



	IAD110P	Units
Load Voltage	350	V
Load Current	100	mA
Max R _{ON}	35	Ω

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_{RMS} Input/Output Isolation
- FCC Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Tape & Reel Versions Available

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

Description

The IAD110P Multifunction Telecom switch combines a 350V Form A relay and two optocouplers in a single package. The relay uses optically coupled MOSFET technology to provide 1500V of input to output isolation. The efficient MOSFET switch and photovoltaic die uses Clare's patented OptoMOS architecture. The optically coupled input uses highly efficient GaAlAs infrared LEDs. IAD110P's allow telecom circuit designers to combine three discrete functions in a single component. The IAD110P's small package uses less space than traditional discrete component solutions.

Approvals

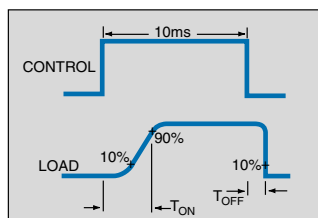
- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-12
- VDE Compatible
- BSI Certified:
 - BS EN 60950:1992 (BS7002:1992)
Certificate #:7969
 - BS EN 41003:1993
Certificate #:7969

Ordering Information

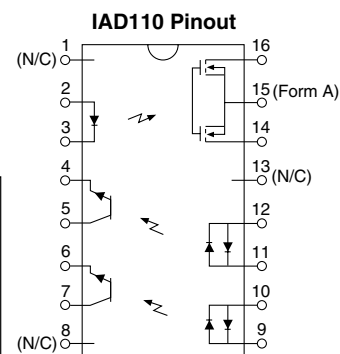
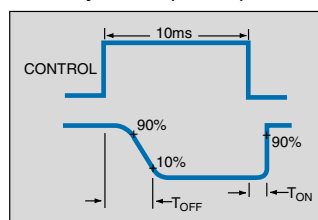
Part #	Description
IAD110P	16 Pin SOIC (50/Tube)
IAD110PR	16 Pin SOIC (1000/Reel)

Pin Configuration

Switching Characteristics of Normally Open (Form A) Devices



Switching Characteristics of Normally Closed (Form B) Devices



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

Absolute Maximum Ratings (@ 25° C)

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

¹ Above 25° derate linearity 1.67mw/°C

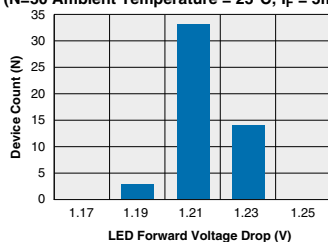
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to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

Electrical Characteristics

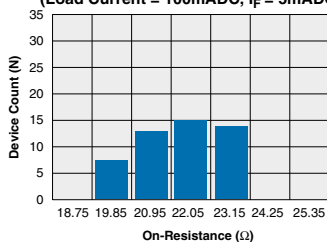
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Relay Portion						
Output Characteristics @ 25°C						
Load Voltage (Peak)	I _L = 1μA	V _L	-	-	350	V
Load Current (Continuous)	-	I _L	-	-	100	mA
Peak Load Current	10ms	I _{LPK}	-	-	350	mA
On-Resistance	I _L = 100mA	R _{ON}	-	-	35	Ω
Off-State Leakage Current	V _L = 350V; T _J = 25°C	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F = 5mA, V _L = 10V	T _{ON}	-	-	3	ms
Turn-Off	I _F = 5mA, V _L = 10V	T _{OFF}	-	-	3	ms
Output Capacitance	V _L = 50V, f = 1MHz	-	-	25	-	pF
Relay Portion						
Input Characteristics @ 25°C						
Input Control Current	I _L = 100mA	I _F	5	-	50	mA
Input Dropout Current	I _L = 1mA	I _F	0.4	-	-	mA
Input Voltage Drop	I _F = 5mA	V _F	0.9	1.2	1.4	V
Reverse Input Voltage	-	V _R	-	-	5	V
Reverse Input Current	V _R = 5V	I _R	-	-	10	μA
Detector Portion						
Output Characteristics @ 25°C						
Phototransistor Blocking Voltage	I _C = 10μA	BV _{CEO}	20	50	-	V
Phototransistor Dark Current	V _{CE} = 5V, I _F = 0mA	I _{CEO}	-	50	500	nA
Saturation Voltage	I _C = 2mA, I _F = 16mA	V _{SAT}	-	0.3	0.5	V
Current Transfer Ratio	I _F = 6mA, V _{CE} = 0.5V	C _{TR}	33	-	-	%
Detector Portion						
Input Characteristics @ 25°C						
Input Control Current	I _C = 2mA, V _{CE} = 0.5V	I _F	6	2	-	mA
Input Voltage Drop	I _F = 5mA	I _{CEO}	0.9	1.2	1.4	V
Input Current (Detector must be off)	I _C = 1μA, V _{CE} = 5V	-	5	25	-	μA
Input to Output Capacitance	V _L = 50V, f = 1MHz	C _{I/O}	-	3	-	pF
Input to Output Isolation	-	V _{I/O}	3750	-	-	V _{RMS}

PERFORMANCE DATA*

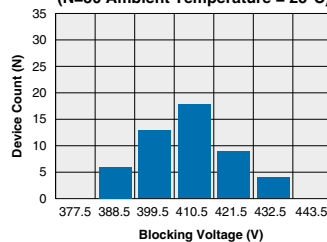
IAD110P
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C; $I_F = 5\text{mADC}$)



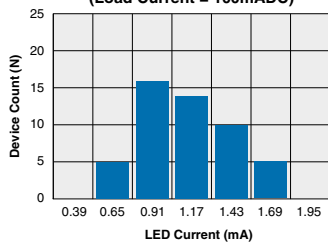
IAD110P
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC; $I_F = 5\text{mADC}$)



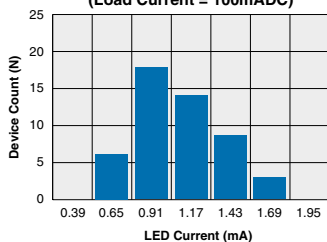
IAD110P
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



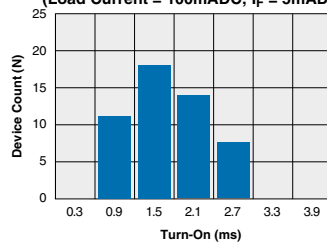
IAD110P
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



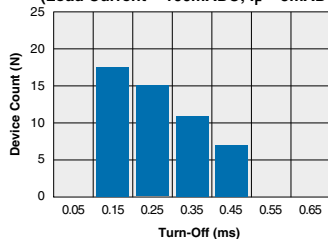
IAD110P
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC)



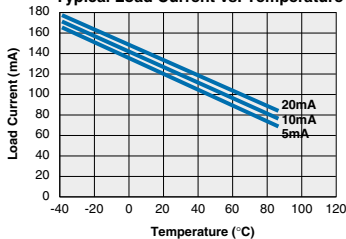
IAD110P
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC; $I_F = 5\text{mADC}$)



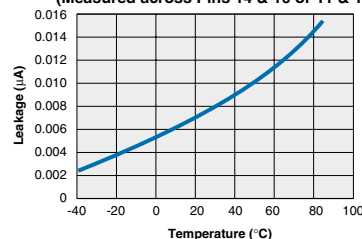
IAD110P
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 100mADC; $I_F = 5\text{mADC}$)



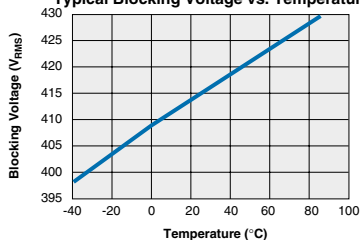
IAD110P
Typical Load Current vs. Temperature



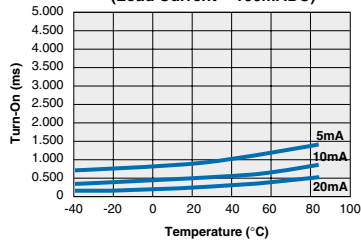
IAD110P
Typical Leakage vs. Temperature
(Measured across Pins 14 & 16 or 11 & 13)



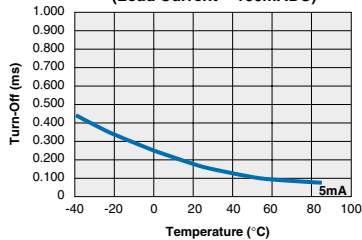
IAD110P
Typical Blocking Voltage vs. Temperature



IAD110P
Typical Turn-On vs. Temperature
(Load Current = 100mADC)

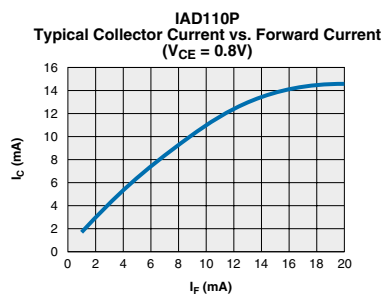
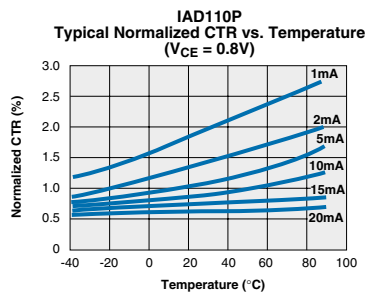
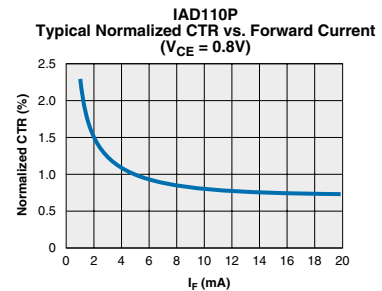
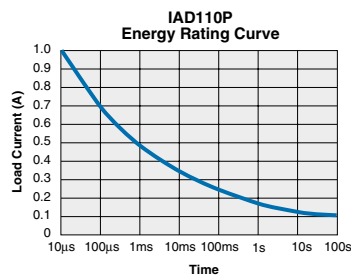
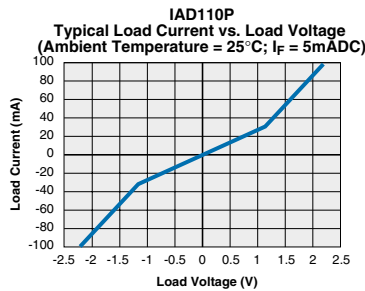
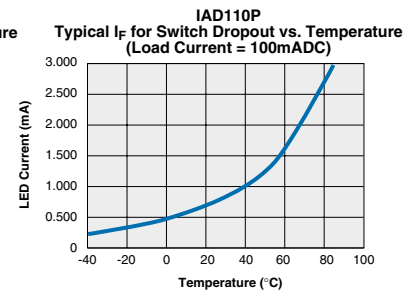
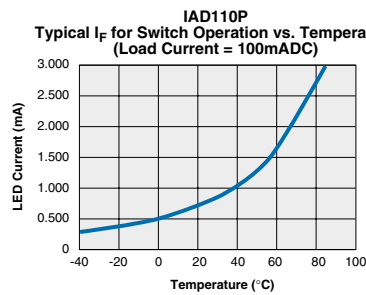
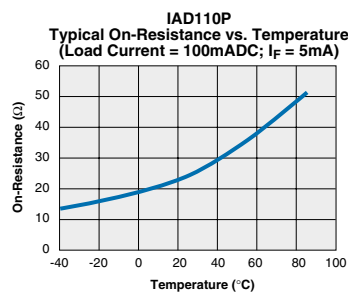
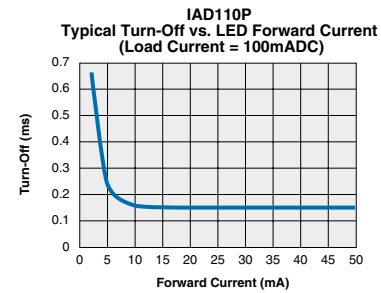
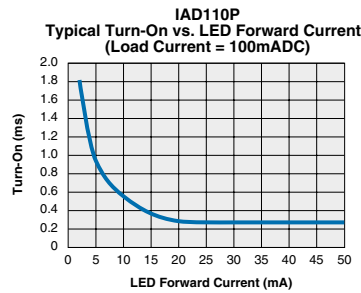
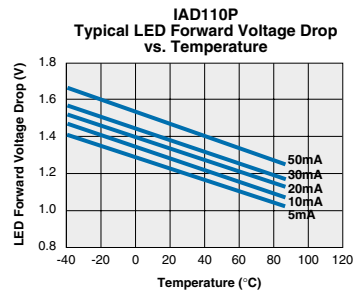


IAD110P
Typical Turn-Off vs. Temperature
(Load Current = 100mADC)



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.

16 Pin SOIC (“P” Suffix)

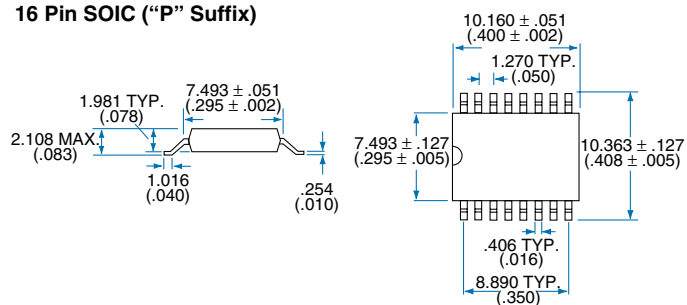


Figure 1: Dimensions of the Carrier Tape

330.2 DIA. (13.00)

Top Cover Tape Thickness .102 MAX. (.004)

Embossed Carrier

Embossment

6.731 MAX. (.265)

.406 MAX. (.016)

12.090 (.476)

3.175 (.125)

Top Cover Tape

.050R TYP.

11.989 ± .102 (.472 ± .004)

10.693 ± .025 (.421 ± .001)

1.549 ± .102 (.061 ± .004)

16.002 ± .305 (.630 ± .012)

1.753 ± .102 (.069 ± .004)

2.007 ± .102 (.079 ± .004)

1.498 ± .102 (.059 ± .004)

3.987 ± .102 (.157 ± .004)

User Direction of Feed

Rev. 2

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