$$Pr\left[u(M_E(x,u,R)) \le OPT_u(x) - \frac{2\Delta u}{\epsilon}\left(ln\left(\frac{|R|}{|R_{OPT}|}\right) + t\right)\right] \le e^{-t}$$

if we set $e^{-t} = \beta \Rightarrow t = ln\left(\frac{1}{\beta}\right)$, $\Delta u = 1$ and $|R_{OPT}| = 1$we get:

$$Pr\left[u(M_E(x,u,R)) \le OPT_u(x) - \tfrac{2}{\epsilon}\left(ln\left(|R|\right) + ln\left(\tfrac{1}{\beta}\right)\right)\right] \quad =$$

$$Pr\left[u(M_E(x,u,R)) \le OPT_u(x) - \frac{2}{\epsilon}ln\left(\frac{|R|}{\beta}\right)\right] \le \beta$$

we want the gap to be at least $\frac{2}{\epsilon}ln\left(\frac{|R|}{\beta}\right)$
from the other hand in the recconcave we know that the gap is at least $\frac{3\alpha}{8}r$
if we combine the two we get

$$\frac{2}{\epsilon}ln\left(\frac{|R|}{\beta}\right) < \frac{3\alpha}{8}r \Rightarrow r > \frac{16}{3\epsilon\alpha}ln\left(\frac{|R|}{\beta}\right)$$

and in the case of median $r = \frac{|s|}{2}$ so the bound on the sample size is

$$|s| > \frac{32}{3\epsilon\alpha}ln\left(\frac{|R|}{\beta}\right)$$

alternatively if we want to bound |R|

$$\frac{3\epsilon\alpha r}{16} > ln\left(\frac{|R|}{\beta}\right) \Rightarrow e^{\frac{3\epsilon\alpha r}{16}} > \frac{|R|}{\beta} \Rightarrow |R| < \beta e^{\frac{3\epsilon\alpha r}{16}} = \beta e^{\frac{3\epsilon\alpha|s|}{32}}$$