



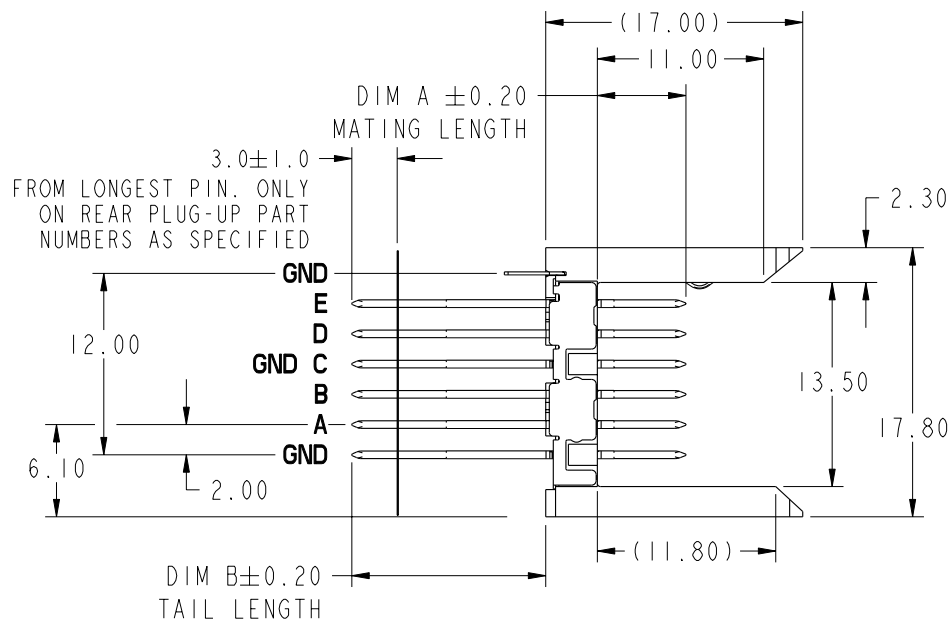
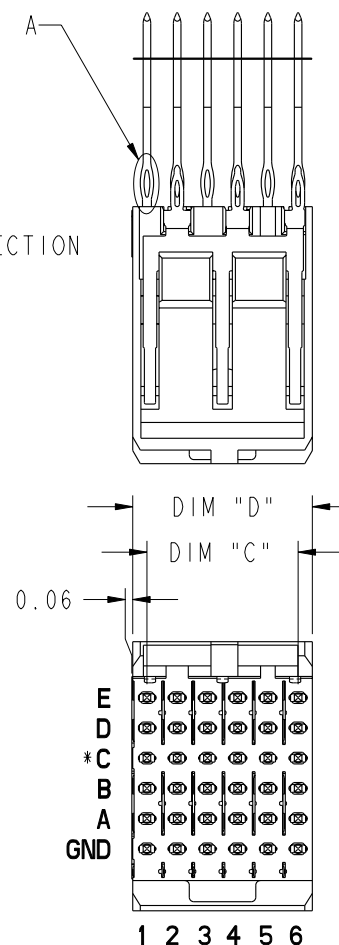
PRODUCT NUMBER

SEE BELOW AND TABLE ON SHEET 2

74977 - X YY ZZZ LF
 BASE NUMBER
 LEAD FREE (OPTIONAL)
 SPECIAL LOAD PATTERN
 SEE SHEETS 6-7
 SIZE, SEE SHEET 2
 PLATING PERFORMANCE
 LEVEL, SEE SHEET 2



DETAIL A
 SCALE 4:1
 SEE NOTE 16



*ROW C INFORMATION

ODD NUMBER COLUMNS WITHIN ROW C ARE COMMONED
 TO GROUND INTERNALLY WITHIN THE HOUSING. THE
 EVEN NUMBER COLUMNS WITHIN ROW C ARE NOT.
 FOR MAXIMUM PERFORMANCE IT IS RECOMMENDED THESE
 EVEN COLUMNS BE GROUND COMMONED WITHIN PCB.
 SEE NOTE 13.

mat'l code SEE NOTE 5				tolerances unless otherwise specified				CUSTOMER		FCI	
ltr	ecn no.	dr	date	linear	0.X ±0.1	projection		COPY		www.fciconnect.com	
Y	V06-0544	DCH	2006-06-09	linear	0.XX ±.05						
AA	V07-0167	DCH	2007-03-19	linear	.XXX ±.020						
AB	V07-0677	HTB	2007-11-14	angles	0° ±2°						
AC	V08-0008	LP	2008-1-22	dr	K. BELL 2000-03-29						
-	-	-	-	engr	M. HAHN 2000-03-29						
W	V05-0814	VS	2005-09-19	chr	M. HAHN 2000-03-29						
X	V06-0048	DAI	2006-02-08	appd	M. HAHN 2000-03-29						
sheet index	revision sheet	AC	AC	AC	AC	AC	AC	AC	AC	code	213
		1	2	3	4	5	6	7		sheet	1 of 7

Pro/E

cage code 22526

PDM: Rev:AC

STATUS: Released

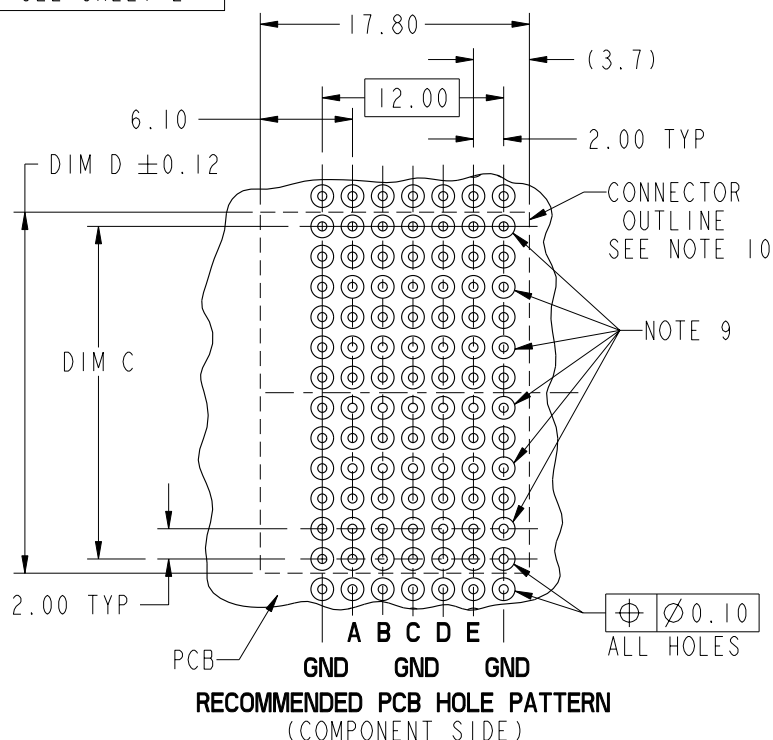
Printed: May 13, 2011



PRODUCT NUMBER	PLATING PERFORM- ANCE LEVEL	SHROUD TO USE FOR REAR PLUG-UP APPLICATIONS	LENGTH DIM D	PIN FIELD DIM C	CONNECTOR SIZE
74977-101ZZZ	TELCORDIA CO	84621-101	11.88	10.00	1 MOD
74977-101ZZZLF		84621-101LF			
74977-102ZZZ		84621-102	23.88	22.00	2 MOD
74977-102ZZZLF		84621-102LF			
74977-103ZZZ		84621-103	35.88	34.00	3 MOD
74977-103ZZZLF		84621-103LF			
74977-104ZZZ		84621-104	47.88	46.00	4 MOD
74977-104ZZZLF		84621-104LF			
74977-501ZZZ	TELCORDIA UE	84621-501	11.88	10.00	1 MOD
74977-501ZZZLF		84621-501LF			
74977-502ZZZ		84621-502	23.88	22.00	2 MOD
74977-502ZZZLF		84621-502LF			
74977-503ZZZ		84621-503	35.88	34.00	3 MOD
74977-503ZZZLF		84621-503LF			
74977-504ZZZ		84621-504	47.88	46.00	4 MOD
74977-504ZZZLF		84621-504LF			
74977-901ZZZ	TELCORDIA CO	84621-101	11.88	10.00	1 MOD
74977-901ZZZLF		84621-101LF			
74977-902ZZZ		84621-102	23.88	22.00	2 MOD
74977-902ZZZLF		84621-102LF			
74977-903ZZZ		84621-103	35.88	34.00	3 MOD
74977-903ZZZLF		84621-103LF			
74977-904ZZZ		84621-104	47.88	46.00	4 MOD
74977-904ZZZLF		84621-104LF			

mat'l code SEE NOTE 5				tolerances unless otherwise specified			CUSTOMER		 www.fciconnect.com				
ltr	ecn no.	dr	date	linear	0.X ±0.1			projection	 title VERTICAL SIGNAL HDR 5 ROW PRESS-FIT, SPECIAL LOAD, STD.				
AC					0.XX ±0.05								
					.XXX ±.020								
				angles	0° ±2°			 MM scale 2:1	product family		METRAL 2000		code
				dr	K. BELL	2000-03-29	A		size	dwg no	74977	sheet	213
				enrg	M. HAHN	2000-03-29							
				chr	M. HAHN	2000-03-29							
				appd	M. HAHN	2000-03-29							
sheet index		revision sheet											

SEE SHEET 2



PRESS-FIT HOLES	OPTION 1
HOLE DIAMETER AFTER PLATING	0.65-0.80
DRILLED HOLE	0.81-0.86 (0.85 DRILL)
COPPER PLATING	0.025 MIN
SnPb PLATING	0.005-0.015

SEE PRINT 58351 FOR ADDITIONAL
PCB INFORMATION

1. SEE APPLICATION SPECIFICATION GS-20-010 FOR INFORMATION ON AVAILABLE TOOLING, CIRCUIT BOARD DESIGN CONSIDERATIONS, REPAIR PROCEDURES AND PRODUCT OFFERINGS.
2. SEE FCI PUBLICATION 950511-028 FOR "ELECTRICAL PERFORMANCE DATA FOR DIFFERENTIAL APPLICATIONS."
3. SEE FCI PUBLICATION 950511-029 FOR "ELECTRICAL PERFORMANCE DATA FOR SINGLE-ENDED APPLICATION."
4. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS AND TOLERANCES ARE IN ACCORDANCE WITH ASME Y14.5, 1994
5. HOUSING MATERIAL: LIQUID CRYSTAL POLYMER, 30% GLASS FILLED, FLAME RETARDANT PER UL 94-V0.
PIN MATERIAL: PHOSPHOR BRONZE
GROUND SPRING MATERIAL: PHOSPHOR BRONZE
STRIPLINE SHIELD MATERIAL: PHOSPHOR BRONZE
6. PLATING INFORMATION: PLATING ON CONTACT AREA MEETS THE PERFORMANCE LEVELS AS SHOWN IN TABLE ON SHEET 1. PLATING ON "LF" TAILS IS Sn. PLATING ON ALL OTHER TAILS IS SnPb.
7. DIMENSIONAL RESTRICTIONS OF PINS IN HEADERS.
DIM A : 5.0mm MIN, 8.0mm MAX FOR ROWS A-E
DIM A : 5.0mm MIN, 6.3mm MAX FOR ROW GND NEXT TO ROW A
DIM C : 5.0mm MIN, 8.0mm MAX FOR ROWS A-E
DIM C : 4.6mm MIN, 6.3mm MAX FOR ROW GND NEXT TO ROW A
8. THE MIN PCB THICKNESS FOR REAR PLUG-UP APPLICATIONS IS 2.9mm
SINCE THE COMPLAINT SECTIONS OF THE GROUND SPRING OF THE HEADER DIRECTLY OPPOSE THE GROUND SPRING OF THE SHROUD, THE MIN PCB THICKNESS FOR FRONT PLUG-UP ONLY APPLICATIONS IS 1.6mm.
9. THESE HOLES ARE NEEDED FOR REAR PLUG-UP DESIGNS USING A SHROUD AND MAY BE OMITTED FOR FRONT PLUG-UP ONLY DESIGNS.
10. THE 'CONNECTOR OUTLINE' IS THE MIN OUTLINE REQUIRED. TO DETERMINE THE OUTLINE NECESSARY TO PERMIT THE VARIOUS TYPES OF REPAIR OPERATIONS, SEE APPLICATION SPECIFICATION GS-20-010.
11. CURRENT RATING : 1 AMP PER PIN
12. TEMPERATURE RANGE : -55°C TO +105°C
13. FOR FRONT PLUG-UP APPLICATIONS, THE EVEN NUMBERED PINS IN ROW 'C' CAN BE USED FOR POWER AS WELL AS FOR GROUND. IF THE SURROUNDING PINS ARE NOT USED FOR POWER, THEN EACH PIN CAN CARRY 3 AMPS. IF THE SURROUNDING PINS ARE USED FOR POWER, THEN EACH PIN CAN CARRY 1 AMP. WHEN THE SURROUNDING PINS ARE USED ONLY FOR LOW SPEED SIGNALS, THEN THE EVEN NUMBERED 'C' ROW PINS CAN ALSO BE USED FOR LOW SPEED SIGNALS. THIS IS NOT TRUE FOR REAR PLUG-UP APPLICATIONS USING METRAL 2000 SHROUD AS IN THIS CASE ALL 'C' ROW PINS ARE COMMON TO GROUND.
14. THE PRODUCTS WHERE THE PART NUMBERS ENDS IN LF MEET EUROPEAN UNION DIRECTIVES AND OTHER COUNTRY REGULATIONS AS DESCRIBED IN GS-22-008.
ALL PRODUCTS WILL WITHSTAND EXPOSURE TO 260°C FOR 60 SECONDS IN A CONVECTION, INFRA-RED OR VAPOR PHASE REFLOW OVEN
15. FOR LEAD FREE PART NUMBERS ADD 'LF' SUFFIX. EXAMPLE: 74977-XYZZZLF
16. PIN TYPE IS AT THE MANUFACTURERS OPTION AND CAN BE EITHER BABY-H OR EYE OF THE NEEDLE STYLE

[illegible]

Pro/E

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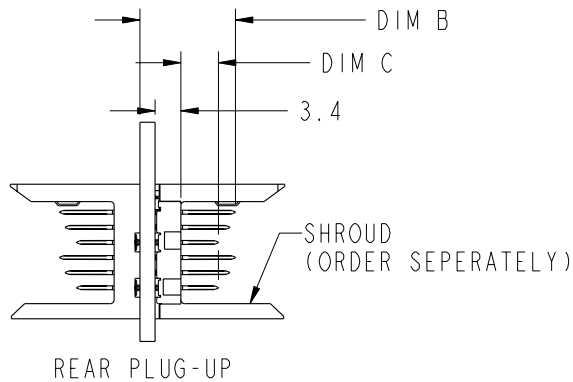
cage code	22526
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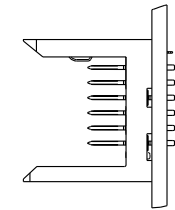


PIN NO.	DIM A MATING LENGTH	DIM B TAIL LENGTH	PCB THICKNESS RANGE ACCOMMODATED BY PIN'S TAIL LENGTH				
			WHEN MATING TO A 73981 OR 84688 SERIES RECEPTACLE		WHEN MATING TO A 52057 SERIES METRAL 4000 RECEPTACLE		
			ROWS A,B,C,D,E	GROUND ROW	ROWS:A,B,D,E	ROW C	GROUND ROW
01*	5.00	4.30	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN
22		12.20	2.95 - 3.80	2.95 - 4.20	2.95 - 3.80	2.95 - 3.80	2.95 - 4.20
30		12.95	2.95 - 4.55	3.25 - 4.95	2.95 - 4.55	2.95 - 4.55	3.25 - 4.95
05		13.70	2.95 - 5.30	4.00 - 5.70	3.30 - 5.30	2.95 - 5.30	4.00 - 5.70
35		14.45	3.05 - 6.05	4.75 - 6.45	4.05 - 6.05	3.05 - 6.05	4.75 - 6.45
48		15.20	3.80 - 6.80	5.50 - 7.20	4.80 - 6.80	3.80 - 6.80	5.50 - 7.20
40		15.70	4.30 - 7.30	6.00 - 7.70	5.30 - 7.30	4.30 - 7.30	6.00 - 7.70
65		16.40	5.00 - 8.00	6.70 - 8.40	6.00 - 8.00	5.00 - 8.00	6.70 - 8.40
09		17.10	5.70 - 8.70	7.40 - 9.10	6.70 - 8.70	5.70 - 8.70	7.40 - 9.10
02*	5.75	4.30	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN
44		12.20	2.95 - 3.80	2.95 - 4.20	2.95 - 3.80	2.95 - 3.80	2.95 - 4.20
31		12.95	2.95 - 4.55	3.25 - 4.95	2.95 - 4.55	2.95 - 4.55	3.25 - 4.95
06		13.70	2.95 - 5.30	4.00 - 5.70	3.30 - 5.30	2.95 - 5.30	4.00 - 5.70
36		14.45	3.05 - 6.05	4.75 - 6.45	4.05 - 6.05	3.05 - 6.05	4.75 - 6.45
49		15.20	3.80 - 6.80	5.50 - 7.20	4.80 - 6.80	3.80 - 6.80	5.50 - 7.20
25		15.70	4.30 - 7.30	6.00 - 7.70	5.30 - 7.30	4.30 - 7.30	6.00 - 7.70
66		16.40	5.00 - 8.00	6.70 - 8.40	6.00 - 8.00	5.00 - 8.00	6.70 - 8.40
10		17.10	5.70 - 8.70	7.40 - 9.10	6.70 - 8.70	5.70 - 8.70	7.40 - 9.10
03*	6.50	4.30	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN
45		12.20	2.95 - 3.80	2.95 - 4.20	2.95 - 3.80	2.95 - 3.80	2.95 - 4.20
32		12.95	2.95 - 4.55	3.25 - 4.95	2.95 - 4.55	2.95 - 4.55	3.25 - 4.95
07		13.70	2.95 - 5.30	4.00 - 5.70	3.30 - 5.30	2.95 - 5.30	4.00 - 5.70
37		14.45	3.05 - 6.05	4.75 - 6.45	4.05 - 6.05	3.05 - 6.05	4.75 - 6.45
50		15.20	3.80 - 6.80	5.50 - 7.20	4.80 - 6.80	3.80 - 6.80	5.50 - 7.20
41		15.70	4.30 - 7.30	6.00 - 7.70	5.30 - 7.30	4.30 - 7.30	6.00 - 7.70
24		16.40	5.00 - 8.00	6.70 - 8.40	6.00 - 8.00	5.00 - 8.00	6.70 - 8.40
11		17.10	5.70 - 8.70	7.40 - 9.10	6.70 - 8.70	5.70 - 8.70	7.40 - 9.10

mat'l code SEE NOTE 5				tolerances unless otherwise specified		CUSTOMER		www.fciconnect.com	
ltr	ecn no.	dr	date	linear	0.X ±0.1	projection		title	VERTICAL SIGNAL HDR 5 ROW PRESS-FIT, SPECIAL LOAD, STD.
AC					0.XX ±0.05				
					.XXX ±.020				
				angles	0° ±2°		product family	METRAL 2000	code
				dr	K. BELL 2000-03-29				
				engr	M. HAHN 2000-03-29				
				chr	M. HAHN 2000-03-29	scale	A	size	dwg no
				appd	M. HAHN 2000-03-29				
sheet index	revision sheet								



PIN NO.	DIM A MATING LENGTH	DIM B TAIL LENGTH	PCB THICKNESS RANGE ACCOMMODATED BY PIN LENGTH				
			WHEN MATING TO A 73981 OR 84688 SERIES RECEPTACLE		WHEN MATING TO A 52057 SERIES METRAL 4000 RECEPTACLE		
			ROWS A,B,C,D,E	GROUND ROW	ROWS:A,B,D,E	ROW C	GROUND ROW
04*	7.25	4.30	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN
46		12.20	2.95 - 3.80	2.95 - 4.20	2.95 - 3.80	2.95 - 3.80	2.95 - 4.20
33		12.95	2.95 - 4.55	3.25 - 4.95	2.95 - 4.55	2.95 - 4.55	3.25 - 4.95
08		13.70	2.95 - 5.30	4.00 - 5.70	3.30 - 5.30	2.95 - 5.30	4.00 - 5.70
38		14.45	3.05 - 6.05	4.75 - 6.45	4.05 - 6.05	3.05 - 6.05	4.75 - 6.45
51		15.20	3.80 - 6.80	5.50 - 7.20	4.80 - 6.80	3.80 - 6.80	5.50 - 7.20
42		15.70	4.30 - 7.30	6.00 - 7.70	5.30 - 7.30	4.30 - 7.30	6.00 - 7.70
67		16.40	5.00 - 8.00	6.70 - 8.40	6.00 - 8.00	5.00 - 8.00	6.70 - 8.40
12	8.00	17.10	5.70 - 8.70	7.40 - 9.10	6.70 - 8.70	5.70 - 8.70	7.40 - 9.10
19*		4.30	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN	1.60 MIN
47		12.20	2.95 - 3.80	2.95 - 4.20	2.95 - 3.80	2.95 - 3.80	2.95 - 4.20
34		12.95	2.95 - 4.55	3.25 - 4.95	2.95 - 4.55	2.95 - 4.55	3.25 - 4.95
20		13.70	2.95 - 5.30	4.00 - 5.70	3.30 - 5.30	2.95 - 5.30	4.00 - 5.70
39		14.45	3.05 - 6.05	4.75 - 6.45	4.05 - 6.05	3.05 - 6.05	4.75 - 6.45
52		15.20	3.80 - 6.80	5.50 - 7.20	4.80 - 6.80	3.80 - 6.80	5.50 - 7.20
43		15.70	4.30 - 7.30	6.00 - 7.70	5.30 - 7.30	4.30 - 7.30	6.00 - 7.70
68		16.40	5.00 - 8.00	6.70 - 8.40	6.00 - 8.00	5.00 - 8.00	6.70 - 8.40
21		17.10	5.70 - 8.70	7.40 - 9.10	6.70 - 8.70	5.70 - 8.70	7.40 - 9.10



STUB MOUNT

mat'l code SEE NOTE 5				tolerances unless otherwise specified		CUSTOMER		FCI www.fciconnect.com	
ltr	ecn no.	dr	date	linear	0.X ±0.1	projection	COPY	title VERTICAL SIGNAL HDR 5 ROW PRESS-FIT, SPECIAL LOAD, STD.	product family METRAL 2000
AC					0.XX ±0.05				
					.XXX ±.020				
				angles	0° ±2°	MM scale 1:1	A	size 74977	code 213 sheet 5
				dr	K. BELL 2000-03-29				
				enrg	M. HAHN 2000-03-29				
				chr	M. HAHN 2000-03-29	cage code 22526	3	4	B
				appd	M. HAHN 2000-03-29				
sheet index	revision sheet								

Pro/E

PDM: Rev:AC

STATUS: Released Printed: May 13, 2011



SPECIAL LOAD PATTERNS		
PRODUCT #	ROW	PIN CODES
74977-XY001 SEE NOTE 15 LEAD FREE OPTION	E	01
	D	
	C	
	B	
	A	
	GND	
74977-XY002 *RPU SEE NOTE 15 LEAD FREE OPTION	E	22
	D	
	C	
	B	
	A	
	GND	
74977-XY003 *RPU SEE NOTE 15 LEAD FREE OPTION	E	30
	D	
	C	
	B	
	A	
	GND	
74977-XY011 SEE NOTE 15 LEAD FREE OPTION	E	02
	D	
	C	
	B	
	A	
	GND	
74977-XY012 *RPU SEE NOTE 15 LEAD FREE OPTION	E	44
	D	
	C	
	B	
	A	
	GND	
74977-XY012 *RPU SEE NOTE 15 LEAD FREE OPTION	E	22
	D	
	C	
	B	
	A	
	GND	

* REAR PLUG-UP PART NUMBER

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
2.95 TO 3.80mm

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
3.25 TO 4.55mm

PCB THICKNESS RANGE
FOR REAR PLUG UP
APPLICATIONS 2.95 TO 3.80mm

SPECIAL LOAD PATTERNS		
PRODUCT #	ROW	PIN CODES
74977-XY013 *RPU SEE NOTE 15 LEAD FREE OPTION	E	06
	D	
	C	
	B	
	A	
	GND	
74977-XY021 SEE NOTE 15 LEAD FREE OPTION	E	03
	D	
	C	
	B	
	A	
	GND	
74977-XY050 SEE NOTE 15 LEAD FREE OPTION	E	02
	D	
	C	
	B	
	A	
	GND	
74977-XY051 *RPU SEE NOTE 15 LEAD FREE OPTION	E	25
	D	
	C	
	B	
	A	
	GND	

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
3.25 TO 4.55mm

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
5.50 TO 7.20mm

mat'l code SEE NOTE 5				tolerances unless otherwise specified		CUSTOMER		FCI www.fciconnect.com	
ltr	ecr no.	dr	date	linear	0.X ± 0.1		projection	COPY	
AC					0.XX ± 0.05				
					.XXX ± .020				
				angles	0° ± 2°			title VERTICAL SIGNAL HDR 5 ROW PRESS-FIT, SPECIAL LOAD, STD.	
				dr	K. BELL	2000-03-29		product family METRAL 2000	
				enrg	M. HAHN	2000-03-29		code 213	
				chr	M. HAHN	2000-03-29		size	
				appd	M. HAHN	2000-03-29		dwg no 74977	
sheet index		revision sheet				scale 1:1		sheet 6	



SPECIAL LOAD PATTERNS		
PRODUCT #	ROW	PIN CODES
74977-XY052 SEE NOTE 15 LEAD FREE OPTION	E	01
	D	
	C	03
	B	01
	A	
	GND	
74977-XY053 SEE NOTE 15 LEAD FREE OPTION	E	02
	D	
	C	
	B	
	A	
	GND	-
74977-XY054 *RPU SEE NOTE 15 LEAD FREE OPTION	E	25
	D	
	C	
	B	
	A	
	GND	-
74977-XY055 *RPU SEE NOTE 15 LEAD FREE OPTION	E	06
	D	
	C	
	B	
	A	
	GND	02

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
*4.30 TO 7.30mm

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
*2.95 TO 5.30mm

*REAR PLUG-UP PART NUMBER
WITH PIN ALIGNER
***REAR PLUG-UP PART NUMBER
WITHOUT PIN ALIGNER

SPECIAL LOAD PATTERNS		
PRODUCT #	ROW	PIN CODES
74977-XY056 *RPU SEE NOTE 15 LEAD FREE OPTION	E	22
	D	
	C	45
	B	22
	A	
	GND	
74977-XY057 SEE NOTE 15 LEAD FREE OPTION	E	02
	D	
	C	
	B	
	A	
	GND	02
74977-XY058 ***RPU SEE NOTE 15 LEAD FREE OPTION	E	22
	D	
	C	45
	B	22
	A	
	GND	
74977-XY059 SEE NOTE 15 LEAD FREE OPTION	E	03
	D	19
	C	
	B	03
	A	
	GND	02

PCB THICKNESS
RANGE FOR REAR
PLUG UP
APPLICATIONS
2.95 TO 3.80mm

mat'l code SEE SHEET 5				tolerances unless otherwise specified		CUSTOMER		FCI www.fciconnect.com	
ltr	ecn no.	dr	date	linear	0.X ±0.1	projection	COPY	title VERTICAL SIGNAL HDR 5 ROW PRESS-FIT, SPECIAL LOAD, STD.	product family METRAL 2000
AC					0.XX ±0.05				
					.XXX ±.020				
				angles	0° ±2°	MM scale 1:1	A	size 74977	code 213 sheet 7
				dr	K. BELL 2000-03-29				
				enrg	M. HAHN 2000-03-29				
				chr	M. HAHN 2000-03-29	scale 1:1	A	size 74977	code 213 sheet 7
				appd	M. HAHN 2000-03-29				
sheet index	revision sheet								

cage code 22526

Pro/E

PDM: Rev:AC

STATUS: Released Printed: May 13, 2011

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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