

TABLE 1. ALD 9100XX 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 ($M\Omega$)	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
ALD910030	3.00	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.60 26000	2.70 2700	2.80 280	2.90 29	3.00 3.0	3.10 0.31	3.22 0.032	3.30 0.01	3.44 0.003	3.50 0.001	4.00 0.0004
ALD910029	2.90	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.50 25000	2.60 2600	2.70 270	2.80 28	2.90 2.9	3.00 0.30	3.12 0.031	3.20 0.01	3.34 0.003	3.40 0.001	3.90 0.0004
ALD910028	2.80	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.40 24000	2.50 2500	2.60 260	2.70 27	2.80 2.8	2.90 0.29	3.02 0.030	3.10 0.01	3.24 0.003	3.30 0.001	3.80 0.0004
ALD910027	2.70	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.30 23000	2.40 2400	2.50 250	2.60 26	2.70 2.7	2.80 0.28	2.92 0.029	3.00 0.01	3.14 0.003	3.20 0.001	3.70 0.0004
ALD910026	2.60	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.20 22000	2.30 2300	2.40 240	2.50 25	2.60 2.6	2.70 0.27	2.82 0.028	2.90 0.01	3.04 0.003	3.10 0.001	3.60 0.0004
ALD910025	2.50	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.10 21000	2.20 2200	2.30 230	2.40 24	2.50 2.5	2.60 0.26	2.72 0.027	2.80 0.01	2.94 0.003	3.00 0.001	3.50 0.0004
ALD910024	2.40	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	2.00 20000	2.10 2100	2.20 220	2.30 23	2.40 2.4	2.50 0.25	2.62 0.026	2.70 0.009	2.84 0.003	2.90 0.001	3.40 0.0003
ALD910023	2.30	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.90 19000	2.00 2000	2.10 210	2.20 22	2.30 2.3	2.40 0.24	2.52 0.025	2.60 0.009	2.74 0.003	2.80 0.001	3.30 0.0003
ALD910022	2.20	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.80 18000	1.90 1900	2.00 200	2.10 21	2.20 2.2	2.30 0.23	2.42 0.024	2.50 0.008	2.64 0.003	2.70 0.001	3.20 0.0003
ALD910021	2.10	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.70 17000	1.80 1800	1.90 190	2.00 20	2.10 2.1	2.20 0.22	2.32 0.023	2.40 0.008	2.54 0.003	2.60 0.001	3.10 0.0003
ALD910020	2.00	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.60 16000	1.70 1700	1.80 180	1.90 19	2.00 2.0	2.10 0.21	2.22 0.022	2.30 0.008	2.44 0.003	2.50 0.001	3.00 0.0003
ALD910019	1.90	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.50 15000	1.60 1600	1.70 170	1.80 18	1.90 1.9	2.00 0.20	2.12 0.021	2.20 0.007	2.34 0.002	2.40 0.001	2.90 0.0003
ALD910018	1.80	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.40 14000	1.50 1500	1.60 160	1.70 17	1.80 1.8	1.90 0.19	2.02 0.020	2.10 0.007	2.24 0.002	2.30 0.001	3.80 0.0003
ALD910017	1.70	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.30 13000	1.40 1400	1.50 150	1.60 16	1.70 1.7	1.80 0.18	1.92 0.019	2.00 0.007	2.14 0.002	2.20 0.001	3.70 0.0003
ALD910016	1.60	V_{IN} (V) $R_{DS(ON)}$ ($M\Omega$)	1.20 12000	1.30 1300	1.40 140	1.50 15	1.60 1.6	1.70 0.17	1.82 0.018	1.90 0.007	2.04 0.002	2.10 0.001	2.60 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 imbalances. 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.