

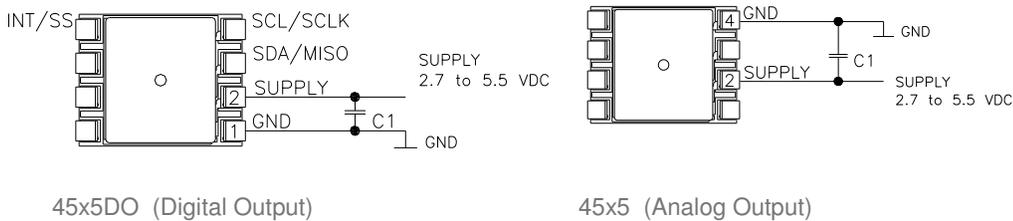
MS45XX SERIES

APPLICATION NOTE

INTRODUCTION

The following are the suggested guidelines for the proper integration of the MS45x5 series pressure sensor into OEM designs. This application note gives guidance in selecting the proper bypass capacitor and pressure hose material. Additional details on the printed circuit board (PCB) layout as well as soldering and cleaning details are also discussed.

CONNECTION DIAGRAM—BYPASS CAPACITOR



It is required that a bypass capacitor be placed between Supply and GND pin. A ceramic capacitor value of 0.1UF 25V 10% X7R 0603 is recommended. Reference AVX, Part Number 06033C104KAT2A

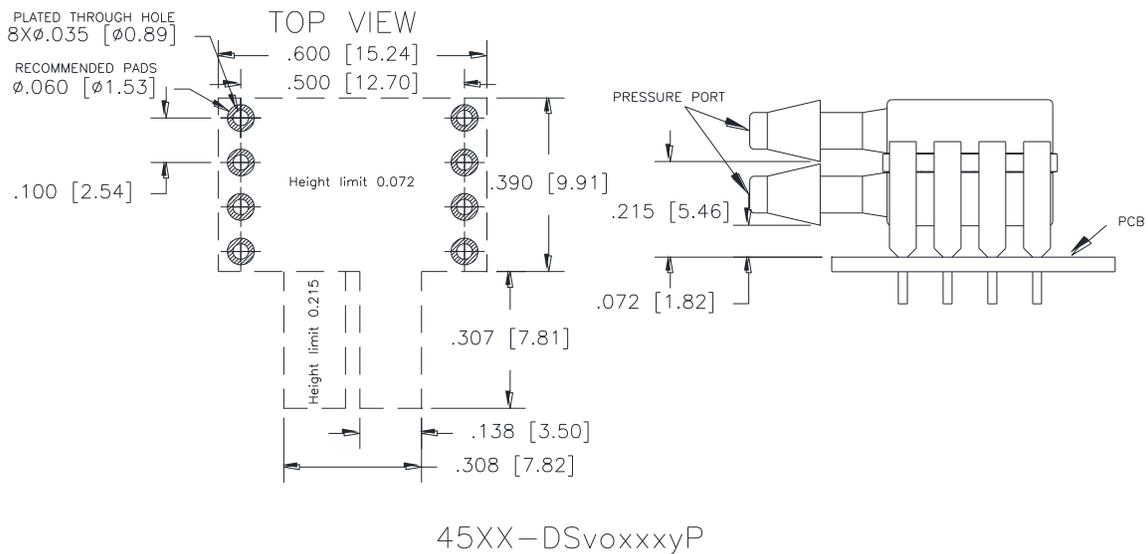
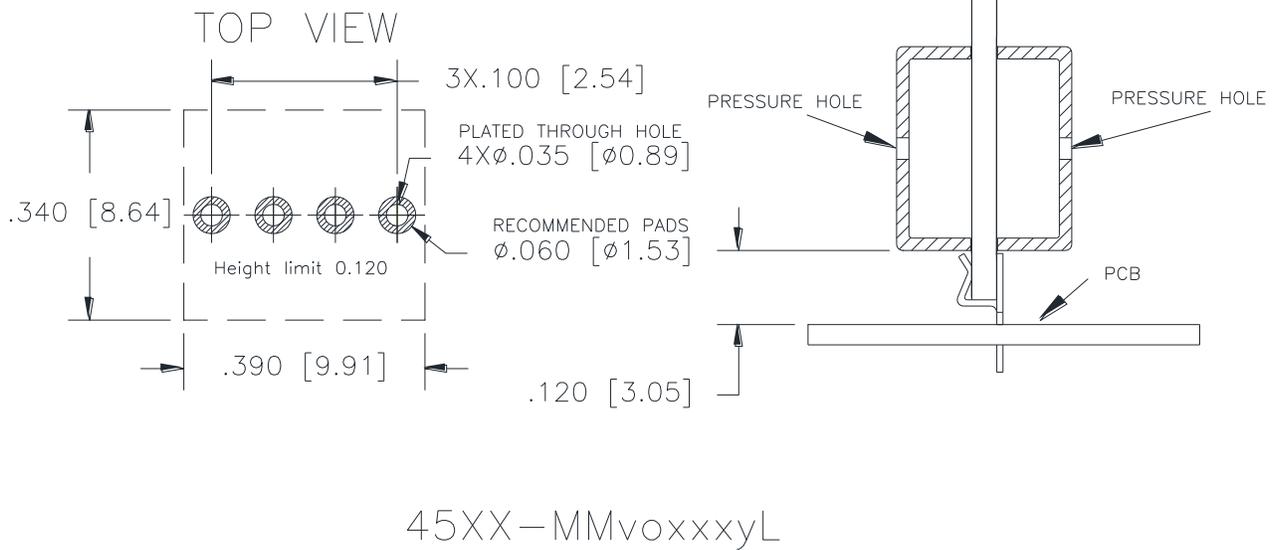
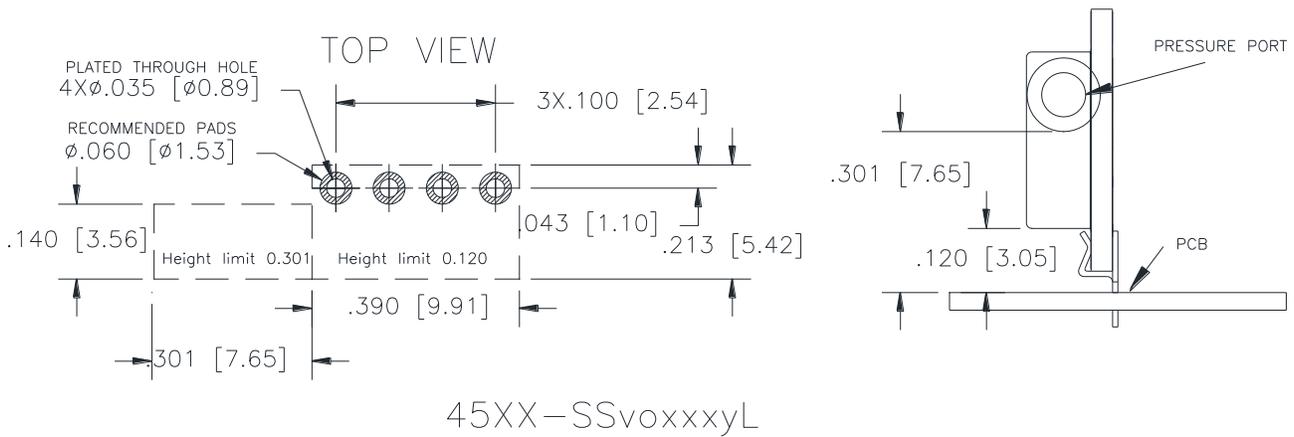
PRESSURE CONNECTION

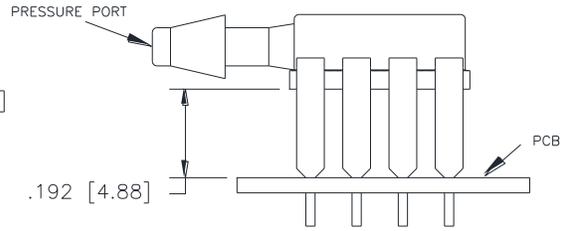
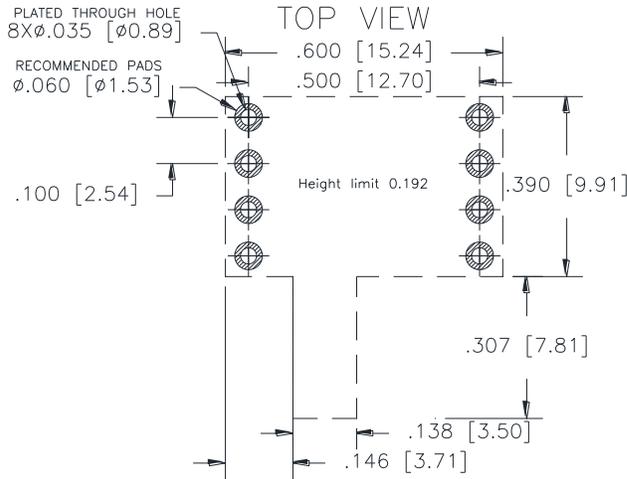
The barbed tubes are designed to be used with 3/32" ID polyurethane tubing with a durometer of 60A-95A. Reference Freelin Wade Part Numbers 1J-135 or 1J-156. Be sure to select the pressure hosing with the proper burst pressure and bend radius requirements for your application.

PCB LAYOUT RECOMMENDATIONS

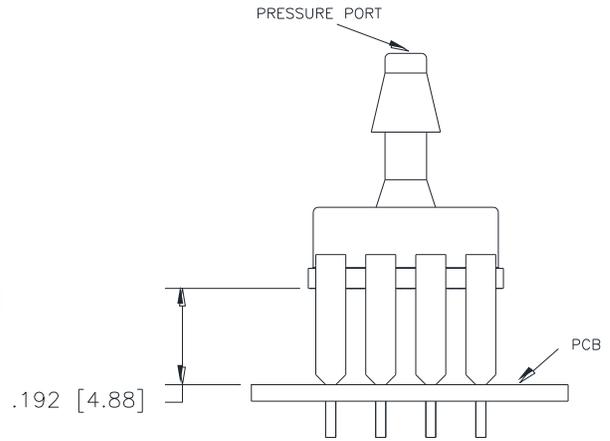
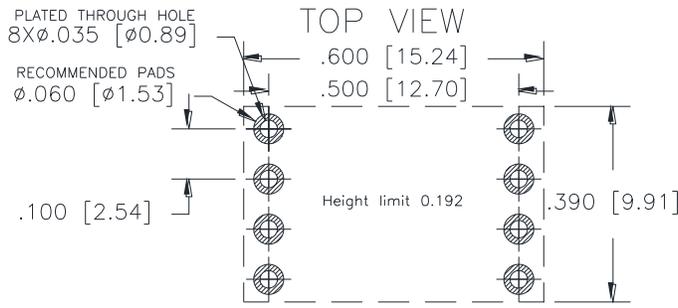
General layout for through hole, J leaded parts and castellation pin styles are given below for each pressure port configuration.

DIMENSIONS ARE IN INCHES [mm]

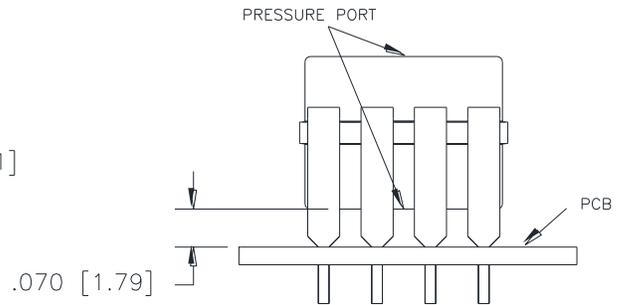
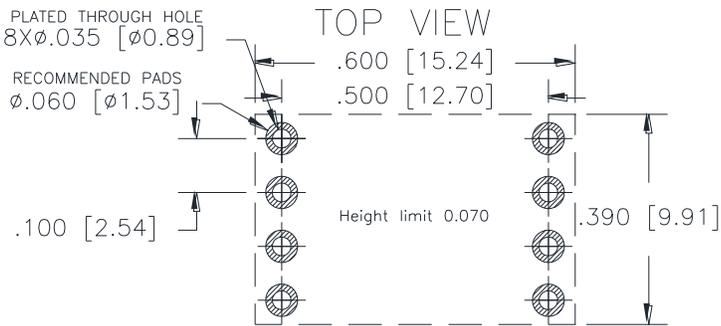




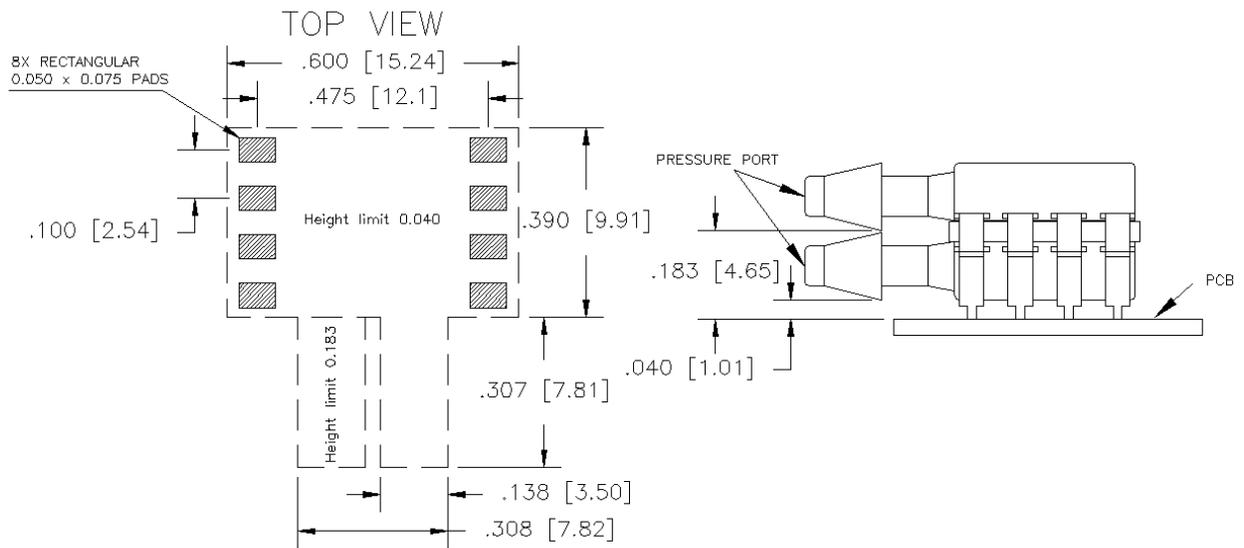
45XX-SSvxxxxyP



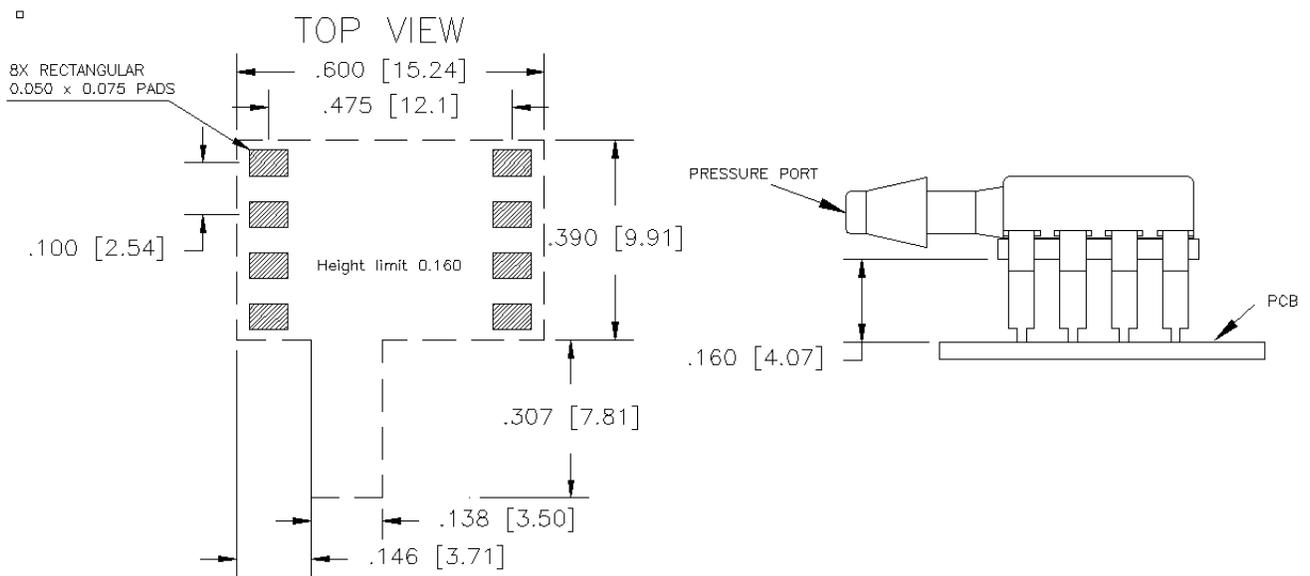
45XX-TPvxxxxyP



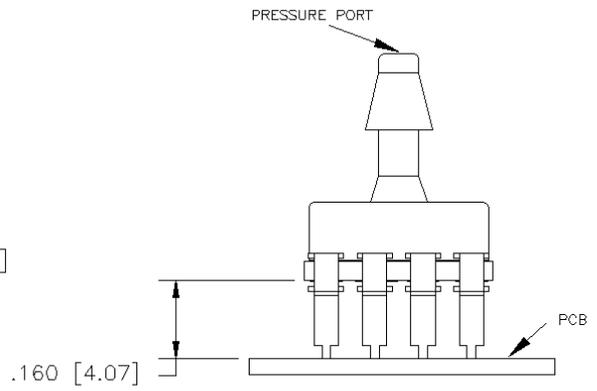
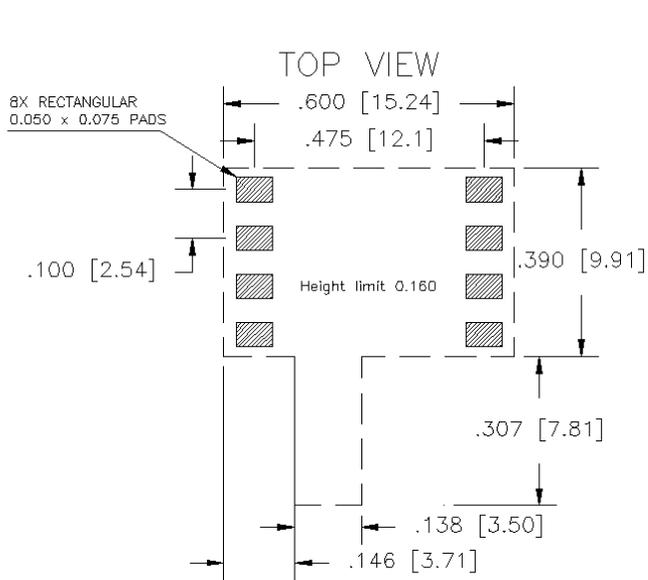
45XX-MMvxxxxyP



45XX-DSv0xxxxxS

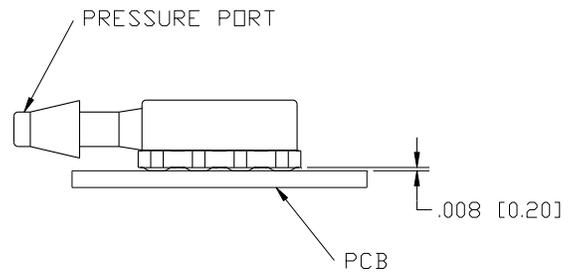
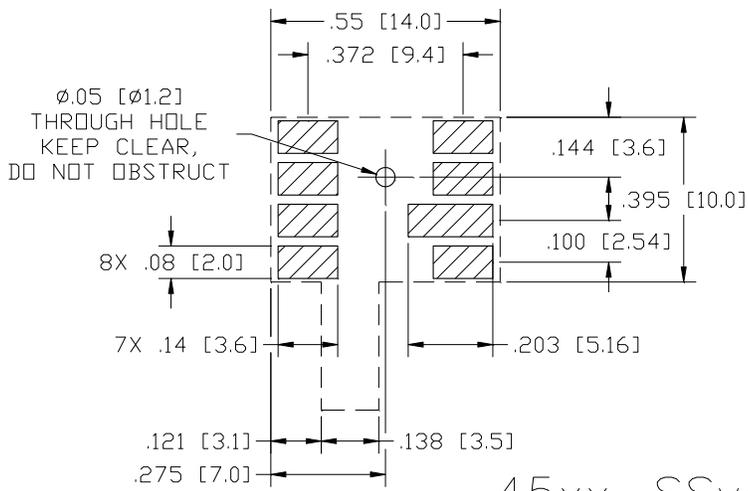


45XX-SSv0xxxxxS



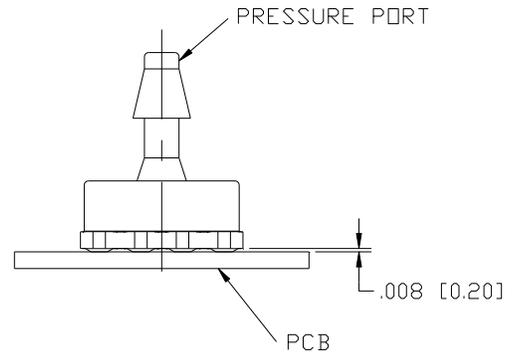
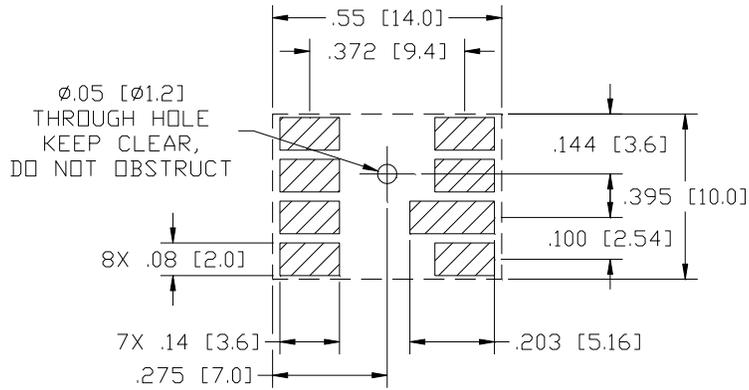
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TOP VIEW



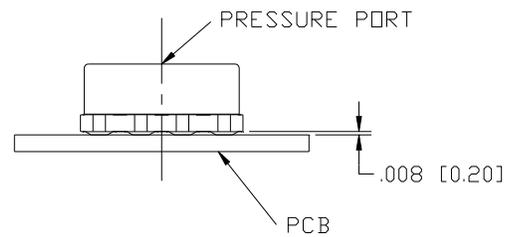
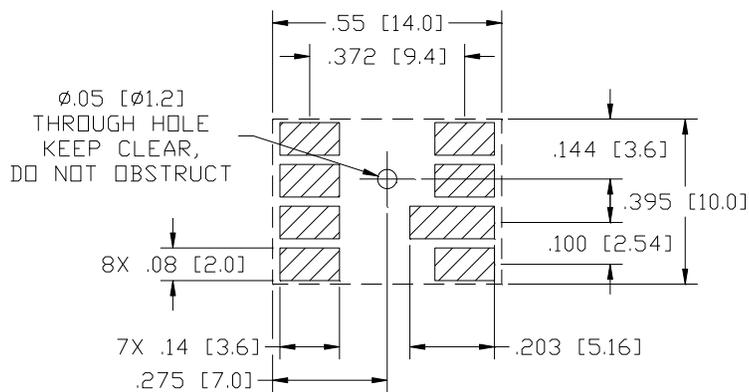
45xx-SSv0xxxxyC

TOP VIEW



45xx-TPvoxxxyc

TOP VIEW



45xx-MMvoxxxyc

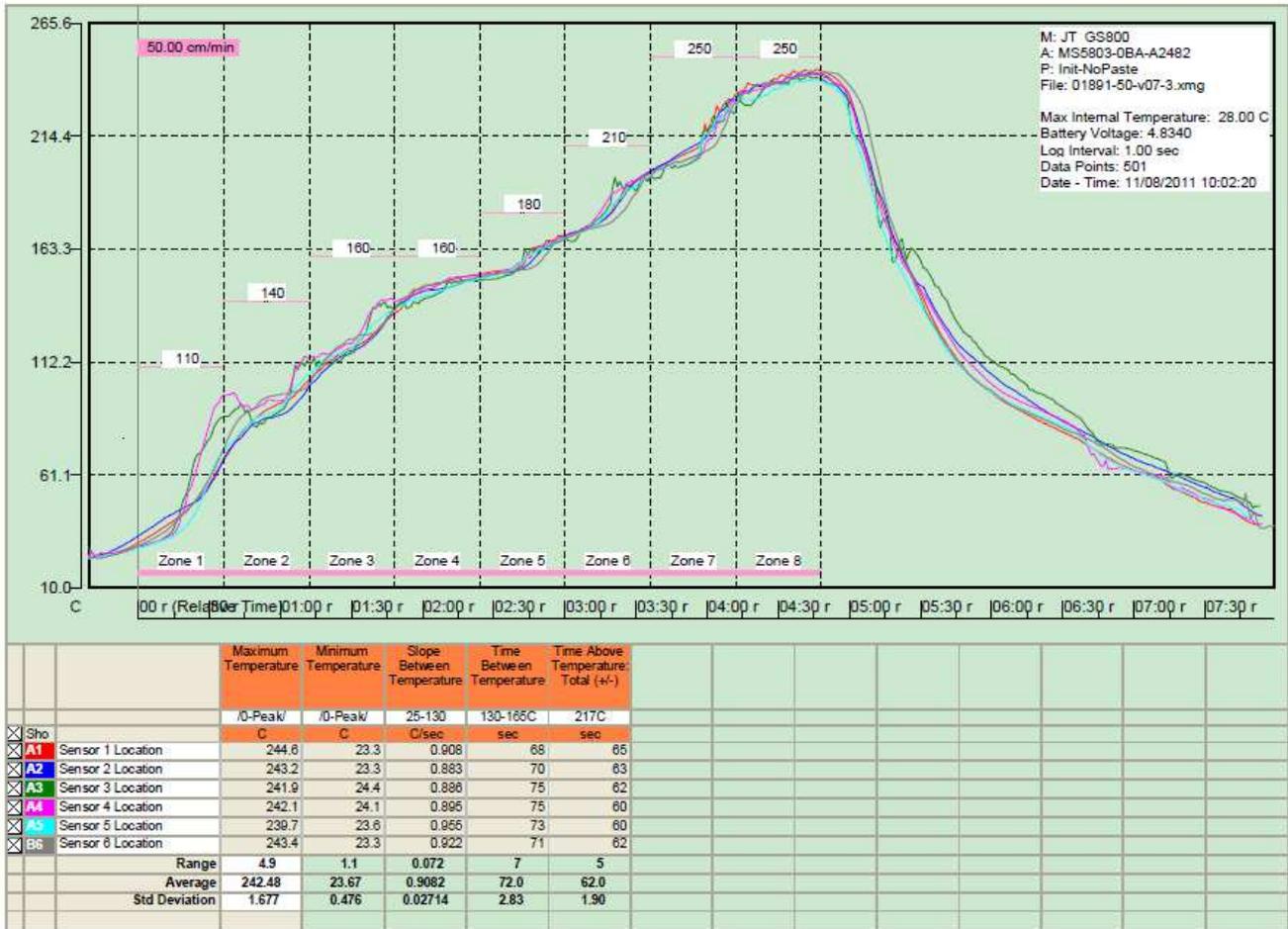
SOLDER PROCESS

REFLOW SOLDERING

The increased melting point of Pb-free solders and the new flux types require an adaptation of the current reflow temperature profiles. One of the most important factors for achieving a successful Pb-free soldering process is by minimizing temperature gradients across the PCB. This ensures that the minimum temperature on the board required for soldering is achieved, but the maximum temperature reach is will not damage sensitive components on the board.

The process window for Pb-free soldering is smaller than that of current Pb-containing solders. For this reason, IR-reflow systems are not recommended for Pb-free soldering. It is highly recommended to use forced convection reflow systems for Pb-free soldering. Chart A below indicates a typical reflow profile; the optimum profile will need to be determined by assembly professionals given the differences with each PCB design and SMT equipment.

Chart A. Typical Reflow Profile



USE OF NITROGEN

Due to both the increased reflow temperature and the increased oxidation of Pb-free solder alloys, it may be necessary to work in Nitrogen. The question if working under Nitrogen is necessary can be answered only if working in air does not lead to satisfying solder joints. Most of the Pb-free solder pastes can be used in air. Soldering in Nitrogen may be useful if a sufficient wetting of the solder joints cannot be achieved in air. Nitrogen improves the wetting of the solder on the solder pads and hence increases the process window.

WAVE AND MANUAL SOLDERING

The sensor pressure port must be sealed in order to use a wave solder processes. Any debris or contamination inside the package may cause sensor failure. Manual soldering can be done without sealing the units with a solder iron temperature of 250°C for 5 seconds max. Tube versions can be sealed with a small plastic cap that will survive the temperatures involved in the process. Reference "Caplug" part # SRC-125-8

SOLDER & CLEANING

No-Clean solder is recommended.

Ultrasonic cleaning is not recommended and can cause sensor failure.

Do not immerse sensor or allow cleaning solutions to enter pressure ports

NORTH AMERICA

Measurement Specialties, Inc.,
a TE Connectivity company
45738 Northport Loop West
Fremont, CA 94538
Tel: +1 800 767 1888
Fax: +1 510 498 1578
customercare.fmt@te.com

EUROPE

MEAS Switzerland Sarl,
a TE Connectivity company
Ch. Chapons-des-Prés 11
CH-2022 Bevaix
Tel: +41 32 847 9550
Fax: +41 32 847 9569
customercare.bevx@te.com

ASIA

Measurement Specialties (China) Ltd.,
a TE Connectivity company
No. 26 Langshan Road
Shenzhen High-Tech Park (North) Nanshan District,
Shenzhen, 518057
China
Tel: +86 755 3330 5088
Fax: +86 755 3330 5099
customercare.shzn@te.com

te.com/sensorsolutions

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