Pick and Place and Soldering of the HSMx-C540/C220 Surface Mount LEDs

Application Note 1217

Introduction

The Avago Technologies' HSMx-C540 high performance surface mount LED is ideal for indoor full color display applications. The ellipse-domed lens was designed for wide horizontal viewing angles. The overall brightness of the display is greatly improved with this lens design. However, the lens shape might be a concern for certain pick-and-place machines.

The Avago Technologies' HSMx-C220 High Performance ChipLED is the smallest and most efficient ChipLED package available on the market. The package contains a reflector cup and lens to maximize light extraction.

This application note presents data and accompanying discussion that addresses these issues.

Placement of the Avago Technologies' HSMx-C540

Due to the oval shape of the component, a typical stainless steel vacuum pick-up tool may not form a vacuum seal with the component and, thus, may not be able to pick it out of the embossed cavity of the carrier tape.

A conventional circular pick-up nozzle may not fit perfectly over the oval lens of the component resulting in air leakage. Therefore, components may slant/skew during placement. Several simulations have been carried out and the machines that are proven to be workable are listed in Table 1.

Figures 1 and 2 show the recommended pick-up nozzles used for the evaluation listed in Table 1. For better results, a soft tip pick-up tool, usually made of nylon or other soft plastic, should be used. The end of the soft tip is contoured to fit snugly over the lens of the component as shown in Figure 3.

Placement of the Avago Technologies' HSMx-C220

For best results, a soft tip pick-up tool should also be used for the HSMX-C220. A soft tip pick-up tool is usually made of nylon or other soft plastic. The end of the soft tip is contoured to fit snugly over the lens of the component. The end of the soft tip should be contoured concavely to fit snugly over the dome of the device to form a vacuum seal.

References

Refer to Application Note 1060, "Surface Mounting SMT LED Indicator Components", for further general information on surface mount LED lamps.

Table 1. Picking and Placing Evaluations Using Various Machines.

Machine Manufacturer	Machine Model	Speed (chip/sec.)	Nozzle Dimensions (mm)			Sample Size	Throw Percentage (%)
			Type	Inner	Outer		
Panasonic	Panasert MSF	0.15	Custom	Refer to Figure 1		2,300	Less than 0.4
Yamaha	YV100X	0.20	Custom	Refer to Figure 2		10,176	Less than 0.4
Juki	KE 750	0.25	MELF	1.0	1.5	200	0

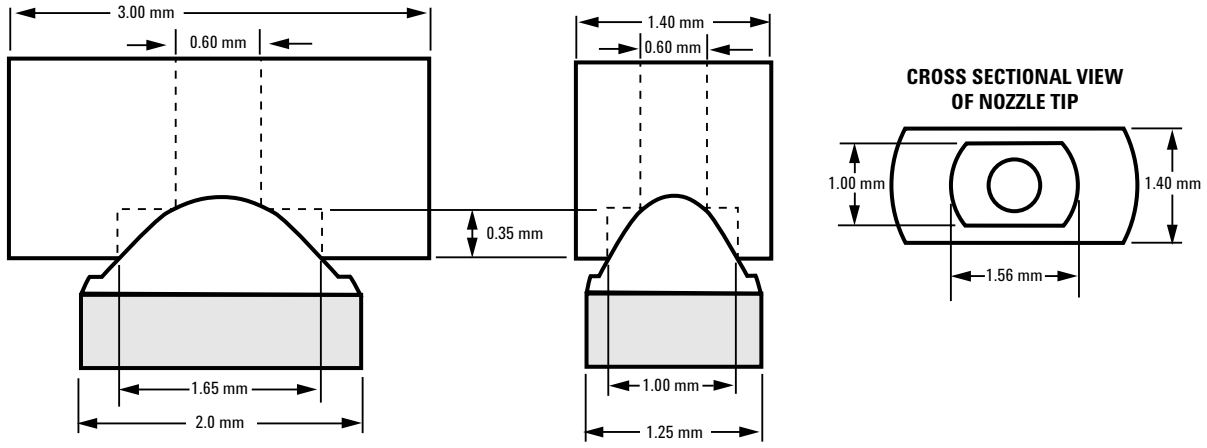

Figure 1. Recommended Pick-up Nozzle for Avago Technologies' HSMx-C540.

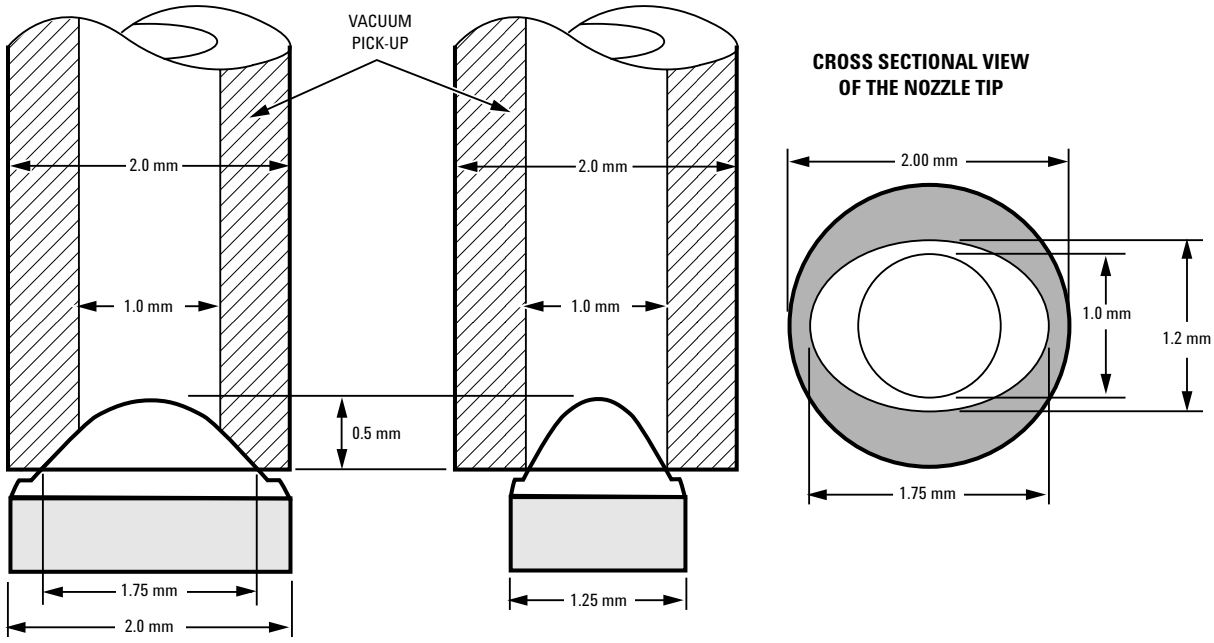

Figure 2. Alternative Vacuum Pick-up Tool for Extracting Avago Technologies' HSMx-C540 from Embossed Carrier Tape.

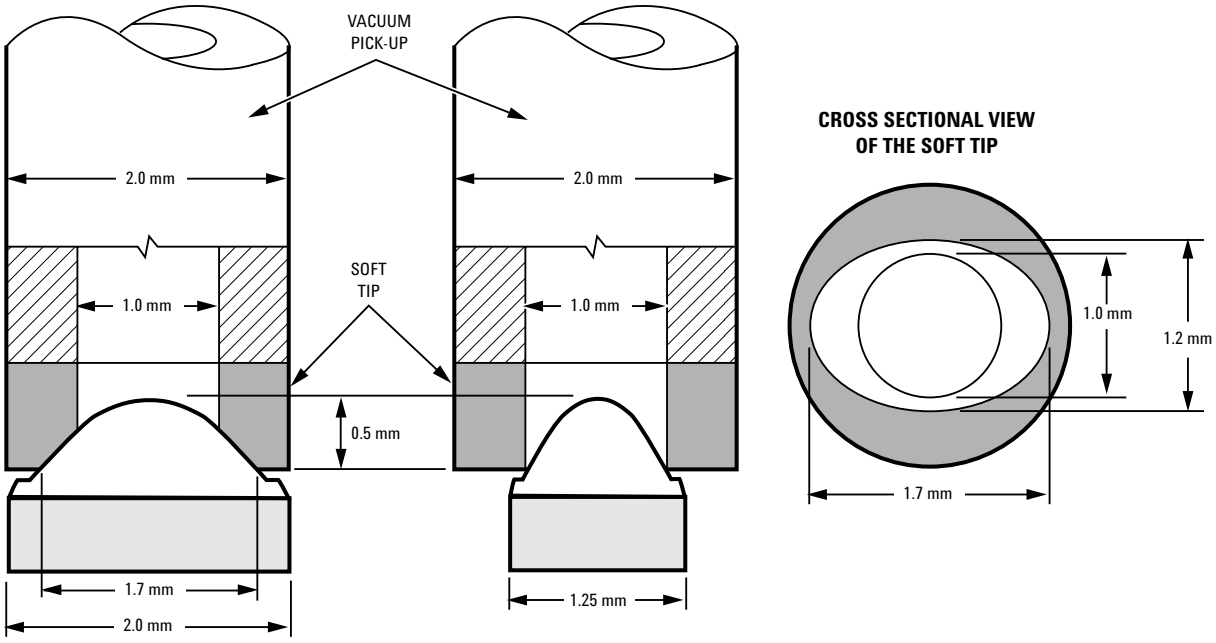

Figure 3. Soft Tip Vacuum Pick-up Tool for Extracting Avago Technologies' HSMx-C540 from Embossed Carrier Tape.

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