



reference

30.1 dB (opt), 29.5 dB (fast)

27.4 dB

25.5 dB

20.1 dB



reference

32.0 dB (opt), 29.8 dB (fast)

26.7 dB

25.5 dB

24.4 dB

reference output

**bilateral guided upsampling
(ours, fast approx. shown)**

transform recipes

fast guided filter

**joint bilateral
upsampling**