

Regulator with ON/OFF Monolithic IC MM3042□~MM3045□N

Outline

This IC is a low current consumption (2.5μA typ.), small CMOS regulator ("L" Active type) with ON/OFF control.

The output current capability has been increased from that of MM3051□~ MM3055□V type regulators.

Features

- | | |
|---|---|
| 1. I/O voltage difference (MM3043L ~ MM3043V) | 0.3V typ. ($I_o=60\text{mA}$) |
| 2. Current consumption | 2.5μA typ. ($V_{IN}=V_{OUT}+1\text{V}$) |
| 3. Output current (MM3045L ~ MM3045R) | 100mA min. ($V_{IN}-V_{OUT}=1.0\text{V}$) |
| 4. Output voltage rank | 2.0~5.5V (0.1V step) |
| 5. Output ON/OFF control function | High: OFF, Low: ON |

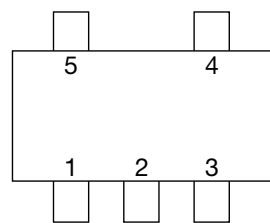
Package

SOT-25A (Mini mold)

Applications

1. Portable equipment
2. Cellular telephone, PHS
3. Cordless telephone
4. Other battery-powered portable equipment

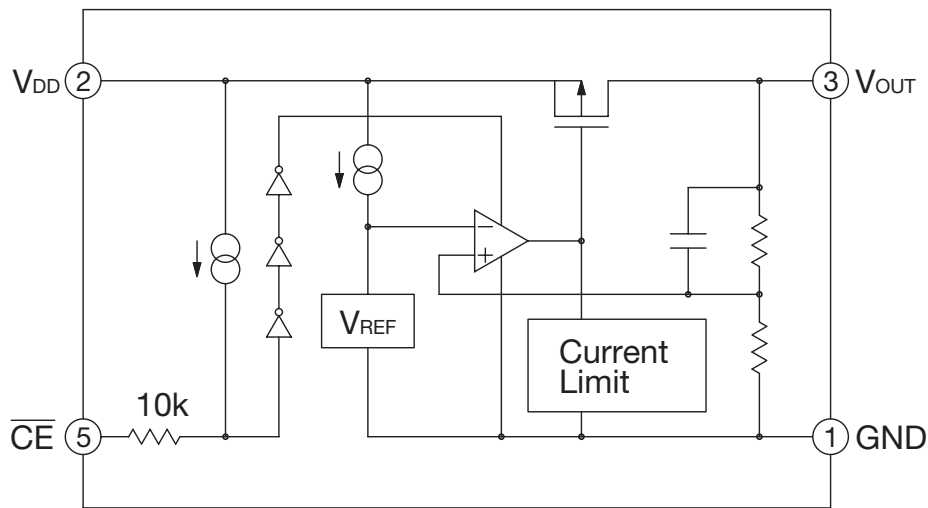
Pin Assignment



SOT-25A
(TOP VIEW)

1	GND
2	V_{DD}
3	V_{OUT}
4	NC
5	\overline{CE}

Equivalent Circuit Diagram



Pin Description

Pin No.	Pin name	Function				
1	GND	GND pin				
2	V _{DD}	Voltage-Supply pin				
3	V _{OUT}	Regulator output pin				
4	NC					
5	\overline{CE}	ON/OFF-Control pin				
		<table border="1"> <thead> <tr> <th>\overline{CE}</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>L</td> <td>ON</td> </tr> <tr> <td>H</td> <td>OFF</td> </tr> </tbody> </table>	\overline{CE}	Output	L	ON
\overline{CE}	Output					
L	ON					
H	OFF					
Connect \overline{CE} pin with GND pin, when it is not used.						

Absolute Maximum Ratings (Except where noted otherwise, Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T _{STG}	-40~+125	°C
Operating temperature	T _{OPR}	-30~+85	°C
Supply voltage	V _{DD}	-0.3~+9	V
Output current	I _{OUT}	150	mA
Allowable loss	P _d	150 (Alone)	mW

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

Item	Symbol	Ratings	Units
Operating temperature	T _{OP}	-30~+85	°C
Supply voltage	V _{OP}	V _{OUT} +0.3~8	V

Electrical Characteristics (Except where noted otherwise, $T_a=25^\circ\text{C}$, $V_{CE}=\text{GND}$)

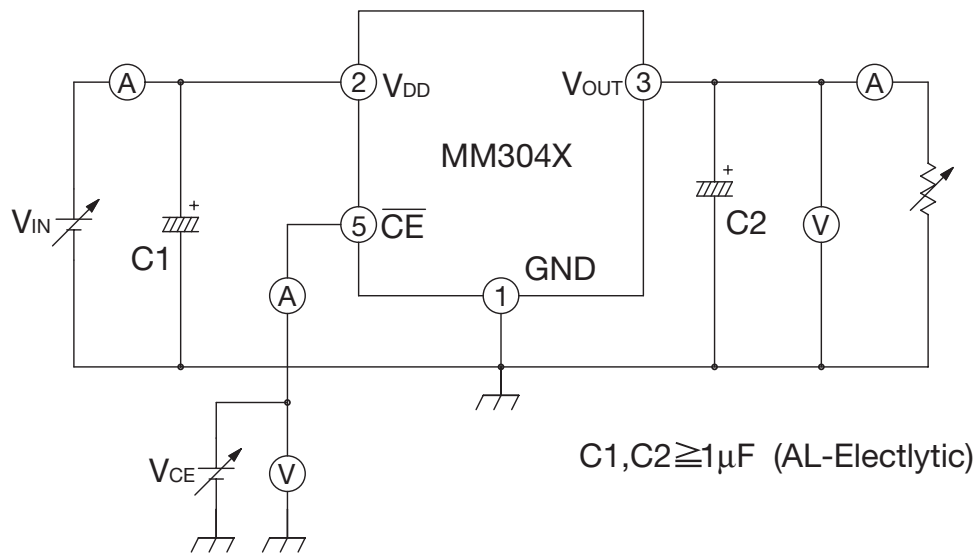
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Supply current	I_{SS}	$V_{IN}=V_{OUT}+1.0\text{V}$, Excluding CE pin current (I_{CE})		2.5	5.0	μA
Supply current (OFF)	$I_{standby}$	$V_{IN}=V_{OUT}+1.0\text{V}$, $V_{CE}=V_{IN}$		0.1	1.0	μA
Line regulation	$\Delta V_{OUT}/\Delta V_{IN}$	$I_{OUT}=30\text{mA}$, $V_{OUT}+0.5\text{V} \leq V_{IN} \leq 8\text{V}$	0	0.15	0.30	%/V
Input voltage	V_{IN}				8.0	V
Vo temperature coefficient	$\Delta V_{OUT}/\Delta T_{opt}$	$I_{OUT}=10\text{mA}$ $-30^\circ\text{C} \leq T_{OPT} \leq 85^\circ\text{C}$		± 100		ppm/ $^\circ\text{C}$
Output short-circuit current	I_{lim}	$V_{IN}=V_{OUT}+1.0\text{V}$, $V_{OUT}=0\text{V}$		60		mA
High threshold voltage	V_{CEH}		1.5			V
Low threshold voltage	V_{CEL}				0.25	V
CE pin current "H"	I_{CEH}	$V_{CE}=V_{IN}$		0	0.1	μA
CE pin current "L"	I_{CEL}	$V_{CE}=\text{GND}$	-4.0	-2.0	-1.0	μA

Note: V_{OUT} is the output voltage typ. value in the specifications.
 Make sure that output current does not exceed loss tolerance.

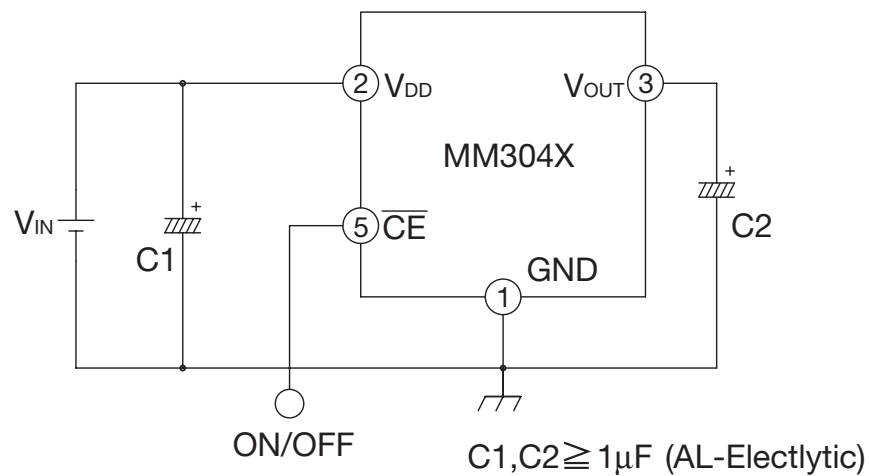
Electrical Characteristics 2 (Except where noted otherwise, Ta=25°C, Vce=GND)

Product name	Item												
	Output voltage			Output current			Load regulation			Input-Output differential voltage			
	V _{OUT} (V)			I _{OUT} (mA)			ΔV _{OUT} /ΔI _{OUT} (mV)			V _{DIF} (V)			
	Test condicions	Min.	Typ.	Max.	Test condicions	Min.	Typ.	Test condicions	Typ.	Max.	Test condicions	Typ.	Max.
MM3042L	V _{IN} -V _{OUT} =1.0V	1.960	2.000	2.040	V _{IN} -V _{OUT} =1.0V	25	40	V _{IN} -V _{OUT} =1.0V 1mA ≤ I _{OUT} ≤ 40mA	40	80	V _{IN} =V _{OUT} -0.2V I _{OUT} =40mA	0.3	0.5
MM3042M													
MM3042N													
MM3042P													
MM3042Q													
MM3042R													
MM3042S													
MM3042T													
MM3042U													
MM3042V													
MM3043L													
MM3043M													
MM3043N													
MM3043P													
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MM3044T													
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MM3044V													
MM3045L													
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Measuring Circuit



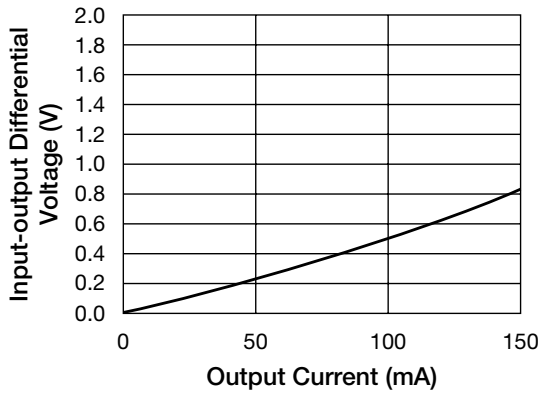
Typical Application Circuit



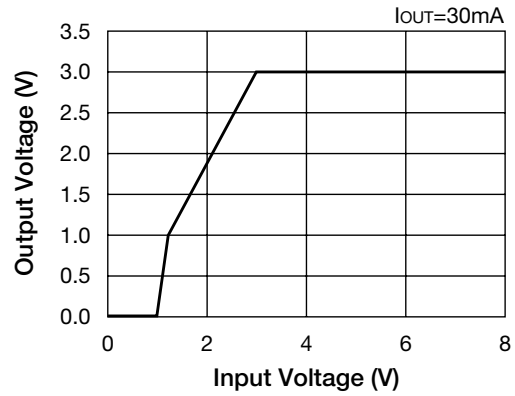
note) This regulator is not internally compensated and thus requires an external output-capacitor(C_{out}) for stability.

Characteristics (3.0V product Ambient Temperature, $T_a=25^{\circ}\text{C}$)

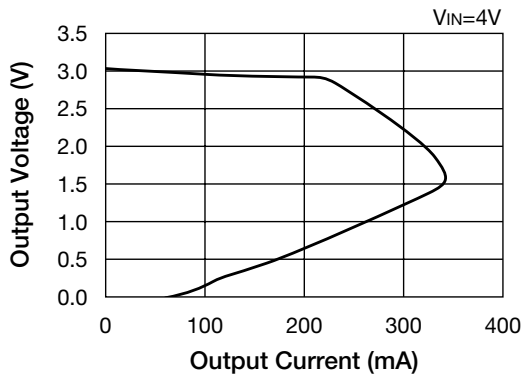
■ **Input-Output Differential Voltage**



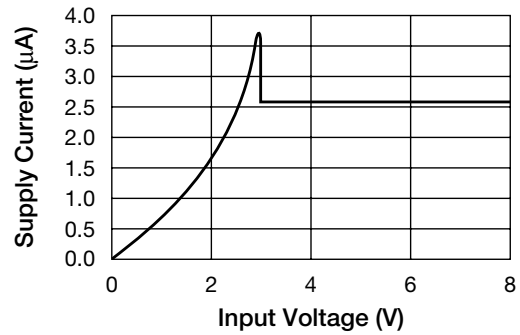
■ **Line Regulation**



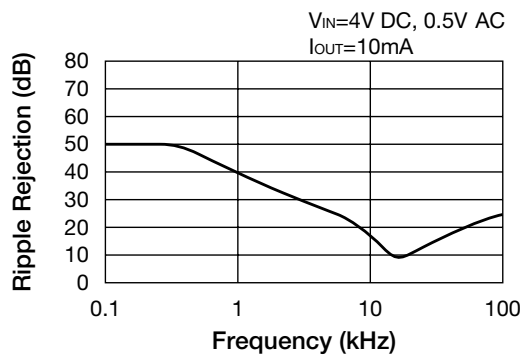
■ **Load Regulation**



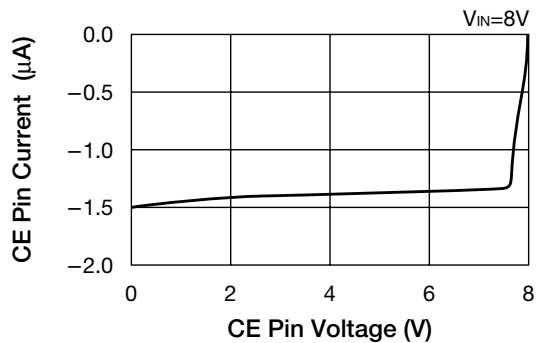
■ **Supply Current**



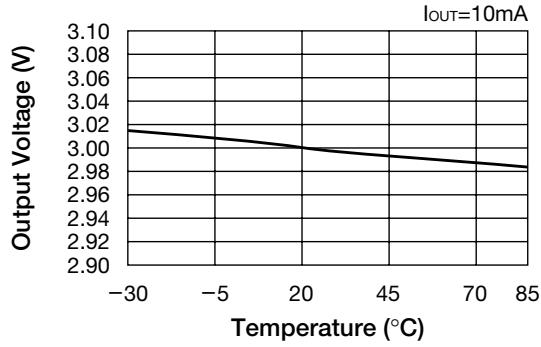
■ **Ripple Rejection**



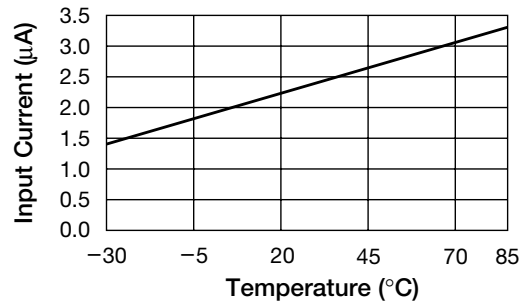
■ **CE Pin Current – CE Pin Voltage**



■ Output Voltage – Temperature



■ Input Current – Temperature



■ Allowable Loss

