

## Supporting Information

for

### Charge transport properties and variable photo-switching of three-terminal Cs<sub>2</sub>AgBiBr<sub>6</sub> device

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**Table – S1:** Variation of the  $m$  value in  $I \propto V^m$  power law with temperature and optical power

Variable Parameter	“ $m$ ” value in Ohmic regime		“ $m$ ” value in TFL regime
	[0 V < $V$ < 0.35 V]		[0.35 V < $V$ < 1 V]
<i>Temperature (K)</i>	303	0.41	1.38
	323	0.52	1.39
	373	0.81	1.57
	423	0.89	2.10
<i>Incident optical power (mW/cm<sup>2</sup>)</i>	0	0.98	1.14
	2.5	0.99	1.23
	8	1.02	1.29
	30	1.03	1.31
	75	1.04	1.63

The observed value of  $m$  both different variations can be interpreted as,

$m \leq 1$  : Ohmic region, i.e., the current is directly proportional to applied electric field.

$m > 1$ : Trap-filled limit region, i.e., charge transport mechanism is dominated by exponent trap distribution.

Thus, after reaching a critical transition electric field and the space charge limited (SCL) condition for a Schottky contact via tunnelling of electrons through the surface states, the second region is transformed from Ohmic to space charge limited current (SCLC).

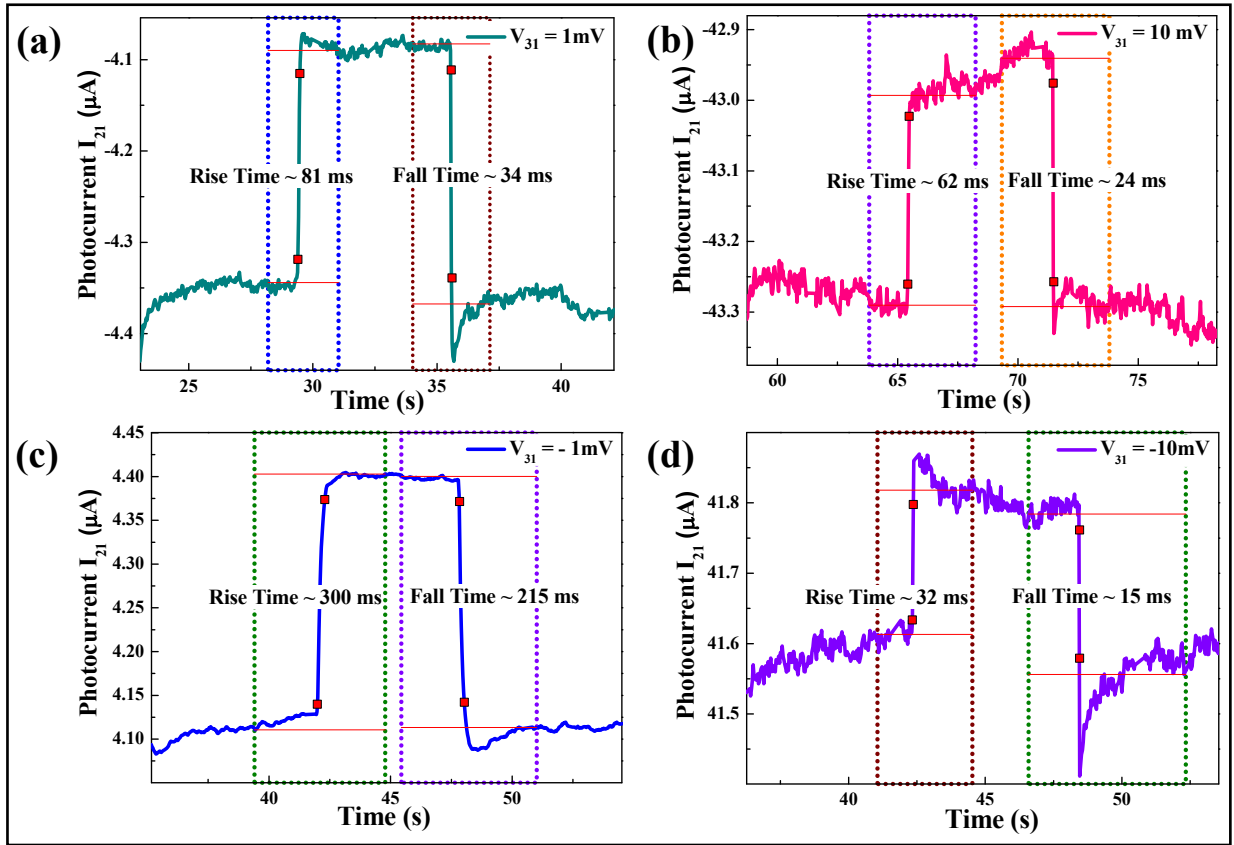


Fig. S1: Response time of the three-terminal device at (a)  $V_{31} = 1\text{ mV}$  (b)  $V_{31} = 10\text{ mV}$  (c)  $V_{31} = -1\text{ mV}$  (d)  $V_{31} = -10\text{ mV}$

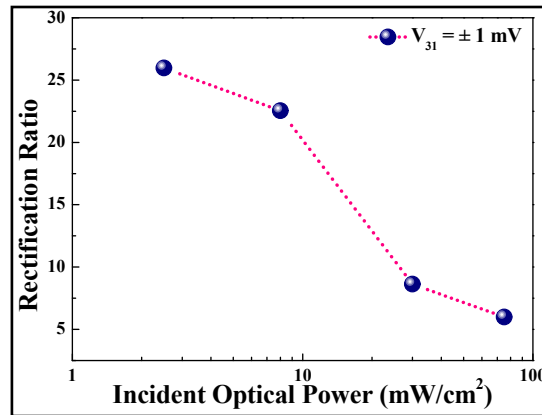


Fig. S2: Variation of rectification ratio with incident optical power at  $V_{31} = \pm 1\text{ mV}$