

**Extended Data Table 2 | Optical and infrared photometry**

Telescope	Instrument/Filter	Lens	SPT0311–58E	SPT0311–58W
<i>HST</i>	ACS/F606W	$> 27.05$	$> 28.11$	$> 27.08$
<i>HST</i>	ACS/F775W	$> 26.55$	$> 27.59$	$> 26.63$
Gemini	GMOS/ <i>i'</i>	$25.00 \pm 0.20$		
Gemini	GMOS/ <i>z'</i>	$24.40 \pm 0.20$		
<i>HST</i>	WFC3/F125W	$23.06 \pm 0.16$	$25.28 \pm 0.10$	$> 26.69$
<i>HST</i>	WFC3/F160W	$22.76 \pm 0.15$	$24.98 \pm 0.12$	$> 27.11$
Gemini	FLAMINGOS/ <i>K<sub>s</sub></i> $2.16 \mu\text{m}$	$22.42 \pm 0.13$	...	...
<i>Spitzer</i>	IRAC/Ch1 $3.6 \mu\text{m}$	$21.40 \pm 0.14$	$24.47 \pm 0.30$	$(23.87 \pm 0.28)$
<i>Spitzer</i>	IRAC/Ch2 $4.5 \mu\text{m}$	$21.63 \pm 0.13$	$24.45 \pm 0.25$	$(23.63 \pm 0.22)$

All data is given in apparent (not corrected for magnification) AB magnitudes. Limiting magnitudes are reported as  $1\sigma$  values. The magnification estimates for the E and W sources are 1.3 and 2.1, respectively, as reported in Methods section 'Gravitational lens modelling'. IRAC photometry for SPT0311–58 W is uncertain owing to blending with the lens, as noted in Methods section 'Image de-blending'.