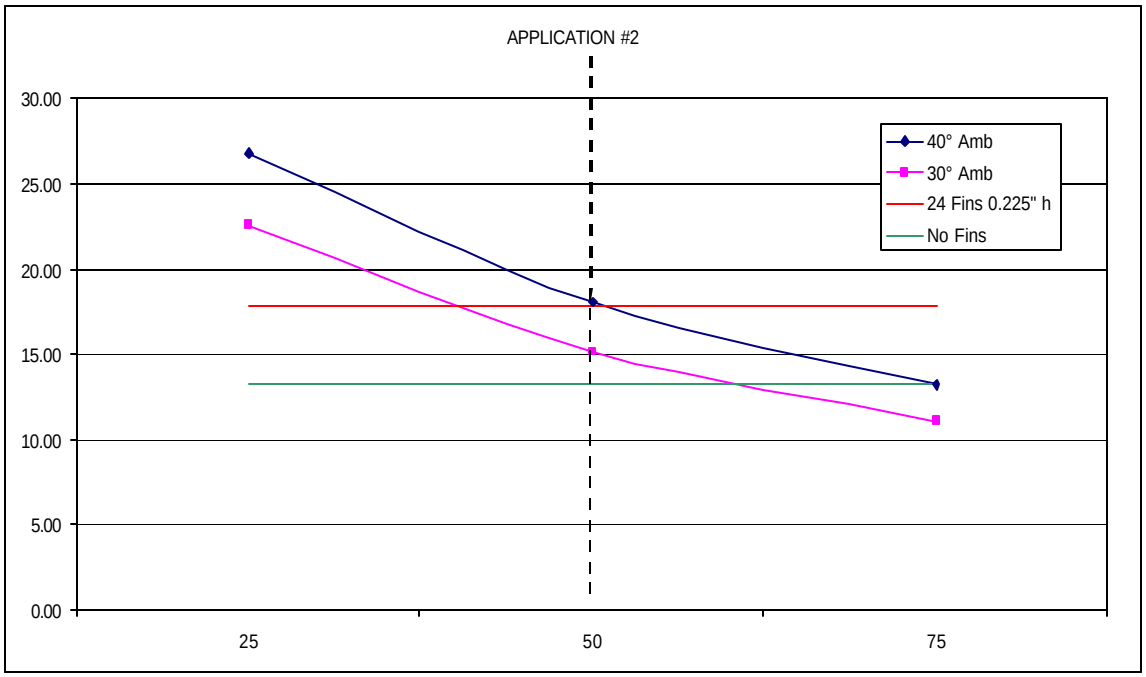
GRAPHICAL PRESENTATION OF THERMAL CALCULATION RESULTS [Application 2, Conductive Plastic Over Aluminum Cup Insert for an LED Edison Socket Bulb]



The graphical presentation of the thermal calculations allows a ready comparison and understanding of the sensitivities of the thermal variables plotted. The two example applications differ only in the total impact of the conductive temperature gradient. Application #2 was the larger of the two temperature gradients presented [9 °C] The wattage and other variables were kept as constant application requirements. The impact of the natural convection air flow rate is the primary driver in the defining of the required convective fin surface area. Natural convection is when the only energy for air movement comes from the fin surface heating of the adjacent air to create a buoyancy and consequent mostly a vertical air movement away. Optimum natural convection air flow at sea level conditions is about 75 linear feet per minute [lfm]. Our design point is a compromise at 50 lfm.

The secondary driver is the ambient temperature and the design altitude for the application. We have selected a design point of 8000' altitude because the vast majority of lighting applications are at elevations below this level. It is a conservative choice that will satisfy the general marketplace.

This light bulb is for a pendant style light fixture hanging at an interior or protected exterior location with little or no shade induced air flow constraints

FLOW LENGTH		2	2	2	2
PERFORMANCE FACTOR		91.60	91.60	91.60	91.60
@ FLOW LENGTH					
TMAX CASE		92.9	96.4	100.0	104.5
TMAX AMBIENT		40.0	40.0	40.0	40.0
INTERFACE DT		7.40	7.40	7.40	7.40
insert material					
HEAT LOAD (watts)		**9**	**9**	**9**	**9**
AIRFLOW RATE (lfm)		50	50	50	50
SLOTTING	if none 1	1	1	1	1
(boundary film control)					
FULL DUCTING	if none 1	1	1	1	1
(correction factor)					
ALTITUDE (maximum!!) ft.		sea level	4000	8000	12000
(correction factor)		1.0000	0.9293	0.8618	0.7974
?sa	?	5.0608	5.4458	5.8444	6.3466
?sa @ ALTITUDE	?	5.0608	5.0608	5.0367	5.0608
REQUIRED SEA		18.10	18.10	18.19	18.10
AVAILABLE SEA		**17.6**	**17.6**	**17.6**	**17.6**
Req. / Avail. Ratio		1.03	1.03	1.03	1.03
width of heatsink		6.5	6.5	6.5	6.5
number of fins		24	24	24	24
required fin height h		0.225	0.225	0.225	0.225
Heat sink height H		0.375	0.375	0.375	0.375
Perimeter		24.10	24.10	24.10	24.10
fin thickness		0.06	0.06	0.06	0.06
base thickness		0.150	0.150	0.150	0.150
centerline spacing		0.280	0.280	0.280	0.280
open spacing		0.220	0.220	0.220	0.220
Heatsink aspect ratio		1.0	1.0	1.0	1.0

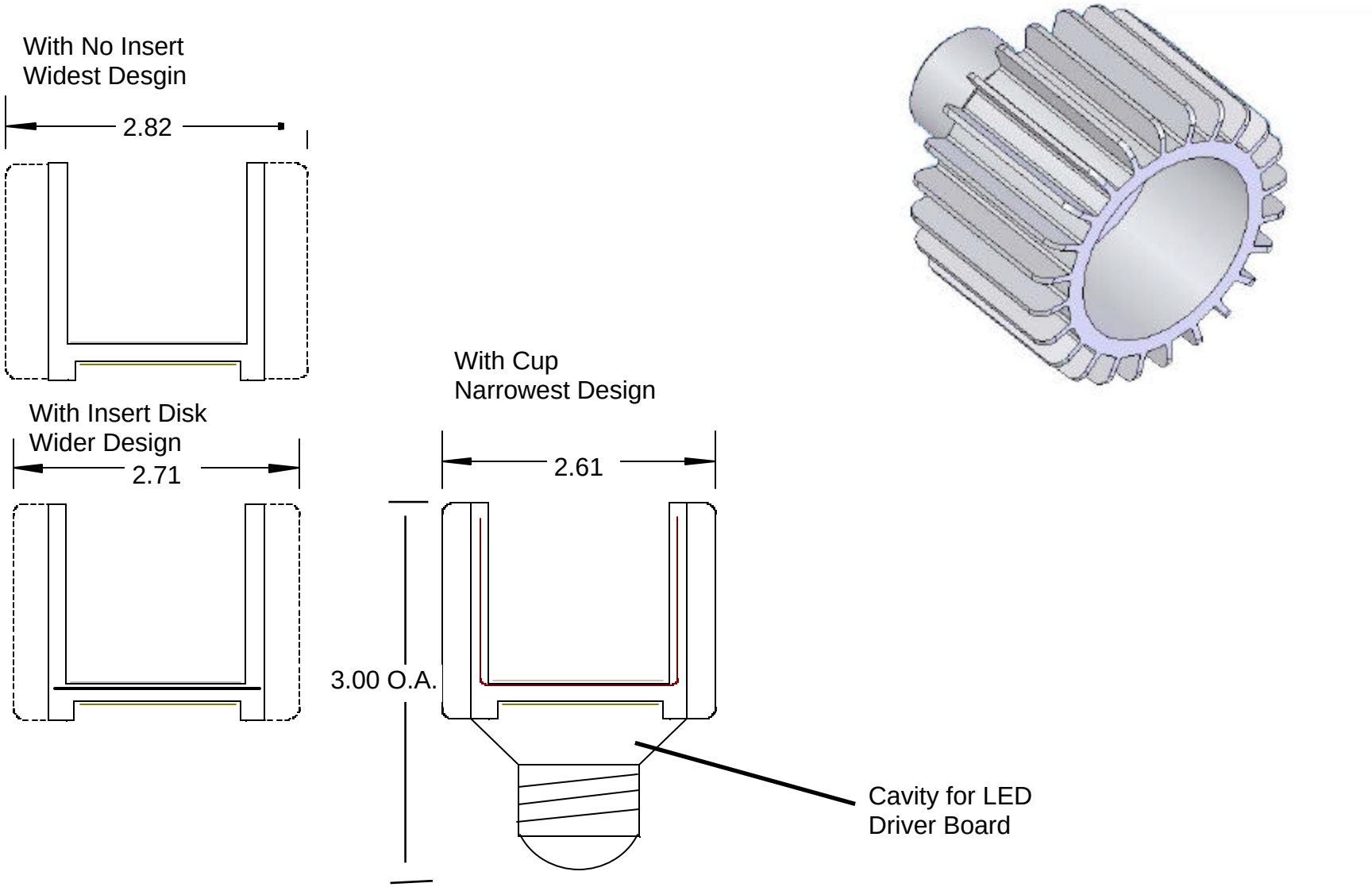

With No Insert
Widest Desgin
2.82
With Insert Disk
Wider Design
2.71
With Cup
Narrowest Design
2.61
3.00 O.A.
Cavity for LED
Driver Board

Figure 3