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

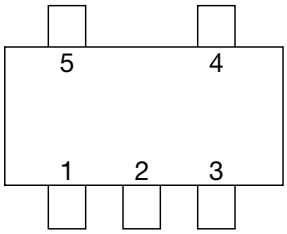
Package

SOT-25 (Mini mold)

Applications

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

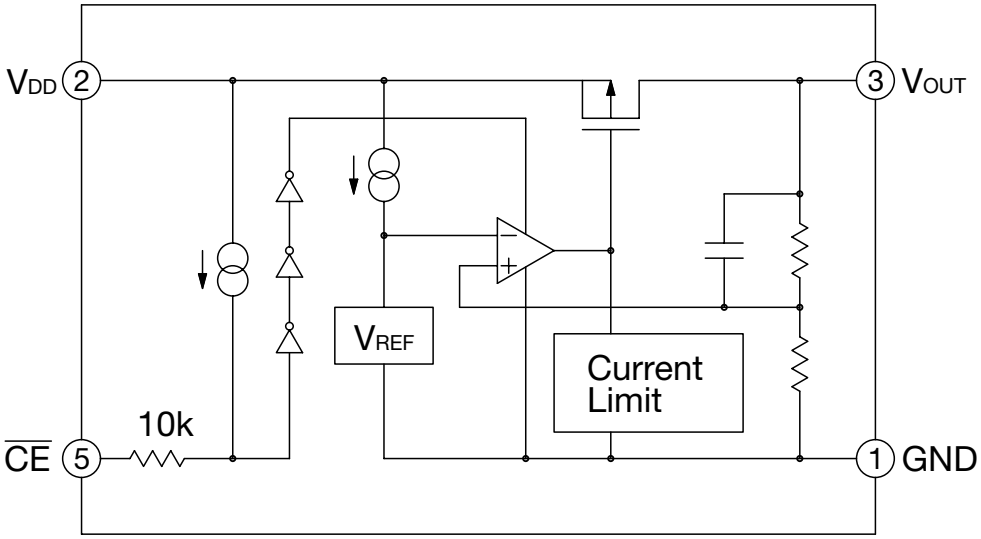
Pin Assignment



SOT-25
(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	VDD	Voltage-Supply pin
3	VOUT	Regulator output pin
4	NC	No connection pin
5	$\overline{CE}$	ON/OFF-Control pin $\overline{CE}$ / Output: L / ON; H / OFF Connect $\overline{CE}$ pin with GND pin, when it is not used.

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

Item	Symbol	Ratings	Units
Storage temperature	TSTG	–40~+125	°C
Operating temperature	TOPR	–30~+85	°C
Supply voltage	VDD	–0.3~+9	V
Output current	IOUT	150	mA
Allowable loss	Pd	150 (Alone)	mW

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

Item	Symbol	Ratings	Units
Operating temperature	TOP	–30~+85	°C
Supply voltage	VOP	VOUT+0.3~8	V

Electrical Characteristics (Except where noted therwise, Ta=25°C, V_{CE}=GND)

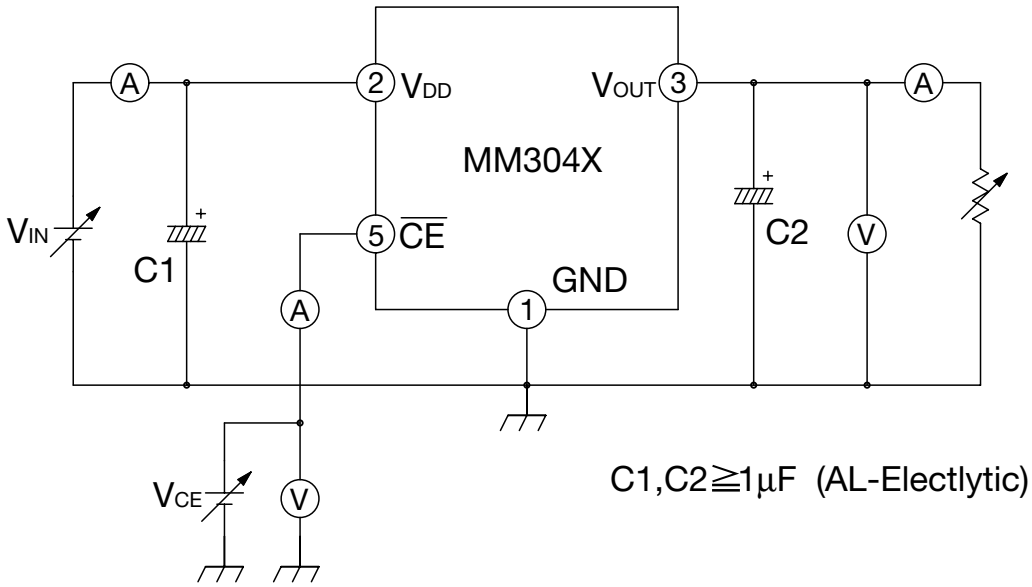
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Supply current	I_{SS}	V_{IN}=V_{OUT}+1.0V, Excluding CE pin current (I_{CE})		2.5	5.0	µA
Supply current (OFF)	Istandby	V_{IN}=V_{OUT}+1.0V, V_{CE}=V_{IN}		0.1	1.0	µA
Line regulation	$\Delta V_{OUT}/\Delta V_{IN}$	I_{OUT}=30mA, V_{OUT}+0.5V ≦ V_{IN} ≦ 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	Ilim	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
$\overline{CE}$ pin current "H"	I_{CEH}	V_{CE}=V_{IN}		0	0.1	µA
$\overline{CE}$ 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.

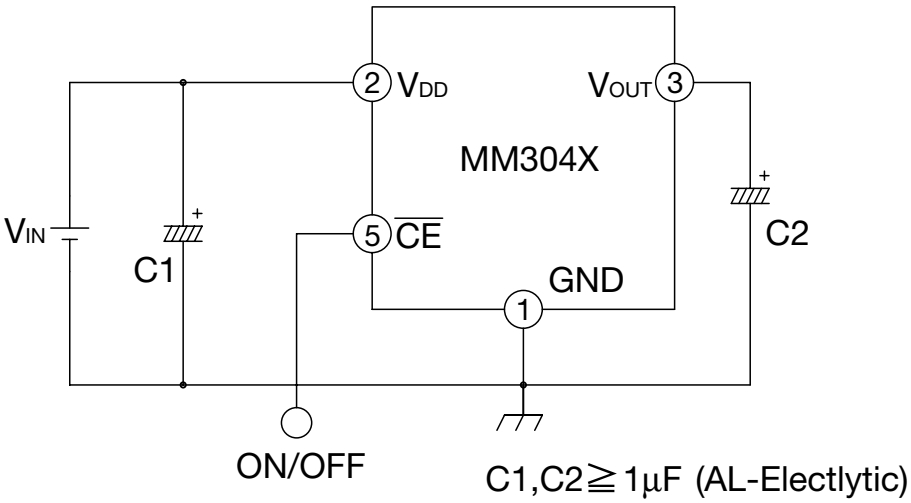
Electrical Characteristics 2 (Except where noted therwise, Ta=25°C, V_{CE}=GND)

Product name	Item												
	Output voltage				Output current			Load regulation			Input-Output differential voltage		
	V_{OUT} (V)				I_{OUT} (mA)			$\Delta V_{OUT}/\Delta I_{OUT}$ (mV)			V_{DIF} (V)		
	Test condisions	Min.	Typ.	Max.	Test condisions	Min.	Typ.	Test condisions	Typ.	Max.	Test condisions	Typ.	Max.
MM3042L	V_{IN}-V_{OUT} =1.0V I_{OUT} =10mA	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		2.058	2.100	2.142									
MM3042N		2.156	2.200	2.244									
MM3042P		2.254	2.300	2.346									
MM3042Q		2.352	2.400	2.448									
MM3042R		2.450	2.500	2.550									
MM3042S		2.548	2.600	2.652									
MM3042T		2.646	2.700	2.754									
MM3042U		2.744	2.800	2.856									
MM3042V		2.842	2.900	2.958									
MM3043L		2.940	3.000	3.060		40	60	V_{IN}-V_{OUT} =1.0V 1mA ≦ I_{OUT} ≦ 60mA			V_{IN}=V_{OUT} -0.2V I_{OUT} =60mA		
MM3043M		3.038	3.100	3.162									
MM3043N		3.136	3.200	3.264									
MM3043P		3.234	3.300	3.366									
MM3043Q		3.332	3.400	3.468									
MM3043R		3.430	3.500	3.570									
MM3043S		3.528	3.600	3.672									
MM3043T		3.626	3.700	3.774									
MM3043U		3.724	3.800	3.876									
MM3043V		3.822	3.900	3.978									
MM3044L		3.920	4.000	4.080		50	80	V_{IN}-V_{OUT} =1.0V 1mA ≦ I_{OUT} ≦ 80mA			V_{IN}=V_{OUT} -0.2V I_{OUT} =80mA		
MM3044M		4.018	4.100	4.182									
MM3044N		4.116	4.200	4.284									
MM3044P		4.214	4.300	4.386									
MM3044Q		4.312	4.400	4.488									
MM3044R		4.410	4.500	4.590									
MM3044S		4.508	4.600	4.692									
MM3044T		4.606	4.700	4.794									
MM3044U		4.704	4.800	4.896									
MM3044V		4.802	4.900	4.998									
MM3045L		4.900	5.000	5.100		65	100	V_{IN}-V_{OUT} =1.0V 1mA ≦ I_{OUT} ≦ 100mA			V_{IN}=V_{OUT} -0.2V I_{OUT} =100mA		
MM3045M		4.998	5.100	5.202									
MM3045N		5.096	5.200	5.304									
MM3045P		5.194	5.300	5.406									
MM3045Q		5.292	5.400	5.508									
MM3045R		5.390	5.500	5.610									

Measuring Circuit



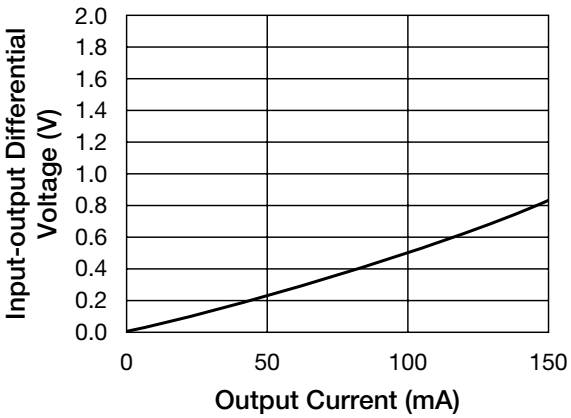
Typical Application Circuit



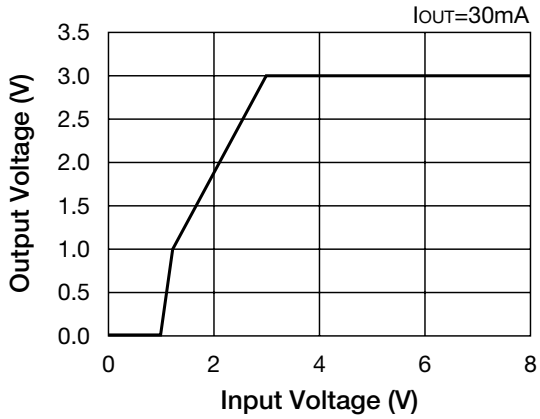
note) This regulator is not internally compensated and thus requires an external output-capacitor(C_{OUT}) for stability.

Characteristics (3.0V product Ambient Temperature, Ta=25°C)

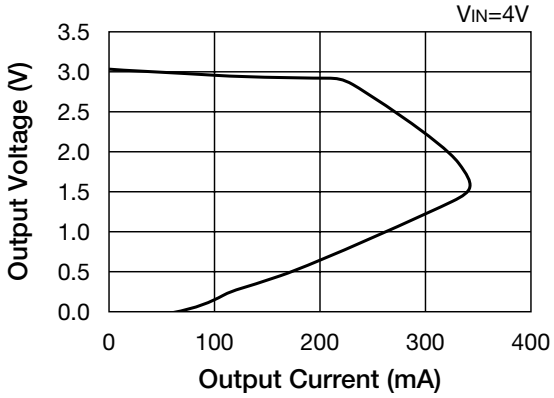
Input-Output Differential Voltage



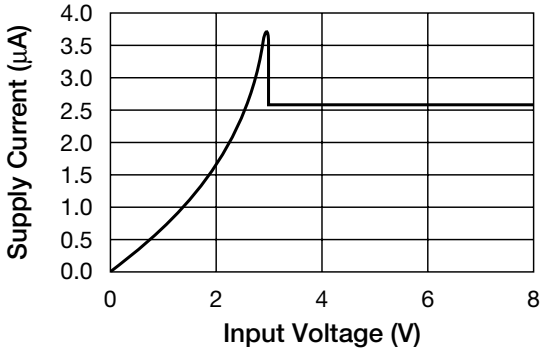
Line Regulation



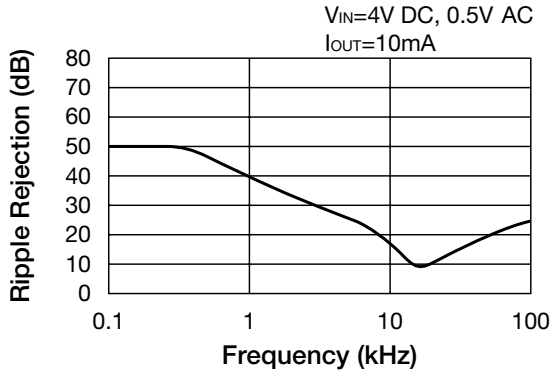
Load Regulation



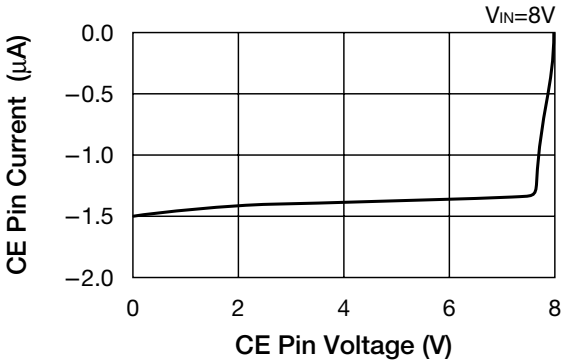
Supply Current



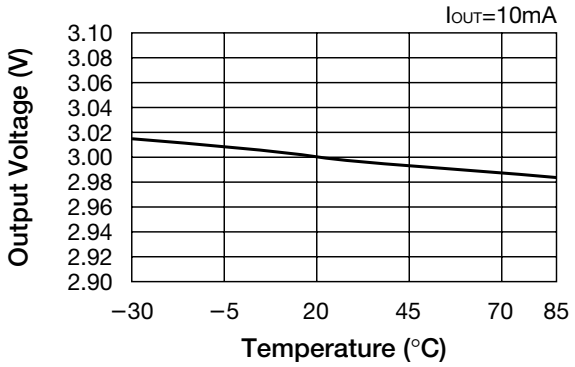
Ripple Rejection



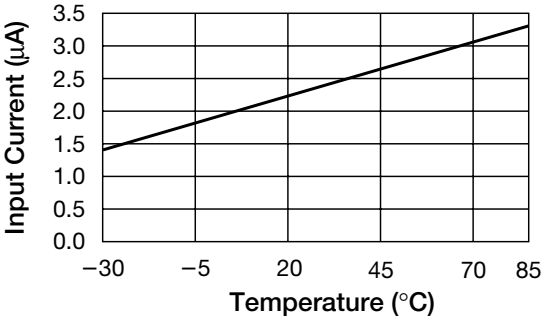
$\overline{CE}$ Pin Current VS $\overline{CE}$ Pin Voltage



Output Voltage VS Temperature



Input Current VS Temperature



Allowable Loss