

Regulator+Reset IC Monolithic IC MM1458

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.

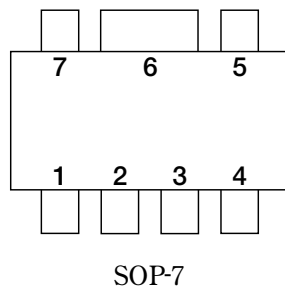
Package

SOP-7

Applications

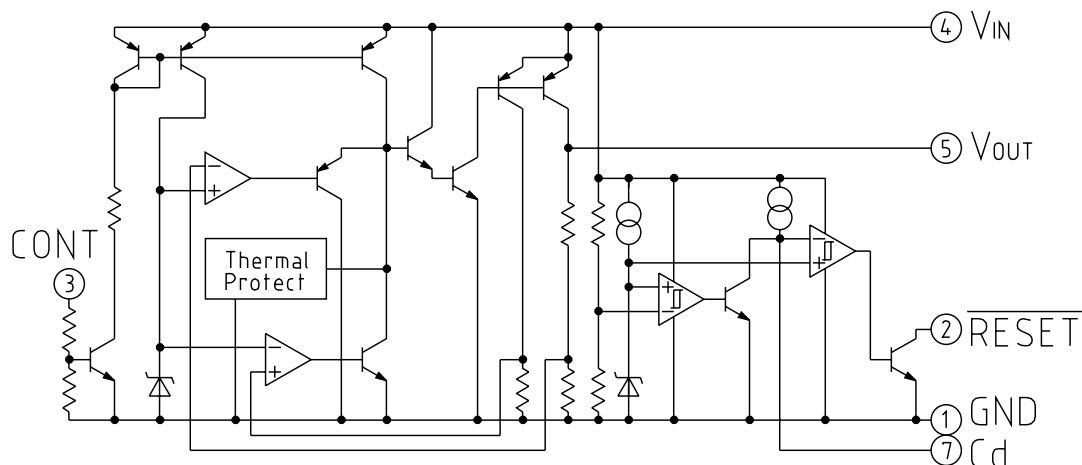
CD-ROM drive.

Pin Assignment



1	GND
2	$\overline{\text{RESET}}$
3	CONT
4	V_{IN}
5	V_{OUT}
6	GND
7	cd

Equivalent Circuit Diagram



Pin Description

Pin No.	Pin name	Functions	Equivalent circuit diagram						
1	GND	GND pin							
2	$\overline{\text{RESET}}$	Input voltage detection output Input voltage detection output pin $\overline{\text{RESET}}$ pin logic <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td>$\overline{\text{RESET}}$</td> </tr> <tr> <td>$V_{IN} < V_S$</td> <td>L</td> </tr> <tr> <td>$V_{IN} > V_S$</td> <td>H</td> </tr> </table>		$\overline{\text{RESET}}$	$V_{IN} < V_S$	L	$V_{IN} > V_S$	H	
	$\overline{\text{RESET}}$								
$V_{IN} < V_S$	L								
$V_{IN} > V_S$	H								
3	CONT	Output voltage on/off-control pin <table border="1" style="margin-left: 20px;"> <tr> <td>V_{CONT}</td> <td>Output</td> </tr> <tr> <td>L</td> <td>OFF</td> </tr> <tr> <td>H</td> <td>ON</td> </tr> </table> <p>Connect cont-terminal with V_{IN}, when it is not used.</p>	V_{CONT}	Output	L	OFF	H	ON	
V_{CONT}	Output								
L	OFF								
H	ON								
4	V_{IN}	Voltage supply input pin							
5	V_{OUT}	Regulator Output pin							
6	GND	GND pin							
7	C_d	Delay time capacitor pin RESET pin output delay time can be set by the capacitance connected to the C_d pin. $t_{PLH} = 100000 \cdot C$ t_{PLH} : transmission delay time [S] C: capacitor value [F]							

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Operating temperature	T_{OPR}	-20~+80	°C
Storage temperature	T_{STG}	-40~+125	°C
Supply voltage	V_{IN}	-0.3~+10	V
Output current	I_{OUT}	400	mA
Power dissipation	P_d	800*	mW

Note: * When mounted on a 25×40×1.1 mm glass epoxy board.

Recommended Operating Conditions

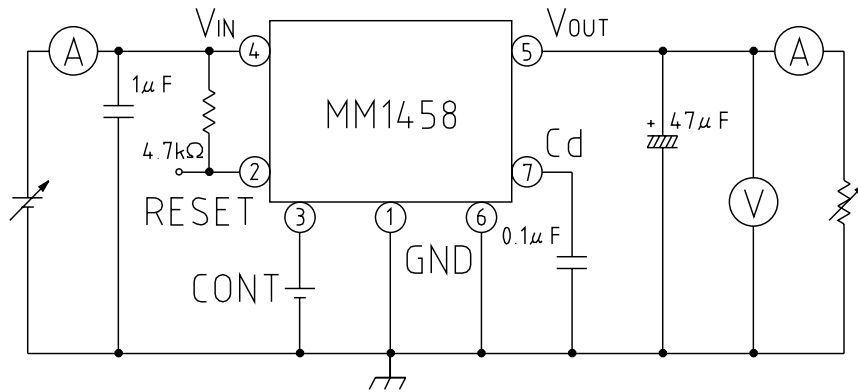
Item	Symbol	Ratings	Unit
Operating temperature	T _{OP}	-20~80	°C
Output current	I _{OP}	0~300	mA
Operating voltage	V _{OP}	0~10	V

Electrical Characteristics (Except where noted otherwise, T_a=25°C, V_{CONT}=1.6V)

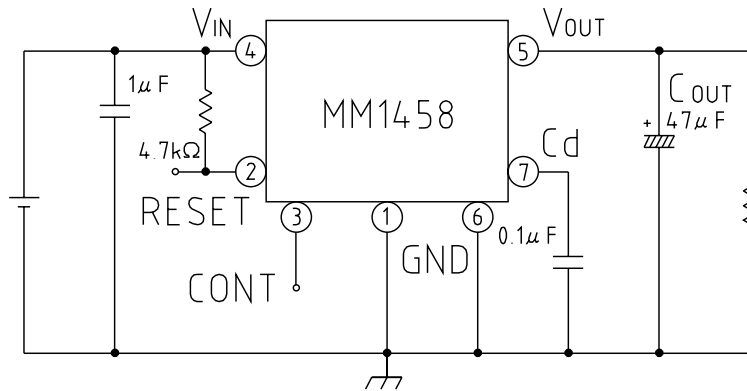
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Unit
No-load input current 1	I _{ccq1}	V _{IN} =5V, I _{OUT} =0mA		3	8	mA
No-load input current 2	I _{ccq2}	V _{IN} =4V, I _{OUT} =0mA		4		mA
Input current (OFF)	I _{ccq3}	V _{IN} =5V, V _{CONT} =0.4V		250		μA
Regulator						
Output Voltage	V _{OUT}	V _{IN} =5V, I _{OUT} =30mA	3.33	3.40	3.47	V
Input-Output differential Voltage	V _{i0}	V _{IN} =3.2V, I _{OUT} =150mA		0.15	0.3	V
Line regulation	ΔV ₁	V _{IN} =4.4~5.5V, I _{OUT} =30mA		10	20	mV
Load regulation	ΔV ₂	V _{IN} =5V, I _{OUT} =0~300mA		20	120	mV
V _{OUT} temperature coefficient *	ΔV _{OUT} / ΔT	T _j =-20~+80°C, V _{IN} =5V I _{OUT} =30mA		100		ppm/°C
Ripple rejection *	RR	V _{IN} =5V, f=120Hz V _{RIPPLE} =1V _{P-P} , I _{OUT} =30mA	50	80		dB
Output noise voltage *	V _n	V _{IN} =5V, f=20~80kHz I _{OUT} =30mA, C _N =0.01μF		40	120	μV _{rms}
CONT terminal current	I _{ON}	V _{CONT} =1.6V		5	10	μA
High threshold voltage	H		1.6		V _{IN} +0.3	V
Low threshold voltage	L		-0.3		0.4	V
Reset						
Detection voltage	V _S	V _{IN} =H→L	4.11	4.20	4.29	V
V _S temperature coefficient *	ΔV _S / ΔT	T _j =-20~80°C		100		ppm/°C
Hysteresis voltage	ΔV _S	V _{IN} =H→L→H	100		200	mV
Low-level output voltage	V _{OL}	V _{IN} =3.9V, R _L =4.7kΩ		100	200	mV
Output leakage current	I _{OH}	V _{IN} =5V			±0.1	μA
Output current 1	I _{OL}	V _{IN} =3.9V, R _L =0Ω	5			mA
Output current 2 *	I _{OL}	V _{IN} =3.9V, R _L =0Ω, T _a =-20~+80°C	3			mA
"H" transmission delay time *	t _{PLH}	C _d =0.0μF		30	90	μS
Reset delay time	t _{PLH1}	V _{IN} =4V→5V, C _d =0.1μF	5	10	20	mS
"L" transmission delay time *	t _{PHL}			30	90	μS
Threshold operating voltage	V _{OPL}	V _{OL} =0.4V		0.65	0.85	V

Note 1: design guaranteed

Measuring Circuit

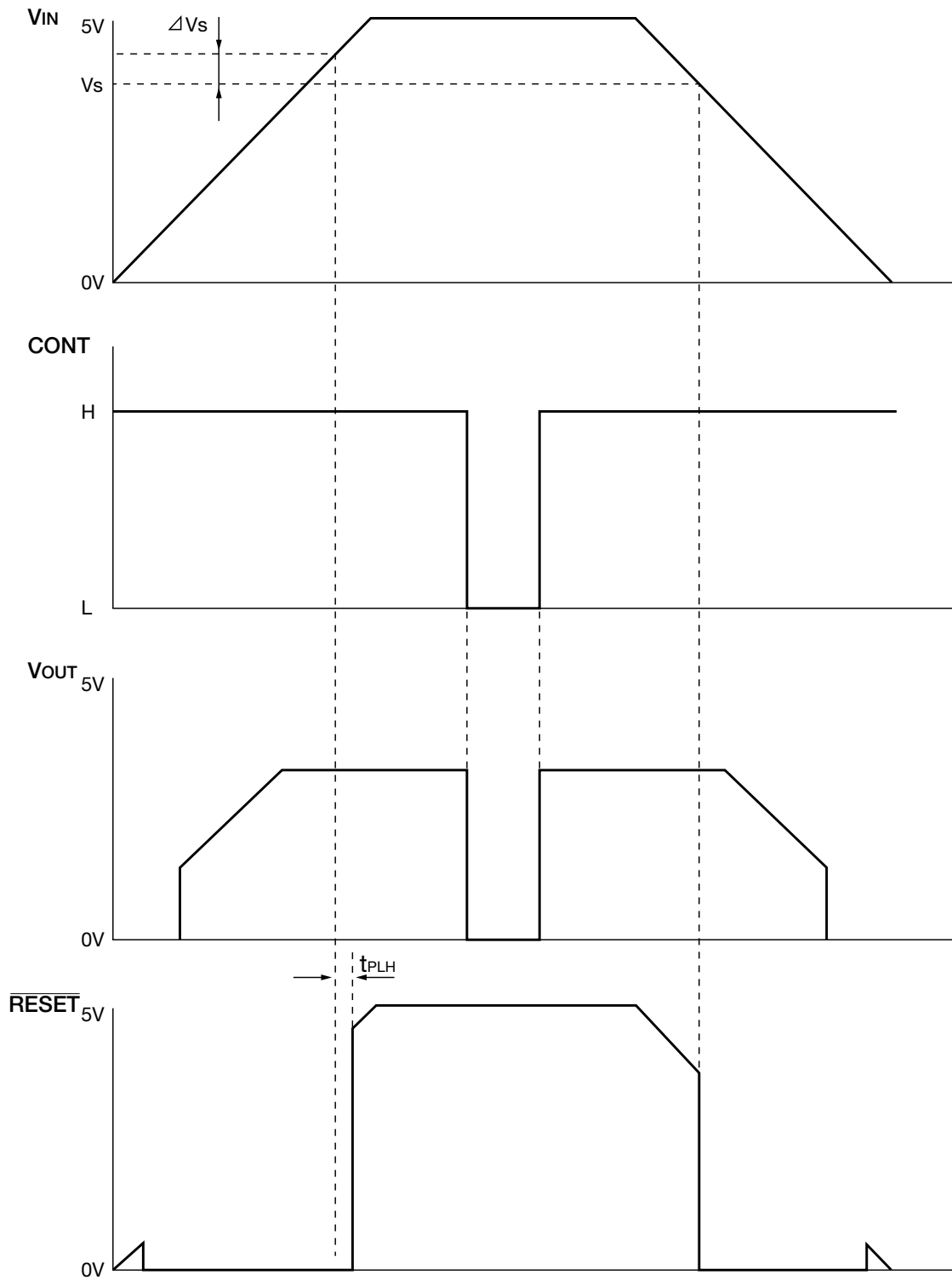


Application Circuit



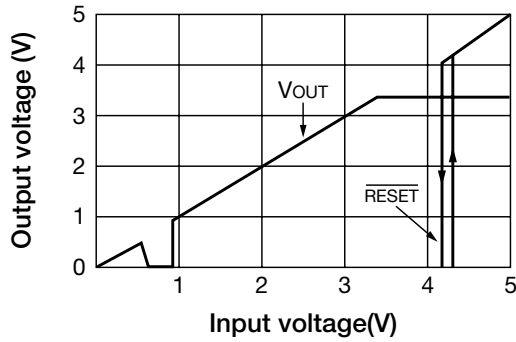
Note 1 : This regulator is not internally compensated and thus requires an external output-capacitor (C_{OUT}) for stability.

Timing Chart

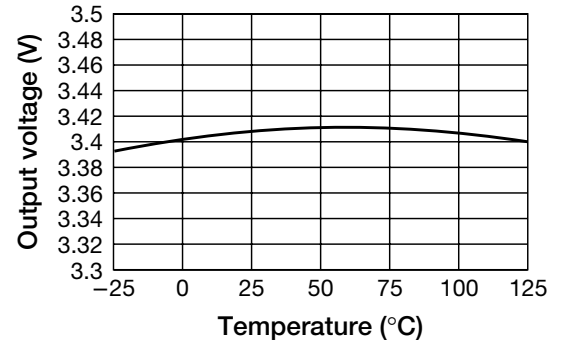


Characteristics

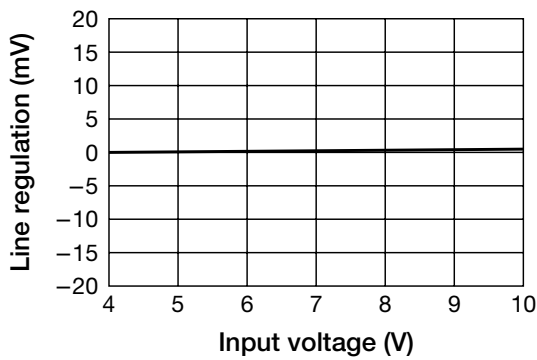
Detection voltage ($I_{OUT}=0mA$)



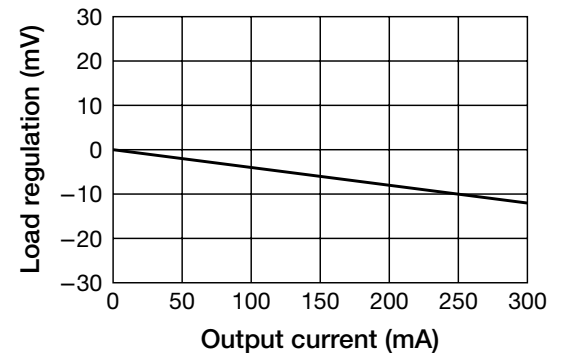
Output voltage vs temperature



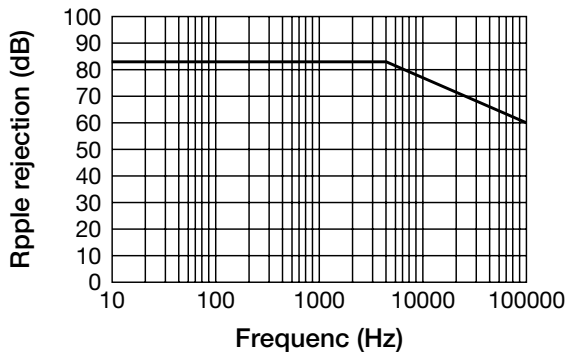
Line regulation



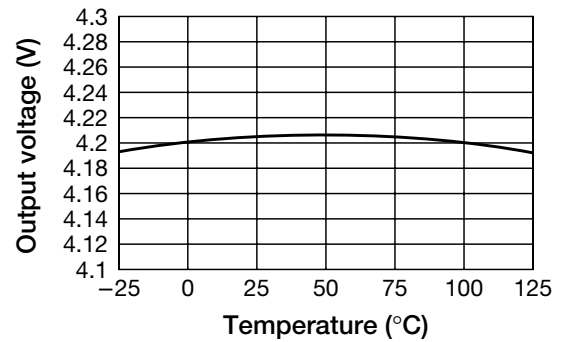
Load regulation



Ripple rejection



Detecting voltage vs temperature



Allowable loss

