

System Reset (with battery back-up) Monolithic IC MM1025, 1174

Outline

These ICs were developed for D-RAM and dummy S-RAM battery back-up. D-RAM and dummy S-RAM power supplies differ from that of S-RAMs because 5V or 3.3V of power supply is required even during battery back-up. Therefore, these ICs provide voltage from a stable power supply during both normal operation and back-up. Also, the internal stable power supply switches automatically to battery back-up if the main power supply voltage goes down for any reason.

Features

1. Battery back-up

MM1025

Current consumption	600μA typ.
Input/output voltage difference $I_L=40\text{mA}$	0.25V typ.
Output current	40mA max.

MM1174

Current consumption	300μA typ.
Input/output voltage difference $I_L=40\text{mA}$	0.13V typ.
Output current	40mA max.

2. Normal operation

MM1025

Input/output voltage difference $I_L=80\text{mA}$ (built-in transistor)	0.29V typ.
Output current $V_{CC}=6\text{V}$	80mA typ.
External transistor drive current $V_{CC}=6\text{V}$	15mA typ.
Current consumption	900μA max.

MM1174 (for external transistor)

Input/output voltage difference $I_L=200\text{mA}$	0.13V typ.
Output current	Depends on external transistor
External transistor drive current (no built-in TR) $V_{CC}=3.6\text{V}$	10mA typ.
Current consumption	500μA max.

3. Switching voltage from V_{CC} to Battery $V_{CC}=\text{High} \rightarrow \text{Low}$

MM1025

4.9V typ.

MM1174

3.25V typ.

4. V_{CC} -Battery forced switching and detection voltage adjustment possible

Package

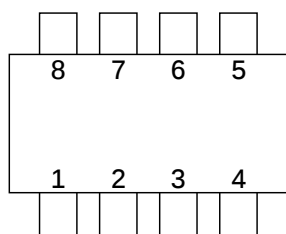
SOP-8A

Applications

1. Memory cards (D-RAM cards, other)
2. PCs, word processors and other equipment with D-RAMs
3. Fax machines, photocopiers and other office equipment with D-RAMs



Pin Assignment



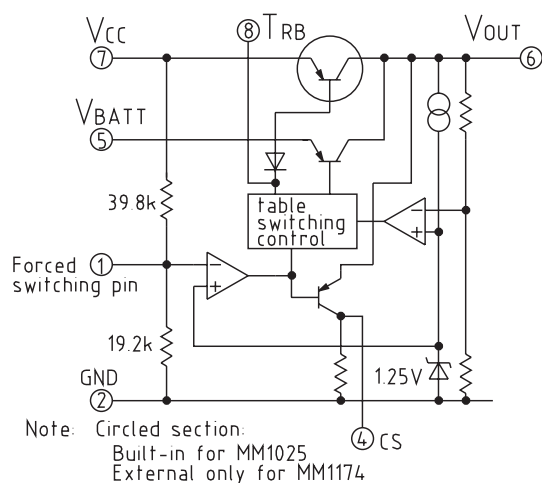
SOP-8P (A)

1	
2	GND
3	GND
4	CS
5	V _{BATT}
6	V _{OUT}
7	V _{CC}
8	TRB

Pin Description

Pin No.	Pin name	Function
1		Forced switching and detection voltage adjustment
2	GND	
3	GND	
4	CS	
5	V _{BATT}	
6	V _{OUT}	
7	V _{CC}	
8	TRB	External transistor drive

Block Diagram



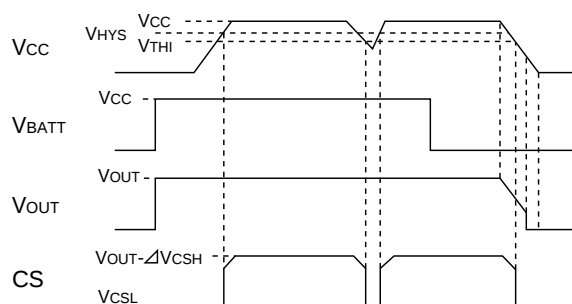
Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Units
Operating temperature	T _{OPR}	-20~+70	°C
Storage temperature	T _{STG}	40~+125	°C
Maximum output current 1	I _L max.	80	mA
Maximum output current 2	I _L max.	40	mA
Power supply voltage	V _{CC}	-0.3~+18	V
Power consumption	P _d	300	mW

Electrical Characteristics (Ta=25°C)

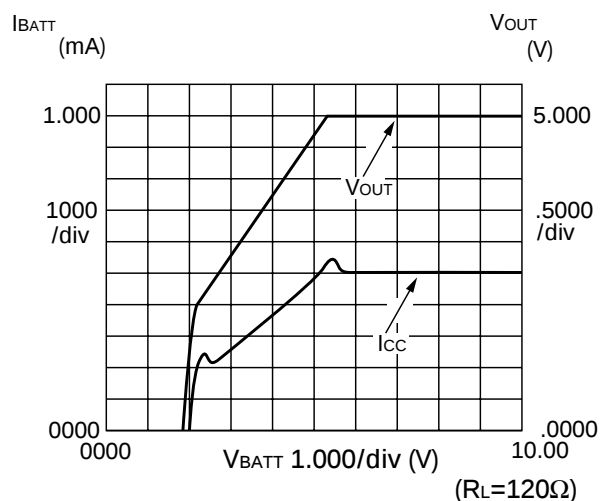
Item		Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Consumption current 1	MM1025	I _{CC}	V _{CC} =6V, V _{BATT} =0V, I _L =0mA	0.6	0.9	1.20	mA
	MM1174		V _{CC} =3.6V, V _{BATT} =0V, I _L =0mA	0.25	0.50	1.00	
I/O voltage difference 1 *1	MM1025	V _{SAT1}	V _{CC} =5V, V _{BATT} =0V, I _L =80mA	0.15	0.29	0.40	V
	MM1174		V _{CC} =3.0V, V _{BATT} =0V, I _L =200mA		0.13	0.20	
Consumption current 2	MM1025	I _{BATT}	V _{CC} =0V, V _{BATT} =6V, I _L =0mA	400	600	780	μA
	MM1174		V _{CC} =0V, V _{BATT} =3.6V, I _L =0mA	150	300	600	
I/O voltage difference 2	MM1025	V _{SAT2}	V _{CC} =0V, V _{BATT} =5V, I _L =40mA	0.15	0.25	0.40	V
	MM1174		V _{CC} =0V, V _{BATT} =3.0V, I _L =20mA		0.13	0.20	
Output voltage	MM1025	V _{OUT}	V _{CC} =6V or V _{BATT} =6V, I _L =5mA	4.8	5.0	5.2	V
	MM1174		V _{CC} =3.6V or V _{BATT} =3.6V, I _L =3mA	3.14	3.27	3.40	
Load fluctuation rate	MM1025	REG-L	V _{CC} : I _L =0~80mA, V _{BATT} : I _L =0~40mA			0.05	%/mA
	MM1174		V _{CC} =0V, V _{BATT} =3.6V, I _L =0~20mA			0.05	
Input fluctuation rate	MM1025	REG-IN	V _{CC} or V _{BATT} =5.5~10V, I _L =5mA			0.05	%/V
	MM1174		V _{CC} or V _{BATT} =3.6V~10V, I _L =3mA			0.05	
Output voltage temperature coefficient	MM1025	TC _{VO}	V _{CC} or V _{BATT} =6V, I _L =5mA		0.01		%/°C
	MM1174		V _{CC} or V _{BATT} =3.6V, I _L =3mA		0.01		
Switching voltage (H→L)	MM1025	V _{TH1}	V _{CC} =6V→4V, V _{BATT} =6V, I _L =40mA	4.8	4.9	5.1	V
	MM1174		V _{CC} =4V→3V, V _{BATT} =3.6V, I _L =3mA	3.1	3.25	3.4	
Hysteresis voltage	MM1025	V _{HYS}	V _{CC} =4V→6V, V _{BATT} =6V, I _L =40mA	100	200	400	mV
	MM1174		V _{CC} =3V→4V, V _{BATT} =3.6V, I _L =3mA	15	30	60	
Maximum base driving current	MM1025	I _B max.	V _{CC} =6V, V _{CC} →Ampere meter→8PIN	9.0	15.0	20.0	mA
	MM1174		V _{CC} =3.6V, V _{CC} →Ampere meter→8PIN	5.0	10.0	20.0	
CS output voltage H	MM1025	ΔV _{CSH}	V _{CC} =6V, V _{BATT} =6V, V _{OUT} -V _{CS}		0.10	0.50	V
	MM1174		V _{CC} =3.6V, V _{BATT} =3.6V, V _{OUT} -V _{CS}		0.10	0.50	
CS output voltage L	MM1025	V _{CSL}	V _{CC} =4V, V _{BATT} =6V			0.50	V
	MM1174		V _{CC} =3.0V, V _{BATT} =3.6V			0.50	

Timing Chart

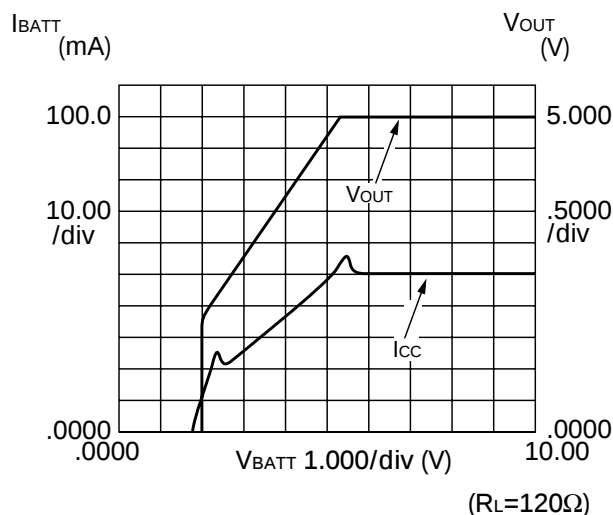


Characteristics (MM1025 series)

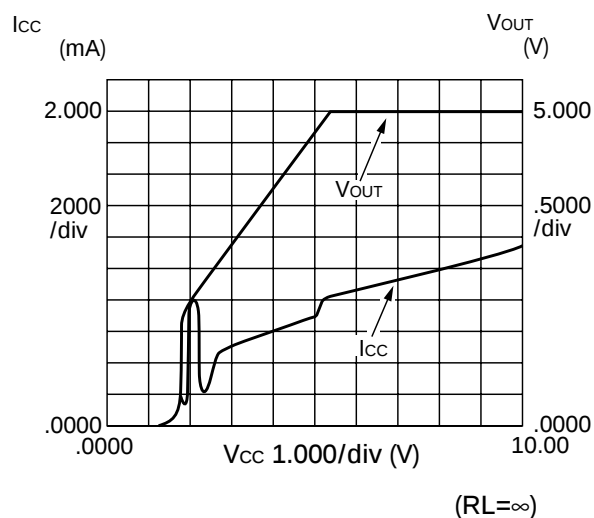
Output voltage and current consumption for V_{CC} voltage supply



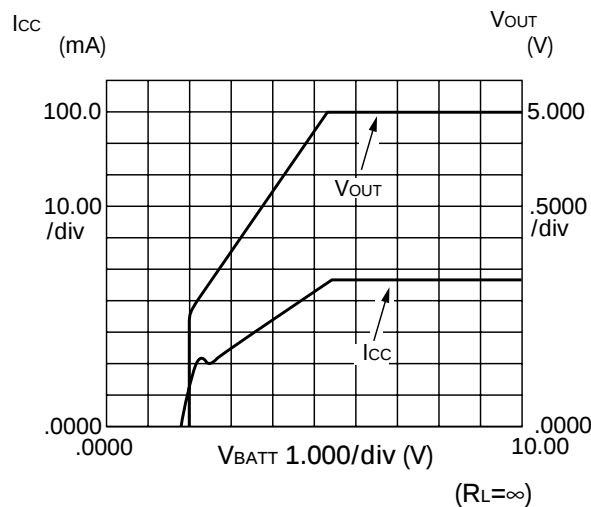
Output voltage and current consumption for battery voltage supply



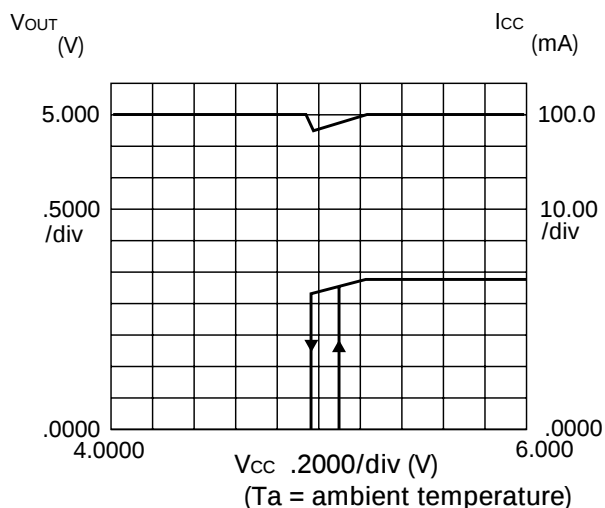
Output voltage and current consumption for V_{CC} voltage supply



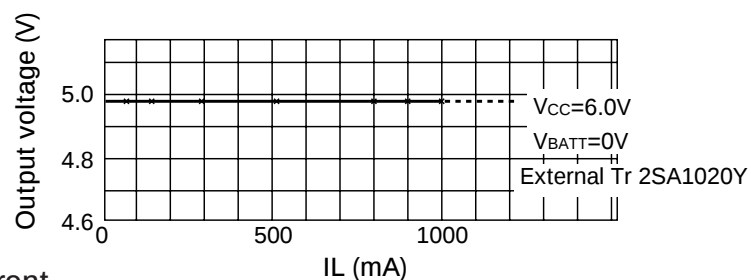
Output voltage and current consumption for battery voltage supply



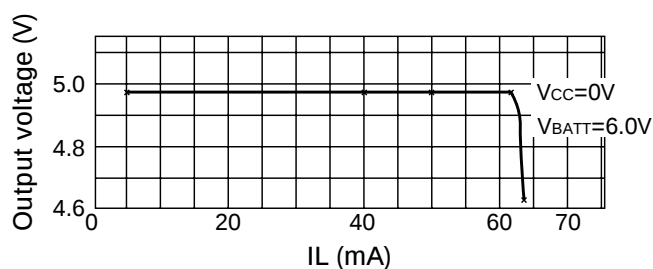
Power supply switching voltage



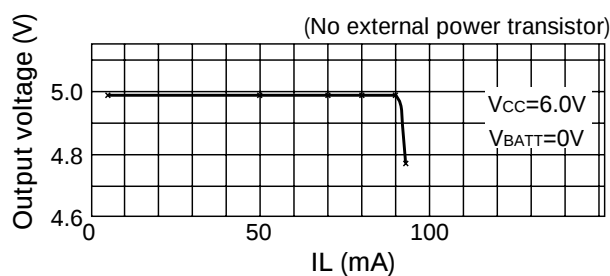
■ V_{CC} output current (external power transistor)



■ V_{BATT} output current

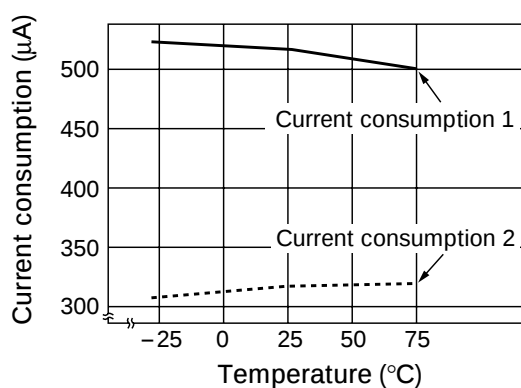


■ V_{CC} output current (no external power transistor)

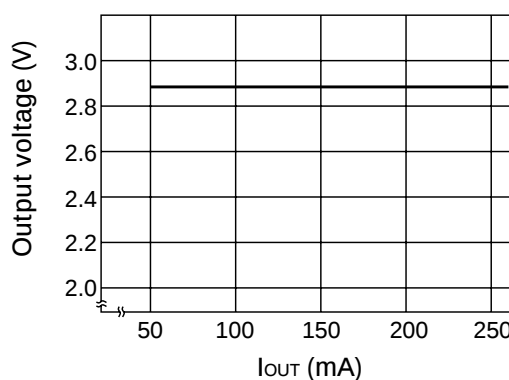


Characteristics (MM1174 series)

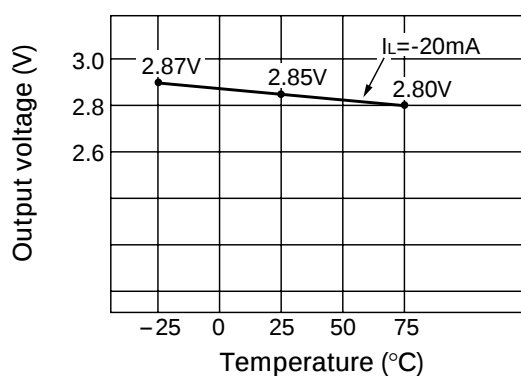
■ Current consumption 1-2 temperatures



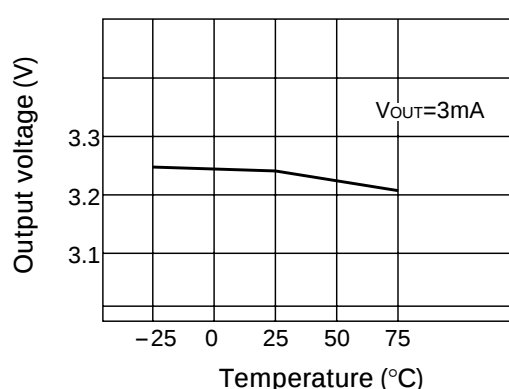
■ Input/output voltage difference 1 temperature (external transistor 2SA1020)



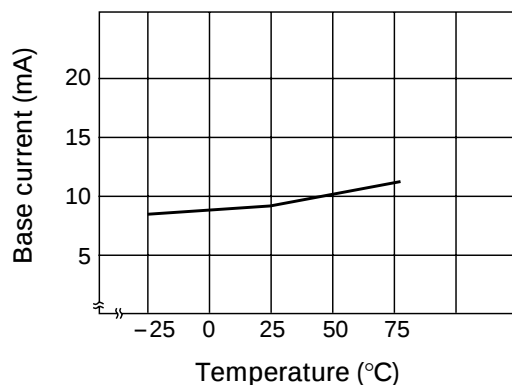
■ Input/output voltage difference 2 temperature



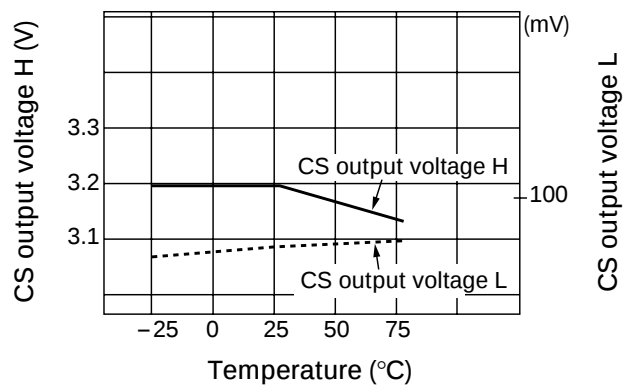
■ Output voltage - Temperature



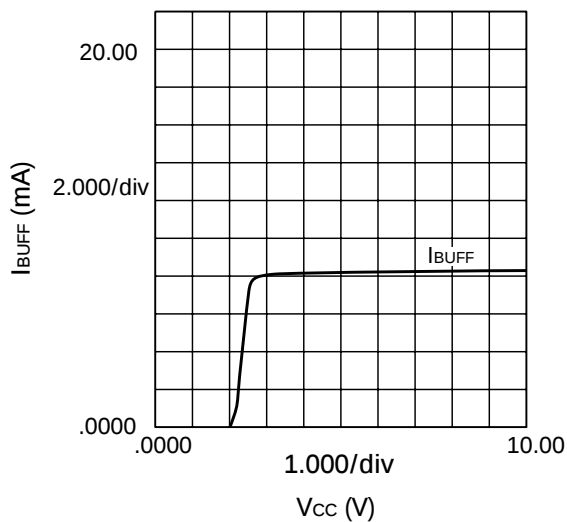
■ Maximum base drive current-Temperature



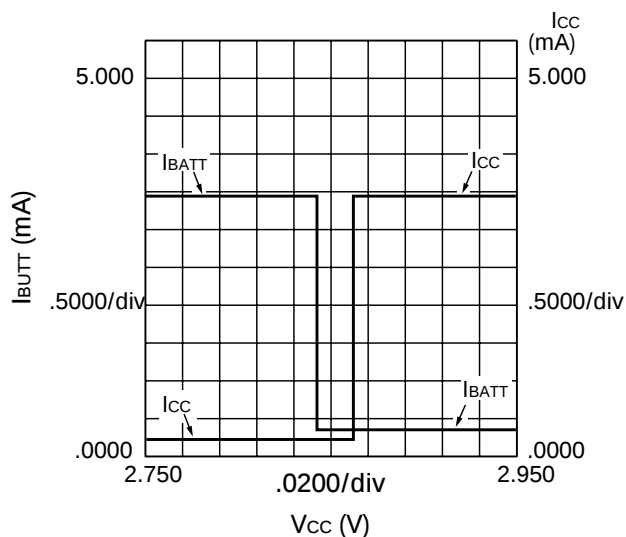
■ CS output voltage H-L temperature



■ Base drive current



■ V_{CC}-I_{CC}, I_{BATT}



■ V_{CC}-V_{OUT}, V_{CS}

