

APPENDIX B

1. Current (I) and voltage (V) values measured with a Keithley 4200 semiconductor characterization system on dye-sensitized solar cell sensitized with Ru complex (N3) dye (sample 8, batch 5)

I (mA)	V (mV)	P (watt)
1.340502058	000.0000E+0	000.0000E+0
1.330997678	5.0000E+0	6.6550E-6
1.32137991	10.0000E+0	13.2138E-6
1.311728498	15.0000E+0	19.6759E-6
1.302220044	20.0000E+0	26.0444E-6
1.292639994	25.0000E+0	32.3160E-6
1.283194637	30.0000E+0	38.4958E-6
1.273656497	35.0000E+0	44.5780E-6
1.26421114	40.0000E+0	50.5684E-6
1.254711067	45.0000E+0	56.4620E-6
1.245299121	50.0000E+0	62.2650E-6
1.235857722	55.0000E+0	67.9722E-6
1.226487919	60.0000E+0	73.5893E-6
1.217126381	65.0000E+0	79.1132E-6
1.207668334	70.0000E+0	84.5368E-6
1.198290032	75.0000E+0	89.8718E-6
1.188823488	80.0000E+0	95.1059E-6
1.179474639	85.0000E+0	100.2553E-6
1.169970259	90.0000E+0	105.2973E-6
1.160591957	95.0000E+0	110.2562E-6
1.151142293	100.0000E+0	115.1142E-6
1.141709392	105.0000E+0	119.8795E-6
1.132230158	110.0000E+0	124.5453E-6
1.122805756	115.0000E+0	129.1227E-6
1.113440027	120.0000E+0	133.6128E-6
1.103902119	125.0000E+0	137.9878E-6
1.094465028	130.0000E+0	142.2804E-6
1.084981719	135.0000E+0	146.4725E-6
1.075460576	140.0000E+0	150.5645E-6
1.065884833	145.0000E+0	154.5533E-6
1.056267065	150.0000E+0	158.4401E-6
1.046590507	155.0000E+0	162.2215E-6
1.036968431	160.0000E+0	165.9149E-6
1.02718675	165.0000E+0	169.4858E-6
1.01748493	170.0000E+0	172.9724E-6
1.007707557	175.0000E+0	176.3488E-6

I (mA)	V (mV)	P (watt)
0.997820869	180.0000E+0	179.6078E-6
0.987934065	185.0000E+0	182.7678E-6
0.977883581	190.0000E+0	185.7979E-6
0.967875123	195.0000E+0	188.7356E-6
0.957748911	200.0000E+0	191.5498E-6
0.947639521	205.0000E+0	194.2661E-6
0.937315868	210.0000E+0	196.8363E-6
0.927017361	215.0000E+0	199.3087E-6
0.916584511	220.0000E+0	201.6486E-6
0.906138914	225.0000E+0	203.8813E-6
0.895643025	230.0000E+0	205.9979E-6
0.884878158	235.0000E+0	207.9464E-6
0.874113292	240.0000E+0	209.7872E-6
0.863163557	245.0000E+0	211.4751E-6
0.852175988	250.0000E+0	213.0440E-6
0.841058209	255.0000E+0	214.4698E-6
0.829873141	260.0000E+0	215.7670E-6
0.818461296	265.0000E+0	216.8922E-6
0.807045144	270.0000E+0	217.9022E-6
0.795435742	275.0000E+0	218.7448E-6
0.78375492	280.0000E+0	219.4514E-6
0.77188079	285.0000E+0	219.9860E-6
0.759956252	290.0000E+0	220.3873E-6
0.747897255	295.0000E+0	220.6297E-6
0.735657581	300.0000E+0	220.6973E-6
0.723375939	305.0000E+0	220.6297E-6
0.710842141	310.0000E+0	220.3611E-6
0.698308344	315.0000E+0	219.9671E-6
0.685635896	320.0000E+0	219.4035E-6
0.672929804	325.0000E+0	218.7022E-6
0.659933838	330.0000E+0	217.7782E-6
0.646971457	335.0000E+0	216.7354E-6
0.633731775	340.0000E+0	215.4688E-6
0.620500534	345.0000E+0	214.0727E-6
0.607134774	350.0000E+0	212.4972E-6
0.593567383	355.0000E+0	210.7164E-6
0.580008375	360.0000E+0	208.8030E-6
0.566176255	365.0000E+0	206.6543E-6
0.55243657	370.0000E+0	204.4015E-6
0.538436347	375.0000E+0	201.9136E-6
0.524444564	380.0000E+0	199.2889E-6
0.510288926	385.0000E+0	196.4612E-6

I (mA)	V (mV)	P (watt)
0.496116467	390.0000E+0	193.4854E-6
0.481725438	395.0000E+0	190.2816E-6
0.467317703	400.0000E+0	186.9271E-6
0.452804903	405.0000E+0	183.3860E-6
0.438145013	410.0000E+0	179.6395E-6
0.423438934	415.0000E+0	175.7272E-6
0.408581604	420.0000E+0	171.6043E-6
0.393728435	425.0000E+0	167.3346E-6
0.378682016	430.0000E+0	162.8333E-6
0.363677624	435.0000E+0	158.1998E-6
0.348421076	440.0000E+0	153.3053E-6
0.333231816	445.0000E+0	148.2882E-6
0.317811442	450.0000E+0	143.0151E-6
0.302483473	455.0000E+0	137.6300E-6
0.287088304	460.0000E+0	132.0606E-6
0.27152925	465.0000E+0	126.2611E-6
0.256054249	470.0000E+0	120.3455E-6
0.240276742	475.0000E+0	114.1315E-6
0.224566436	480.0000E+0	107.7919E-6
0.208730082	485.0000E+0	101.2341E-6
0.192902138	490.0000E+0	94.5220E-6
0.1769019	495.0000E+0	87.5664E-6
0.160947908	500.0000E+0	80.4740E-6
0.144775418	505.0000E+0	73.1116E-6
0.128733183	510.0000E+0	65.6539E-6
0.112585891	515.0000E+0	57.9817E-6
0.096278942	520.0000E+0	50.0650E-6
0.080035017	525.0000E+0	42.0184E-6
0.063551597	530.0000E+0	33.6823E-6
0.047219433	535.0000E+0	25.2624E-6
0.031009124	540.0000E+0	16.7449E-6
0.015319831	545.0000E+0	8.3493E-6
-0.001252341	550.0000E+0	-688.7873E-9

2. Current (I) and voltage (V) values measured with a Keithley 4200 semiconductor characterization system on dye-sensitized solar cell sensitized with roselle dye (batch 5)

I (mA)	V (mV)	P (watt)
0.978900469	000.0000E+0	000.0000E+0
0.976442418	5.0000E+0	4.8822E-6
0.973786984	10.0000E+0	9.7379E-6
0.971093599	15.0000E+0	14.5664E-6
0.968362496	20.0000E+0	19.3672E-6
0.965438085	25.0000E+0	24.1360E-6
0.962622929	30.0000E+0	28.8787E-6
0.959555618	35.0000E+0	33.5844E-6
0.956639647	40.0000E+0	38.2656E-6
0.953479961	45.0000E+0	42.9066E-6
0.950316025	50.0000E+0	47.5158E-6
0.947034452	55.0000E+0	52.0869E-6
0.943740306	60.0000E+0	56.6244E-6
0.94024447	65.0000E+0	61.1159E-6
0.936630939	70.0000E+0	65.5642E-6
0.933030096	75.0000E+0	69.9773E-6
0.929240079	80.0000E+0	74.3392E-6
0.925378699	85.0000E+0	78.6572E-6
0.921206374	90.0000E+0	82.9086E-6
0.916907971	95.0000E+0	87.1063E-6
0.912407937	100.0000E+0	91.2408E-6
0.907777576	105.0000E+0	95.3166E-6
0.90300024	110.0000E+0	99.3300E-6
0.898168248	115.0000E+0	103.2894E-6
0.893016928	120.0000E+0	107.1620E-6
0.887684932	125.0000E+0	110.9606E-6
0.882105029	130.0000E+0	114.6736E-6
0.87634864	135.0000E+0	118.3071E-6
0.870365358	140.0000E+0	121.8512E-6
0.86412573	145.0000E+0	125.2982E-6
0.857634062	150.0000E+0	128.6451E-6
0.850873475	155.0000E+0	131.8854E-6
0.843890128	160.0000E+0	135.0224E-6
0.836671621	165.0000E+0	138.0508E-6
0.829217664	170.0000E+0	140.9670E-6
0.821465452	175.0000E+0	143.7565E-6
0.81339397	180.0000E+0	146.4109E-6
0.805225747	185.0000E+0	148.9668E-6

I (mA)	V (mV)	P (watt)
0.796523993	190.0000E+0	151.3396E-6
0.787687721	195.0000E+0	153.5991E-6
0.778506976	200.0000E+0	155.7014E-6
0.769183214	205.0000E+0	157.6826E-6
0.759557122	210.0000E+0	159.5070E-6
0.749704021	215.0000E+0	161.1864E-6
0.739502138	220.0000E+0	162.6905E-6
0.729165855	225.0000E+0	164.0623E-6
0.718590105	230.0000E+0	165.2757E-6
0.707598345	235.0000E+0	166.2856E-6
0.696434348	240.0000E+0	167.1442E-6
0.684972038	245.0000E+0	167.8182E-6
0.673467643	250.0000E+0	168.3669E-6
0.661580882	255.0000E+0	168.7031E-6
0.64958079	260.0000E+0	168.8910E-6
0.637269695	265.0000E+0	168.8765E-6
0.624903943	270.0000E+0	168.7241E-6
0.612176897	275.0000E+0	168.3487E-6
0.599466613	280.0000E+0	167.8507E-6
0.586378213	285.0000E+0	167.1178E-6
0.573197322	290.0000E+0	166.2272E-6
0.559869397	295.0000E+0	165.1615E-6
0.546251598	300.0000E+0	163.8755E-6
0.532537117	305.0000E+0	162.4238E-6
0.518625195	310.0000E+0	160.7738E-6
0.504662807	315.0000E+0	158.9688E-6
0.490326434	320.0000E+0	156.9045E-6
0.476040499	325.0000E+0	154.7132E-6
0.461342832	330.0000E+0	152.2431E-6
0.446674559	335.0000E+0	149.6360E-6
0.431791996	340.0000E+0	146.8093E-6
0.41689261	345.0000E+0	143.8279E-6
0.401820987	350.0000E+0	140.6373E-6
0.386539265	355.0000E+0	137.2214E-6
0.371261762	360.0000E+0	133.6542E-6
0.355677475	365.0000E+0	129.8223E-6
0.340131053	370.0000E+0	125.8485E-6
0.324315712	375.0000E+0	121.6184E-6
0.308618008	380.0000E+0	117.2748E-6
0.292596786	385.0000E+0	112.6498E-6
0.276554521	390.0000E+0	107.8563E-6
0.260344212	395.0000E+0	102.8360E-6

I (mA)	V (mV)	P (watt)
0.24409192	400.0000E+0	97.6368E-6
0.227822777	405.0000E+0	92.2682E-6
0.211246923	410.0000E+0	86.6112E-6
0.194717286	415.0000E+0	80.8077E-6
0.17805738	420.0000E+0	74.7841E-6
0.161456323	425.0000E+0	68.6189E-6
0.144594742	430.0000E+0	62.1757E-6
0.127745763	435.0000E+0	55.5694E-6
0.110695109	440.0000E+0	48.7058E-6
0.09366966	445.0000E+0	41.6830E-6
0.076446733	450.0000E+0	34.4010E-6
0.059223799	455.0000E+0	26.9468E-6
0.041883224	460.0000E+0	19.2663E-6
0.024937613	465.0000E+0	11.5960E-6
0.008340742	470.0000E+0	3.9201E-6
