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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.

REVISION:	ECR/ECN INFORMATION:	TITLE:	PRODUCT SPECIFICATION STANDARD .093 SERIES PLUGS & RECEPTACLES	SHEET No.
A	EC No: UCR#2002-0324 DATE: 2001 / 10 / 04			1 of 3
DOCUMENT NUMBER:		CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-43660-9999		BWIRKUS 10/4/01	BWIRKUS 10/4/01	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
TEMPLATE FILENAME: PRODUCT_SPEC(SIZE_A)(V.1).DOC			



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

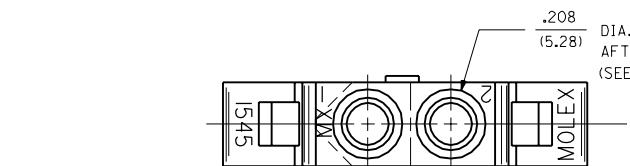
5.3 ENVIRONMENTAL REQUIREMENTS

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.

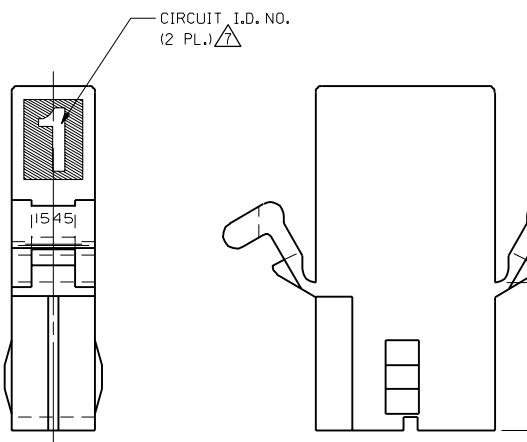
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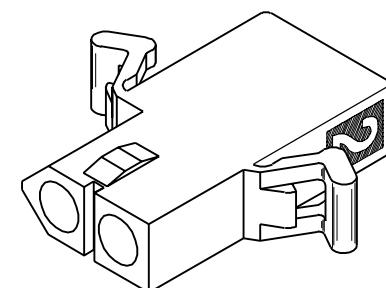
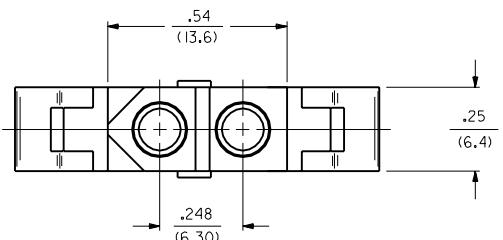
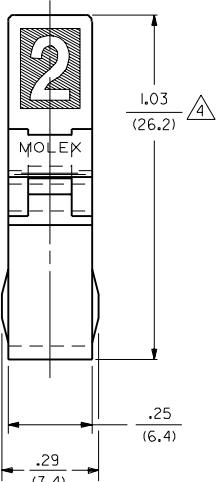
.208
(5.28) DIA. TERMINAL ENTRY FOR TOOLS BUILT
AFTER FEB. 1985.
(SEE DETAIL 2 FOR OPTIONAL CONFIGURATION.)

.200
(5.08) SQ. TERMINAL ENTRY
FOR TOOLS BUILT PRIOR
TO FEB. 1985

DETAIL "2"



OPTIONAL MOUNTING EARS
(PRESNT SHOWN)
SEE DETAIL 3 AND 4



RECEPTACLE

DIMENSIONS SHOWN IN METRIC/INCH		REVISE ONLY ON CAD SYSTEM			
UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR $\pm 10'$					
3 PLACE $\pm .010$					
2 PLACE $\pm .014$					
1 PLACE $\pm .035$					
DRAFT WHERE APPROPRIATE MUST REMAIN WITHIN DIMENSIONS					
DRAWN BY: GEP CHPD. RW DRAFTED BY: RAS REVISIONS: 4 : 1					
FILE NAME: S1545X2.DWG		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION			
MOLEX INCORPORATED		SHEET NO. 2			
1545		DATE 8/9/88			
PART NO. 1545-0000		DRNG. NO. SD-1545-*			
SEE CHART		DIV. C			

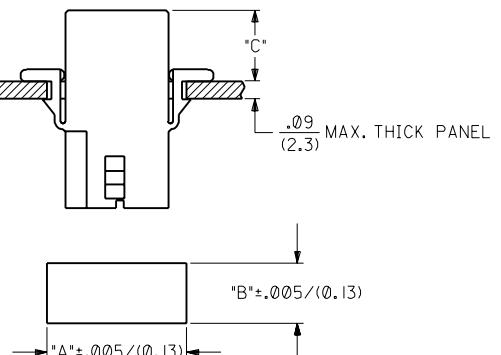
I3	I2	II	I0	9	8	7	6	I545	4	3	2	I
PLUG		I	LEGEND : PLUG									
PART NO.	ENG. NO.		I545-P***-*									
03-09-2021	I545-P		OPTIONS: _____									
03-09-2022	I545-PI		BLANK = WITH STD. EARS									
03-09-7021	I545-PBK		I = WITHOUT EARS									
03-09-7022	I545-PBK		2 = WITHOUT EARS, WITHOUT RAMPS									
03-09-2023	I545-P2		3 = WITH PREBENT EARS & RAMPS									
03-09-7024	I545-P IRD											
03-09-7023	I545-P IBU											

RECEPTACLE		H
PART NO.	ENG. NO.	
03-09-1021	I545-R	
03-09-6021	I545-R3BK	
03-09-6023	I545-R3RD	
03-09-6024	I545-R3BU	
03-09-1022	I545-R1	
03-09-6022	I545-RBK	
03-09-1023	I545-R2	
03-09-6025	I545-RBU	
03-09-6026	I545-RIRD	
03-09-1027	I545-R3	

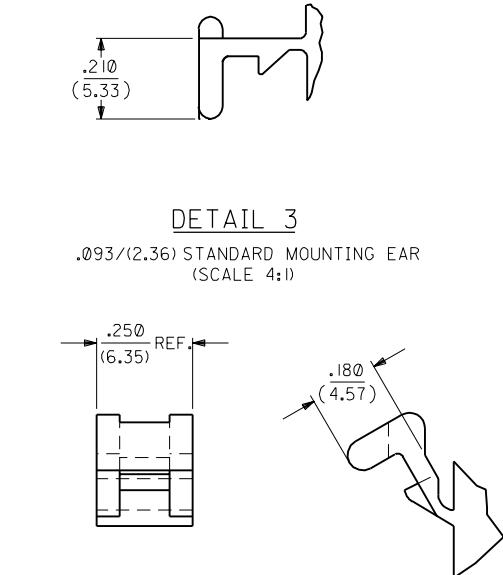
NOTES:

1. MATERIAL: A - NYLON, PA66, 94V-2. COLOR: NATURAL.
 2. FINISH: NONE.
 3. PRODUCT SPECIFICATION: PS-02-09.
4. .97/(24.6) REF. FOR TOOLS BUILT PRIOR TO FEB. 1985.
5. 1.00/(25.4) REF. FOR TOOLS BUILT PRIOR TO FEB. 1985.
6. RIBS ARE PRESENT ONLY ON PARTS WITH MOUNTING EARS.
7. EACH TERMINAL POCKET WILL ACCEPT UP TO:
- (2) #18 AWG WIRES HAVING 1/32" THK. INSULATION OR
- (1) #16 AWG WIRE HAVING 1/16" THK. INSULATION OR
- (1) #16 AWG & (1) 18 AWG WIRE HAVING 1/32" THK. INSULATION.
8. CIRCUIT I.D. NUMBERS ON SIDE OF HOUSING APPEAR ON PARTS FROM TOOLS BUILT AFTER 11/25/91.

LEGEND : RECEPTACLE									
I545-R***-*					BLANK = WITH STD. EARS & RAMPS				
I = WITHOUT EARS, WITH RAMPS					2 = WITHOUT EARS, WITHOUT RAMPS				
3 = WITH PREBENT EARS & RAMPS					COLOR: BLANK=NATURAL COLOR				
AM=AMBER BK=BLACK BU=BLUE					BN=BROWN CY=GRAY CN=GREEN				
OR=ORANGE RD=RED YW=YELLOW					BLANK = MATERIAL CODE A				



HOUSING	DIM. "A"	DIM. "B"	DIM. "C" (PREBENT)	DIM. "C" (STD. EAR)
PLUG	.800/(20.32)	.375/(9.53)	.40/(10.2)	.39/(9.9)
RECEPTACLE	.725/(18.42)	.312/(7.92)	.41/(10.4)	.40/(10.2)



DIMENSIONS SHOWN IN (METRIC) INCH		$\nabla = 0$	$\nabla = 0$	REVISE ONLY ON CAD SYSTEM
UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR: $\pm 10^\circ$				
3 PLACE $\pm .010$ $\pm .005$		INCH METRIC		
2 PLACE $\pm .014$ $\pm .025$				
1 PLACE $\pm .035$				
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS				
DRAWN BY	GEP	CHK'D.	RW	DATE
APPROVED BY	RAS	SCALE	2 : 1	8 / 9 / 88
FILE NAME S1545X3.DGN		DIV. CP SIZE C		
THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION.				

J

I

H

G

F

E

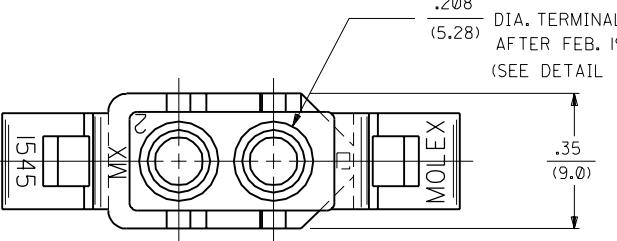
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C

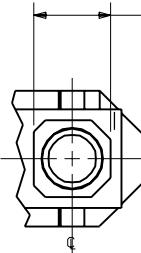
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A

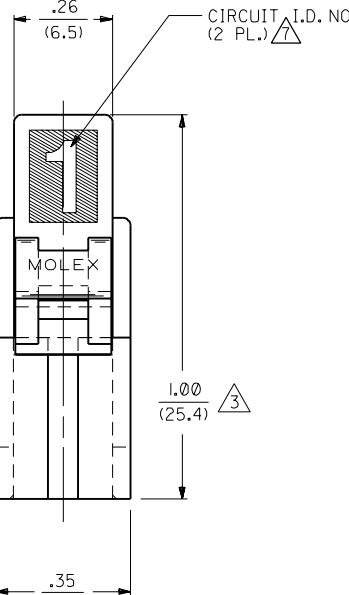
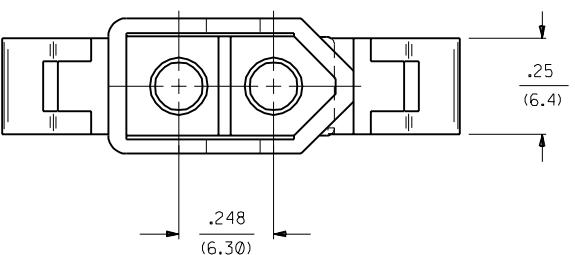
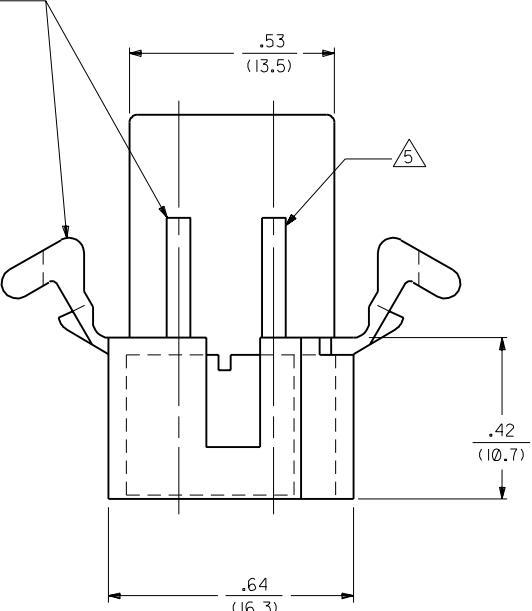
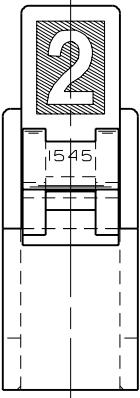
.208
(5.28) DIA. TERMINAL ENTRY FOR TOOLS BUILT
AFTER FEB. 1985.
(SEE DETAIL I FOR OPTIONAL CONFIGURATION.)



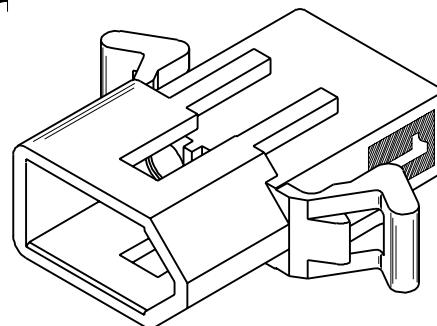
.200
(5.08) SQ. TERMINAL ENTRY
FOR TOOLS BUILT PRIOR
TO FEB. 1985



OPTIONAL MOUNTING
EARS AND RIBS (PRE-
BENT EAR SHOWN)
SEE DETAIL 3 & 4



DETAIL "I"



PLUG

3	U	
2	T	
1	U	
REV. & REDRAWN ECR U2 1744 GEP 7-29-88 RW		
REVISIONS		
REV. SH. REV. LTR.		
REVIS. ONLY ON CAD SYSTEM		
DIMENSIONS SHOWN IN (METRIC) INCH		
UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR $\pm 1/2^\circ$		
3 PLACE	$\pm .010$	---
2 PLACE	$\pm .014$	$\pm .25$
1 PLACE	---	$\pm .35$
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS		
DRAWN BY: GEP CHK'D. RW APPR'D. BY: RAS SCALE 4 : 1		
FILE NAME: S1545X1 DGN THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION.		
SHEET NO. 1 OF 3 DATE 8 / 9 / 88		
MOLEX INCORPORATED LISLE, ILL. 60532 U.S.A.		
PART NO. SEE CHART DRWNG. NO. SD-1545-*		

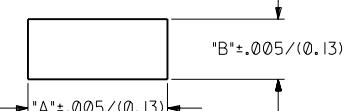
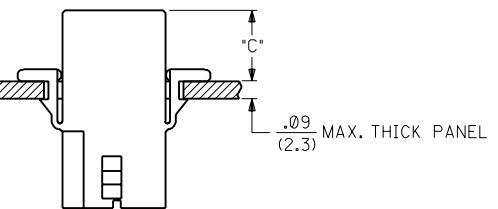
I3	I2	II	I0	9	8	7	6	I545	4	3	2	I
PLUG		I	LEGEND : PLUG									
PART NO.	ENG. NO.		I545-P***-*									
03-09-2021	I545-P		OPTIONS: _____									
03-09-2022	I545-PI		BLANK = WITH STD. EARS									
03-09-7021	I545-PBK		I = WITHOUT EARS									
03-09-7022	I545-PBK		2 = WITHOUT EARS, WITHOUT RAMPS									
03-09-2023	I545-P2		3 = WITH PREBENT EARS & RAMPS									
03-09-7024	I545-P IRD											
03-09-7023	I545-P IBU											

RECEPTACLE		H
PART NO.	ENG. NO.	
03-09-1021	I545-R	
03-09-6021	I545-R3BK	
03-09-6023	I545-R3RD	
03-09-6024	I545-R3BU	
03-09-1022	I545-R1	
03-09-6022	I545-RBK	
03-09-1023	I545-R2	
03-09-6025	I545-RBU	
03-09-6026	I545-RIRD	
03-09-1027	I545-R3	

NOTES:

1. MATERIAL: A - NYLON, PA66, 94V-2. COLOR: NATURAL.
 2. FINISH: NONE.
 3. PRODUCT SPECIFICATION: PS-02-09.
4. .97/(24.6) REF. FOR TOOLS BUILT PRIOR TO FEB. 1985.
5. 1.00/(25.4) REF. FOR TOOLS BUILT PRIOR TO FEB. 1985.
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7. EACH TERMINAL POCKET WILL ACCEPT UP TO:
- (2) #18 AWG WIRES HAVING 1/32" THK. INSULATION OR
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I545-R***-*					BLANK = WITH STD. EARS & RAMPS				
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AM=AMBER BK=BLACK BU=BLUE					BN=BROWN CY=GRAY CN=GREEN				
OR=ORANGE RD=RED YW=YELLOW					BLANK = MATERIAL CODE A				

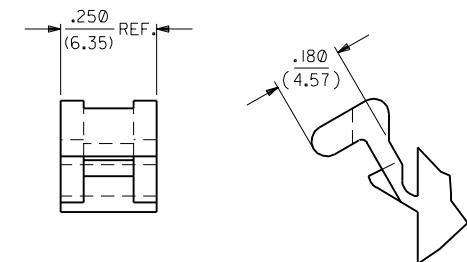


RECOMMENDED PANEL OPENING
(SCALE 2:1)

HOUSING	DIM. "A"	DIM. "B"	DIM. "C" (PREBENT)	DIM. "C" (STD. EAR)
PLUG	.800 / (20.32)	.375 / (9.53)	.40 / (10.2)	.39 / (9.9)
RECEPTACLE	.725 / (18.42)	.312 / (7.92)	.41 / (10.4)	.40 / (10.2)



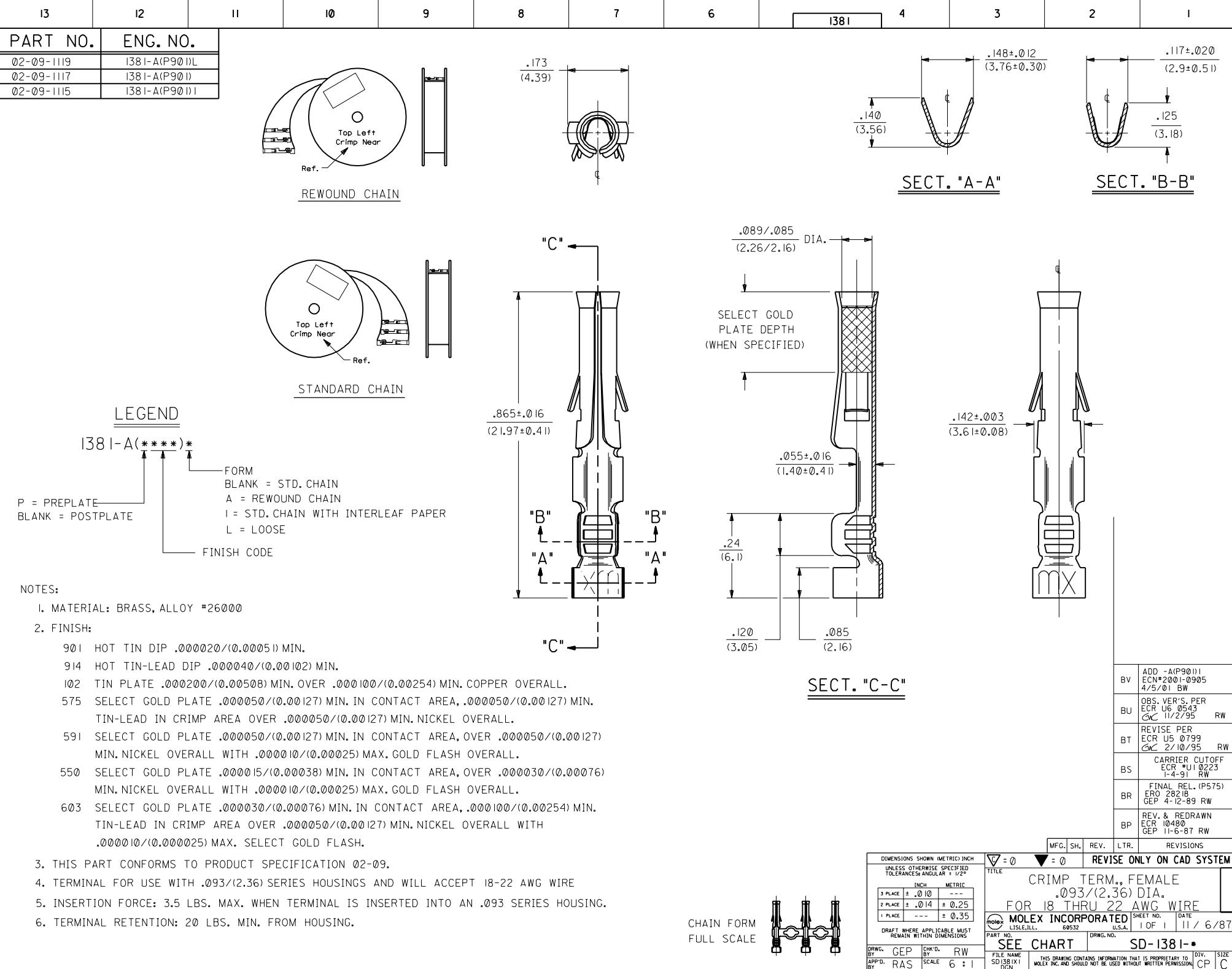
DETAIL 3
.093/(2.36) STANDARD MOUNTING EAR
(SCALE 4:1)



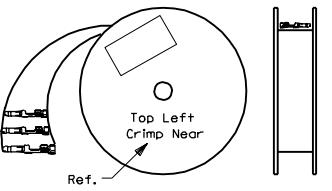
DETAIL 4

.093/(2.36) PREBENT MOUNTING EAR
(SCALE 4:1)

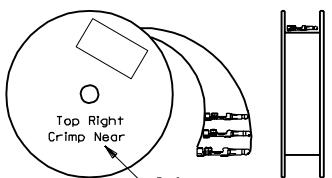
DIMENSIONS SHOWN IN (METRIC) INCH		$\nabla = 0$	$\nabla = 0$	REVISE ONLY ON CAD SYSTEM
UNLESS OTHERWISE SPECIFIED TOLERANCES ANGULAR: $\pm 10^\circ$				
3 PLACE $\pm .010$ --- 2 PLACE $\pm .014$ $\pm .025$ 1 PLACE --- $\pm .035$				
INCH METRIC				
DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS				
DRAWN BY	GEP	CHK'D.	RW	
APPROVED BY	RAS	SCALE	2 : 1	
FILE NAME S1545X3.DGN		THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION		
PART NO.		SD-1545-#		
DRAWING NO.		DIV. CP SIZE C		



PART NO.	ENG. NO.
02-09-2118	1380-(P90)I
02-09-2116	1380-(P90)I
02-09-2127	1380-(P90)I
02-09-2156	1380-(P914)I
02-09-2157	1380-(P914)
NOT TOOLED	1380-(563)L
02-09-6135	1380-(563)
02-09-6126	1380-(59)I
02-09-6125	1380-(59)I
02-09-6124	1380-(558)L
02-09-6121	1380-(558)
02-09-6123	1380-(550)L
02-09-6122	1380-(550)
NOT TOOLED	1380-(603)L
02-09-6136	1380-(603)
02-09-2159	1380-(P914)A
02-09-2147	1380-(102)L
02-09-2148	1380-(102)
02-09-2119	1380-A(P90)I
02-09-2117	1380-A(P90)I



REWOUND CHAIN



STANDARD CHAIN

OPTIONAL DETENT _____
BLANK = WITH DETENT
A = WITHOUT DETENT

P = PREPLATE _____
BLANK = POSTPLATE

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

NOTES:

1. MATERIAL: BRASS, ALLOY #C26000

2. FINISH:

 - 901 HOT TIN DIP .000020/(0.00051) 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.

