This is illustrated with the documentation example.

We first run a simple linear regression,

```
require(lme4)
l <- lm(Reaction ~ Days, sleepstudy)
s <- summary(l)
s
```

```
##
## Call:
## lm(formula = Reaction ~ Days, data = sleepstudy)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -110.848  -27.483    1.546   26.142  139.953
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  251.405      6.610  38.033  < 2e-16 ***
## Days          10.467      1.238   8.454 9.89e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 47.71 on 178 degrees of freedom
## Multiple R-squared:  0.2865, Adjusted R-squared:  0.2825
## F-statistic: 71.46 on 1 and 178 DF,  p-value: 9.894e-15
```

```
names(s)
```

```
##  [1] "call"          "terms"         "residuals"     "coefficients"
##  [5] "aliased"       "sigma"         "df"            "r.squared"
##  [9] "adj.r.squared" "fstatistic"    "cov.unscaled"
```

```
class(s)
```

```
## [1] "summary.lm"
```

```
round(sqrt(s$fstatistic[1]),3)
```

```
## value
## 8.454
```

the F statistics which is simply t^2. Next we turn to the mixed model containing a random effect

```
f <- lmer(Reaction ~ Days + (Days | Subject), sleepstudy)
s <- summary(f)
s
```

```
## Linear mixed model fit by REML ['lmerMod']
## Formula: Reaction ~ Days + (Days | Subject)
##    Data: sleepstudy
##
## REML criterion at convergence: 1743.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.9536  -0.4634   0.0231   0.4633   5.1793
##
```

```
## Random effects:
##  Groups    Name         Variance Std.Dev. Corr
##  Subject  (Intercept) 611.90   24.737
##           Days          35.08    5.923   0.07
##  Residual              654.94   25.592
## Number of obs: 180, groups:  Subject, 18
##
## Fixed effects:
##             Estimate Std. Error t value
## (Intercept)  251.405      6.824  36.843
## Days          10.467      1.546   6.771
##
## Correlation of Fixed Effects:
##      (Intr)
## Days -0.138
```

```r
names(s)
```

```
##  [1] "methTitle"    "objClass"     "devcomp"      "isLmer"
##  [5] "useScale"     "logLik"       "family"       "link"
##  [9] "ngrps"        "coefficients" "sigma"        "vcov"
## [13] "varcor"       "AICtab"       "call"         "residuals"
## [17] "fitMsgs"      "optinfo"
```

```r
class(with(s,coefficients))
```

```
## [1] "matrix"
```

```r
t <- with(s,coefficients)[,3]
p <- 2*(1-pnorm(abs(t)))
p
```

```
## (Intercept)        Days
## 0.00000e+00 1.28122e-11
```

We can see that the P values from two models are very close, giving a sense of what they do.