Socket Terminal, 14-18 AWG, (P-B)	4550
Socket Terminal, 18-22 AWG, (P-B)	2151

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Housings are molded of UL 94V-2 rated PA66.

Terminals are tin-plated brass or phosphor-bronze.

See appropriate sales drawings for additional information on dimensions, materials, platings and markings.

<u>REVISION:</u> A	<u>ECR/ECN INFORMATION:</u> <u>EC No:</u> UCR#2002-0324 <u>DATE:</u> 2001 / 10/ 04	<u>TITLE:</u> PRODUCT SPECIFICATION STANDARD .093 SERIES PLUGS & RECEPTACLES	<u>SHEET No.</u> 1 of 3
<u>DOCUMENT NUMBER:</u> PS-43660-9999	<u>CREATED / REVISED BY:</u> BWIRKUS 10/4/01	<u>CHECKED BY:</u> BWIRKUS 10/4/01	<u>APPROVED BY:</u> SFRY 10/5/01



PRODUCT SPECIFICATION

2.3 SAFETY AGENCY APPROVALS

UL File #E29179
CSA File #E29179
TUV License #R75107

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See the appropriate sales drawings for necessary referenced documents and specifications.

4.0 RATINGS

4.1 VOLTAGE

250 Volts AC (RMS)

4.2 CURRENT AND APPLICABLE WIRES

AWG	Circuit Size	Amps
14	3	14
14	9	11
18	3	10
18	9	7
22	3	7
22	9	5

4.3 TEMPERATURE

Operating: - 55°C to + 105°C

5.0 PERFORMANCE

5.1 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	Contact Resistance (Low Level)	Mate connectors: apply a maximum voltage of 20 mV and a current of 20 mA. (Measurement locations in Section 7.0)	10 milliohms MAXIMUM [initial]
2	Dielectric Withstanding Voltage	Mate connectors: apply a voltage of 2000 VAC for 1 minute between adjacent terminals and between terminals to ground.	No breakdown; current leakage < 500 mA
3	Temperature Rise (via Current Cycling)	Mate connectors, measuring the temperature rise at 60 minute intervals during 96 hours of steady state at rated current; followed by 240 hours of current cycling (45 minutes ON and 15 minutes OFF per hour) with measurements made during last 5 minute period of each ON cycle; followed by 96 hours of steady state at rated current with measurements taken at 60 minute intervals.	Temperature rise: +30°C MAXIMUM

REVISION: A	ECR/ECN INFORMATION: EC No: UCR#2002-0324 DATE: 2001 / 10 / 04	TITLE: PRODUCT SPECIFICATION STANDARD .093 SERIES PLUGS & RECEPTACLES	SHEET No. 2 of 3
DOCUMENT NUMBER: PS-43660-9999	CREATED / REVISED BY: BWIRKUS 10/4/01	CHECKED BY: BWIRKUS 10/4/01	APPROVED BY: SFRY 10/5/01



PRODUCT SPECIFICATION

5.2 MECHANICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
4	Connector Mate and Unmate Forces	Mate and unmate connector (male to female) at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch) per minute for a total of 25 cycles. Initial mate forces to be measured. Unmate forces to be measured after 25 cycles.	15.6 N (3.5 lbf) MAXIMUM insertion force 4.4 N (1 lbf) MINIMUM withdrawal force
5	Terminal Retention Force (in Housing)	Axial pullout force on the terminal in the housing at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch) per minute.	89 N (20 lbf) MINIMUM retention force
6	Wire Pullout Force (Axial)	Apply an axial pullout force on the wire at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch).	MINIMUM pullout forces: 14 AWG 178 N (40 lbf) 16 AWG 156 N (35 lbf) 18 AWG 133 N (30 lbf) 20 AWG 89 N (20 lbf) 22 AWG 62 N (14 lbf) 24 AWG 36 N (8 lbf)
7	Terminal Insertion Force (into Housing)	Apply an axial insertion force on the terminal at a rate of 25 ± 6 mm ($1 \pm \frac{1}{4}$ inch).	22N (5 lbf) MAXIMUM insertion force

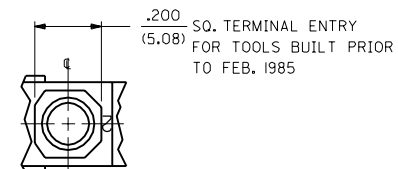
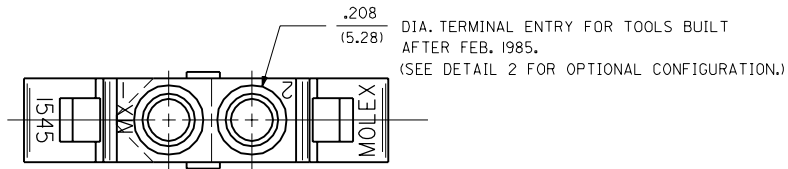
5.3 ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
8	Thermal Cycling	Mate connectors; expose to temperature cycling between -25°C and 70°C for 500 cycles with a dwell time of 30 minutes at each extreme. Measurements to be taken initially and after every 100 cycles.	10 milliohms MAXIMUM (change from initial) & Visual: No Damage

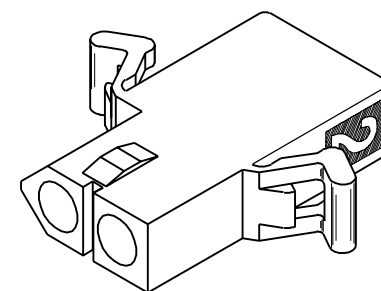
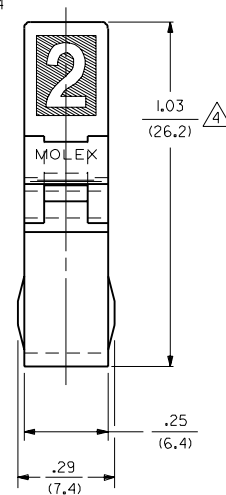
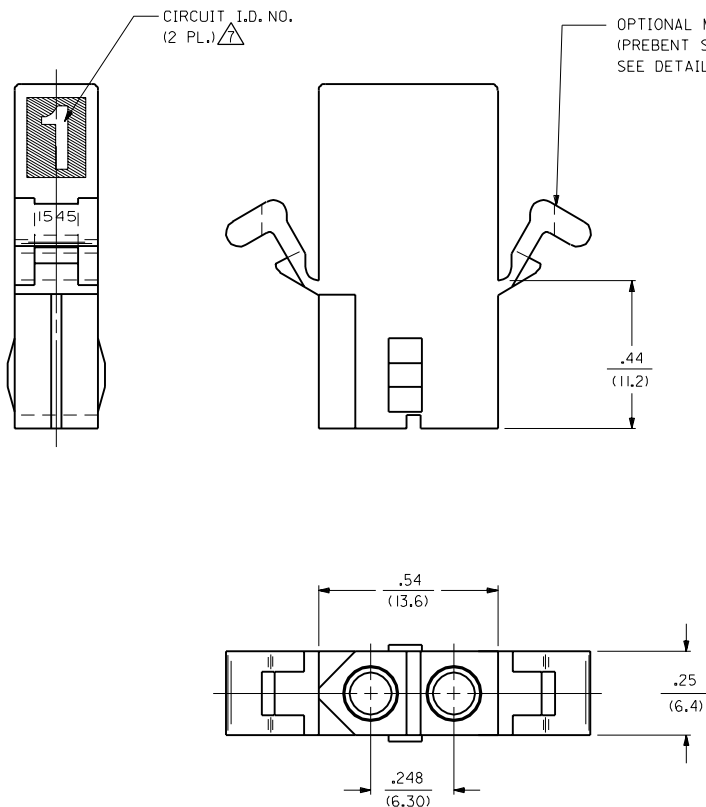
6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. See the appropriate sales drawings for additional information on packaging requirements.

REVISION: A	ECR/ECN INFORMATION: EC No: UCR#2002-0324 DATE: 2001 / 10/ 04	TITLE: PRODUCT SPECIFICATION STANDARD .093 SERIES PLUGS & RECEPTACLES	SHEET No. 3 of 3
DOCUMENT NUMBER: PS-43660-9999	CREATED / REVISED BY: BWIRKUS 10/4/01	CHECKED BY: BWIRKUS 10/4/01	APPROVED BY: SFRY 10/5/01



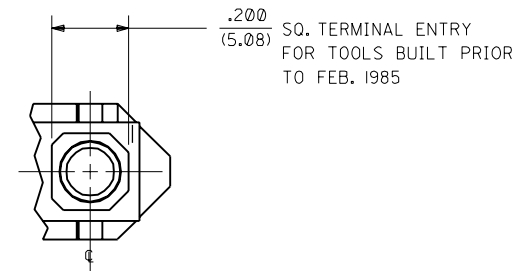
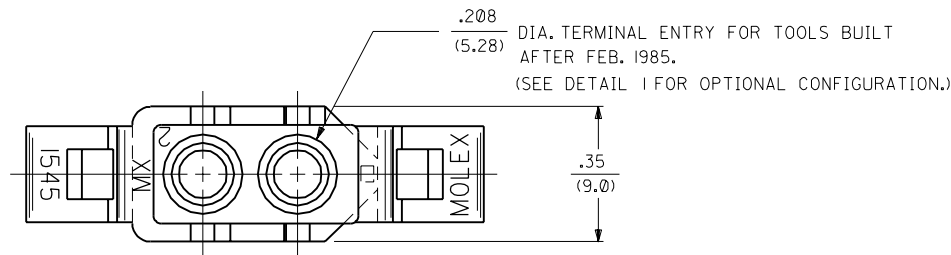
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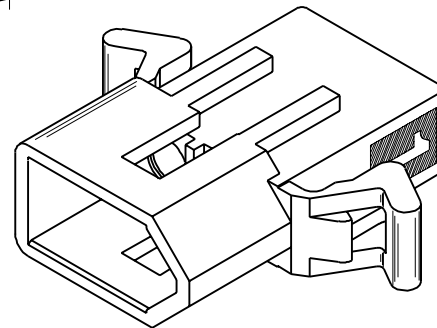
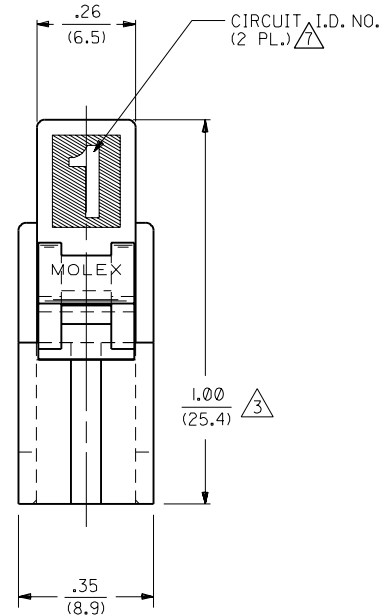
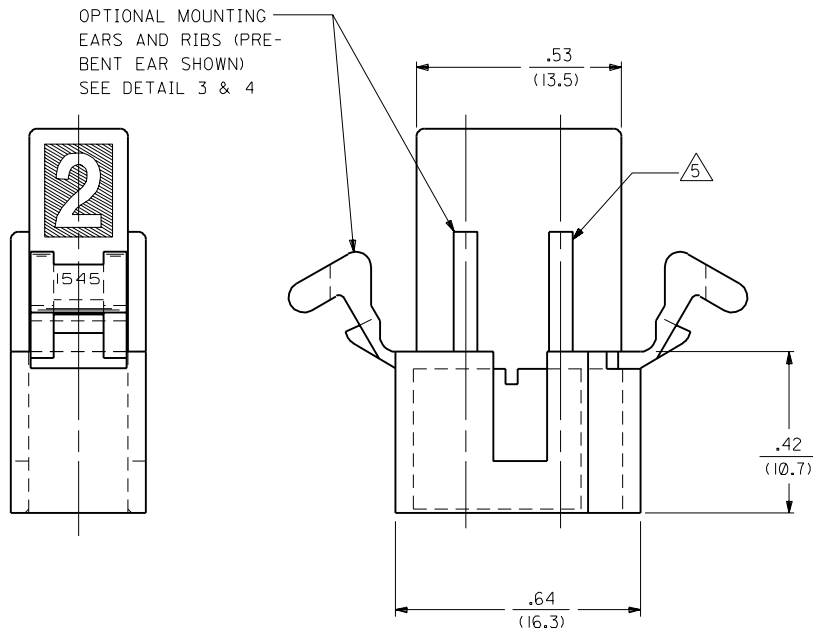
RECEPTACLE

				DIMENSIONS SHOWN (METRIC) INCH		$\nabla = 0$ $\blacktriangledown = 0$		REVISE ONLY ON CAD SYSTEM	
				UNLESS OTHERWISE SPECIFIED TOLERANCES: ANGULAR $\pm .005^\circ$		TITLE			
				INCH METRIC		.093/(2.36) HOUSING,			
				3 PLACE $\pm .010$ ---		PLUG AND RECEPTACLE,			
				2 PLACE $\pm .014$ ± 0.25		2 CKT, 248/(6.30) CTR.			
				1 PLACE --- ± 0.35					
T		SEE SHT. I				MOLEX INCORPORATED		SHEET NO. DATE	
S		SEE SHT. I		DRAWING APPLICABLE MUST REMAIN WITHIN DIMENSIONS		1515.F.H.I. 60552 U.S.A.		2 8/9/88	
R		SEE SHT. I				PART NO. SEE CHART		DRWG. NO. SD-1545--	
LTR.		REVISIONS		LTR.		REVISIONS		LTR.	
				DRWG. BY		CHKD. BY		FILE NAME	
				GEP		S		S145X2	
				RAS		4		1	
				4		1			
								THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX AND SHOULD NOT BE REPRODUCED OR USED FOR ANY PURPOSES	
								REV. SIZE	

[illegible]



DETAIL "I"

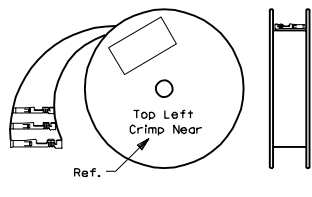


PLUG

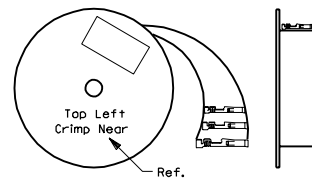
DIMENSIONS SHOWN (METRIC) INCH		REVISE ONLY ON CAD SYSTEM	
UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR ± 1/2°		TITLE	
INCH METRIC		.093/(2.36) HOUSING, PLUG & RECEPTACLE, 2 CKT., .248/(6.30) CTR.	
3 PLACE ± .010	---	DATE	
2 PLACE ± .014	± 0.25	8 / 9 / 88	
1 PLACE ---	± 0.35	SHEET NO. 1 OF 3	
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		MOLEX INCORPORATED U.S.A.	
DRAWN BY: GEP		PART NO. 1545JLL 60532	
CHK'D BY: RW		DRWG. NO. SD-1545-	
APPROV. BY: RAS		FILE NAME: S1545X1 RCH	
SCALE: 4 : 1		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION.	

U	OBSOLETE P/N UCR2002-0270 COMERCIAL 01/9/25
T2	UPDATE PER UCR2001-0729 JBS 2/8/01 BW
T1	X-REMOVE -P2 ECR U6 0406 9/29/95 RW
T	REVISE PER ECR U3 0571 4-14-93 RW
S1	ADD EDP NUMBER ECR U2 1394 9/18/92 RW
S	REVISE PER ECR U1 2259 11/26/91 RW
R2	ADD WITH EDP NO. -R1RD, ERO 30382 9/10/90 RW
R1	ADD WITH EDP'S -R1RD, ERO 27549 11-28-88
R	REV. & REDRAWN ECR U8 1744 7-29-88 RW

PART NO.	ENG. NO.
02-09-1119	1381-A(P90)IL
02-09-1117	1381-A(P90)I
02-09-1115	1381-A(P90)II



REWOUND CHAIN



STANDARD CHAIN

LEGEND

1381-A(****)*

P = PREPLATE
BLANK = POSTPLATE

FORM
BLANK = STD. CHAIN
A = REWOUND CHAIN
I = STD. CHAIN WITH INTERLEAF PAPER
L = LOOSE

FINISH CODE

NOTES:

1. MATERIAL: BRASS, ALLOY #26000

2. FINISH:

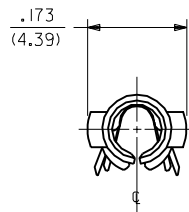
- 901 HOT TIN DIP .000020/(0.0005) MIN.
914 HOT TIN-LEAD DIP .000040/(0.0010) MIN.
102 TIN PLATE .000200/(0.0050) MIN. OVER .000100/(0.0025) MIN. COPPER OVERALL.
575 SELECT GOLD PLATE .000050/(0.00127) MIN. IN CONTACT AREA, .000050/(0.00127) MIN. TIN-LEAD IN CRIMP AREA OVER .000050/(0.00127) MIN. NICKEL OVERALL.
591 SELECT GOLD PLATE .000050/(0.00127) MIN. IN CONTACT AREA, OVER .000050/(0.00127) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. GOLD FLASH OVERALL.
550 SELECT GOLD PLATE .000015/(0.00038) MIN. IN CONTACT AREA, OVER .000030/(0.00076) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. GOLD FLASH OVERALL.
603 SELECT GOLD PLATE .000030/(0.00076) MIN. IN CONTACT AREA, .000100/(0.00254) MIN. TIN-LEAD IN CRIMP AREA OVER .000050/(0.00127) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. SELECT GOLD FLASH.

3. THIS PART CONFORMS TO PRODUCT SPECIFICATION 02-09.

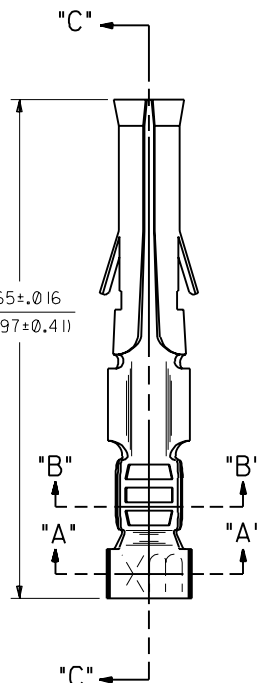
4. TERMINAL FOR USE WITH .093/(2.36) SERIES HOUSINGS AND WILL ACCEPT 18-22 AWG WIRE

5. INSERTION FORCE: 3.5 LBS. MAX. WHEN TERMINAL IS INSERTED INTO AN .093 SERIES HOUSING.

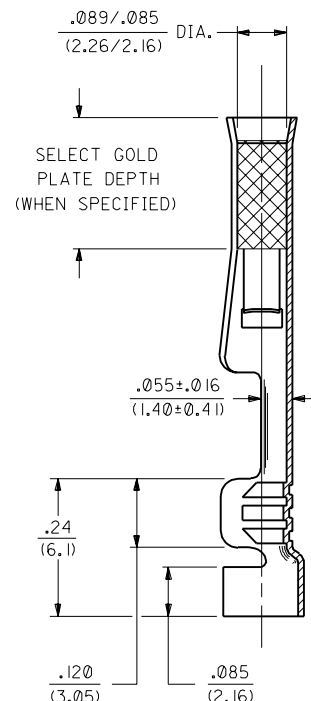
6. TERMINAL RETENTION: 20 LBS. MIN. FROM HOUSING.



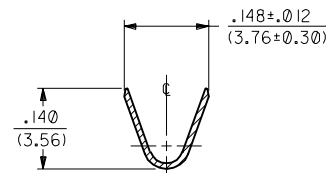
.865±.016
(2.197±0.41)



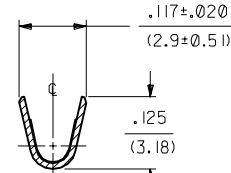
SELECT GOLD
PLATE DEPTH
(WHEN SPECIFIED)



SECT. "C-C"

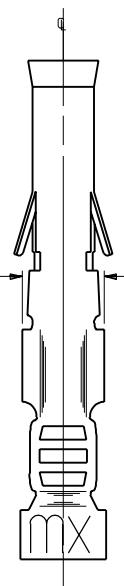


SECT. "A-A"

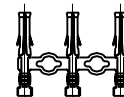


SECT. "B-B"

.142±.003
(3.61±0.08)

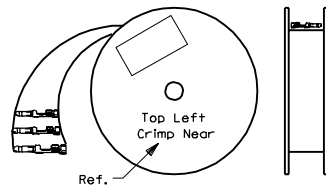


CHAIN FORM
FULL SCALE

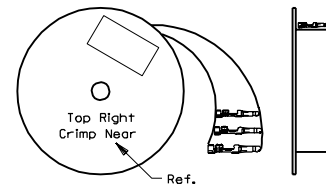


DIMENSIONS SHOWN (METRIC) INCH UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR ± 1/2°		MFG. SH. REV. LTR. REVISIONS																									
TITLE CRIMP TERM., FEMALE .093/(2.36) DIA. FOR 18 THRU 22 AWG WIRE		REVISE ONLY ON CAD SYSTEM																									
<table border="1"> <tr> <th>5 PLACE</th> <th>INCH</th> <th>METRIC</th> </tr> <tr> <td>± .010</td> <td>± 0.25</td> <td>± 0.35</td> </tr> <tr> <td>± .014</td> <td>± 0.25</td> <td>± 0.35</td> </tr> <tr> <td>± .018</td> <td>± 0.25</td> <td>± 0.35</td> </tr> </table>		5 PLACE	INCH	METRIC	± .010	± 0.25	± 0.35	± .014	± 0.25	± 0.35	± .018	± 0.25	± 0.35	<table border="1"> <tr> <th>5 PLACE</th> <th>INCH</th> <th>METRIC</th> </tr> <tr> <td>± .010</td> <td>± 0.25</td> <td>± 0.35</td> </tr> <tr> <td>± .014</td> <td>± 0.25</td> <td>± 0.35</td> </tr> <tr> <td>± .018</td> <td>± 0.25</td> <td>± 0.35</td> </tr> </table>		5 PLACE	INCH	METRIC	± .010	± 0.25	± 0.35	± .014	± 0.25	± 0.35	± .018	± 0.25	± 0.35
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± .018	± 0.25	± 0.35																									
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		<table border="1"> <tr> <th>FILE NAME</th> <th>SHEET NO.</th> <th>DATE</th> </tr> <tr> <td>SD1381X1</td> <td>1 OF 1</td> <td>11/6/87</td> </tr> </table>		FILE NAME	SHEET NO.	DATE	SD1381X1	1 OF 1	11/6/87																		
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SD1381X1	1 OF 1	11/6/87																									
<table border="1"> <tr> <th>FILE NAME</th> <th>SCALE</th> </tr> <tr> <td>SD1381X1</td> <td>6 : 1</td> </tr> </table>		FILE NAME	SCALE	SD1381X1	6 : 1	<table border="1"> <tr> <th>FILE NAME</th> <th>SCALE</th> </tr> <tr> <td>SD1381X1</td> <td>6 : 1</td> </tr> </table>		FILE NAME	SCALE	SD1381X1	6 : 1																
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SD1381X1	6 : 1																										
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SD1381X1	6 : 1																										

PART NO.	ENG. NO.
02-09-2118	I380-(P90)IL
02-09-2116	I380-(P90)I
02-09-2127	I380-(P90)II
02-09-2156	I380-(P914)L
02-09-2157	I380-(P914)
NOT TOOLED	I380-(563)L
02-09-6135	I380-(563)
02-09-6126	I380-(591)L
02-09-6125	I380-(591)
02-09-6124	I380-(558)L
02-09-6121	I380-(558)
02-09-6123	I380-(550)L
02-09-6122	I380-(550)
NOT TOOLED	I380-(603)L
02-09-6136	I380-(603)
02-09-2159	I380-(P914)A
02-09-2147	I380-(102)L
02-09-2148	I380-(102)
02-09-2119	I380-A(P90)IL
02-09-2117	I380-A(P90)I



REWOUND CHAIN



STANDARD CHAIN

LEGEND

I380-*(***)*

OPTIONAL DETENT
BLANK = WITH DETENT
A = WITHOUT DETENT

FORM
BLANK = STD. CHAIN
A = REWOUND CHAIN
L = LOOSE
I = STD. CHAIN WITH INTERLEAF PAPER

P = PREPLATE
BLANK = POSTPLATE

NOTES:

1. MATERIAL: BRASS, ALLOY #C26000

2. FINISH:

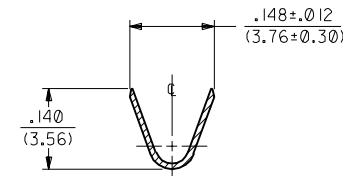
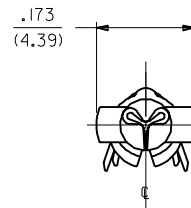
- 901 HOT TIN DIP .000020/(0.0005) MIN.
- 914 HOT TIN-LEAD DIP .000040/(0.00102) MIN.
- 102 TIN PLATE .000200/(0.00508) MIN. OVER .000100/(0.00254) MIN. COPPER OVERALL.
- 558 SELECT GOLD PLATE .000030/(0.00076) MIN. IN CONTACT AREA, OVER .000050/(0.00127) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. GOLD FLASH OVERALL.
- 591 SELECT GOLD PLATE .000050/(0.00127) MIN. IN CONTACT AREA, OVER .000050/(0.00127) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. GOLD FLASH OVERALL.
- 550 SELECT GOLD PLATE .000015/(0.00038) MIN. IN CONTACT AREA, OVER .000030/(0.00076) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. GOLD FLASH OVERALL.
- 563 SELECT GOLD PLATE .000030/(0.00076) MIN. IN CONTACT AREA, .000100/(0.00254) MIN. TIN-LEAD IN CRIMP AREA OVER .000050/(0.00127) MIN. NICKEL OVERALL.
- 603 SELECT GOLD PLATE .000030/(0.00076) MIN. IN CONTACT AREA, .000100/(0.00254) MIN. TIN-LEAD IN CRIMP AREA OVER .000050/(0.00127) MIN. NICKEL OVERALL WITH .000010/(0.00025) MAX. SELECT GOLD FLASH.

3. THIS PART CONFORMS TO PRODUCT SPECIFICATION 02-09.

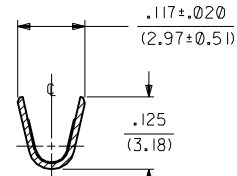
4. TERMINAL FOR USE WITH .093/(2.36) SERIES HOUSINGS AND WILL ACCEPT 18 THRU 22 AWG

5. INSERTION FORCE: 3.5 LBS. MAX. WHEN TERMINAL IS INSERTED INTO AN .093 SERIES HOUSING.

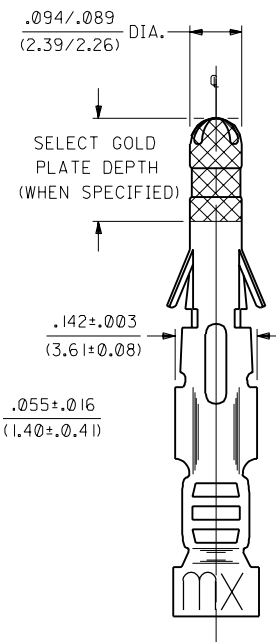
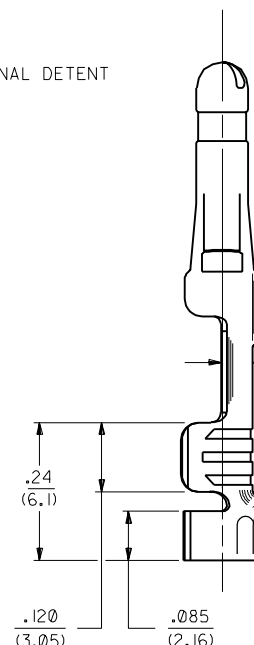
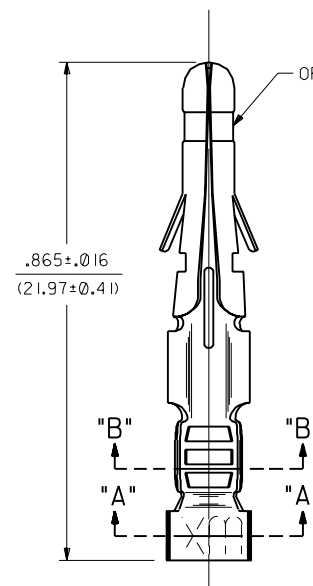
6. TERMINAL RETENTION: 20 LBS. MIN. FROM HOUSING.



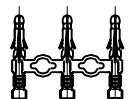
SECT. "A-A"



SECT. "B-B"



CHAIN FORM
FULL SCALE



DIMENSIONS SHOWN (METRIC) INCH UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR ± 1/2°		TITLE CRIMP TERMINAL, MALE .093/(2.36) DIA. FOR 18 THRU 22 AWG WIRE	
5 PLACE ± .010	INCH	2 PLACE ± .014	METRIC
2 PLACE ± .014	INCH	1 PLACE ± .035	METRIC
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		PART NO. SEE CHART	
DRWG. BY GEP	CHK'D. BY RW	FILE NAME SD1380X1	DRWG. NO. SD-1380-
APP'D. BY RAS	SCALE 6 : 1	THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION.	

BT	ADD -IP90111 ECN #2001-0905 4-4-01 BW
BS1	REVISED ECN# UCR1999-0518 STAMBAUGH 99-2-9
BS	CARRIER CUTOFF ECR #U10223 1-4-91 RW
BR	ADDED OPT. DETENT ECR 10480 7-15-88 RW
BP	REV. & REDRAWN ECR 10480 11-6-87 RW