Regulator+Reset IC
Monolithic IC MM1482

Outline

This IC, developed for use in CD-ROM drives, combines a 3V regulator adapted to low power consumption with a much-sought reset function (regulator input monitoring), with internal delay circuit, set to detect 4.2V.

Features

1. Large output current 300mA max.
2. High ripple rejection rate 80dB typ.
3. Internal thermal shutdown circuit.
4. Internal current-limiting circuit.
5. Adjustment-free reset detection voltage 4.2V typ.
6. Easy to set delay time from voltage detection to reset release.
7. Operating temperature range and ripple elimination rate are available separately for 3 ranks.

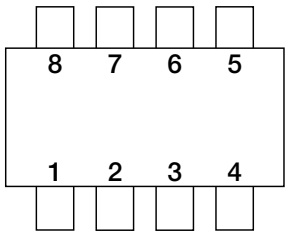
Package

SOP-8D

Applications

1. CD-ROM drive
2. Optical disc drivers

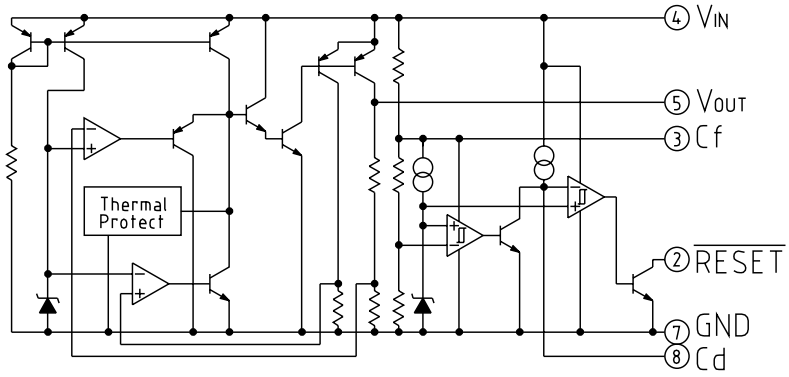
Pin Assignment



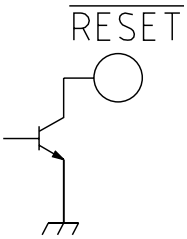
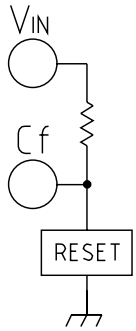
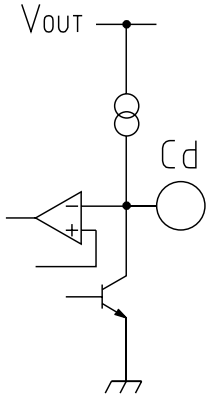
SOP-8D
(TOP VIEW)

1	N. C
2	$\overline{\text{RESET}}$
3	Cf
4	V_{IN}
5	V_{OUT}
6	N. C
7	GND
8	Cd

Equivalent Circuit Diagram



Pin Description

Pin No.	Pin name	Functions	Equivalent circuit diagram
1	N. C		
2	$\overline{\text{RESET}}$	V_{IN} pin voltage detection output $\overline{\text{RESET}}$ pin logic $V_{IN}<VS$: L $V_{IN}>VS$: H	
3	Cf	Ripple-filter pin (RESET) Please connect a capacitor between Cf-GND to reject ripple voltage of V_{IN} for RESET. It become C-R low-pass filter. Internal impedance of Cf is typically 14kΩ.	
4	V_{IN}	Voltage supply input pin	
5	V_{OUT}	Regulator Output pin	
6	N. C		
7	GND	GND pin	
8	Cd	Delay time capacitor pin RESET pin output delay time can be set by the capacitance connected to the Cd pin. t_{PLH}=100000·C t_{PLH}: transmission delay time [s] C: capacitor value [F]	

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Operating temperature *1	T_{OPR}	−30~+85	°C
Storage temperature	T_{STG}	−40~+125	°C
Supply voltage	V_{IN}	−0.3~+10	V
Output current	I_{OUT}	400	mA
Power dissipation	Pd	400(Alone)* 950(With board mounted)*2	mW

Note1: *1 Rank B: −20 ~+80°C ; Rank A: −30 ~ +85°C
Note2: *2 When mounted on a (Copper foil area 80% 192×142×1^{t} mm glass epoxy board.

Recommended Operating Conditions (Typical model MM1482C) (Except where noted otherwise, Ta=25°C)

Item	Symbol	Ratings	Unit
Operating temperature	T_{OP}	–20~+80	°C
Output current	I_{OP}	0~300	mA
Operating voltage	V_{OP}	0~10	V

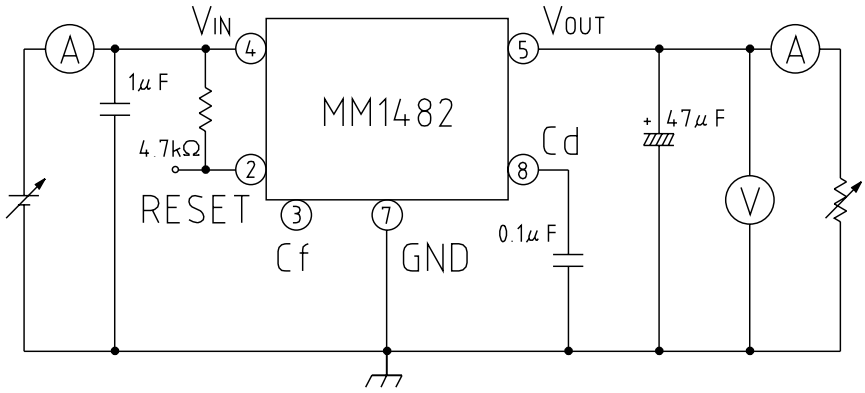
Note1: *1 Rank B: −20 ~+80°C ; Rank A: −30 ~ +85°C

Electrical Characteristics (Typical model 1482C) (Except where noted otherwise, Ta=25°C, V_{CONT}=1.6V) (Except where noted otherwise, resistance unit is Ω)

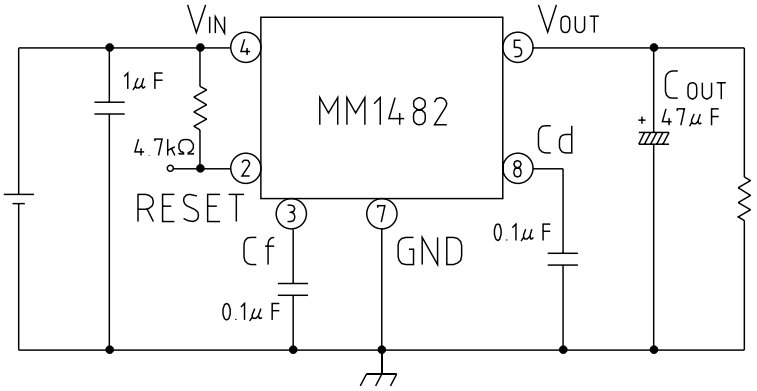
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
No-Load Input Current	Iccgl	V_{IN}=5V I_{OUT}=0mA C rank		2.2	4	mA
		A, B rank		3.0	6.0	mA
Regulator						
Output Voltage	V_{OUT}	V_{IN}=5V I_{OUT} =30mA	3.23	3.30	3.37	V
Input-Output differential Voltage	ViO	V_{IN}=3.2V I_{OUT}=150mA		0.15	0.3	V
Line Regulation	⊿V1	V_{IN}=4.4V~5.5V I_{OUT}=30mA		0.05	5	mV
Load Regulation	⊿V2	V_{IN}=5V I_{OUT}=0mA~300mA		20	120	mV
V_{OUT} Temperature Coefficient *1	⊿V_{OUT}/⊿T	Tj=–20~+80°C V_{IN}=5V I_{OUT}=30mA		100		ppm/°C
Ripple Rejection *1	RR	V_{IN}=5V f=120Hz V_{RIPPLE}=1V_{P-P} I_{OUT}=30mA C rank	50	80		dB
		A, B rank	50	90		dB
Output Noise Voltage *1	Vn	V_{IN}=5V, f=20~80kHz I_{OUT}=30mA C rank		60	120	μVrms
		A, B rank		40	120	μVrms
Reset						
Detecting Voltage	Vs	V_{IN}=H→L	4.11	4.20	4.29	V
Vs temperature Coefficient *1	⊿Vs/⊿T	Tj=20~80°C		100		ppm/°C
Hysteresis Voltage	⊿Vs	V_{IN}=H→L→H	100		200	mV
Low-Level Output Voltage	V_{OL}	V_{IN}=3.9V R_L=4.7k		100	200	mV
Output Leakage Current	I_{OH}	V_{IN}=5V			±0.1	μA
Output Current when ON 1	I_{OL}	V_{IN}=3.9V, R_L=0	5			mA
Output Current when ON 2 *1	I_{OL}	V_{IN}=3.9V, R_L=0 Ta=–20~+80°C	3			mA
"H"Transmission Delay Time *1	t_{PLH}	Cd Pin open		30	90	μs
Reset Delay Time *1	t_{PLH1}	V_{IN}=4V→5V, Cd=0.1μF	5	10	20	ms
"L"Transmission Delay Time *1	t_{PHL}	Cd pin open		30	90	μs
Threshold Operating Voltage	V_{OPL}	VOL=0.4V		0.65	0.85	V
Cf terminal impedance	R_{CF}	V_{IN}=5V		14		kΩ

Note 1: design guaranteed

Measuring Circuit



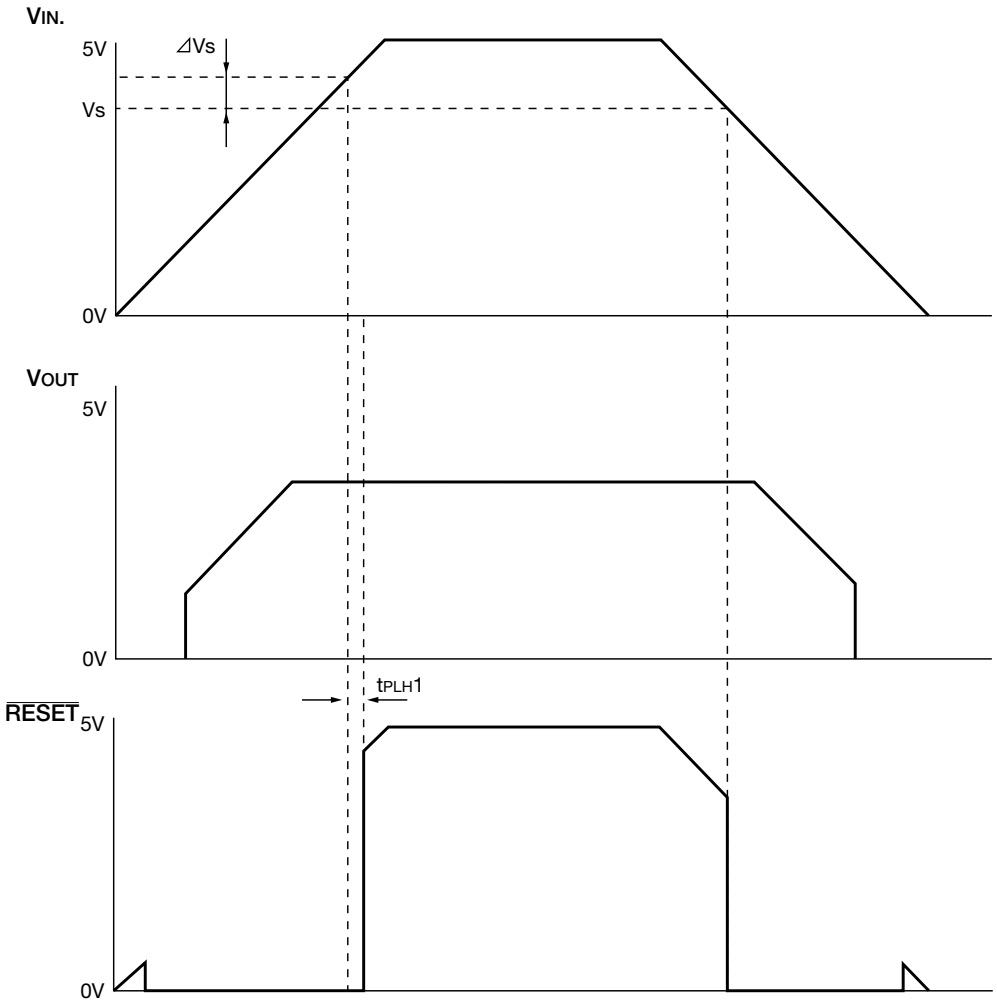
Application Circuit



Note 1 : This regulator is not internally compensated and thus requires an external output-capacitor (C_{OUT}) for stability.

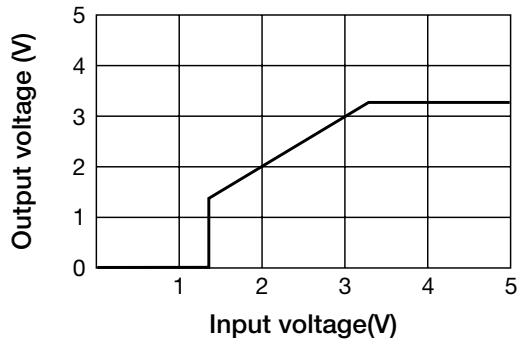
Note 2 : Please be careful with regard to set wiring and temperature-related capacitor changes that may cause oscillation.

Timing Chart

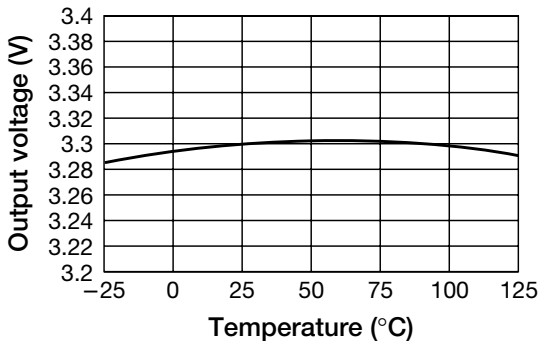


Characteristics (Typical model MM1482C)

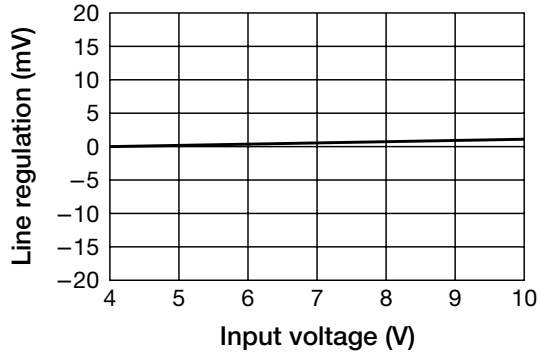
Regulator Output



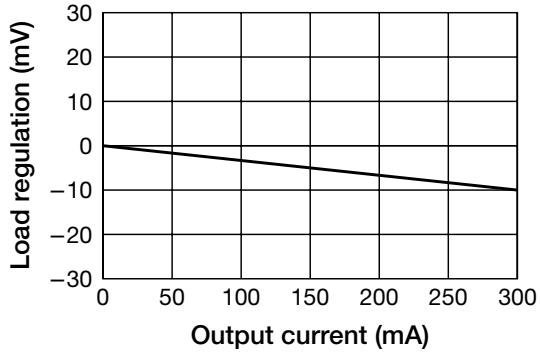
Output voltage vs temperature



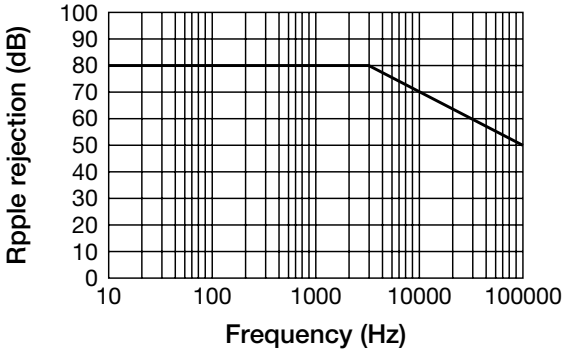
Line regulation



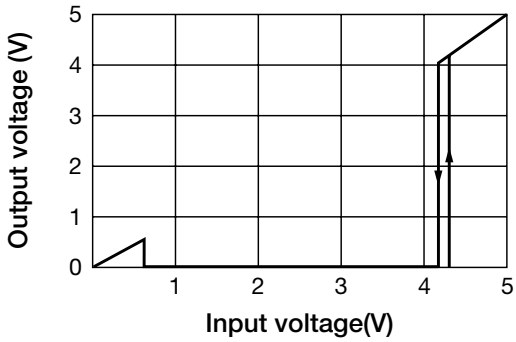
Load regulation



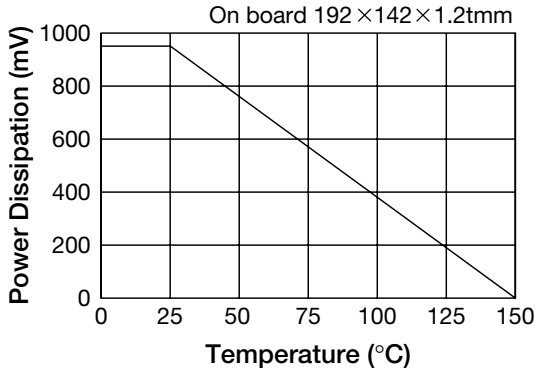
Ripple rejection



Reset Output



Power Dissipation



Detecting voltage vs temperature