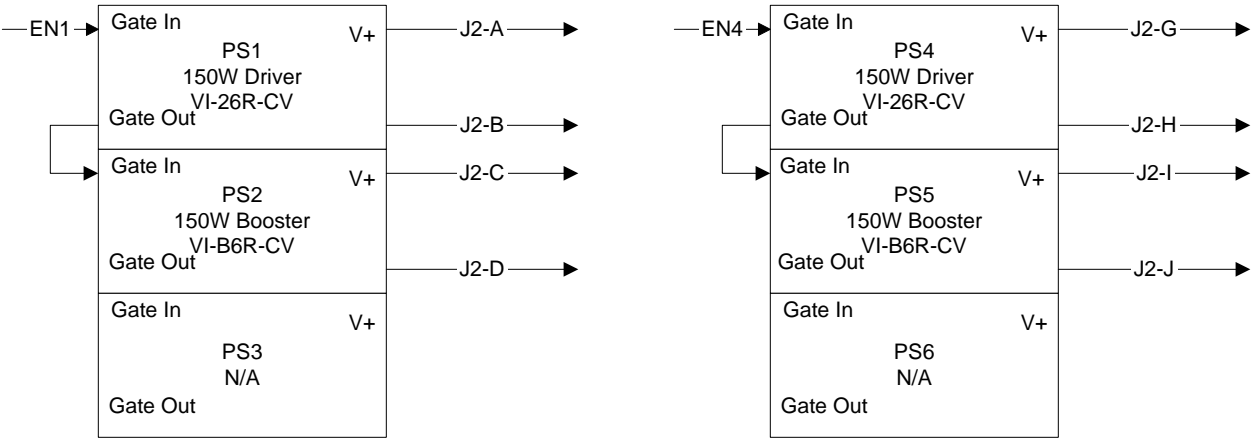


# MuTr Safety Review Supporting Documentation

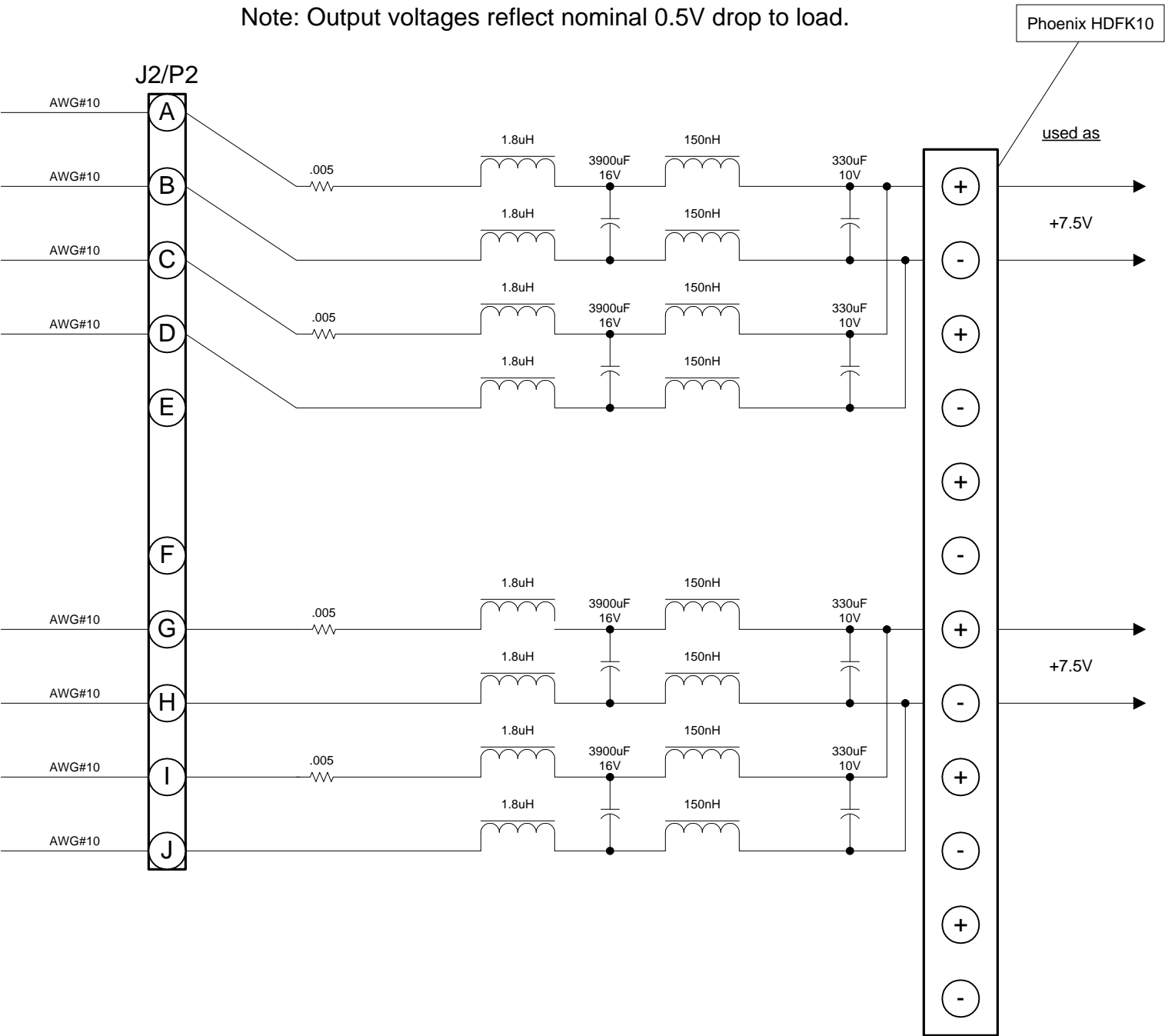
<b><u>Contents</u></b>	<b><u>Page</u></b>
 <i><b>Drawings</b></i>	
LVHP Supply – variant M	2
LVHP Supply – variant N	3
 <i><b>Data Sheets</b></i>	
Phoenix Contact HDFK10	4
Molex Mini-Fit Sr. connectors	5
Raychem fuses	8
Alpha wire 5616B1201	15
Phoenix Contact Combicon header	17
Molex HCS-125	19
Amphenol Skewclear cable	21
Alpha wire plenum rated multipair	24
AMP circular plastic connectors	26
Lecroy 1469 HV Supply	28
Judd wire Flexrad cable	33
Belden shielded Mass-Ter cable (cathode readout)	34

**LVHP Variant "M"**

MuTr - 10 Slots

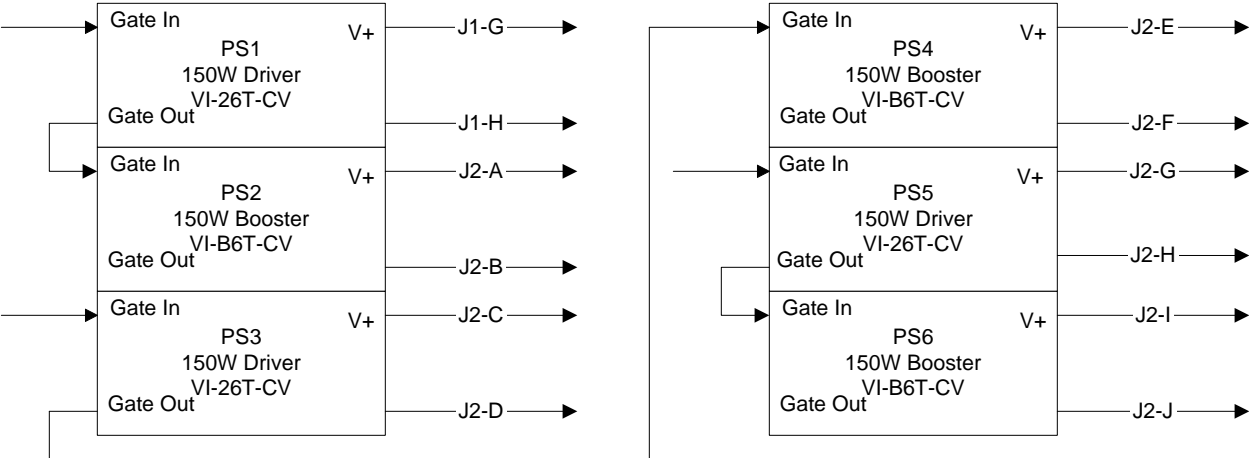


Note: Output voltages reflect nominal 0.5V drop to load.

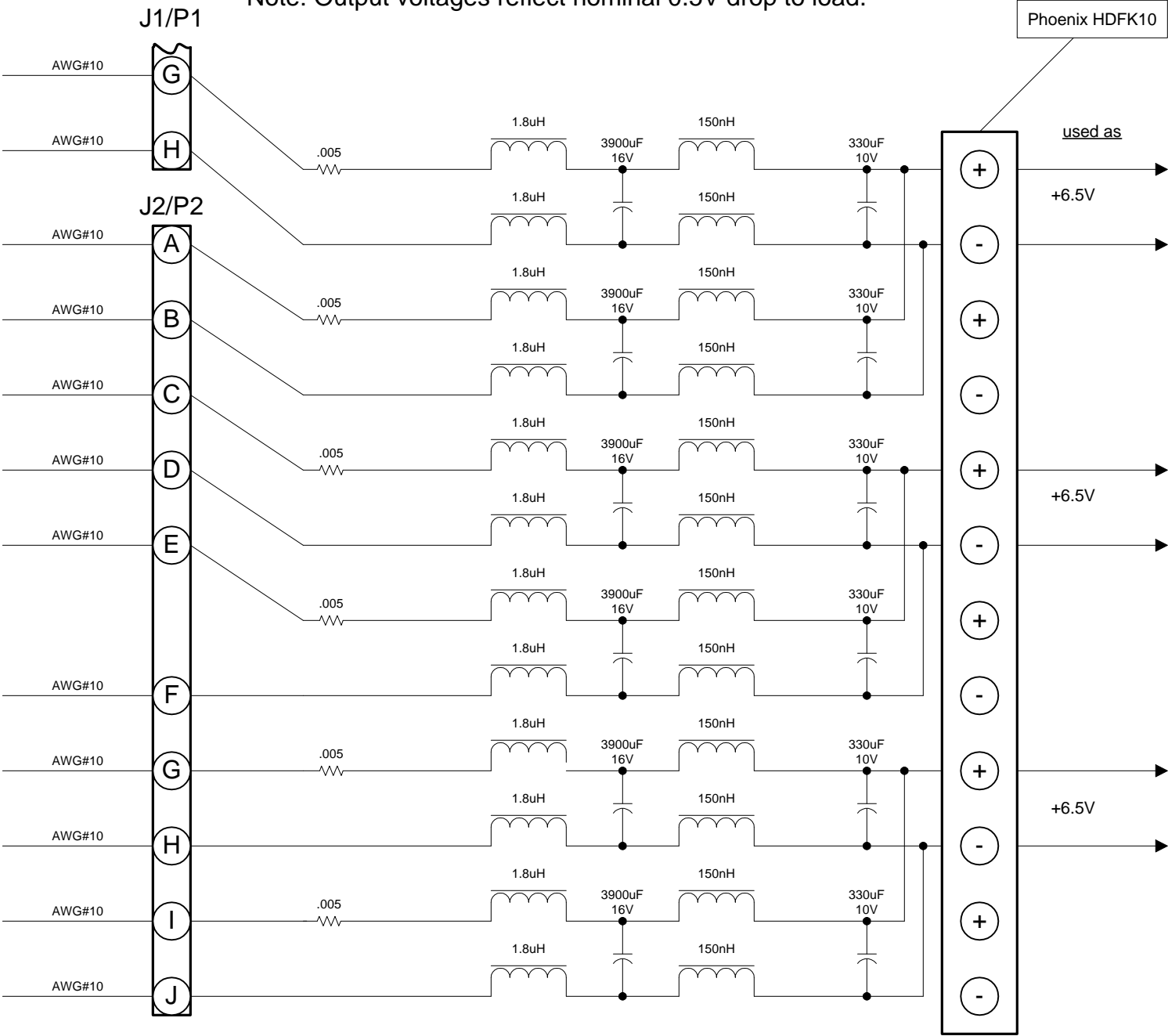


**LVHP Variant "N"**

**MuTr GLink - 3 Slots**



Note: Output voltages reflect nominal 0.5V drop to load.



## PRODUCTS **(IEC) Terminal Blocks**

### Panel Feed Through Terminal Blocks

#### Types

- [Panel Feed Through](#)
- [Potting Panel Feed Through](#)
- [High Current Panel Feed Through](#)

*Information listed below is per UL ratings*

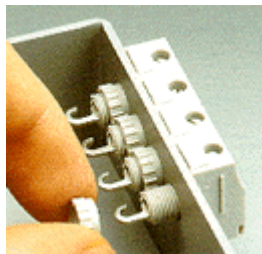
#### Panel Feed Through

Product	AWG	Width	V	A
DFK	28-12	6.1	300	15
DFK 4	30-10	6.2	300	30
DFK 4-Si	30-10	12.2	300	8
DFK 4-PE	30-10	6.2	300	8
DFK/FA-2.8	28-12	6.1	300	15
DFK-2.8-Front 2.5	28-12	6.2	300	15
DFK 5-9.5	30-10	9.5	600	30



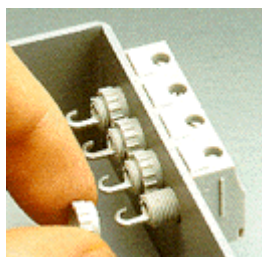
#### Potting Panel Feed Through

Product	AWG	Width	V	A
VDFK	30-10	10.0	300	30
VDFK 4/K	30-10	10.0	300	30
VDFK 6	26-8	10.0	600	50
VDFK 6/K	26-8	10.0	600	50



#### High Current Panel Feed Through

Product	AWG	Width	V	A
HDFKV 4	10-30	8.1	300	30
HDFKV 10	24-6	10.1	300	65
HDFKV 10-Twin	24-6	10.1	300	65
HDFKV 25-TWIN	8-2	15.1	600	115
HDFKV 16	20-4	12.1	600	101
HDFKV 25	8-2	15.1	600	115
HDFK 50	6-1/0	18.1	600	150
HDFKV 50	6-1/0	18.1	600	150



To receive PHOENIX CONTACT literature, use our [electronic request form](#)

Return to the [\(IEC\) Terminal Blocks](#) Page

## FEATURES AND SPECIFICATIONS

### Features and Benefits

- High current
- Fully polarized
- Positive locks
- Low engagement force
- Wire-to-wire, wire-to-board

### Reference Information

Product Specification: PS-42815-0001

Packaging: Bag

UL File No.: E29179

CSA File No.: LR19980

TUV License No.: R9751144

Mates With: 42818 plug, 42819 and 42820 headers

Use With: 42815 terminal

Designed In: Millimeters

### Electrical

Voltage: 600V

Current: 49.0A max.

### Mechanical

Contact Insertion Force: 5.0kg max.

Contact Retention to Housing: 9.0kg min.

Wire Pull-Out Force: 12 AWG—31.0kg

Insertion Force to PCB: 2.0kg max.

Mating Force: 1.0kg max.

Unmating Force: 0.5kg min.

Normal Force: 200g min.

Durability: 30 cycles

### Physical

Housing: Polyester

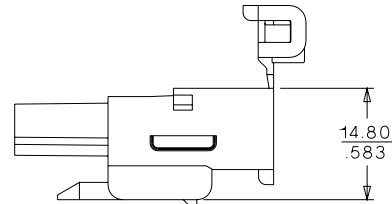
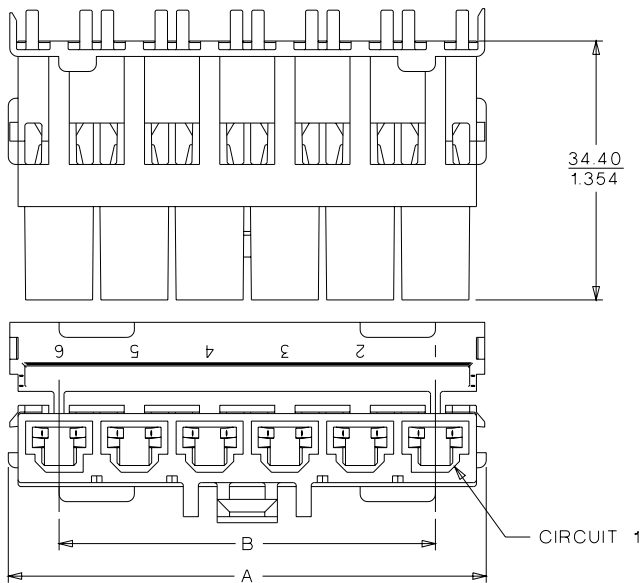
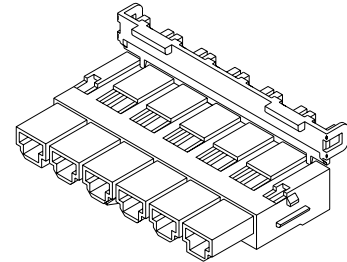
Contact: Copper Alloy

Plating: Tin/Lead over Nickel

Temperature: -40 to +105°C

# molex® 10.00mm (.393") Pitch Mini-Fit, Sr.™ Receptacle Housing

## 42816 Single Row



## ORDERING INFORMATION AND DIMENSIONS

Circuits	Order No.	Dimension	
		A	B
2	42816-0212	23.50 (.925)	10.00 (.393)
3	42816-0312	33.50 (1.318)	20.00 (.787)
4	42816-0412	43.50 (1.712)	30.00 (1.181)
5	42816-0512	53.50 (2.106)	40.00 (1.574)
6	42816-0612	63.50 (2.499)	50.00 (1.968)

## FEATURES AND SPECIFICATIONS

### Features and Benefits

- High current
- Fully polarized
- Positive locks
- Low engagement force
- Wire-to-wire, wire-to-board

### Reference Information

Product Specification: PS-42815-0001  
 Packaging: Reel  
 UL File No.: E29179  
 CSA File No.: LR19980  
 TUV License No.: R9751144  
 Use With: 42816 and 43914 housings  
 Designed In: Millimeters

### Electrical

Voltage: 600V  
 Current: 49.0A max.  
 Contact Resistance: 1mΩ max.  
 Dielectric Withstanding Voltage: 1500V  
 Insulation Resistance: 1000 MΩ min.

### Mechanical

Contact Insertion Force: 5.0kg max.  
 Contact Retention to Housing: 9.0kg min.  
 Wire Pull-Out Force: 12 AWG—31.0kg  
 Insertion Force to PCB: 2.0kg max.  
 Mating Force: 1.0kg max.  
 Unmating Force: 0.5kg min.  
 Normal Force: 200g min.  
 Durability: 30 cycles

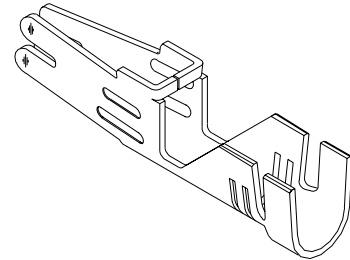
### Physical

Contact: Copper Alloy  
 Plating: Tin/Lead over Nickel  
 Temperature: -40 to +105°C

# molex® 10.00mm (.393") Pitch Mini-Fit, Sr.™ Terminal

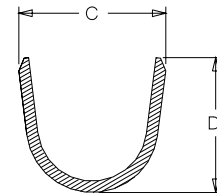
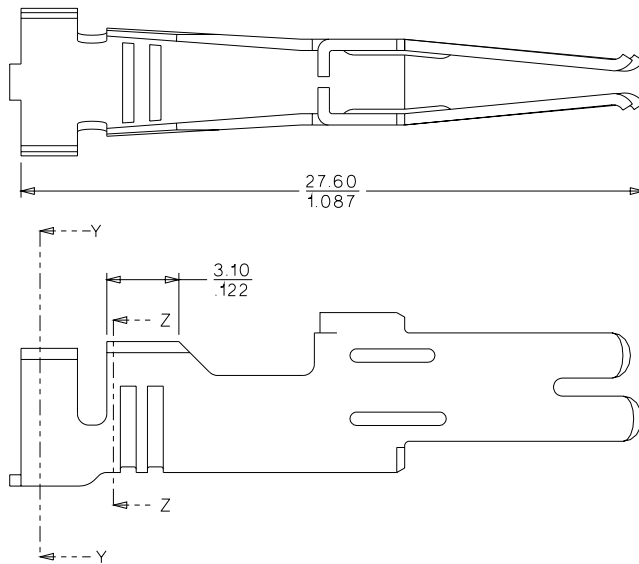
## 42815

## Female

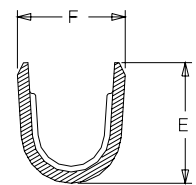
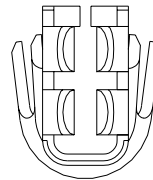


Power Connectors

K



SECTION Y-Y



SECTION Z-Z

## ORDERING INFORMATION AND DIMENSIONS

Order No.	Wire Size (AWG)	Dimension			
		C	D	E	F
42815-0011	12 and 10	5.90 (.232)	6.60 (.260)	6.10 (.240)	5.40 (.213)
42815-0031	8	6.00 (.236)	5.50 (.216)	7.42 (.292)	5.83 (.229)

## FEATURES AND SPECIFICATIONS

## Features and Benefits

- High current
- Fully polarized
- Positive locks
- Low engagement force
- Wire-to-wire, wire-to-board
- Metal board retention clip

## Reference Information

Product Specification: PS-42815-0001  
 Packaging: Tray  
 UL File No.: E29179  
 CSA File No.: LR19980  
 TUV License No.: R9751144  
 Mates With: 42816 housing  
 Designed In: Millimeters

## Electrical

Voltage: 600V  
 Current: 49.0A max.  
 Contact Resistance: 1mΩ max.  
 Dielectric Withstanding Voltage: 1500V  
 Insulation Resistance: 1000 MΩ min.

## Mechanical

Contact Insertion Force: 5.0kg max.  
 Contact Retention to Housing: 9.0kg min.  
 Wire Pull-Out Force: 12 AWG—31.0kg  
 Insertion Force to PCB: 2.0kg max.  
 Mating Force: 1.0kg max.  
 Unmating Force: 0.5kg min.  
 Normal Force: 200g min.  
 Durability: 30 cycles

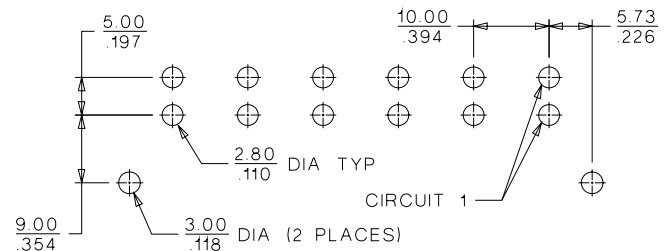
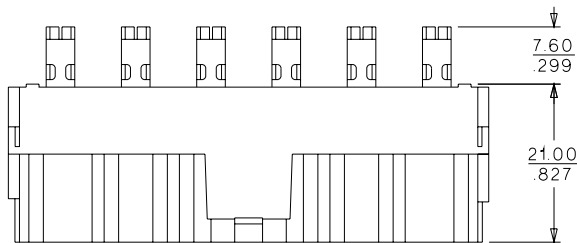
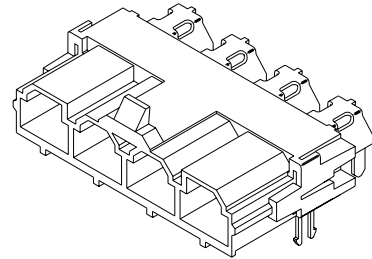
## Physical

Housing: Glass-filled, 4/6 nylon  
 Contact: Copper Alloy  
 Plating: Tin/Lead over Nickel  
 Temperature: -40 to +105°C

# molex® 10.00mm (.393") Pitch Mini-Fit, Sr.™ Header

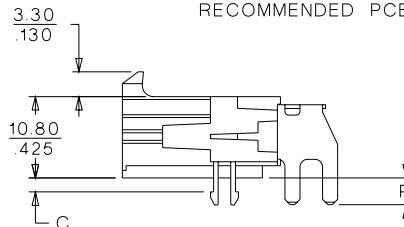
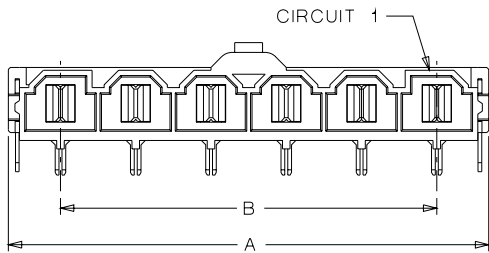
42820

## Right Angle, Single Row Metal Clip Mount SMC



PCB LAYOUT: COMPONENT SIDE

RECOMMENDED PCB THICKNESS: SEE TABLE



## ORDERING INFORMATION AND DIMENSIONS

Circuits	Order No.	Dimension			
		A	B	C	P
2	42820-2212	23.82 (.937)	10.00 (.393)	1.80 (.070)	3.50 (.137)
	42820-2222			2.60 (.102)	5.10 (.200)
	42820-2232			3.40 (.133)	5.10 (.200)
3	42820-3212	33.82 (1.331)	20.00 (.787)	1.80 (.070)	3.50 (.137)
	42820-3222			2.60 (.102)	5.10 (.200)
	42820-3232			3.40 (.133)	5.10 (.200)
4	42820-4212	43.82 (1.725)	30.00 (1.181)	1.80 (.070)	3.50 (.137)
	42820-4222			2.60 (.102)	5.10 (.200)
	42820-4232			3.40 (.133)	5.10 (.200)
5	42820-5212	53.82 (2.118)	40.00 (1.574)	1.80 (.070)	3.50 (.137)
	42820-5222			2.60 (.102)	5.10 (.200)
	42820-5232			3.40 (.133)	5.10 (.200)
6	42820-6212	63.82 (2.512)	50.00 (1.968)	1.80 (.070)	3.50 (.137)
	42820-6222			2.60 (.102)	5.10 (.200)
	42820-6232			3.40 (.133)	5.10 (.200)

**Overview**

Raychem's families of PolySwitch resettable fuses continue to expand to include devices with wider voltage, current, and temperature ranges. Fifteen standard product families of PolySwitch devices are available in leaded, axial, and surface-mount configurations. Many have received UL component recognition and meet the requirements of other agencies, including Bellcore, CSA, TÜV, and ITU-T.

**PolySwitch devices are used in a wide variety of applications:****Automotive**

- Actuators and medium motors
- Trace protection
- Wire harnesses

**Battery Protection**

- Lithium cells and battery packs
- Rechargeable battery packs

**Computers and Peripherals**

- DDC.2 computer video ports
- Hard disk drives/storage devices
- IEEE1394 (FireWire) computer and video ports
- Mouse and keyboard ports
- USB (Universal Serial Bus) ports
- PC cards and sockets
- SCSI add-on cards

**General Electronics**

- Loudspeakers
- Medical electronics
- MOSFET device protection
- Motors, fans, and blowers
- POS equipment
- Process and industrial controls
- Satellite video receivers
- Security and fire alarm systems
- Test and measurement equipment
- Transformers

**Telecommunications**

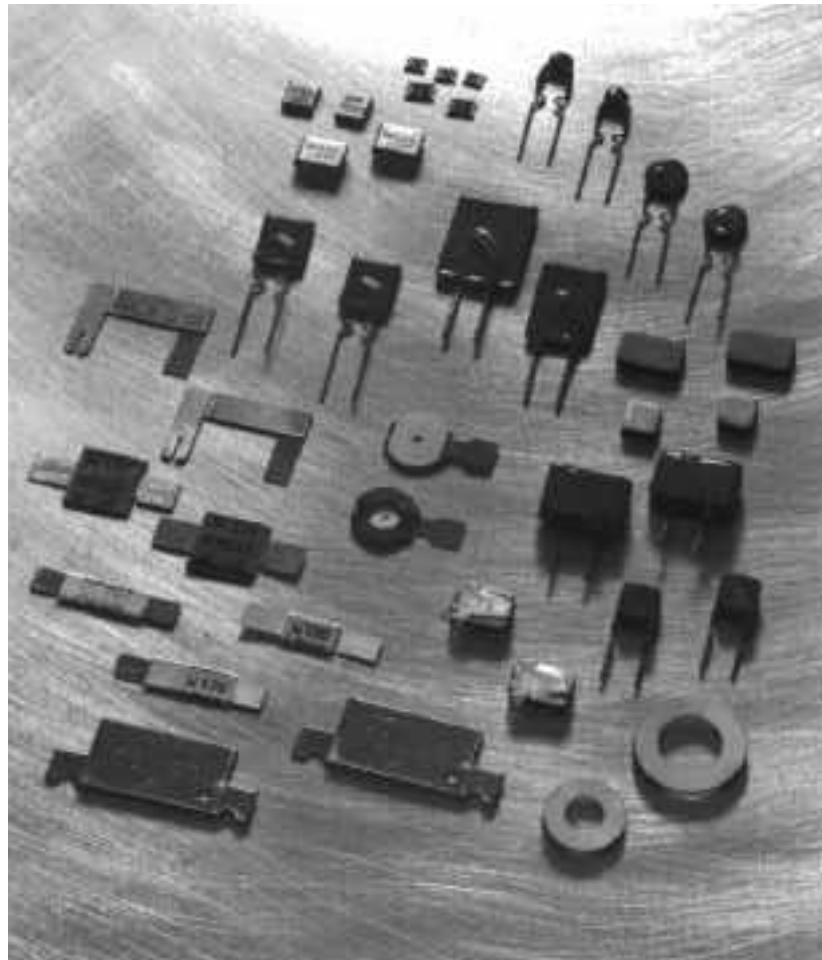
- Customer premise equipment/UL1459
- ITU-T recommendations
- MDF modules/primary protection modules
- Network equipment
- PBX and key telephone systems

**PolySwitch Resettable Fuses****Benefits:**

- Reduced warranty and service costs
- Increased reliability
- Superior shock and vibration withstand
- Automated insertion
- Wide variety of applications

**Features:**

- Remotely resettable
- Testable
- Solid-state
- Tape and reel
- Variety of form factors
- Low resistance

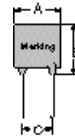


Standard PolySwitch product families include RGE, RTE, RUE, RXE, SMD, miniSMD, TS, BBR, TC, TR, LR4, LTP, SRP, TAC, and VTP devices. In addition, special devices, such as speaker devices (SPK), terminal devices (TD) and custom chip devices, can be manufactured to meet performance requirements that could be outside of the performance band of the standard products listed in this short-form catalog. Please contact a PolySwitch Customer Service representative to discuss your special product needs.



## RGE

This product line can be used in a wide variety of automotive, computer and general electronics applications. The RGE devices feature high current carrying capability (up to 14 amps) in a small package with fast trip times.



Lead size  
RGE300-RGE1100  
Ø 0.81 (0.032)  
20 AWG

Lead size  
RGE1200-RGE1400  
Ø 1.0 (0.04)  
18 AWG

Part number	$I_H^*$ (A)	$V^{**}$ max. (V)	$I$ max. (A)	$R_1$ max. (Ω)	Agency recognition	Dimensions (millimeters/inches)		
						A (max.)	B (max.)	C (nom.)
RGE300	3.00	16	100	0.105	UL, TÜV, CSA	7.1 (0.28)	10.2 (0.40)	5.1 (0.20)
RGE400	4.00	16	100	0.063	UL, TÜV, CSA	8.9 (0.35)	11.9 (0.47)	5.1 (0.20)
RGE500	5.00	16	100	0.044	UL, TÜV, CSA	10.4 (0.41)	13.5 (0.53)	5.1 (0.20)
RGE600	6.00	16	100	0.030	UL, TÜV, CSA	10.7 (0.42)	16.3 (0.64)	5.1 (0.20)
RGE700	7.00	16	100	0.021	UL, TÜV, CSA	11.2 (0.44)	18.8 (0.74)	5.1 (0.20)
RGE800	8.00	16	100	0.018	UL, TÜV, CSA	12.7 (0.50)	20.9 (0.82)	5.1 (0.20)
RGE900	9.00	16	100	0.015	UL, TÜV, CSA	14.0 (0.55)	20.8 (0.82)	5.1 (0.20)
RGE1000	10.00	16	100	0.012	UL, TÜV, CSA	14.0 (0.55)	26.0 (1.02)	5.1 (0.20)
RGE1100	11.00	16	100	0.010	UL, TÜV, CSA	17.5 (0.69)	25.1 (0.99)	5.1 (0.20)
RGE1200	12.00	16	100	0.009	UL, TÜV, CSA	17.5 (0.69)	30.0 (1.18)	10.2 (0.40)
RGE1400	14.00	16	100	0.008	UL, TÜV, CSA	27.9 (1.10)	30.0 (1.18)	10.2 (0.40)

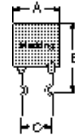
\*Hold current 25°C.

\*\*Device may withstand higher interrupt current at lower voltages. Each application will need to be individually evaluated.

## RUE

These devices are designed to be used in a wide variety of general electronics applications. RUE devices complement the RXE line by providing a smaller form factor with lower resistance and higher hold current capability (up to 9 amps).

RUE090-RUE250



Lead size  
RUE090-250  
Ø 0.51 (0.020)  
24 AWG

RUE300-RUE900



Lead size  
RUE300-900  
Ø 0.81 (0.032)  
20 AWG

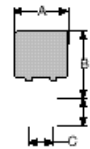
Part number	$I_H^*$ (A)	$V^{**}$ max. (V)	$I$ max. (A)	$R_1$ max. (Ω)	Agency recognition	Dimensions (millimeters/inches)		
						A (max.)	B (max.)	C (nom.)
RUE090	0.90	30	40	0.22	UL, TÜV, CSA	7.4 (0.29)	12.2 (0.48)	5.1 (0.20)
RUE110	1.10	30	40	0.17	UL, TÜV, CSA	7.4 (0.29)	14.2 (0.56)	5.1 (0.20)
RUE135	1.35	30	40	0.13	UL, TÜV, CSA	8.9 (0.35)	13.5 (0.53)	5.1 (0.20)
RUE160	1.60	30	40	0.11	UL, TÜV, CSA	8.9 (0.35)	15.2 (0.60)	5.1 (0.20)
RUE185	1.85	30	40	0.09	UL, TÜV, CSA	10.2 (0.40)	15.7 (0.62)	5.1 (0.20)
RUE250	2.50	30	40	0.07	UL, TÜV, CSA	11.4 (0.45)	18.3 (0.72)	5.1 (0.20)
RUE300	3.00	30	40	0.08	UL, TÜV, CSA	11.4 (0.45)	17.3 (0.68)	5.1 (0.20)
RUE400	4.00	30	40	0.05	UL, TÜV, CSA	14.0 (0.55)	20.1 (0.79)	5.1 (0.20)
RUE500	5.00	30	40	0.05	UL, TÜV, CSA	14.0 (0.55)	24.9 (0.98)	10.2 (0.40)
RUE600	6.00	30	40	0.04	UL, TÜV, CSA	16.5 (0.65)	24.9 (0.98)	10.2 (0.40)
RUE700	7.00	30	40	0.03	UL, TÜV, CSA	19.1 (0.75)	26.7 (1.05)	10.2 (0.40)
RUE800	8.00	30	40	0.02	UL, TÜV, CSA	21.6 (0.85)	29.2 (1.15)	10.2 (0.40)
RUE900	9.00	30	40	0.02	UL, TÜV, CSA	24.1 (0.95)	29.7 (1.17)	10.2 (0.40)

\*Hold current 20°C.

\*\*Device may withstand higher interrupt current at lower voltages. Each application will need to be individually evaluated.

## RTE

These devices are designed to meet the high current and voltage requirements of IEEE 1394 applications. With faster time-to-trip and smaller size, these devices help designers meet curcuit protection needs for high-power port protection.



Lead size  
Ø 0.51 (0.020)  
24 AWG

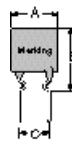
Part number	$I_H^*$ (A)	$V$ max. (V)	$I$ max. (A)	$R_1$ max. (Ω)	Agency recognition	Dimensions (millimeters/inches)		
						A (max.)	B (max.)	C (nom.)
New RTE120	1.20	33	40	0.180	pending	7.4 (0.29)	12.2 (0.48)	5.1 (0.20)
New RTE135	1.35	33	40	0.143	pending	7.4 (0.29)	14.2 (0.56)	5.1 (0.20)
New RTE190	1.90	33	40	0.092	pending	8.9 (0.35)	13.5 (0.53)	5.1 (0.20)

\*Hold current 20°C.

## RUSB

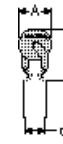
Engineered specifically for Universal Serial Bus (USB) applications these leaded devices deliver lower voltage drops than comparable leaded devices. Designed for both single port and multiport USB applications these devices are the first generation of leaded devices specifically for USB applications.

Figure 1



Lead size  
Ø 0.51 (0.020)  
24 AWG

Figure 2



Lead size  
Ø 0.51 (0.020)  
24 AWG

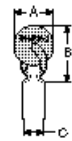
Part number	I <sub>H</sub> * (A)	Vmax. (Vdc)	I max. (A)	R <sub>1</sub> max. (Ω)	Agency recognition	Dimensions (millimeters/inches)			Fig.
						A (max.)	B (max.)	C (nom.)	
RUSB075	0.75	6	40	0.230	UL, TÜV, CSA	6.9 (0.27)	11.4 (0.45)	5.1 (0.20)	2
RUSB090	0.90	16	40	0.180	UL	7.4 (0.29)	12.2 (0.48)	5.1 (0.20)	1
RUSB110	1.10	16	40	0.140	UL	7.4 (0.29)	14.2 (0.56)	5.1 (0.20)	1
RUSB120	1.20	6	40	0.140	UL, TÜV, CSA	6.9 (0.27)	11.7 (0.46)	5.1 (0.20)	2
RUSB135	1.35	16	40	0.115	UL	8.9 (0.35)	13.5 (0.53)	5.1 (0.20)	1
RUSB160	1.60	16	40	0.110	UL	8.9 (0.35)	15.2 (0.60)	5.1 (0.20)	1
RUSB185	1.85	16	40	0.085	UL	10.2 (0.40)	15.7 (0.62)	5.1 (0.20)	1
RUSB250	2.50	16	40	0.060	UL	11.4 (0.45)	18.3 (0.72)	5.1 (0.20)	1

\*Hold current 20°C.

## RXE

These products function as a general-purpose line of resettable fuses and are well suited for power supplies, alarm systems, speakers, motors, and many other applications. Products range in hold currents from .10 amp to 3.75 amps and complement our RUE devices by providing a higher voltage rating.

RXE010–RXE090



I size  
310–090  
11 (0.020)  
16G

RXE110–RXE375



Lead size  
RXE110–375  
Ø 0.81 (0.032)  
20 AWG

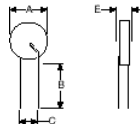
Part number	I <sub>H</sub> * (A)	V** max. (V)	I max. (A)	R <sub>1</sub> max. (Ω)	Agency recognition	Dimensions (millimeters/inches)			Fig.
						A (max.)	B (max.)	C (nom.)	
RXE010	0.10	60	40	7.50	UL, TÜV, CSA	7.4 (0.29)	12.7 (0.50)	5.1 (0.20)	2
RXE017	0.17	60	40	8.00	UL, TÜV, CSA	7.4 (0.29)	12.7 (0.50)	5.1 (0.20)	1
RXE020	0.20	60	40	4.40	UL, TÜV, CSA	7.4 (0.29)	12.2 (0.48)	5.1 (0.20)	1
RXE025	0.25	60	40	3.00	UL, TÜV, CSA	7.4 (0.29)	12.7 (0.50)	5.1 (0.20)	1
RXE030	0.30	60	40	2.10	UL, TÜV, CSA	7.4 (0.29)	13.0 (0.51)	5.1 (0.20)	1
RXE040	0.40	60	40	1.29	UL, TÜV, CSA	7.6 (0.30)	13.5 (0.53)	5.1 (0.20)	1
RXE050	0.50	60	40	1.17	UL, TÜV, CSA	7.9 (0.31)	13.7 (0.54)	5.1 (0.20)	1
RXE065	0.65	60	40	0.72	UL, TÜV, CSA	9.7 (0.38)	14.5 (0.57)	5.1 (0.20)	1
RXE075	0.75	60	40	0.60	UL, TÜV, CSA	10.4 (0.41)	15.2 (0.60)	5.1 (0.20)	1
RXE090	0.90	60	40	0.47	UL, TÜV, CSA	11.7 (0.46)	15.8 (0.62)	5.1 (0.20)	1
RXE110	1.10	60	40	0.38	UL, TÜV, CSA	13.0 (0.51)	18.0 (0.71)	5.1 (0.20)	1
RXE135	1.35	60	40	0.30	UL, TÜV, CSA	14.5 (0.57)	19.6 (0.77)	5.1 (0.20)	1
RXE160	1.60	60	40	0.22	UL, TÜV, CSA	16.3 (0.64)	21.3 (0.84)	5.1 (0.20)	1
RXE185	1.85	60	40	0.19	UL, TÜV, CSA	17.8 (0.70)	22.9 (0.90)	5.1 (0.20)	1
RXE250	2.50	60	40	0.13	UL, TÜV, CSA	21.3 (0.84)	26.4 (1.04)	10.2 (0.40)	1
RXE300	3.00	60	40	0.10	UL, TÜV, CSA	24.9 (0.98)	30.0 (1.18)	10.2 (0.40)	1
RXE375	3.75	60	40	0.08	UL, TÜV, CSA	28.5 (1.12)	33.5 (1.32)	10.2 (0.40)	1

\*Hold current 20°C.

\*\*Device may withstand higher interrupt current at lower voltages. Each application will need to be individually evaluated.

## BBR devices

This radial-leaded device provides overcurrent protection of the power tap in hybrid-coaxial applications. BBR devices are not intended for continuous utility line voltage operation (i.e. 120V or 240V).



Lead size  
Ø 0.81 (0.032)  
20 AWG

Part number	I <sub>H</sub> * (A)	Vmax. (V)	I max. (A)	R <sub>1</sub> max. (Ω)	Agency recognition	Dimensions (millimeters/inches)				
						A (max.)	B (min.)	C (max.)	D (max.)	E (max.)
New BBR450U	0.45	90	20	2.0	UL, CSA	10.2 (0.40)	7.6 (0.30)	5.8 (0.23)	—	3.0 (0.12)

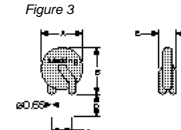
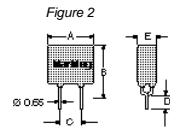
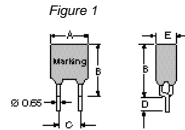
\*Hold current 20°C.

## TR

This product line provides radial-leaded devices that protect against short duration, high-voltage faults (250-600 Vrms) and are suitable for telecommunications applications.

TR devices are not intended for continuous utility line voltage operation (i.e. 120 V or 240 V).

Part number	IH* (A)	Max. operating voltage (Vdc)	V max. (Vrms)	I max. (A)	R max. initial ( $\Omega$ )	R <sub>1</sub> max. ( $\Omega$ )	Agency recognition
TR250-080U	0.080	60	250	3	20.0	33	
TR250-080T-B-1.0-0.125	0.080	60	250	3	22.0	33	
TR250-110U	0.110	60	250	3	9.0	16	
TR250-120U**	0.120	60	250	3	10.0	16	UL, CSA
TR250-120UT-B-0.5	0.120	60	250	3	12.0	16	
TR250-120**	0.120	60	250	3	8.0	16	UL, CSA
TR250-120T-RF-B-0.5	0.120	60	250	3	10.5	16	UL, CSA
TR250-120T-R1-B-0.5**	0.120	60	250	3	9.0	14	UL, CSA
TR250-120T-R2-B-0.5	0.120	60	250	3	10.5	16	UL, CSA
TR250-145U**	0.145	60	250	3	6.5	14	UL, CSA
TR250-145**	0.145	60	250	3	6.0	14	UL, CSA
TR250-145-RA-B-0.5	0.145	60	250	3	5.5	12	UL, CSA
TR250-180U**	0.180	60	250	10	2.0	4	UL, CSA
TR600-150**	0.150	60	600	3	12.0	22	UL, CSA
TR600-150-RA-B-0.5	0.150	60	600	3	10.0	20	UL, CSA
TR600-150-RB	0.150	60	600	3	12.0	22	UL, CSA
TR600-150-RB-B-0.5	0.150	60	600	3	12.0	22	UL, CSA
TR600-160**	0.160	60	600	3	10.0	18	UL, CSA
TR600-160-0.130	0.160	60	600	3	10.0	18	UL, CSA
TR600-160-RA-B-0.5-0.130**	0.160	60	600	3	7.0	14	UL, CSA



Dimensions (millimeters/inches)						
Part number	A (max.)	B (max.)	C (nom.)	D (min.)	E (max.)	Fig.
TR250-080U	4.80 (.200)	9.1 (.360)	5.00 (.197)	4.7 (.185)	3.80 (.150)	3
TR250-080T-B-1.0-0.125	5.30 (.21)	9.3 (.370)	5.00 (.197)	4.7 (.185)	3.80 (.150)	3
TR250-110U	5.30 (.210)	9.4 (.370)	5.00 (.197)	4.7 (.185)	3.80 (.150)	3
TR250-120U**	6.00 (.236)	10.00 (.393)	5.00 (.197)	4.7 (.185)	3.80 (.150)	1
TR250-120UT-B-0.5	6.00 (.236)	10.00 (.393)	5.00 (.197)	4.7 (.185)	3.80 (.150)	1
TR250-120**	6.50 (.256)	11.00 (.433)	5.00 (.197)	4.7 (.185)	4.60 (.180)	1
TR250-120T-RF-B-0.5	6.50 (.256)	11.00 (.433)	5.00 (.197)	4.7 (.185)	4.60 (.180)	1
TR250-120T-R1-B-0.5**	6.50 (.256)	11.00 (.433)	5.00 (.197)	4.7 (.185)	4.60 (.180)	1
TR250-120T-R2-B-0.5	6.50 (.256)	11.00 (.433)	5.00 (.197)	4.7 (.185)	4.60 (.180)	1
TR250-145U**	6.00 (.236)	10.00 (.393)	5.00 (.197)	4.7 (.185)	3.80 (.150)	1
TR250-145**	6.50 (.256)	11.00 (.433)	5.00 (.197)	4.7 (.185)	4.60 (.180)	1
TR250-145-RA-B-0.5	6.50 (.256)	11.00 (.433)	5.00 (.197)	4.7 (.185)	4.60 (.180)	1
TR250-180U**	10.40 (.410)	12.60 (.495)	5.00 (.197)	4.7 (.185)	3.60 (.140)	1
TR600-150**	13.50 (.531)	12.60 (.495)	5.00 (.197)	4.7 (.185)	6.00 (.236)	2
TR600-150-RA-B-0.5	13.50 (.531)	12.60 (.495)	5.00 (.197)	4.7 (.185)	6.00 (.236)	2
TR600-150-RB	13.50 (.531)	12.60 (.495)	5.00 (.197)	4.7 (.185)	6.00 (.236)	2
TR600-150-RB-B-0.5	13.50 (.531)	12.60 (.495)	5.00 (.197)	4.7 (.185)	6.00 (.236)	2
TR600-160**	16.00 (.630)	12.60 (.495)	5.00 (.197)	4.7 (.185)	6.00 (.236)	2
TR600-160-0.130	16.00 (.630)	12.60 (.495)	5.00 (.197)	3.3 (.130)	6.00 (.236)	2
TR600-160-RA-B-0.5-0.130**	16.00 (.630)	12.60 (.495)	5.00 (.197)	3.3 (.130)	6.00 (.236)	2

\*Hold current 20°C.

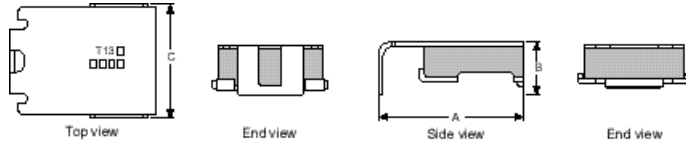
\*\*Denotes product available tape and reel per EIA-468-B.

## Surface-Mount Devices for Telecommunications Applications

### TS

This product line provides surface-mount devices that protect against high-voltage faults (250–600 V) and are suitable for telecommunications applications.

TS devices are not intended for continuous utility line voltage (i.e., 120 V or 240 V).



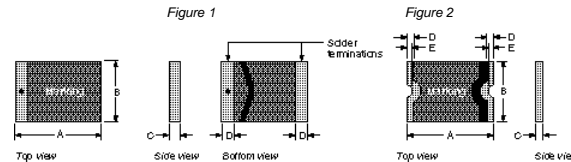
Part number	I <sub>H</sub> <sup>+</sup> (A)	Max. operating voltage (Vdc)	V max. (Vrms)	I max. (A)	R initial (Ω)	R1 max. (Ω)	Agency recognition	Dimensions (millimeters/inches)		
								A (max.)	B (max.)	C (max.)
TS250-130-2	0.130	60	250 600	3.0 1.0	6.5–12.0	20.0	UL, CSA	9.4 (.370)	3.4 (.135)	7.4 (.290)
TS250-130-RA-2	0.130	60	250 600	3.0 1.0	6.5–9.0	20.0	UL, CSA	9.4 (.370)	3.4 (.135)	7.4 (.290)
TS250-130-RB-2	0.130	60	250 600	3.0 1.0	9.0–12.0	20.0	UL, CSA	9.4 (.370)	3.4 (.135)	7.4 (.290)
TS250-130-RC-B-0.5-2	0.130	60	250 600	3.0 1.0	7.0–10.0 Resistance binned to 0.5 ohm	20.0	UL, CSA	9.4 (.370)	3.4 (.135)	7.4 (.290)

\*Hold current 20°C.

## Surface-Mount Devices for Electronics Applications

### miniSMD

This product line is designed for surface-mount applications and complements the SMD product line. Its small size allows for installation in limited space applications, such as PC cards, subnotebook computers, and disk drives. The miniSMD product line is suitable for applications where space is constrained and circuit protection is desired.

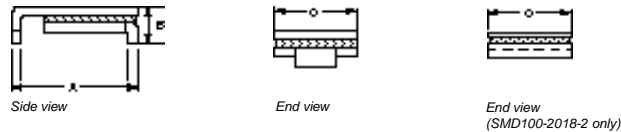


Part number	I <sub>H</sub> <sup>+</sup> (A)	Vmax. (Vdc)	I max. (A)	R1 max. (Ω)	Agency recognition	Dimensions (millimeters/inches)					Fig.
						A (max.)	B (max.)	C (max.)	D (min.)	E (max.)	
miniSMDC014-2	0.14	60	10	6.50	UL	4.73 (.186)	3.41 (.134)	0.81 (.032)	0.30 (.012)	0.50 (.020)	2
miniSMDC020-2	0.20	30	10	5.00	UL, TÜV, CSA	4.73 (.186)	3.41 (.134)	0.81 (.032)	0.65 (.025)		1
miniSMDC035-02	0.35	6	40	1.30	UL, TÜV, CSA	3.43 (.135)	2.80 (.110)	0.62 (.025)	0.35 (.014)	0.50 (.020)	2
miniSMDC050-2	0.50	15	40	1.00	UL, TÜV, CSA	4.73 (.186)	3.41 (.134)	0.62 (.025)	0.65 (.025)		1
miniSMDC050-2	0.50	15	40	1.00	UL, TÜV, CSA	4.73 (.186)	3.41 (.134)	0.62 (.025)	0.30 (.012)	0.50 (.020)	2
miniSMDC075-2	0.75	13.2	40	0.45	UL, TÜV, CSA	4.73 (.186)	3.41 (.134)	0.62 (.025)	0.65 (.025)		1
miniSMDC075-2	0.75	13.2	40	0.45	UL, TÜV, CSA	4.73 (.186)	3.41 (.134)	0.62 (.025)	0.30 (.012)	0.50 (.020)	2
miniSMDC110-2	1.10	6	40	0.21	UL, TÜV, CSA	4.73 (.186)	3.41 (.134)	0.62 (.025)	0.30 (.012)	0.50 (.020)	2
miniSMDE190-2	1.90	16	100	0.08	UL	11.51 (.453)	5.33 (.210)	0.53 (.021)	1.02 (.040)		2

\*Hold current 20°C.

### SMD

This product line is also designed for surface-mount applications. The products range in hold currents from 0.3 amp to 2.6 amps and voltages from 6 volts to 60 volts. These devices are ideally suited for high-density board applications in computer and computer peripheral products, telecommunications, and general electronics applications. They are designed to be reflowed onto a printed circuit board using standard surface-mount processes.



Part number	I <sub>H</sub> <sup>+</sup> (A)	V**max. (V)		I max. (A)				R <sub>1</sub> max. (Ω)	Agency recognition	Dimensions (millimeters/inches)		
		(V)	(A)	(V)	(A)	(V)	(A)			A (max.)	B (max.)	C (max.)
SMD030-2	0.30	60	10	12	60	5	125	4.800	UL, TÜV, CSA	7.98 (.310)	3.20 (.125)	5.44 (.210)
SMD050-2	0.50	60	10	12	60	5	125	1.400	UL, TÜV, CSA	7.98 (.310)	3.20 (.125)	5.44 (.210)
SMD075-2	0.75	30	40	12	60	5	125	1.000	UL, TÜV, CSA	7.98 (.310)	3.20 (.125)	5.44 (.210)
SMD100-2	1.10	30	40	12	60	5	125	0.480	UL, TÜV, CSA	7.98 (.310)	3.00 (.118)	5.44 (.210)
SMD100-2018-2	1.10	15	40	12	60	5	125	0.400	UL, TÜV, CSA	5.44 (.214)	1.52 (.060)	4.93 (.194)
SMD100/33-2	1.10	33	40	12	60	5	125	0.400	UL	7.98 (.310)	3.00 (.118)	5.44 (.210)
SMD125-2	1.25	15	40	12	60	5	125	0.250	UL, TÜV, CSA	7.98 (.310)	3.00 (.118)	5.44 (.210)
SMD150-2	1.50	15	40	12	60	5	125	0.250	UL, TÜV, CSA	9.50 (.370)	3.00 (.118)	6.71 (.260)
SMD150/33-2	1.50	33	40	12	60	5	125	0.230	UL	9.50 (.370)	3.00 (.118)	6.71 (.260)
SMD200-2	2.00	15	40	12	60	5	125	0.125	UL, TÜV, CSA	9.50 (.370)	3.00 (.118)	6.71 (.260)
SMD200-2018-2	2.00	6	40	-	-	-	-	0.100	UL	5.44 (.214)	1.52 (.060)	4.93 (.194)
SMD250-2	2.50	15	40	12	60	5	125	0.085	UL, TÜV, CSA	9.50 (.370)	3.00 (.118)	6.71 (.260)
SMD260-2	2.60	6	40	-	-	-	-	0.075	UL, TÜV, CSA	7.88 (.310)	3.00 (.118)	5.44 (.210)

\*Hold current 20°C.

\*\*Voltage rating is Vrms except for SMD100-2018, which is 15 Vdc.

## VTP

The conductive polymer composite in the VTP battery overcurrent protection devices provides increased safety with extended battery run time. These devices reach a high-resistance state at lower temperatures in NiMH and rechargeable lithium temperature-sensitive chemistries.

Figure 1

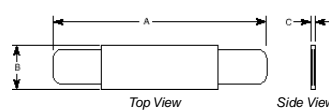


Figure 2

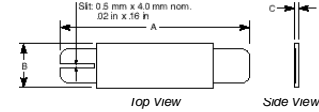


Figure 3

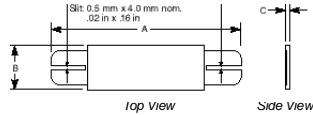


Figure 4

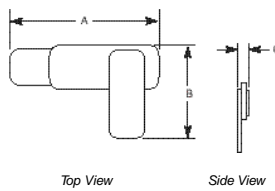
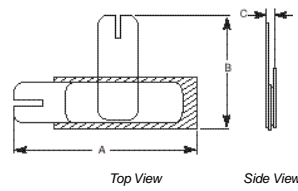


Figure 5



Part number	I <sub>H</sub> <sup>+</sup> (A)	V max. (Vdc)	I max. (A)	R max. initial (Ω)	Agency recognition	Dimensions (millimeters/inches)			Fig.
						A (max.)	B (max.)	C (max.)	
VTP170	1.7	16	100	0.052	UL, TÜV, CSA	17.5 (0.69)	7.4 (0.29)	0.8 (0.03)	1
VTP170XS	1.7	16	100	0.052	UL, TÜV, CSA	22.9 (0.9)	5.3 (0.21)	0.8 (0.03)	2
VTP200X	2.0	16	100	0.039	UL, TÜV, CSA	20.3 (0.8)	14.7 (0.58)	0.7 (0.03)	4
VTP200XSS	2.0	16	100	0.039	UL, TÜV, CSA	19.8 (0.78)	12.5 (0.49)	1.0 (0.04)	5
VTP210G	2.1	16	100	0.030	UL, TÜV, CSA	23.1 (0.91)	5.3 (0.21)	0.8 (0.03)	1
VTP210S	2.1	16	100	0.030	UL, TÜV, CSA	23.1 (0.91)	5.3 (0.21)	0.8 (0.03)	2
VTP210SS	2.1	16	100	0.030	UL, TÜV, CSA	23.1 (0.91)	5.3 (0.21)	0.8 (0.03)	3
VTP210L	2.1	16	100	0.030	UL, TÜV, CSA	26.0 (1.02)	5.3 (0.21)	0.8 (0.03)	1

\*Hold current 25°C.

## LR4

LR4 battery protective devices' low-resistance material is combined with our proven strap product design to increase the operating range of these devices. The smaller thermal mass of the devices also means reduced reaction time to overcurrent events. The LR4 devices are ideally suited for battery packs intended for computer and camcorder applications.

Figure 1

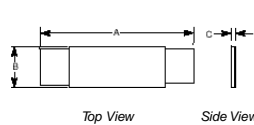
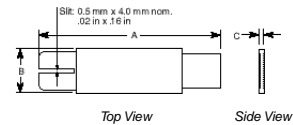


Figure 2

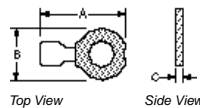


Part number	I <sub>H</sub> <sup>+</sup> (A)	V max. (Vdc)	I max. (A)	R max. initial (Ω)	Agency recognition	Dimensions (millimeters/inches)			Fig.
						A (max.)	B (max.)	C (max.)	
LR4-190	1.9	15	100	0.072	UL, TÜV, CSA	22.1 (0.87)	5.5 (0.22)	1.0 (0.04)	1
LR4-190S	1.9	15	100	0.072	UL, TÜV, CSA	22.1 (0.87)	5.5 (0.22)	1.0 (0.04)	2
LR4-260	2.6	15	100	0.042	UL, TÜV, CSA	23.1 (0.91)	5.5 (0.22)	1.0 (0.04)	1
LR4-260S	2.6	15	100	0.042	UL, TÜV, CSA	23.1 (0.91)	5.5 (0.22)	1.0 (0.04)	2
LR4-380	3.8	15	100	0.026	UL, TÜV, CSA	26.0 (1.02)	7.5 (0.30)	1.0 (0.04)	1
LR4-450	4.5	20	100	0.020	UL, TÜV, CSA	26.0 (1.02)	10.5 (0.41)	1.0 (0.04)	1
LR4-550	5.5	20	100	0.016	UL, TÜV, CSA	37.0 (1.38)	7.5 (0.30)	1.0 (0.04)	1
LR4-600	6.0	20	100	0.014	UL, TÜV, CSA	26.0 (1.02)	14.5 (0.57)	1.0 (0.04)	1
LR4-730	7.3	20	100	0.012	UL, TÜV, CSA	29.1 (1.15)	14.5 (0.57)	1.0 (0.04)	1

\*Hold current 20°C.

## TAC

The AAA cap parts provide reliable, non-cycling protection for rechargeable batteries. Their unique cap design makes them easy to install directly on AAA size battery cells.



Part number	I <sub>H</sub> <sup>+</sup> (A)	V max. (V)	I max. (A)	R max. initial (Ω)	Agency recognition	Dimensions (millimeters/inches)		
						A (max.)	B (max.)	C (max.)
TAC100-09	1.0	15	50	0.155	UL	17.5 (0.69)	10.5 (0.42)	0.9 (0.036)
TAC170-09	1.7	15	50	0.098	UL	17.5 (0.69)	10.5 (0.42)	0.9 (0.036)
TAC210	2.1	15	50	0.062	UL pending	17.5 (0.69)	10.5 (0.42)	0.9 (0.036)

\*Hold current 20°C.

## LTP

Similar to the SRP family of PolySwitch strap products, LTP devices provide reliable, noncycling protection for rechargeable batteries and have a slim, low-profile design that makes them easy to install. LTP devices also offer additional protection at elevated temperatures.

Figure 1

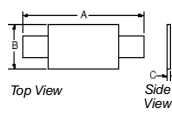


Figure 2

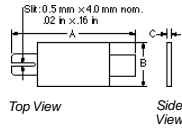


Figure 3

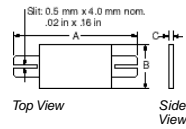
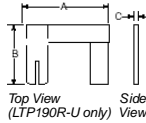


Figure 4



Part number	$I_H^*$ (A)	V max. (Vdc)	I max. (A)	R max. initial ( $\Omega$ )	Agency recognition	Dimensions (millimeters/inches)			Fig.
						A (max.)	B (max.)	C (max.)	
LTP070	0.70	15	100	0.200	UL, TÜV, CSA	22.1 (0.87)	5.2 (0.20)	1.2 (0.05)	1
LTP070S	0.70	15	100	0.200	UL, TÜV, CSA	22.1 (0.87)	5.2 (0.20)	1.2 (0.05)	2
LTP100	1.00	24	100	0.130	UL, TÜV, CSA	23.1 (0.91)	5.2 (0.20)	1.0 (0.04)	1
LTP100S	1.00	24	100	0.130	UL, TÜV, CSA	23.1 (0.91)	5.2 (0.20)	1.0 (0.04)	2
New LTP100SS	1.00	24	100	0.130	UL, TÜV, CSA	23.1 (0.91)	5.2 (0.20)	1.0 (0.04)	3
LTP180	1.80	24	100	0.068	UL, TÜV, CSA	26.0 (1.02)	5.2 (0.20)	1.0 (0.04)	1
New LTP180L	1.80	24	100	0.068	UL, TÜV, CSA	37.5 (1.48)	5.2 (0.20)	1.0 (0.04)	2
LTP180S	1.80	24	100	0.068	UL, TÜV, CSA	26.0 (1.02)	5.2 (0.20)	1.0 (0.04)	2
LTP190	1.90	24	100	0.057	UL, TÜV, CSA	23.4 (0.92)	11.0 (0.43)	1.0 (0.04)	1
LTP190R-U	1.90	15	100	0.057	UL, TÜV, CSA	20.8 (0.82)	14.3 (0.56)	0.76 (0.03)	4
LTP260	2.60	24	100	0.042	UL, TÜV, CSA	26.0 (1.02)	11.9 (0.47)	1.0 (0.04)	1
LTP300	3.00	24	100	0.031	UL, TÜV, CSA	31.8 (1.25)	13.5 (0.53)	1.1 (0.04)	1
LTP310	3.10	24	100	0.030	UL, TÜV, CSA	26.0 (1.02)	15.9 (0.62)	1.0 (0.04)	1
LTP340	3.40	24	100	0.027	UL, TÜV, CSA	26.0 (1.02)	15.9 (0.62)	1.0 (0.04)	1

\*Hold current 20°C.

## SRP

These products provide reliable, non-cycling protection for rechargeable batteries. Weldable nickel leads and a narrow, low-profile design make these devices easy to install directly onto battery cells.

Figure 1

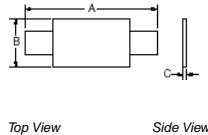


Figure 2

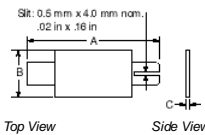
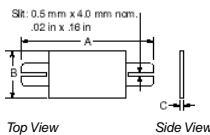


Figure 3



Part number	$I_H^*$ (A)	V max. (Vdc)	I max. (A)	R max. initial ( $\Omega$ )	Agency recognition	Dimensions (millimeters/inches)			Fig.
						A (max.)	B (max.)	C (max.)	
SRP120	1.20	15	100	0.160	UL, TÜV, CSA	22.1 (0.87)	5.2 (0.20)	1.0 (0.04)	1
SRP120S	1.20	15	100	0.160	UL, TÜV, CSA	22.1 (0.87)	5.2 (0.20)	1.0 (0.04)	2
SRP175	1.75	15	100	0.090	UL, TÜV, CSA	23.1 (0.91)	5.2 (0.20)	1.0 (0.04)	1
SRP175S	1.75	15	100	0.090	UL, TÜV, CSA	23.1 (0.91)	5.2 (0.20)	1.0 (0.04)	2
New SRP175SS	1.75	15	100	0.090	UL, TÜV, CSA	23.1 (0.91)	5.2 (0.20)	1.0 (0.04)	3
SRP200	2.00	30	100	0.060	UL, TÜV, CSA	23.4 (0.92)	11.0 (0.43)	1.1 (0.04)	1
SRP350	3.50	30	100	0.031	UL, TÜV, CSA	31.8 (1.25)	13.5 (0.53)	1.1 (0.04)	1
SRP420	4.20	30	100	0.024	UL, TÜV, CSA	32.4 (1.28)	13.6 (0.54)	1.1 (0.04)	1

\*Hold current 20°C.

## Definitions

$I_H$  = Hold current—maximum current at which the device will not trip under specified conditions.

$I_{max}$  = The highest fault current that can safely be used to trip a PolySwitch device under specified conditions.

Max. operating voltage = The maximum voltage across a PolySwitch device under a typical fault condition.

$V_{max}$  = The highest voltage that can safely be dropped across a PolySwitch device in its tripped state under specified fault conditions.

$R_{1max}$  = Maximum device resistance under specified conditions measured 1 hour post trip or post reflow.

$R_{max}$  initial = Maximum device resistance under specified conditions as supplied.

Trip Current = Minimum current at which a device will trip under specified conditions.

## WARNING!

- Operation beyond maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against occasional overcurrent or overtemperature fault conditions, and should not be used when repeated



## **INSTRUMENTATION CABLE UNSHIELDED/OVERALL SHIELDED MULTIPAIR INDIVIDUALLY AND OVERALL SHIELDED MULTIPAIR**

UL STANDARD 1277,  
TYPE TC  
90°C 600 VOLT

### **CHARACTERISTICS**

#### **Operating Temperature:**

- -20°C to 90°C

#### **Voltage Rating:**

- 600 Volt

#### **Product Description:**

- Stranded Bare Copper Conductors
- PVC/Nylon Insulation:  
Paired Construction Color Coded -  
One Black, One White  
White Conductor Printed with  
Pair Number for Easy Identification
- When Shielded: Aluminum  
Polyester Tape and Tinned Copper  
Drain Wire
- PVC Jacket - Black, UV Resistant

### **SPECIFICATIONS**

- UL Standard 1277, Type TC
- Passes UL Vertical Tray Flame Test
- Complies with NEC Article 340  
(Article 725 Class 1)  
+ Not UL Listed



### **AVAILABILITY**

- Bulk, Cut to Length
- ^ Available in 1000 ft (305m) put-ups



### **UNSHIELDED PAIRS**

Alpha Part No.	No. of Pairs	AWG	No. of Strands	Nom. Insulation Thickness		Nom. Jacket Thickness		Nom. O.D.	
				In.	mm	In.	mm	In.	mm
<u>^5606B1801</u>	1	18	7	0.021	0,53	0.045	1,14	0.27	7,0
<u>^5606B1601</u>	1	16	7	0.021	0,53	0.045	1,14	0.29	7,4



## OVERALL SHIELDED PAIRS

Alpha Part No.	No. of Pairs	AWG	No. of Strands	Nom. Insulation Thickness		Nom. Jacket Thickness		Nom. O.D.	
				In.	mm	In.	mm	In.	mm
<u>^5616B2001+</u>	1	20	7	0.016	0,41	0.035	0,89	0.22	5,5
<u>^5616B1801</u>	1	18	7	0.021	0,53	0.045	1,14	0.28	7,0
<u>5616B1804</u>	4	18	7	0.021	0,53	0.045	1,14	0.49	11,9
<u>^5616B1808</u>	8	18	7	0.021	0,53	0.060	1,52	0.64	16,2
<u>5616B1812</u>	12	18	7	0.021	0,53	0.060	1,52	0.74	18,8
<u>^5616B1601</u>	1	16	7	0.021	0,53	0.045	1,14	0.30	7,5
<u>^5616B1602</u>	2	16	7	0.021	0,53	0.045	1,14	0.46	10,2
<u>5616B1604</u>	4	16	7	0.021	0,53	0.060	1,52	0.53	13,7
<u>5616B1608</u>	8	16	7	0.021	0,53	0.060	1,52	0.69	17,8
<u>^5616B1401</u>	1	14	19	0.021	0,53	0.045	1,14	0.32	8,3
<u>5616B1201</u>	1	12	19	0.021	0,53	0.045	1,14	0.36	9,2



## INDIVIDUALLY AND OVERALL SHIELDED PAIRS

Alpha Part No.	No. of Pairs	AWG	No. of Strands	Nom. Insulation Thickness		Nom. Jacket Thickness		Nom. O.D.	
				In.	mm	In.	mm	In.	mm
<u>5626B1804</u>	4	18	7	0.021	0,53	0.050	1,34	0.510	13,0
<u>5626B1808</u>	8	18	7	0.021	0,53	0.070	1,78	0.700	17,8
<u>5626B1602</u>	2	16	7	0.021	0,53	0.050	1,34	0.470	12,0

Tel: 908-925-8000  
Toll-Free: 1-800-52 ALPHA  
Fax: 908-925-6923

IN EUROPE:  
Tel: +44 01932 772422  
Fax: +44 01932 772433

Master Catalog Page



# 327





**PC 4/...-STF-7,62**

Plug with screw flange

Pitch 7.62

	(IEC)	rigid	flexible		I	U
	[mm <sup>2</sup> ]	solid	stranded	AWG	[A]	[V]
Connection data		0.2-4	0.2 - 4	24-10	20	400

**CA F** LR/NV

Description	No. of positions	Dim. a [mm]	Type	Order No.	Pcs. Pkt.
<b>Plugs, 7.62 mm pitch, color: green</b>	2	7.62	PC 4/2-STF-7,62	<a href="#">18 28 24 9</a>	50
	3	15.24	PC 4/3-STF-7,62	<a href="#">18 28 25 2</a>	
	4	22.86	PC 4/4-STF-7,62	<a href="#">18 28 26 5</a>	
	5	30.48	PC 4/5-STF-7,62	<a href="#">18 28 27 8</a>	
	6	38.10	PC 4/6-STF-7,62	<a href="#">18 28 28 1</a>	
	7	45.72	PC 4/7-STF-7,62	<a href="#">18 28 29 4</a>	
	8	53.34	PC 4/8-STF-7,62	<a href="#">18 28 30 4</a>	
	9	60.96	PC 4/9-STF-7,62	<a href="#">18 28 31 7</a>	
	10	68.58	PC 4/10-STF-7,62	<a href="#">18 28 32 0</a>	
	11	76.20	PC 4/11-STF-7,62	<a href="#">18 28 33 3</a>	
	12	83.82	PC 4/12-STF-7,62	<a href="#">18 27 58 3</a>	

**Accessories**

(5) **Coding section**, is inserted into plug and header slots, red insulating material

**CP-HCC 4**[16 00 02 7](#)

100

(6) **Marker card**, with 12 pcs., 10-section marker strips, white, self-adhesive, for 120 terminal blocks

**SK 7,62/3,8** (see [info](#))

(7) **Screwdriver**, blade: 0.6 x 3.5 x 100, length: 180 mm

**SZS 0,6 x 3,5**[12 05 05 3](#)

10

**Technical data****Dimensions**

see description

Pitch [mm] 7.62

**Technical data in accordance with IEC / DIN VDE**

Insulation material group	—		I	
Surge voltage category / contamination class	—/—	III / 3	III / 2	II / 2
Rated voltage	[V]	400	630	1000
Rated surge voltage	[kV]	6	6	6
Nominal current / cross section	[A]/[mm <sup>2</sup> ]		20 / 4	

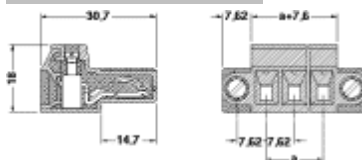
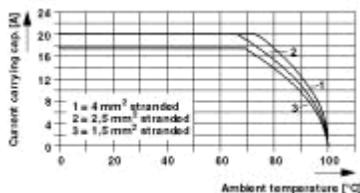
Maximum load current / cross section	[A]/[mm <sup>2</sup> ]	20 / 4
<b>Connection capacity</b>		
solid / stranded / conductor sizes	[mm <sup>2</sup> ]/[mm <sup>2</sup> ]/AWG	0.2 - 4 / 0.2 - 4 / 24 - 10
stranded with ferrules without / with plastic collar	[mm <sup>2</sup> ]	0.25 - 4 / 0.25 - 4
<b>Multiple connection (2 conductors with same cross section)</b>		
solid / stranded	[mm <sup>2</sup> ]	0.2 - 2.5 / 0.2 - 1.5
stranded with ferrules without plastic collar	[mm <sup>2</sup> ]	0.25 - 1.5
stranded with TWIN ferrules with plastic collar	[mm <sup>2</sup> ]	0.5 - 2.5
<b>Stripping length</b>	[mm]	7
<b>Internal cylindrical gage (IEC 947-1:1988)</b>	—	A 4
<b>Thread</b>	—	M 3
<b>Torque</b>	[Nm]	0.5 - 0.6
<b>Insulation material</b>		PA
Inflammability class acc. to UL 94		V2
Temperature indices RTI/Ti		125/100
<b>Approval data (UL and CSA)</b>		
Nominal voltage / current / conductor sizes	UL: [V] / [A] / AWG	300 / 20 / 30 - 10
	CSA: [V] / [A] / AWG	300 / 20 / 28 - 10

**Note:**

Only actuate COMBICON plug connectors when under no load condition. If for operating reasons small loads must be switched, experimental values are available on request.

Articles printed in bold can be delivered at short notice.

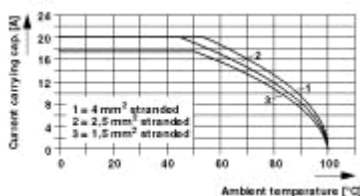
Products with black or gray housing available on request.

**Dimensional drawing****Diagram**

Current carrying capacity depending on ambient temperature

Plug : PC 4/2-ST(F)-7,62

Header : PC(V) 4/2-G-7,62



FEATURES AND SPECIFICATIONS

Features and Benefits

- Meets the need for a connector system rated at greater than the industry-standard 12.0A per circuit; the HCS-125 is an enhanced version of Molex's proven .125" system
- Positive locks prevent accidental unmating
- Fully isolated terminals protect terminals
- Pull tabs
- 1, 2, 3 and 4 circuit housings

Reference Information

Packaging: Bag  
UL File No.: E29179  
CSA File No.: LR19980  
Mates With: HCS-125 receptacles  
TUV License No.: R9151436  
Use With: .125" terminals  
Designed In: Inches

Electrical

Voltage: 600V  
Current: 20.0A max.  
Dielectric Withstanding Voltage: 1500V AC rms

Mechanical

Contact Retention to Housing: 20 lb min.

Physical

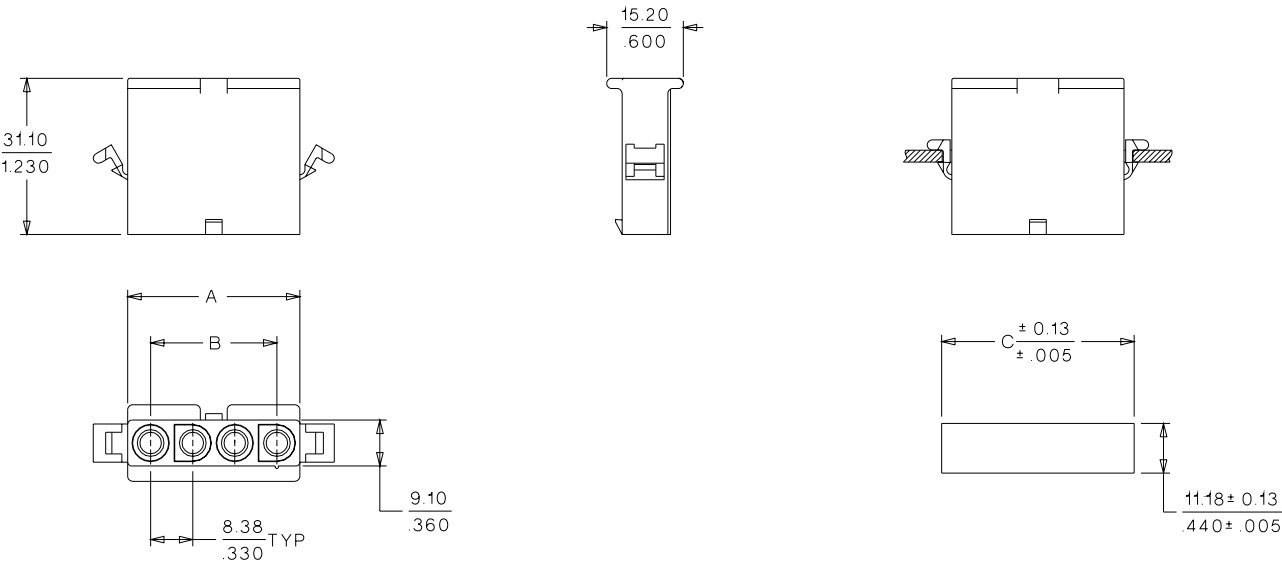
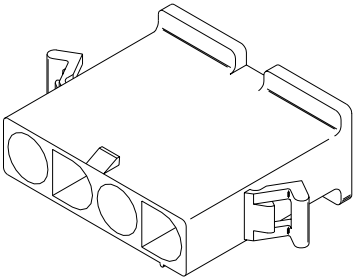
Housing: Nylon, UL 94V-2  
Temperature: -40 to +105°C  
Wire Accommodation: 10 to 18 AWG

molex®

3.18mm (.125") Diameter  
HCS-125  
Pin and Socket  
Plug

42179

Single Row



ORDERING INFORMATION AND DIMENSIONS

Circuits	Order No.		Dimension		
	Panel Mount	Free Hanging	A	B	C
1	03-12-2015	03-12-2016	9.10 (.360)		13.23 (.521)
2	03-12-2025	03-12-2026	17.50 (.690)	8.38 (.330)	21.62 (.851)
3	03-12-2035	03-12-2036	25.90 (1.020)	16.76 (.660)	30.00 (1.181)
4	03-12-2045	03-12-2046	34.30 (1.350)	25.14 (.990)	38.38 (1.511)

## FEATURES AND SPECIFICATIONS

### Features and Benefits

- Meets the need for a connector system rated at greater than the industry-standard 12.0A per circuit. The HCS-125 is an enhanced version of Molex's proven .125" system
- Positive locks prevent accidental unmating
- Fully isolated terminals protect terminals
- Pull tabs
- 1, 2, 3 and 4 circuit housings

### Reference Information

Packaging: Bag  
UL File No.: E29179  
CSA File No.: LR19980  
TUV License No.: R9151436  
Use With: .125" terminals  
Designed In: Inches

### Electrical

Voltage: 600V  
Current: 20.0A  
Dielectric Withstanding Voltage: 1500V AC rms

### Mechanical

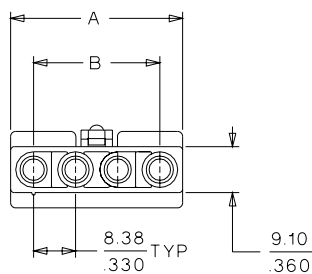
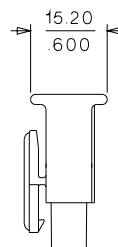
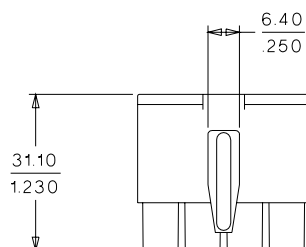
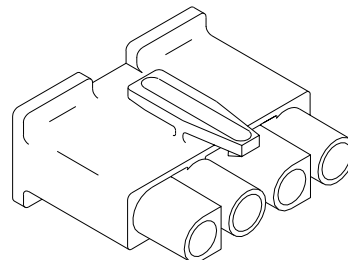
Contact Retention to Housing: 20 lb min.

### Physical

Housing: Nylon, UL 94V-2  
Temperature: -40 to +105°C  
Wire Accommodation: 10 to 18 AWG

# molex® 3.18mm (.125") Diameter HCS-125 Pin and Socket Receptacle

**42179**  
**Single Row**



## ORDERING INFORMATION AND DIMENSIONS

Circuits	Order No.	Dimension	
		A	B
1	03-12-1016	9.10 (.360)	
2	03-12-1026	17.50 (.690)	8.38 (.330)
3	03-12-1036	25.90 (1.020)	16.76 (.660)
4	03-12-1046	34.30 (1.350)	25.14 (.990)

**Spectra-Strip®**  
**Electronic Cable**

online catalog

**Amphenol**[HOME](#)**Searches**

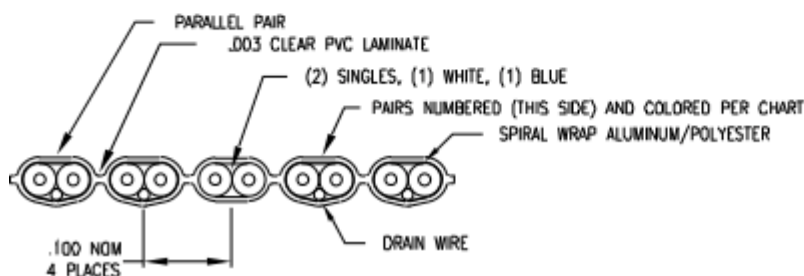
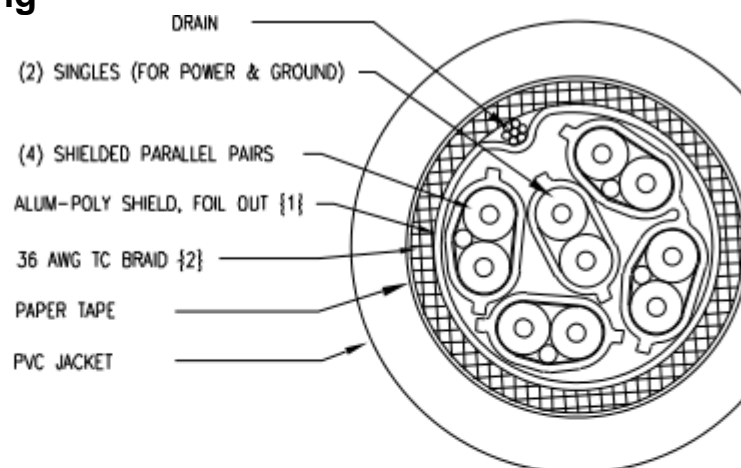
family

application

part

**Information**new product  
informationolder product  
informationcable  
assemblyprocess  
info request

email

[Part Information](#) | [Outline Drawing](#) | [Introduction](#) | [Specifications](#)**Part Information:****Part Number:** 165-3099-975**Description:** SKEWCLEAR for LVDS video, 4 pair 30 awg, 100 ohm**Family:** SKEWCLEAR[Add to Information Request](#)**Outline Drawing****Introduction**

LVDS addresses all areas of concern for most high data-rate applications, most notably: raw speed, ultra low power dissipation, reliable data transmission, and low noise emissions. LVDS uses a low voltage differential swing of only 345 mV(typ) that corresponds to a mere 1.2 mW load power dissipation. Further, its CMOS current mode driver design greatly reduces quiescent power supply requirements.

[Click here to see SKEWCLEAR LVDS background.](#)

#### Chipset WWW Sites:

[National Semiconductor](#)

[Silicon Image](#)

[Texas Instruments](#)

Channel Link™ - trademark of National Semiconductor

Panel Link™ - trademark of Silicon Image

Flatlink™ - trademark of Texas Instruments



## Specifications

Physical	
<b>(4) Shielded Parallel Pairs</b>	30 AWG solid silver plated copper .0315 nom diameter polyolefin white (.011 nom wall)
<b>Parallel Pair With Drain</b>	30 AWG solid tinned copper .001 aluminized polyester, spiral, foil in, 20% min overlap
<b>(2) Singles</b>	30 AWG solid silver plated copper .0315 nom diameter polyolefin, (1) white, (1) blue
<b>Laminate</b>	.003 clear PVC
<b>Pair Spacing</b>	.100 nom (in flat form)
<b>Cabling</b>	Ribbon stagger-slit per sheet 2, twisted to round with TBD inch nominal right hand lay
<b>Overall Shield (1)</b>	.001 aluminized polyester spiral 20% min overlap, foil out
<b>Overall Shield (2)</b>	36 AWG tinned copper braid 85% min coverage
<b>Separator</b>	.002 paper tape
<b>Jacket</b>	.025 nom PVC black
<b>Diameter</b>	.225 ± .015

<b>Electrical</b>	
<b>Impedance</b>	100 +/- 10 ohms (Differential TDR)
<b>Capacitance</b>	54 pF/M nom
<b>Prop Delay</b>	5.1 ns/M nom
<b>Skew (within-pair)</b>	131 ps/10M (Ref: 4 ps/ft) (TDT method, drain grounded)(differential 50%-50%, Tektronix 11801, SD-24/SD-26 sampling heads)
<b>Skew (pair/pair)</b>	350 ps / 10 M (Ref: 10.6 ps/ft) (TDT method, drain grounded)(differential 50%-50%, Tektronix 11801, SD-24/SD-26 sampling heads)
<b>Attenuation (nom)</b>	5.4 dB/10M @ 140 MHz 7.0 dB/10M @ 231 MHz 9.5 dB/10M @ 420 MHz 12.5 dB/10M @ 693 MHz
<b>Approvals</b>	UL/CSA Pending UL CL2 FT4 75C



## **COMMUNICATION & CONTROL PLENUM-RATED MULTIPAIR, INDIVIDUALLY FOIL SHIELDED FEP/PLENUM RATED**

UL STANDARD 13,  
TYPE CL2P  
CSA PCC FT6  
150 VOLT



### **APPLICATIONS**

- Remote Control
- Intercom Systems
- Burglar Alarm Systems
- Signaling And Power-Limited Circuits
- Cash Registers
- Other Low Voltage Systems

### **CHARACTERISTICS**

#### **Operating Temperature:**

- -55°C to 125°C

#### **Voltage Rating:**

- 150 Volt

#### **Color Description:**

- Color Code: See Chart Below
- Jacket Color: Gray

#### **Product Description:**

- Conductor: Stranded Tinned Copper
- Shield: Each Pair Shielded With Aluminum Polyester Foil
- Insulation: Color-Coded FEP
- Drain Wire: Stranded Tinned Copper
- Jacket: Polyvinylidene Flouride (PVDF)

### **SPECIFICATIONS**

- UL Standard 13, Type CL2P
- CSA PCC FT6
- Passes Steiner Tunnel Test



## AVAILABILITY

■ 1000 ft (305m), 500 ft (152m)

■ ^1000 ft (305m)

1000 ft put-ups may contain multiple lengths

Insulation Thickness: **0.007"** (0,18mm)

Alpha Part No.	No. of Pairs	Cond. AWG Size	Stranding	Jacket Thickness		Diameter		Nominal Capacitance pF/ft
				In.	mm	In.	mm	
^58602	2	24	7/32	0.012	0,30	0.170	4,3	25.2
58603	3	24	7/32	0.012	0,30	0.180	4,6	25.2
58604	4	24	7/30	0.012	0,30	0.200	5,1	25.2
58612*	2	22	7/30	0.012	0,30	0.200	5,1	28.6
58613*	3	22	7/30	0.012	0,30	0.210	5,3	28.6
58616*	6	22	7/30	0.012	0,30	0.270	6,9	28.6
58632*	2	18	7/0.0152	0.012	0,30	0.260	6,7	35.5
58633	3	18	7/0.0152	0.012	0,30	0.270	6,9	35.5
58642	2	16	7/0.0192	0.012	0,30	0.300	7,6	38
^58643	3	16	7/0.0192	0.012	0,30	0.320	8,1	38

\*These part numbers also have an overall aluminum/polyester shield

COLOR CODE CHART	
Pair No.	Combination
1	Black paired with Red
2	Black paired with White
3	Black paired with Green
4	Black paired with Blue
5	Black paired with Yellow
6	Black paired with Brown

Tel: 908-925-8000  
 Toll-Free: 1-800-52 ALPHA  
 Fax: 908-925-6923

**IN EUROPE:**  
 Tel: +44 01932 772422  
 Fax: +44 01932 772433

Master Catalog Page



# 223



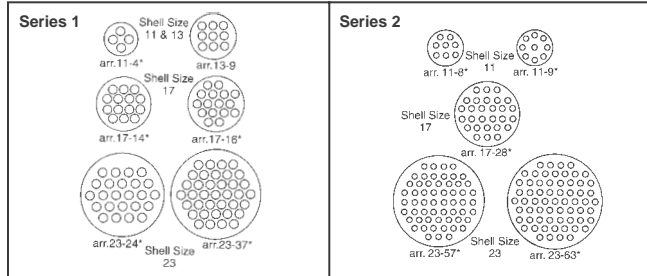
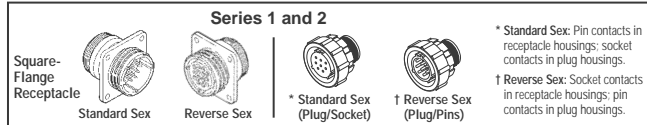
Communication and Control Product Section Index

# AMP Circular Plastic Connectors

• Lightweight, all-plastic connectors • CPC connectors made of UL recognized, high-grade black thermoplastic material • 94V-1 rated, heat-stabilized, fire-resistant, self-extinguishing • Two connector series for different connection needs: **Series 1** — Standard density applications with Multimate contacts. **Series 2** — High-density applications with size 20 DM and 20 DF contacts, .040" (1.02 mm) dia. • Available in panel-mount, chassis-mount and free hanging versions • Quick-connect/disconnect capability with thread assist, positive detent coupling • Built-in pin and socket protection. Plug or socket half can be "hot", depending on connector sex • 5-key polarization for proper mating of connector halves • Full complement of optional accessories

Note: Contacts (pins and sockets) must be ordered separately.

Component Diameter	
Arrangement	Overall Dia. Inch (mm)
Shell Size	
11	.942 (23.93)
13	1.070 (27.18)
17	1.315 (33.40)
23	1.743 (44.2)



## Circular Plastic Connectors – Series 1 and 2 (Shell Only)

Shell Size	No. of Contacts	Sex	Description (Shell Only)	Digi-Key Part No.	Price Each 1	25	AMP Part No.
Series 1							
11	4	Rev.	Receptacle-Square Flanged	A1360-ND	1.39	1.30	206430-1
			Receptacle-Free Hanging Plug	A1361-ND	1.39	1.30	206430-2
		Std.	Receptacle-Square Flanged	A1357-ND	1.70	1.58	206429-1
			Receptacle-Free Hanging Plug	A1301-ND	1.35	1.26	206061-1
13	9	Std.	Receptacle-Square Flanged	A1351-ND	1.39	1.30	206153-1
			Receptacle-Free Hanging Plug	A1300-ND	1.68	1.56	206060-1
			Receptacle-Square Flanged	A1303-ND	1.46	1.35	206705-1
17	14	Rev.	Receptacle-Square Flanged	A1352-ND	1.50	1.39	206705-2
			Receptacle-Free Hanging Plug	A1302-ND	1.85	1.71	206708-1
			Receptacle-Square Flanged	A1362-ND	1.54	1.43	206043-1
17	16	Std.	Receptacle-Square Flanged	A1363-ND	1.95	1.81	206043-3
			Receptacle-Free Hanging Plug	A1358-ND	1.93	1.79	206044-1
			Receptacle-Square Flanged	A1305-ND	1.54	1.43	206036-1
23	24	Std.	Receptacle-Square Flanged	A1353-ND	1.54	1.43	206036-3
			Receptacle-Free Hanging Plug	A1304-ND	1.93	1.79	206037-1
			Receptacle-Square Flanged	A1354-ND	1.93	1.79	206838-1
23	37	Rev.	Receptacle-Square Flanged	A1355-ND	2.60	2.42	206838-2
			Receptacle-Free Hanging Plug	A1350-ND	2.48	2.30	206837-1
			Receptacle-Square Flanged	A1364-ND	1.76	1.64	206306-1
23	37	Std.	Receptacle-Square Flanged	A1365-ND	2.44	2.27	206306-2
			Receptacle-Free Hanging Plug	A1359-ND	2.21	2.06	206305-1
			Receptacle-Square Flanged	A1307-ND	1.76	1.64	206151-1
23	37	Std.	Receptacle-Square Flanged	A1356-ND	1.93	1.79	206151-2
			Receptacle-Free Hanging Plug	A1306-ND	2.21	2.06	206150-1
			Series 2				
11	8	Std.	Receptacle-Square Flanged	A1366-ND	2.54	2.36	205841-1
			Receptacle-Free Hanging Plug	A1367-ND	2.52	2.34	205841-2
		Rev.	Receptacle-Square Flanged	A1368-ND	3.08	2.85	205838-1
			Receptacle-Free Hanging Plug	A1369-ND	2.58	2.40	206433-1
11	9	Std.	Receptacle-Square Flanged	A1370-ND	2.58	2.40	206433-2
			Receptacle-Free Hanging Plug	A1371-ND	3.08	2.85	206434-1
		Std.	Receptacle-Square Flanged	A1372-ND	2.50	2.32	206486-1
			Receptacle-Free Hanging Plug	A1373-ND	2.58	2.40	206486-2
17	28	Std.	Receptacle-Square Flanged	A1374-ND	2.99	2.78	206485-1
			Receptacle-Free Hanging Plug	A1375-ND	2.75	2.55	205840-3
		Rev.	Receptacle-Square Flanged	A1376-ND	3.24	3.01	206152-1
			Receptacle-Free Hanging Plug	A1377-ND	3.24	3.01	205839-3
23	57	Std.	Receptacle-Square Flanged	A1378-ND	2.67	2.47	206038-1
			Receptacle-Free Hanging Plug	A1379-ND	3.28	3.04	206038-2
		Rev.	Receptacle-Square Flanged	A1380-ND	3.18	2.95	206039-1
			Receptacle-Free Hanging Plug	A1381-ND	4.22	3.92	206438-1
23	63	Std.	Receptacle-Square Flanged	A1382-ND	6.77	6.27	206438-2
			Receptacle-Free Hanging Plug	A1383-ND	4.37	4.05	206437-1
		Std.	Receptacle-Square Flanged	A1384-ND	4.06	3.77	205843-1
			Receptacle-Free Hanging Plug	A1385-ND	4.31	3.99	205843-2
23	63	Std.	Receptacle-Square Flanged	A1386-ND	4.33	4.01	205842-1
			Receptacle-Free Hanging Plug	A1386-ND	4.33	4.01	205842-1

## VDE Tested Connectors – Series 1 (Shell Only)

Designed to meet requirements of VDE as shown in DIN Specification 57627. Recognized under the Component Program of UL for 600VAC & 600VDC service, File No. E28476. Certified by CSA, File No. LR7189.

Shell Size	No. of Contacts	Sex	Description (Shell Only)	Digi-Key Part No.	Price Each 1	Price Each 25	AMP Part No.
Series 1							
13	7	Std.	Receptacle-Square Flanged	A1635-ND	2.50	2.32	211401-1
			Receptacle-Free Hanging Plug	A1638-ND	2.26	2.09	211399-1
	Rev.		Receptacle-Square Flanged	A1641-ND	2.17	2.02	211398-1
			Receptacle-Free Hanging Plug	A1644-ND	2.58	2.40	211400-1
17	9	Std.	Receptacle-Square Flanged	A1636-ND	2.28	2.11	211767-1
			Receptacle-Free Hanging Plug	A1639-ND	2.99	2.78	211766-1
	Rev.		Receptacle-Square Flanged	A1642-ND	2.52	2.34	211769-1
			Receptacle-Free Hanging Plug	A1645-ND	2.69	2.49	211768-1
23	19	Std.	Receptacle-Square Flanged	A1637-ND	2.97	2.76	211771-1
			Receptacle-Free Hanging Plug	A1640-ND	3.63	3.37	211770-2
	Rev.		Receptacle-Square Flanged	A1643-ND	2.52	2.34	211773-1
			Receptacle-Free Hanging Plug	A1646-ND	3.03	2.82	211772-1

## Sealed Connectors – Series 1 (Shell Only)


Sealed CPC connectors are designed to meet the requirements of UL, CSA, and VDE for environmentally sealed connectors used in industrial applications. **Operating Temperature Range:** -50°C - 125°C. **Voltage Rating:** 600 V (AC or DC). **Contacts:** 13 amps., single contact rating at 30°C T-Rise. **Flammability Rating:** UL 94V-0 rated. **Sealing Capability:** Per IP66 and IP67. **Housing Material:** Black, high strength, impact resistant thermoplastic. **Seal:** Gray Elastomer. **Fluid Resistance:** Diesel fuel, gear and engine fuel, gasoline, anti-freeze, hydraulic fluid, water.

Shell Size	No. of Contacts	Sex	Description (Shell Only)	Digi-Key Part No.	Price Each 1	Price Each 25	AMP Part No.
Series 1							
11	4	Rev.	Square Flange Free-Hanging	A1675-ND	2.58	2.40	206430-3
			Square Flange Free-Hanging	A1676-ND	5.68	5.27	206430-4
13	9	Std.	Square Flange Free-Hanging	A1669-ND	2.58	2.40	206705-3
			Square Flange Free-Hanging	A1670-ND	2.64	2.46	206705-4
17	14	Rev.	Square Flange Free-Hanging	A1677-ND	2.64	2.46	206043-4
			Square Flange Free-Hanging	A1678-ND	6.11	5.67	206043-5
17	16	Std.	Square Flange Free-Hanging	A1671-ND	3.14	2.91	206038-4
			Square Flange Free-Hanging	A1672-ND	2.73	2.53	206038-5
23	24	Std.	Square Flange Free-Hanging	A1673-ND	3.20	2.97	206838-3
			Square Flange Free-Hanging	A1674-ND	3.77	3.50	206838-4


## Circular Plastic Connectors – Series 3 and 4 (Shell Only)

Note: Contacts (pins and sockets) must be ordered separately.


Series 3




Shell Size 17  
Arr. 17-3




Shell Size 23  
Arr. 23-7



↑ Reverse Sex  
Square Flange  
Receptacle




\* Standard Sex  
Free-Hanging  
Receptacle




↑ Reverse Sex  
Plug


Series 4




Shell Size 23  
Arr. 23-13M




Shell Size 23  
Arr. 23-16M




Shell Size 23  
Arr. 23-22M



\* Standard Sex  
Square Flange  
Receptacle



\* Standard Sex  
Free-Hanging  
Receptacle



\* Standard  
Sex Plug

\* Standard Sex: Pin contacts in receptacle housings; socket contacts in plug housings.  
↑ Reverse Sex: Socket contacts in receptacle housings; pin contacts in plug housings.

Shell Size	No. of Contacts	Sex	Description (Shell Only)	Digi-Key Part No.	Price Each	Each 25	AMP Part No.
Series 1							
17	3	Std.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A1681-ND	2.17	2.02	206036-2
				A1683-ND	2.17	2.02	206207-1
		Rev.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A1685-ND	2.81	2.61	206037-2
				A16015-ND	2.17	2.02	206425-1
23	7			A16017-ND	2.93	2.72	206425-2
				A16019-ND	3.87	3.60	206426-1
		Std.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A1682-ND	3.34	3.10	206137-1
				A1684-ND	3.42	3.18	206137-2
		Rev.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A1686-ND	3.08	2.85	206136-1
				A16016-ND	2.69	2.49	206227-1
Series 4							
23	13	Std.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A16029-ND	3.98	3.69	211825-1
				A16032-ND	3.32	3.08	211825-2
				A16035-ND	5.92	5.50	211824-1
23	16	Std.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A16030-ND	2.58	2.40	207486-1
				A16033-ND	3.71	3.44	207486-2
				A16036-ND	3.01	2.80	207485-1
23	22	Std.	Receptacle-Square Flanged Receptacle-Free Hanging Plug	A16031-ND	2.52	2.34	206613-1
				A16034-ND	3.44	3.20	206613-3
				A16037-ND	3.59	3.33	206612-1

## NEW! Flexible Tubing Connectors To be used with all circular plastic connectors

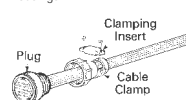
Characteristics: • One-piece plastic quick screw connection with UNEF-inner thread • Material: High-quality, impact resistant plastic (PA); Sealing: Santoprene® • Properties: Easy to assemble due to one-piece screw connection with push-in lock. Simple disconnect by displacing the snap-in sleeve. Smallest outer dimensions to be used under confined conditions • Temperature Range: From approx. -30°C up to +100°C • Color: Black

Shell Size	Trade Size Tubing Outer - Dia.	Inner Thread UNEF	Dimensions (mm)	Digi-Key Part No.	Price Each 1	Price Each 25	AMP Part No.
			Largest Outer øB				
			Total Length D				
11	0.51" (13.0mm)	5/8" - 24	20.6	A16102-ND	1.90	1.83	1-969807-2
13	0.62" (15.8mm)	3/4" - 20	23.6	A16103-ND	1.98	1.91	1-969809-3
17	0.83" (21.2mm)	15/16" - 20	30.1	A16104-ND	2.42	2.33	1-969811-4
23	1.12" (28.5mm)	1" - 20	37.0	A16105-ND	3.55	3.41	1-969813-5

NOTE: Must also be used with Flexible Corrugated Tubing (AMP #s 969789-2, 969789-3, 969789-4 & 969789-5).

## Cable Clamps – Plastic Shell

Cable clamps are used to prevent excessive strain on cable or wire from being transmitted to the contacts inside the connector housings.



Shell Size	Cable Outer Dia.	Digi-Key Part No.	Price Each 1	Price Each 25	AMP Part No.
11	8.36mm	A1330-ND	2.30	2.18	206062-1
13	11.51mm	A1331-ND	2.32	2.20	206966-1
17	11.51mm	A1332-ND	2.32	2.20	206070-1
23	17.86mm	A1334-ND	2.39	2.27	206138-1
11	11.51mm	A1687-ND	2.30	2.18	206358-1
13	17.86mm	A1688-ND	2.43	2.31	207008-1
17	17.86mm	A1689-ND	2.58	2.45	206322-1
23	28.58mm	A1690-ND	3.04	2.88	206512-1
23	28.58mm	A16061-ND*	3.81	3.54	207774-1

\* Self-Centering

1-800-344-4539 • www.digikey.com

218-681-6674 • FAX: 218-681-3380

## Contacts (Pins and Sockets) – Series 1, 2, 3 and 4

Series 4 requires a combination of Fig. 5 and 6.

Fig. 1 – Crimp			Fig. 2 – Solder Tab			Fig. 3 – Crimp with Insulation Support			Fig. 4 – Contacts			Fig. 5 – Power Contacts			Fig. 6 – Crimp		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin			Socket			Pin			Socket			Pin			Socket		
Pin																	

## AMP Circular Plastic Connector Sealing Accessories

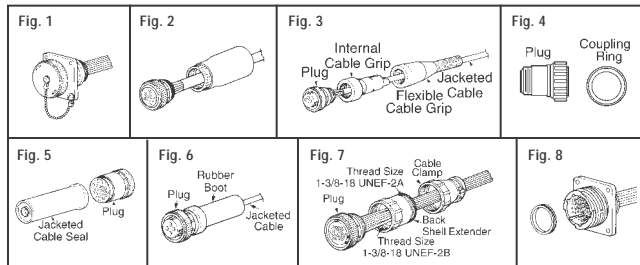
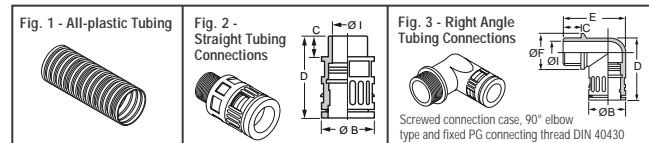


Fig.	Description	Shell Size	Digi-Key Part No.	Price Each	100	AMP Part No.
1	Sealing Cap for Receptacles, Plastic Strap	11	A16038-ND	2.58	2.40	206903-1
	Sealing Cap for Receptacles, Plastic Strap	13	A16039-ND	2.36	2.19	211870-1
	Sealing Cap for Receptacles, Plastic Strap	17	A16040-ND	2.79	2.59	207445-1
	Sealing Cap for Receptacles, Plastic Strap	23	A16041-ND	3.22	2.99	207446-1
1	Sealing Cap for Receptacles, Metal Bead Chain	11	A16042-ND	4.33	4.01	208800-1
	Sealing Cap for Receptacles, Metal Bead Chain	13	A16043-ND	5.13	4.75	213485-1
	Sealing Cap for Receptacles, Metal Bead Chain	17	A16044-ND	4.16	3.86	208652-1
	Sealing Cap for Receptacles, Metal Bead Chain	23	A16045-ND	5.00	4.64	208680-1
2	Cable Entry Seal, Heat Shrinkable Sealing Boots	11	A16046-ND	5.90	5.48	54010-1
	Cable Entry Seal, Heat Shrinkable Sealing Boots	13	A16047-ND	6.52	6.05	54123-1
	Cable Entry Seal, Heat Shrinkable Sealing Boots	17	A16048-ND	6.42	5.95	54011-1
	Cable Entry Seal, Heat Shrinkable Sealing Boots	23	A16049-ND	7.20	6.67	54012-1
3	Flexible Cable Boot, Black Thermoplastic	11	A16050-ND	1.70	1.58	207489-1
	Flexible Cable Boot, Black Thermoplastic	17	A16052-ND	3.08	2.85	207241-1
	Internal Cable Grip, Black Thermoplastic	11	A16051-ND	1.85	1.71	207490-1
	Internal Cable Grip, Blk. Thermoplastic 8.25mm	17	A16053-ND	2.56	2.38	207387-1
3	Internal Cable Grip, Blk. Thermoplastic 9.78mm	17	A16054-ND	2.48	2.30	207387-2
	Replacement Coupling Ring	11	A16055-ND	.72	.68	213811-1
	Replacement Coupling Ring	13	A16056-ND	1.02	.95	213813-1
	Replacement Coupling Ring	17	A16057-ND	.81	.76	213810-1
4	Replacement Coupling Ring	23	A16058-ND	1.30	1.21	213812-1
	Jacketed Cable Seals, Cable Dia. 7.62mm	23	A16063-ND	10.15	9.41	207052-1
	Jacketed Cable Seals, Cable Dia. 11.43mm	23	A16064-ND	16.83	15.60	207052-2
	Jacketed Cable Seals, Cable Dia. 15.24mm	23	A16065-ND	9.39	8.71	207052-3
6	Rubber Boots*	11	A16059-ND	3.30	3.06	206304-1
	Back Shell Extenders	23	A16062-ND	3.08	2.85	207055-1
8	Peripheral Seals for Receptacles Only	11	A1335-ND	.56	.45	206403-1
	Peripheral Seals for Receptacles Only	13	A1336-ND	.82	.66	206403-4
	Peripheral Seals for Receptacles Only	17	A1337-ND	.63	.51	206403-2
	Peripheral Seals for Receptacles Only	23	A1338-ND	1.15	.93	206403-3
Keying Plug, Series 1 & 4			A16066-ND	.16	.14	200821-1
Keying Plug, Series 2			A16067-ND	.35	.33	206509-1
Keying Plug, Series 3 & 4 (Socket Cavities)			A16068-ND	.52	.49	206508-1
Keying Plug, Series 3 & 4 (Pin Cavities)			A16069-ND	1.41	1.31	207597-1

\* Rubber boots are used with jacketed cable to provide splashproof connections for Series 1 & 3 connectors. Black neoprene.

## AMP NEW! Flexible Corrugated Tubing and Connectors



**PLASTIC TUBING:** • Properties: Air- and liquid-tight, oil resistant up to +80°C, benzene resistant, highly resistant to acids and solvents, ozone resistant, free of silicon, cadmium and halogens, self-extinguishing and flame retarding • Temperature Range: Approximately -40°C to +115°C, temporarily withstands temperatures up to approx. +150°C • Color: Black • UL File No. E86359, GGVs certified

**CONNECTIONS:** • One-piece plastic quick screw connection with PG-thread acc. to DIN 40430 for corrugated tubings • Material: High-quality, impact resistant plastic material (PA) Sealing: Santoprene® • Properties: Easy to assemble due to one-piece screw connection with push-in lock. Simple disconnect by displacing the snap-in sleeve. Smallest outer dimensions to be used under confined conditions • Temperature Range: From approximately -30°C up to +100°C • Color: Black • GGVs certified

Trade Size Tubing Outer Dia. - In. (mm)	Bending Radius (mm) ±10%	Digi-Key Part No.	Note: X in Part No. = Meters Per Roll				AMP Part No.
			Price Per Roll	5 meter	10 meter	25 meter	
Fig. 1 — All-Plastic Tubing							
0.51 (13.0)	20	A16090-X-ND	11.70	21.45	48.75	78.00	969789-2
0.62 (15.8)	35	A16091-X-ND	14.70	26.95	61.25	98.00	969789-3
0.83 (21.2)	45	A16092-X-ND	24.00	44.00	100.00	160.00	969789-4
1.12 (28.5)	55	A16093-X-ND	37.65	69.03	156.88	251.00	969789-5

Trade Size Tubing Outer - Dia. Inch (mm)	Thread DIN 40430 PG	Smallest Inner ø	Largest Inner ø	Thread Length C	Total Length D	Total Height E	Connection øF	Digi-Key Part No.	Price Each	100	AMP Part No.
<b>Fig. 2 – Panel Mount Straight Tubing Connections</b>											
0.51 (13.0)	9	10.0	20.0	10	35.0	—	—	A16094-ND	1.60	1.53	969803-2
0.62 (15.8)	11	12.5	23.0	10	37.0	—	—	A16095-ND	1.62	1.56	969803-3
0.83 (21.2)	16	17.0	29.5	12	43.5	—	—	A16096-ND	1.70	1.64	969803-4
1.12 (28.5)	21	23.5	37.0	12	46.0	—	—	A16097-ND	3.02	2.89	969803-5

Trade Size Tubing Outer - Dia. Inch (mm)	Thread DIN 40430 PG	Smallest Inner ø	Largest Inner ø	Thread Length C	Total Length D	Total Height E	Connection øF	Digi-Key Part No.	Price Each	100	AMP Part No.
<b>Fig. 3 – Panel Mount Right Angle Tubing Connections</b>											
0.51 (13.0)	9	12.0	20.0	10	36.0	34.0	20.0	A16098-ND	2.94	2.82	969817-2
0.62 (15.8)	11	15.5	23.0	10	42.0	37.5	23.0	A16099-ND	3.05	2.94	969817-3
0.83 (21.2)	16	18.0	29.5	12	50.0	47.0	27.0	A16100-ND	3.13	3.02	969817-4
1.12 (28.5)	21	24.0	37.0	12	57.0	55.0	34.0	A16101-ND	5.21	5.01	969817-5

Note: Must order counter nuts and seals separately.

		Dimensions (mm)				Digi-Key Part No.	Price Each 1 25	AMP Part No.
Thread	Thick- ness	Hex Width	Height	Outer Dia.	Inner Dia.			
Counter nuts								
9	5.0	22	—	—	—	A16106-ND	22 20	796260-2
11	5.0	24	—	—	—	A16107-ND	23 21	796260-3
16	6.0	30	—	—	—	A16108-ND	24 23	796260-4
21	7.0	36	—	—	—	A16109-ND	28 36	796260-6
Flat O-Ring Seal								
9	—	—	1.6	19	15	A16110-ND	.39 .37	796257-2
11	—	—	1.8	23	18	A16111-ND	.42 .41	796255-2
16	—	—	1.8	27	25	A16112-ND	.45 .43	796255-3
21	—	—	2.2	43	34	A16113-ND	.76 .72	796258-6

1-800-344-4539 • www.digikey.com

218-681-6674 • FAX: 218-681-3380

(Q002) 95

information about ranges, resolution, limits, etc., is stored in the HV card. New 1460 series HV cards with different features can be inserted into older 1450 systems with no loss in performance.

Depending on load and voltage, the HV card can require more supply current than available in the average HV crate slot. The user must confirm that sufficient supply current is available for their application. The required information is in the data sheets for the HV cards and HV crates.

### Model 1461 3 kV Independent HV Supply

The Model 1461 HV card supplies 12 independent channels, in a single slot, suitable for photomultiplier tubes. The high voltage output is programmable from 0 to 3 kV. The output current supports a 1.2 Mohm load to 3 kV. Other features include voltage measurement, current measurement, programmable current trip, hardware voltage limit (once per card), and separate programmable ramp up and ramp down rates.

### Model 1469 3.5 kV Distributed HV Supply

The Model 1469 HV Card is ideal for chamber applications. The card supplies 24 channels of high voltage, programmable in groups of 8 channels. All channels within a group are programmed to the same output voltage, in steps of 1 V, from 0 to 3.5 kV with channel-to-channel variation within each group nominally less than 500 mV. Each channel provides current readback and current trip resolution of 25 nA and a maximum output current of 98  $\mu$ A.

Features include 12-bit voltage readback for each group, current trip for each channel, programmable ramp up rate, and programmable ramp down rate. In the event of a channel trip, a relay disconnects the output while other outputs within the group remain powered. An added feature protects the bulk from hard shorts to ground, a bulk trip de-energizes the bulk supply quickly.

### Reconfiguring HV Modules

The 146x Series HV cards can be optimized from the standard design to accommodate different voltage and current requirements of Photo Multiplier, Drift Chambers, Resistive Plate, Silicon Detectors, Germanium Detectors and Micro Strip Gas Detectors. For example, the basic method for realizing higher currents in the Model 1461 is the combining of output channels. Lower voltages are realized by removing multiplier stages. Contact a LeCroy representative for more information.

## High Voltage Card Comparison Matrix for the VISy

Specifications	Model 1461	Model 1469
<b>Description</b>	12 ch., Max. 3 kV, Max. 2.5 mA/ch.	24 ch., Max. 3.5 kV, Max. 98 $\mu$ A/ch.
<b>Channels</b>	12 fully independent	24, programmable in groups of 8
<b>Voltage</b>	Programmable 0 to 3 kV	Programmable 0 to 3.5 kV
<b>Voltage Polarity</b>	1461N for neg.; 1461P for pos.	1469N for neg.; 1469P for pos.

<b>Voltage Set Resolution</b>	< 1 V (750 mV nominal)	< 1 V (900 mV)
<b>Voltage Output Matching</b>	N/A	< 500 mV variation within group
<b>Voltage Output Accuracy @ 25°C</b>	$\pm(0.1\%$ of setting + 1.5 V) from 5% - 100% of full scale. (Below 5% a min. load may be necessary)	$\pm(0.1\%$ of setting + 1.5 V)
<b>Temperature Stability</b>	< 100 ppm/°C	< 100 ppm/°C
<b>Voltage Repeatability</b>	< $\pm 0.5$ V at constant load, line and temp.	< $\pm 0.5$ V at constant load, line and temp.
<b>Voltage Output Ripple</b>	< 100 mV p-p < 50 mV p-p for < 1 mA or freq. > 25 kHz	< 50 mV p-p < 25 mV p-p for freq. > 25 kHz
<b>Voltage Measurement Resolution</b>	< 1 V (750 mV nominal)	< 1 V (900 mV)
<b>Voltage Measurement Accuracy @ 25°C</b>	$\pm(0.1\%$ of reading + 1.5 V)	$\pm(0.1\%$ of reading + 1.5 V)
<b>Voltage Ramp Rates</b>	Programmable/ch. separate ramp up & down rates (nominally 50 to 2000 V/s in 50 V steps)	Programmable/group separate ramp up & down rates (nominally 1 to 500 V/s in 1 V steps)
<b>Output Current Capability</b>	> 2.5 mA (2.8 - 3 kV), > 1.0 mA (0 - 1 kV), linear derate from 1 to 2.8 kV	98 $\mu$ A; (300 $\mu$ A charging avg./ch. within bulk)
<b>Current Measurement Resolution</b>	< 1 $\mu$ A	26 nA
<b>Current Measurement Accuracy</b>	$\pm(2\%$ of reading + 15 $\mu$ A)	$\pm(1\%$ of reading + 100 nA)
<b>Current Trip</b>	Programmable/ch. 1 $\mu$ A resolution (from 50 to 2550 $\mu$ A)	Programmable/ch. 5 $\mu$ A to 98 $\mu$ A/ch. 26 nA resolution, relay disconnect 2.5 mA bulk trip
<b>Current Trip Detect Time</b>	< 200 msec	< 10 msec
<b>24 V Power Requirement</b>	171 mA supply per mA output +38 mA supply per channel. Multiple modules can exceed the power supplied by the standard crate.	< 208 mA

<b>Hardware Voltage Limit</b>	One potentiometer & 1000:1 test point	One potentiometer & 1000:1 test point
<b>HV ON LED</b>	One; steady on for all channels stable HV, flash for any channel changing output or trip	One; steady on for all channels stable HV, flash for any channel changing output or trip
<b>Dimensions</b>	6 U (10.3" high x 14.6 " deep x 1" wide; Eurocard C size)	6 U (10.3" high x 15.0 " deep x 1" wide; Eurocard C size)
<b>Connectors</b>	SHV (12 )	LHV (3), block type, 8 conductors each

## High Voltage Card Alternate Configurations

Specifications	1461/M006	1461/M100	1461/M104	1461/M202	1461/M410
<b>Channels</b>	2 fully independent	12 fully independent	3 fully independent	6 fully independent	12 fully independent
<b>Voltage</b>	Programmable 0 - 3 kV	Programmable 0 - 2.1 kV	Programmable 0 - 2.25 kV	Programmable 0 - 1.5 kV	Programmable to 120 V in 250 mV steps
<b>Voltage Polarity</b>	1461N/M006 for neg.; 1461P/M006 for pos.	1461N/M100 for neg.; 1461P/M100 for pos.	1461N/M104 for neg.; 1461P/M104 for pos.	1469N/M202 for neg.; 1469P/M202 for pos.	1461N/M410 f neg.; 1461P/M410 f pos.
<b>Voltage Set Resolution</b>	< 1 V (750 mV nominal)	< 1 V (500 mV nominal)	< 1 V (500 mV nominal)	< 0.5 V (380 mV nominal)	< 50 mV (35 m nominal)
<b>Voltage Output Accuracy @ 25°C</b>	±(0.1% of setting +1.5 V) from 5-100% of full scale (Below 5% a minimum load may be necessary)	±(0.1% of setting +1.5 V) from 5-100% of full scale (Below 5% a minimum load may be necessary)	±(0.1% of setting +1.5 V) from 5-100% of full scale (Below 5% a minimum load may be necessary)	±(0.1% of setting +1.5 V) from 5-100% of full scale (Below 5% a minimum load may be necessary)	±(0.1% of setting +500 mV) from 5-100% of full scale (Below 5% a minimum load may be necessary)
<b>Temperature Stability</b>	< 100 ppm/°C	< 100 ppm/°C	< 100 ppm/°C	< 100 ppm/°C	< 100 ppm/°C
<b>Voltage Repeatability</b>	< ±0.5 V at constant load, line and temp.	< ±500 mV at constant load, line and temp.	< ±500 mV at constant load, line and temp.	< ±0.5 mV at constant load, line and temp.	< ±500 mV at constant load, line and temp.
<b>Voltage Output Ripple</b>	< 100 mV p-p max. (< 50 mV p-p for < 4.8 mA for freq. > 25 kHz)	< 100 mV p-p max. (< 50 mV p-p for < 1.3 mA for freq. > 25 kHz)	< 100 mV p-p max. (< 50 mV p-p for < 4.4 mA for freq. > 25 kHz)	< 100 mV p-p (< 50 mV p-p for < 1 mA for freq. > 25 kHz)	< 5 mV p-p max. (< 3 mV p-p for freq. > 25 kHz)

**Power Requirements (current from 24 V supply):** (38 mA + 171 mA/output mA) per channel. Note, multiple modules can exceed the power supplied by a standard mainframe.

**Hardware Voltage Limit:** One potentiometer on panel and 1000:1 test point.

**HV On LED:** One per card, steady on for all channels stable HV, flash for any channel changing output or trip.

**Dimensions:** 6 U (10.3" high x 14.6" deep x 1" wide; Eurocard C size).

**Connector Type:** 12 SHV.

## **Model 1469 24-Channel, 3.5 kV Supply/Distributor Card**

**Channels:** 24, programmable in groups of 8.

**Voltage:** Programmable 0 to 3.5 kV.

**Voltage Polarity:** Model 1469N for negative voltage, Model 1469P for positive voltage.

**Voltage Set Resolution:** < 1 V (900 mV).

**Voltage Output Accuracy:**  $\pm(0.1\%$  of setting +1.5 V) at 25°C.

**Voltage Output Matching:** < 500 mV variation within group.

**Temperature Stability:** < 100 ppm/°C.

**Voltage Repeatability:** <  $\pm 0.5$  V at constant load, line and temperature.

**Voltage Output Ripple:** < 50 mV p-p (< 25 mV p-p for freq. > 25 kHz).

**Voltage Measurement Resolution:** < 1 V (900 mV).

**Voltage Measurement Accuracy:**  $\pm(0.1\%$  of reading + 1.5 V) at 25°C.

**Voltage Ramp Rate:** Programmable per group, separate ramp up and ramp down rates (nominally 1 to 500 V/sec in 1 V/sec steps).

**Current:** Maximum 98  $\mu$ A per channel; (300  $\mu$ A charging avg./ch. within bulk).

**Bulk Charge Current Capability:** 2.5 mA maximum, channel: 300  $\mu$ A average per channel.

**Current Trip:** Programmable per channel, 5  $\mu$ A to 98  $\mu$ A/ch., 26 nA resolution, relay disconnect 2.5 mA bulk trip.

**Programmable Trip Time Constant (SOT):** 0 - 15 samples.

**Current Measurement Resolution:** 26 nA.

**Current Measurement Accuracy:**  $\pm(1\%$  of reading + 100 nA).

**Current Measurement Sample Rate:** Approximately 1800 samples/sec.

**Current Trip Detect Time:** < 10 msec.

**Power Requirements (current from 24 V supply):** Less than 208 mA.

**Hardware Voltage Limit:** One potentiometer on panel and 1000 to 1 test point.

**HV ON LED:** One per card, steady on for all channels stable HV, flash for any channel changing output or trip.

**Dimensions:** 6 U (10.3" high x 14.6" long x 1" wide; Eurocard C size).

**Connector Type:** Three 8 HV channel multiconductor, block type: (LHV) AMP P/N 443160-1.

## **Model 1471 Independent 8-Channel, 200 $\mu$ A, 6 kV Card**

**Channels:** 8, fully independent.

**Output Voltage:** 0 to 6 kV, programmable.

**Voltage Polarity:** Model 1471N for negative voltage, Model 1471P for positive voltage.

**Voltage Set Resolution:** < 1 V (nominally 500 mV).

**Voltage Measurement Resolution:** < 1 V (nominally 500 mV).

**Voltage Measurement Accuracy:**  $\pm(0.1\%$  of reading + 3 V) at 25°C.

**Voltage Output Accuracy:**  $\pm(0.1\%$  of setting + 3 V) at 25°C, from 5 to 100% of full scale (below 5% of full scale, a minimum load may be necessary).

**Voltage Output Temperature Stability:** < 100 ppm/°C.

**Voltage Repeatability:** <  $\pm 1$  V at constant load, line and temperature.

**Voltage Output Ripple:** < 50 mV p-p (< 10 mV p-p for  $f > 1$  kHz or  $f > 25$  kHz).

**Voltage Ramp Rates:** Programmable per channel, separate up and down rates. nominally 10 to 500 V/s in 1 V steps. Trip at maximum charging current; programmable ON (default) or OFF.

**Output Current Capability:** 200  $\mu$ A per channel.

**Charging Current:** Maximum 200  $\mu$ A per channel.



# FLEXRAD HV (105°C XLPE)

---

## Product Categories:

- [5kV UL3239, CSA TV-6](#)
  - [10kV UL3239, CSA TV-10](#)
  - [15kV UL3239, CSA TV-15](#)
  - [20kV UL3239, CSA TV-20](#)
  - [25kV UL3239, CSA TV-20](#)
  - [30kV UL3239, CSA TV-30](#)
  - [40kV UL3239, CSA TV-40](#)
- 

## Properties:

- **Overview:** FLEXRAD HV is specially designed as a high voltage lead wire for consumer electronics, appliances, test equipment and instrumentation. It has Judd Wire's superior cross-linked polyethylene insulation and is temperature rated for 105°C continuous, with excellent overload capacity for short duration.
  - **Application-matching variety:** FLEXRAD HV is available in seven voltage ratings, 5kv to 40kv, so it is easily matched to your applications without expensive "overkill." There is no need, for example, to substitute a 15kv wire in a 5kv application. Savings of up to 20% in cost, space requirement and wire weight are possible by specifying the right FLEXRAD HV for each job.
  - **Superior production properties:** The excellent flexibility of FLEXRAD HV makes it easy to use in tight places. Its tough irradiated polyethylene insulation resists shrink-back and melting, even when in direct contact with a soldering iron.
  - **Excellent performance characteristics:** FLEXRAD HV has high resistance to abrasion, deformation, cut-through and chemical attack.
  - **Flame retardant rating VW-1.**
  - **Three conductor styles:** Solid tinned copper, stranded bare copper with tinned overcoat (TOP), or stranded tinned copper with tinned overcoat (TOC).
- 

## Conductors:

**Solid Tinned Copper**



**Stranded Copper w/Tinned Overcoat**

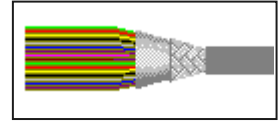


• [Contents](#) • [Profile](#) • [Sales](#) • [Trade #](#) • [Technical Info](#) • [Exit](#)



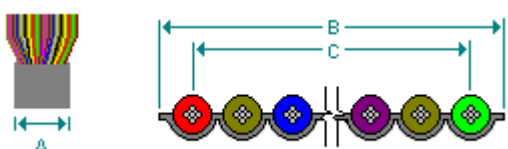
1-800-BELDEN-1

**Shielded MASS-TER® Cable**  
 .050" Pitch  
 28 AWG, 17 Pairs  
 PVC Shielded, Rounded-to-Flat



Trade Number	Conductors AWG (Strand) Type	Pitch	Insulation Thickness	Drain Wire AWG Type	Shields	Dielectric Dia. (Type)
<b>9M28334</b>	28 (7x36) TC	0.05 ±0.005 in.	0.01 in. <b>Jacket</b> 0.05 in. <b>Substrate</b> 0.004 in.		Beldfoil 65% TC Braid	

Description		
<b>Insulation:</b>	Color Coded PVC	.050" Pitch. 28 AWG, 17 Pairs. PVC. Shielded, Rounded-to-Flat. Belden's shielded MASS-TER cable offers end users the termination ease of Vari-Twist® flat cable with the flexibility and air flow enhancements of round cable. MASS-TER cable was designed to meet the assembly requirement needs of today's computers, computer peripherals, terminals, telecommunication systems and military communication systems. MASS-TER cable is PVC jacketed in round construction of pre-insulated twisted pairs followed by a flat terminating section laminated to a patented clear PVC/Polyester substrate. Standard twist length is 18 inches followed by a 2 inch flat section. Belden manufactures MASS-TER cable using an innovative spiraling technique which maintains the stringent conductor-to-conductor tolerance of ±.005" on .050" centering. Conductors are 28 AWG, stranded, tinned copper. Shielded MASS-TER cable contains an overall Beldfoil® and 65% tinned copper braid shield. Because the conductor pairs are non-laminated, it is easier to fit MASS-TER around corners. Each adjacent pair is twisted in an opposite direction to reduce crosstalk. Each pair consists of a tan conductor paired with a color-coded conductor. Color sequence for each terminating section is Brown/Tan, Red/Tan, Orange/Tan, Yellow/Tan, Green/Tan, Blue/Tan, Violet/Tan, Gray/Tan, White/Tan, Black/Tan. Sequence is repeated as necessary. The Vari-Twist flat section of MASS-TER makes it easy to terminate. Belden MASS-TER is designed for mass-termination with standard IDC connectors. For further information on Belden's MASS-TER cable capabilities, contact your nearest Belden Distributor Belden Sales Representative. Applications: External Interconnection or Internal Wiring of Electronic Equipment and/or Class 2 Remote Control, Signaling, and Power-Limited Cables. Packaging: H100 * Test Configuration: G-S (ground-signal) with shield grounded
<b>Jacket:</b>	Chrome PVC	
<b>Substrate:</b>	Clear PVC/Polyester	
<b>Ground Plane:</b>		

Dimensions		
<b>A:</b>	0.41 ± 0.0 in.	
	(Metric) 10.4135 ± mm	
<b>B:</b>	1.7 ± 0.0 in.	
	(Metric) 43.1779 ± mm	
<b>C:</b>	1.65 ± 0.015 in.	
	(Metric) 41.9080 ± .381 mm	

Approvals		
<b>UL: File #</b>	E34972	<b>NEC:</b> CL2
<b>Style</b>	20381	
<b>CSA: File #</b>		<b>Temperature Rating:</b> -20°C to +105°C
		<b>Flame Rating: UL CSA</b> 1581 Vertical Tray

Electrical		
<b>Voltage Rating:</b>	300.0 V RMS	<b>Impedance (Balanced):</b> 110.0 ohms <b>*(Unbalanced):</b> 65.0 ohms
<b>Current Rating:</b>	0.5 Amps	
<b>Conductor Resistance:</b>	68.0 ohms/M'	<b>Capacitance* @ 1MHz:</b> 27.0 pF/ft (88.6 pF/m)
<b>Insulation Resistance:</b>	>1x10 <sup>10</sup> ohms*10 ft.(3m)	<b>Impedance* @ 1MHz:</b> 0.22 uH/ft (.72 uH/m)
		<b>Propagation Delay:</b> 1.7 ns/ft (5.6 ns/m)

[▲ Top](#)

(Select other related products with BACK or PREVIOUS.)

Disclaimer: Great effort is made to ensure the accuracy of the information presented, but errors or omissions may exist. This listing of information is presented as a courtesy and does not ensure that a product with these specifications is available. Specifications and availability should be confirmed with a call to our sales representatives or to customer service. Have a question? Call us at 1-800-BELDEN-1 or send us a [comment](#). Page displayed 6/8/100 for category Flat Cables.



[Return to Belden's Home Page](#)

[Products](#) | [Trade Shows](#) | [Distributors](#) | [Links](#) | [Message Center](#) | [Financial Info](#) | [Search](#) | [FAQs](#)

Copyright © 2000 Belden Inc.