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Product specifications

Sichuan Yonggui Technology Co., Ltd



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1.Product overview

This product conforms to the design requirements of the connecting devices IEC 62196-1-2014 and IEC 62196-3-2014 for conductive charging of electric vehicles. The overall protection level of the charging gun reaches IP44, and the protection level of the gun head reaches IP67. The handle design conforms to the ergonomics, comfortable grip, and can meet the user's use needs.

2.Scope of application

This specification applies to all specifications of European standard DC charging gun Products.

3.Specifications

Table 1: Specifications

Product name	European standard DC charging gun	
Model number	CPED300A****E-V2xx (...Indicates rated current, * * * * indicates cable length, xx represents the serial number)	
Rated voltage	DC1000V	
Rated current	Power line: 300A signal line: 2A	
Number of terminals	Power wire: 2 ground wire: 1 signal wire: 2	
Applicable standards	<ul style="list-style-type: none"> · IEC 62196.1-2014 Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles - Part 1: General requirements · IEC 62196.3-2014 Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles –Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers · IEC 61851.1-2001 Electric vehicle conductive charging system - Part 1: General requirements · IEC 60309.1-2012 plugs, socket-outlets and couplers for industrial purposes - Part 1: General requirements 	
Operating Ambient temperature range	- 35~+50℃ Both use under condensation and freeze is prohibited.	
Degree of protection	IP44	
Dimension	Charging gun	(L) 274 * (W) 74 * (H) 175 (mm)
	Cable	Length according to customer requirements

Note: This product meets the requirements of RoHS 2.0+REACH.

4. Product serial number

Table 2. Product Serial number

Product model	Rated current
CPED300A****E-V2xx	300A

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Note: the above table **** indicates the cable length in mm, xx represents the serial number

5. Structure and dimensions

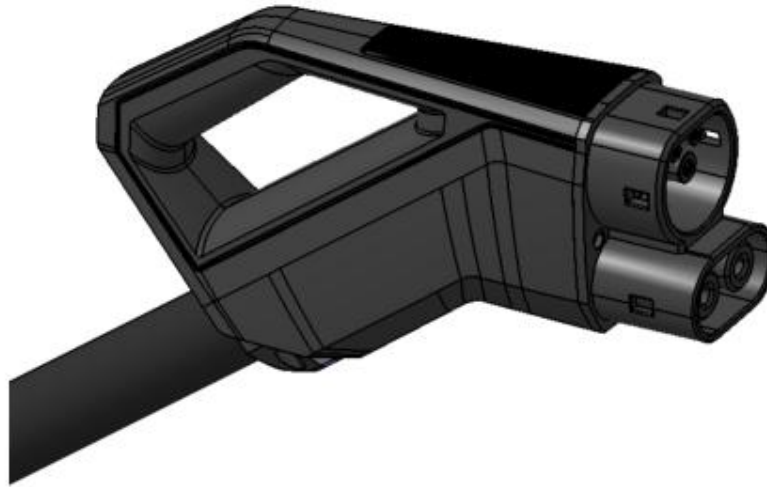

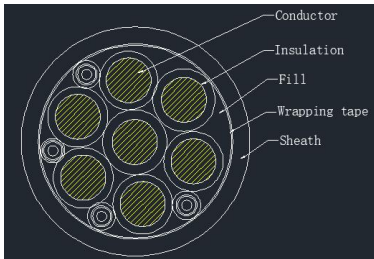
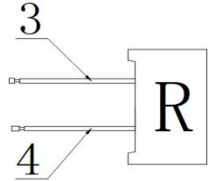
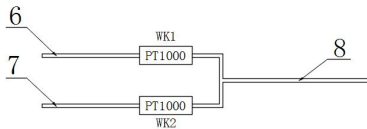


Figure 1 Structure and dimension

table 3. Cable core wire function allocation table

Core function allocation						
 <p>Front view of charging gun head</p>		 <p>Cable cross section</p>		 <p>Resistance wiring diagram (The resistance 3 # line is connected to the 3 # ground wire, and the resistance 4 # is connected to the PP signal terminal)</p>		
Core number	Core color	Terminal	Sectional area of core conductor (mm ²)			
			300A			
1	Brown	DC+	3x35			
2	Blue	DC-	3x35			
3	Yellow / Green	PE + Resistance lead	35			
4	Black	PP (Resistance lead)	0.75			
5	Orange	CP	0.75			
6	Violet	WK1+	 <p>(The negative lines of temperature sensors WK1 and WK2 are connected to line 8 #)</p>			
7	Pink	WK2+				

Wiring diagram of temperature sensor

8	Black	WK-	
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6. Charging gun wiring diagram

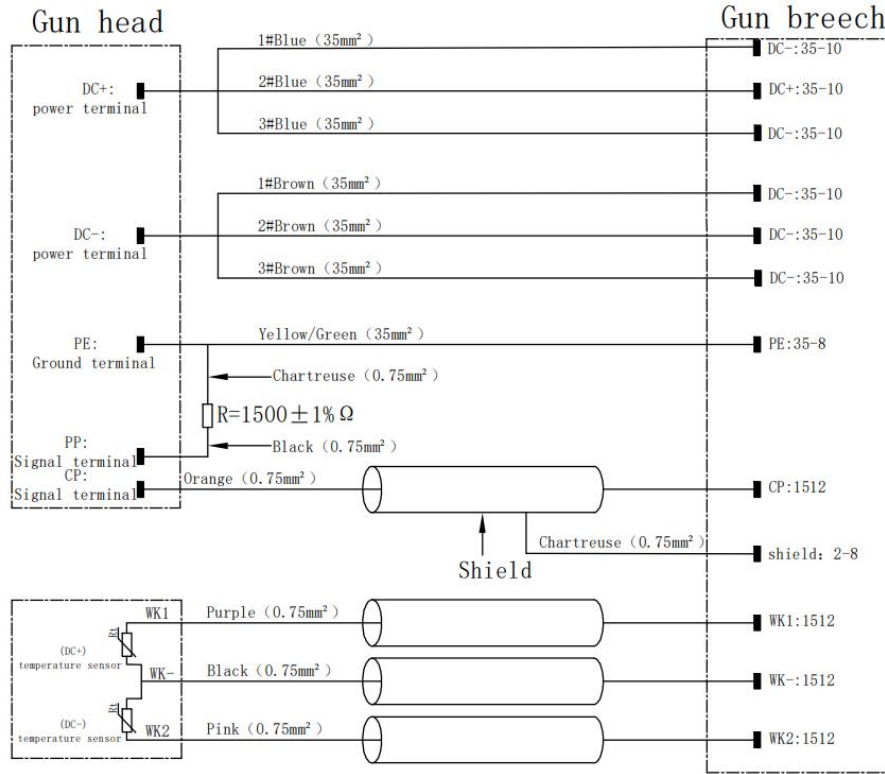


Figure 2 Charging gun wiring diagram (see Table 3 for core wire diameter)

7. The main components

Table 4. The main components

Serial number	Part name	Material	surface treatment	Remarks
1	Charging gun shell	PBT+PC	-	Color: Cold gray
2	Charging gun head	PA66+GF25	-	Color: Black
3	Ground terminal	Brass + red copper	silver	-
4	Signal terminal	brass	silver	-
5	Power terminal	Brass + red copper	silver	300A
		Brass	silver	
6	Sealing ring (inside the housing)	Silica gel	-	-
7	Cable snap ring (inside the housing)	Aluminum alloy	anodic oxidation	-
8	Resistance (inside the housing)	-	-	-
9	Temperature sensor (inside the housing)	-	-	-
10	Electric vehicle cable	TPU (outer sheath)	-	-

-1) Charging gun shell

Consists of high-incombustibility , -insulation and –weather resistance resin materials,PBT+PC (UL94-V-0) .

-2) Charging gun head

Composed of high incombustibility, insulation and wear resistance nylon plus glass fiber material ,PA66 + GF25 (UL94-V-0)

-3) , - 5) Ground terminal, Power terminal

Composed of brass alloy and pure copper, the whole terminal is silver plated, T2 or H62 .

-5) Power terminal (300A)

It is composed of a stainless steel sleeve that wraps the jack end of the high-conductivity copper material, and then cooperates

with the crimping end of the pure copper material. The entire terminal is silver-plated, T2.

-4) Signal terminal

Composed of brass material, the terminal is silver plated , H62.

-6) Sealing ring

Composed of high incombustibility, insulation and weather resistance silicone material

-7) Cable snap ring

7-1) The cable snap ring suitable for 300A cable is forged by aluminum alloy material;

-8) Resistance

Resistance $R=1500 \pm 1\% \Omega$.

-9) Temperature sensor

Model: PT1000, $R_0 \text{ } ^\circ\text{C} = 1000 \Omega$.

-10) Electric vehicle cable

The structure is shown in Table 3, 5 and figure 3.

10-1) Reference standard:

- IEC 60228 Conductors of insulated cables
- IEC 62893-1 Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV - Part 1: General Requirements
- IEC 62893-2 Charging cables for electric vehicles for rated voltages up to and including 0,6/1 kV - Part 2: Test methods

10-2) technical requirements:

- (1) Rated voltage: 1000V;
- (2) Ambient temperature: - 40 ~ 90 °C;
- (3) Conductor resistance (20 °C): $35\text{mm}^2 \leq 0.554 \Omega / \text{Km}$ 、 $0.75\text{mm}^2 \leq 26 \Omega / \text{Km}$;
- (4) Main line: line-line insulation impedance: 1000V DC 15min $\geq 500\text{m} \Omega$; leakage current: 3500V DC 15min $\leq 5\text{mA}$;
- (5) Bending radius of cable: $\leq 6D$;
- (6) UV resistance: ISO 4892-3 (1000H, no discoloration, no cracking, tensile strength retention rate, elongation at break $\geq 80\%$);
- (7) Weather resistance, friction resistance, halogen-free, rocking test, low temperature impact test, meandering test, damp heat test, high and low temperature cycle test, anti-extrusion test, compatibility test, chemical liquid resistance and other tests refer to IEC60228 , IEC62893-1 and IEC62893-2.

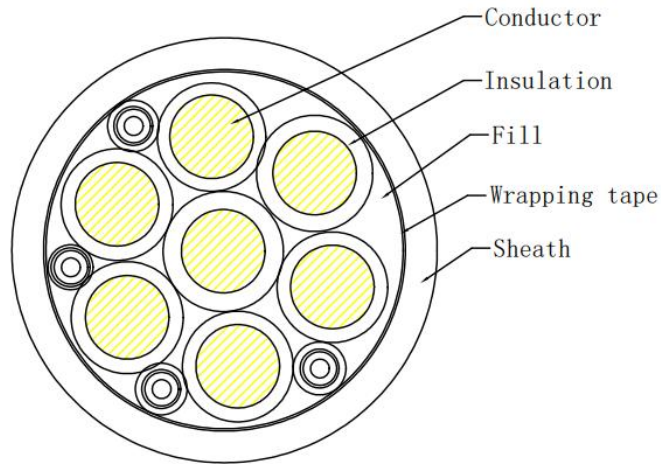


Figure 3 cable structure

Table 5. Detailed parameters of electric vehicle cable

Explain				Unit	Cable specification	
structure	DC line structure	Conductor	Specification structure	mm ²	300A 3*35	
		Insulation	Colour	-	Brown, Blue	
	PE line structure	Conductor	Specification structure	mm ²	1*35	
		Insulation	Colour	-	Yellow / Green	
	Signal line structure	Conductor	Specification structure	mm ²	(4*0.75) P	
		Insulation	Colour	-	Black, Orange, Purple, Pink	
	Outer sheath			Texture of material	-	TPU
				External diameter	mm	37.5±0.05
				Colour	-	black

8.Nameplate information

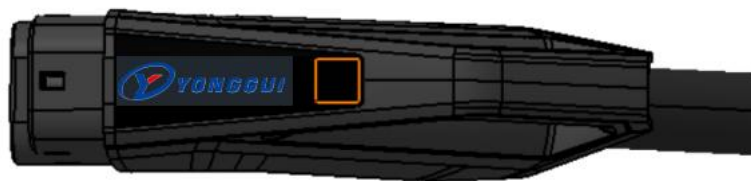


Figure 4 Product nameplate location diagram

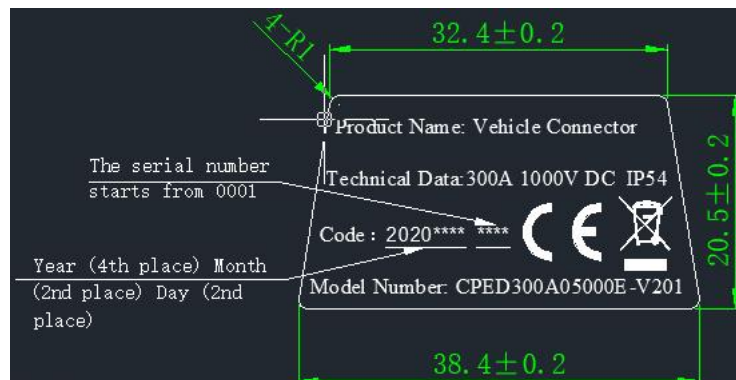


Figure 5 Product nameplate

9 Test Items with IEC Standards

Table a: Test Items with IEC Standards

Reference standard	Items
IEC62196-1 15	Resistance to ageing of rubber and thermoplastic material.
IEC62196-1 20	IP degree and humidity
IEC62196-1 21	Insulation resistance and dielectric strength.
IEC62196-1 23	Normal operation
IEC62196-1 24	Temperature rise
IEC62196-1 25	Pull force on cord anchorage
IEC62196-1 26	2. Impact blow test, 3. Drop test, 4. Flexing test,
IEC62196-1 27	Torque test on screws or nuts
IEC62196-1 29	Resistance to heat, fire and tracking
IEC62196-1 30	Corrosion and resistance to rusting
IEC62196-1 31	Conditional short-circuit current withstand test

Appendix

Appendix I : Reference standards and tests

Table B: test items and criteria

Items		Decision criteria
1	Appearance	The accessible surface of the charging gun should be free of burrs, flashes and similar sharp edges; the casing of the charging gun should be marked with the manufacturer's name or trademark, product model, rated voltage and rated current, etc.
2	Dimension	The external dimensions of the charging gun meet the requirements of the IEC62196-3 standard
3	Temperature rise	The maximum allowable temperature rise of the terminal should not exceed 50K
4	Insulation resistance	> 10MΩ (Applied voltage: 500V DC, 1 minute)
5	Withstand voltage	3500V AC Leakage current ≤10mA, no breakdown or flashover in 1 minute
6	Charge gun insertion/withdrawal force	< 100N
7	Cable retention force	The cable must not fall out of the charging gun case.
8	Drop test	The specimen shall not be damaged and there shall be no separation or fall off of any parts in the gun shell
9	Vehicle drive over test	The specimen shall not be damaged and there shall be no separation or fall off of any parts in the gun shell
10	Service life test	Conduct no-load live plugging 10000 times, during the test, there shall be no continuous flash arc, after the test, there shall be no: 1.Deterioration without shell or partition; 2.No electrical connection or mechanical connection is loose; 3.Keep the continuity of signal transmission between contacts; 4.There shall be no flashover or breakdown during dielectric strength test (voltage reduced by 500V);
11	Protection level	Internal protection of gun shell IP67
12	High temperature resistance test	The sample is not damaged and can be used normally (check the sample after returning to room temperature.)
13	Low temperature resistance test	The sample is not damaged and can be used normally (check the sample after returning to room temperature.)

Appendix II : Test Method

Test conditions

- Ambient temperature 20 ± 15 °C, relative humidity $65 \pm 20\%$

Table C Test Method

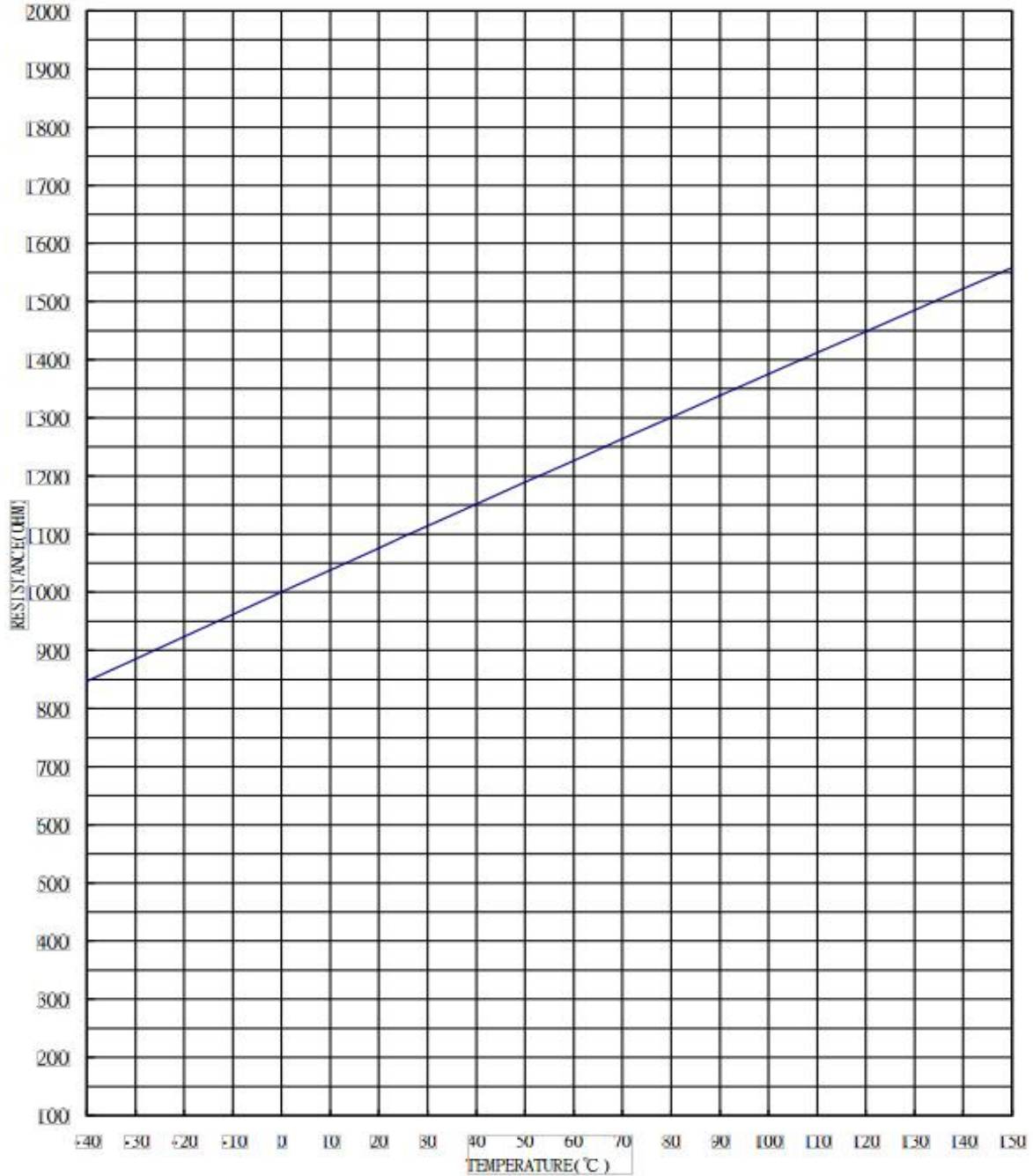
Items		Test Method
1	Appearance	Check the surface condition visually and manually.
2	Dimension	Matching test
3	Temperature rise	Supply current according to product specification, measure the temperature of the following points. Test point: - DC terminal contact point surface -Shell surface
4	Insulation resistance	Insulation resistance tester plus 500V DC voltage to measure the insulation resistance between adjacent terminals and between each terminal and the shell
5	Withstand voltage	Apply 3500V AC voltage between adjacent power terminals and between power terminals and housing for 1 minute
6	Charge gun insertion/withdrawal force	When the vehicle charging base is fixed, measure the insertion / pull-out force of the charging gun head at the specified speed (excluding the insertion / pull-out force of the rubber seal of the vehicle charging base).
7	Cable retention force	In charging gun fixed condition, apply 753 ± 1 N \times 120s to cable out direction from charging gun.
8	Drop test	Lift the test sample to a predetermined height, and then let it fall freely according to the predetermined state and collide with the impact table.
9	Vehicle drive over test	Roll over the connector which is placed naturally on concrete floor with the wheel of 2t vehicle.
10	Service life test	10,000 times of no-load live plugging and unplugging.
11	Protection level	Swing tube type water spray test: select a swing tube of appropriate radius so that the height of the sample table is at the diameter of the swing tube, place the sample on the sample table so that the distance from the top of the sample to the sample spout is not more than 200mm, the sample table Does not rotate. Test condition: The water flow is calculated according to the number of spray holes of the pendulum tube, and each hole is 0.07 L / min. When spraying water, spray water from the spray holes in the 90 ° arcs on both sides of the midpoint of the pendulum tube to the sample. The test sample is placed in the center of the semicircle of the pendulum tube. The swing tube swings 180 ° on both sides of the vertical line for a total of 360 °. Each swing (2 \times 360 °) is about 12s. Test time: continuous watering for 10 min.
12	High temperature resistance test	Put the charging gun in the thermostat (105 °C \times 1000 hours).
13	Low temperature resistance test	Put the charging gun in the thermostat (- 35 °C \times 120 hours).

Appendix III: Temperature monitoring

1. DC + and DC- are monitored by PT1000 temperature resistance sensors, and connected to power supply equipment through cable wires: WK-, WK1 +, WK2 +

2. DC + and DC- are monitored by PT1000 temperature resistance sensors. It is recommended to set the temperature threshold at the pile end to 93 °.

3.The relationship between temperature and impedance is shown in the figure below:





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Pt1000 platinum resistance temperature and resistance value comparison table

Temperature (°C)	0	1	2	3	4	5	6	7	8	9
	Resistance (Ω)									
-200	185.2									
-190	228.3	224	219.7	215.4	211.1	206.8	202.5	198.2	193.8	189.5
-180	271	266.7	262.4	258.2	253.9	249.7	245.4	241.1	236.8	232.5
-170	313.4	309.1	304.9	300.7	296.4	292.2	288	283.7	279.5	275.2
-160	355.4	351.2	347	342.8	338.6	334.4	330.2	326	321.8	317.6
-150	397.2	393.1	388.9	384.7	380.5	376.4	372.2	368	363.8	359.6
-140	438.8	434.6	430.5	426.3	422.2	418	413.9	409.7	405.6	401.4
-130	480	475.9	471.8	467.7	463.6	459.4	455.3	451.2	447	442.9
-120	521.1	517	512.9	508.8	504.7	500.6	496.5	492.4	488.3	484.2
-110	561.9	557.9	553.8	549.7	545.6	541.5	537.5	533.4	529.3	525.2
-100	602.6	598.5	594.4	590.4	586.3	582.3	578.2	574.1	570.1	566
-90	643	639	634.9	630.9	626.8	622.8	618.8	614.7	610.7	606.6
-80	683.3	679.2	675.2	671.2	667.2	663.1	659.1	655.1	651.1	647
-70	723.3	719.3	715.3	711.3	707.3	703.3	699.3	695.3	691.3	687.3
-60	763.3	759.3	755.3	751.3	747.3	743.3	739.3	735.3	731.3	727.3
-50	803.1	799.1	795.1	791.1	787.2	783.2	779.2	775.2	771.2	767.3
-40	842.7	838.7	834.8	830.8	826.9	822.9	818.9	815	811	807
-30	882.2	878.3	874.3	870.4	866.4	862.5	858.5	854.6	850.6	846.7
-20	921.6	917.7	913.7	909.8	905.9	901.9	898	894	890.1	886.2
-10	960.9	956.9	953	949.1	945.2	941.2	937.3	933.4	929.5	925.5
0	1000	996.1	992.2	988.3	984.4	980.4	976.5	972.6	968.7	964.8
0	1000	1003.9	1007.8	1011.7	1015.6	1019.5	1023.4	1027.3	1031.2	1035.1
10	1039	1042.9	1046.8	1050.7	1054.6	1058.5	1062.4	1066.3	1070.2	1074
20	1077.9	1081.8	1085.7	1089.6	1093.5	1097.3	1101.2	1105.1	1109	1112.9
30	1116.7	1120.6	1124.5	1128.3	1132.2	1136.1	1140	1143.8	1147.7	1151.5
40	1155.4	1159.3	1163.1	1167	1170.8	1174.7	1178.6	1182.4	1186.3	1190.1
50	1194	1197.8	1201.7	1205.5	1209.4	1213.2	1217.1	1220.9	1224.7	1228.6
60	1232.4	1236.3	1240.1	1243.9	1247.8	1251.6	1255.4	1259.3	1263.1	1266.9
70	1270.8	1274.6	1278.4	1282.2	1286.1	1289.9	1293.7	1297.5	1301.3	1305.2
80	1309	1312.8	1316.6	1320.4	1324.2	1328	1331.8	1335.7	1339.5	1343.3
90	1347.1	1350.9	1354.7	1358.5	1362.3	1366.1	1369.9	1373.7	1377.5	1381.3
100	1385.1	1388.8	1392.6	1396.4	1400.2	1404	1407.8	1411.6	1415.4	1419.1



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130	1498.3	1502.1	1505.8	1509.6	1513.3	1517.1	1520.8	1524.6	1528.3	1532.1
140	1535.8	1539.6	1543.3	1547.1	1550.8	1554.6	1558.3	1562	1565.8	1569.5
150	1573.3	1577	1580.7	1584.5	1588.2	1591.9	1595.6	1599.4	1603.1	1606.8
160	1610.5	1614.3	1618	1621.7	1625.4	1629.1	1632.9	1636.6	1640.3	1644
170	1647.7	1651.4	1655.1	1658.9	1662.6	1666.3	1670	1673.7	1677.4	1681.1
180	1684.8	1688.5	1692.2	1695.9	1699.6	1703.3	1707	1710.7	1714.3	1718
190	1721.7	1725.4	1729.1	1732.8	1736.5	1740.2	1743.8	1747.5	1751.2	1754.9
200	1758.6	1762.2	1765.9	1769.6	1773.3	1776.9	1780.6	1784.3	1787.9	1791.6
210	1795.3	1798.9	1802.6	1806.3	1809.9	1813.6	1817.2	1820.9	1824.6	1828.2
220	1831.9	1835.5	1839.2	1842.8	1846.5	1850.1	1853.8	1857.4	1861.1	1864.7
230	1868.4	1872	1875.6	1879.3	1882.9	1886.6	1890.2	1893.8	1897.5	1901.1
240	1904.7	1908.4	1912	1915.6	1919.2	1922.9	1926.5	1930.1	1933.7	1937.4
250	1941	1944.6	1948.2	1951.8	1955.5	1959.1	1962.7	1966.3	1969.9	1973.5
260	1977.1	1980.7	1984.3	1987.9	1991.5	1995.1	1998.7	2002.3	2005.9	2009.5
270	2013.1	2016.7	2020.3	2023.9	2027.5	2031.1	2034.7	2038.3	2041.9	2045.5
280	2049	2052.6	2056.2	2059.8	2063.4	2067	2070.5	2074.1	2077.7	2081.3
290	2084.8	2088.4	2092	2095.6	2099.1	2102.7	2106.3	2109.8	2113.4	2117
300	2120.5	2124.1	2127.6	2131.2	2134.8	2138.3	2141.9	2145.4	2149	2152.5
310	2156.1	2159.6	2163.2	2166.7	2170.3	2173.8	2177.4	2180.9	2184.4	2188
320	2191.5	2195.1	2198.6	2202.1	2205.7	2209.2	2212.7	2216.3	2219.8	2223.3
330	2226.8	2230.4	2233.9	2237.4	2240.9	2244.5	2248	2251.5	2255	2258.5
340	2262.1	2265.6	2269.1	2272.6	2276.1	2279.6	2283.1	2286.6	2290.2	2293.7
350	2297.2	2300.7	2304.2	2307.7	2311.2	2314.7	2318.2	2321.7	2325.2	2328.7
360	2332.1	2335.6	2339.1	2342.6	2346.1	2349.6	2353.1	2356.6	2360	2363.5
370	2367	2370.5	2374	2377.4	2380.9	2384.4	2387.9	2391.3	2394.8	2398.3
380	2401.8	2405.2	2408.7	2412.2	2415.6	2419.1	2422.6	2426	2429.5	2432.9
390	2436.4	2439.9	2443.3	2446.8	2450.2	2453.7	2457.1	2460.6	2464	2467.5
400	2470.9	2474.4	2477.8	2481.3	2484.7	2488.1	2491.6	2495	2498.5	2501.9
410	2505.3	2508.8	2512.2	2515.6	2519.1	2522.5	2525.9	2529.3	2532.8	2536.2
420	2539.6	2543	2546.5	2549.9	2553.3	2556.7	2560.1	2563.5	2567	2570.4
430	2573.8	2577.2	2580.6	2584	2587.4	2590.8	2594.2	2597.6	2601	2604.4
440	2607.8	2611.2	2614.6	2618	2621.4	2624.8	2628.2	2631.6	2635	2638.4
450	2641.8	2645.2	2648.6	2652	2655.3	2658.7	2662.1	2665.5	2668.9	2672.2



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480	2742.9	2746.3	2749.6	2753	2756.3	2759.7	2763	2766.4	2769.7	2773.1
490	2776.4	2779.8	2783.1	2786.4	2789.8	2793.1	2796.4	2799.8	2803.1	2806.4
500	2809.8	2813.1	2816.4	2819.8	2823.1	2826.4	2829.7	2833.1	2836.4	2839.7
510	2843	2846.3	2849.7	2853	2856.3	2859.6	2862.9	2866.2	2868.5	2872.9
520	2876.2	2879.5	2882.8	2886.1	2889.4	2892.7	2896	2899.3	2902.6	2905.9
530	2909.2	2912.5	2915.8	2919.1	2922.4	2925.6	2928.9	2932.2	2935.5	2938.8
540	2942.1	2945.4	2948.6	2951.9	2955.2	2958.5	2961.8	2965	2968.3	2971.6
550	2974.9	2978.1	2981.4	2984.7	2988	2991.2	2994.5	2997.8	3001	3004.3
560	3007.5	3010.8	3014.1	3017.3	3020.6	3023.8	3027.1	3030.3	3033.6	3036.9
570	3040.1	3043.4	3046.6	3049.8	3053.1	3056.3	3059.6	3062.8	3066.1	3069.3
580	3072.5	3075.8	3079	3082.3	3085.5	3088.7	3092	3095.2	3098.4	3101.6
590	3104.9	3108.1	3111.3	3114.5	3117.8	3121	3124.2	3127.4	3130.6	3133.9
600	3137.1	3140.3	3143.5	3146.7	3149.9	3153.1	3156.4	3159.6	3162.8	3166
610	3169.2	3172.4	3175.6	3178.8	3182	3185.2	3188.4	3191.6	3194.8	3198
620	3201.2	3204.3	3207.5	3210.7	3213.9	3217.1	3220.3	3223.5	3226.7	3229.8
630	3233	3236.2	3239.4	3242.6	3245.7	3248.9	3252.1	3255.3	3258.4	3261.6
640	3264.8	3267.9	3271.1	3274.3	3277.4	3280.6	3283.8	3286.9	3290.1	3293.2
650	3296.4	3299.6	3302.7	3305.9	3309	3312.2	3315.3	3318.5	3321.6	3324.8
660	3327.9									

1. Electrical characteristics

	Parameter	Symbol	Test Conditions	Tolerance	Unit.
a.	Resistance At 0°C	R ₀	R0°C=1000Ω	Class 2B	Ω
b.	TCR		3850μ		ppm/K
c.	Insulation test		500V DC	MIN: 100 MOHM	

2. Maximum Ratings

	Parameter	Specification	Unit
a.	Operation Temperature Range	-40 ----- +150	°C