

GENERAL DESCRIPTION

The M62253FP is a charge controller designed for charging lithium ion batteries.

The IC has a current and voltage control circuit allowing the constant current/voltage charging to lithium ion batteries.

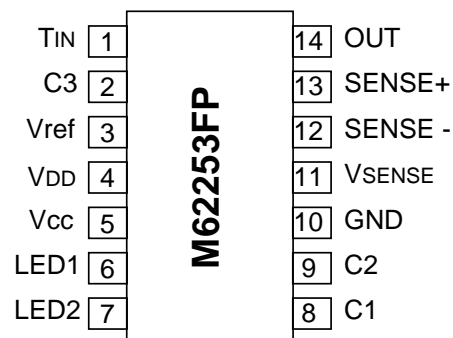
A charger system for lithium ion batteries can be easily designed by utilizing the IC's following functions ;

- charge disabling function for an over discharged battery
- charge control function by detecting the battery temperature

FEATURES

- Constant current and voltage charging
- Charge disabling functions for an over discharged battery and a high/low temperature battery
- Recharging function
- 2 LED driving circuits to Indicate charging conditions
- Delay circuit to prevent chattering

PIN CONFIGURATION(TOP VIEW)

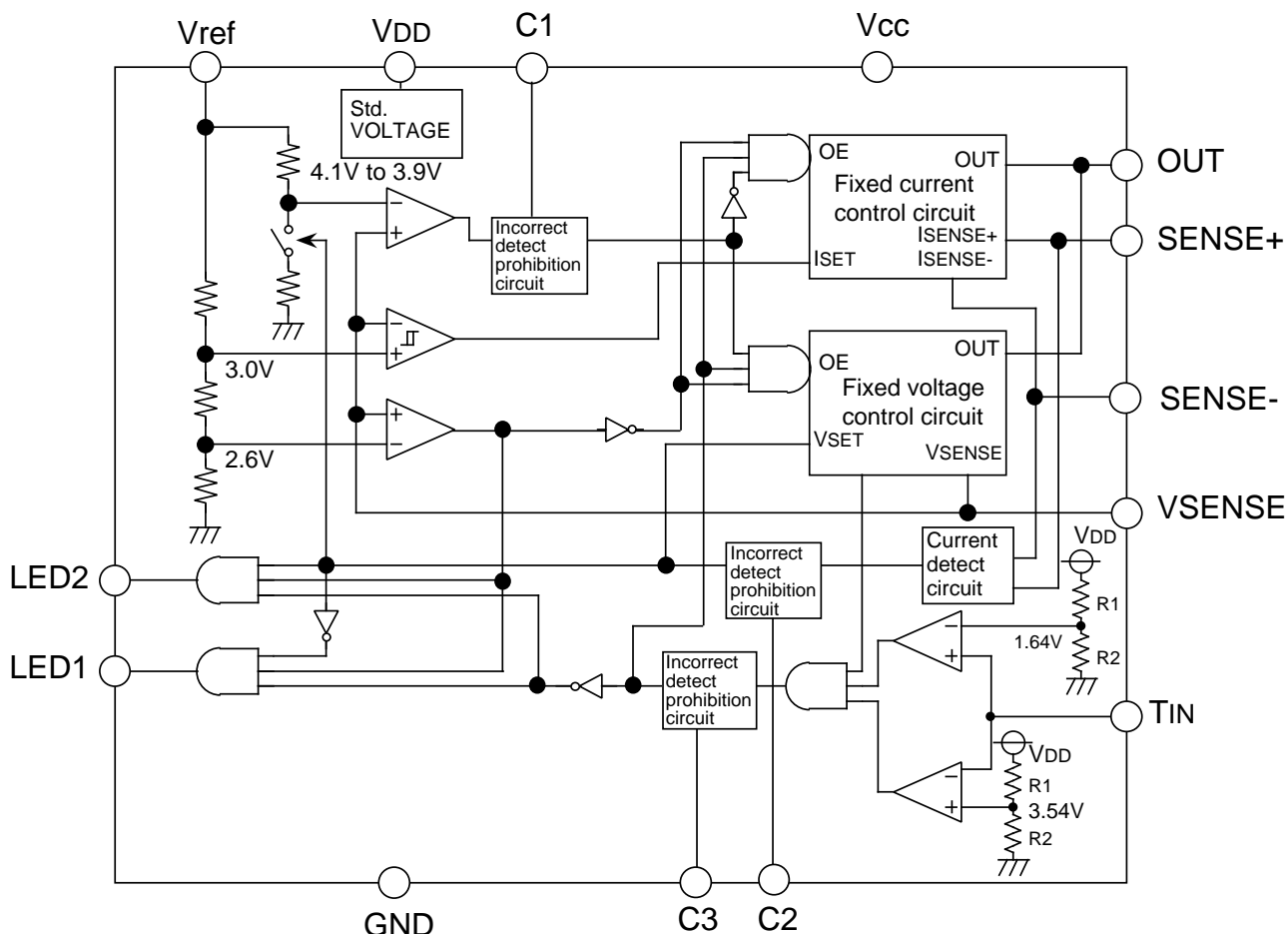


Outline 14P2N-A

APPLICATION

Lithium ion battery charger for digital equipment

BLOCK DIAGRAM



EXPLANATION OF TERMINALS

Pin No.	Symbol	Function
1	TIN	Temperature detection (also using for battery connect detection)
2	C3	Setting delay time of temperature detection (Tpd=50ms at 0.1μF)
3	Vref	Reference voltage of internal circuit.
4	VDD	5.0V reference voltage
5	Vcc	Power supply
6,7	LED1,2	LED connection (LED1 is on during charging, LED2 is on at charge completion.)
8	C1	Setting delay time of voltage detection (Tpd = 1.20sec at 2.2μF)
9	C2	Setting delay time of current detection (Tpd = 1.30sec at 2.2μF)
10	GND	Ground
11	VSENSE	Battery voltage detection
12	SENSE-	Charging current detection
13	SENSE+	Charging current detection
14	OUT	Output (open collector configuration)

LITHIUM ION BATTERY CHARGER CONTROL IC

ABSOLUTE MAXIMUM RATING

(Ta=25°C unless otherwise noted)

Symbol	Parameter	Test conditions	Ratings	Unit
Vcc	Supply voltage		16	V
IOUT	OUT pin output current		30	mA
VSENSE	SENSE pin voltage		Vcc	V
TIN	TIN pin voltage		Vcc	V
Pd	Power dissipation	Ta = 25°C	450	mW
Ktheata	Thermal derating	Ta = 25°C	4.5	mW/°C
Topr	Operating temperature		-20 to +85	°C
Tstg	Storage temperature		-40 to +125	°C

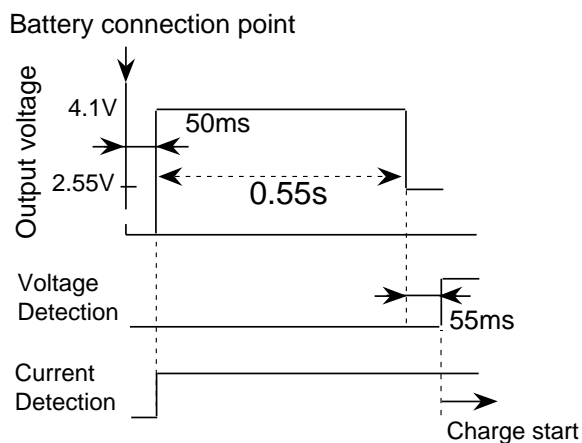
ELECTRICAL CHARACTERISTICS

(Vcc=8.5V, Vref=4.10V, VSENSE=3.6V, Ta=25°C, unless otherwise noted)

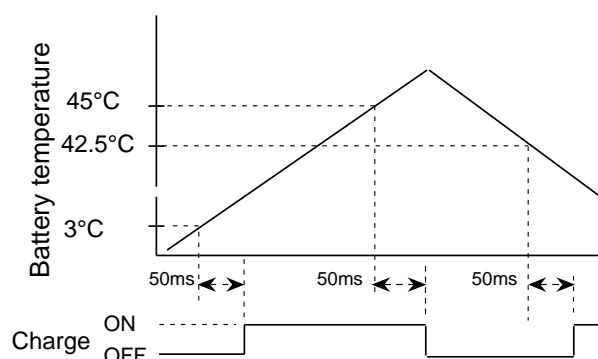
Block	Symbol	Parameter	Test condition	Limit			Unit
				MIN	TYP	MAX	
	Vcc	Supply voltage range		6.0	—	15	V
	Icc	circuit current	LED OFF		7		mA
VDD	VDD	VDD pin output voltage		4.75	5.00	5.25	V
Voltage detect part	VTHchgON	Charge start voltage		2.5	2.6	2.7	V
	VTHqchgON	Fast charge start voltage		2.9	3.0	3.1	V
	VTHqchgOFF	Const current charge stop voltage		4.06	4.09	4.12	V
	Vochg1	Output voltage set1	Charge time	4.07	4.10	4.13	V
	Vochg2	Output voltage set2	Charge complete time	2.45	2.55	2.65	V
	VTHrchgON	Recharge start voltage	Charge complete time	3.8	3.9	4.0	V
Current detect part	ISSET1	Charge current set voltage 1	2.6V battery voltage 3.0V	15	25	35	mV
	ISSET2	Charge current set voltage 2	3.0V battery voltage 4.1V	235	250	265	mV
	ITHchgOFF	Charge complete detect voltage	Const voltage charge time	15	25	35	mV
	IINSENSE+	SENSE+ pin input current	Charge time	—	60	85	μA
	IINSENSE-	SENSE- pin input current	Charge time	—	60	85	μA
LED	IoutLED1	LED1 pin output current		8	10	12	mA
	IoutLED2	LED2 pin output current		8	10	12	mA
	VOHLED1	LED1 pin output "H" voltage				2.5	V
	VOHLED2	LED2 pin output "H" voltage				2.5	V
TIN	VTHINTH1	TIN pin up side threshold voltage 1	Resistance ratio(R1/R2) *in the block diagram	0.398	0.410	0.422	
	VTHINTL1	TIN pin low side threshold voltage 1		1.989	2.050	2.112	
	IinTIN	TIN pin input current		-1.0			μA
	VTHINTH2	TIN pin up side threshold voltage 2	Resistance ratio(R1/R2) *in the block diagram	0.388	0.400	0.412	
	VTHINTL2	TIN pin low side threshold voltage 2		1.804	1.860	1.916	
OUT	VOHOUT	OUT pin saturation voltage	IOUT=20mA		1.0	2.0	V
	ILOUT	OUT pin leak current	VC=15V			1.0	μA
C1	tdC1	Voltage detect delay time	Recharge time@C1= 2.2μ F	0.88	1.20	1.52	s
C2	tdBDET1	Connect detect time 1	4.1V output time C2= 2.2μ F	0.95	1.30	1.63	s
	tdBDET2	Connect detect time 2	2.55V output time C2= 2.2μ F	88	120	152	ms
	tdIDET	Current detect delay time	C2= 2.2μF	0.95	1.30	1.65	s
	tdILED	LED switching delay time	C2= 2.2μF	1.8	2.5	3.2	s
	tdchg	Discharge time	C2= 2.2μF(After current detect)	30	90	—	ms
C3	tdC3	Temperature detect delay time	C3= 0.1μF	36	50	64	ms

4. Timing chart (a case of application's constants)

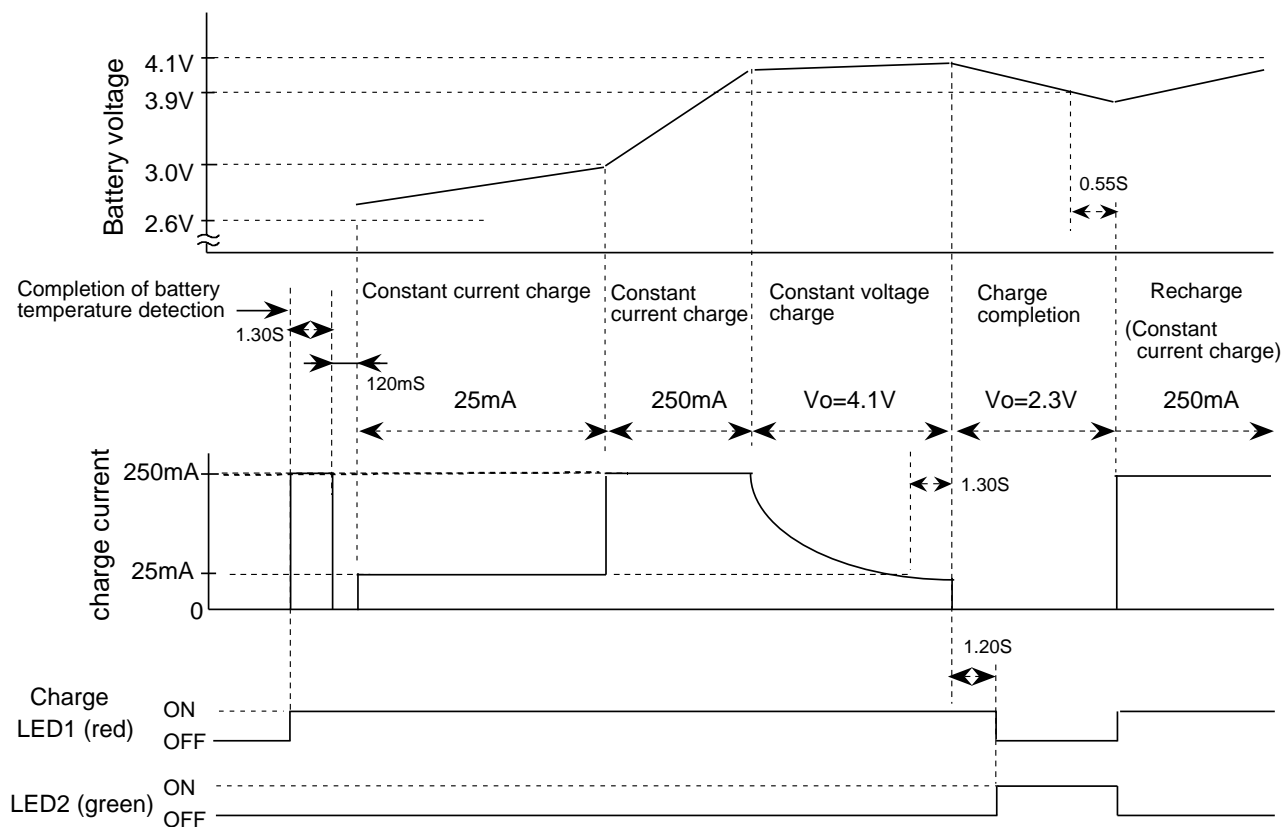
(1) Timing of battery connecting detection



(2) Timing of temperature detection



(3) Timing of charging



5. APPLICATION EXAMPLE

