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SEMICONDUCTOR®

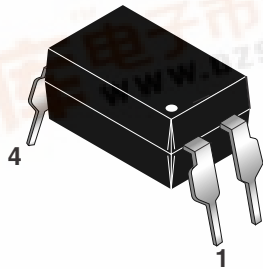
4-PIN PHOTOTRANSISTOR OPTOCOUPLERS

H11AA814 SERIES

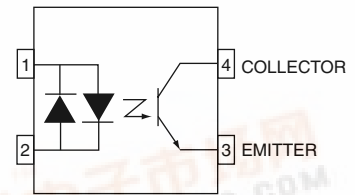
H11A617 SERIES

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

APPLICATIONS

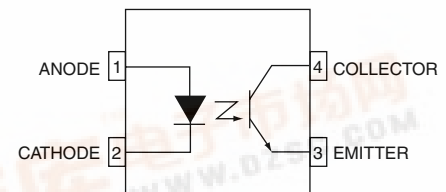
H11AA814 Series

- AC line monitor
- Unknown polarity DC sensor
- Telephone line interface

H11A617 and H11A817 Series

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs

H11A617 & H11A817 SCHEMATIC



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 H11A817A/B/C/D	6 5	V
Forward Current - Peak (1 μs pulse, 300 pps)	I _{F(pk)}	All	1.0	A
LED Power Dissipation (25°C ambient) Derate above 25°C	P _D	All	100	mW
			1.33	mW/°C
DETECTOR				
Collector-Emitter Voltage	V _{CEO}	All	70	V
Emitter-Collector Voltage	V _{ECO}	H11AA814/A H11A617A/B/C/D H11A817A/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	mW
			2.0	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 mA)	V _F	H11A617A/B/C/D		1.35	1.65	V
	(I _F = 20 mA)		H11A817/A/B/C/D		1.2	1.5	
	(I _F = ±20 mA)		H11AA814/A		1.2	1.5	
Reverse Leakage Current	(V _R = 6.0 V)	I _R	H11A617A/B/C/D		.001	10	μA
	(V _R = 5.0 V)		H11A817/A/B/C/D				
DETECTOR							
Collector-Emitter Breakdown Voltage	(I _C = 1.0 mA, I _F = 0)	BV _{CEO}	ALL	70	100		V
Emitter-Collector Breakdown Voltage	(I _E = 100 μA, 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} = 10V, 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 V, f = 1 MHz)	C _{CE}	ALL		8		pF

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

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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	%
	H11A817D			300		600	%
	(I _F = 1 mA, V _{CE} = 5 V) (note 1)		H11A617A	13			%
			H11A617B	22			%
			H11A617C	34			%
			H11A617D	56			%
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)	$f = 60\text{ Hz}$, $t = 1\text{ min}$	V_{ISO}	5300			Vac(rms)
Isolation Resistance	($V_{I-O} = 500\text{ VDC}$)	R_{ISO}	10^{11}			Ω
Isolation Capacitance	($V_{I-O} = 0$, $f = 1\text{ MHz}$)	C_{ISO}		0.5		pf

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

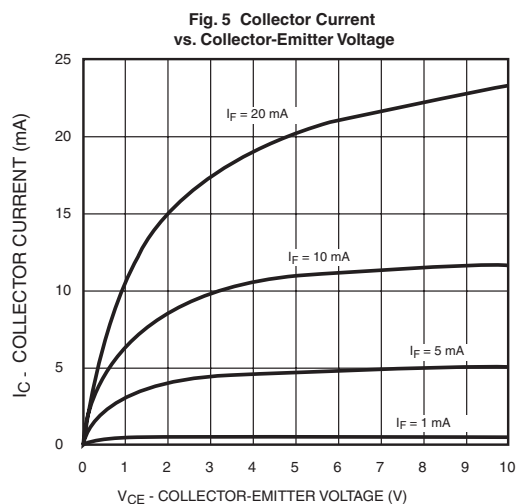
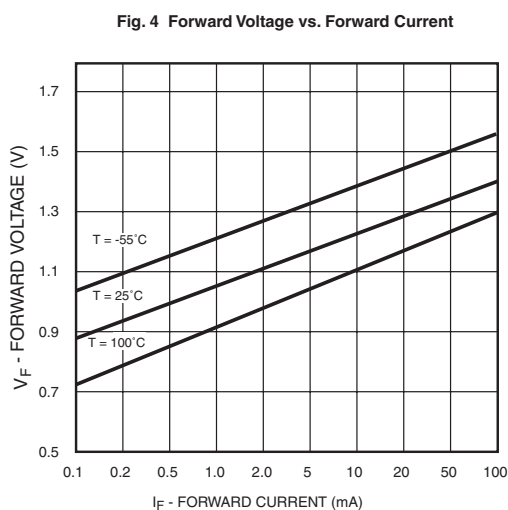
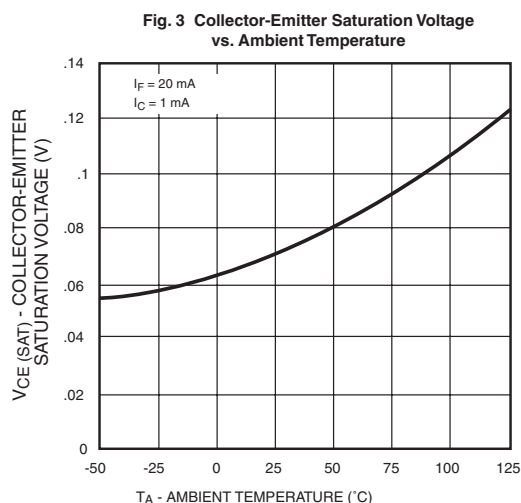
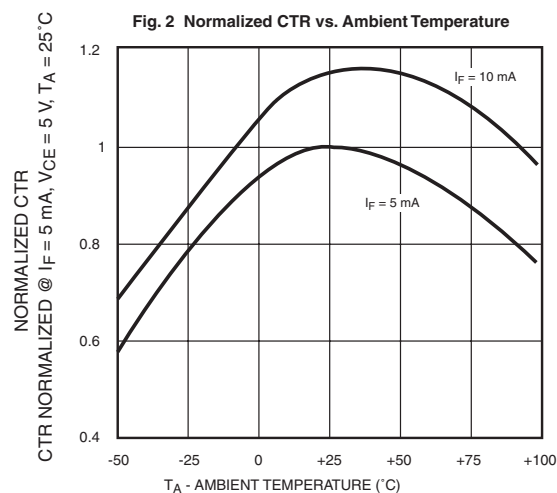
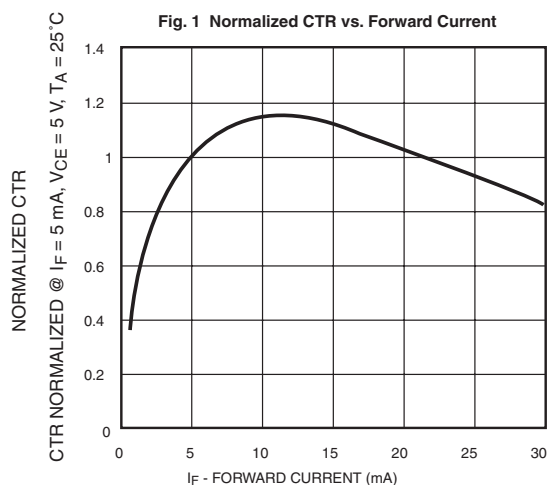
NOTES

- Current Transfer Ratio (CTR) = $I_C/I_F \times 100\%$.
- For test circuit setup and waveforms, refer to Figure 8.
- For this test, Pins 1 and 2 are common, and Pins 3 and 4 are common.

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Fig. 6 Collector Leakage Current vs. Ambient Temperature

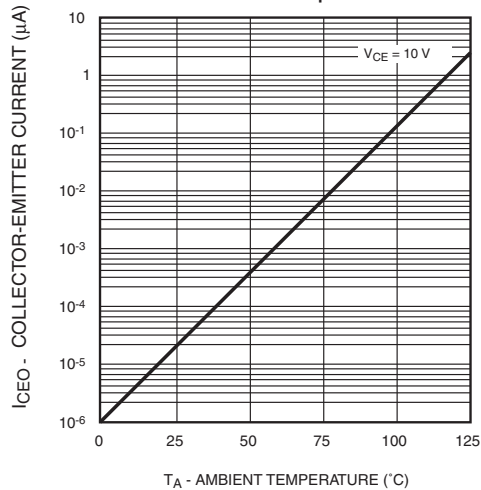


Fig. 7 Rise and Fall Time vs. Load Resistor

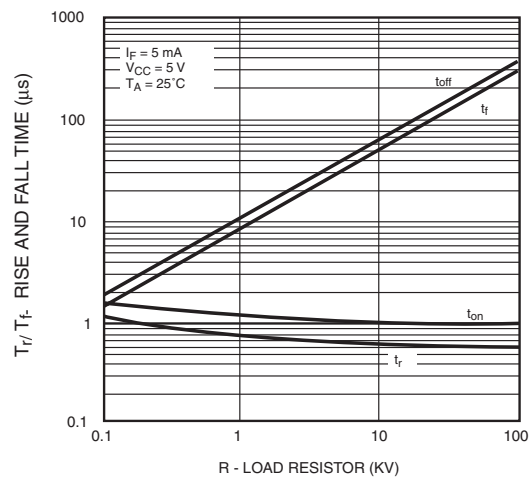
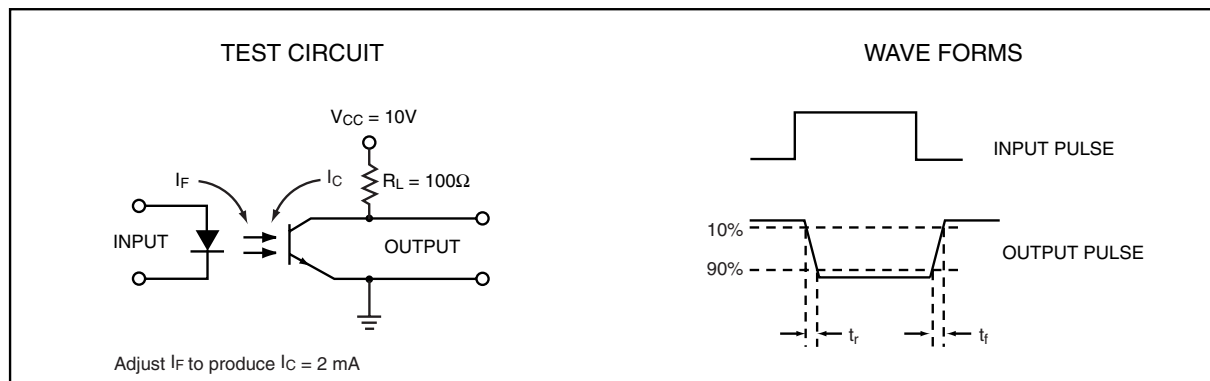
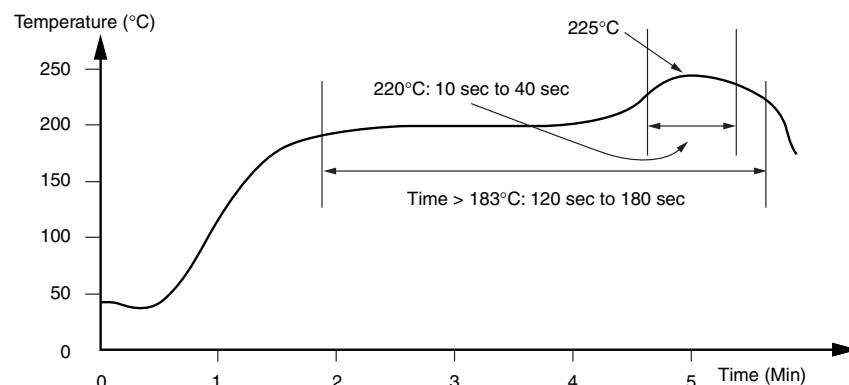


Figure 8. Switching Time Test Circuit and Waveforms



Recommended Thermal Reflow Profile for Surface Mount DIP Package

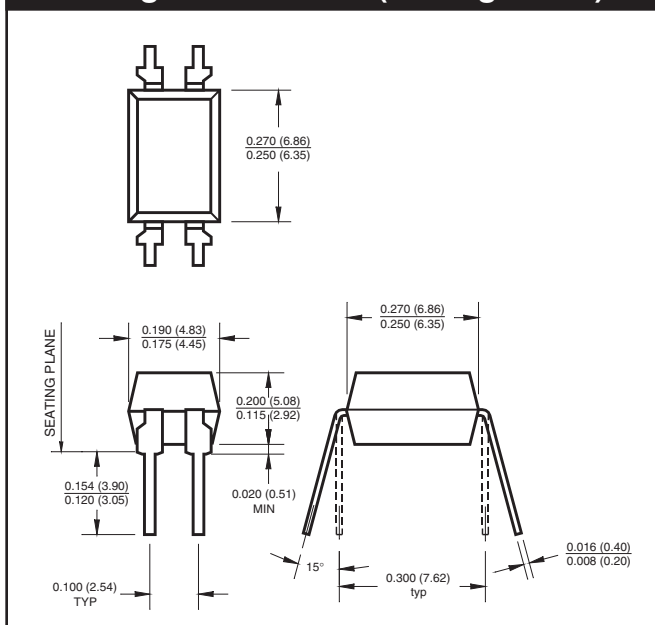


H11AA814 SERIES

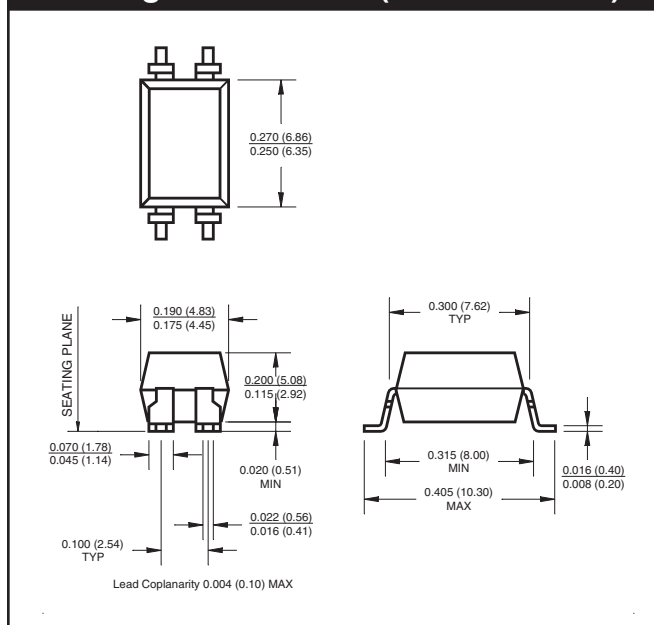
H11A617 SERIES

H11A817 SERIES

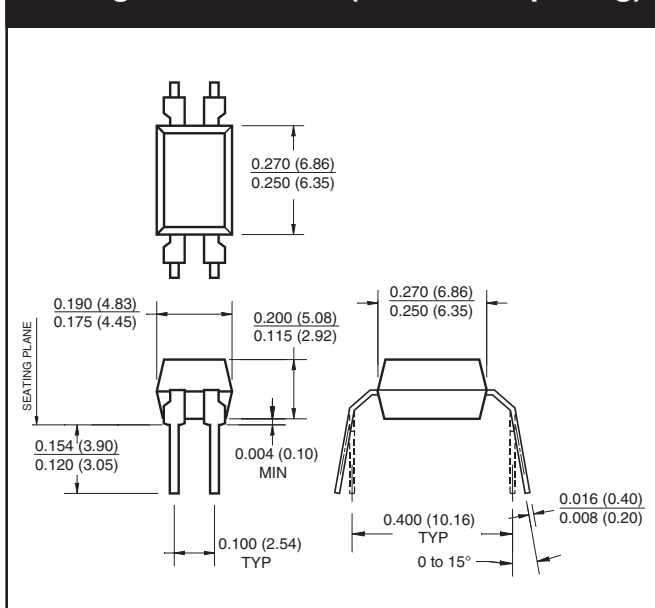
Package Dimensions (Through Hole)



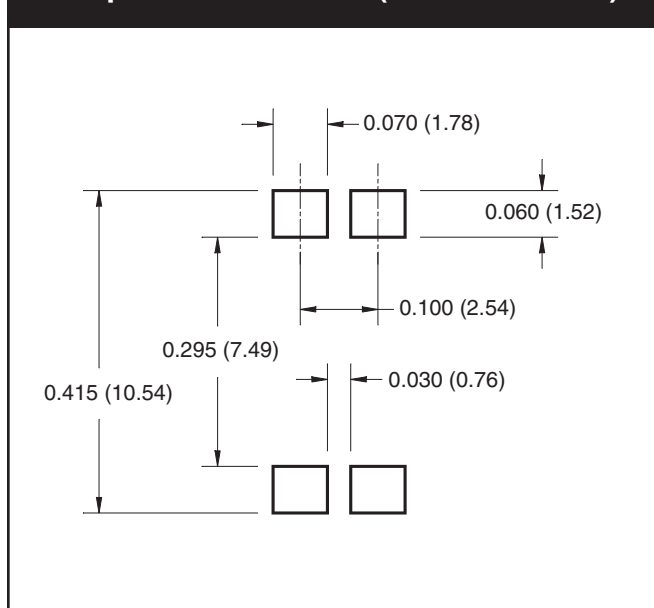
Package Dimensions (Surface Mount)



Package Dimensions (0.4" Lead Spacing)



Footprint Dimensions (Surface Mount)



NOTE

All dimensions are in inches (millimeters)

H11AA814 SERIES

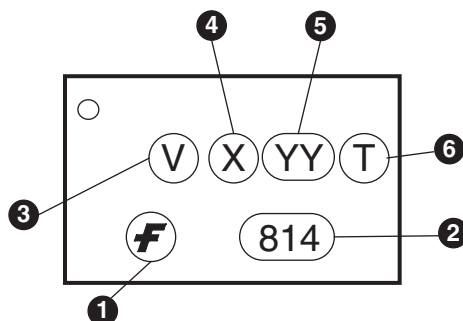
H11A617 SERIES

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



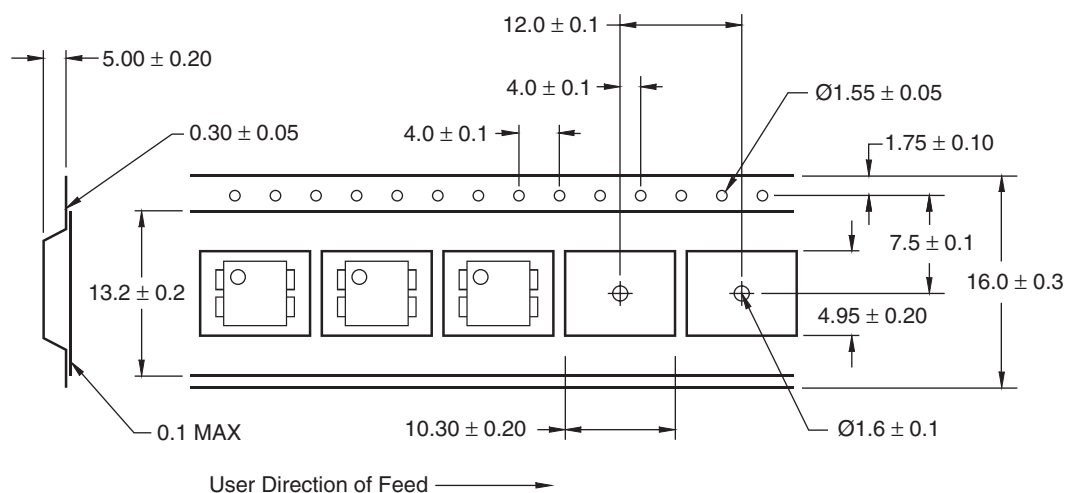
Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

H11AA814 SERIES

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Carrier Tape Specifications



NOTE

All dimensions are in millimeters



4-PIN PHOTOTRANSISTOR OPTOCOUPLEDERS

H11AA814 SERIES**H11A617 SERIES****H11A817 SERIES**

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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.