

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 μ 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 μ 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 μ 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)

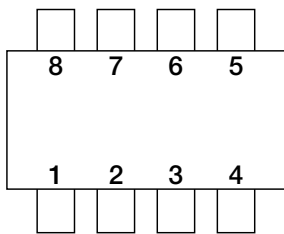
SOP-8C (MM××××□ F)

*□ 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

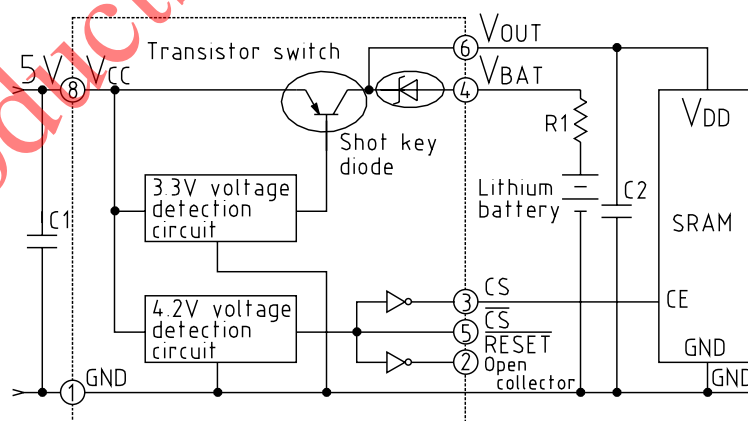


DIP-8P(C)/SOP-8P(C)/SOP-8P(C) Taping
(TOP VIEW)

Pin no.	Pin name			
	MM1026	MM1245	MM1080	MM1134
1	GND	GND	GND	GND
2	RESET	Tc	NC	RESET
3	CS	CS	CS	CS
4	V _{BATT}	V _{BATT}	V _{BATT}	V _{BATT}
5	\overline{CS}	\overline{CS}	NC	\overline{CS}
6	V _{OUT}	V _{OUT}	V _{OUT}	V _{OUT}
7	NC	Tr.B	NC	Y
8	V _{CC}	V _{CC}	V _{CC}	V _{CC}

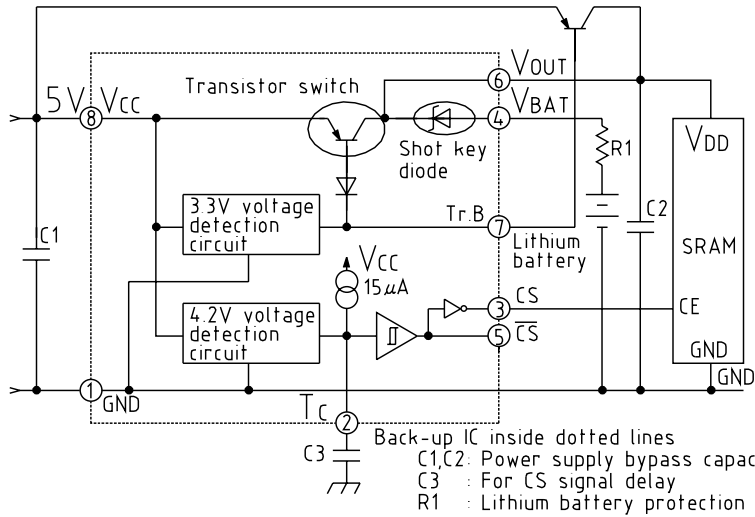
Block Diagram

MM1026

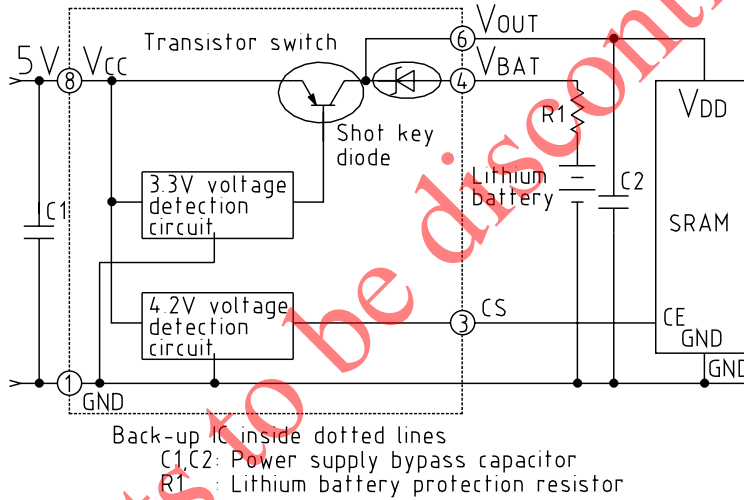


Back-up IC inside dotted lines
C1,C2: Power supply bypass capacitor
R1 : Lithium battery protection resistor

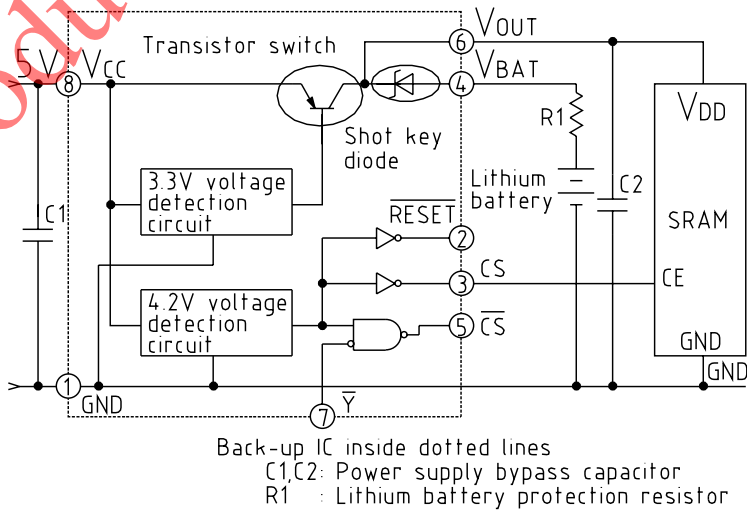
MM1245



MM1080

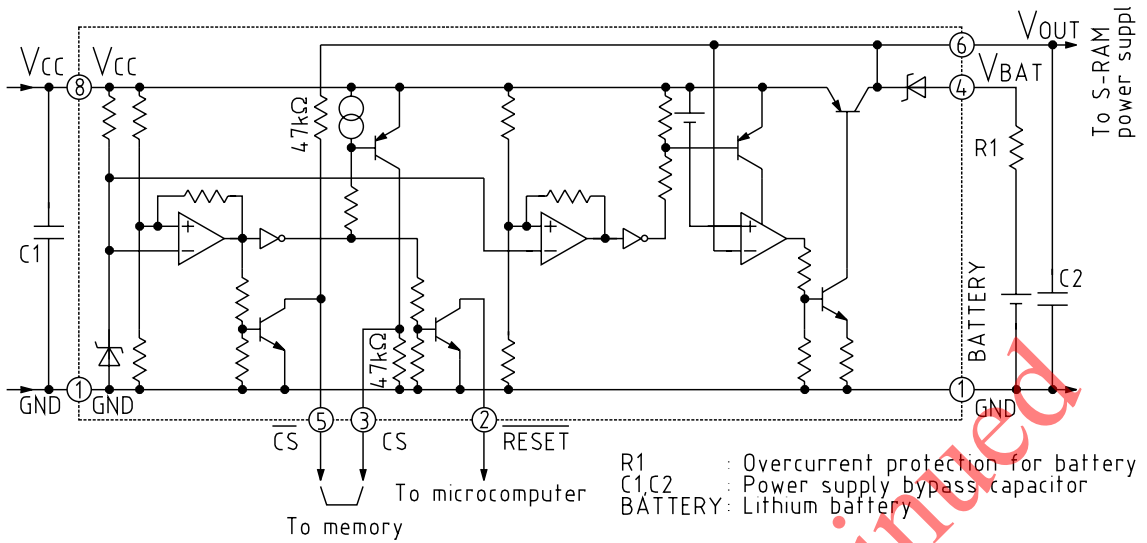


MM1134

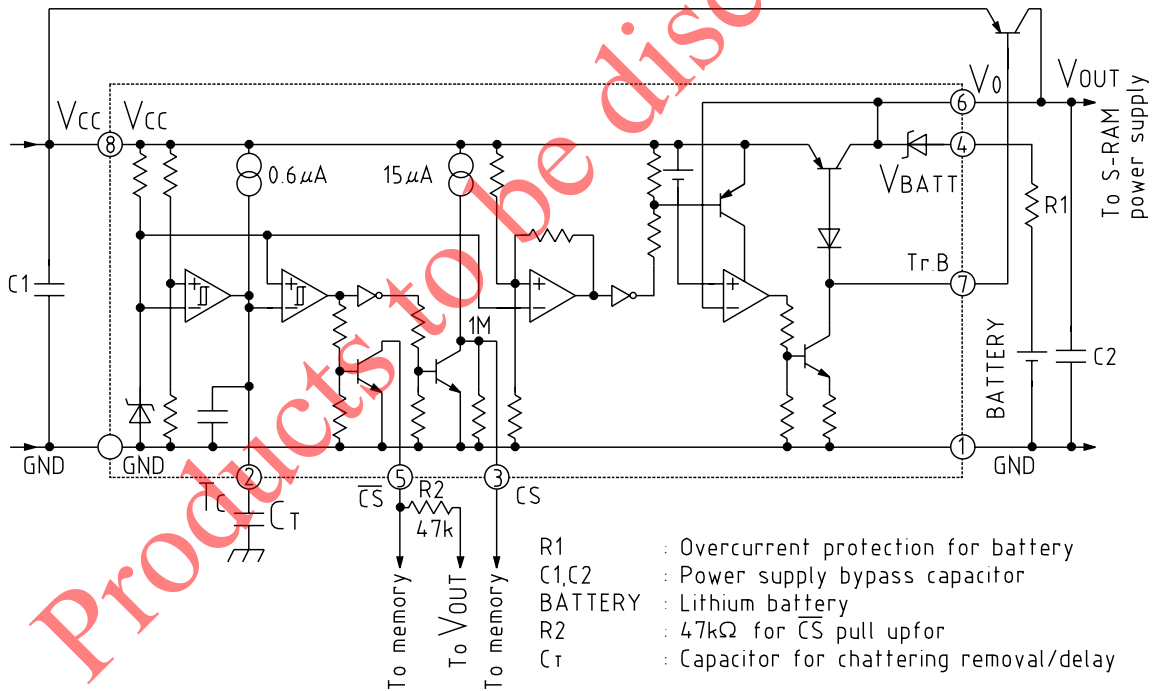


Equivalent Circuit Diagram

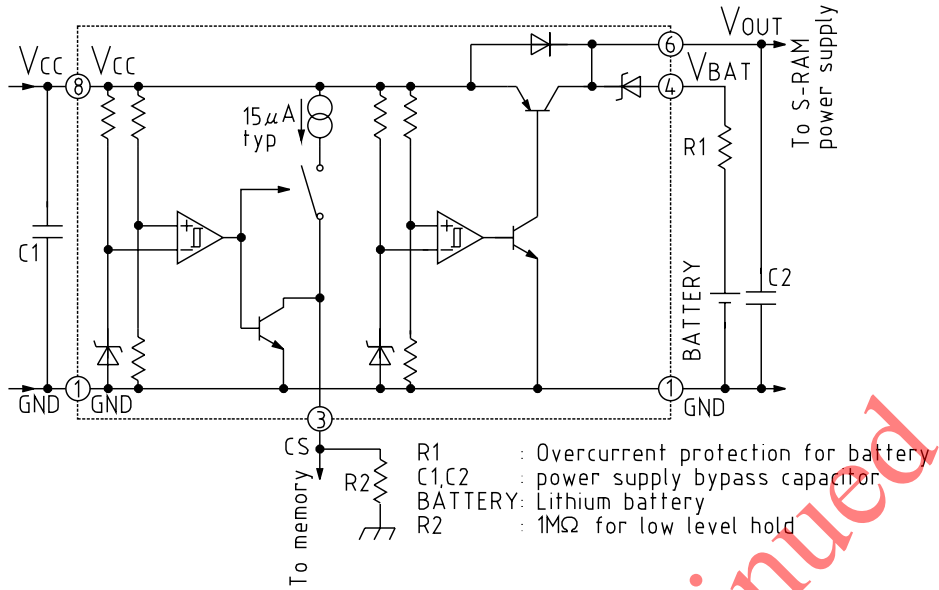
MM1026



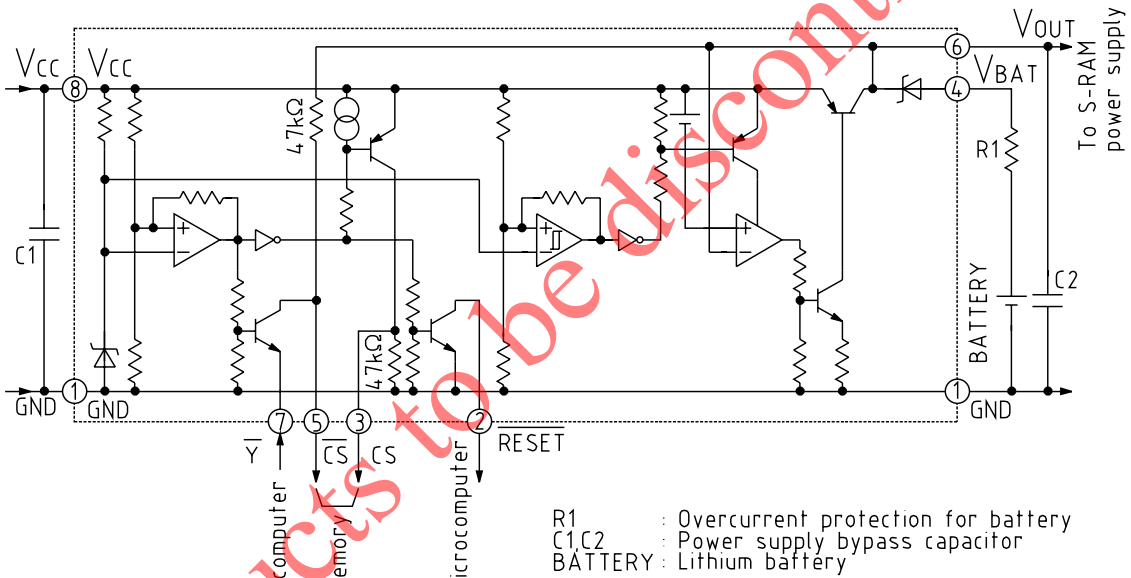
MM1245



MM1080



MM1134



Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Units
Storage temperature	T _{STG}	-40~+125	°C
Operating temperature	T _{OPR}	-20~+75	°C
Power supply voltage	V _{CC max.}	7	V
Operating voltage	V _{CCOP}	7	V
Allowable loss	P _d	300	mW
Output current	MM1245	I _{o1}	80
	MM1026		
	MM1134		
	MM1080		
Output current	I _{o2}	200	μ A

Note : I_{o1} expresses V_{CC} output current value, and I_{o2} expresses V_{BATT} output current value.

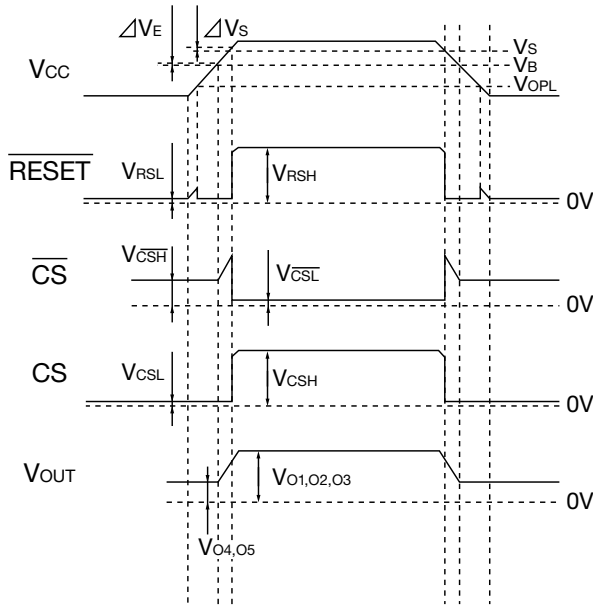
Electrical Characteristics (Except where noted otherwise, Ta=25°C, VCC=VRS=5V, RRS=10kΩ)

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	Vo2	VCC=5V, VBATT=3V, Io1=15mA	4.75	4.90		V
	MM1134						
	MM1080			4.5	4.7		V
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	Vs	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	VCSL	VCC=3.7V, VBATT=3V, ICS=1μA			0.1	V
CS output voltage H	(CS only)	VCSH	VCC=5V, VBATT=3V, ICS=-1μA	4.90			V
C S output voltage L	MM1026	VCSL	VCC=5V, VBATT=3V, ICS=1μA				
	MM1245						
C S output voltage H	MM1026	VCSH	VCC=3.7V, VBATT=3V, ICS=-1μA				
	MM1134						
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		μs
Tc pin charge current	MM1245	ITC	VCC=5V, VBATT=3V, VTC=0V	0.60	0.80	1.10	μA
CS source current		ICSSOU	VCC=5V, VBATT=3V, VCS=4.5V	25	50	80	μA
Power supply switching voltage		VBL	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							

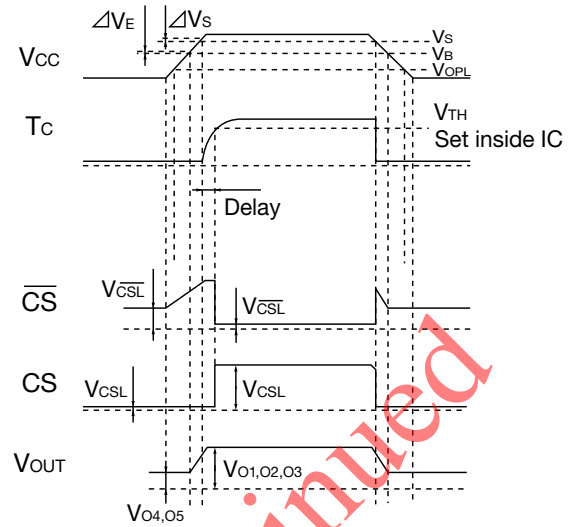
Note : Detection voltage ranks A, B — MM1026
 B — MM1134, MM1080
 B, C — MM1245

Timing Chart

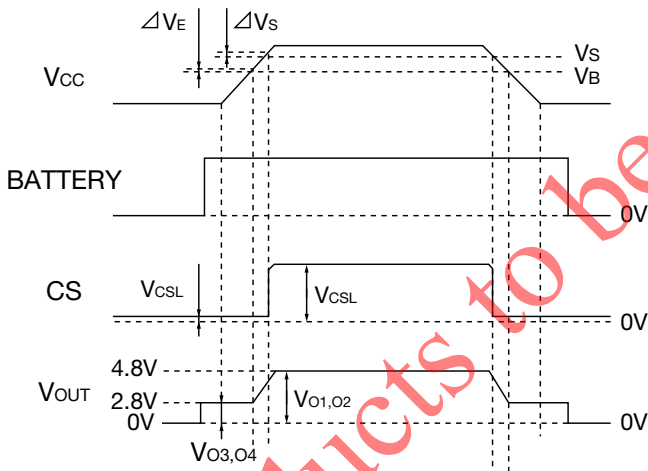
MM1026



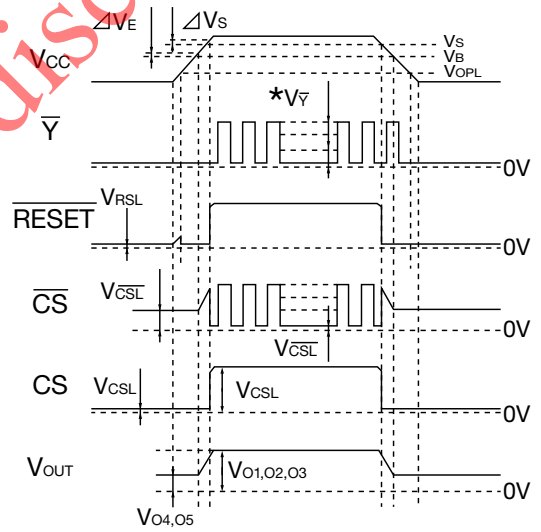
MM1245



MM1080



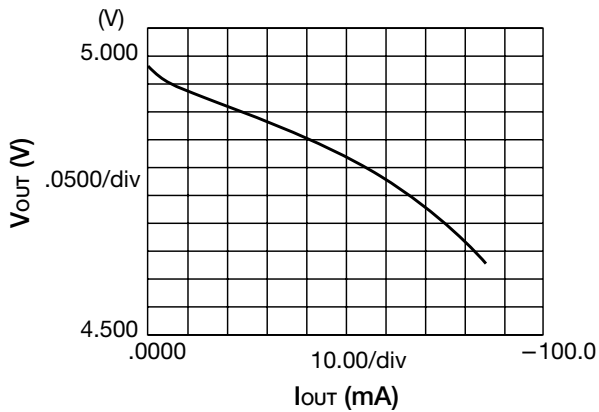
MM1134



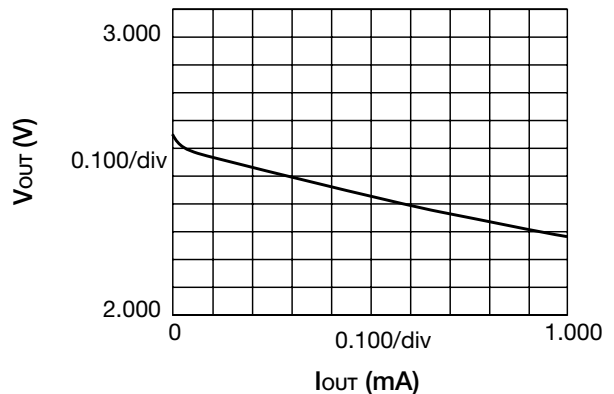
* Use \bar{Y} pin input voltage at less than 5V when $V_{CC} \leq V_S$.

Characteristics (MM1026, MM1134 series)

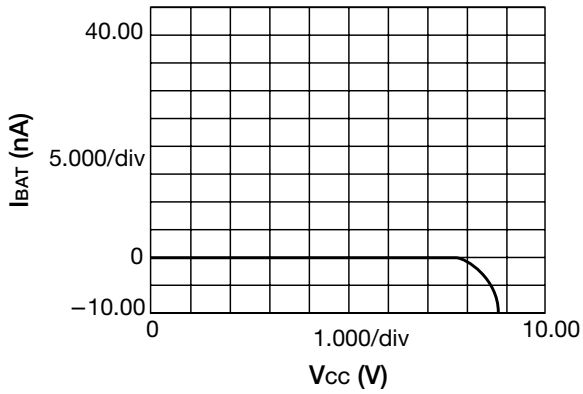
VOUT-IOUT (VCC=5.0V)



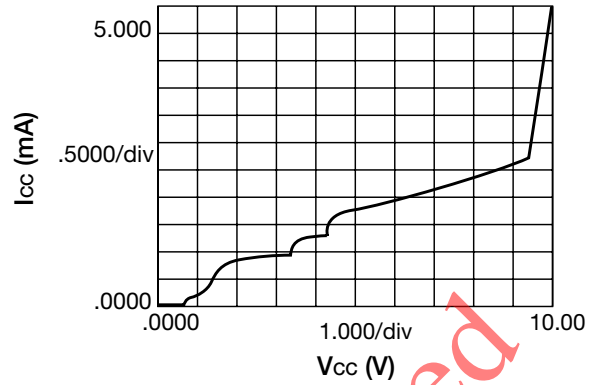
VOUT-IOUT (VBAT=3.0V)



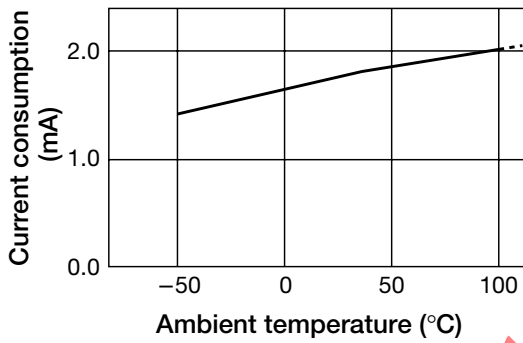
■ VCC-IBAT



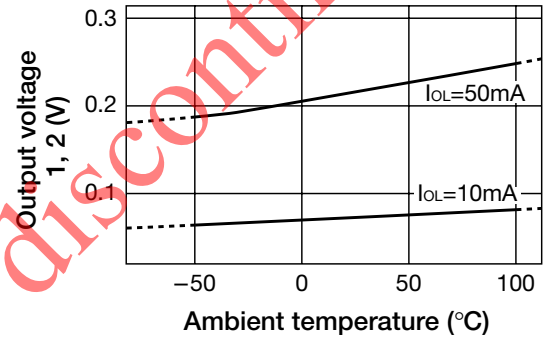
■ VCC-Icc



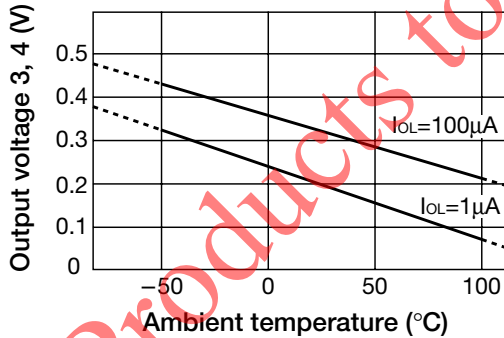
■ Current consumption-Temperature characteristics



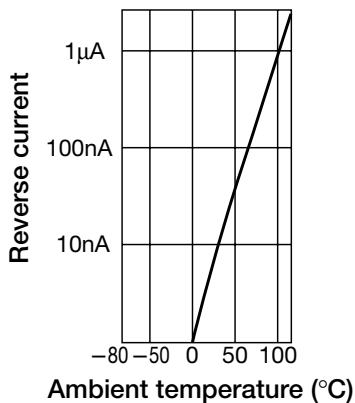
■ Output voltage 1, 2-Temperature characteristics



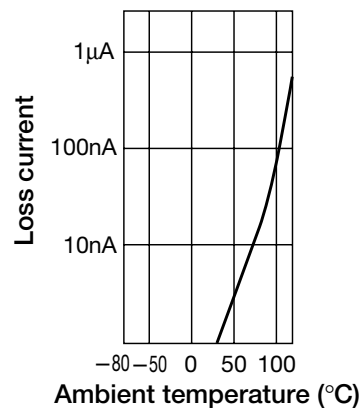
■ Output voltage 3, 4-Temperature



■ Reverse current-Temperature

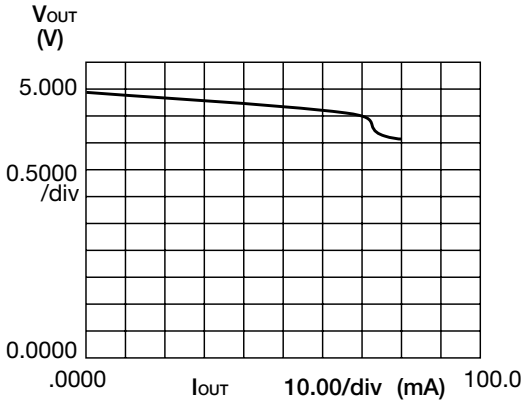


■ Loss current-Temperature

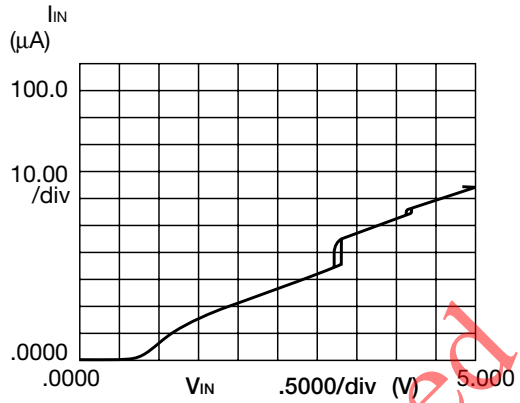


Characteristics (MM1080 series)

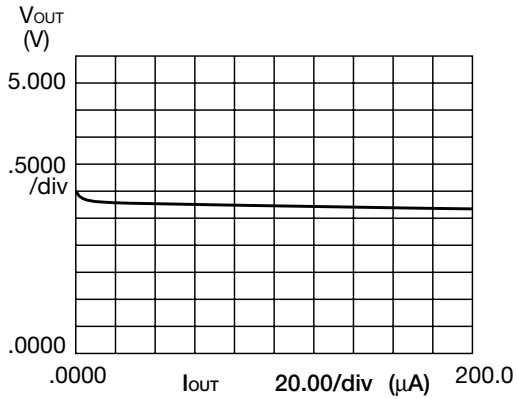
Current consumption-Temperature (Vcc=5V)



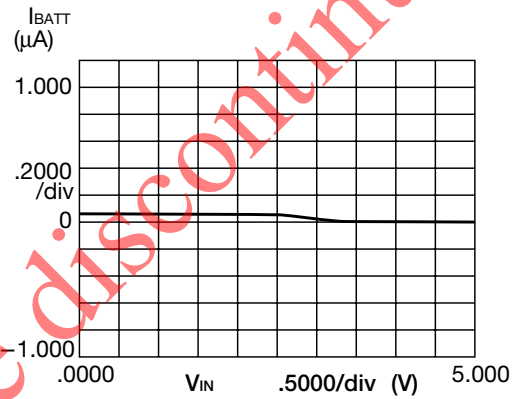
VIN-IIN



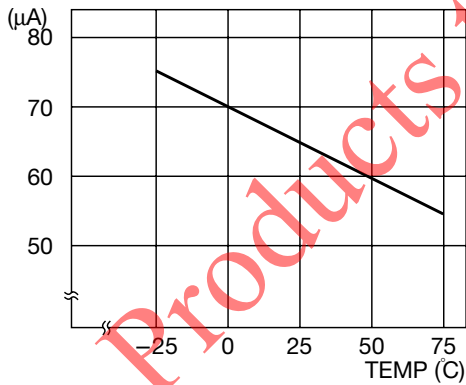
VOUT-IOUT (VBAT=3.0V)



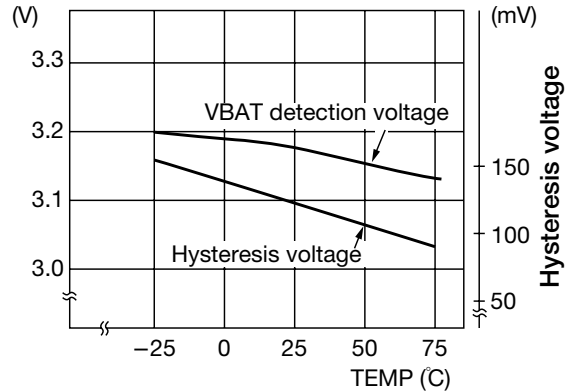
VIN-IBATT



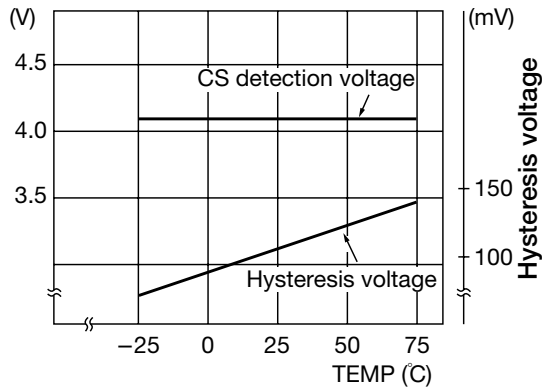
Current consumption-Temperature (VCC=5V)



V_{BAT} detection voltage-Temperature

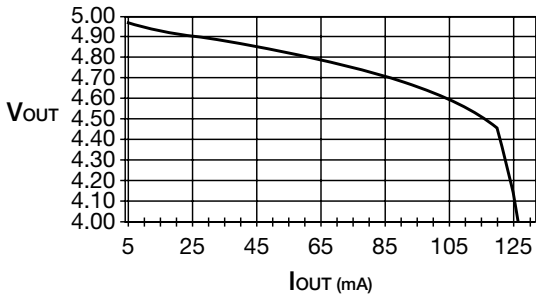


CS detection voltage-Temperature

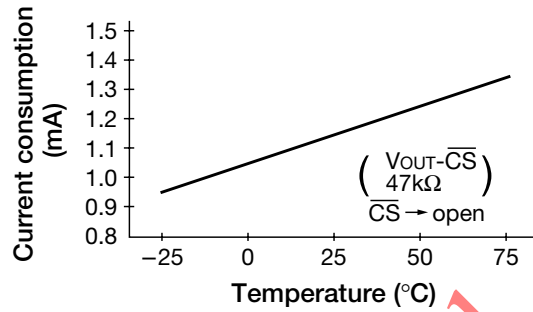


Characteristics (MM1245 series)

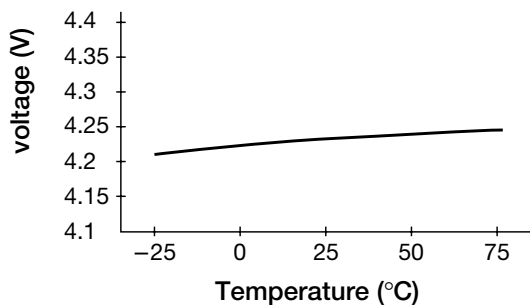
I_{OUT}-V_{OUT}



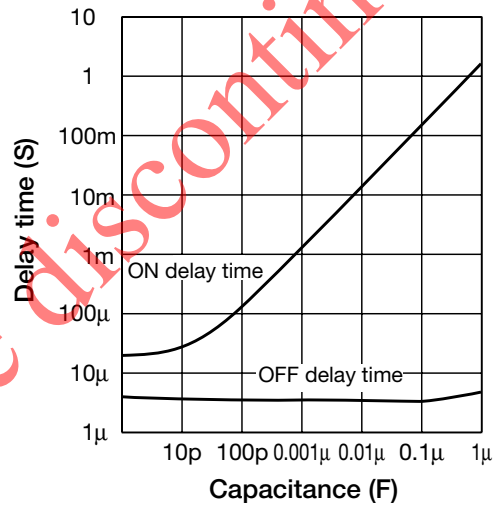
Current consumption-Temperature



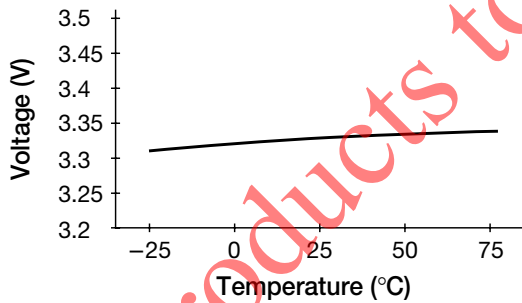
CS detection voltage-Temperature



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



V_{BAT} detection voltage-Temperature



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

Products to be discontinued