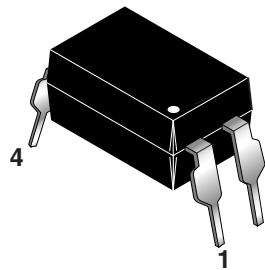


H11AA814 SERIES

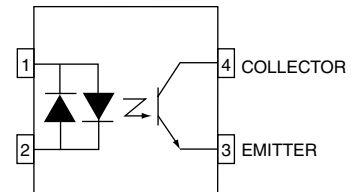
H11A617 SERIES

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.

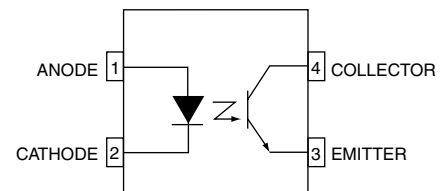
The H11A617 and H11A817 Series consists of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 4-pin dual in-line package.

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 |
|--|-----------|---|----------------|-------------|
| TOTAL DEVICE | | | | |
| 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 |
| EMITTER | | | | |
| Continuous Forward Current | I_F | All | 50 | mA |
| Reverse Voltage | V_R | H11A617A/B/C/D H11A817/A/B/C/D | 6 5 | V |
| Forward Current - Peak (1 μ s pulse, 300 pps) | $I_F(pk)$ | All | 1.0 | A |
| LED Power Dissipation (25°C ambient) Derate above 25°C | P_D | All | 100 1.33 | mW mW/°C |
| DETECTOR | | | | |
| Collector-Emitter Voltage | V_{CEO} | All | 70 | V |
| Emitter-Collector Voltage | V_{ECO} | H11AA814/A H11A617A/B/C/D H11A817/A/B/C/D | 6 7 6 | V |
| Continuous Collector Current | I_C | All | 50 | mA |
| Detector Power Dissipation (25°C ambient) Derate above 25°C | P_D | All | 150 2.0 | mW 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 |
|-------------------------------------|---|------------|--|-----|------|------|---------------|
| EMITTER | | | | | | | |
| 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 | μA |
| | $(V_R = 5.0 \text{ V})$ | | H11A817/A/B/C/D | | | | |
| DETECTOR | | | | | | | |
| 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, H11A617C/D | | 1 | 100 | nA |
| | | | H11A617A/B | | | 50 | |
| 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 _A = 25°C Unless otherwise specified.) | | | | | | | |
|--|--|-----------------------|----------------|-----|------|-----|------|
| DC Characteristic | Test Conditions | Symbol | Device | Min | Typ* | Max | Unit |
| Current Transfer Ratio | (I _F = ±1 mA, V _{CE} = 5 V) (note 1) | CTR | H11AA814 | 20 | | 300 | % |
| | (I _F = ±1 mA, V _{CE} = 5 V) (note 1) | | H11AA814A | 50 | | 150 | % |
| | (I _F = 10 mA, V _{CE} = 5 V) (note 1) | | H11A617A | 40 | | 80 | % |
| | | | H11A617B | 63 | | 125 | % |
| | | | H11A617C | 100 | | 200 | % |
| | | | H11A617D | 160 | | 320 | % |
| | (I _F = 5 mA, V _{CE} = 5 V) (note 1) | | H11A817 | 50 | | 600 | % |
| | | | H11A817A | 80 | | 160 | % |
| | | | H11A817B | 130 | | 260 | % |
| | | | H11A817C | 200 | | 400 | % |
| | (I _F = 1 mA, V _{CE} = 5 V) (note 1) | | H11A817D | 300 | | 600 | % |
| | | | H11A617A | 13 | | | % |
| | | | H11A617B | 22 | | | % |
| | | | H11A617C | 34 | | | % |
| Collector-Emitter Saturation Voltage | (I _C = 1 mA, I _F = ±20 mA) (I _C = 2.5 mA, I _F = 10 mA) (I _C = 1 mA, I _F = 20 mA) | V _{CE (SAT)} | H11AA814/A | | | 0.2 | V |
| | | | H11A617A/B/C/D | | | 0.4 | |
| | | | H11A817A/B/C/D | | | 0.2 | |
| AC Characteristic | | | | | | | |
| Rise Time | (I _C = 2 mA, V _{CE} = 2 V, R _L = 100V) (note 2) | t _r | ALL | | 2.4 | 18 | μs |
| Fall Time | (I _C = 2 mA, V _{CE} = 2 V, R _L = 100V) (note 2) | t _f | 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 _{ISO} | 5300 | | | Vac(rms) |
| Isolation Resistance | (V _{I-O} = 500 VDC) | R _{ISO} | 10 ¹¹ | | | Ω |
| Isolation Capacitance | (V _{I-O} = 0, f = 1 MHz) | C _{ISO} | | 0.5 | | pf |

*Typical values at T_A = 25°C.

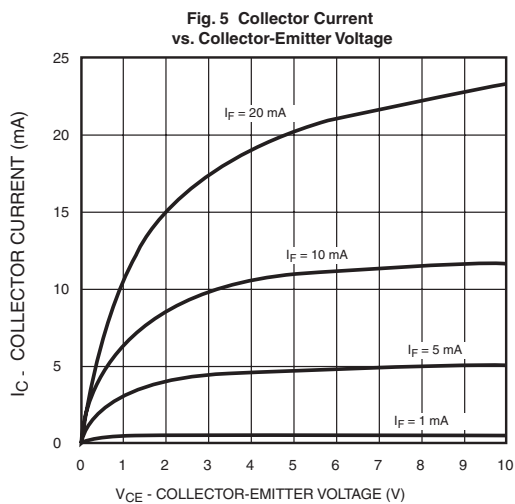
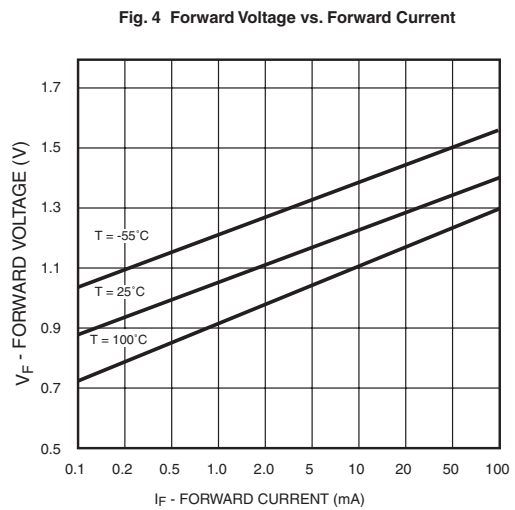
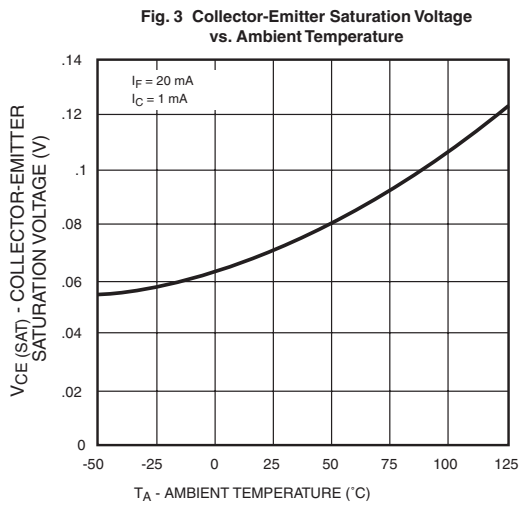
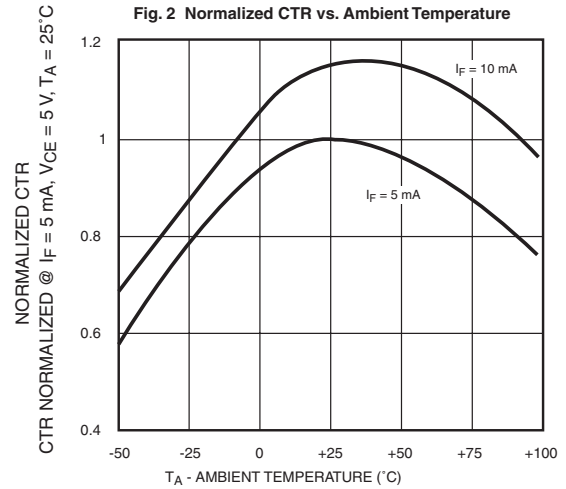
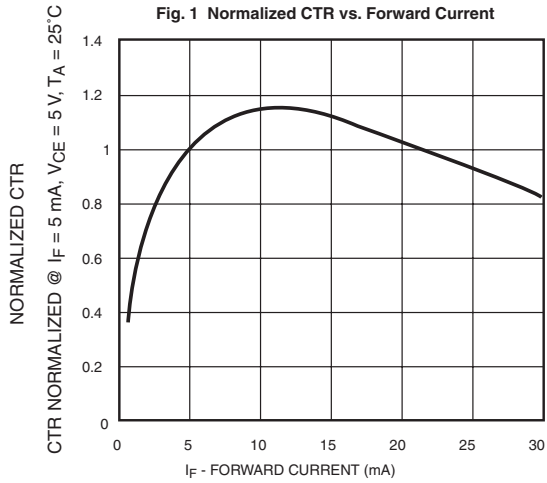
NOTES

1. Current Transfer Ratio (CTR) = I_C/I_F 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

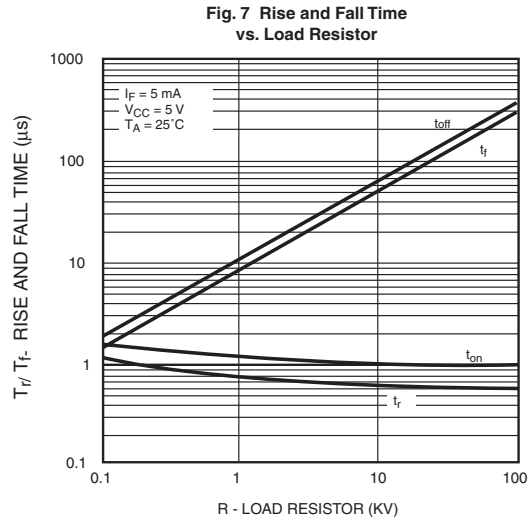
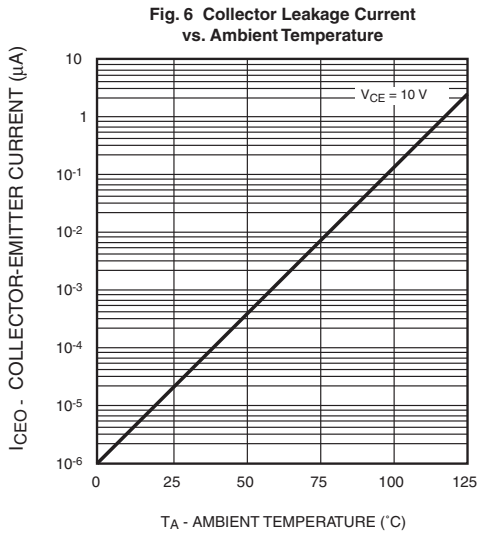
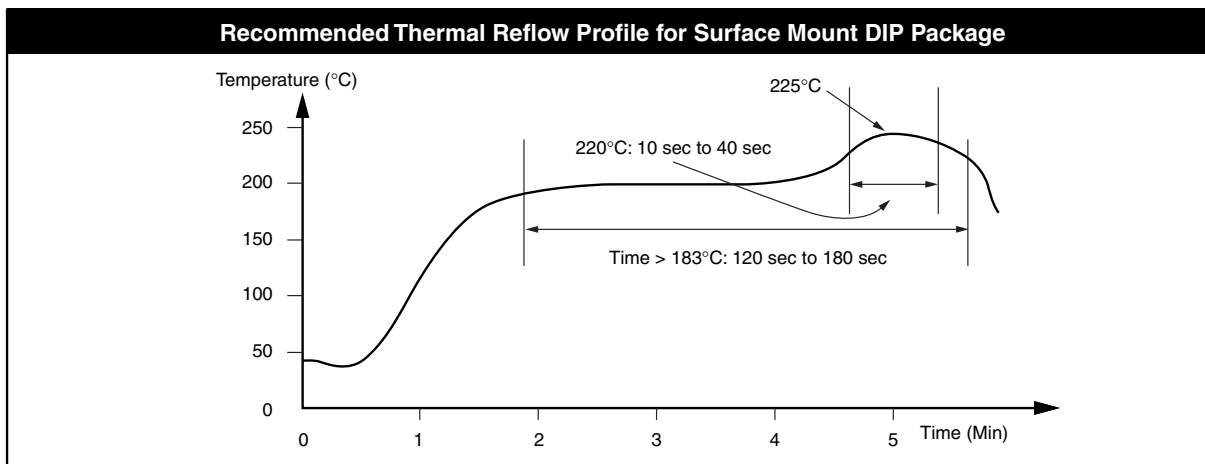
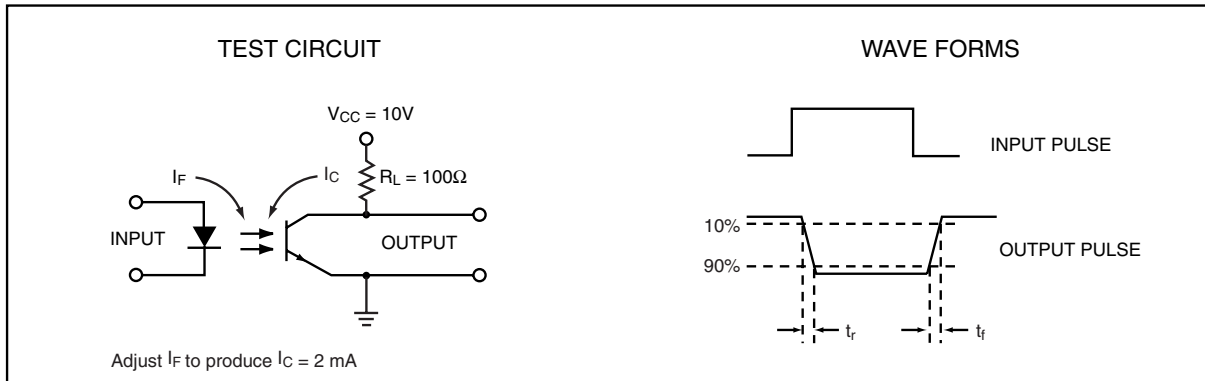


Figure 8. Switching Time Test Circuit and Waveforms

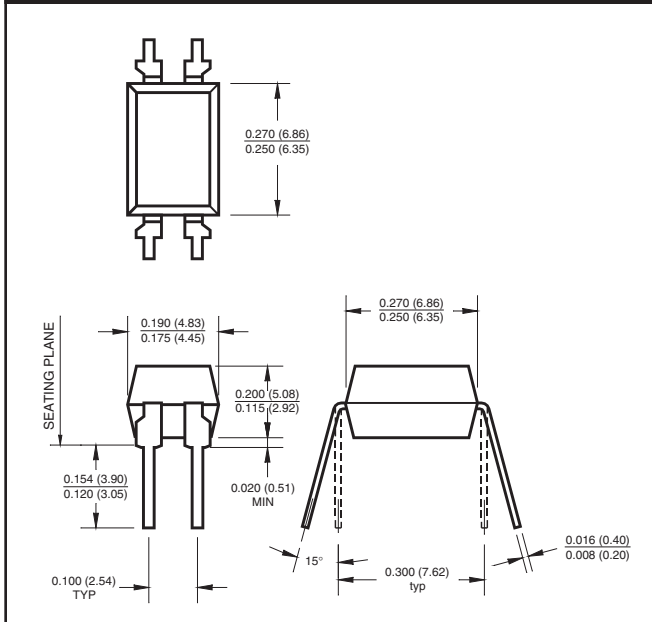


H11AA814 SERIES

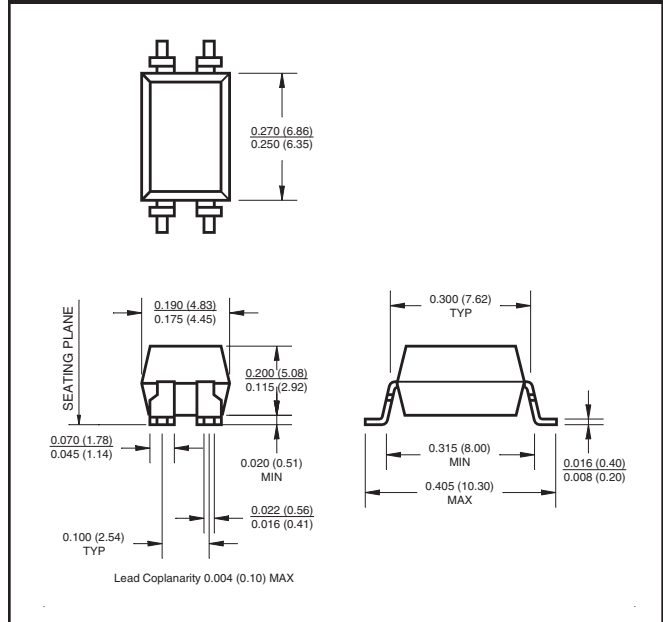
H11A617 SERIES

H11A817 SERIES

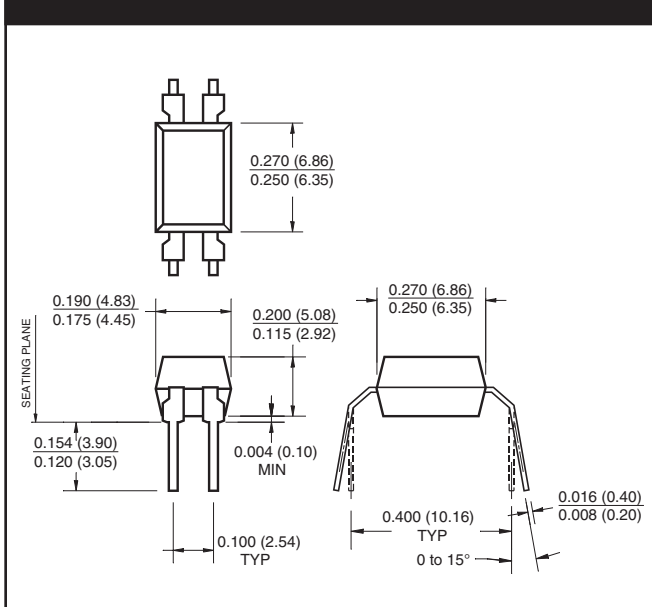
Package Dimensions (Through Hole)



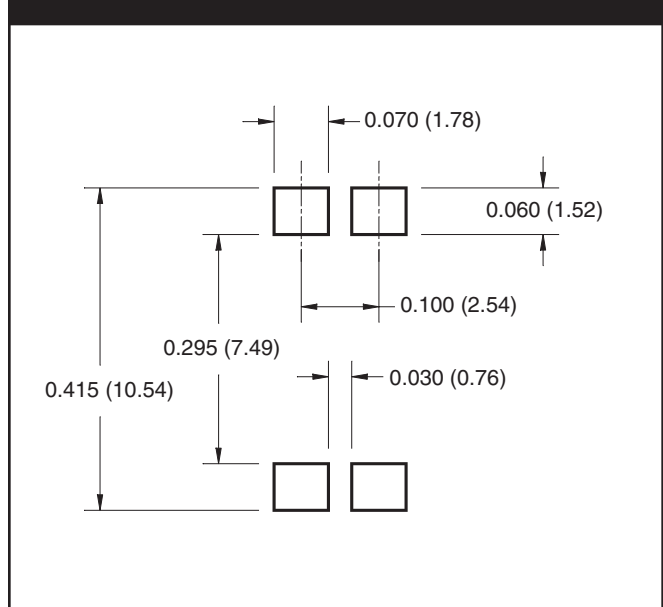
Package Dimensions (Surface Mount)



Package Dimensions (0.4" Lead Spacing)



Footprint Dimensions (Surface Mount)



NOTE
All dimensions are in inches (millimeters)

H11AA814 SERIES

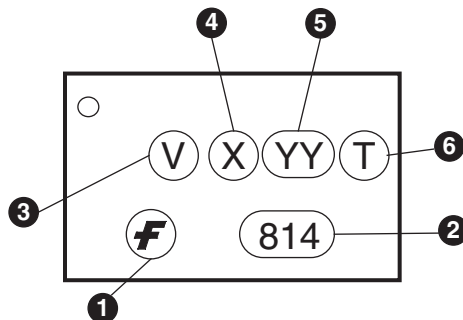
H11A617 SERIES

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



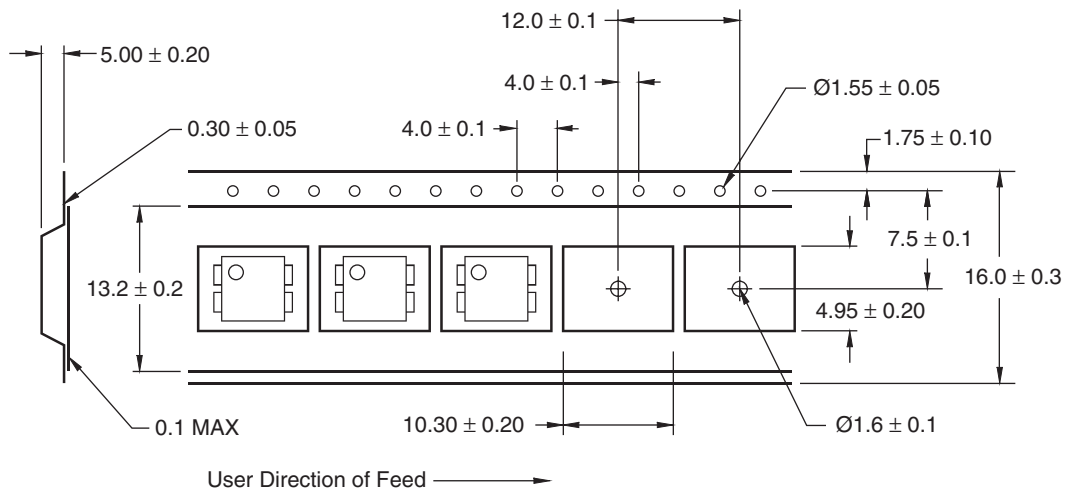
| Definitions | |
|-------------|--|
| 1 | Fairchild logo |
| 2 | Device number |
| 3 | VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table) |
| 4 | One digit year code |
| 5 | Two digit work week ranging from '01' to '53' |
| 6 | Assembly package code |

H11AA814 SERIES

H11A617 SERIES

H11A817 SERIES

Carrier Tape Specifications



NOTE
All dimensions are in millimeters

H11AA814 SERIES

H11A617 SERIES

H11A817 SERIES

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.