



# THE DATASHEET OF H11C2



**H11C1**

**H11C2**

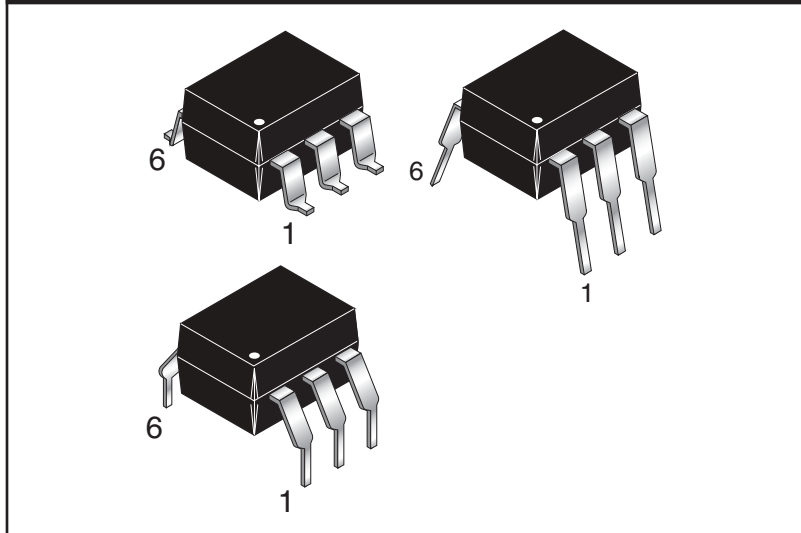
**H11C3**

**H11C4**

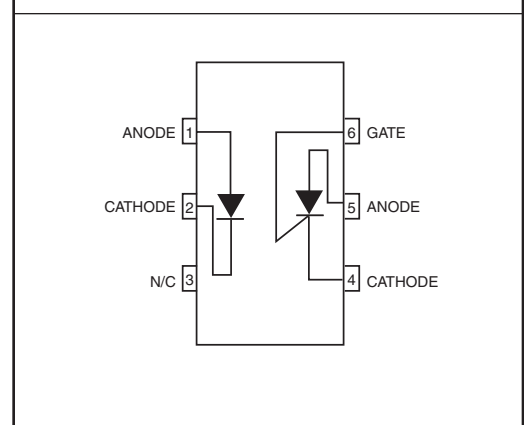
**H11C5**

**H11C6**

**PACKAGE**



**SCHEMATIC**



**DESCRIPTION**

The H11C series consists of a gallium-arsenide infrared emitting diode optically coupled with a light activated silicon controlled rectifier in a dual-in-line package

**FEATURES**

- High efficiency, low degradation, liquid epitaxial LED
- Underwriters Laboratory (UL) recognized fl File #E90700
- VDE recognized (File #94766) – ordering option .300. (e.g., H11C1.300)
- 200V/400V Peak blocking voltage
- High isolation voltage - 5300V AC (RMS)

**APPLICATIONS**

- Low power logic circuits
- Telecommunications equipment
- Portable electronics
- Solid state relays
- Interfacing coupling systems of different potentials and impedances.
- 10 A, T<sup>2</sup>L compatible, solid state relay
- 25 W logic indicator lamp driver
- 200 V symmetrical transistor coupler (H11C1, H11C2, H11C3)
- 400 V symmetrical transistor coupler (H11C4, H11C5, H11C6)

**H11C1**

**H11C2**

**H11C3**

**H11C4**

**H11C5**

**H11C6**

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
<b>EMITTER</b>				
Continuous Forward Current	$I_F$	All	60	mA
Reverse Voltage	$V_R$	All	6	V
Forward Current - Peak (1 $\mu$ s pulse, 300 pps)	$I_{F(pk)}$	All	3.0	A
LED Power Dissipation Derate above 25°C	$P_D$	All	100	mW
			1.33	mW/°C
<b>DETECTOR</b>				
Power Dissipation (ambient) Derate linearly above 25°C ambient	$P_D$	All	400	mW
			5.3	mW/°C
Power Dissipation (case) Derate linearly above 25°C case	$P_D$	All	1	W
			13.3	mW/°C
Peak Reverse Gate Voltage	$V_{GR}$	All	6	V
RMS On-State Current	$I_{DM (RMS)}$	All	300	mA
Peak On-State Current (100 $\mu$ S, 1% duty cycle)	$I_{DM (Peak)}$	All	10	A
Surge Current (10ms)	$I_{DM (Surge)}$	All	5	A
Peak Forward Voltage	$V_{DM}$	H11C1, H11C2, H11C3	200	V
Peak Forward Voltage	$V_{DM}$	H11C4, H11C5, H11C6	400	V

**H11C1**

**H11C2**

**H11C3**

**H11C4**

**H11C5**

**H11C6**

**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	$I_F = 10 \text{ mA}$	$V_F$	All		1.2	1.5	V
Reverse Leakage Current	$V_R = 3 \text{ V}$	$I_R$	All			10	$\mu\text{A}$
Capacitance	$V_F = 0 \text{ V}, f = 1.0 \text{ MHz}$	$C_J$	All		50		pF
<b>DETECTOR</b>							
Off-State Voltage	$R_{GK} = 10\text{k}\Omega, T_A = 100^\circ\text{C}, I_D = 50\mu\text{A}$	$V_{DM}$	H11C1, H11C2, H11C3	200			V
	$R_{GK} = 10\text{k}\Omega, T_A = 100^\circ\text{C}, I_D = 150\mu\text{A}$		H11C4, H11C5, H11C6	400			
Reverse Voltage	$R_{GK} = 10\text{k}\Omega, T_A = 100^\circ\text{C}, I_R = 50\mu\text{A}$	$V_{RM}$	H11C1, H11C2, H11C3	200			V
	$R_{GK} = 10\text{k}\Omega, T_A = 100^\circ\text{C}, I_R = 150\mu\text{A}$		H11C4, H11C5, H11C6	400			
On-State Voltage	$I_{TM} = 300 \text{ mA}$	$V_{TM}$	All		1.2	1.3	V
Off-State Current	$V_{DM} = 200\text{V}, T_A = 100^\circ\text{C}, I_F = 0 \text{ mA}, R_{GK} = 10\text{k}\Omega$	$I_{DM}$	H11C1, H11C2, H11C3			50	$\mu\text{A}$
	$V_{DM} = 400\text{V}, T_A = 100^\circ\text{C}, I_F = 0 \text{ mA}, R_{GK} = 10\text{k}\Omega$		H11C4, H11C5, H11C6			150	
Reverse Current	$V_{RM} = 200 \text{ V}, T_A = 100^\circ\text{C}, I_F = 0 \text{ mA}, R_{GK} = 10\text{k}\Omega$	$I_{RM}$	H11C1, H11C2, H11C3			50	$\mu\text{A}$
	$V_{RM} = 400 \text{ V}, T_A = 100^\circ\text{C}, I_F = 0 \text{ mA}, R_{GK} = 10\text{k}\Omega$		H11C4, H11C5, H11C6			150	

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

Characteristics	Test Conditions	Symbol	Device	Min	Typ*	Max	Units
Input Current to Trigger	$V_{AK} = 50 \text{ V}, R_{GK} = 10 \text{ k}\Omega$	$I_{FT}$	H11C1, H11C2, H11C4, H11C5			20	mA
			H11C3, H11C6			30	
	$V_{AK} = 100 \text{ V}, R_{GK} = 27 \text{ k}\Omega$		H11C1, H11C2, H11C4, H11C5			11	
			H11C3, H11C6			14	
Coupled dv/dt, input to output (figure 8)		dv/dt	ALL	500			V/ $\mu\text{S}$

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

**H11C1**

**H11C2**

**H11C3**

**H11C4**

**H11C5**

**H11C6**

**ISOLATION CHARACTERISTICS**

Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
Isolation Voltage	(t = 1 min.) (note 1)	$V_{ISO}$	5300			V
Isolation Resistance	(note 1) ( $V_{I-O} = 500$ VDC)	$R_{ISO}$	$10^{11}$			$\Omega$
Isolation Capacitance	(note 1) (f = 1 MHz, $V_{I-O} = 0$ )	$C_{I-O}$		0.8		pF

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

Note

1. For this test, LED pins 1 and 2 are common, and SCR pins 4, 5 and 6 are common.

H11C1

H11C2

H11C3

H11C4

H11C5

H11C6

Figure 1. LED Forward Current vs. Forward Voltage

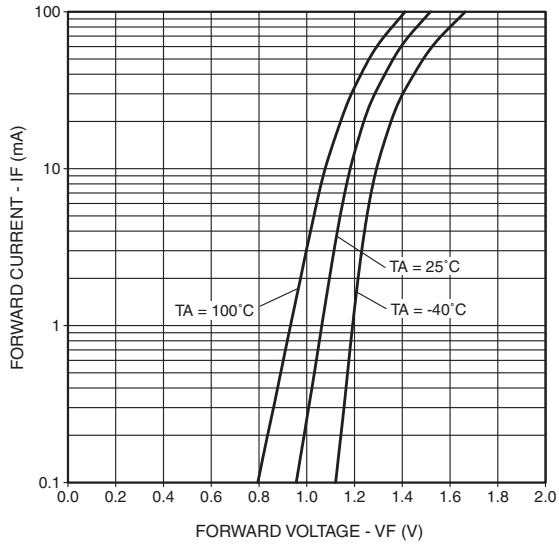


Figure 2. Trigger Current vs. Anode-Cathode Voltage

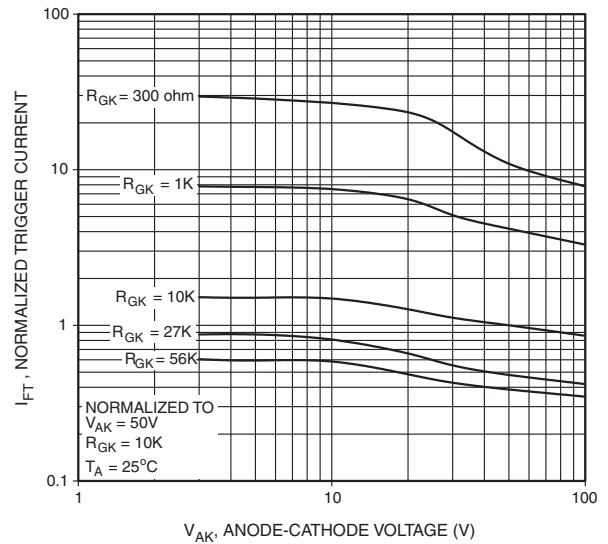


Figure 3. Input Trigger Current vs. Temperature

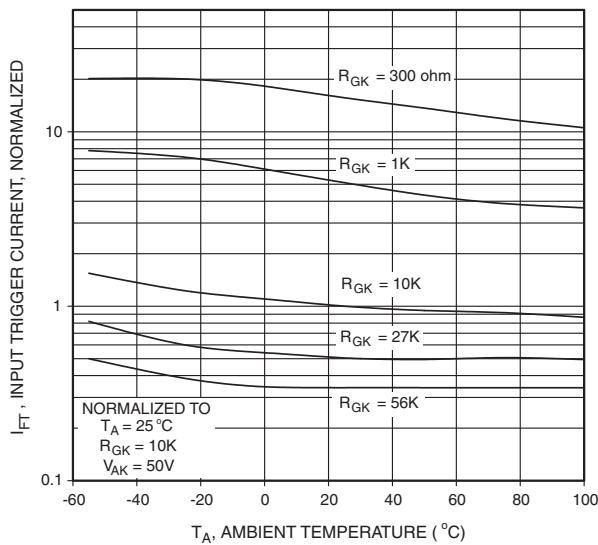
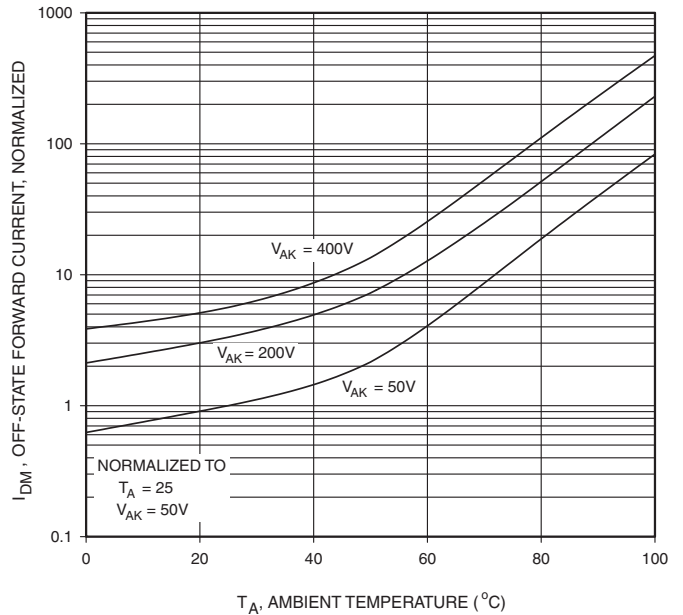


Figure 4. Off-State Current vs. Temperature



H11C1

H11C2

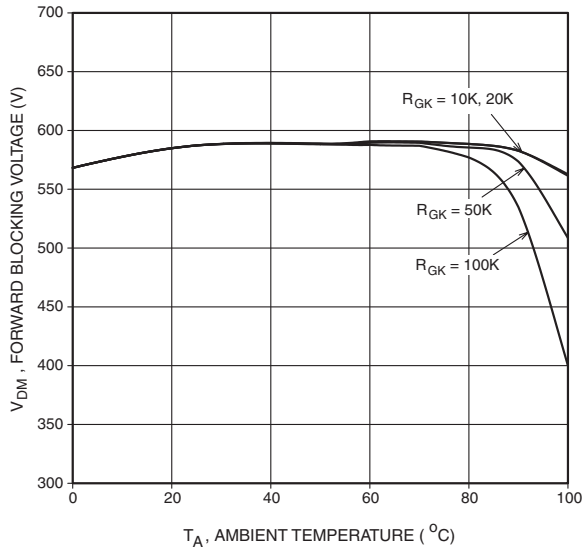
H11C3

H11C4

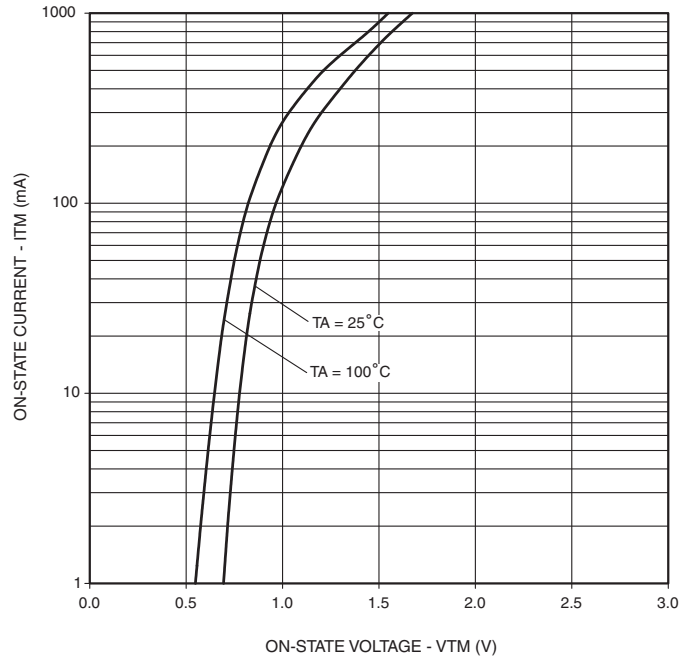
H11C5

H11C6

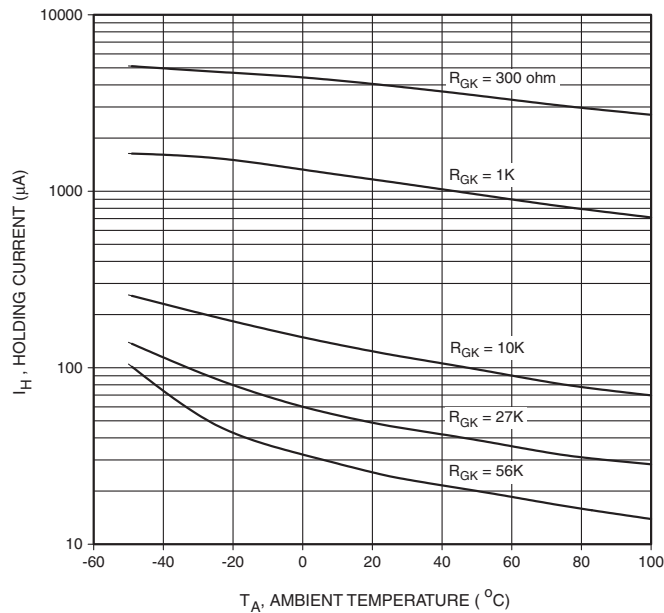
**Figure 5. Forward Blocking Voltage,  $V_{DM}$  vs. Temperature**



**Figure 6. On-State Characteristics**



**Figure 7. Holding Current,  $I_H$  vs. Temperature**





**H11C1**

**H11C2**

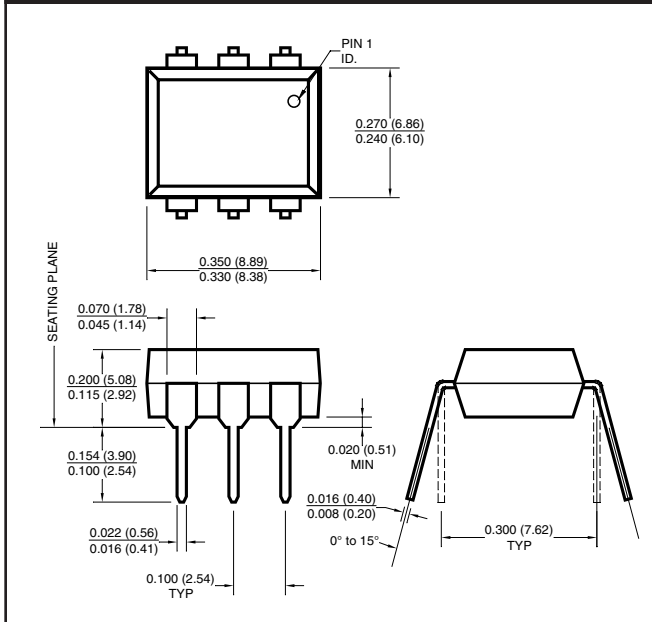
**H11C3**

**H11C4**

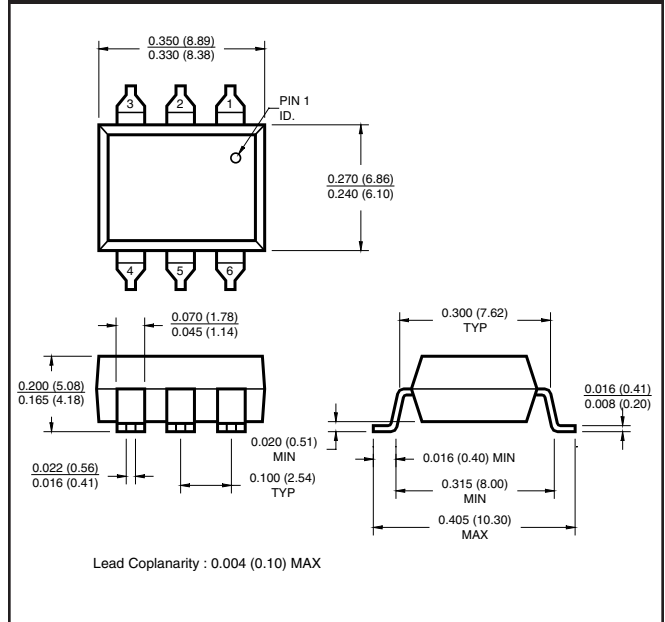
**H11C5**

**H11C6**

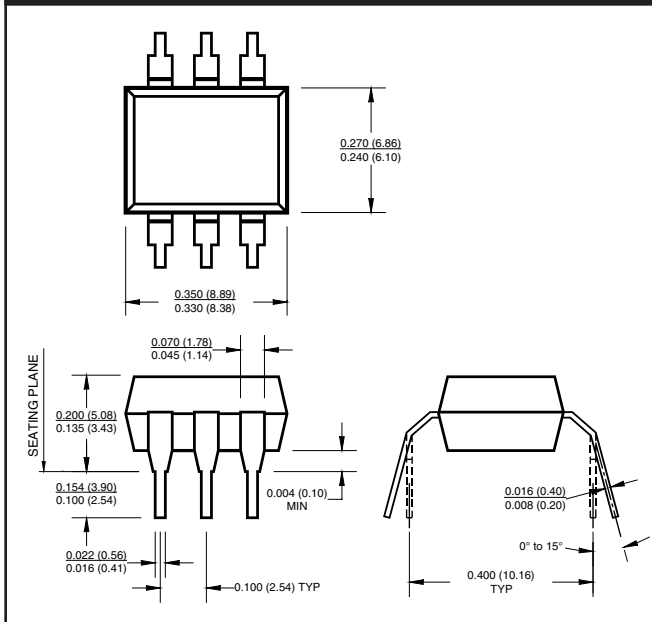
**Package Dimensions (Through Hole)**



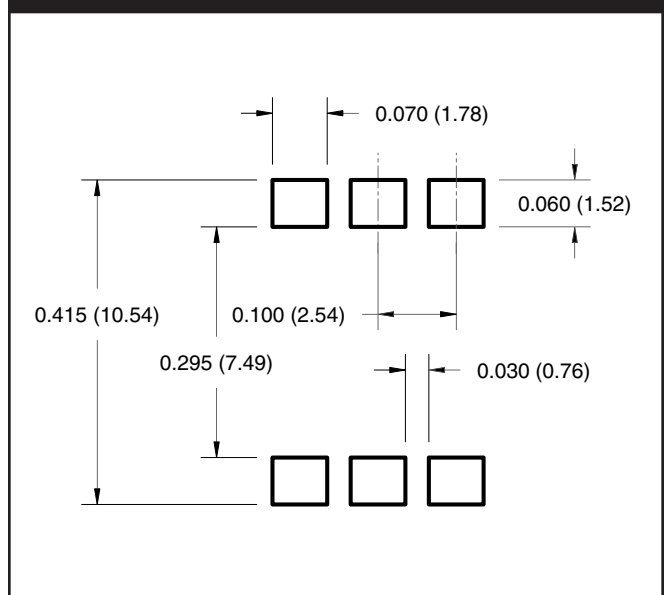
**Package Dimensions (Surface Mount)**



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



**Recommended Pad Layout for Surface Mount Leadform**



**Note**

All dimensions are in inches (millimeters)

**H11C1**

**H11C2**

**H11C3**

**H11C4**

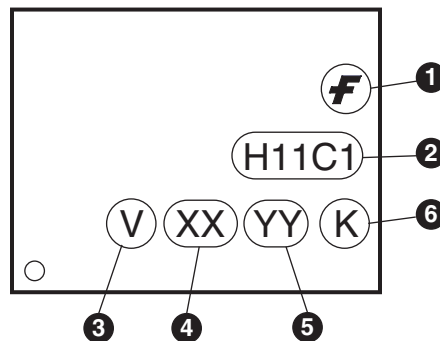
**H11C5**

**H11C6**

**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 and 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	Two digit year code, e.g., '03'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

H11C1

H11C2

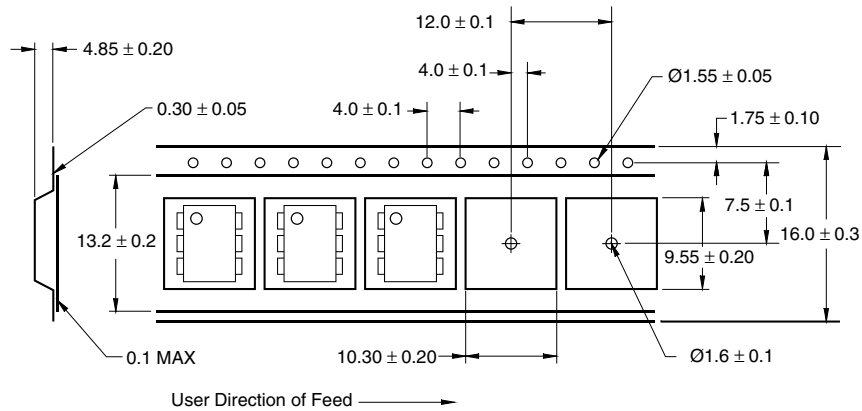
H11C3

H11C4

H11C5

H11C6

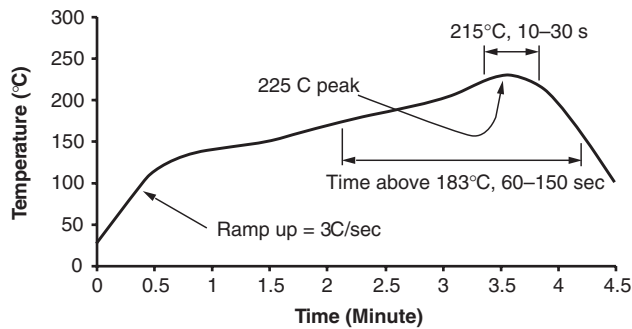
**Carrier Tape Specifications**



**NOTE**

All dimensions are in inches (millimeters)

**Reflow Profile (Black Package, No Suffix)**



- Peak reflow temperature: 225°C (package surface temperature)
- Time of temperature higher than 183°C for 60–150 seconds
- One time soldering reflow is recommended

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**H11C1**

**H11C2**

**H11C3**

**H11C4**

**H11C5**

**H11C6**

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