TABLE 1. ALD 8100XX SUPERCAPACITOR AUTO BALANCING (SAB™) MOSFETS EQUIVALENT ON RESISTANCE AT DIFFERENT INPUT VOLTAGES AND OUTPUT CURRENTS

ALD Part Number	Gate-Threshold Voltage V_t (V)	V_{IN} (V) [2] Equivalent ON Resistance (MΩ)	OUTPUT CURRENT I_{OUT} = $I_{DS(ON)}$ (μA) [1] TA = 25°C										
			0.0001	0.001	0.01	0.1	1	10	100	300	1000	3000	10000
ALD810028	2.80	V_{IN} (V)	2.40	2.50	2.60	2.70	2.80	2.90	3.04	3.14	3.32	3.62	4.22
		$R_{DS(ON)}$ (MΩ)	24000	2500	260	27	2.8	0.29	0.030	0.01	0.003	0.001	0.0004
ALD810027	2.70	V_{IN} (V)	2.30	2.40	2.50	2.60	2.70	2.80	2.94	3.04	3.22	3.52	4.12
		$R_{DS(ON)}$ (MΩ)	23000	2400	250	26	2.7	0.28	0.029	0.01	0.003	0.001	0.0004
ALD810026	2.60	V_{IN} (V)	2.20	2.30	2.40	2.50	2.60	2.70	2.84	2.94	3.12	3.42	4.02
		$R_{DS(ON)}$ (MΩ)	22000	2300	240	25	2.6	0.27	0.028	0.01	0.003	0.001	0.0004
ALD810025	2.50	V_{IN} (V)	2.10	2.20	2.30	2.40	2.50	2.60	2.74	2.84	3.02	3.32	3.92
		$R_{DS(ON)}$ (MΩ)	21000	2200	230	24	2.5	0.26	0.027	0.01	0.003	0.001	0.0004
ALD810024	2.40	V_{IN} (V)	2.00	2.10	2.20	2.30	2.40	2.50	2.64	2.74	2.92	3.22	3.82
		$R_{DS(ON)}$ (MΩ)	20000	2100	220	23	2.4	0.25	0.026	0.009	0.003	0.001	0.0004
ALD810023	2.30	V_{IN} (V)	1.90	2.00	2.10	2.20	2.30	2.40	2.54	2.64	2.82	3.12	3.72
		$R_{DS(ON)}$ (MΩ)	19000	2000	210	22	2.3	0.24	0.025	0.009	0.003	0.001	0.0004
ALD810022	2.20	V_{IN} (V)	1.80	1.90	2.00	2.10	2.20	2.30	2.44	2.54	2.72	3.02	3.62
		$R_{DS(ON)}$ (MΩ)	18000	1900	200	21	2.2	0.23	0.024	0.008	0.003	0.001	0.0004
ALD810021	2.10	V_{IN} (V)	1.70	1.80	1.90	2.00	2.10	2.20	2.34	2.44	2.62	2.92	3.52
		$R_{DS(ON)}$ (MΩ)	17000	1800	190	20	2.1	0.22	0.023	0.008	0.003	0.001	0.0004
ALD810020	2.00	V_{IN} (V)	1.60	1.70	1.80	1.90	2.00	2.10	2.24	2.34	2.52	2.82	3.42
		$R_{DS(ON)}$ (MΩ)	16000	1700	180	19	2.0	0.21	0.022	0.008	0.003	0.001	0.0003
ALD810019	1.90	V_{IN} (V)	1.50	1.60	1.70	1.80	1.90	2.00	2.14	2.24	2.42	2.72	3.32
		$R_{DS(ON)}$ (MΩ)	15000	1600	170	18	1.9	0.20	0.021	0.007	0.002	0.001	0.0003
ALD810018	1.80	V_{IN} (V)	1.40	1.50	1.60	1.70	1.80	1.90	2.04	2.14	2.32	2.62	3.22
		$R_{DS(ON)}$ (MΩ)	14000	1500	160	17	1.8	0.19	0.020	0.007	0.002	0.001	0.0003
ALD810017	1.70	V_{IN} (V)	1.30	1.40	1.50	1.60	1.70	1.80	1.94	2.04	2.22	2.52	3.12
		$R_{DS(ON)}$ (MΩ)	13000	1400	150	16	1.7	0.18	0.019	0.007	0.002	0.001	0.0003
ALD810016	1.60	V_{IN} (V)	1.20	1.30	1.40	1.50	1.60	1.70	1.84	1.94	2.12	2.42	3.02
		$R_{DS(ON)}$ (MΩ)	12000	1300	140	15	1.6	0.17	0.018	0.007	0.002	0.001	0.0003

Selection of an SAB MOSFET device depends on a set of desired voltage vs. current characteristics that closely match the supercapacitor operating V_{IN} voltage and I_{OUT} currents that provide the best leakage and regulation profile of a supercapacitor load. The table lists V_{IN} which corresponds to different supercapacitor load voltages. At each $V_{IN} = V_{GS} = V_{DS}$ bias voltage, a corresponding I_{OUT}, Drain Source ON Current, $I_{DS(ON)}$, is produced by a specific SAB MOSFET, which is equal to the amount of current available to compensate for supercapacitor leakage current inbalances. This current results in an Equivalent ON Resistance $R_{DS(ON)}$ across a supercapacitor cell. Selection of an SAB MOSFET part number operating at maximum supercapacitor operating voltage at an I_{OUT} that corresponds to the maximum supercapacitor leakage current offer the best possible tradeoff between leakage current balancing and voltage regulation.

Notes: 1) The SAB MOSFET Output Current (I_{OUT}) = Drain Source ON Current ($I_{DS(ON)}$) and is the maximum current available to offset the supercapacitor leakage current.

2) The Input Voltage (V_{IN}) = Drain Gate Source Voltage ($V_{GS} = V_{DS}$) and is normally the same as the voltage across the supercapacitor.