Let $G$ be a simple linear algebraic group over a field $F$, and $V$ an absolutely irreducible representation of $G$. We show that under some mild hypotheses there exists an invariant homogeneous polynomial $f$ for the action of $G$ on $V$ defined over $F$, such that twisted forms of $f$ up to a scalar multiple classify twisted forms of $G$ over $F$. (Received January 27, 2014)