1.0 General

This charger was designed as a low cost 2 cell series, Lithium-ion battery pack charger. It is a desktop type charger and draws power from a wall type AC adapter. The charger is a low dropout linear device and can charge a 2 cell series Lithium-ion battery pack to 8.4 volts with as little as 0.4 volts of overhead.

Molicel Model # MQC-1821B

2.0 Specifications

2.1 Electrical Requirements

Specification	Min.	Typ.	Max.	Unit
Input Voltage	8.8	9	12.0	V
Input Current		0.6	0.65	A
Output Voltage	8.31	8.4	8.48	V
Output Current	0.43	0.5	0.6	A
Termination Current		0.05		A
Charge Re-start Voltage		8.2		V
Charge time		3.5		Hrs
Operating Temperature	0		50	°C
Storage Temperature	-40		85	°C

2.1.1 Input Power

Power is supplied with an AC adapter. The connector to the input of the charger is a Hosiden 3150. The AC adapter holds all the regulatory approvals necessary for operation in various world countries.

2.1.2 Output Current and Voltage Requirements

To insure the safety of charging the lithium-ion pack the output voltage and current characteristics of the charger are properly controlled at all times.

2.1.3 User Indications

To provide the charger user with indication of the battery pack status a single two color LED is used. Applying power to the unit will cause a green indication from the LED. This is considered the “ready” condition. During the charging sequence the LED color will change to red. At the completion of the charging sequence, the LED will change to green to indicate the “ready” condition.

No color from the LED indicates a problem with the power source or charger.

Condition	LED Indication	Comments
No battery, powered	Green	Ready condition
Charging	Red	
Charge complete	Green	
Fault	No indication	No power applied, or charger over-temperature fault.

Insertion of a fully charged battery will not cause a change in the status of the charger LED. LED will stay in the green or “ready” condition, indicating to the user that the battery is fully charged.

2.1.3 Charging Process

When no battery is detected in the charger the charger will go to the “ready” mode. In this mode the LED will be green.

Plugging a battery into the charger that is less than 8.2 volts will cause the charger to output a charging current. Until the battery reaches the pre-set charging voltage of 8.4 volts the charger will output the maximum current, 0.5 A. When the battery voltage reaches 8.4 volts the charger will decrease the output current to main the battery at a 8.4 volt level.

The charging process is terminated when the current being delivered to the battery drops below 50 mA. When this occurs, charging is stopped and the status LED will go green.

If the battery self discharges below 8.2 volts the charger will re-start the charging sequence. In this way batteries left for long periods in the charger will maintain a full charge condition.

If the charger is placed in a very hot environment or plugged into an adapter with too high a voltage, the charger will overheat and shutdown. This will not cause damage to the charger. This will cause the LED to be turned off. The charger will reset when it cools off and continue charging.

2.2 Physical Requirements

2.2.3 Materials

The charger shall be constructed of materials that meet the necessary safety agency standards for flammability.

2.3 Environmental

The charger is designed to be operated in a warm, dry environment typical of human habituated areas with an operating temperature range of 0 to 50°C and a relative humidity low enough to be non-condensing.

Storage temperatures of -40 to 85°C.

Drop test from 1 meter to hard linoleum covered concrete. Units function normally.

3.0 Agency Certifications

3.1 UL

The UL safety specifications should be met with the use of a UL registered AC wall transformer so that no line voltages are present in the unit.

3.2 CSA

The CSA safety specifications should be met with the use of a CSA registered AC wall transformer so that no line voltages are present in the unit.

3.3 FCC Class B

The units shall meet all requirements necessary for FCC class B verification.

3.4 CE

The units shall meet all requirements necessary for CE verification.

4.0 Packaging

Units will be shipped, 24 to a carton. Each charger will be separately packaged in a plastic bag. There will be cardboard separators between each charger in the carton. The carton measurements are;

30 cm X 30 cm X 8 cm

Approximate weight of one carton including 24 chargers is; 2 kg.

5.0 History Record

REV.:	DATE EFFECTIVE:	DESCRIPTION OF REVISION	
		OLD	NEW
AA	010420	First release	
BB	010523	Revise current regulation tolerances	
REASON for CHANGE:			