

Application note 1 for the 2009 IC Cost Model – September 3, 2009

Gross Margin Versus Volume Calculations

Introduction

Many of our IC Cost Model users utilize the model to calculate costs for components that they buy and then compare the calculated manufacturing cost to the price they pay. In some cases this may result in a very high implied gross margin. In this applications note we will address pricing and gross margin versus volume curves and how they relate to expected gross margins.

Pricing curve

Figure 1 illustrates a “typical” pricing versus volume curve for electronic components.

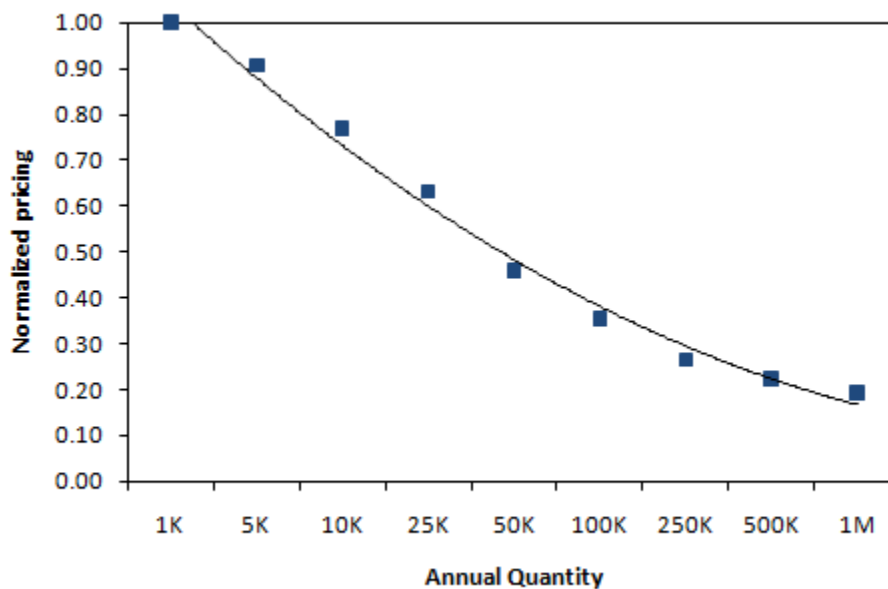


Figure 1. Typical price versus volume curve for electronic components.

Gross margin versus volume

From figure 1 it is evident that if you are buying one thousand pieces (1K) of a part per year your pricing will be roughly five times as high as it will buying one million (1M) parts per year. Even at the 1M piece price the manufacturer will still expect to make a

gross margin on the part. Gross margins vary with part type, manufacturer and industry growth. Table 1 presents some examples of average gross margins over the last five years.

Average five year gross margins.

Entity	Gross Margin (%)
North American Semiconductor Industry	45.9%
Intel (microprocessors)	55.2%
International Rectifier (discretes and power ICs)	37.9%
Micron Technology (memory)	18.8%
Texas Instruments (DSP and analog ICs)	49.5%
Xilinx (Programmable logic devices)	62.4%

Please note that many of the companies listed here are market leaders in their segment and therefore command higher gross margins than their competitors. These are also their average gross margins and represent a blend of higher margin – lower volume parts and lower margin – higher volume parts.

Cost calculation example

If you calculate the cost for a non memory IC using the IC Cost Model and the result is \$1.00. Then a reasonable high volume selling price estimate would be:

$$\$1.00 / (1 - .47) = \$1.67 \text{ (40\% gross margin)}$$

At 1M pieces the price might be \$1.67. At 100k quantity the price would go up to \$2.97, at 10K pieces it would be \$6.43 and at 1K pieces it would be \$8.35 (an 88% gross margin).

Conclusion

If you are buying parts in low volume don't be surprised to be paying very high margins. Conversely in high volume pricing be consistent with more typical industry margins.