Ordering number : EISB0006A

SANYO SiP (System in Package) technology

ISB
(Integrated System in Board)

ISB-E48-0, ISB-E48-1

Ultrathin Miniature Package

Charger Circuit Voltage Sensor + 3 P-channel MOSFETs

Overview

The ISB-E48-0, ISB-E48-1 incorporates in its power input block a high-precision voltage detector that provides protection against overvoltage. The ISB-E48-0, ISB-E48-1 also includes three P-channel MOSFET chips and allows for easy implementation of a charger circuit for cell phones and other portable equipment by incorporating the IC in a current interrupting switch activated by a voltage-detector or in an output block of a charger control IC.

Application

- Battery charger for portable equipment including cell phones.

Features

- On-chip high-precision voltage detector and three P-channel MOSFET chips.
- Miniature package makes this IC ideal for miniaturization of electronic devices and high-density mounting on printed circuit boards.

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Specifications

Absolute Maximum Ratings at Ta = 25°C

Internal Device	Parameter	Symbol	Conditions	Ratings	Unit
IC	Input voltage	V_{IN}		12	V
	Output current	I_{OUT}		50	mA
	Output voltage	V_{OUT}		V_{SS}-0.3 to V_{IN}+0.3	V
	Allowable power dissipation	P_D-IC	When mounted on a specified board *	0.65	W
TR1	Drain-to-source voltage	V_{DSS}		-20	V
	Gate-to-source voltage	V_{GSS}		±10	V
	Drain current	I_D		-2.0	A
	Allowable power dissipation	P_D-T	When mounted on a specified board *	1.4	W
TR2 and TR3	Drain-to-source voltage	V_{DSS}		-20	V
	Gate-to-source voltage	V_{GSS}		±10	V
	Drain current	I_D		-4	A
	Allowable power dissipation	P_D-T	When mounted on a specified board *	1.5	W
Operating ambient temperature		Topr		-30 to +85	°C
Storage ambient temperature		Tstg		-40 to +125	°C

* Specified board: 40mm×25mm×0.8mm FR4 board

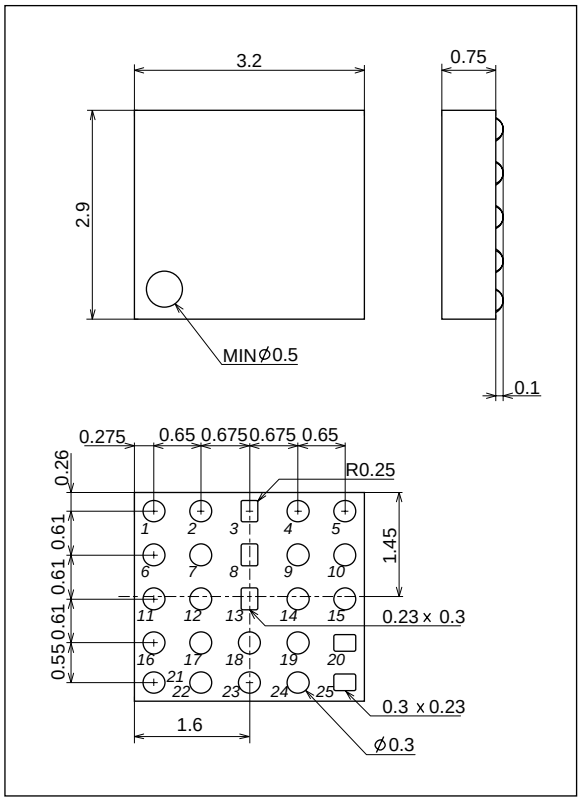
Electrical Characteristics

Overall Operating Characteristics at Ta = 25°C, with a dedicated test circuit

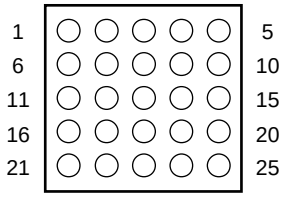
Internal Device	Parameter	Symbol	Conditions	Ratings			Unit
				min	typ	max	
IC	Detecting voltage	V_{DF}	ISB-E48-0	2.646	2.7	2.754	V
			ISB-E48-1	3.234	3.3	3.366	V
	Current consumption	I_{SS}	V_{IN}=3.0V		0.9	3.0	μA
	Output current	$I_{OUT}1$	ISB-E48-0 NchV_{DS}=0.5V,V_{IN}=2.0V	3.0	7.7		mA
			ISB-E48-1 NchV_{DS}=0.5V,V_{IN}=3.0V	5.0	10.1		mA
		$I_{OUT}2$	PchV_{DS}=2.1V, V_{IN}=8.0V		-10.0	-2.0	mA
TR1	Drain-to-source breakdown voltage	V_{DSS}	I_D=-1mA, V_{GS}=0V	-20			V
	Drain-to-source cutoff current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-10	μA
	Gate-to-source leakage current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
	Gate-to-source cutoff voltage	V_{GS}(off)	V_{DS}=-10V, I_D=-1mA	-0.3		-1.0	V
	Drain-to-source on resistance	R_{DS}(on)1	I_D=-1A, V_{GS}=-4V		125	165	mΩ
		R_{DS}(on)2	I_D=-0.5A, V_{GS}=-2.5V		155	220	mΩ
		R_{DS}(on)3	I_D=-0.1A, V_{GS}=-1.8V		195	280	mΩ
TR2 and TR3	Drain-to-source breakdown voltage	V_{DSS}	I_D=-1mA, V_{GS}=0V	-20			V
	Drain-to-source cutoff current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1.0	μA
	Gate-to-source leakage current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
	Gate-to-source cutoff voltage	V_{GS}(off)	V_{DS}=-10V, I_D=-1mA	-0.4		-1.3	V
	Drain-to-source on resistance	R_{DS}(on)1	I_D=-2A, V_{GS}=-4.5V * Design guaranteed value			63	mΩ
		R_{DS}(on)2	I_D=-1A, V_{GS}=-2.5V * Design guaranteed value			96	mΩ

Package Dimensions

unit : mm



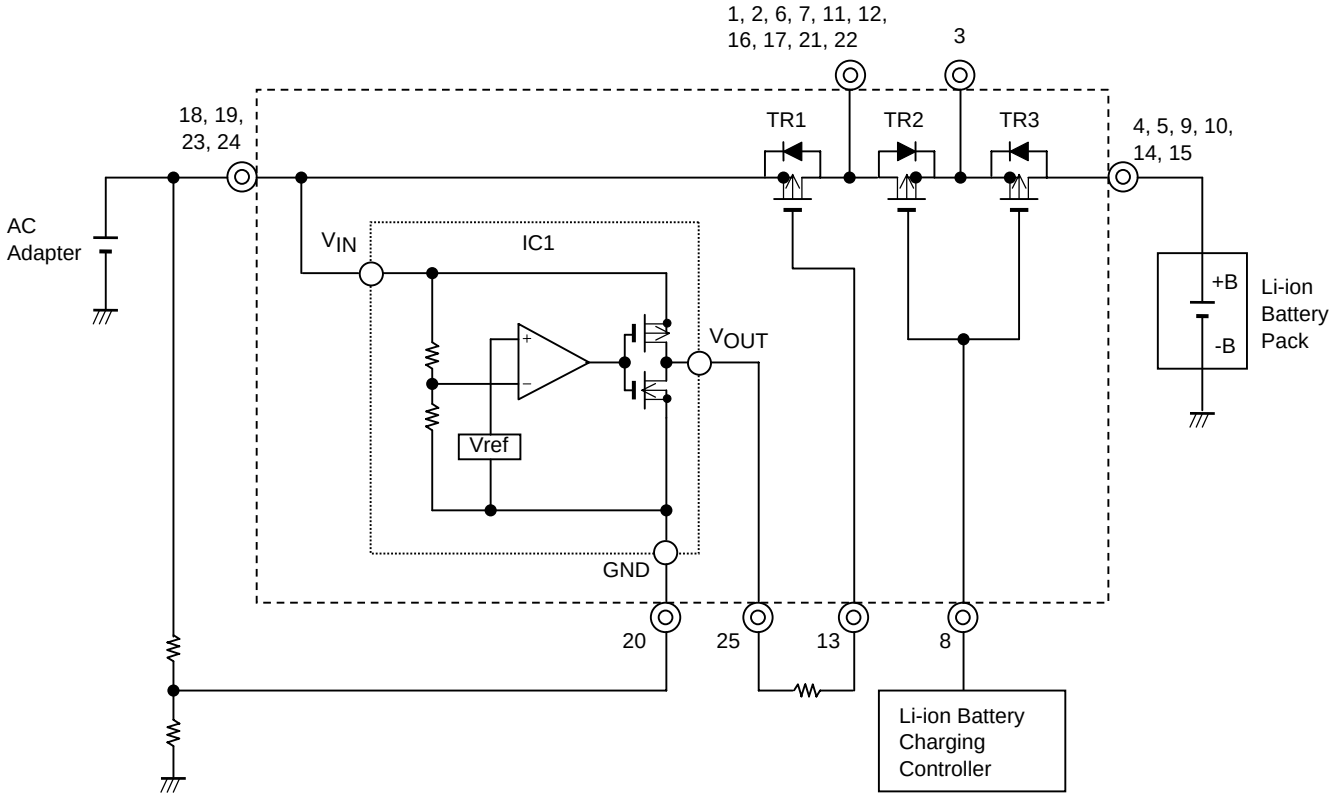
Pin Assignments Diagram



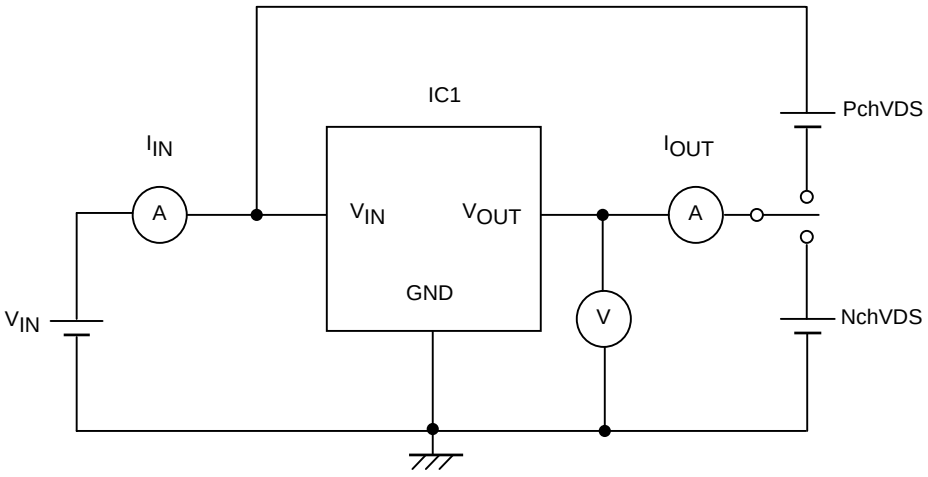
(Bottom view)

1	TR1, 2 Drain	TR1, 2 Drain	TR2, 3 Source	TR3 Drain	TR3 Drain	5
6	TR1, 2 Drain	TR1, 2 Drain	TR2, 3 Gate	TR3 Drain	TR3 Drain	10
11	TR1, 2 Drain	TR1, 2 Drain	TR1 Gate	TR3 Drain	TR3 Drain	15
16	TR1, 2 Drain	TR1, 2 Drain	IC V_{IN} TR1 Source	IC V_{IN} TR1 Source	IC GND	20
21	TR1, 2 Drain	TR1, 2 Drain	IC V_{IN} TR1 Source	IC V_{IN} TR1 Source	IC V_{OUT}	25

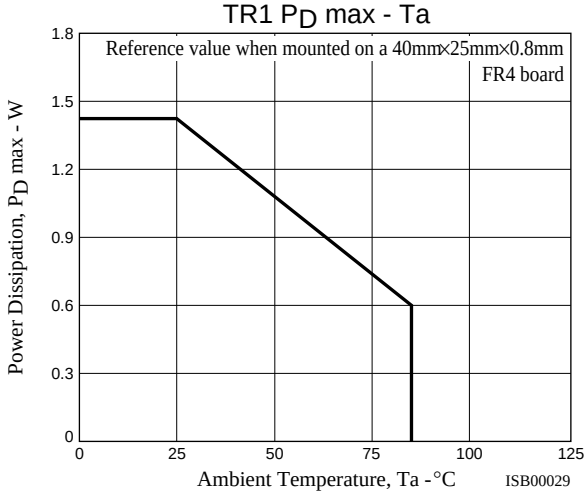
Internal Equivalent Circuit and Sample Peripheral Circuit



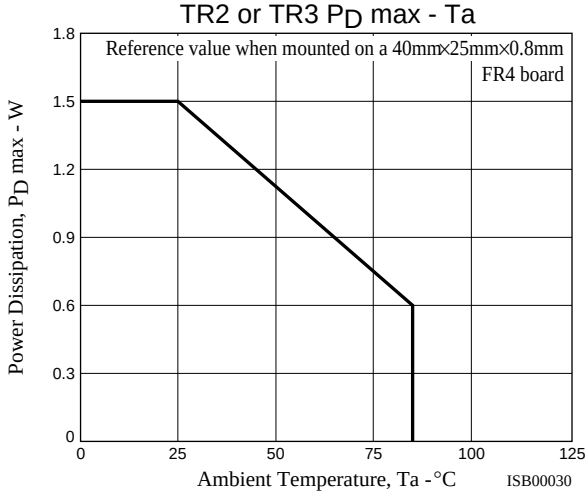
IC Test Circuit



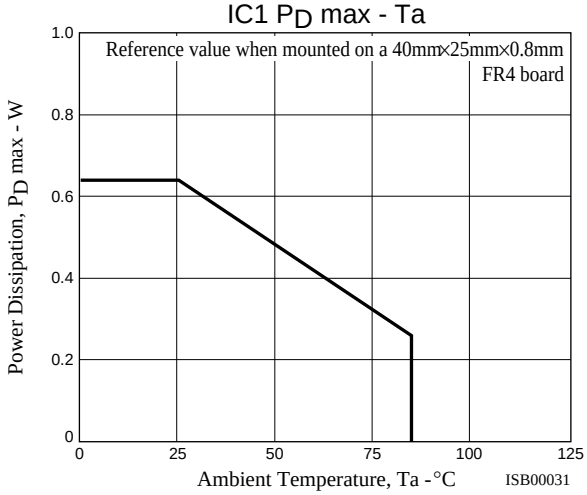
TR1 P_D max - Ta



TR2 or TR3 P_D max - Ta



IC1 P_D max - Ta



<Manufactured by>

ISB Management Department, Custom Module Division, Electronic Device Company, Component & Device Group, SANYO Electric Co., Ltd.

This catalog provides information as of May, 2007. Specifications and information herein are subject to change without notice.