



**DESCRIPTION**

The IS354 and IS354A optically coupled isolators each consists of two infrared light emitting diodes in reverse parallel connection allowing AC input voltage and optically coupled to an NPN silicon photo transistor in a space efficient Mini Flat Package.

**FEATURES**

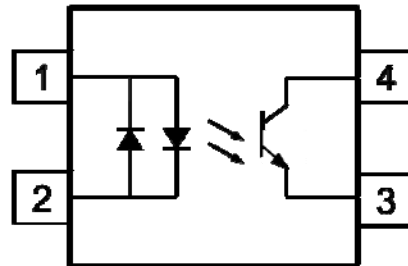
- AC Isolation Voltage 3750V<sub>RMS</sub>
- Wide Operating Temperature Range -55°C to +100°C
- Lead Free and RoHS Compliant
- UL File E91231 Package Code "FPA1"

**APPLICATIONS**

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- System Appliances

**ORDER INFORMATION**

- Available in Tape and Reel



**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 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	±50mA
Power dissipation	70mW

**Output**

Collector to Emitter Voltage BV <sub>CEO</sub>	35V
Emitter to Collector Voltage BV <sub>ECO</sub>	6V
Collector Current	50mA
Power Dissipation	150mW

**Total Package**

Isolation Voltage	3750V <sub>RMS</sub>
Total Power Dissipation	170mW
Operating Temperature	-55 to 100 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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**IS354 / IS354A**

**ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)**

**INPUT**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	$V_F$	$I_F = \pm 20\text{mA}$		1.2	1.4	V
Terminal Capacitance	$C_t$	$V = 0\text{V}, f = 1\text{KHz}$		30	250	pF

**OUTPUT**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector - Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	35			V
Emitter - Collector Breakdown Voltage	$BV_{ECO}$	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector - Emitter Dark Current	$I_{CEO}$	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

**COUPLED**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	20		400	%
		Optional CTR Grades A	50		150	
Collector - Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$			0.2	V
Input to Output Isolation Voltage	$V_{ISO}$	R.H. = 40% - 60%, 1 minute Note 1	3750			$V_{RMS}$
Input to Output Isolation Resistance	$R_{ISO}$	$V_{IO} = 500\text{V}, \text{R.H.} = 40\% \text{ to } 60\%$ Note 1	$5 \times 10^{10}$			$\Omega$
Floating Capacitance	$C_f$	$V = 0\text{V}, f = 1\text{MHz}$		0.6	1	pF
Output Rise Time	$t_r$	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$		4	18	$\mu\text{s}$
Output Fall Time	$t_f$			3	18	$\mu\text{s}$

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

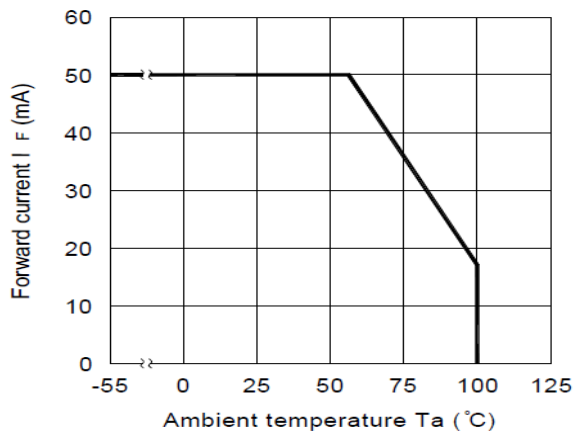


Fig 1 Forward Current vs  $T_A$

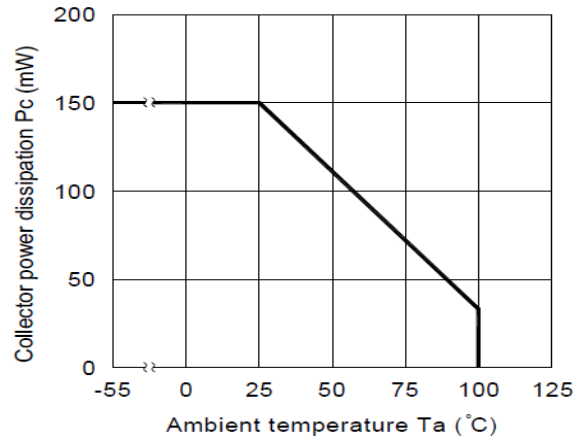


Fig 2 Collector Power Dissipation vs  $T_A$

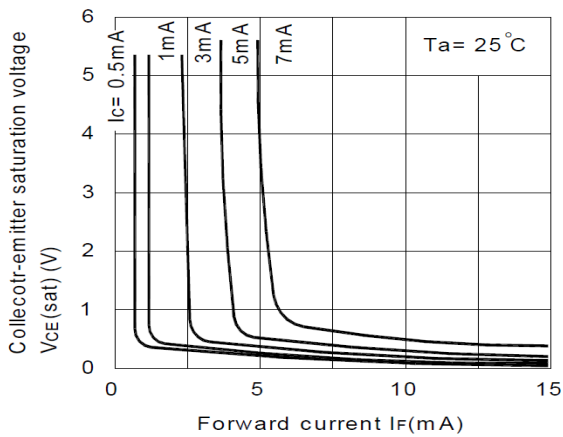


Fig 3 Collector-emitter Saturation Voltage vs Forward Current

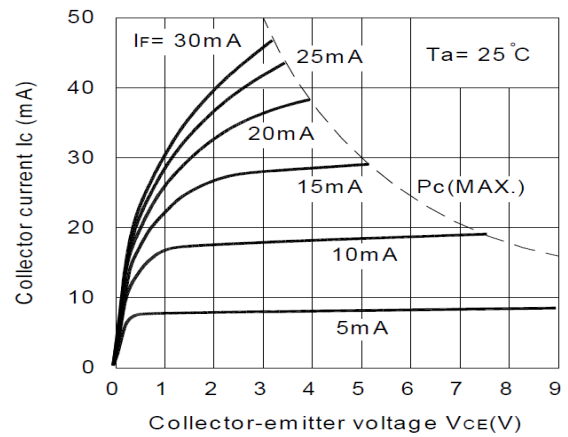


Fig 4 Collector Current vs Collector-emitter Voltage

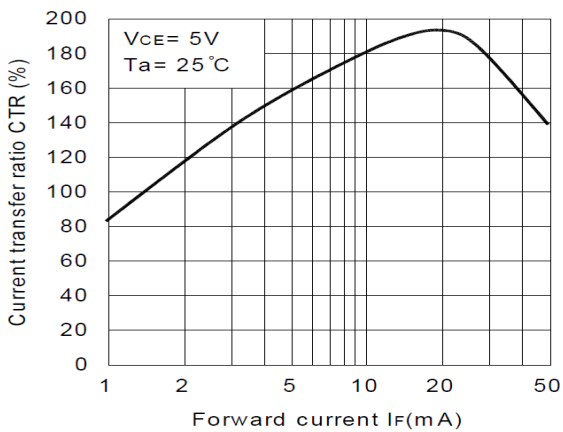


Fig 5 Current Transfer Ratio vs Forward Current

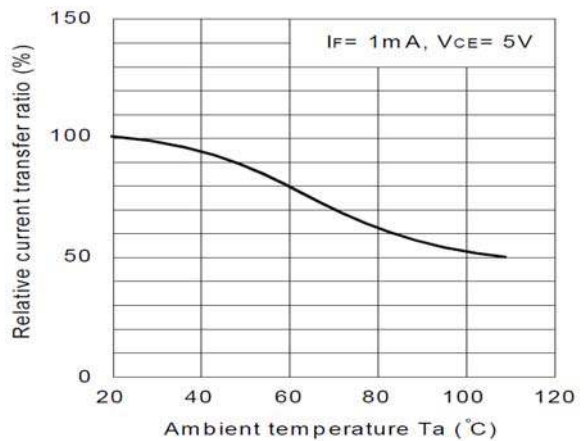
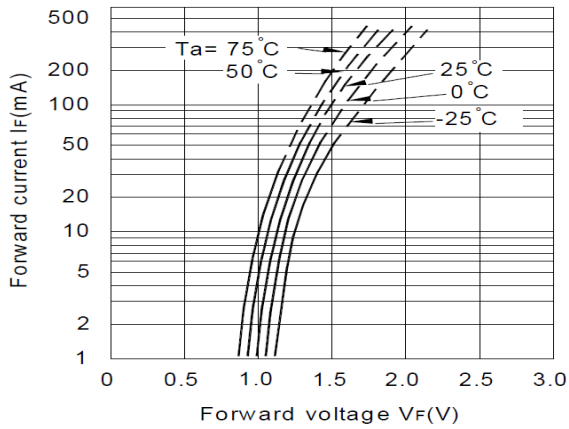
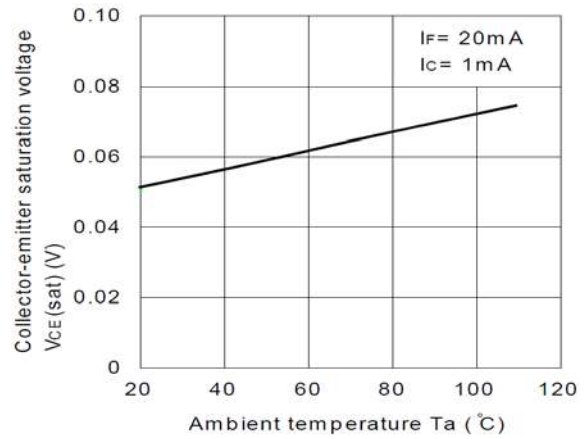


Fig 6 Relative Current Transfer Ratio vs  $T_A$

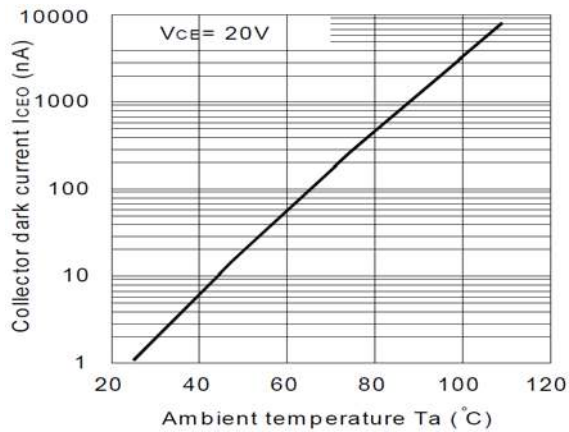
## IS354 / IS354A



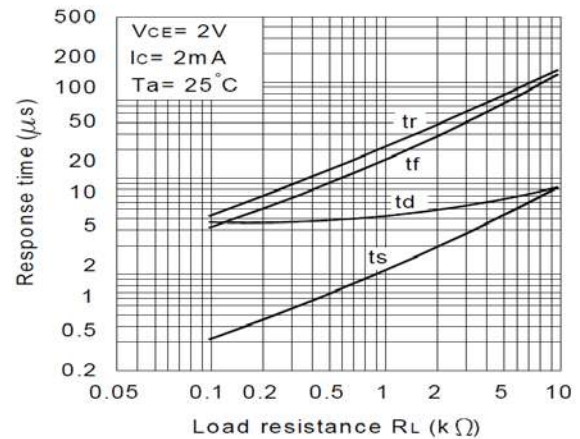
**Fig 7 Forward Current vs Forward Voltage**



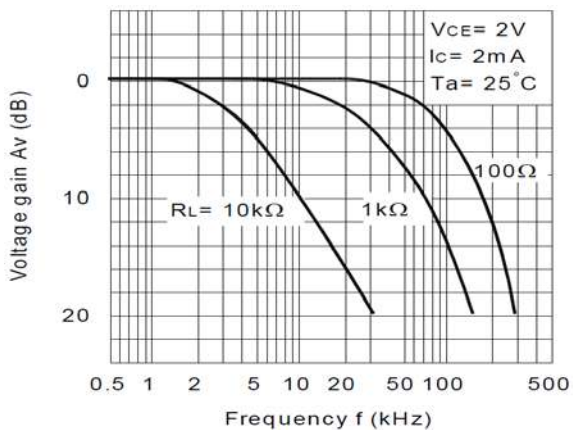
**Fig 8 Collector-emitter Saturation Voltage vs  $T_A$**



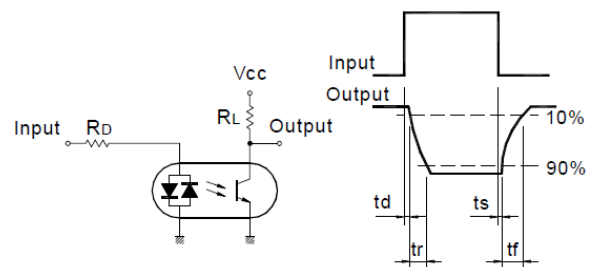
**Fig 9 Collector Dark Current vs  $T_A$**



**Fig 10 Response Time vs Load Resistance**



**Fig 11 Frequency Response**



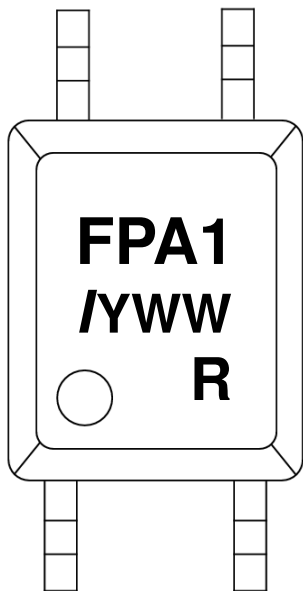
**Response Time Test Circuit**

## IS354 / IS354A

### ORDER INFORMATION

IS354, IS354A			
After PN	PN	Description	Packing quantity
None	IS354, IS354A	Surface Mount Tape & Reel	3000 pcs per reel

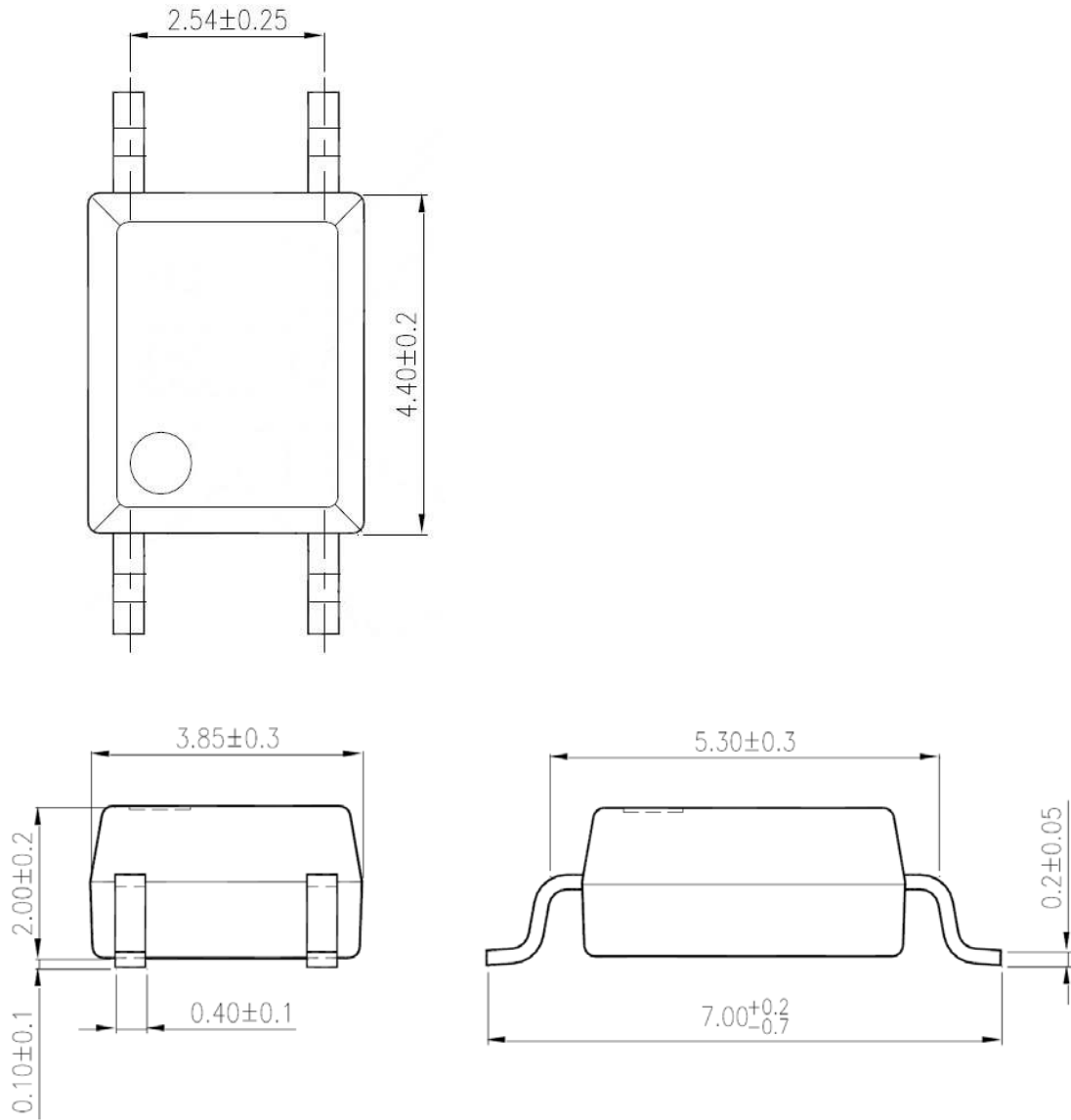
### DEVICE MARKING



**FPA1**      denotes Device Part Number  
**/**            denotes Isocom  
**Y**            denotes 1 digit Year code  
**WW**        denotes 2 digit Week code  
**R**            denotes CTR Grade

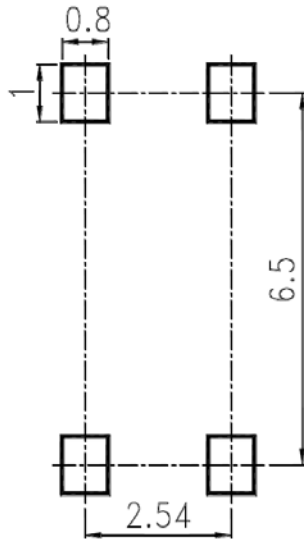
**IS354 / IS354A**

**PACKAGE DIMENSIONS (mm)**

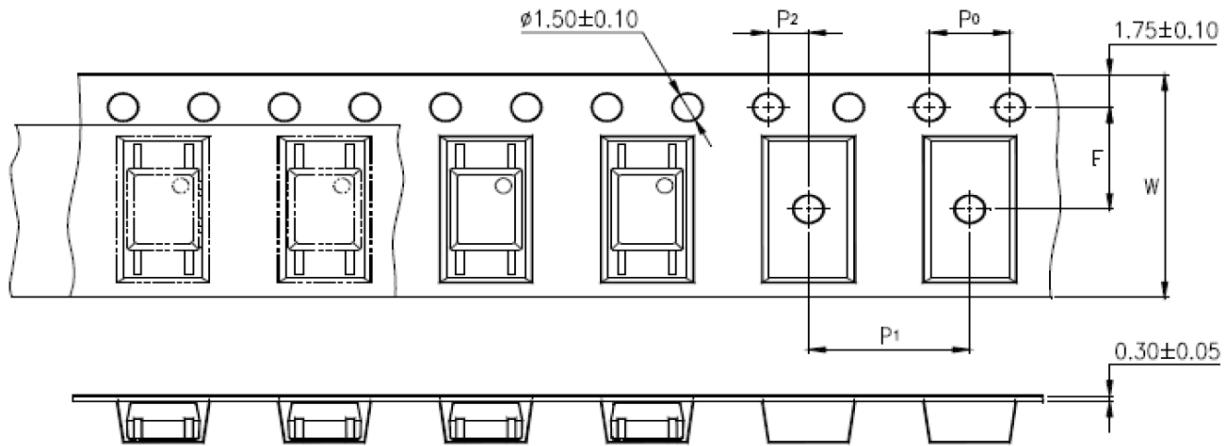


## IS354 / IS354A

### RECOMMENDED SOLDER PAD LAYOUT (mm)

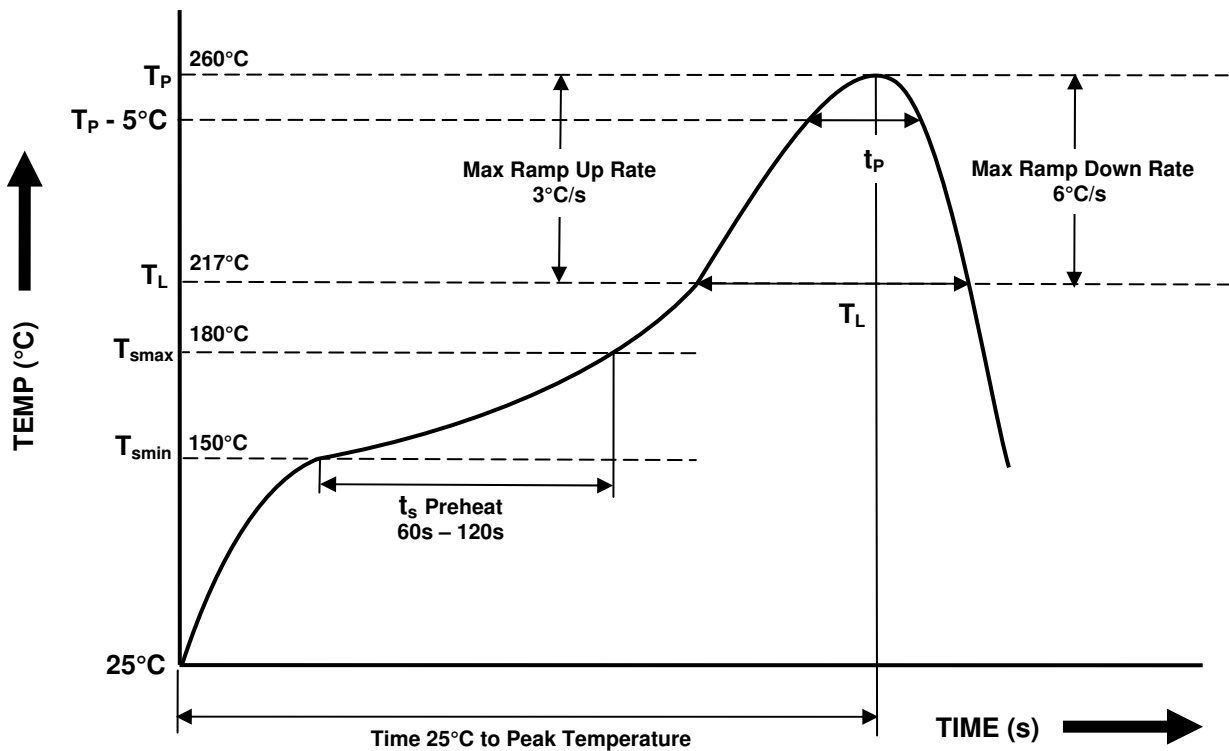


### TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	$12 \pm 0.3$ (0.47)
Pitch of Sprocket Holes	$P_0$	$4 \pm 0.1$ (0.15)
Distance of Component to Sprocket Holes	F	$5.5 \pm 0.1$ (0.217)
	$P_2$	$2 \pm 0.1$ (0.079)
Distance of Component to Component	$P_1$	$8 \pm 0.1$ (0.315)

**IR REFLOW SOLDERING TEMPERATURE PROFILE**  
**One Time Reflow Soldering is Recommended.**  
**Do not immerse device body in solder paste.**



Profile Details	Conditions
<b>Preheat</b> - Min Temperature (T <sub>Smin</sub> ) - Max Temperature (T <sub>Smax</sub> ) - Time T <sub>Smin</sub> to T <sub>Smax</sub> (t <sub>s</sub> )	150°C 180°C 60s - 120s
<b>Soldering Zone</b> - Peak Temperature (T <sub>P</sub> ) - Liquidous Temperature (T <sub>L</sub> ) - Time within 5°C of Actual Peak Temperature (T <sub>P</sub> - 5°C) - Time maintained above T <sub>L</sub> (t <sub>L</sub> ) - Ramp Up Rate (T <sub>L</sub> to T <sub>P</sub> ) - Ramp Down Rate (T <sub>P</sub> to T <sub>L</sub> )	260°C 217°C 20s 60s 3°C/s max 3 - 6°C/s
Average Ramp Up Rate (T <sub>Smax</sub> to T <sub>P</sub> )	3°C/s max
Time 25°C to Peak Temperature	8 minutes max





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