



	IAA170P	Units
Load Voltage	350	V
Load Current	100	mA
Max R <sub>ON</sub>	50	Ω

### Description

The IAA170P multifunction switch combines 350V, 100mA, 50Ω relay(s) and optocoupler(s) into a single package. Various combinations are available depending on the part number. This switch provides an ideal way to consolidate functionality into a single package.

### Features

- Three Functions in One Package
- Small 16 Pin SOIC Package (PCMCIA Compatible)
- Bi-Directional Current Sensing
- Bi-Directional Current Switching
- Replaces up to Three or Four Components
- 3750V<sub>RMS</sub> Input/Output Isolation
- FCC Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable

### Applications

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringer Injection
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

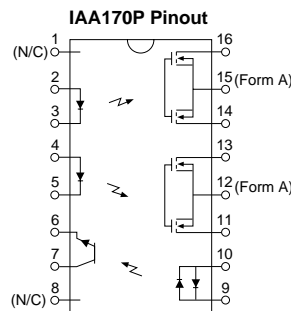
### Approvals

- Tape & Reel Versions Available
- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-12
- VDE Compatible
- BSI Certified:
  - BS EN 60950:1992 (BS7002:1992)  
Certificate #:7969
  - BS EN 41003:1993  
Certificate #:7969

### Ordering Information

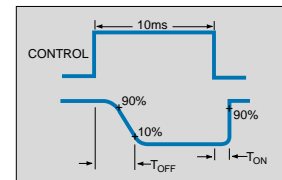
Part #	Description
IAA170P	16 Pin SOIC (50/Tube)
IAA170PTR	16 Pin SOIC (1000/Reel)

### Pin Configuration

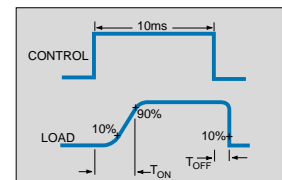


1. (N/C)
2. + LED - Form A Relay #1
3. - LED - Form A Relay #1
4. + LED - Form A Relay #2
5. - LED - Form A Relay #2
6. Emitter - Phototransistor
7. Collector - Phototransistor
8. (N/C)
9. LED - Phototransistor +/-
10. LED - Phototransistor +/-
11. Output - Form A Relay #2
12. Common Source Relay #2
13. Output - Form A Relay #2
14. Output - Form A Relay #1
15. Common Source Relay #1
16. Output - Form A Relay #1

Switching Characteristics of Normally Closed (Form B) Devices



Switching Characteristics of Normally Open (Form A) Devices



**Absolute Maximum Ratings (@ 25° C)**

Parameter	Min	Typ	Max	Units
Total Package Dissipation	-	-	1 <sup>1</sup>	W
Isolation Voltage Input to Output	3750	-	-	V <sub>RMS</sub>
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature (10 Seconds Max.)	-	-	+220	°C

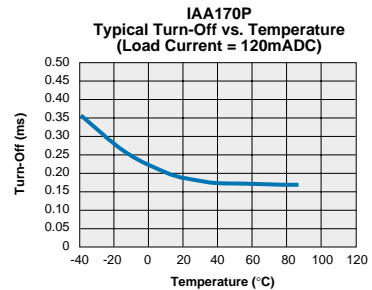
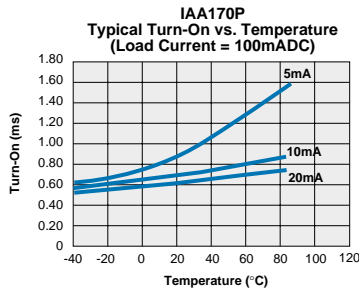
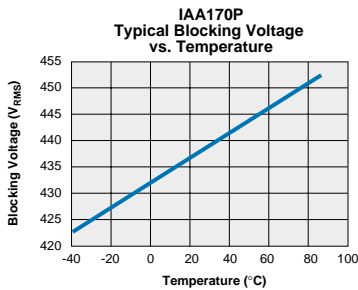
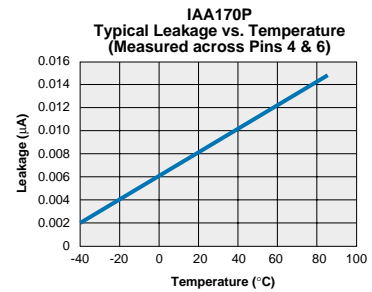
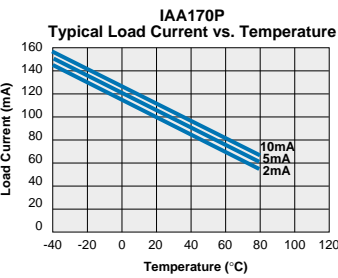
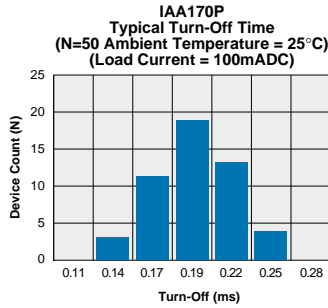
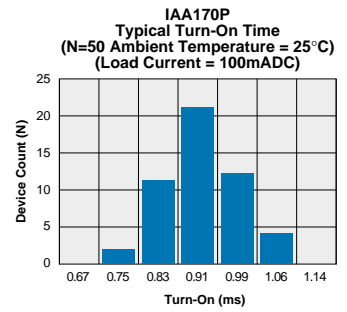
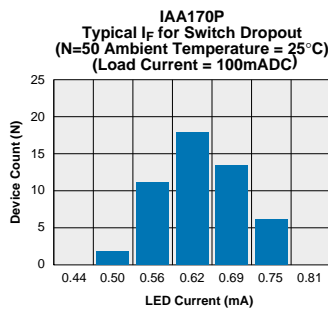
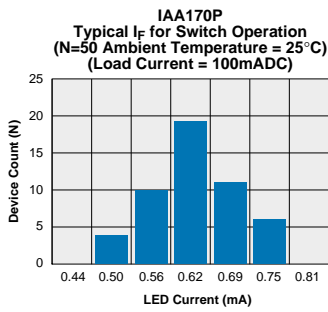
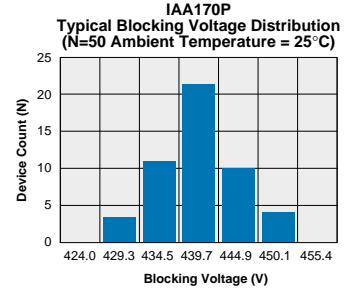
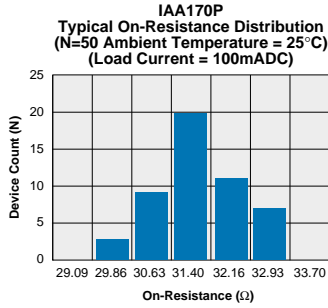
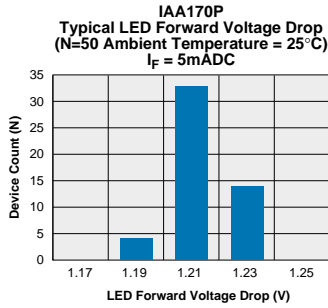
<sup>1</sup> Above 25° derate linearly 1.67mw/°C

*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.*

**Electrical Characteristics**

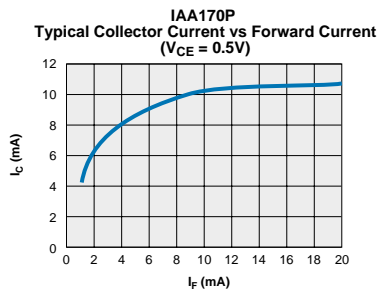
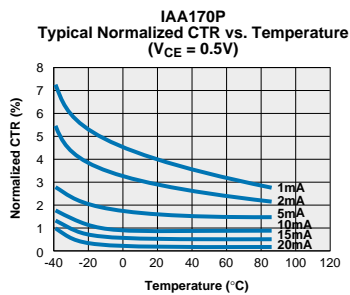
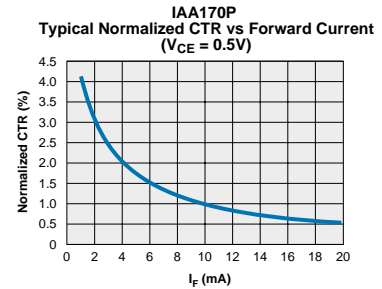
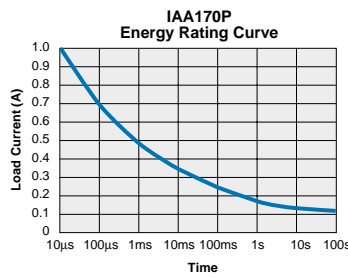
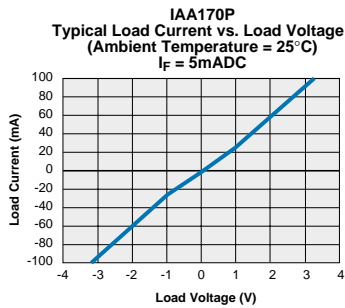
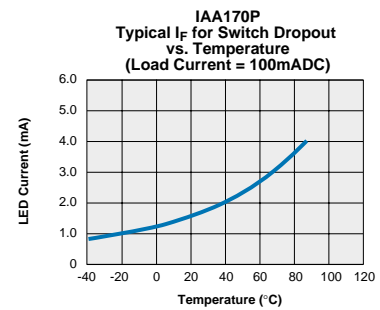
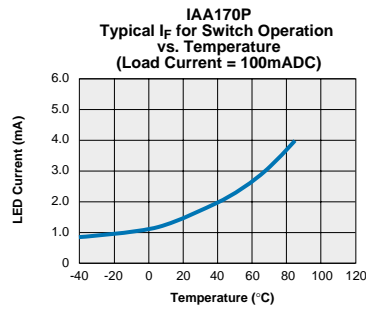
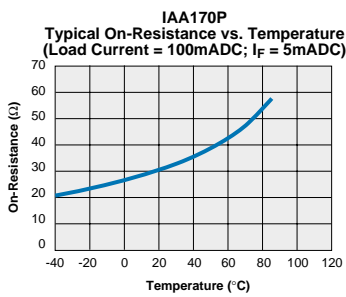
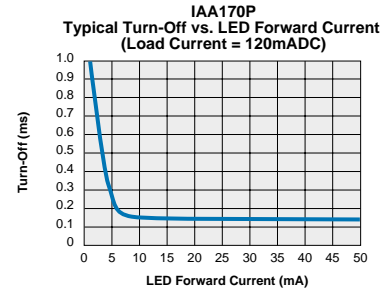
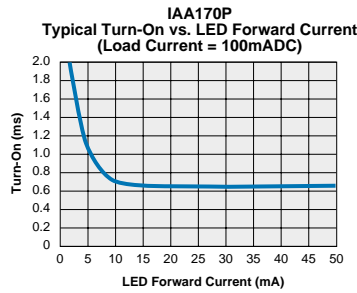
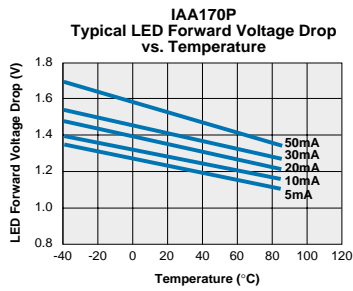
Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Relay Portion</b>						
<b>Output Characteristics @ 25°C</b>						
Load Voltage (Peak)	-	V <sub>L</sub>	-	-	350	V
Load Current (Continuous)	-	I <sub>L</sub>	-	-	100	mA
Peak Load Current	10ms	I <sub>LPK</sub>	-	-	350	mA
On-Resistance	I <sub>L</sub> =100mA	R <sub>ON</sub>	-	-	50	Ω
Off-State Leakage Current	V <sub>L</sub> =350V; T <sub>J</sub> =25°C	I <sub>LEAK</sub>	-	-	1	μA
<b>Switching Speeds</b>						
Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	5	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	5	ms
Output Capacitance	V <sub>L</sub> =50V, f=1MHz	-	-	25	-	pF
<b>Relay Portion</b>						
<b>Input Characteristics @ 25°C</b>						
Input Control Current	I <sub>L</sub> =100mA	I <sub>F</sub>	5	-	50	mA
Input Dropout Current	I <sub>L</sub> =1mA	I <sub>F</sub>	0.4	-	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Voltage	-	V <sub>R</sub>	-	-	5	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA
<b>Detector Portion</b>						
<b>Output Characteristics @ 25°C</b>						
Phototransistor Blocking Voltage	I <sub>C</sub> =10μA	B <sub>VCEO</sub>	20	50	-	V
Phototransistor Dark Current	V <sub>CE</sub> =5V, I <sub>F</sub> =0mA	I <sub>CCEO</sub>	-	50	500	nA
Saturation Voltage	I <sub>C</sub> =2mA, I <sub>F</sub> =16mA	V <sub>SAT</sub>	-	0.3	0.5	V
Current Transfer Ratio	I <sub>F</sub> =6mA, V <sub>CE</sub> =0.5V	C <sub>TR</sub>	33	-	-	%
<b>Detector Portion</b>						
<b>Input Characteristics @ 25°C</b>						
Input Control Current	I <sub>C</sub> =2mA, V <sub>CE</sub> =0.5V	I <sub>F</sub>	6	2	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	I <sub>CCEO</sub>	0.9	1.2	1.4	V
Input Current (Detector must be off)	I <sub>C</sub> =1μA, V <sub>CE</sub> =5V	-	5	25	-	μA
Input to Output Capacitance	V <sub>L</sub> =50V, f=1MHz	C <sub>I/O</sub>	-	3	-	pF
Input to Output Isolation	-	V <sub>I/O</sub>	3750	-	-	V <sub>RMS</sub>

PERFORMANCE DATA\*



The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

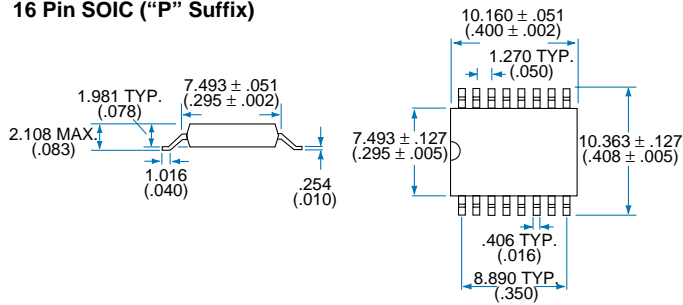
PERFORMANCE DATA\*



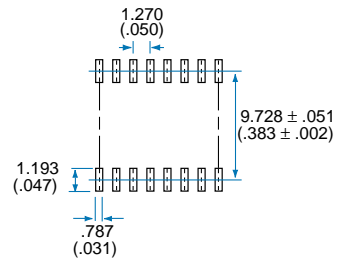
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

### Mechanical Dimensions

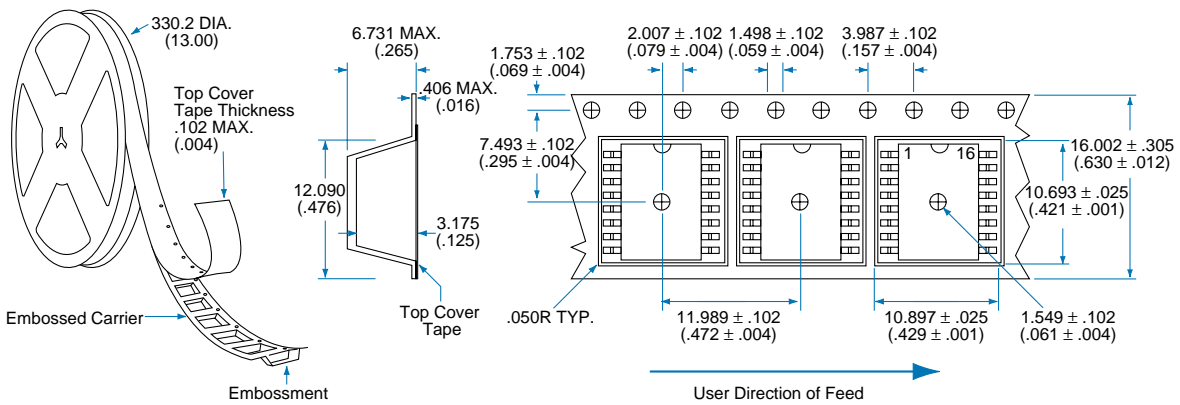
16 Pin SOIC ("P" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 16 Pin SOIC Package



Dimensions  
mm  
(inches)



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## CLARE LOCATIONS

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Tel: 1-978-524-6700  
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Clare Micronix Division  
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Aliso Viejo, CA 92656-1490  
Tel: 1-949-831-4622  
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## SALES OFFICES

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#### Americas Headquarters

Clare  
78 Cherry Hill Drive  
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Fax: 1-978-524-4900  
Toll Free: 1-800-27-CLARE

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Fax: 1-201-236-8685  
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1852 West 11th Street, #348  
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Tel: 1-209-832-4367  
Fax: 1-209-832-4732  
Toll Free: 1-800-27-CLARE

#### Canada

Clare Canada Ltd.  
3425 Harvester Road, Suite 202  
Burlington, Ontario L7N 3N1  
Tel: 1-905-333-9066  
Fax: 1-905-333-1824

## EUROPE

#### European Headquarters

CP Clare nv  
Bampslaan 17  
B-3500 Hasselt (Belgium)  
Tel: 32-11-300868  
Fax: 32-11-300890

#### France

Clare France Sales  
Lead Rep  
99 route de Versailles  
91160 Champlan  
France  
Tel: 33 1 69 79 93 50  
Fax: 33 1 69 79 93 59

#### Germany

Clare Germany Sales  
ActiveComp Electronic GmbH  
Mitterstrasse 12  
85077 Manching  
Germany  
Tel: 49 8459 3214 10  
Fax: 49 8459 3214 29

#### Italy

C.L.A.R.E.s.a.s.  
Via C. Colombo 10/A  
I-20066 Melzo (Milano)  
Tel: 39-02-95737160  
Fax: 39-02-95738829

#### Sweden

Clare Sales  
Comptronic AB  
Box 167  
S-16329 Spånga  
Tel: 46-862-10370  
Fax: 46-862-10371

#### United Kingdom

Clare UK Sales  
Marco Polo House  
Cook Way  
Bindon Road  
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UK-Somerset TA2 6BG  
Tel: 44-1-823 352541  
Fax: 44-1-823 352797

## ASIA/PACIFIC

#### Asian Headquarters

Clare  
Room N1016, Chia-Hsin, Bldg II,  
10F, No. 96, Sec. 2  
Chung Shan North Road  
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Tel: 886-2-2523-6368  
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