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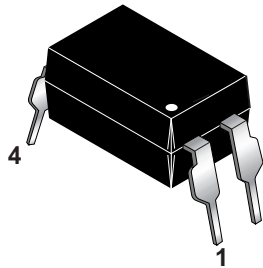
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**H11AA814 SERIES**

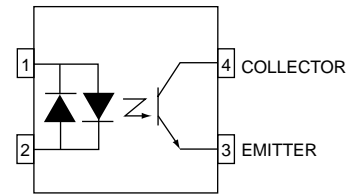
**H11A617 SERIES**

**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.

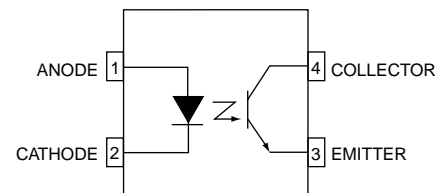
The H11A617 and H11A817 Series consists of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 4-pin dual in-line package.

**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                                            | $T_{STG}$ | All                                             | -55 to +150    | °C          |
| Operating Temperature                                          | $T_{OPR}$ | All                                             | -55 to +100    | °C          |
| Lead Solder Temperature                                        | $T_{SOL}$ | All                                             | 260 for 10 sec | °C          |
| Total Device Power Dissipation (-55°C to 50 °C)                | $P_D$     | All                                             | 200            | mW          |
| <b>EMITTER</b>                                                 |           |                                                 |                |             |
| Continuous Forward Current                                     | $I_F$     | All                                             | 50             | mA          |
| Reverse Voltage                                                | $V_R$     | H11A617A/B/C/D<br>H11A817/A/B/C/D               | 6<br>5         | V           |
| Forward Current - Peak (1 $\mu$ s pulse, 300 pps)              | $I_F(pk)$ | All                                             | 1.0            | A           |
| LED Power Dissipation (25°C ambient)<br>Derate above 25°C      | $P_D$     | All                                             | 100<br>1.33    | mW<br>mW/°C |
| <b>DETECTOR</b>                                                |           |                                                 |                |             |
| Collector-Emitter Voltage                                      | $V_{CEO}$ | All                                             | 70             | V           |
| Emitter-Collector Voltage                                      | $V_{ECO}$ | H11AA814/A<br>H11A617A/B/C/D<br>H11A817/A/B/C/D | 6<br>7<br>6    | V           |
| Continuous Collector Current                                   | $I_C$     | All                                             | 50             | mA          |
| Detector Power Dissipation (25°C ambient)<br>Derate above 25°C | $P_D$     | All                                             | 150<br>2.0     | mW<br>mW/°C |

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  Unless otherwise specified.)

**INDIVIDUAL COMPONENT CHARACTERISTICS**

| Parameter                           | Test Conditions                             | Symbol     | Device                                                   | Min | Typ* | Max       | Unit          |
|-------------------------------------|---------------------------------------------|------------|----------------------------------------------------------|-----|------|-----------|---------------|
| <b>EMITTER</b>                      |                                             |            |                                                          |     |      |           |               |
| Input Forward Voltage               | $(I_F = 60 \text{ mA})$                     | $V_F$      | H11A617A/B/C/D                                           |     | 1.35 | 1.65      | V             |
|                                     | $(I_F = 20 \text{ mA})$                     |            | H11A817/A/B/C/D                                          |     | 1.2  | 1.5       |               |
|                                     | $(I_F = \pm 20 \text{ mA})$                 |            | H11AA814/A                                               |     | 1.2  | 1.5       |               |
| Reverse Leakage Current             | $(V_R = 6.0 \text{ V})$                     | $I_R$      | H11A617A/B/C/D                                           |     | .001 | 10        | $\mu\text{A}$ |
|                                     | $(V_R = 5.0 \text{ V})$                     |            | H11A817/A/B/C/D                                          |     |      |           |               |
| <b>DETECTOR</b>                     |                                             |            |                                                          |     |      |           |               |
| Collector-Emitter Breakdown Voltage | $(I_C = 1.0 \text{ mA}, I_F = 0)$           | $BV_{CEO}$ | ALL                                                      | 70  | 100  |           | V             |
| Emitter-Collector Breakdown Voltage | $(I_E = 100 \mu\text{A}, I_F = 0)$          | $BV_{ECO}$ | H11AA814/A                                               | 6   | 10   |           | V             |
|                                     |                                             |            | H11A617A/B/C/D                                           | 7   |      |           |               |
|                                     |                                             |            | H11A817/A/B/C/D                                          | 6   |      |           |               |
| Collector-Emitter Dark Current      | $(V_{CE} = 10\text{V}, I_F = 0)$            | $I_{CEO}$  | H11AA814/A, H11A817/A/B/C/D,<br>H11A617C/D<br>H11A617A/B |     | 1    | 100<br>50 | nA            |
| Collector-Emitter Capacitance       | $(V_{CE} = 0 \text{ V}, f = 1 \text{ MHz})$ | $C_{CE}$   | ALL                                                      |     | 8    |           | pF            |

\*Typical values at  $T_A = 25^\circ\text{C}$ .

**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)<br>(I <sub>C</sub> = 2.5 mA, I <sub>F</sub> = 10 mA)<br>(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.

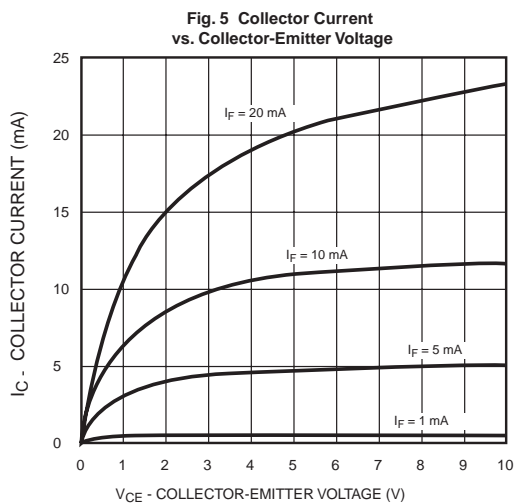
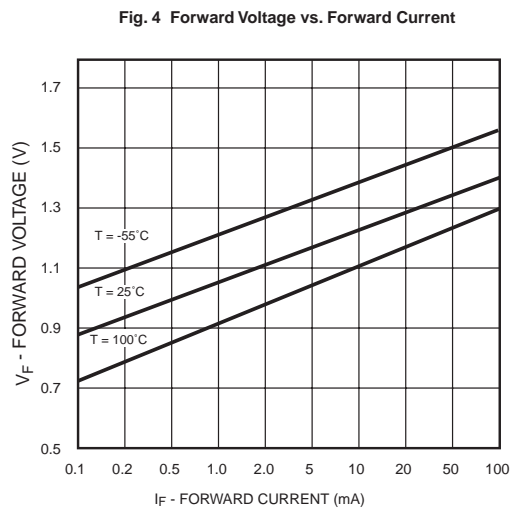
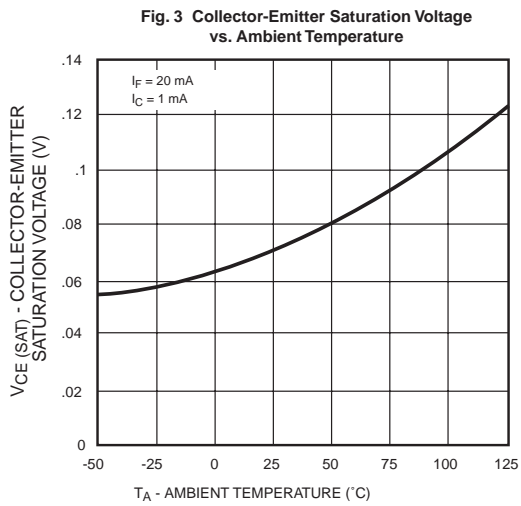
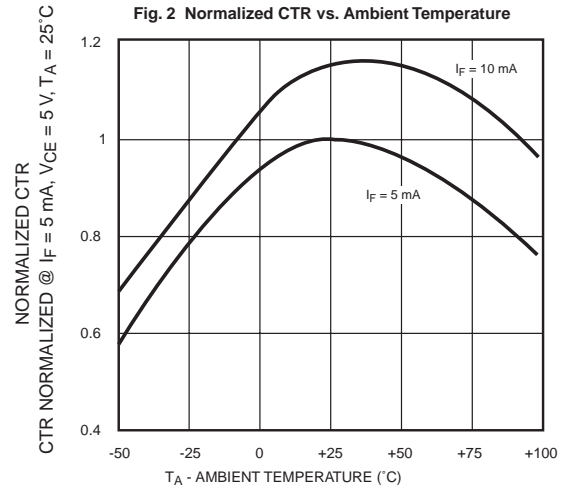
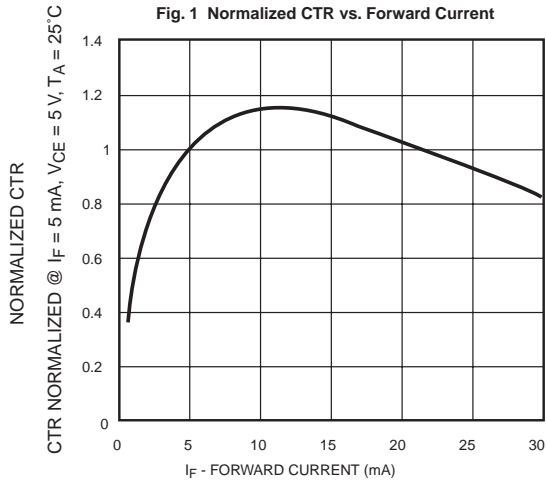
**NOTES**

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.

**H11AA814 SERIES**

**H11A617 SERIES**

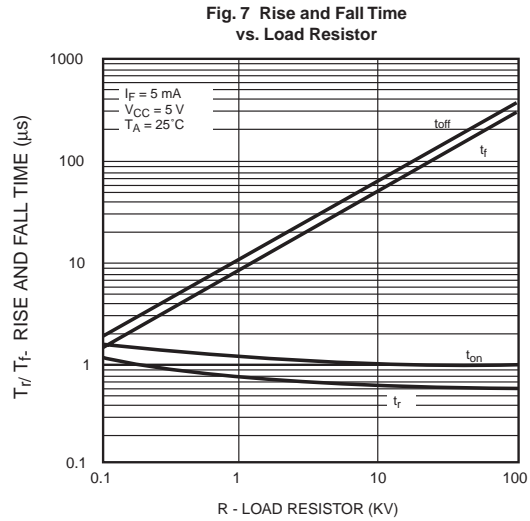
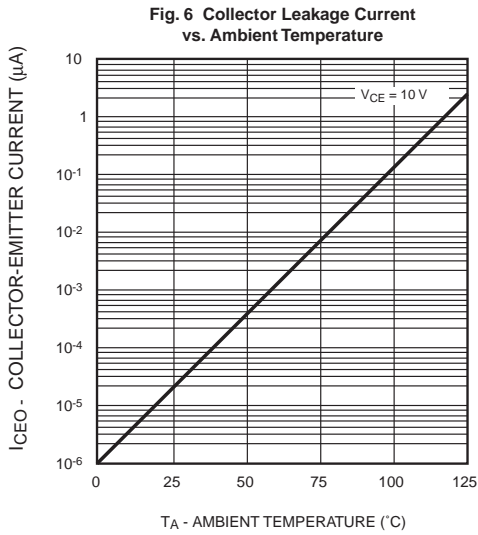
**H11A817 SERIES**



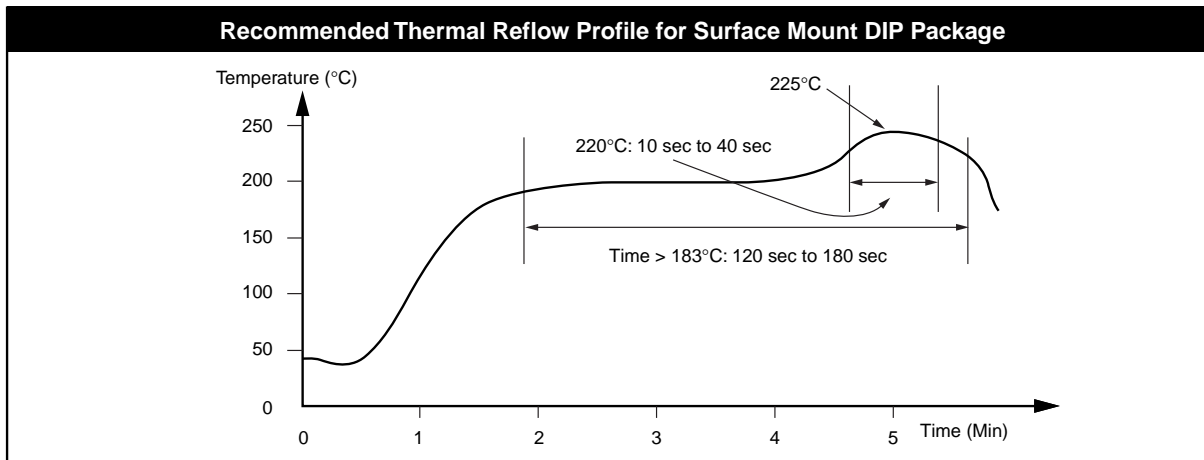
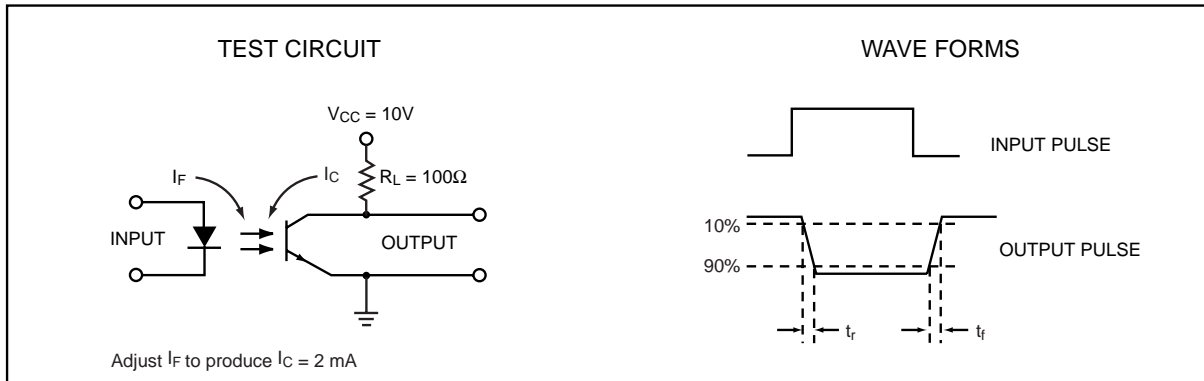
**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**



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

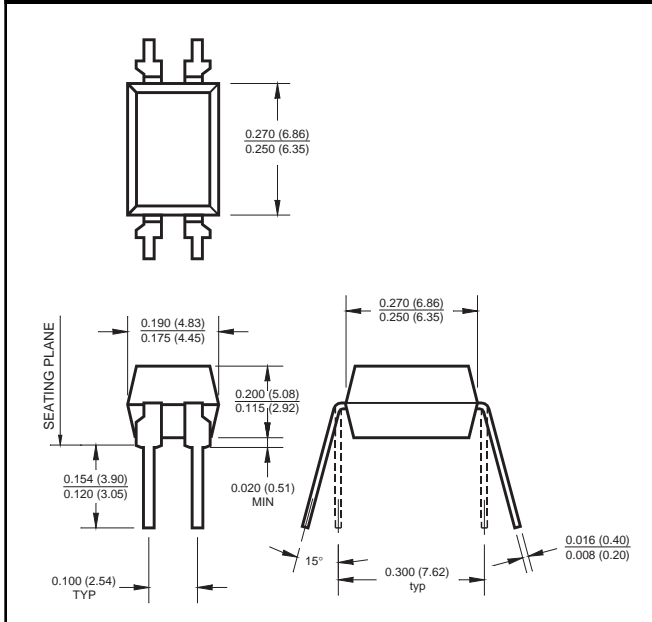


**H11AA814 SERIES**

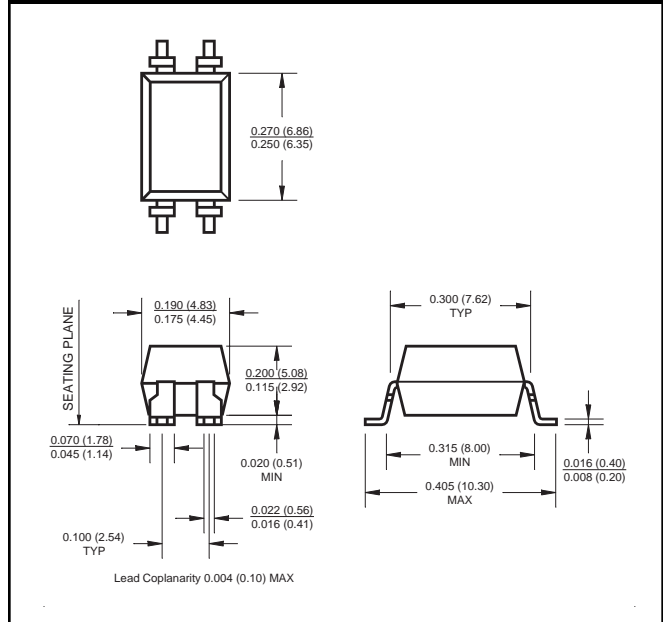
**H11A617 SERIES**

**H11A817 SERIES**

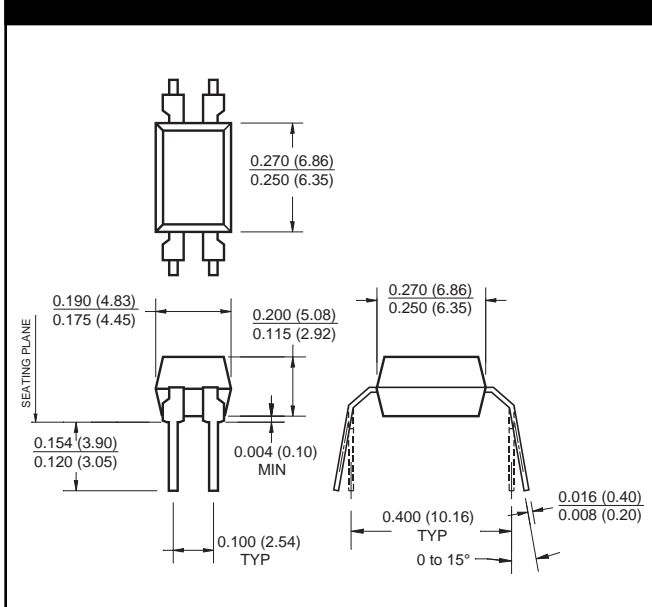
**Package Dimensions (Through Hole)**



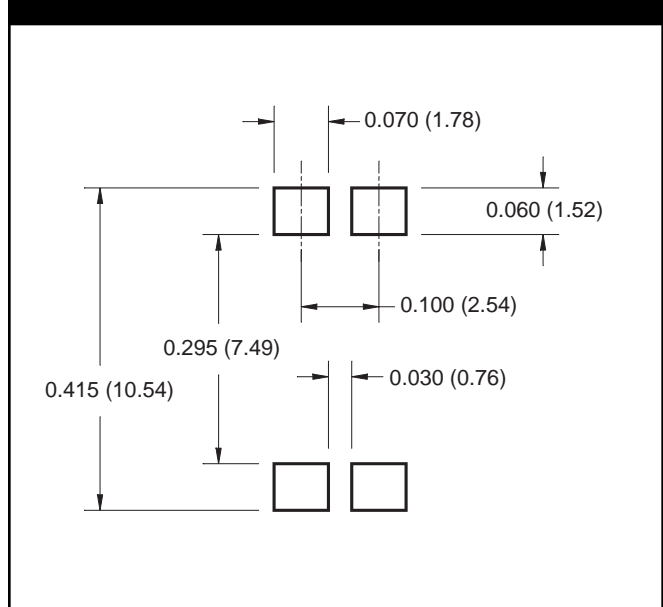
**Package Dimensions (Surface Mount)**



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



**Footprint Dimensions (Surface Mount)**



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

**H11AA814 SERIES**

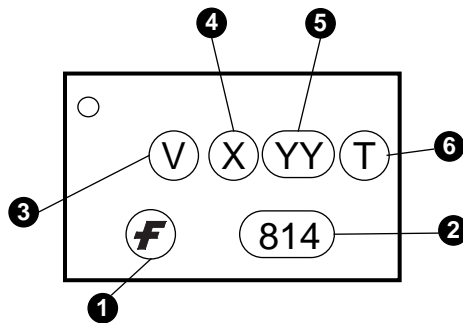
**H11A617 SERIES**

**H11A817 SERIES**

**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                                                                  |

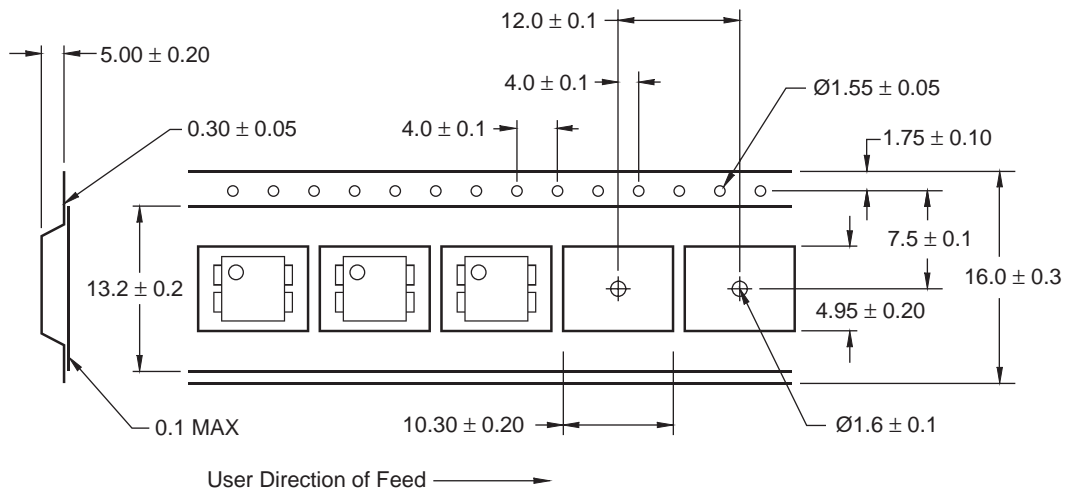


**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**

**Carrier Tape Specifications**



**NOTE**  
All dimensions are in millimeters

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**H11AA814 SERIES**

**H11A617 SERIES**

**H11A817 SERIES**

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