

# System Reset (with battery back-up) Monolithic IC MM1026, 1245, 1080 ,1134

## Outline

These ICs protect S-RAM data in back-up mode (CS signal makes R-SAM CE pin low and  $\overline{C E}$  pin high) when power supply voltage goes below a certain set voltage (detection voltage 3.5V, 4.2V or 4.5V typ.). Further, it switches from main power supply to battery back-up when power supply voltage drops. Conversely, when power supply rises, it first switches the S-RAM from battery back-up to main power supply (switching voltage 3.3V typ.), then from back-up mode to normal mode (CS signal makes S-RAM CE pin high and CE pin low). These signal processes provide reliable protection against data damage.

## Features

### MM1026

- Power supply switching circuit (switching between main power supply and battery)
- CS control for S-RAM (normal mode : S-RAM can be accessed; back-up mode: S-RAM can not be accessed low current consumption mode)
- Reset output

### MM1245

- Power supply switching circuit
- CS control for S-RAM
- CS control signal delay, power supply line chattering removal approx. 1s max.
- Supply current from main power supply can be increased by external power transistor

### MM1080

- Power supply switching circuit
- CS control for S-RAM
- Low current consumption 60 $\mu$ A typ.

### MM1134

- Power supply switching circuit
- CS control for S-RAM
- Gate circuit with CS signal

## Characteristics

1. Battery back-up		
1. Low IC current consumption (loss current)		0.3 $\mu$ A typ.
2. Drop voltage inside IC (input/output voltage difference)	$I_o=100\mu A$	0.3V typ.
3. Reverse current (reverse leak current)		0.1 $\mu$ A max.
2. Normal operation		
1. Drop voltage inside IC (input/output voltage difference)	$I_o=50\mu A$	0.2V typ.
2. Output voltage $V_{CC}=5V$	$I_o=50mA$	4.8V typ.
3. Battery- $V_{CC}$ switching voltage		3.3V typ.
4. Detection voltage (CS, $\overline{C S}$ , reset output)	A : 3.5V typ. B : 4.2V typ. C : 4.5V typ.	

## Package

DIP-8B (MM××××□ D)

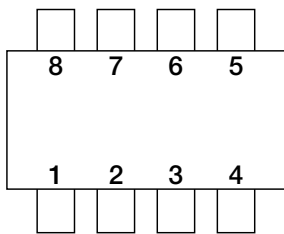
SOP-8C (MM××××□ F)

\*□ contains detection voltage rank.

## Applications

1. Memory cards (S-RAM cards)
2. PCs, word processors
3. Fax machines, photocopiers, other office equipment
4. Sequence controllers, other FA equipment
5. Video games and other equipment with S-RAMs

## Pin Assignment

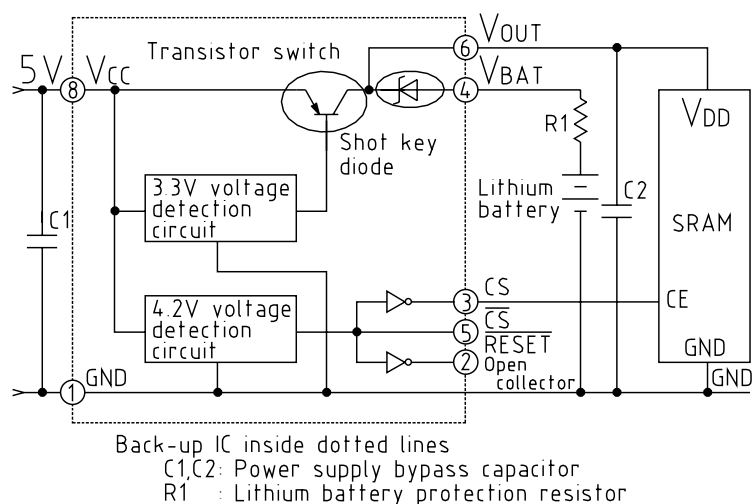


DIP-8P(C)/SOP-8P(C)/SOP-8P(C) Taping  
(TOP VIEW)

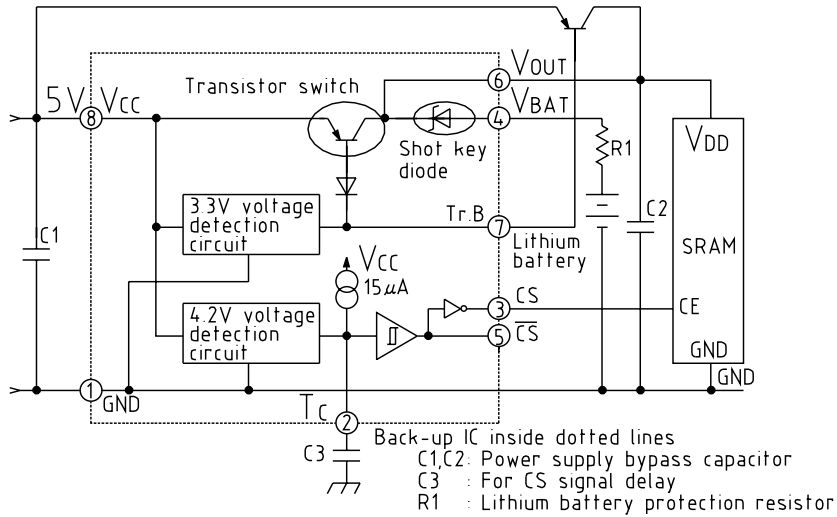
Pin no.	Pin name			
	MM1026	MM1245	MM1080	MM1134
1	GND	GND	GND	GND
2	RESET	T <sub>c</sub>	NC	RESET
3	CS	CS	CS	CS
4	V <sub>BATT</sub>	V <sub>BATT</sub>	V <sub>BATT</sub>	V <sub>BATT</sub>
5	CS	CS	NC	CS
6	V <sub>OUT</sub>	V <sub>OUT</sub>	V <sub>OUT</sub>	V <sub>OUT</sub>
7	NC	Tr.B	NC	Y
8	V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>	V <sub>CC</sub>

## Block Diagram

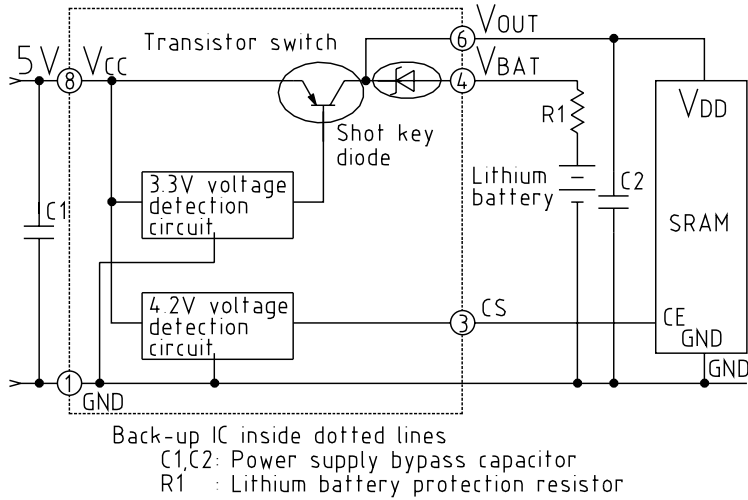
### MM1026



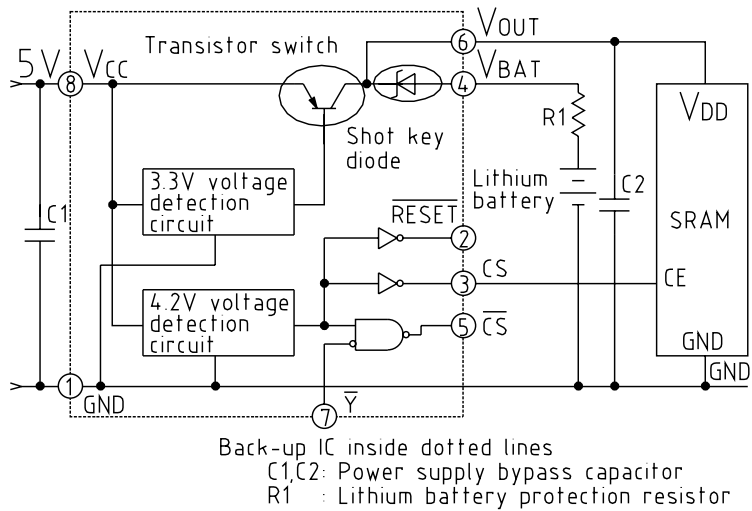
MM1245



MM1080

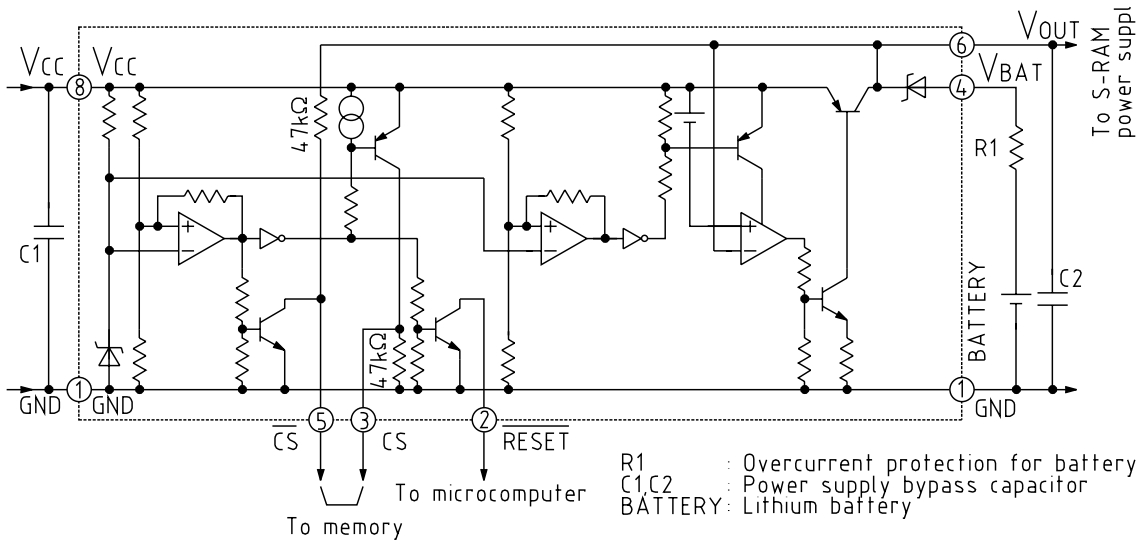


MM1134

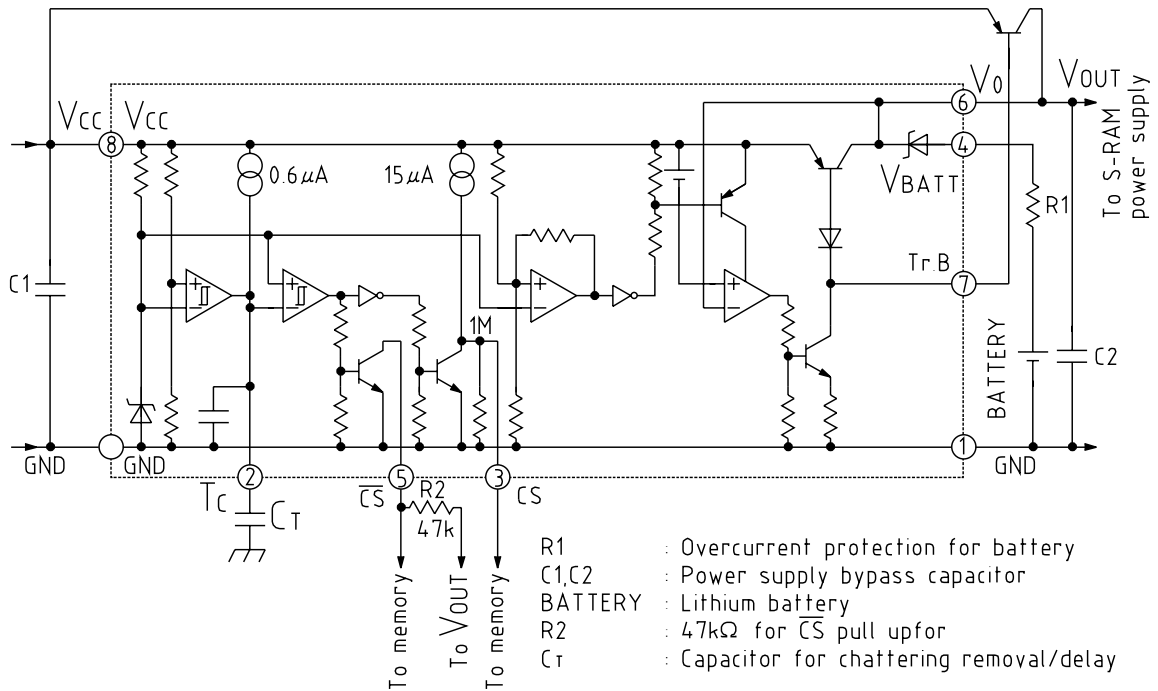


Equivalent Circuit Diagram

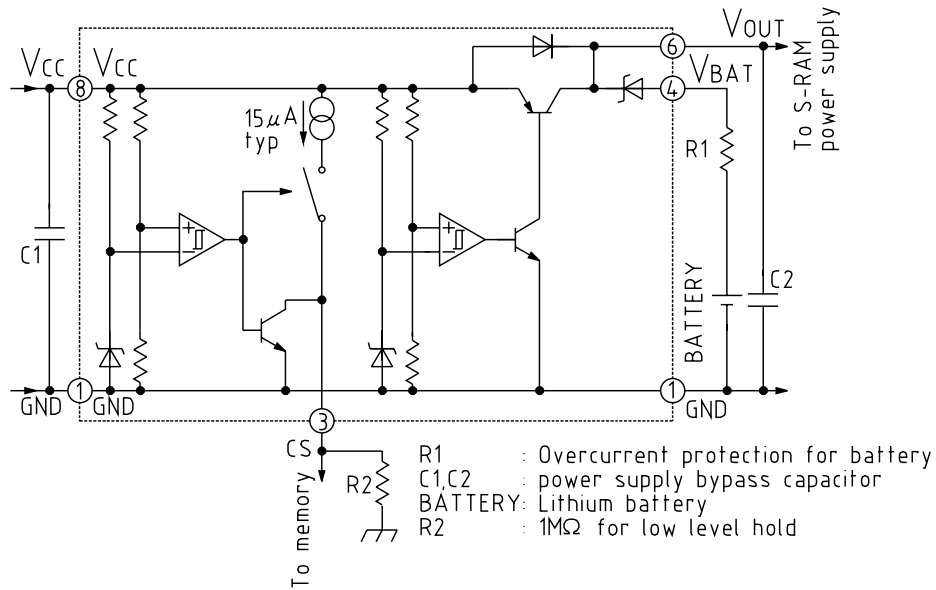
MM1026



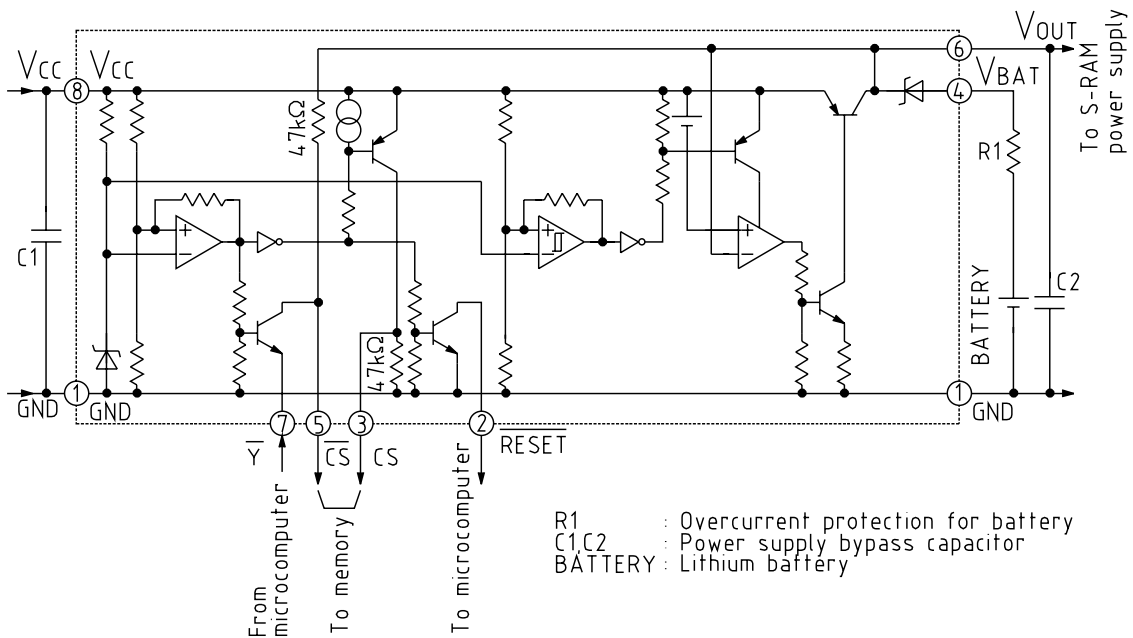
MM1245



MM1080



MM1134



Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Units
Storage temperature	T <sub>STG</sub>	-40~+125	°C
Operating temperature	T <sub>OPR</sub>	-20~+75	°C
Power supply voltage	V <sub>CC max.</sub>	7	V
Operating voltage	V <sub>CCOP</sub>	7	V
Allowable loss	P <sub>d</sub>	300	mW
Output current	MM1245 MM1026 MM1134	I <sub>o1</sub>	80 mA
	MM1080		50 mA
		I <sub>o2</sub>	200 µA

Note : I<sub>o1</sub> expresses V<sub>CC</sub> output current value, and I<sub>o2</sub> expresses V<sub>BATT</sub> output current value.

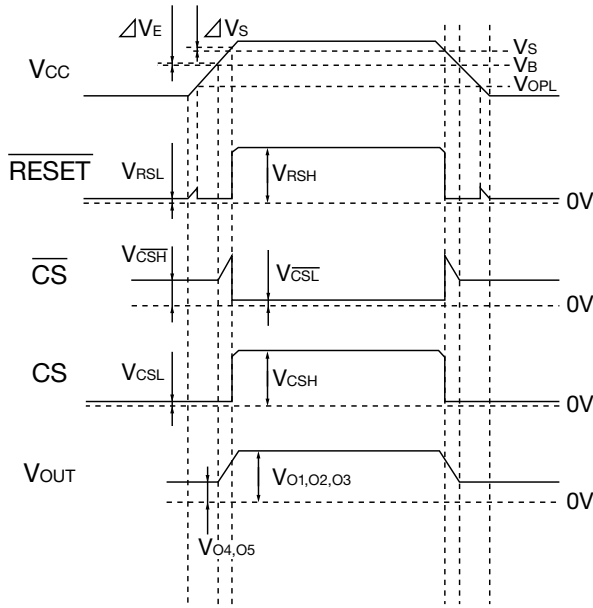
**Electrical Characteristics** (Except where noted otherwise, Ta=25°C, VCC=VRS=5V, RRS=10kΩ)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Consumption current	MM1026	VCC=5V, VBATT=3V, Io1=0mA			2.0	mA
	MM1245		0.6	1.0	1.4	mA
	MM1080			60	120	μA
	MM1134			1.4	2.2	mA
I/O voltage difference 1	VSAT1	VCC=5V, VBATT=3V, Io1=1mA		0.03	0.05	V
Output voltage 1	Vo1	VCC=5V, VBATT=3V, Io1=1mA	4.95	4.97		V
I/O voltage difference 2	MM1245 VSAT2	VCC=5V, VBATT=3V, Io1=30mA		0.15	0.30	V
Output voltage 2	MM1026 MM1134	VCC=5V, VBATT=3V, Io1=15mA	4.75	4.90		V
	MM1080					
I/O voltage difference 3	MM1245 VSAT3	VCC=5V, VBATT=3V, Io1=80mA		0.30	0.50	
Output voltage 3	Except MM1245 Vo3	VCC=5V, VBATT=3V, Io1=50mA	4.7	4.8		V
Detection voltage	A type	VCC=H→L	3.35	3.50	3.65	V
	B type		4.05	4.20	4.35	V
	C type		4.30	4.50	4.70	V
Hysteresis voltage	ΔVs	VCC=L→H		100		mV
Maximum base driving current	MM1245 IBUF	VCC=5V, VBUF=4.5V	14	20	26	mA
Reset output voltage L	MM1026 VRSL	VCC=3V		0.2	0.4	V
Reset leakage current H	MM1134 IRSH	VCC=5V, VRS=7.0V		±0.01	±0.1	μA
Reset operation limit voltage	VoPL	VRSL ≤ 0.4V, VCC=H→L		0.8	1.2	V
CS output voltage L	MM1080 (CS only) VCSL	VCC=3.7V, VBATT=3V, ICS=1μA			0.1	V
CS output voltage H	MM1026 (CS only) VCSH	VCC=5V, VBATT=3V, ICS=-1μA	4.90			V
C S output voltage L	MM1245 VCSL	VCC=5V, VBATT=3V, ICS=1μA				
			0.1			
C S output voltage H	Δ	VCSH VCC=3.7V, VBATT=3V, ICS=-1μA				V0-0.1
Detection voltage temperature characteristic	Vs/ T				±0.05	%/°C
ON delay time	MM1245 Tdon	CTC=OPEN		50		μs
OFF delay time			Tdoff	CTC=OPEN		5
Tc pin charge current	MM1245 ITC	VCC=5V, VBATT=3V, VTC=0V	0.60	0.80	1.10	μA
CS source current	MM1245 ICSSOU	VCC=5V, VBATT=3V, VCS=4.5V	25	50	80	μA
Power supply switching voltage	VB1	VCC=H L	3.15	3.30	3.45	V
Hysteresis voltage	VB	VCC=L H		100		mV
Switching voltage temperature characteristic	VB/ T				±0.05	%/°C
Loss current	IBL	VCC=0V, VBATT=3V, Io2=0μA			0.1	μA
I/O voltage difference 2	Vsat2	VCC=0V, VBATT=3V, Io2=1μA		0.2	0.3	V
Output voltage 4	Vo4	VCC=0V, VBATT=3V, Io2=1μA	2.7	2.8		V
Output voltage 5	Vo5	VCC=0V, VBATT=3V, Io2=100μA	2.6	2.7		V
Reverse current	IOREV	VCC=5V, VBATT=0V			0.1	μA
Y pin Lo H						

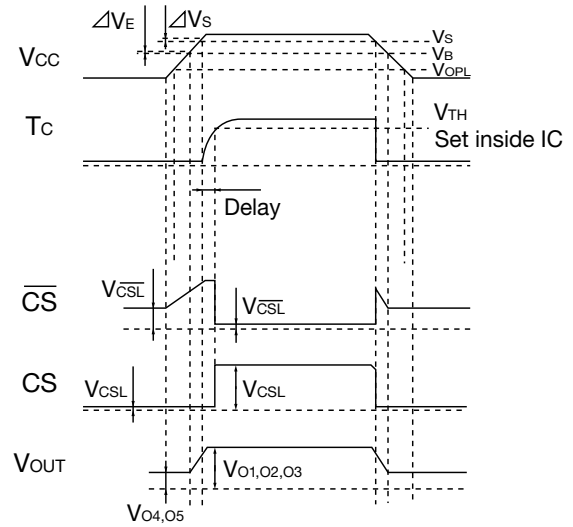
Note : Detection voltage ranks A, B — MM1026  
 B — MM1134, MM1080  
 B, C — MM1245

Timing Chart

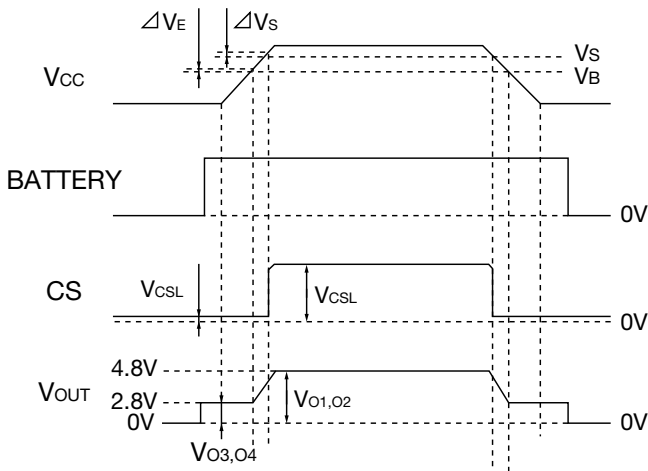
MM1026



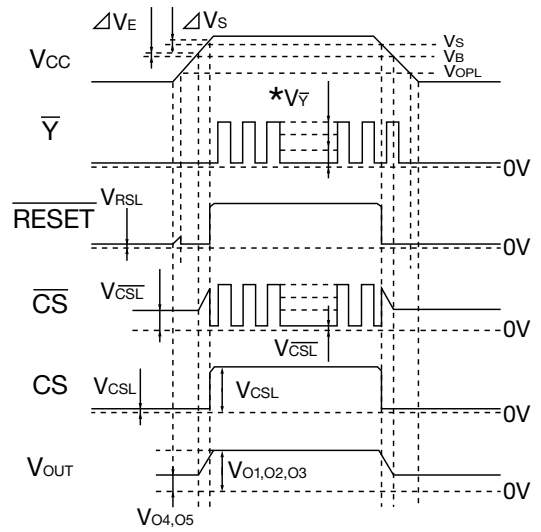
MM1245



MM1080



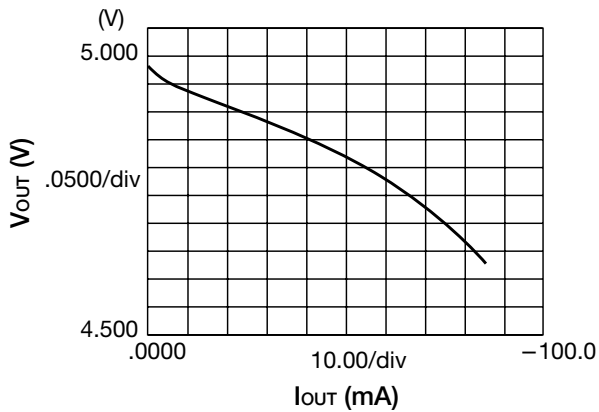
MM1134



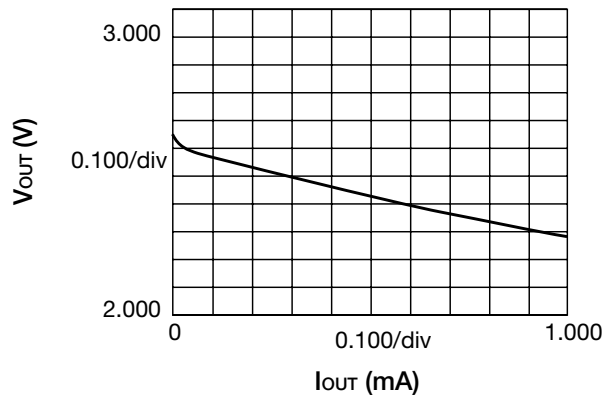
\* Use Y pin input voltage at less than 5V when VCC ≤ Vs.

Characteristics (MM1026, MM1134 series)

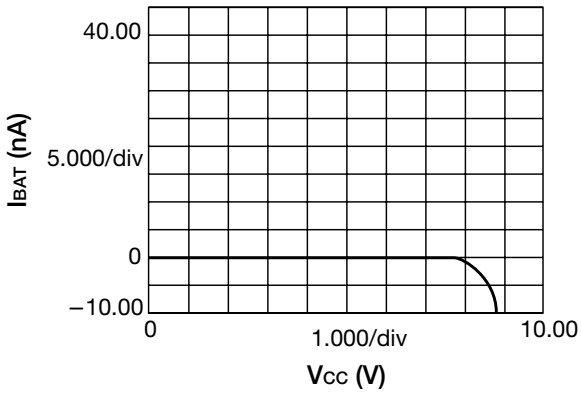
VOUT-IOUT (VCC=5.0V)



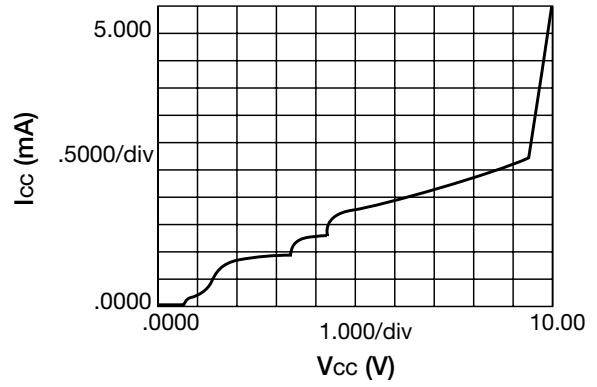
VOUT-IOUT (VBAT=3.0V)



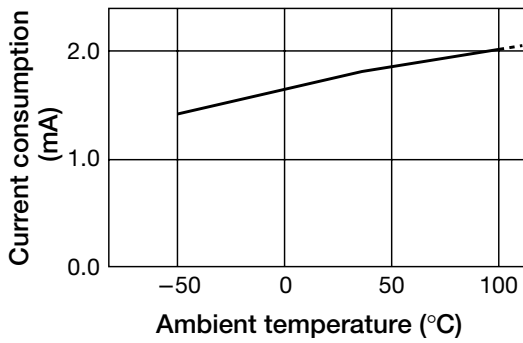
**VCC-IBAT**



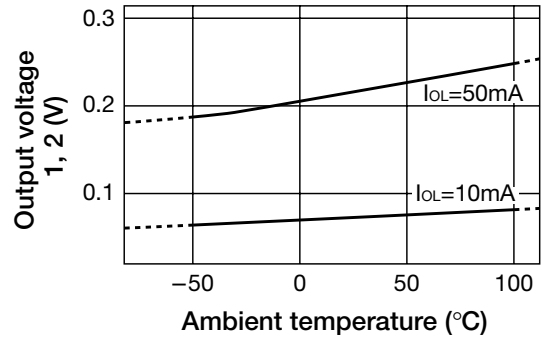
**VCC-Icc**



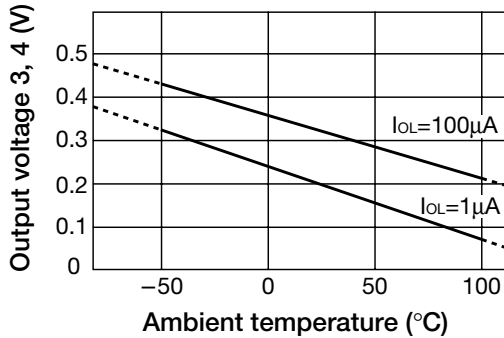
**Current consumption-Temperature characteristics**



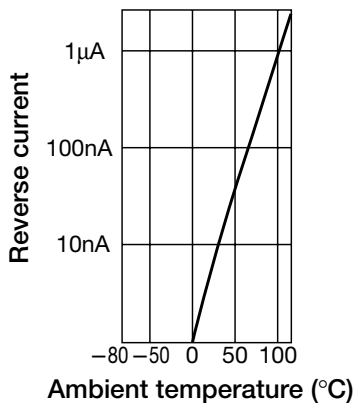
**Output voltage 1, 2-Temperature characteristics**



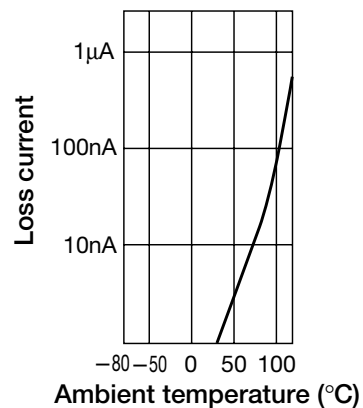
**Output voltage 3, 4-Temperature**



**Reverse current-Temperature**



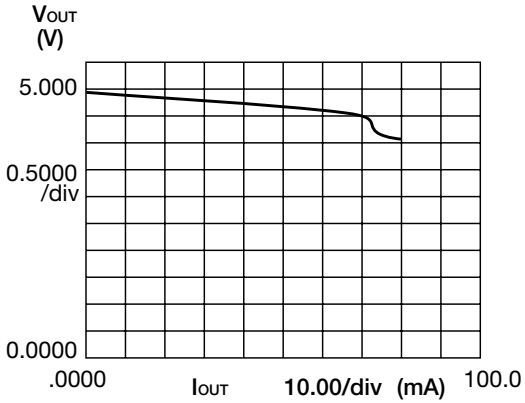
**Loss current-Temperature**



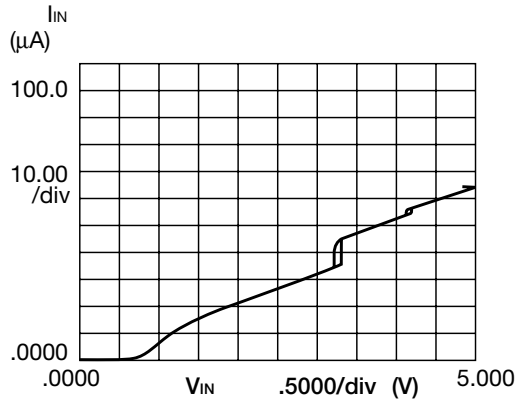


**Characteristics** (MM1080 series)

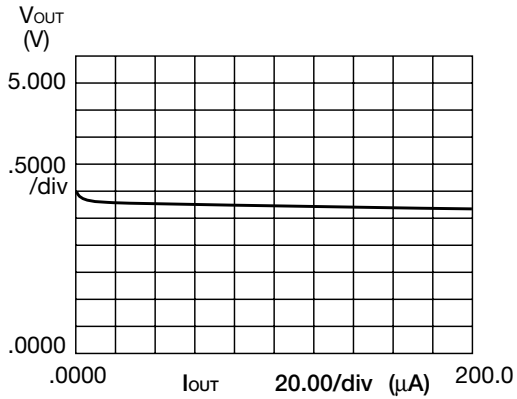
**Current consumption-Temperature (Vcc=5V)**



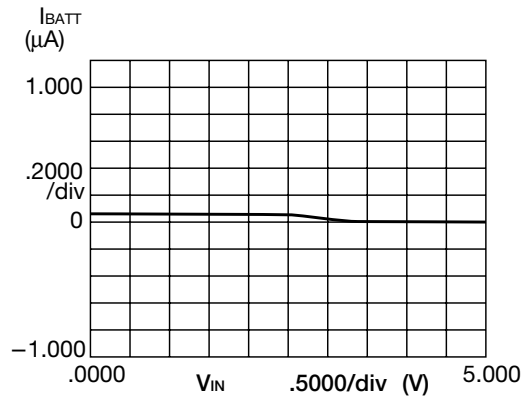
**VIN-IIN**



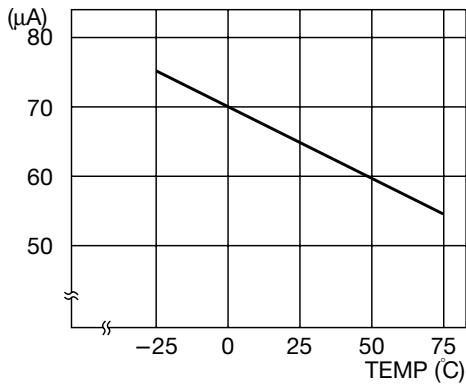
**VOUT-IOUT (VBAT=3.0V)**



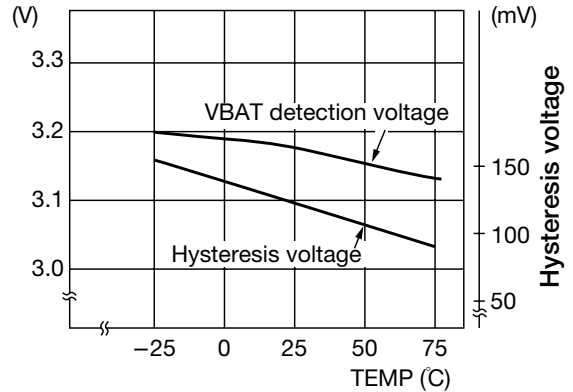
**VIN-IBATT**



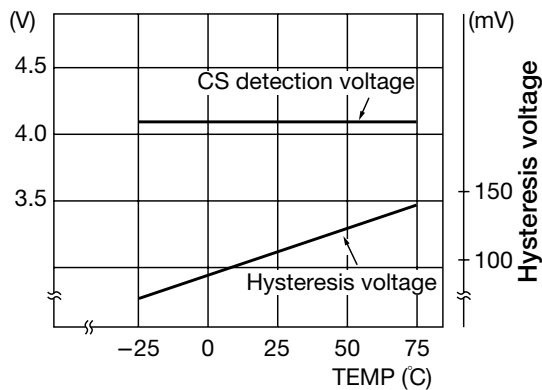
**Current consumption-Temperature (VCC=5V)**



**V<sub>BAT</sub> detection voltage-Temperature**

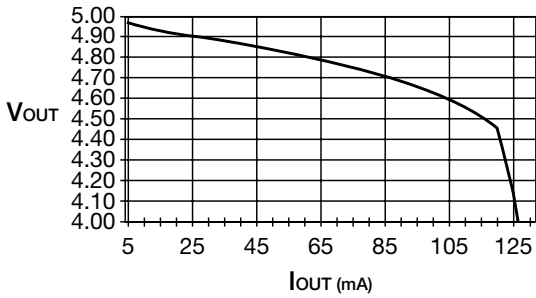


**CS detection voltage-Temperature**

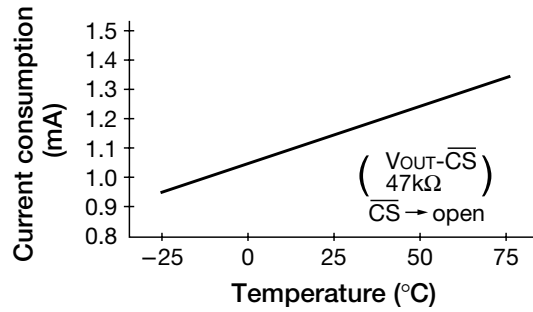


**Characteristics** (MM1245 series)

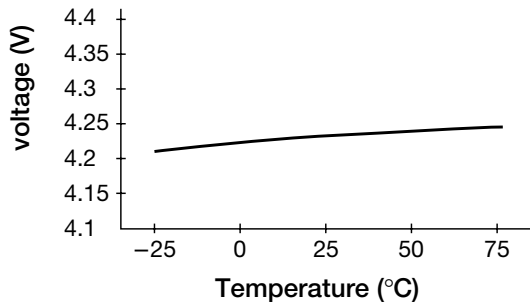
**I<sub>OUT</sub>-V<sub>OUT</sub>**



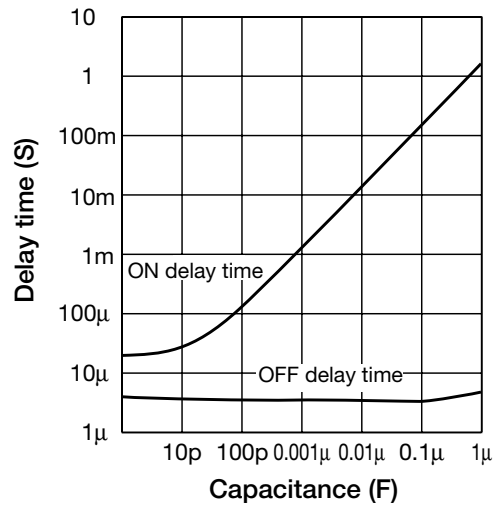
**Current consumption-Temperature**



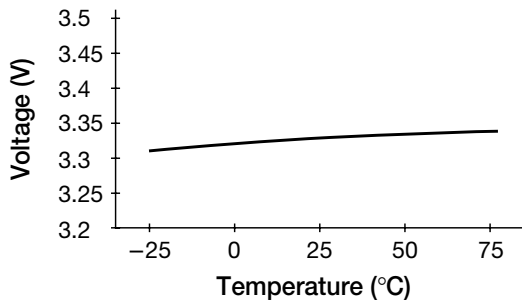
**CS detection voltage-Temperature**



**CS-CS pin ON/OFF delay time vs. capacitance TC**



**V<sub>BAT</sub> detection voltage-Temperature**



Use 1s max. for CS-CS pin ON delay time.