1035-11-1823 **Heon Kim*** (hkim@math.lsu.edu), 940 Stanford Ave, Apt 324, Baton Rouge, LA 70808. *Sign Ambiguities.*

In 1934, it was known that there are two kinds of multiplicative relations, *norm and Davenport-Hasse* relations, between Gaussian sums. In 1964, H. Hasse conjectured that the norm and Davenport-Hasse relations are the only multiplicative relations connecting the Gaussian sums over $\mathbb{F}_p$. However, in 1966, K. Yamamoto provided a simple counterexample disproving the conjecture when Gaussian sums are considered as numbers. This counterexample was a new type of multiplicative relation, called a *sign ambiguity*, involving a $\pm$ sign not connected to elementary properties of Gauss sums. Here, we provide an explicit product formula giving an infinite class of new sign ambiguities and we resolve the ambiguous sign by using the Stickelberger's theorem. (Received September 20, 2007)