



# THE DATASHEET OF H11AA814



**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**

**PACKAGE**



**H11AA814 SCHEMATIC**



**DESCRIPTION**

The H11AA814 Series consists of two gallium arsenide infrared emitting diodes, connected in inverse parallel, driving a single silicon phototransistor in a 4-pin dual in-line package.

The H11A617 and H11A817 Series consists of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 4-pin dual in-line package.

**FEATURES**

- Compact 4-pin package
- Current transfer ratio in selected groups:
 

H11AA814:	20-300%	H11A817:	50-600%
H11AA814A:	50-150%	H11A817A:	80-160%
H11A617A:	40%-80%	H11A817B:	130-260%
H11A617B:	63%-125%	H11A817C:	200-400%
H11A617C:	100%-200%	H11A817D:	300-600%
H11A617D:	160%-320%		
- Minimum  $BV_{CEO}$  of 70V guaranteed

**H11A617 & H11A817 SCHEMATIC**



**APPLICATIONS**

- H11AA814 Series
- AC line monitor
  - Unknown polarity DC sensor
  - Telephone line interface
- H11A617 and H11A817 Series
- Power supply regulators
  - Digital logic inputs
  - Microprocessor inputs

**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**

Parameter	Symbol	Device	Value	Units
<b>TOTAL DEVICE</b>				
Storage Temperature	T <sub>STG</sub>	All	-55 to +150	°C
Operating Temperature	T <sub>OPR</sub>	All	-55 to +100	°C
Lead Solder Temperature	T <sub>SOL</sub>	All	260 for 10 sec	°C
Total Device Power Dissipation (-55°C to 50 °C)	P <sub>D</sub>	All	200	mW
<b>EMITTER</b>				
Continuous Forward Current	I <sub>F</sub>	All	50	mA
Reverse Voltage	V <sub>R</sub>	H11A617A/B/C/D H11A817/A/B/C/D	6 5	V
Forward Current - Peak (1 μs pulse, 300 pps)	I <sub>F(pk)</sub>	All	1.0	A
LED Power Dissipation (25°C ambient) Derate above 25°C	P <sub>D</sub>	All	100 1.33	mW mW/°C
<b>DETECTOR</b>				
Collector-Emitter Voltage	V <sub>CEO</sub>	All	70	V
Emitter-Collector Voltage	V <sub>ECO</sub>	H11AA814/A H11A617A/B/C/D H11A817/A/B/C/D	6 7 6	V
Continuous Collector Current	I <sub>C</sub>	All	50	mA
Detector Power Dissipation (25°C ambient) Derate above 25°C	P <sub>D</sub>	All	150 2.0	mW mW/°C

**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C Unless otherwise specified.)

**INDIVIDUAL COMPONENT CHARACTERISTICS**

Parameter	Test Conditions	Symbol	Device	Min	Typ*	Max	Unit
<b>EMITTER</b>							
Input Forward Voltage	(I <sub>F</sub> = 60 mA)	V <sub>F</sub>	H11A617A/B/C/D		1.35	1.65	V
	(I <sub>F</sub> = 20 mA)		H11A817/A/B/C/D		1.2	1.5	
	(I <sub>F</sub> = ±20 mA)		H11AA814/A		1.2	1.5	
Reverse Leakage Current	(V <sub>R</sub> = 6.0 V)	I <sub>R</sub>	H11A617A/B/C/D		.001	10	μA
	(V <sub>R</sub> = 5.0 V)		H11A817/A/B/C/D				
<b>DETECTOR</b>							
Collector-Emitter Breakdown Voltage	(I <sub>C</sub> = 1.0 mA, I <sub>F</sub> = 0)	BV <sub>CEO</sub>	ALL	70	100		V
Emitter-Collector Breakdown Voltage	(I <sub>E</sub> = 100 μA, I <sub>F</sub> = 0)	BV <sub>ECO</sub>	H11AA814/A	6	10		V
			H11A617A/B/C/D	7			
			H11A817/A/B/C/D	6			
Collector-Emitter Dark Current	(V <sub>CE</sub> = 10V, I <sub>F</sub> = 0)	I <sub>CEO</sub>	H11AA814/A, H11A817/A/B/C/D, H11A617C/D		1	100	nA
			H11A617A/B			50	
Collector-Emitter Capacitance	(V <sub>CE</sub> = 0 V, f = 1 MHz)	C <sub>CE</sub>	ALL		8		pF

\*Typical values at T<sub>A</sub> = 25°C.

**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**

TRANSFER CHARACTERISTICS (T <sub>A</sub> = 25°C Unless otherwise specified.)							
DC Characteristic	Test Conditions	Symbol	Device	Min	Typ*	Max	Unit
Current Transfer Ratio	(I <sub>F</sub> = ±1 mA, V <sub>CE</sub> = 5 V) (note 1)	CTR	H11AA814	20		300	%
	(I <sub>F</sub> = ±1 mA, V <sub>CE</sub> = 5 V) (note 1)		H11AA814A	50		150	%
	(I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 5 V) (note 1)		H11A617A	40		80	%
			H11A617B	63		125	%
			H11A617C	100		200	%
			H11A617D	160		320	%
	(I <sub>F</sub> = 5 mA, V <sub>CE</sub> = 5 V) (note 1)		H11A817	50		600	%
			H11A817A	80		160	%
			H11A817B	130		260	%
			H11A817C	200		400	%
	(I <sub>F</sub> = 1 mA, V <sub>CE</sub> = 5 V) (note 1)		H11A817D	300		600	%
			H11A617A	13			%
			H11A617B	22			%
			H11A617C	34			%
Collector-Emitter Saturation Voltage	(I <sub>C</sub> = 1 mA, I <sub>F</sub> = ±20 mA) (I <sub>C</sub> = 2.5 mA, I <sub>F</sub> = 10 mA) (I <sub>C</sub> = 1 mA, I <sub>F</sub> = 20 mA)	V <sub>CE (SAT)</sub>	H11AA814/A			0.2	V
			H11A617A/B/C/D			0.4	
			H11A817A/B/C/D			0.2	
AC Characteristic							
Rise Time	(I <sub>C</sub> = 2 mA, V <sub>CE</sub> = 2 V, R <sub>L</sub> = 100Ω) (note 2)	t <sub>r</sub>	ALL		2.4	18	μs
Fall Time	(I <sub>C</sub> = 2 mA, V <sub>CE</sub> = 2 V, R <sub>L</sub> = 100Ω) (note 2)	t <sub>f</sub>	ALL		2.4	18	μs

ISOLATION CHARACTERISTICS						
Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
Input-Output Isolation Voltage (note 3)	f = 60Hz, t = 1 min	V <sub>ISO</sub>	5300			Vac(rms)
Isolation Resistance	(V <sub>I-O</sub> = 500 VDC)	R <sub>ISO</sub>	10 <sup>11</sup>			Ω
Isolation Capacitance	(V <sub>I-O</sub> = 0, f = 1 MHz)	C <sub>ISO</sub>		0.5		pf

\*Typical values at T<sub>A</sub> = 25°C.

**NOTES**

1. Current Transfer Ratio (CTR) = I<sub>C</sub>/I<sub>F</sub> x 100%.
2. For test circuit setup and waveforms, refer to Figure 8.
3. For this test, Pins 1 and 2 are common, and Pins 3 and 4 are common.

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**H11A817 SERIES**



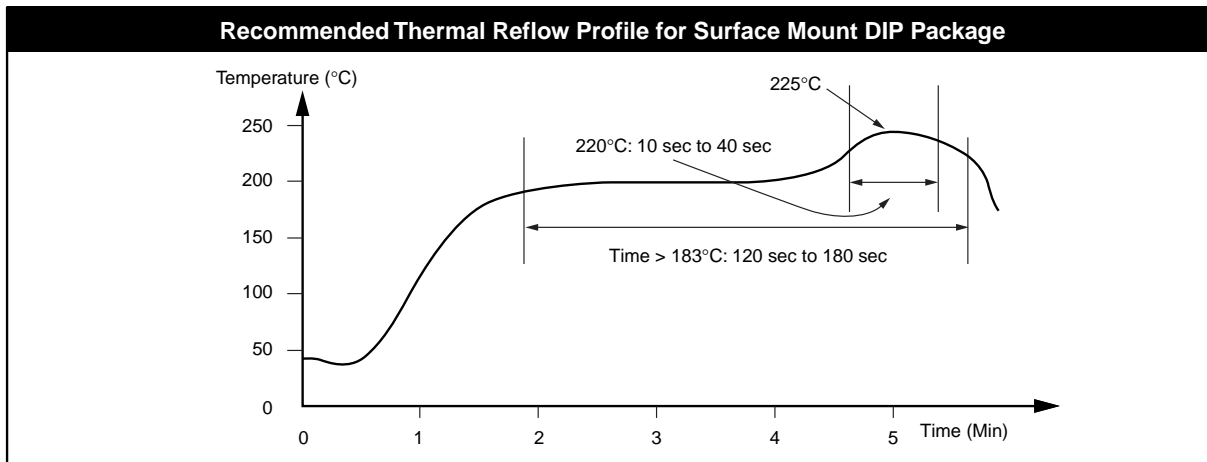
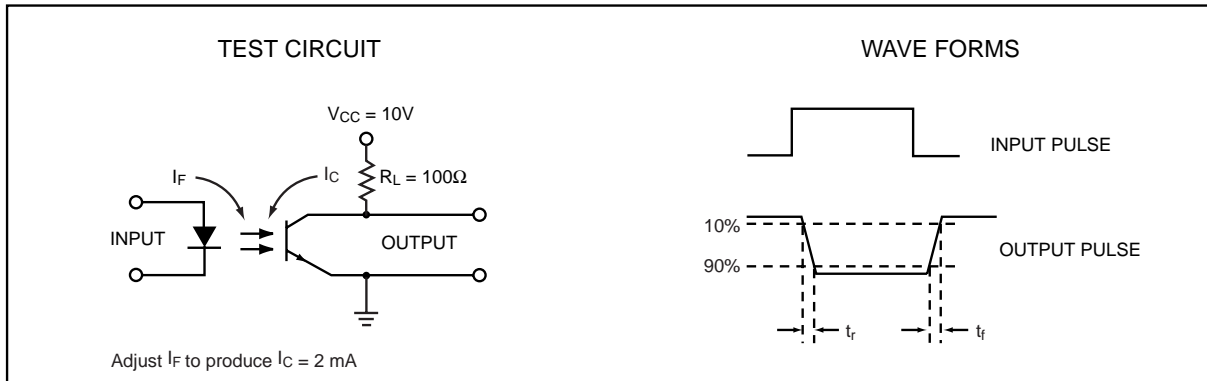
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**Figure 8. Switching Time Test Circuit and Waveforms**



**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**

**Package Dimensions (Through Hole)**



**Package Dimensions (Surface Mount)**



**Package Dimensions (0.4" Lead Spacing)**



**Footprint Dimensions (Surface Mount)**



**NOTE**  
All dimensions are in inches (millimeters)

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**ORDERING INFORMATION**

Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
W	.W	0.4" Lead Spacing
300	.300	VDE 0884
300W	.300W	VDE 0884, 0.4" Lead Spacing
3S	.3S	VDE 0884, Surface Mount
3SD	.3SD	VDE 0884, Surface Mount, Tape & Reel

**MARKING INFORMATION**



Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

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**Carrier Tape Specifications**



**NOTE**  
All dimensions are in millimeters

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