The new JVT H.264 video coding standard is becoming the dominant standard, mainly due to its high coding efficiency. Among all modules in the encoder, motion estimation plays a key role since it can significantly affect the output quality of an encoded sequence. However, motion estimation requires a significant part of the encoding time. One reason is because the H.264 allows motion estimation performing on multiple reference frames. In this paper, a new method for fast reference frame selection is proposed. The method performs a simple and quick test prior to motion estimation in order to choose the best reference frame.