M62015L/FP, M62016L/FP

Low Power 2 Output System Reset IC

REJ03D0783-0100
Rev.1.00
Sep 14, 2005

Description

The M62015 and M62016 are semiconductor integrated circuits whose optimum use is for the detection of the rise and fall in the power supply to a microcomputer system in order to reset or release the microcomputer system.

The M62015 and M62016 carry out voltage detection in two steps and have two output pins. As Bi-CMOS process and low power dissipating circuits are employed, they output optimum signals through each output pin to a system that requires RAM backup.

These ICs also support the backup mode of Renesas microcomputer the M16C.

Features

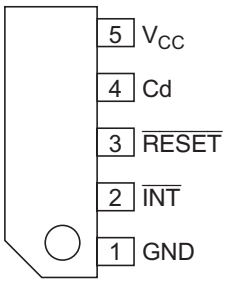
- Bi-CMOS process realizes a configuration of low current dissipating circuits.
  Circuit current
  I_{CC} = 3 µA (Typ, normal mode, V_{CC} = 3.0 V)
  I_{CC} = 1 µA (Typ, backup mode, V_{CC} = 2.5 V)
- Two-step detection of supply voltage
  Detection voltage in normal mode: V_S = 2.7 V (Typ)
  Detection voltage in backup mode: V_{BATT} = 2.0 V (Typ)
- Two outputs
  Reset output ($\overline{RESET}$): output of compulsive reset signal
  Interruption output ($\overline{INT}$): output of interruption signal
- Two types of output forms
  CMOS output: M62015L/FP
  open drain output: M62016L/FP

Application

- Prevention of errors in microcomputer system in electronic equipment that requires RAM backup, such as office, industrial, and home-use equipment.

Pin Arrangement

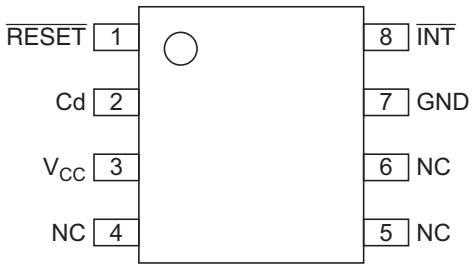
M62015L
M62016L



(Top view)

Package: 5P5T

M62015FP
M62016FP

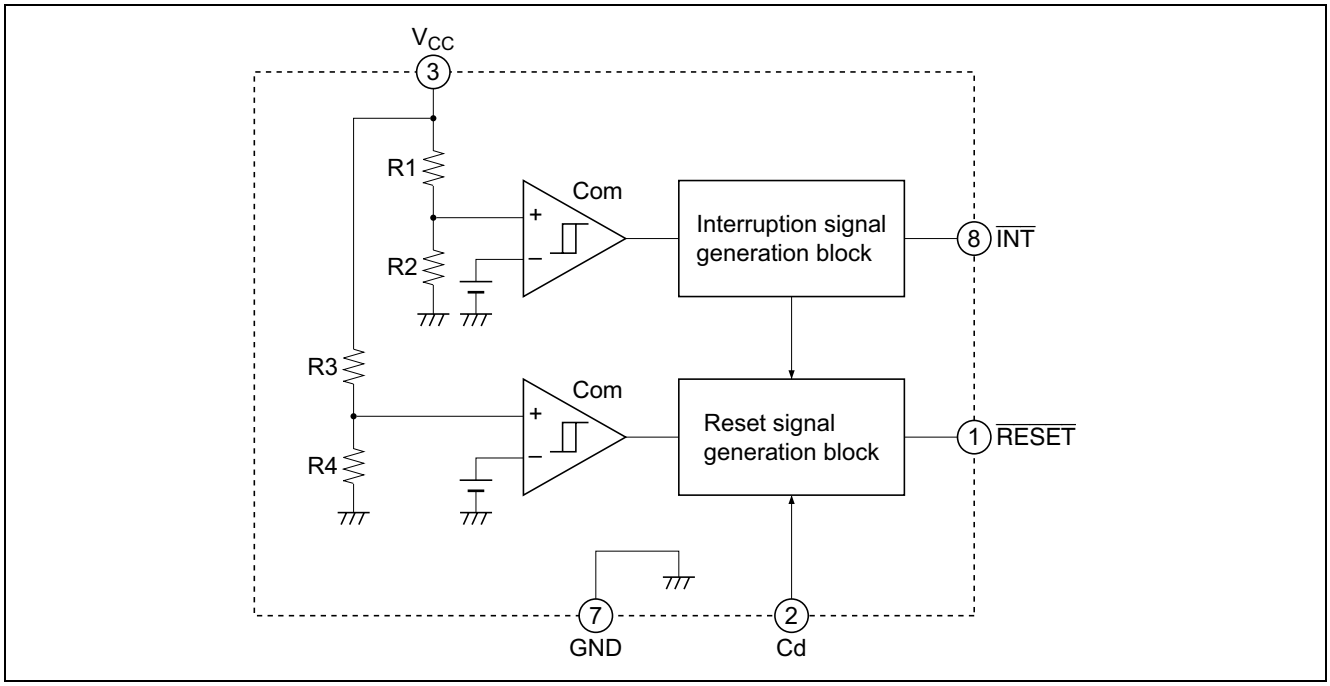


(Top view)

NC: No Connection

Package: PRSP0008DA-A (8P2S-A)

Block Diagram



Absolute Maximum Ratings

(Ta = 25°C, unless otherwise noted)

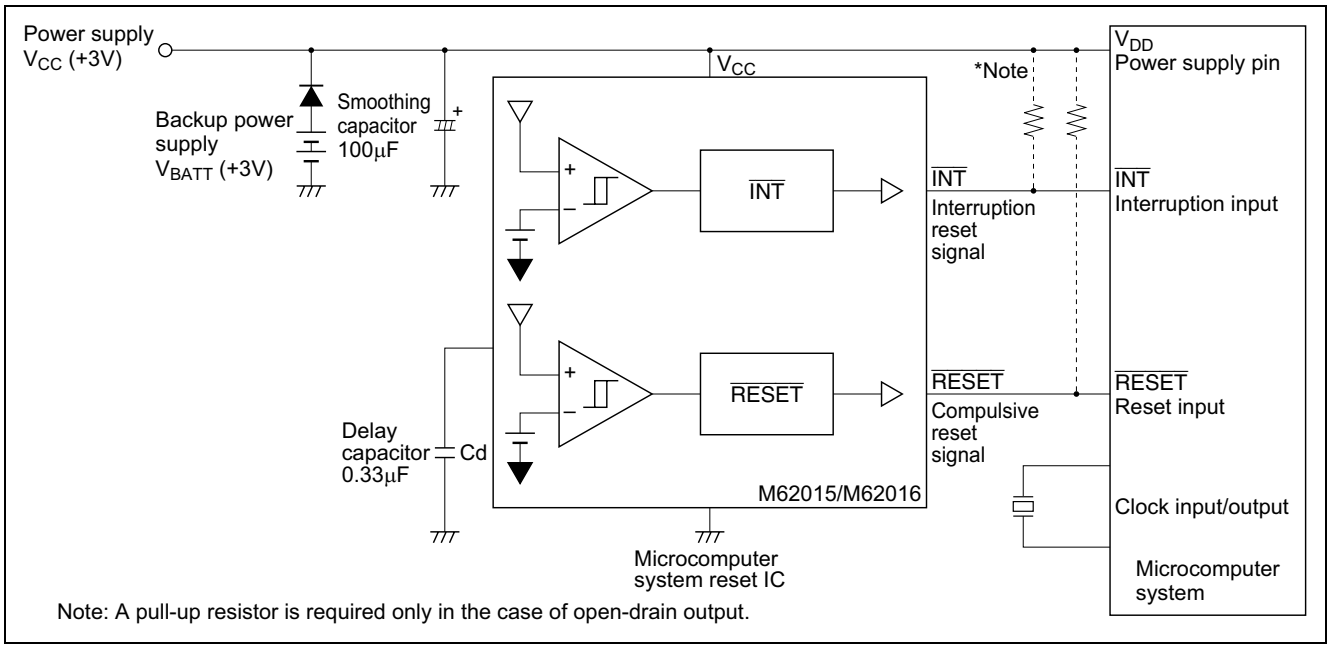
Item	Symbol	Ratings	Unit	Conditions
Supply voltage	V_{CC}	8	V	
Output sink current	Isink	4	mA	
Power dissipation	Pd	440	mW	
Thermal derating	Kθ	4.4	mW/°C	Ta ≥ 25°C
Operating temperature	Topr	–20 to +75	°C	
Storage temperature	Tstg	–40 to +125	°C	

Electrical Characteristics

(Ta = 25°C, unless otherwise noted)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Supply voltage	V_S	2.55	2.70	2.85	V	Interruption level during V_{CC} drop
Battery voltage	V_{BATT}	1.85	2.00	2.15	V	Reset level at backup
Hysteresis voltage	ΔV_S	—	60	—	mV	$\Delta V_S = V_{SH} - V_{SL}$
Circuit current	I_{CC}	—	3.0	12	μA	V_{CC} = 3.0V: in normal mode
		—	1.0	4.0		V_{CC} = 2.5V: in backup mode
Sink ability	Vsat	—	0.4	0.6	V	V_{CC} = 2.5V, Isink = 2mA
Delay time	td	—	50	—	ms	External capacitance Cd = 0.33μF
Reset output response time	$t_{\overline{RESET}}$	—	50	—	μs	When V_{CC} falling
Interruption output reset time	$t_{\overline{INT}}$	—	40	—	μs	When V_{CC} falling

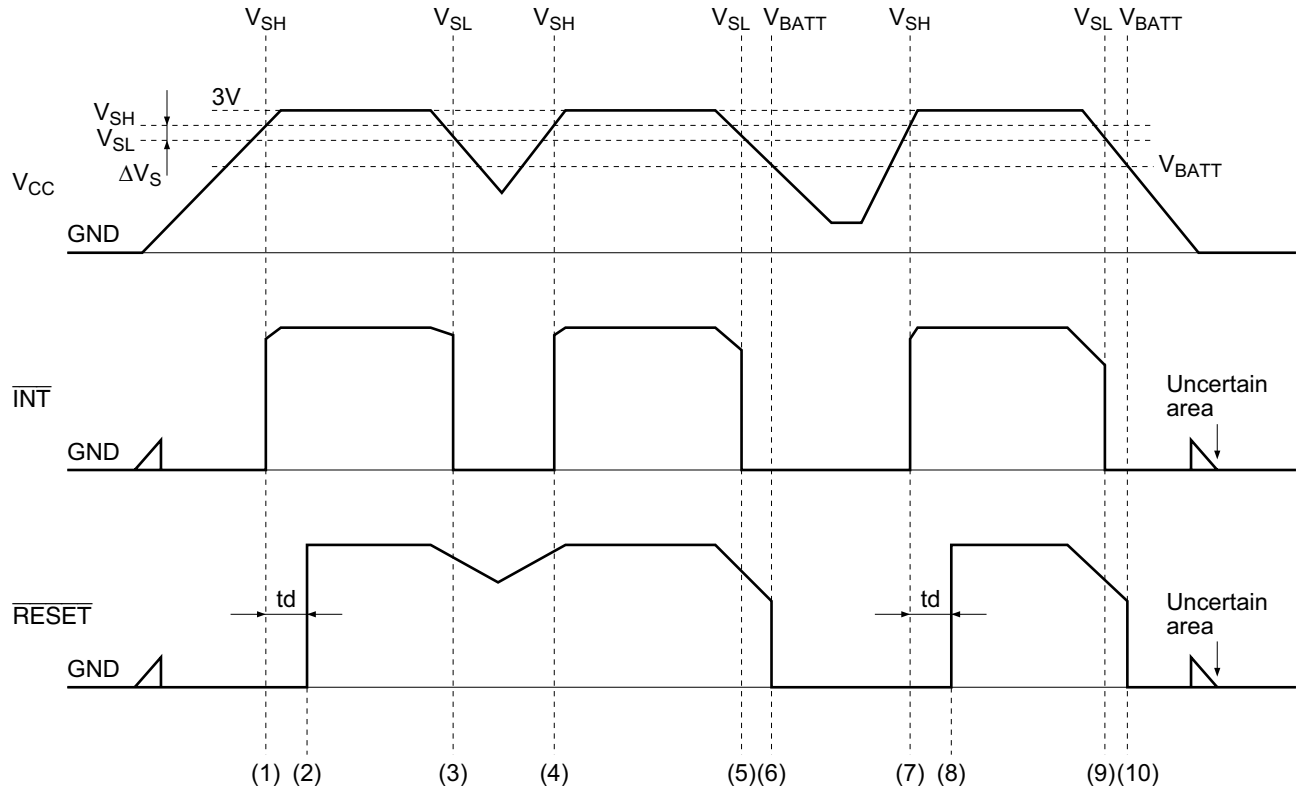
Application Example



Note: A pull-up resistor is required only in the case of open-drain output.

Figure 1 Application Example

Operating Description



(1): If V_{CC} rises to V_{SH} (2.76V), the $\overline{INT}$ output is set to high level.
(2): $\overline{RESET}$ goes high t_d (s) after V_{SH}.
* td = $1.52 \times 10^5 \times C$ (s)
(3): If V_{CC} drops to V_{SL} (2.70V), $\overline{INT}$ goes low.
* $\overline{RESET}$ output continues to be held high.
(4): If V_{CC} returns to V_{SH}, the $\overline{INT}$ output is set to high level.
(5): Same as (3).
(6): If V_{CC} becomes lower than V_{BATT} (2.00V), the $\overline{RESET}$ output is set to low thereby resetting the microcomputer and initializing system.
(7): Same as (1).
(8): Same as (2).
(9): Same as (3) and (5).
(10): Same as (6).

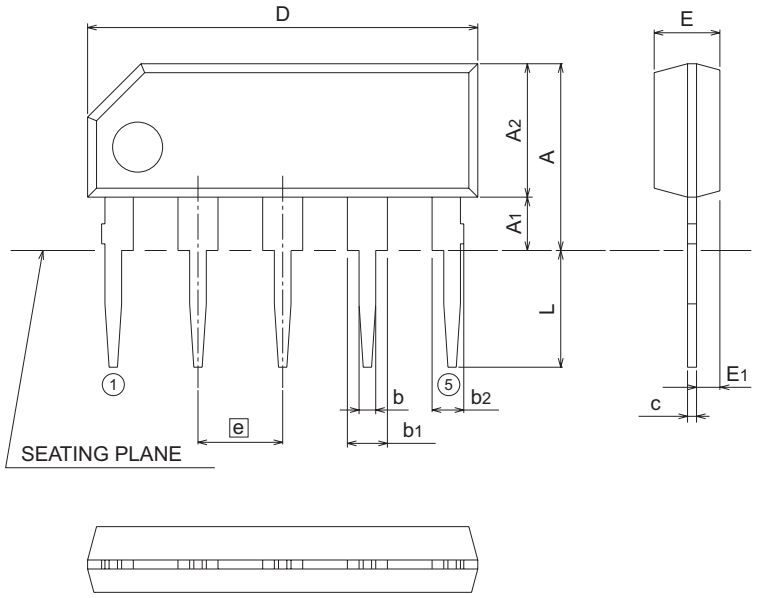
Figure 2 Operating Waveform

Package Dimensions

5P5T

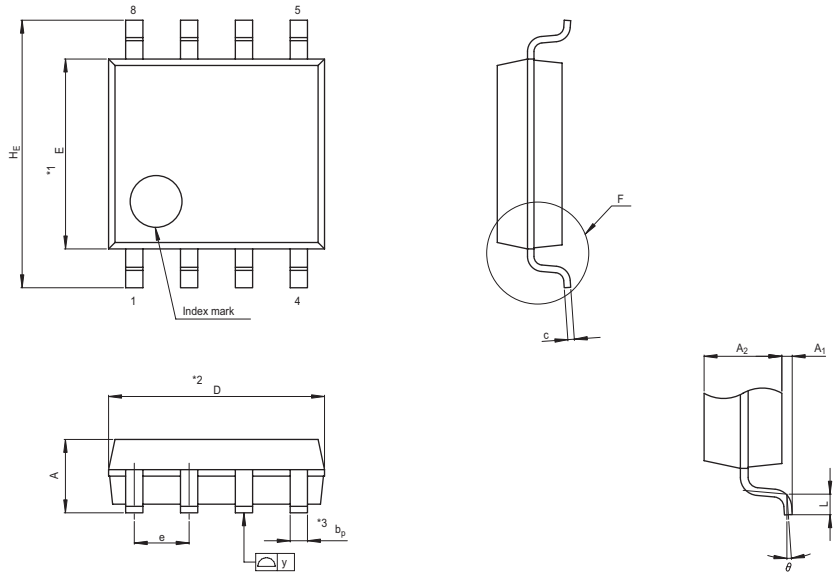
Plastic 5pin 240mil SIP

EIAJ Package Code	JEDEC Code	Weight(g)	Lead Material
SIP5-P-240-2.54	–	0.22	Cu Alloy



Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	–	–	6.1
A_1	1.4	–	–
A_2	–	4.0	–
b	0.4	0.5	0.6
b_1	1.1	1.2	1.5
b_2	0.75	0.85	1.15
c	0.22	0.27	0.34
D	11.5	11.7	11.9
E	1.77	1.97	2.17
E_1	0.6	0.7	0.8
e	–	2.54	–
L	3.0	–	–

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP8-4.4x5-1.27	PRSP0008DA-A	8P2S-A	0.07g



NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	4.8	5.0	5.2
E	4.2	4.4	4.6
A_2	——	1.5	——
A_1	0.05	——	——
A	——	——	1.9
b_p	0.35	0.4	0.5
c	0.13	0.15	0.2
θ	0°	——	10°
H_E	5.9	6.2	6.5
e	1.12	1.27	1.42
y	——	——	0.1
L	0.2	0.4	0.6

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