

H11AV1, H11AV2, H11AV3



DESCRIPTION

The H11AV series optocoupler consists of an infrared emitting diode optically coupled to an NPN silicon photo transistor in a standard 6 pin dual in line plastic package.

FEATURES

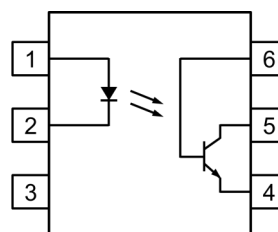
- High AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range -55°C to 100°C
- RoHS Compliant
- UL Approval E91231 Model "GG"
- VDE Approval 40028086

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measurement Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Add Suffix "X" for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



- | | |
|---|-----------|
| 1 | Anode |
| 2 | Cathode |
| 3 | NC |
| 4 | Emitter |
| 5 | Collector |
| 6 | Base |

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	60mA
Reverse Voltage	6V
Power Dissipation	105mW
Junction Temperature	125°C

Output

Collector Current	50mA
Collector to Emitter Voltage V _{CEO}	70V
Collector to Base Voltage V _{CBO}	70V
Emitter to Collector Voltage V _{ECO}	6V
Emitter to Base Voltage V _{EBO}	6V
Power Dissipation	160mW

Total Package

Total Power Dissipation	200mW
Isolation Voltage	5000V _{RMS}
Operating Temperature	-55 to 100°C
Storage Temperature	-55 to 125°C
Lead Soldering Temperature (10s)	260°C

ISOCOM COMPONENTS 2004 LTD

Unit 25B, Park View Road West, Park View Industrial Estate
Hartlepool, Cleveland, TS25 1PE, United Kingdom
Tel : +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
e-mail : sales@isocom.co.uk
<http://www.isocom.com>

ISOCOM COMPONENTS ASIA LTD

Hong Kong Office
Block A, 8/F, Wah Hing Industrial Mansions
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong
Tel : +852 2995 9217 Fax : +852 8161 6292
e-mail : sales@isocom.com.hk

H11AV1, H11AV2, H11AV3

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

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 60\text{mA}$		1.4	1.7	V
Reverse Current	I_R	$V_R = 6\text{V}$			10	μA
Terminal Capacitance	C_t	$V_F = 0\text{V}, f = 1\text{kHz}$		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0,1\text{mA}, I_F = 0\text{mA}$	70			V
Collector-Base Breakdown Voltage	BV_{CBO}	$I_C = 0,1\text{mA}, I_F = 0\text{mA}$	70			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_F = 0\text{mA}$			50	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	$I_F = 10\text{mA}, V_{CE} = 10\text{V}$				%
		H11AV1	100		300	
		H11AV2	50			
		H11AV3	20			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 10\text{mA}, I_C = 2.5\text{mA}$		0.25	0.4	V
Floating Capacitance	C_f	$V_{IO} = 0\text{V}, f = 1\text{MHz}$		0.6	1	pF
Cut-Off Frequency	f_c	$V_{CC} = 5\text{V}, I_F = 10\text{mA}$ $R_L = 75\Omega, -3\text{dB}$		150		kHz
Output Rise Time	t_r	$V_{CC} = 5\text{V}, I_F = 10\text{mA}$ $R_L = 75\Omega$		2	7	μs
Output Fall Time	t_f			2	8	μs

H11AV1, H11AV2, H11AV3

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

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	R.H. = 40% to 60%, $t = 1 \text{ min}$ Note 1	5000			V_{RMS}
Isolation Resistance	R_{ISO}	$V_{\text{I-O}} = 500\text{VDC}$ R.H. = 40% to 60% Note 1	5×10^{10}	1×10^{11}		Ω

Note 1 : Measured with input leads shorted together and output leads shorted together.



H11AV1, H11AV2, H11AV3

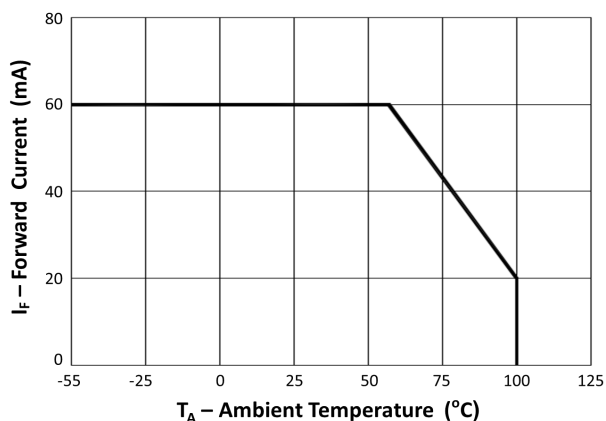


Fig 1 Forward Current vs Ambient Temperature

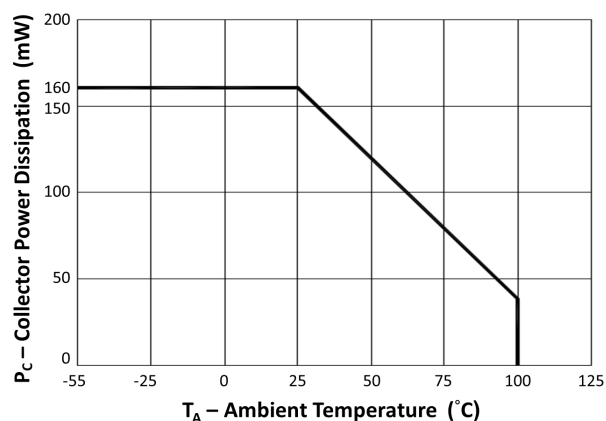


Fig 2 Collector Power Dissipation vs Ambient Temperature

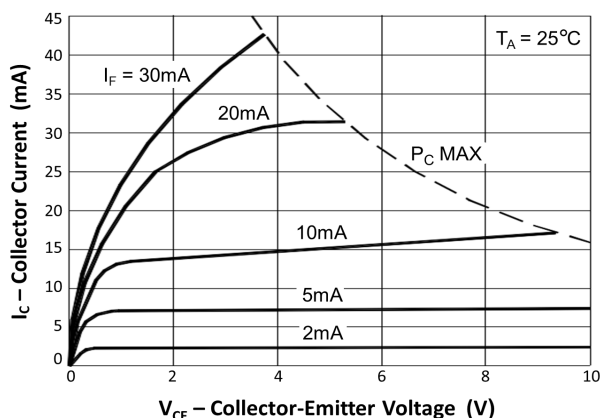


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

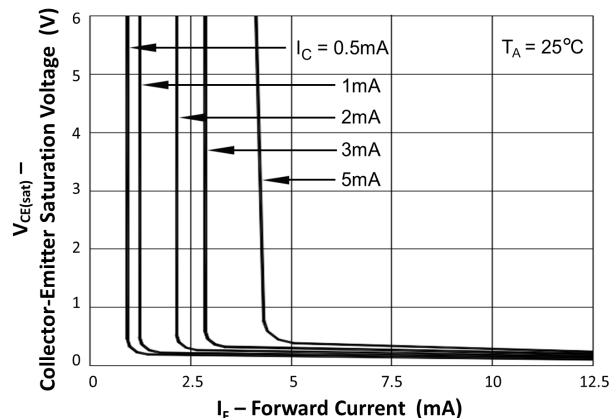


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

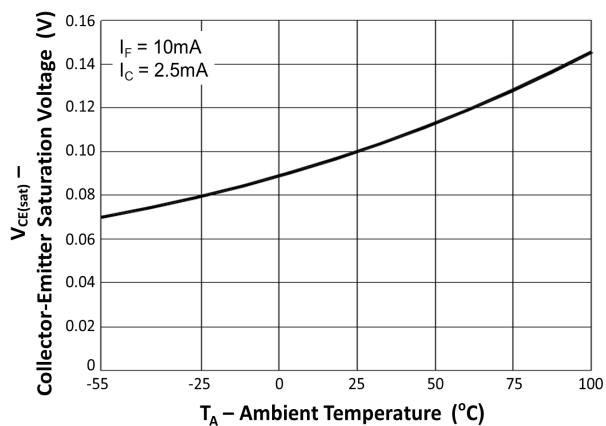


Fig 5 Collector-Emitter Saturation Voltage vs Ambient Temperature

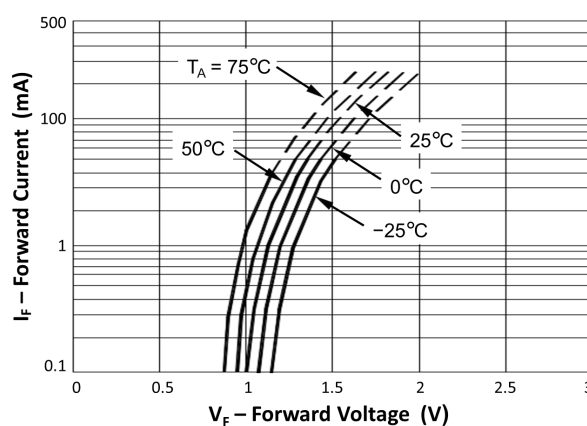


Fig 6 Forward Current vs Forward Voltage



H11AV1, H11AV2, H11AV3

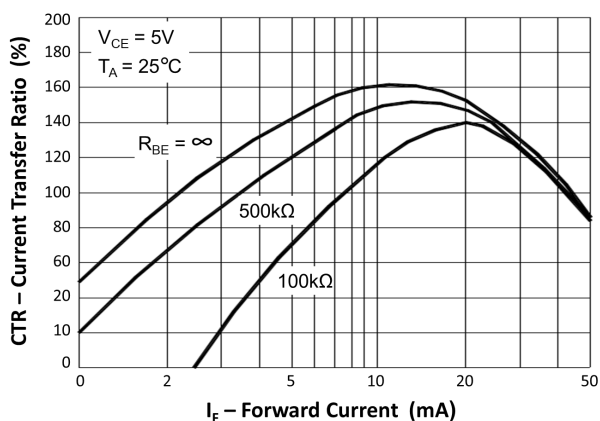


Fig 7 Current Transfer Ratio vs Forward Current

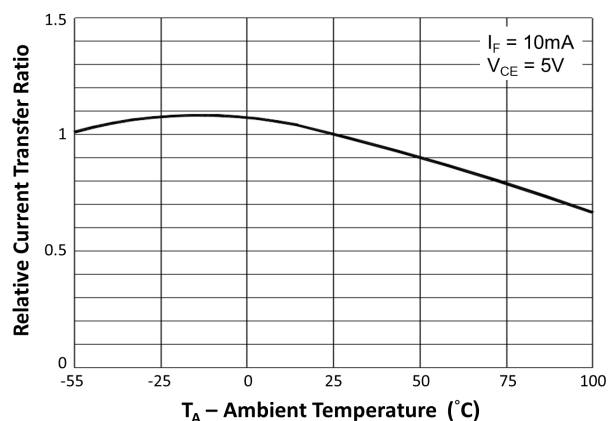


Fig 8 Relative Current Transfer Ratio vs Ambient Temperature

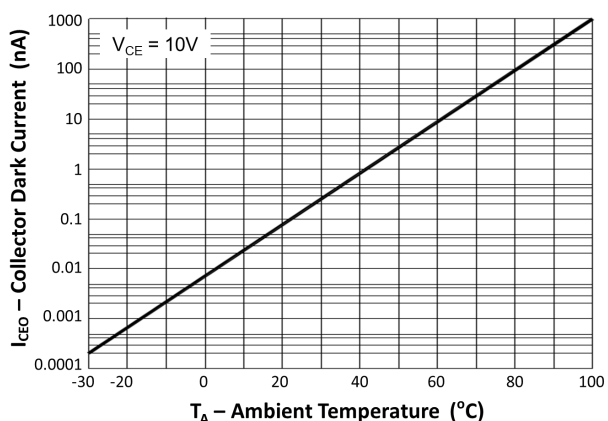


Fig 9 Collector Dark Current vs Ambient Temperature

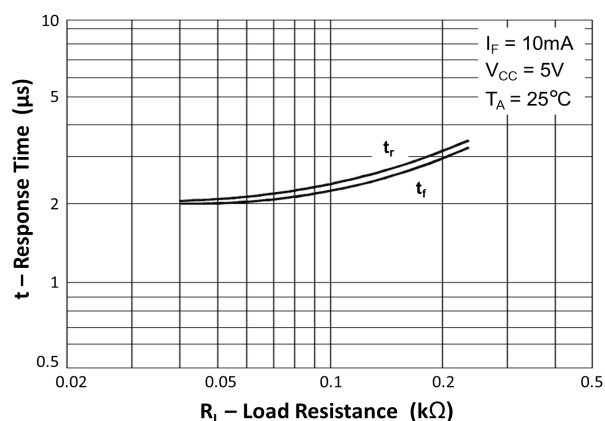


Fig 10 Response Time vs Load Resistance

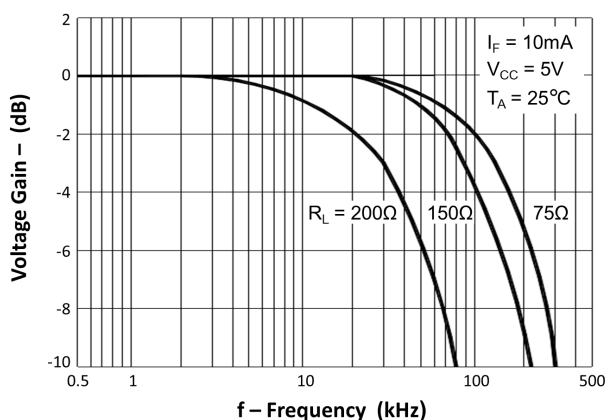
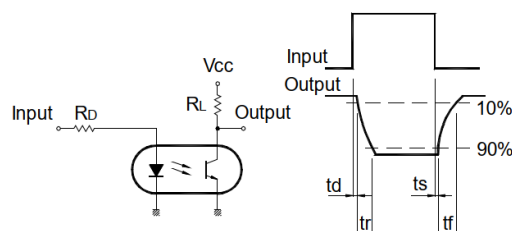
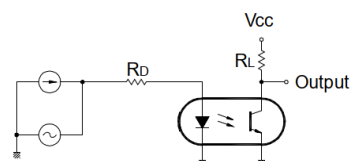


Fig 11 Frequency Response



Response Time Test Circuit



Frequency Response Test Circuit

H11AV1, H11AV2, H11AV3

ORDER INFORMATION

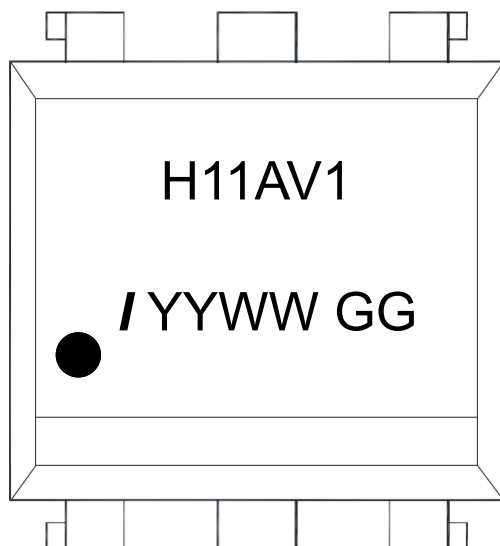
H11AV1, H11AV2, H11AV3 (UL Approval)			
After PN	PN	Description	Packing quantity
None	H11AV1, H11AV2, H11AV3	Standard DIP6	65 pcs per tube
G	H11AV1G, H11AV2G, H11AV3G	10mm Lead Spacing	65 pcs per tube
SM	H11AV1SM, H11AV2SM, H11AV3SM	Surface Mount	65 pcs per tube
SMT&R	H11AV1SMT&R H11AV2SMT&R H11AV3SMT&R	Surface Mount Tape and Reel	1000 pcs per reel

H11AV1X, H11AV2X, H11AV3X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	H11AV1X, H11AV2X, H11AV3X	Standard DIP6	65 pcs per tube
G	H11AV1XG, H11AV2XG, H11AV3XG	10mm Lead Spacing	65 pcs per tube
SM	H11AV1XSM H11AV2XSM H11AV3XSM	Surface Mount	65 pcs per tube
SMT&R	H11AV1XSMT&R H11AV2XSMT&R H11AV3XSMT&R	Surface Mount Tape and Reel	1000 pcs per reel

H11AV1, H11AV2, H11AV3

DEVICE MARKING

Example : H11AV1



H11AV1

Device Part Number

/

Isocom

YY

2 digit Year Code

WW

2 digit Week Code

GG

UL Model

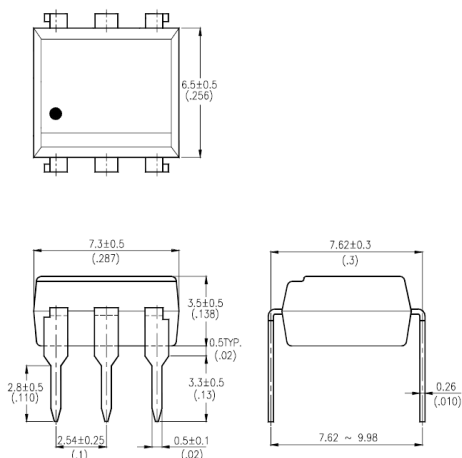


ISOCOM
COMPONENTS

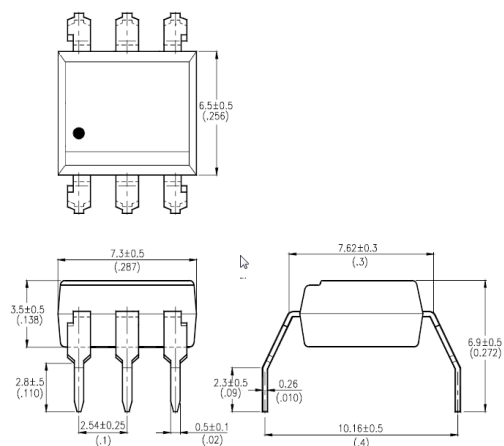
H11AV1, H11AV2, H11AV3

PACKAGE DIMENSIONS in mm (inch)

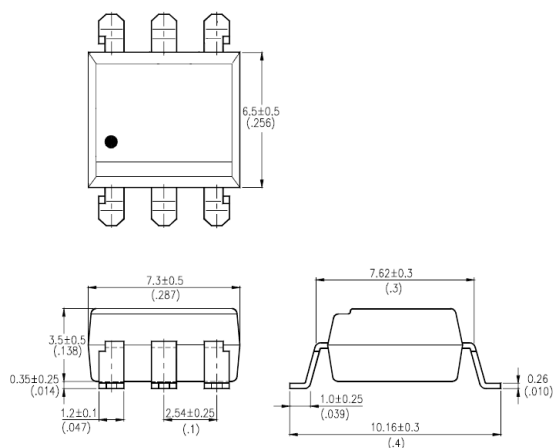
DIP



G Form



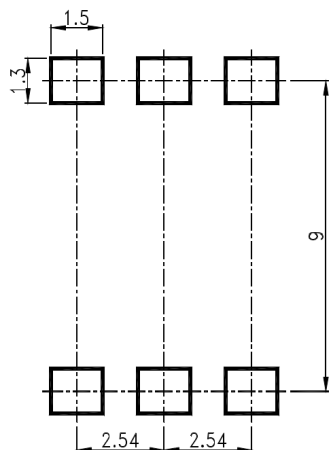
Surface Mount



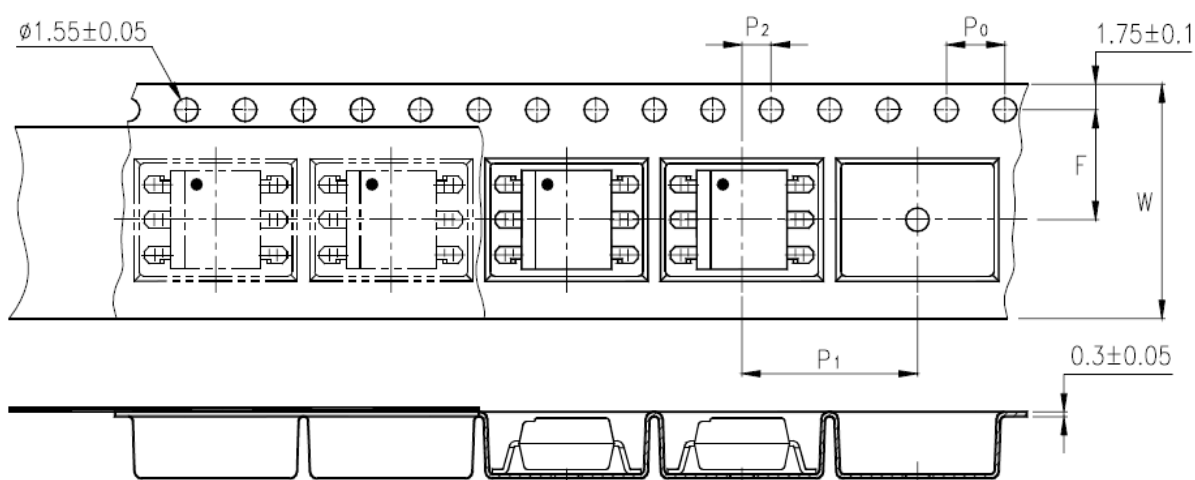


H11AV1, H11AV2, H11AV3

RECOMMENDED SOLDER PAD LAYOUT (mm)



TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P ₀	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P ₂	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P ₁	12 ± 0.1 (0.472)

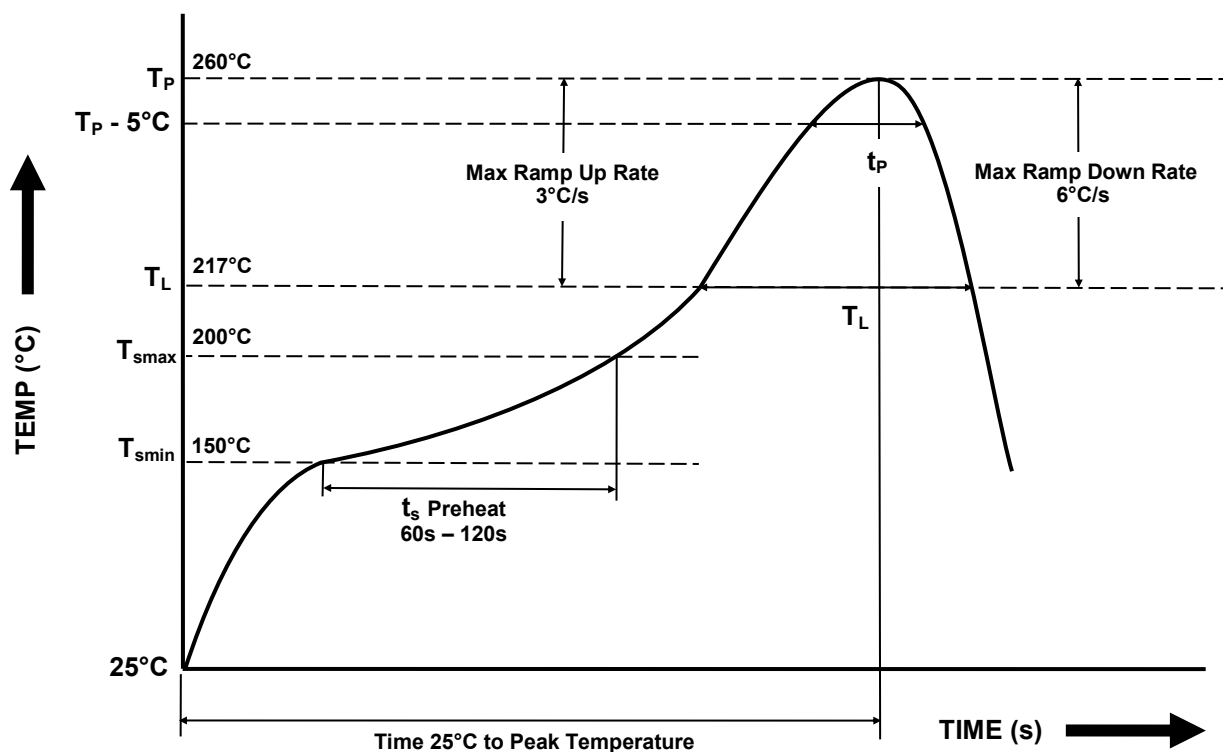


H11AV1, H11AV2, H11AV3

IR REFLOW SOLDERING TEMPERATURE PROFILE

One Time Reflow Soldering is Recommended.

Do not immerse device body in solder paste.



Profile Details	Conditions
Preheat <ul style="list-style-type: none">- Min Temperature (T_{SMIN})- Max Temperature (T_{SMAX})- Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s - 120s
Soldering Zone <ul style="list-style-type: none">- Peak Temperature (T_P)- Time at Peak Temperature- Liquidous Temperature (T_L)- Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$)- Time maintained above T_L (t_L)- Ramp Up Rate (T_L to T_P)- Ramp Down Rate (T_P to T_L)	260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max

DISCLAIMER

Isocom Components is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing Isocom Components products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such Isocom Components products could cause loss of human life, bodily injury or damage to property.

In developing your designs, please ensure that Isocom Components products are used within specified operating ranges as set forth in the most recent Isocom Components products specifications.

The Isocom Components products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Isocom Components products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation Instruments, traffic signal instruments, combustion control instruments, medical Instruments, all types of safety devices, etc... Unintended Usage of Isocom Components products listed in this document shall be made at the customer's own risk.

Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

The products described in this document are subject to the foreign exchange and foreign trade laws.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by Isocom Components for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of Isocom Components or others.