

**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) <sup>2</sup> Equivalent ON Resistance ( $M\Omega$ )	OUTPUT CURRENT $I_{OUT} = I_{DS(ON)}$ ( $\mu A$ ) <sup>1</sup>											TA = 25°C	
			0.0001	0.001	0.01	0.1	1	10	100	300	1000	3000	10000		
ALD810030	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	3.24 0.032	3.34 0.01	3.52 0.003	3.82 0.001	4.42 0.0004		
ALD810029	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	3.14 0.031	3.24 0.01	3.42 0.003	3.72 0.001	4.32 0.0004		
ALD810028	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	3.04 0.030	3.14 0.01	3.32 0.003	3.62 0.001	4.22 0.0004		
ALD810027	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	2.94 0.029	3.04 0.01	3.22 0.003	3.52 0.001	4.12 0.0004		
ALD810026	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	2.84 0.028	2.94 0.01	3.12 0.003	3.42 0.001	4.02 0.0004		
ALD810025	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	2.74 0.027	2.84 0.01	3.02 0.003	3.32 0.001	3.92 0.0004		
ALD810024	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	2.64 0.026	2.74 0.009	2.92 0.003	3.22 0.001	3.82 0.0004		
ALD810023	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	2.54 0.025	2.64 0.009	2.82 0.003	3.12 0.001	3.72 0.0004		
ALD810022	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	2.44 0.024	2.54 0.008	2.72 0.003	3.02 0.001	3.62 0.0004		
ALD810021	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	2.34 0.023	2.44 0.008	2.62 0.003	2.92 0.001	3.52 0.0004		
ALD810020	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	2.24 0.022	2.34 0.008	2.52 0.003	2.82 0.001	3.42 0.0003		
ALD810019	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	2.14 0.021	2.24 0.007	2.42 0.002	2.72 0.001	3.32 0.0003		
ALD810018	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	2.04 0.020	2.14 0.007	2.32 0.002	2.62 0.001	3.22 0.0003		
ALD810017	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	1.94 0.019	2.04 0.007	2.22 0.002	2.52 0.001	3.12 0.0003		
ALD810016	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	1.84 0.018	1.94 0.007	2.12 0.002	2.42 0.001	3.02 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.