

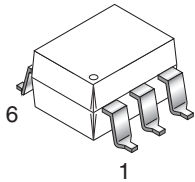
**H11AV1-M**

**H11AV1A-M**

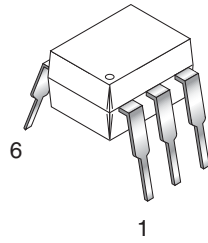
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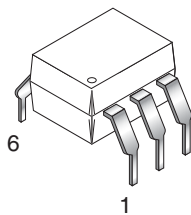
**PACKAGE OUTLINE**



H11AV1S-M, H11AV2S-M

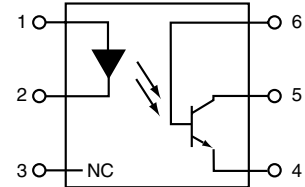


H11AV1-M, H11AV2-M



H11AV1A-M, H11AV2A-M

**SCHEMATIC**



- PIN 1. ANODE
- 2. CATHODE
- 3. NO CONNECTION
- 4. EMITTER
- 5. COLLECTOR
- 6. BASE

**DESCRIPTION**

The general purpose optocouplers consist of a gallium arsenide infrared emitting diode driving a silicon phototransistor in a 6-pin dual in-line white package.

**FEATURES**

- H11AV1 and H11AV2 feature 0.3" input-output lead spacing
- H11AV1A and H11AV2A feature 0.4" input-output lead spacing
- UL recognized (File #E90700, Vol. 2)
- VDE recognized (File #102497)
- Add option V (e.g., H11AV1AV-M)

**APPLICATIONS**

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs

**H11AV1-M**

**H11AV1A-M**

**H11AV2-M**

**H11AV2A-M**

**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Value	Units
<b>TOTAL DEVICE</b>			
Storage Temperature	$T_{STG}$	-40 to +150	$^\circ\text{C}$
Operating Temperature	$T_{OPR}$	-40 to +100	$^\circ\text{C}$
Wave solder temperature (see page 9 for reflow solder profiles)	$T_{SOL}$	260 for 10 sec	$^\circ\text{C}$
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	250	mW
Derate above $25^\circ\text{C}$		2.94	mW/ $^\circ\text{C}$
<b>EMITTER</b>			
DC/Average Forward Input Current	$I_F$	60	mA
Reverse Input Voltage	$V_R$	6	V
LED Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	120	mW
Derate above $25^\circ\text{C}$		1.41	mW/ $^\circ\text{C}$
<b>DETECTOR</b>			
Collector-Emitter Voltage	$V_{CEO}$	70	V
Collector-Base Voltage	$V_{CBO}$	70	V
Emitter-Collector Voltage	$V_{ECO}$	7	V
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	150	mW
Derate above $25^\circ\text{C}$		1.76	mW/ $^\circ\text{C}$

**H11AV1-M**

**H11AV1A-M**

**H11AV2-M**

**H11AV2A-M**

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

**INDIVIDUAL COMPONENT CHARACTERISTICS**

Parameter	Test Conditions	Symbol	Min	Typ*	Max	Unit
<b>EMITTER</b>						
Input Forward Voltage ( $I_F = 10\text{ mA}$ )	$T_A = 25^\circ\text{C}$	$V_F$	0.8	1.18	1.5	V
	$T_A = -55^\circ\text{C}$		0.9	1.28	1.7	
	$T_A = 100^\circ\text{C}$		0.7	1.05	1.4	
Reverse Leakage Current	( $V_R = 6.0\text{ V}$ )	$I_R$			10	$\mu\text{A}$
<b>DETECTOR</b>						
Collector-Emitter Breakdown Voltage	( $I_C = 1.0\text{ mA}$ , $I_F = 0$ )	$BV_{CEO}$	70	100		V
Collector-Base Breakdown Voltage	( $I_C = 100\ \mu\text{A}$ , $I_F = 0$ )	$BV_{CBO}$	70	120		V
Emitter-Collector Breakdown Voltage	( $I_E = 100\ \mu\text{A}$ , $I_F = 0$ )	$BV_{ECO}$	7	10		V
Collector-Emitter Dark Current	( $V_{CE} = 10\text{ V}$ , $I_F = 0$ )	$I_{CEO}$		1	50	nA
Collector-Base Dark Current	( $V_{CB} = 10\text{ V}$ )	$I_{CBO}$		0.5		nA
Capacitance	( $V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_{CE}$		8		pF

**ISOLATION CHARACTERISTICS**

Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
Input-Output Isolation Voltage	( $f = 60\text{ Hz}$ , $t = 1\text{ sec}$ )	$V_{ISO}$	7500			Vac(pk)
Isolation Resistance	( $V_{I-O} = 500\text{ VDC}$ )	$R_{ISO}$	$10^{11}$			$\Omega$
Isolation Capacitance	( $V_{I-O} = 0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_{ISO}$		0.2	2	pF

Note

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

**H11AV1-M**

**H11AV1A-M**

**H11AV2-M**

**H11AV2A-M**

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

DC Characteristic	Test Conditions	Symbol	Device	Min	Typ*	Max	Unit
Current Transfer Ratio, Collector to Emitter	$(I_F = 10 \text{ mA}, V_{CE} = 10 \text{ V})$	CTR	H11AV1 H11AV1A	100		300	%
			H11AV2 H11AV2A	50			
Collector-Emitter Saturation Voltage	$(I_C = 2 \text{ mA}, I_F = 20 \text{ mA})$	$V_{CE(SAT)}$	All			0.4	V
<b>AC Characteristic</b>	$(I_C = 2 \text{ mA}, V_{CC} = 10 \text{ V}, R_L = 100\Omega)$ (Fig. 11)	$T_{ON}$	All			15	$\mu\text{s}$
Non-Saturated Turn-on Time							
Non Saturated Turn-off Time							

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

**H11AV1-M**

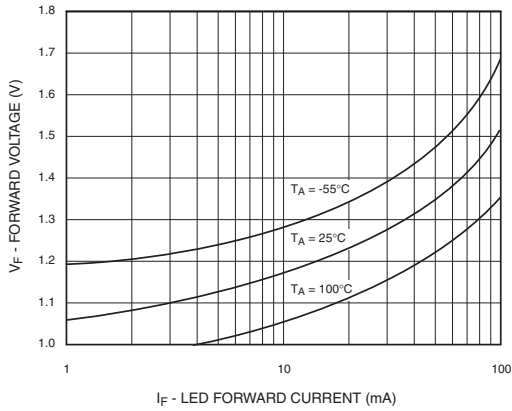
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**H11AV2-M**

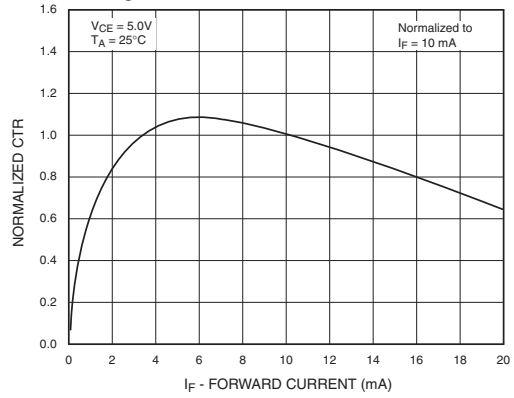
**H11AV2A-M**

**TYPICAL PERFORMANCE CURVES**

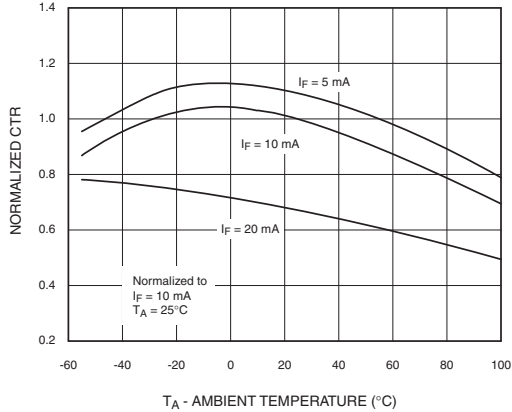
**Fig. 1 LED Forward Voltage vs. Forward Current**



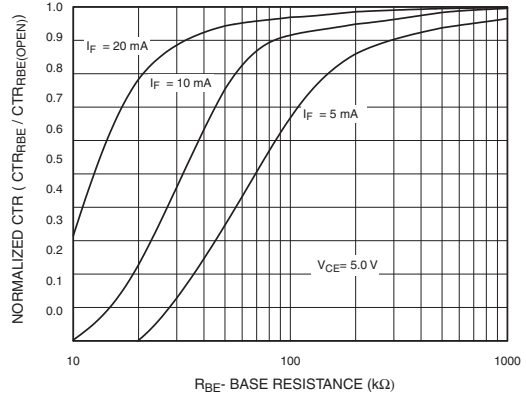
**Fig. 2 Normalized CTR vs. Forward Current**



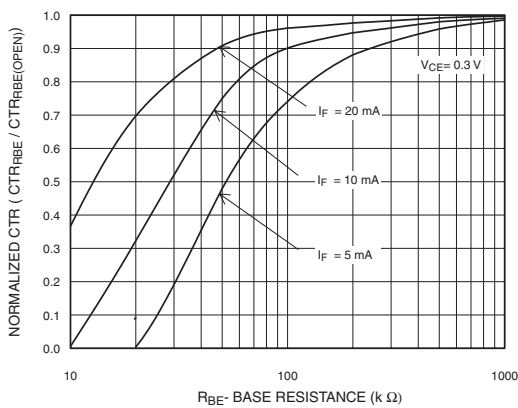
**Fig. 3 Normalized CTR vs. Ambient Temperature**



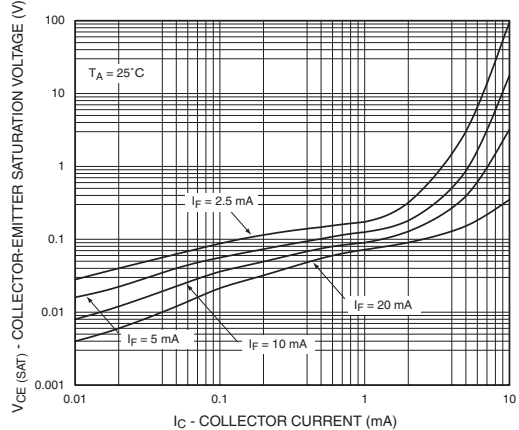
**Fig. 4 CTR vs. R<sub>BE</sub> (Unsaturated)**



**Fig. 5 CTR vs. R<sub>BE</sub> (Saturated)**



**Fig. 6 Collector-Emitter Saturation Voltage vs. Collector Current**



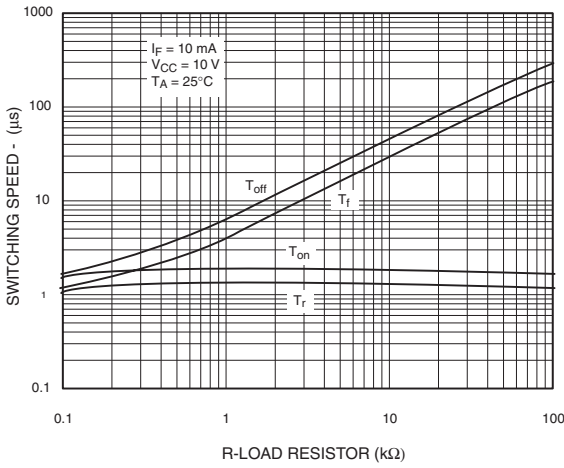
**H11AV1-M**

**H11AV1A-M**

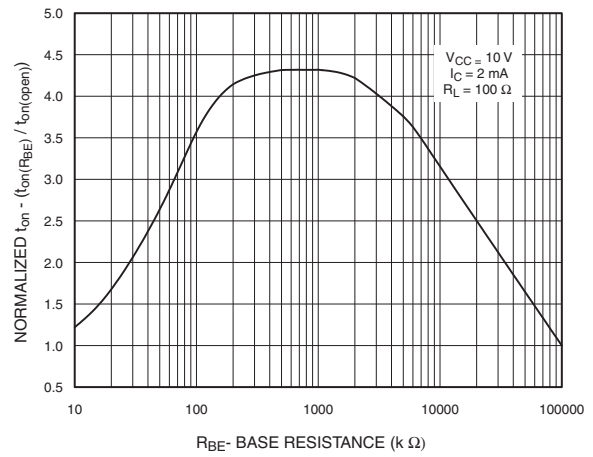
**H11AV2-M**

**H11AV2A-M**

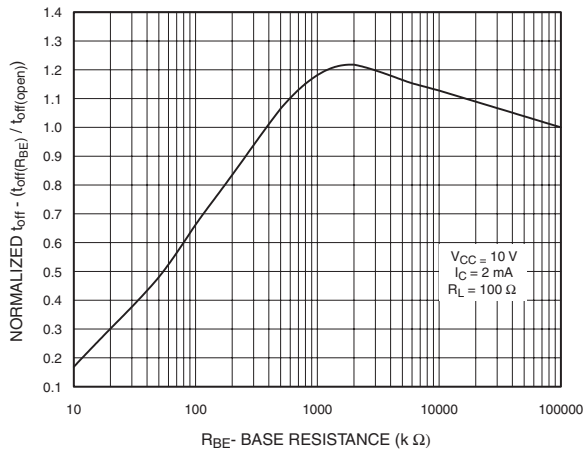
**Fig. 7 Switching Speed vs. Load Resistor**



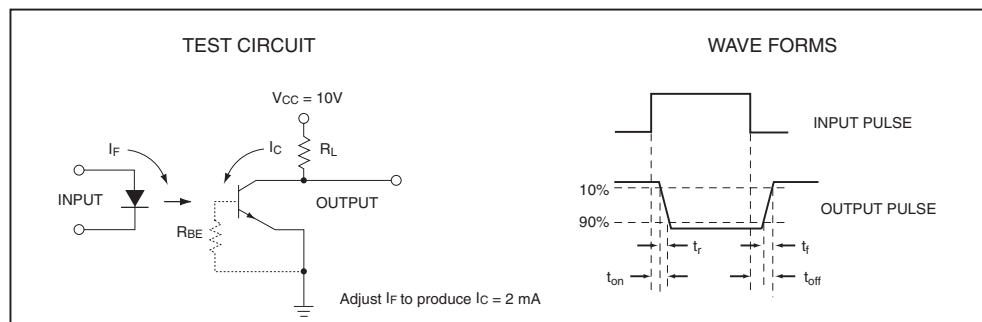
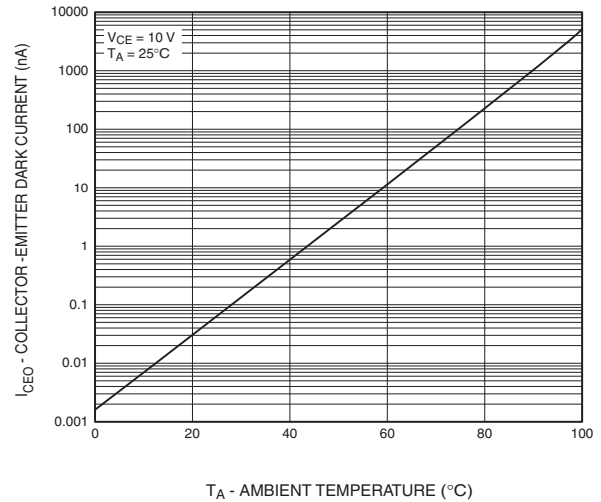
**Fig. 8 Normalized  $t_{on}$  vs.  $R_{BE}$**



**Fig. 9 Normalized  $t_{off}$  vs.  $R_{BE}$**



**Fig. 10 Dark Current vs. Ambient Temperature**



**Figure 11. Switching Time Test Circuit and Waveforms**

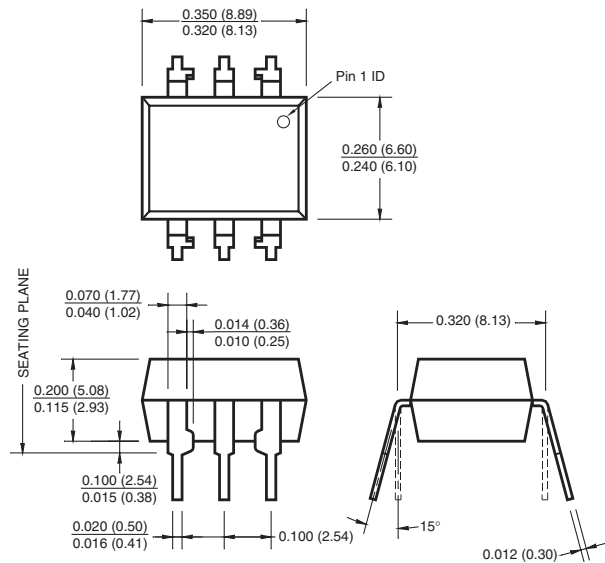
**H11AV1-M**

**H11AV1A-M**

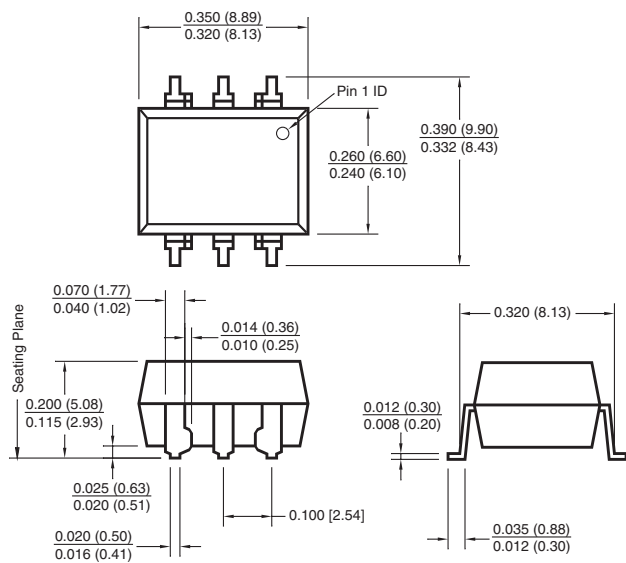
**H11AV2-M**

**H11AV2A-M**

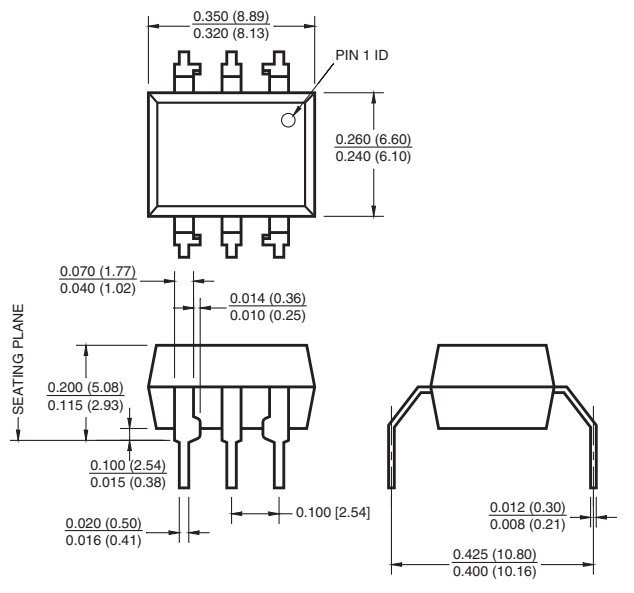
**Package Dimensions (Through Hole)**



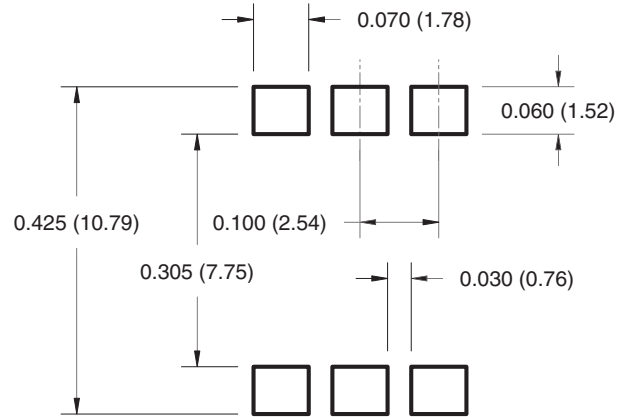
**Package Dimensions (Surface Mount)**



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



**Recommended Pad Layout for Surface Mount Leadform**



**NOTE**

All dimensions are in inches (millimeters)

**H11AV1-M**

**H11AV1A-M**

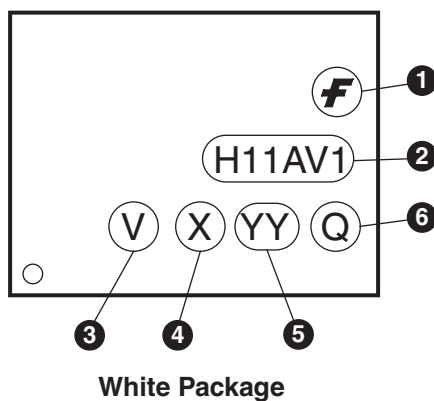
**H11AV2-M**

**H11AV2A-M**

**ORDERING INFORMATION**

Order Entry Identifier		
Order Entry Identifier	Option	Example
S	Surface Mount Lead Bend	H11AV1S-M
SR2	Surface Mount; Tape and reel	H11AV1SR2-M
N/A	0.4" Lead Spacing	H11AV1A-M
V	VDE 0884	H11AV1V-M
N/A	VDE 0884, 0.4" Lead Spacing	H11AV1AV-M
SV	VDE 0884, Surface Mount	H11AV1SV-M
SR2V	VDE 0884, Surface Mount, Tape & Reel	H11AV1SR2V-M

**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 • One digit for white package parts, e.g., '3'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

\*Note – Parts built in the white package (M suffix) that do not have the 'V' option (see definition 3 above) that are marked with date code '325' or earlier are marked in the portrait format.



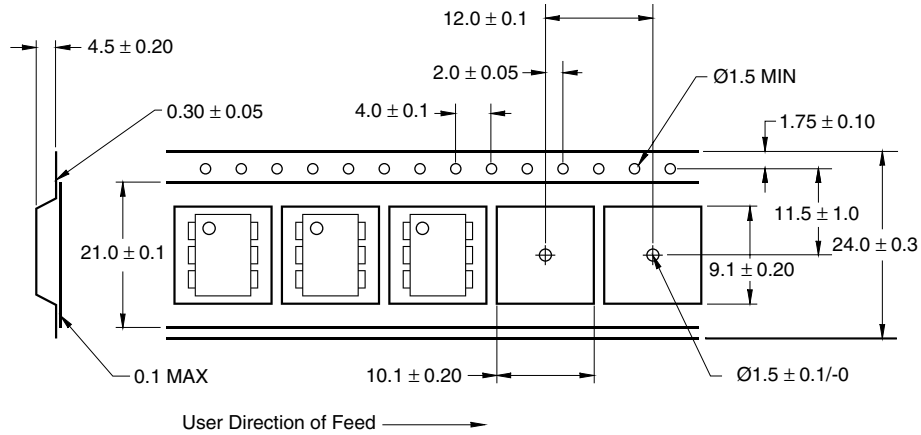
**H11AV1-M**

**H11AV1A-M**

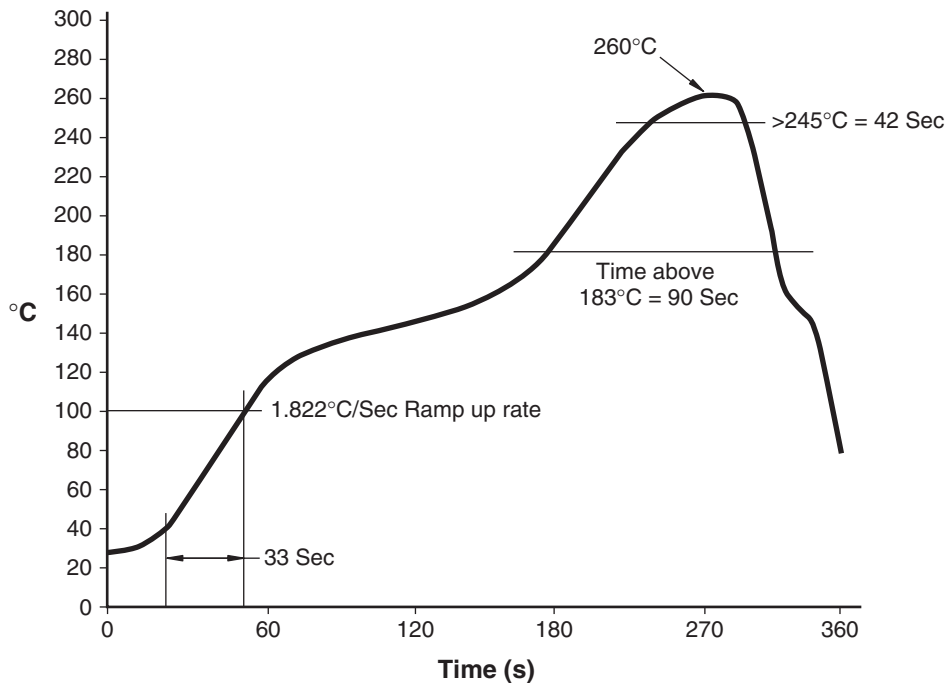
**H11AV2-M**

**H11AV2A-M**

**Carrier Tape Specifications**



**Reflow Profile**



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**H11AV1-M**

**H11AV1A-M**

**H11AV2-M**

**H11AV2A-M**

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