

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 =60mA) |
| 2. Current consumption | 2.5μA typ. (V _{IN} =V _{OUT} +1V) |
| 3. Output current (MM3045L ~ MM3045R) | 100mA min. (V _{IN} -V _{OUT} =1.0V) |
| 4. Output voltage rank | 2.0~5.5V (0.1V step) |
| 5. Output ON/OFF control function | High: OFF, Low: ON |

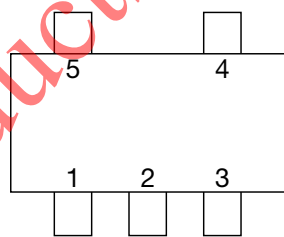
Package

SOT-25A (Mini mold)

Applications

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

Pin Assignment

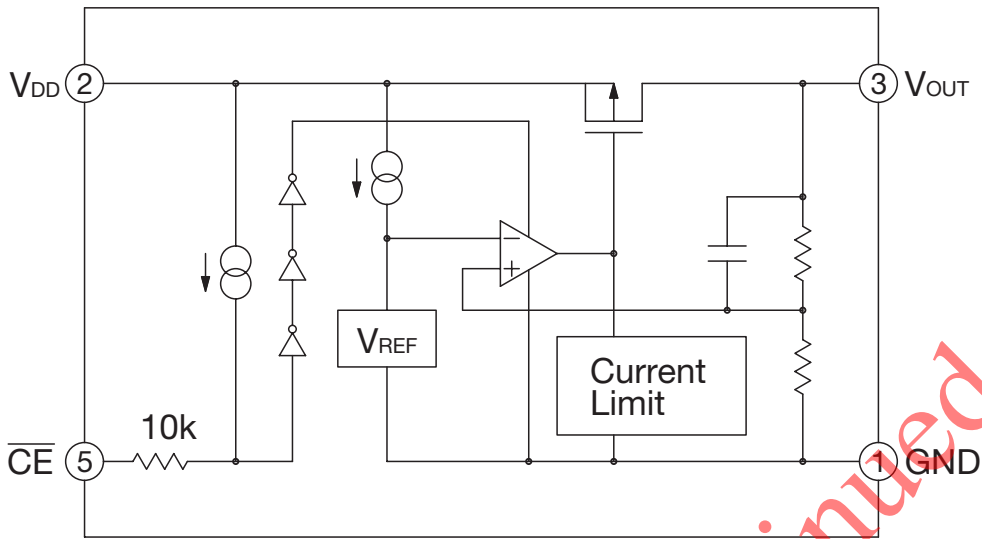


SOT-25A
(TOP VIEW)

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

Products to be discontinued

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"> <tr> <td>\overline{CE}</td> <td>Output</td> </tr> <tr> <td>L</td> <td>ON</td> </tr> <tr> <td>H</td> <td>OFF</td> </tr> </table>	\overline{CE}	Output	L	ON	H	OFF
		\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, T_a=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, T_a=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, Ta=25°C, VCE=GND)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Supply current	I _{SS}	V _{IN} =V _{OUT} +1.0V, Excluding CE pin current (I _{CE})		2.5	5.0	μA
Supply current (OFF)	I _{standby}	V _{IN} =V _{OUT} +1.0V, V _{CE} =V _{IN}		0.1	1.0	μA
Line regulation	$\Delta V_{OUT}/\Delta V_{IN}$	I _{OUT} =30mA, V _{OUT} +0.5V ≤ V _{IN} ≤ 8V	0	0.15	0.30	%/V
Input voltage	V _{IN}				8.0	V
Vo temperature coefficient	$\Delta V_{OUT}/\Delta V_{opt}$	I _{OUT} =10mA -30°C ≤ T _{OPT} ≤ 85°C		±100		ppm/°C
Output short-circuit current	I _{lim}	V _{IN} =V _{OUT} +1.0V, V _{OUT} =0V		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} =GND	-4.0	-2.0	-1.0	μA

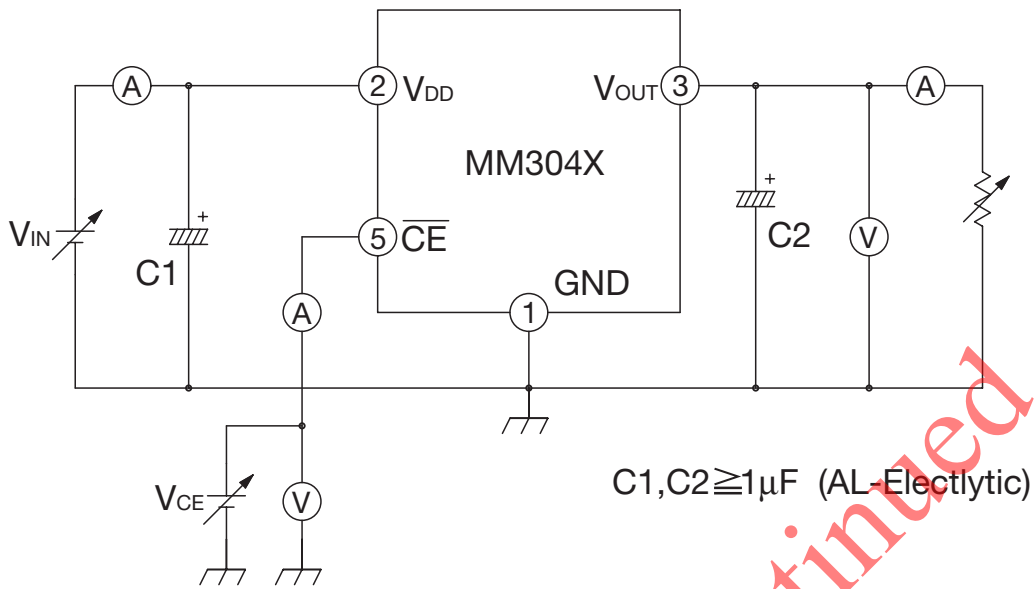
Note: V_{OUT} is the output voltage typ. value in the specifications.
 Make sure that output current does not exceed loss tolerance.

Products to be discontinued

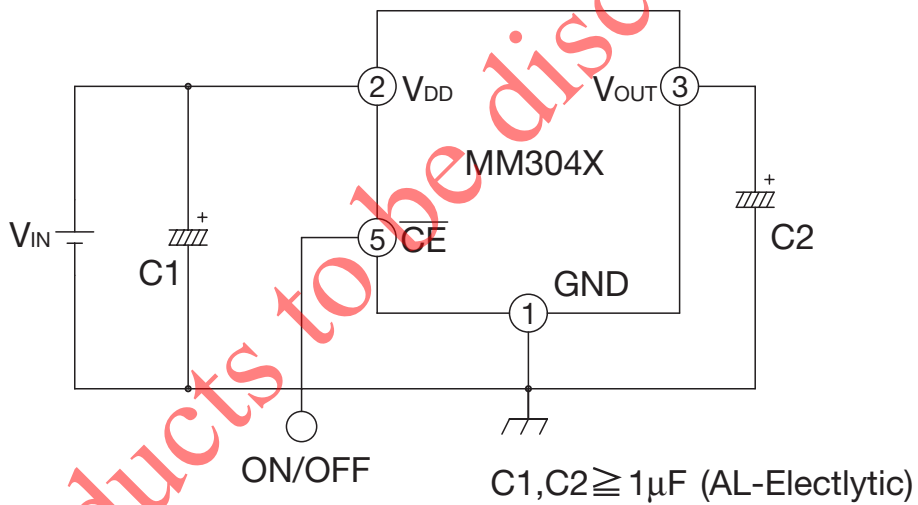
Electrical Characteristics 2 (Except where noted otherwise, Ta=25°C, VCE=GND)

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 conditions	Min.	Typ.	Max.	Test conditions	Min.	Typ.	Test conditions	Typ.	Max.	Test conditions	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	I _{OUT} =10mA	3.136	3.200	3.264	V _{IN} -V _{OUT} =1.0V	40	60	V _{IN} -V _{OUT} =1.0V 1mA ≤ I _{OUT} ≤ 60mA	40	80	V _{IN} =V _{OUT} -0.2V I _{OUT} =60mA	0.3	0.5										
MM3043P																							
MM3043Q																							
MM3043R																							
MM3043S																							
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MM3043U																							
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MM3044M																							
MM3044N																							
MM3044P																							
MM3044Q	I _{OUT} =10mA	4.312	4.400	4.488	V _{IN} -V _{OUT} =1.0V	50	80	V _{IN} -V _{OUT} =1.0V 1mA ≤ I _{OUT} ≤ 80mA	50	80	V _{IN} =V _{OUT} -0.2V I _{OUT} =80mA	0.3	0.5										
MM3044R																							
MM3044S																							
MM3044T																							
MM3044U																							
MM3044V																							
MM3045L																							
MM3045M		I _{OUT} =10mA	4.998	5.100										5.202	V _{IN} -V _{OUT} =1.0V	65	100	V _{IN} -V _{OUT} =1.0V 1mA ≤ I _{OUT} ≤ 100mA	65	100	V _{IN} =V _{OUT} -0.2V I _{OUT} =100mA	0.3	0.5
MM3045N																							
MM3045P																							
MM3045Q																							
MM3045R																							

Measuring Circuit



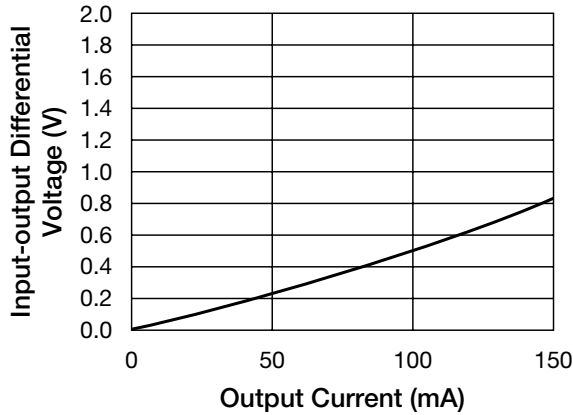
Typical Application Circuit



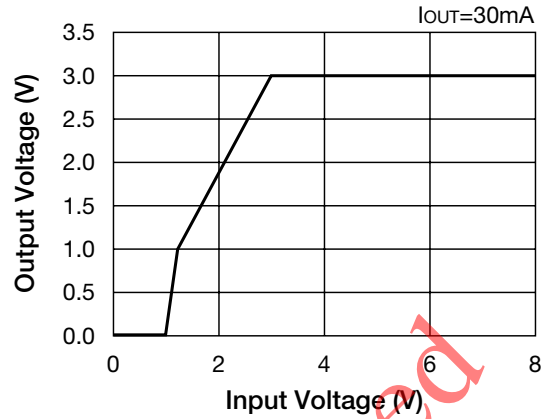
note) This regulator is not internally compensated and thus requires an external output-capacitor(C_{OUT}) for stability.

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

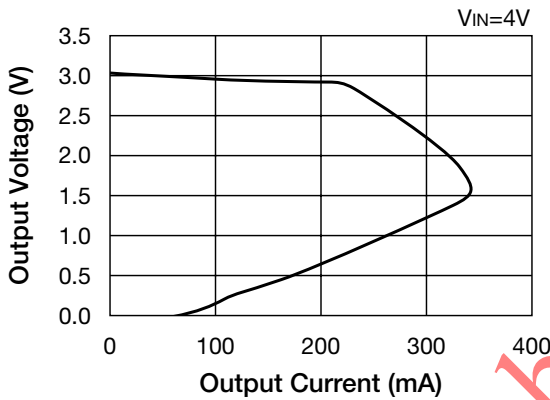
Input-Output Differential Voltage



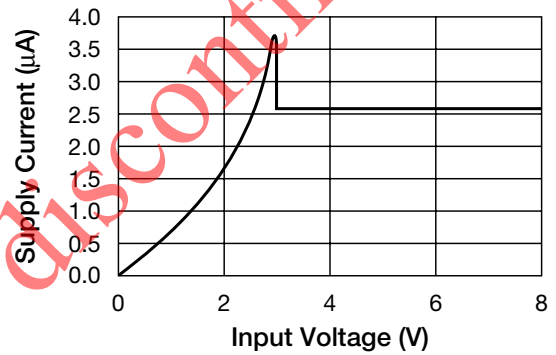
Line Regulation



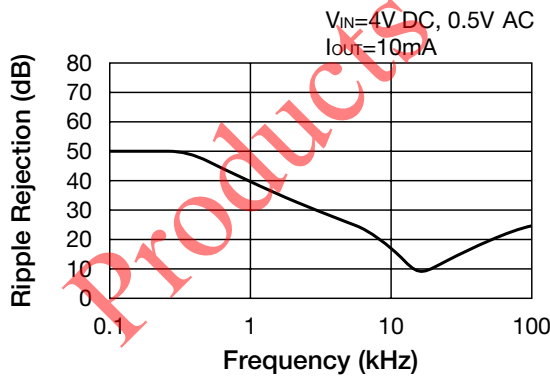
Load Regulation



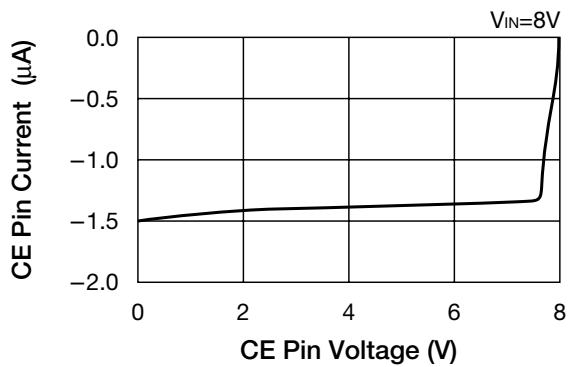
Supply Current



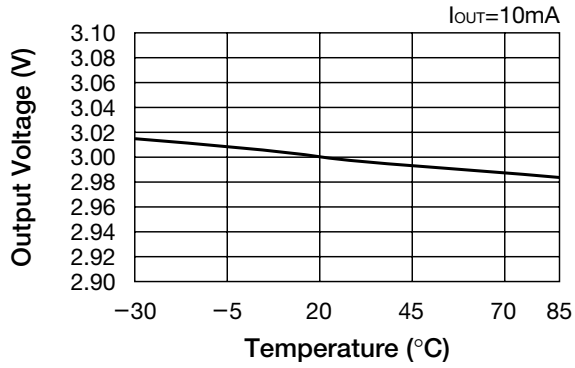
Ripple Rejection



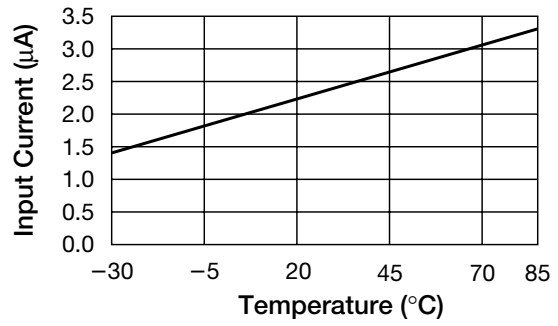
CE Pin Current – CE Pin Voltage



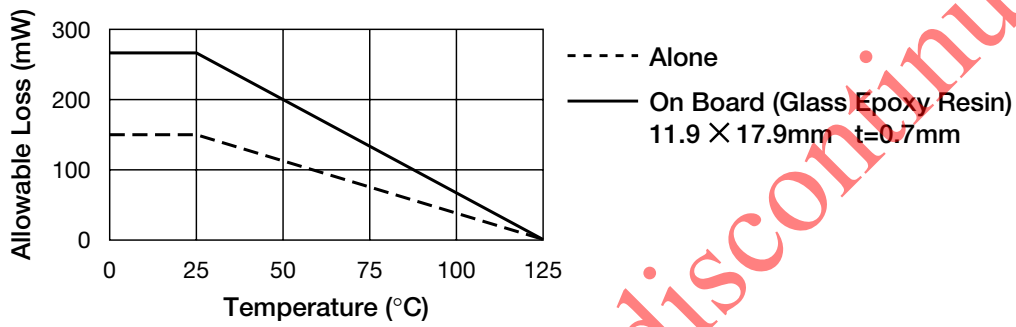
■ Output Voltage – Temperature



■ Input Current – Temperature



■ Allowable Loss



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