

To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

GENERAL PURPOSE BATTERY CHARGER CONTROL IC

DESCRIPTION

The M62258FP is designed as general purpose battery charger control. The M62258FP has function which require for the batterycharge control on single chip. Not only the combination of M62258 and microcomputer capable of handing battery charge control, but also it is capable of monitoring battery temperature, prevent from over current or voltage, using minimal peripherals. It also has feedback function to the primary side of SW power supply, which can used to control feedback of charge current and output voltage.

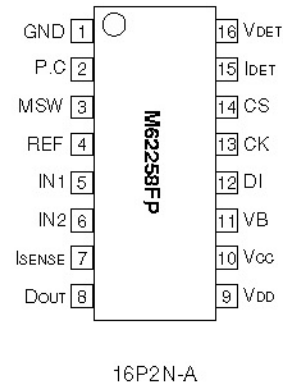
FEATURES

- Built-in 3 wire serial data interface function for MCU.
- Built-in multiplexer and level magnification circuit with 2input ports.
- Built-in low input/output operation 5V voltage regulator function. (Pre drive type)
- Built-in charge current/output voltage control circuit.

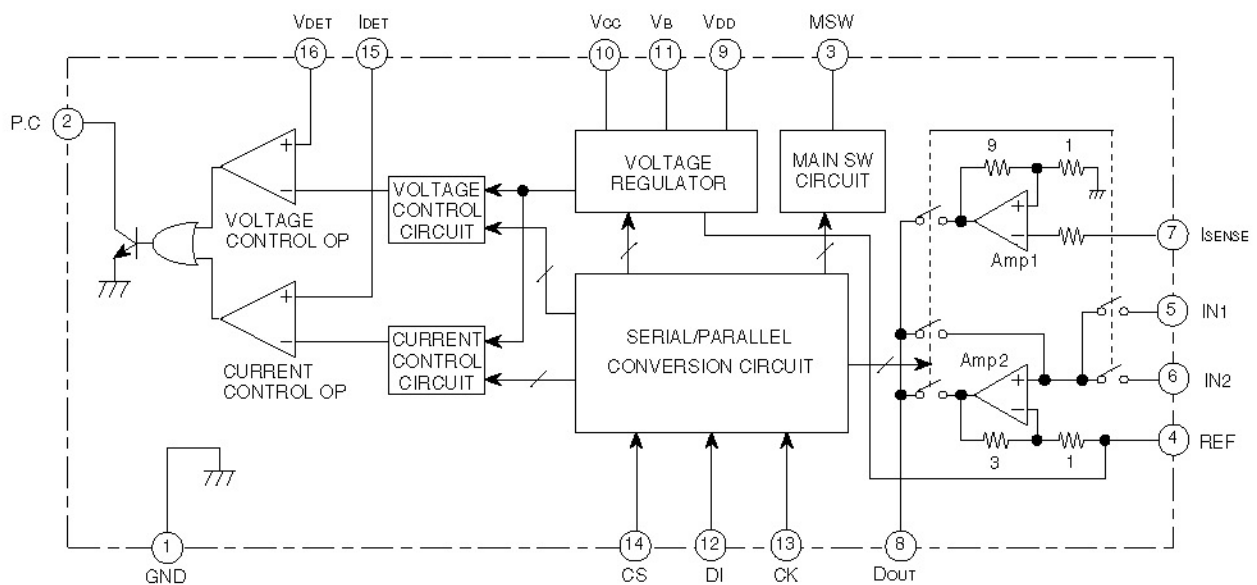
APPLICATION

Video camera, hand held telephone and general battery charger for other digital equipment

PIN CONFIGURATION (TOP VIEW)



BLOCK DIAGRAM



GENERAL PURPOSE BATTERY CHARGER CONTROL IC

EXPLANATION OF TERMINALS

Pin No.	Symbol	Function
⑫	DI	The serial data input pin which used to receive 8 bit wide serial data
⑬	CK	The shift clock input pin which takes the input signal of DI pin to 8 bit shift register by the rising edge of clock signal
⑭	CS	When this pin is "Low", DI pin can receive the data into the 8 bit shift register. The each bit will be latched at rising edge of the clock signal
⑧	DOUT	The output pin of the amplified A-D data
④	REF	The reference voltage output pin of the A-D converter
⑤,⑥	IN1,2	The A-D converter input pin
⑦	ISENSE	The current sense input pin
③	MSW1	The main switch driver output pin (Open collector)
⑨	VDD	The stabilized +5V output pin
⑪	V _B	The pre-drive pin which used to connect the external PNP Tr
⑩	VCC	The power supply pin
⑮	IDET	The current detection input pin
⑯	VD _{DET}	The voltage detection input pin
②	P.C	The feedback pin for voltage and current control
①	GND	The ground pin

ABSOLUTE MAXIMUM RATINGS

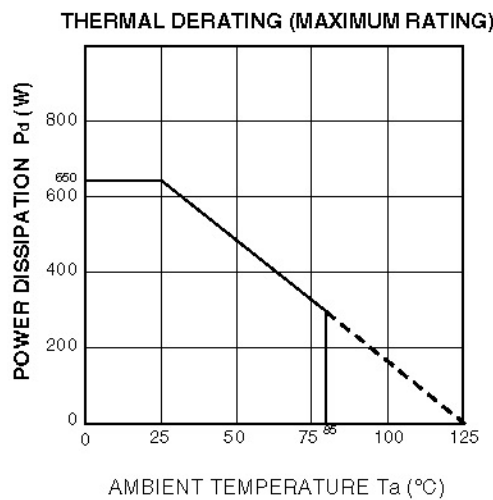
Symbol	Parameter	Ratings	Unit
V _{CC}	Supply voltage	16	V
I _{sw}	Main switch drive current	200	mA
I _B	Regulator output current	20	mA
I _{PC}	P.C drive current	10	mA
V _{sw}	Main switch max. voltage	V _{CC}	V
V _{PC}	P.C max.voltage	V _{CC}	V
P _d	Power dissipation	650	mW
K _θ	Thermal derating	6.5	mW/ °C
T _{opr}	Operating temperature	-20to+85	°C
T _{stg}	Storage temperature	-40to+125	°C

GENERAL PURPOSE BATTERY CHARGER CONTROL IC

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$, $V_{CC}=12\text{V}$, $I_{SW}=50\text{mA}$, unless otherwise noted)

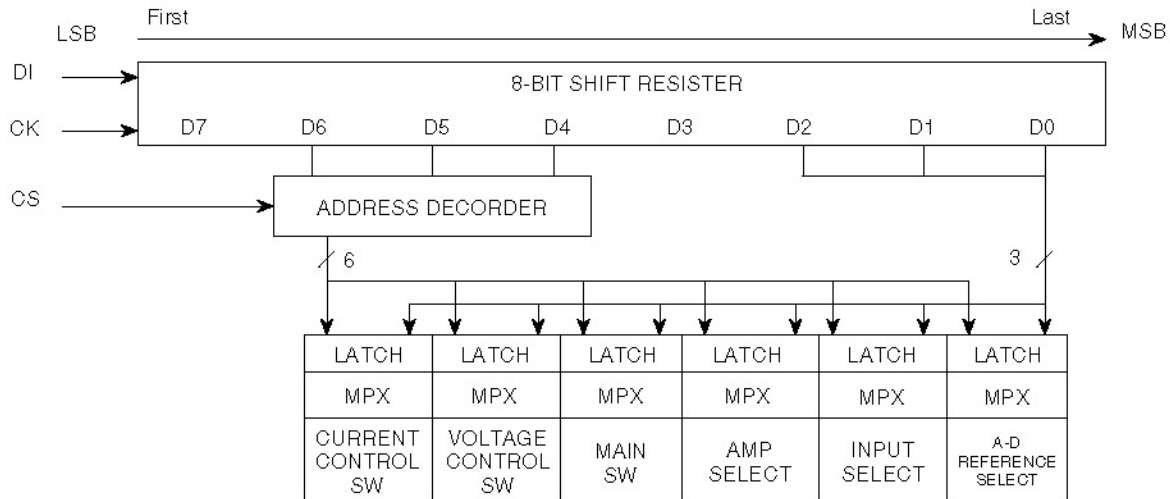
Block	Symbol	Parameter	Test conditions	Limits			Unit
				Min	Typ	Max	
	V_{CC}	Supply voltage		$V_{DD}+0.2$		15	V
	I_{CC}	Circuit current			15		mA
5V power supply	V_{DD}	Stabilized voltage output	$I_B=10\text{mA}$	4.75	5.00	5.25	V
	Reg-in	Input regulation	$V_{DD}+0.2\text{V}$		50	200	mV
	Reg-L	Load regulation	$I_{DD}=1$ to 100mA		10	100	mV
	R.R	Ripple rejection ratio	$f=120\text{Hz}$, $V_{in}=0.01\text{V}$		60		dB
	V_{DEF}	Min. input-output voltage difference			0.2		V
SW	V_{satM}	Main-SW output saturation voltage	$I_{SW}=50\text{mA}$		0.8	1.2	V
Control Op.	V_{IN}	Input voltage range		0		$V_{CC}-2$	V
	I_{IB}	Input bias current		-1			μA
Level Mag.	V_{PCL}	P.C output "L" voltage	$I_{PC}=5\text{mA}$		0.2	0.4	V
	V_{ISENSE}	I_{SENSE} input voltage range				0.5	V
	V_{IN-IN}	IN input voltage range	$V_{CC}\geq 7\text{V}$	0.2		5	V
			$V_{CC}=5.5\text{V}$	0.2		3.5	V
	I_{IN}	IN input current		-100			nA

TYPICAL CHARACTERISTICS

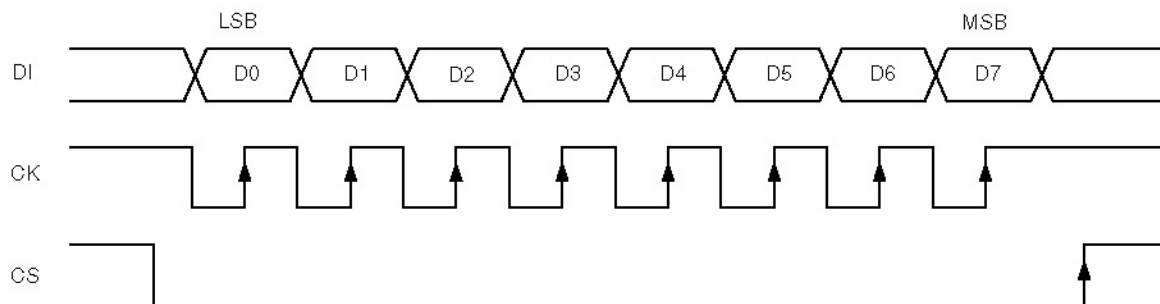


GENERAL PURPOSE BATTERY CHARGER CONTROL IC

DIGITAL DATA FORMAT



DATA TIMING CHART (MODEL)



DATA SETTINGS

Control function	Address				Data				Description
	D7	D6	D5	D4	D3	D2	D1	D0	
RESET	0	0	0	0	-	-	-	-	Main-SW is OFF, A-D reference voltage=0.8V Voltage setting reference voltage=4.0V Current setting reference voltage=45mV
Current control	0	0	0	1	-	-	-	-	See Table 1
Voltage control	0	0	1	0	-	-	-	-	See Table 2
Main SW	0	0	1	1	-	-	-	-	See Table 3
Amp. select	0	1	0	0	-	-	-	-	See Table 4
Input select	0	1	0	1	-	-	-	-	See Table 5
A-D reference select	0	1	1	0	-	-	-	-	See Table 6

GENERAL PURPOSE BATTERY CHARGER CONTROL IC

Table 1. Current control data

D2	D1	D0	Current control input voltage	Current ratio
0	0	0	0V	0
0	0	1	45mV	1/8
0	1	0	80mV	1/4
0	1	1	160mV	1/2
1	0	0	240mV	3/4
1	0	1	320mV	1
1	1	0	—	Trickle

*During trickle charge mode, use constant voltage mode and charge directly to the battery using external resistor

*45mV selected at RESET

Table 2. Voltage control data

D2	D1	D0	Voltage control input voltage	Voltage ratio
0	0	0	0V	0
0	0	1	0.8V	1
0	1	0	1.6V	2
0	1	1	2.4V	3
1	0	0	3.2V	4
1	0	1	4.0V	5
1	1	0	4.8V	6

*Output port of microcomputer can be used to control voltage and current setting

*4.0V setting at RESET

Table 3. Main SW select

D0	SW1
0	OFF
1	ON

*Main SW is off at RESET

Table 4. Amp. select

D1	D0	State
0	0	Select Amp.1 output
0	1	Select Amp.2 input
1	0	Select Amp.2 output

*Amp.1 output is selected at RESET

Table 5. Input select

D0	State
0	Select in1
1	Select in2

*IN1 selected at RESET

Table 6. A-D Reference voltage select

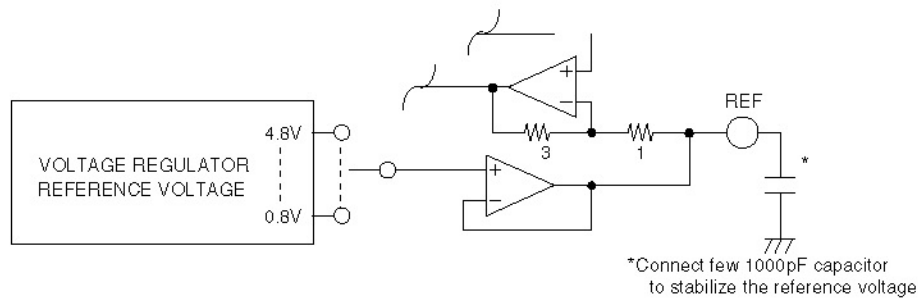
D2	D1	D0	State
0	0	0	Select 0V
0	0	1	Select 0.8V
0	1	0	Select 1.6V
0	1	1	Select 2.4V
1	0	0	Select 3.2V
1	0	1	Select 4.0V
1	1	0	Select 4.8V

*0.8V is selected at RESET

GENERAL PURPOSE BATTERY CHARGER CONTROL IC

Function block description

(1).A-D converter input



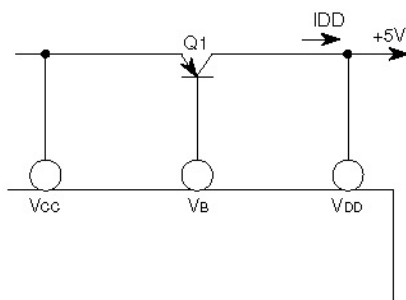
Select the desire reference voltage to be detected by serial data from the microcomputer.

The input voltage level of IN1 and IN2 will be magnified 4 times using selected reference voltage as a canter.

This magnified data will be return to the A-D input port of the microcomputer.

As result, accuracy of the A-D converter of the microcomputer will be increased by 2 bit.

(2).+5V voltage regulator



Since it capable of driving external PNP Tr. base up to 20mA, it can supply current of

$$IDD\ MAX=20mA \times Q1hFE.$$

Also, since this is low I/O type power source, it can be operate

$$Vcc-VDD=0.1V$$

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APPLICATION EXAMPLE

