

Table 1 Comparison of data storage technologies. (Data drawn from public sources and HP internal research)

	Memristor	PCM	STT-RAM	DRAM	Flash	HD
Chip area per bit (F ²)	4	8–16	14–64	6–8	4–8	n/a
Energy per bit (pJ) ²	0.1–3	2–100	0.1–1	2–4	10 ¹ –10 ⁷	10 ⁶ –10 ⁷
Read time (ns)	<10	20–70	10–30	10–50	25,000	5–8x10 ⁶
Write time (ns)	20–30	50–500	13–95	10–50	200,000	5–8x10 ⁶
Retention	>10 years	<10 years	Weeks	<Second	~10 years	~10 years
Endurance (cycles)	~10 ¹²	10 ⁷ –10 ⁸	10 ¹⁵	>10 ¹⁷	10 ³ –10 ⁶	10 ¹⁵ ?
3D capability	Yes	No	No	No	Yes	n/a