



# Trouble Shooting Guide, Electrical

Applicable for W710, Z710

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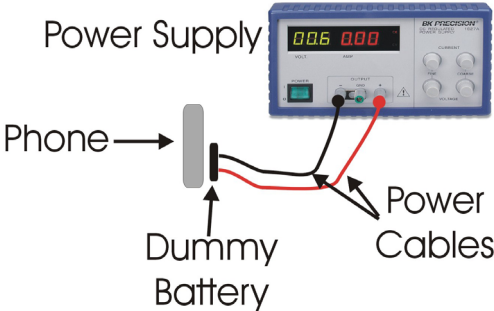

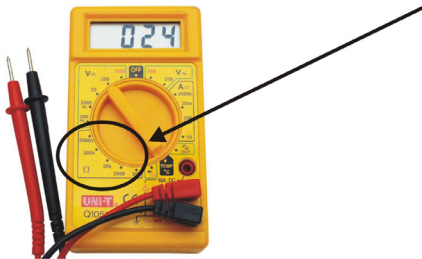
# 1 General

The purpose of this document is to indicate the electrical level repair actions associated with the different failure symptoms.

For symptoms that have multiple repair actions, the repair actions are listed in order of their probability of creating a successful repair. The first action has the highest probability, and subsequent actions have lower probabilities. The intention is for the repair technician to implement the first repair action and then retest the phone. If the phone continues to fail the same test, then the technician should continue to the second repair action. If the phone continues to fail the same test after all of the repair actions are exhausted, then the phone will be considered not repairable at this level.

This document should be used only after the actions from the Mechanical Trouble Shooting Guide have been exhausted for the specific symptom.

Voltage, current, and resistance information is provided for some symptoms to enable faster repairs. The phone should be fully assembled. Purchasing this equipment and performing these measurements is optional but recommended.

<p>Measure Current in Milliamps (mA)</p>  <p>Power Supply</p> <p>Phone</p> <p>Dummy Battery</p> <p>Power Cables</p>	<p>Perform current measurements using a dummy battery and power supply with digital current display. The phone should be fully assembled.</p>
<p>Measure Diode Voltage (VDC ➡)</p>  <p>Multimeter</p>	<p>Perform voltage measurements with a multimeter.</p>
<p>Measure Resistance in Ohms (<math>\Omega</math>)</p>  <p>Multimeter</p>	<p>Perform resistance measurements with a multimeter.</p>



## 2 Repair Actions for Manual Test Failures

Failure	Failure Symptom	Repair Action
<b>2.1 Power On / Off</b>	Current draw when powered off	N1302 N1300 N705 <b>N702</b>
	Current draw greater than 400 mAmps during power up sequence	N1300 N705
	Hangs at gray display with constant vibration	B300
	Some current draw when pressing power key, but current returns to 0 when power key is released  Measure resistance across L801: (Ohms) Resistance = 1.2 to 1.7 Ohms	If resistance is outside of range, then replace L801
	Powers On when battery is installed <b>BUT</b> will not power off  Powers On when power key is pressed <b>BUT</b> will not power off. Power key fails service menu keypad test.  Measure voltage across V501 (Vdc) Pos1 to neg2 = 0.54 – 0.56 Pos1 to neg3 = 0.49 – 0.52 Pos2 to neg3 = 0.56 – 0.58	If voltage is outside of range, then replace V501
	Power on sequence begins (quick vibration and display flash), then display darkens. Maintains a small current (less than 20 mAmps)	N1206 N1203
	Other symptoms	Replace X800 if damaged
<b>2.2 Software Flash</b>	EMMA does not respond. Display turns on and charging icon appears.	D601
	Measure voltage across V601 (Vdc) Pos1 to neg2 = 0.66 – 0.69 Pos1 to neg3 = 0.66 – 0.68	If voltage is outside of range, then replace V601
	Measure voltage across V604 (Vdc) Pos1 to neg2 = 1.03 – 1.06 Pos1 to neg6 = 0.51 – 0.53 Pos3 to neg4 = 0.45 – 0.48	If voltage is outside of range, then replace V604
<b>2.3 Charging</b>	<b>Charging from power outlet</b>  Measure voltage across V803 (Vdc) Pos1 to neg5 = 0.45 – 0.48 Pos4 to neg5 = 0.70 – 0.72	If voltage is outside of range, then replace V803
	Measure voltage across V804 (Vdc) Pos1 to neg4 = 2.78 – 2.81 Pos1 to neg5 = 0.40 – 0.43	If voltage is outside of range, then replace V804
	If above measurements are correct.	<b>N702</b>



Failure	Failure Symptom	Repair Action
	Charging from computer via USB Measure voltage across V609 (Vdc) Pos1 to neg3 = 0.21 – 0.23	If voltage is outside of range, then replace V609 D601 N702
<b>2.4 Hands-Free connection (PHF)</b>		N703 N702
<b>2.5 SIM</b>		Replace X701 if damaged N702
<b>2.6 Display</b>		Replace X424 if damaged N702
<b>2.7 Keypad Illumination (LEDs)</b>	Navigation LEDs - Individual	V562-V569
	Number Key LEDs - Individual	V555-V561, V701
	LED Group V555-V561	V526
	LED Group V562-V569	V537
	Multiple LEDs or Groups	N702
<b>2.8 Main Keypad Keys</b>		No Repair Action
<b>2.9 Volume Up / Down Key</b>		Replace X1221 if damaged
<b>2.10 PTT Key</b>		Replace X1221 if damaged
<b>2.11 Flip Keys</b>		Replace X424 if damaged
<b>2.12 Keypad Lock Key</b>		S527
<b>2.13 Vibrator</b>		Replace X424 if damaged N702
<b>2.14 Earphone (Receiver, Flip Speaker)</b>		Replace X424 if damaged N702
<b>2.15 Polyphonic Speaker (Alert, Ringer, Base Speaker)</b>		Replace X1214, X1215 if damaged N704, N705 N702
<b>2.16 Microphone</b>		Replace X702 if damaged N702
<b>2.17 Real Time Clock</b>		B300 N702
<b>2.18 Camera</b>		Replace X424 if damaged N810 N401
<b>2.19 Flip Sensor</b>		N400
<b>2.20 IR</b>		D600
<b>2.21 Bluetooth</b>		N1100 N807
<b>2.22 FM Radio</b>		No Repair Action
<b>2.23 Accelerometer</b>		N501
<b>2.24 Memory Card</b>		X201



### 3 Repair Actions for Go/No Go Test Failures

Failure	Repair Action
Fails any part of Go/No Go testing	run the calibration routine
Fails Go/No Go test, but passes calibration	replace the antenna check X1202 and X1204 for damage and replace if necessary rerun the phone through Go/No Go testing
Fails Go/No Go test after passing calibration	change X1201 and retest



## 4 Repair Actions for Calibration Routine Failures

### 4.1 GSM 850, 900, 1800, or 1900

The variable **F** in the table below will be replaced by one of the different frequencies (GSM850, GSM900, etc.).

Routine	Repair Action
F_Calibrate_RXVCO	N1203
F_Calibrate_TXVCO	N1203
F_Calibrate_TXCHVCO	N1203
F_Check_Output_Power	N1300 X1201 N1204
F_Calculate_POWTX_Value	N1300
Calibrate_VCXO	N1206
F_Measure_Multiframe	N1300 N1204
F_RSSI_Calibration	N1203 N1204

### 4.2 EDGE 850, 900, 1800, or 1900

The variable **F** in the table below will be replaced by one of the different frequencies (EDGE850, EDGE900, etc.).

The variable **X** in the table below will be replaced by one of the different levels (1, 2, or 3).

Routine	Repair Action
F_Check_Output_Power	N1300
F_Get_POWTX_Value_For_PLX	N1300
F_Calibrate_VGAGAINX	N1300 N1203
F_Calibrate_PowerX	N1300 N1203



## 5 Revision History

Rev.	Date	Changes / Comments
A	2006-Aug-29	Initial Release
B	2006-Nov-27	Removed N811 and X903 from FM radio section. These parts are not reparable. Attempting to remove the shield can causes solder ball shorts under the FM radio ASIC.
C	2007-Aug-15	Added N1100 to Bluetooth section. Added N705 to Power section.
4	2008-Jan-22	Added N702 to several sections. Changed document number and revision to new format.