

# Honeywell

50040083

## ENGINEERING SPECIFICATION

REV. B

### RoHS Electrical and Mechanical Component Requirements

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First Used On:

Ref. No.: 705587

		<b>Date</b>
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### REVISION HISTORY

REVISION	ECO	DATE	REVISION	ECO	DATE
A	0053683	6/23/09			
B	0065887	6/3/10			

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#### A. SCOPE

This specification explains the RoHS requirement as they apply to manufacturing and process changes affecting electrical and mechanical components used in Honeywell Environmental and Combustion Controls.

#### B. DEFINITION

RoHS: Restriction of Hazardous Substances in electrical and electronic equipment. This European directive states that no component can contain concentrations of the following materials greater than shown below. **See the latest RoHS document for a complete list of restricted materials.**

Lead Pb: 1000 PPM (0.1% by volume)

Mercury Hg: 1000PPM (0.1 % by volume)

Cadmium Cd: 75PPM (0.01% by volume)

Hexavalent Chromium: 1000 PPM (0.1% by volume)

Polybrominated Biphenyls PBB: 1000 PPM (0.1% by volume)

Polybrominated Diphenyl Ethers PBDE: 1000 PPM (0.1% by volume)

Decabromodiphenyl Deca BDE: 1000PPM (0.1% by volume)

#### C. MECHANICAL COMPONENTS MANUFACTURED TO HONEYWELL SPECIFICATIONS

1. Mechanical parts manufactured to Honeywell specs and soldered to the PCB: antennas, contacts, etc. are subject to plating restrictions as specified in Section B, above.
2. Plastic and other mechanical parts not soldered directly to the PCB must also comply with Section B. This also includes plated and painted parts. The exceptions are Steels and Aluminum that are normally alloyed with the metals specified in section B.
3. A Certificate of Compliance (C of C) is required; the required certificate may be used by Honeywell to demonstrate compliance to the European Union RoHS Directive 2002/95/EC (Restriction of the use of certain hazardous substances in electrical and electronic equipment). The C of C must be included with PPAP documentation. Every shipment of parts or material, samples and production, submitted to Honeywell must be accompanied by a C of C from the original manufacturer of the part or material that lists the original manufacturer part number and certifies the material is ROHS compliant. The C of C supplied must be a separate document and not printed on nor a part of the shipping list. It may be included as an addition with other Honeywell Certificate of Compliance statements where applicable. Additionally, documentation listing Honeywell Purchase Order Number, Honeywell Part Number and the manufacturer must be referenced for tracking purposes.

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Any deviation from the above requirement requires prior written approval from the Honeywell Supplier Quality Engineer.

The following sections apply to *all* Electrical and Mechanical parts soldered to the PCB

#### **D. SUPPLIER RESPONSIBILITIES**

All parts supplied must be RoHS compliant

#### **E. NEW PROCESS REQUIREMENTS**

*The largest impact to our components will be the introduction of a LEAD FREE soldering process. The new solder will be a lead free alloy with a higher processing temperature.*

All components that are subject to any soldering condition below shall pass through the process without any short or long term degradation of fit, form, or function.

The following profiles are for component requirements only. These are worst case profiles and typical reflow profiles are much less severe. Each PWB assembly must be profiled to ensure acceptable solder joints at the lowest possible temperature extremes.

##### **1. Wave Soldering**

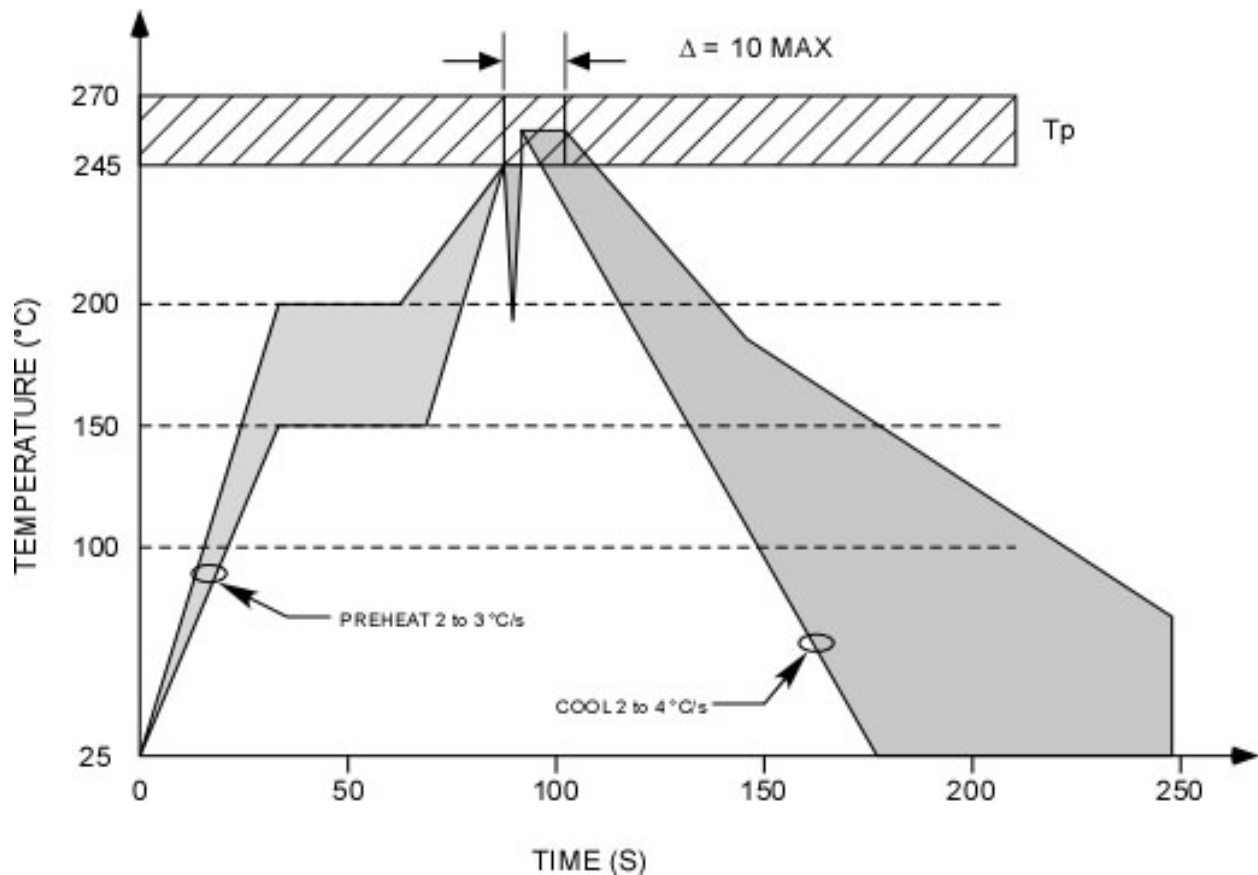
- a. Category 1 Wave Solder (through hole parts) – the component leads are immersed in the wave solder for 5 seconds. Maximum solder bath temperature is 260 to 270 C. ( see typical solder profile figure A) Top side PC Board temperature is 110 C to 115 C
- b. Category 2 Wave Solder (surface mount parts) – the components are immersed in the wave solder for 3 – 5 seconds minimum. Maximum solder bath temperature is 260 C. ( see typical solder profile figure A)

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**FIGURE A**

## 2. Reflow Soldering

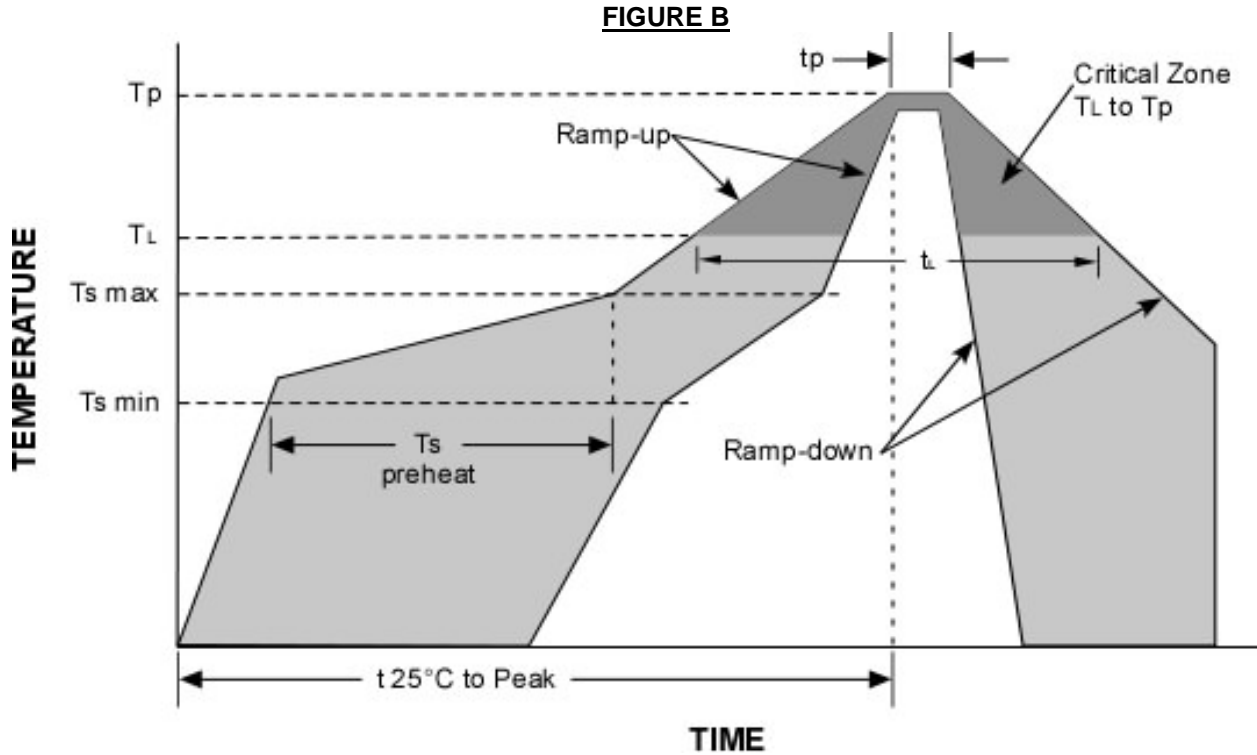
- a. Category 3 Reflow Solder Temperatures: Reflow temperature profile required, studied and recommended by Honeywell Security are Based on JEDEC/IPC standard J-STD-20D, to ensure that all packages can be successfully assembled. Components are required to withstand processing temperatures ramp, peak and dwell times. Per FIGURE B and TABLES 1 and 2

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The lead-free reflow profile recommendations are listed below in Table 1 and 2

<b>Table 1. Lead-Free Reflow Profile Recommendation (IPC/JEDEC J-STD-020D)</b>	
<b>Reflow Parameter</b>	<b>Lead-Free Assembly</b>
Minimum preheat temperature ( $T_{sMIN}$ )	150°C
Maximum preheat temperature ( $T_{sMAX}$ )	200°C
Preheat Time	60-120 seconds
$T_{sMAX}$ to $T_L$ ramp-up rate	3°C/second maximum
Time above temperature $T_L$ ( $t_L$ )	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	See Table 2 below
Time 25°C to $T_P$	8 minute maximum
Time within 5° of Peak $T_P$	30 seconds
Ramp-down rate	6°C/second maximum

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<b>Table 2. Lead-Free Process - Peak Reflow Temperatures (TP)</b>			
<b>Package Thickness</b>	<b>Volume mm3 &lt;350</b>	<b>Volume mm3 350-2000</b>	<b>Volume mm3 &gt; 2000</b>
1.6 mm	260°C	260°C	260°C
1.6mm-2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

### 3. Hand Soldering

- a. Category 4 Hand solder only. Temperature range 370°C to 430°C

### F. PART NUMBERING (Internal Use Only)

New part numbers for ROHS compliant parts created or revised in the PDM systems must use the ROHS attribute in the PDM system.

Existing Part Numbers: Upon every revision opportunity on existing electrical components, PCBs, and mechanical parts, the part is to be replaced with RoHS compliant part.

“Exception”: if the part absolutely cannot, now or in the future, be used on a RoHS compliant product because of cost, or availability issues it may not be revised to ROHS compliance with Engineering VP approval.

### G. NEW PRODUCTS

New released products MUST be RoHS compliant according to the regulations of the region where the products are sold. Any deviation requires written Engineering VP approval when components are not available as RoHS compliant parts.

### H. EXISTING PRODUCTS

Existing products sold in regions that require RoHS or similar regulations must be converted or modified according to the regulations of the region to comply.