

Low-Noise, Low-Saturation Three-Pin Regulator Monolithic IC MM1180, 1181

Outline

MM1180 series is high withstand voltage, low noise stabilized power supply with reduced reactive current at low input voltage and small input / output differential voltage 0.2V at 40mA output current. The output current is up to 100mA. MMP-4P package can control output ON / OFF by ON / OFF terminal.

Features

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|--|--|
| 1. Input voltage | 16V max. |
| 2. Input / output differential voltage | 0.2V typ. ($I_o=40\text{mA}$) |
| 3. Output noise voltage | $100\mu\text{VRMS}$ typ. |
| 4. Maximum output current | 100mA max. |
| 5. No-load input current | $300\mu\text{A}$ typ. |
| 6. With thermal shutdown circuit | |
| 7. Output rank | G : $5.0\text{V}\pm4\%$ J : $3.0\text{V}\pm4\%$
I : $4.0\text{V}\pm4\%$ Z : $3.3\text{V}\pm4\%$
H : $4.5\text{V}\pm4\%$ C : $4.8\text{V}\pm4\%$ (MM1181) |
| 8. Output ON / OFF control function
(MMP-4A only) | |

On/Off Pin Level	Low	High
MM1180 output	ON	OFF
MM1181 output	OFF	ON

Package

TO-92A (MM1180□T, MM1181□T)

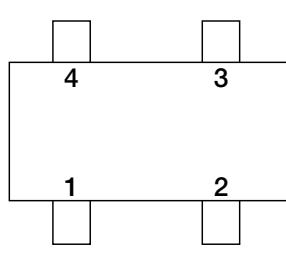
MMP-4A (MM1180□M, MM1181□M)

*The output voltage rank appears in the boxes.

Applications

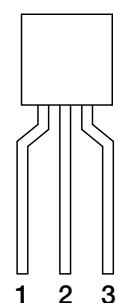
1. Handheld computers
2. Handy transceivers
3. Cordless phones
4. Portable equipment with battery

Pin Assignment



MMP-4A

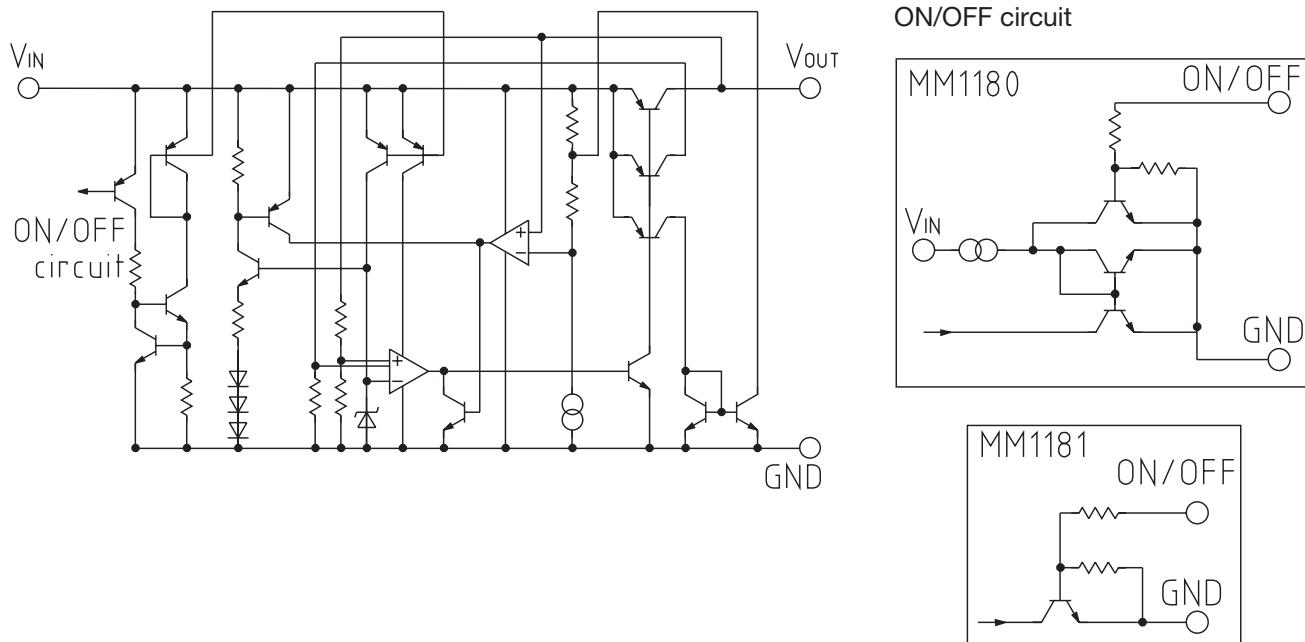
1	V _{OUT}
2	V _{IN}
3	ON/OFF terminal
4	GND



TO-92A

1	V _{IN}
2	GND
3	V _{OUT}

Equivalent Circuit Diagram



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Storage temperature	T_{STG}	-40~+125	°C
Operating temperature	T_{OPR}	-20~+75	°C
Supply voltage	V_{CC} max.	-0.3~16	V
Output current	I_{OUT}	100	mA
Allowable loss	P_d	200 (MMP-4A), 300 (T0-92A)	mW

Electrical Characteristics (Ta=25°C)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Output voltage	V_o	$V_{IN}=V_o+1V$ $I_o=40mA$	4.80	5.00	5.20	V
			4.32	4.50	4.68	
			3.84	4.00	4.16	
			2.88	3.00	3.12	
			3.17	3.30	3.43	
No-load input current	I_{CCQ}	$V_{IN}=V_o+1V, I_o=0\mu A$		300	450	μA
Min Input / output differential voltage	V_d min.	$V_{IN}=V_o$ min., $I_o=40mA$		0.2	0.3	V
Line regulation	ΔV_2	$V_{IN}=(V_o+1V)\sim16V, I_o=40mA$		± 0.01	± 0.1	%/V
Load regulation	ΔV_1	$V_{IN}=V_o+1V, I_o=0\sim100mA$		± 0.01	± 0.03	
Output voltage temperature coefficient	$\Delta V_o/T$	$T_a=-20\sim+75^{\circ}C$		± 100		ppm/ $^{\circ}C$
Ripple rejection rate	RR	$V_{IN}=V_o+2V, f=120Hz, I_o=40mA$ $V_{RIPPLE}=1V$	50	60		dB

MM1180

Off input current	I _{CCQ2}	V _{IN} =V _O +1V		3	5	µA
On / Off terminal current	I _{ON}	V (ON/OFF) =2.4V		5	8	µA
On / Off terminal current	I _{OFF}	V (ON/OFF) =0.6V		1	2	µA

MM1181

Off input current	I _{CCQ2}	V _{IN} =V _O +1V		3	5	µA
On / Off terminal current	I _{ON}	V (ON/OFF) =0.6V		1	2	µA
On / Off terminal current	I _{OFF}	V (ON/OFF) =2.4V		5	8	µA

ON / OFF Terminal Level

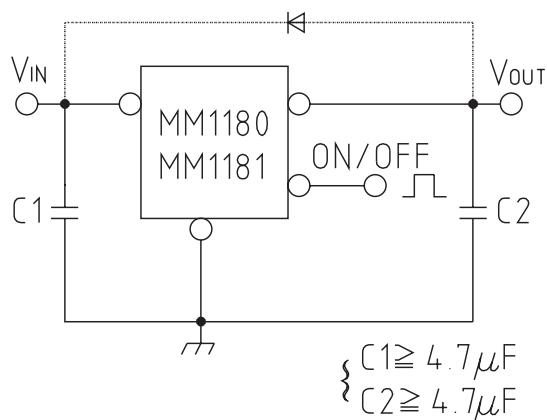
High			2.4		V _{IN} +0.3	V
Low			-0.3		0.6	V

Thermal Shutdown

Fall		V _{IN} =V _O +1V	135	145	155	°C
Rise		V _{IN} =V _O +1V		80		°C

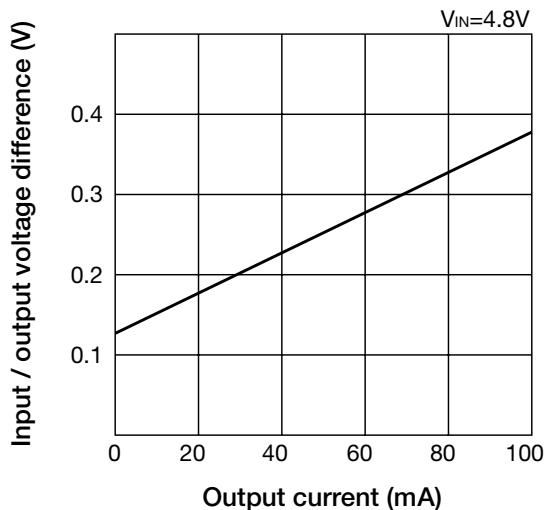
Current Limit (drooping type)

Current Limit		V _{IN} =V _O +1V	150	200		mA
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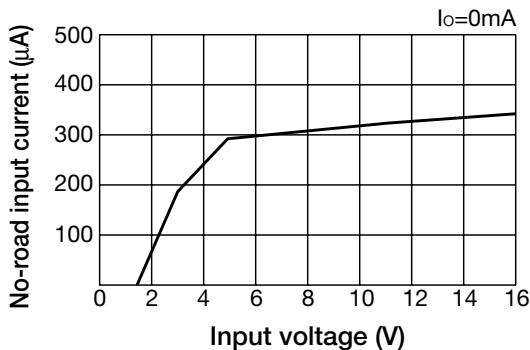
Measuring Circuit

Characteristics (MM1180G)

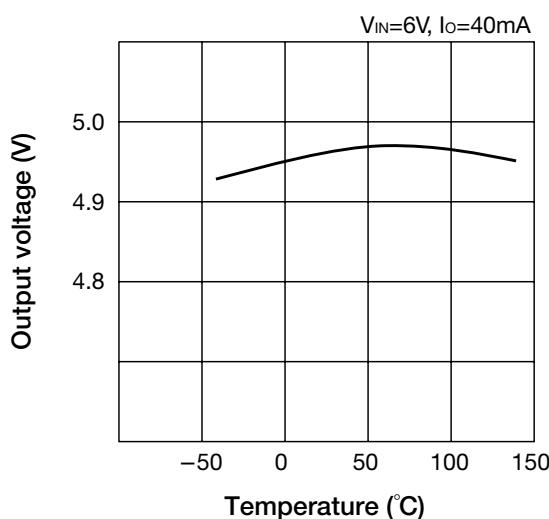
■ Input / output voltage difference



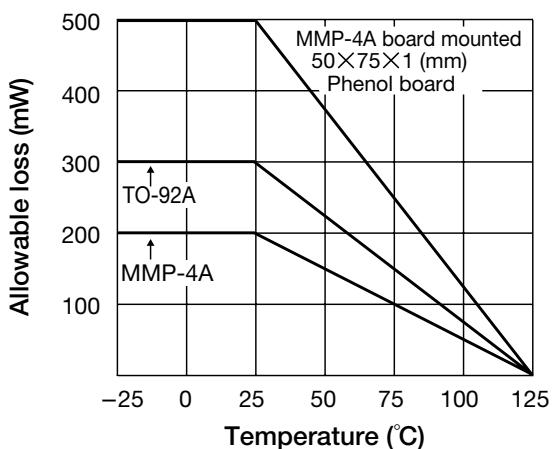
■ No-load input current



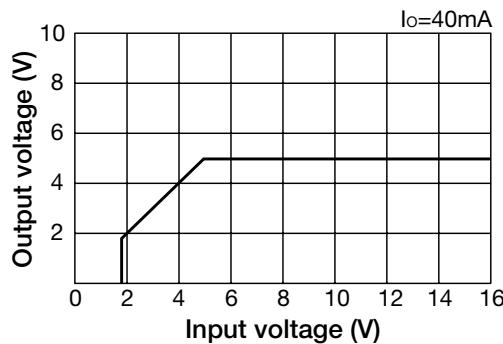
■ Output voltage temperature characteristic



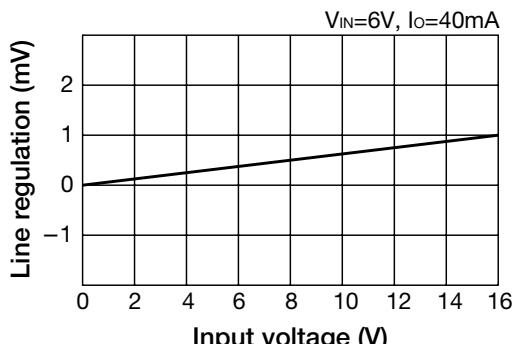
■ Allowable loss

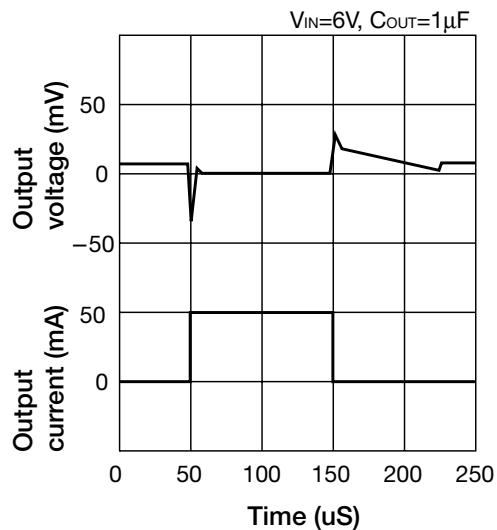
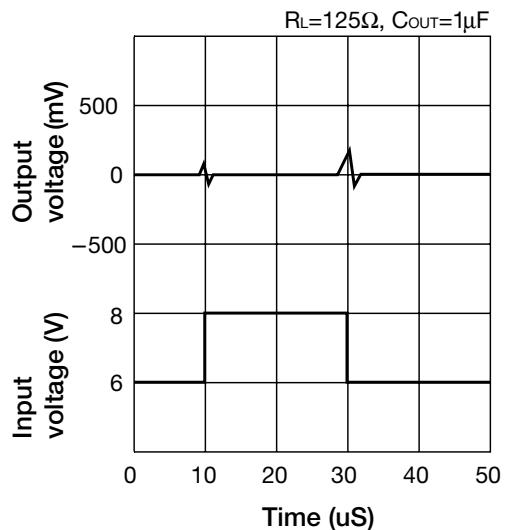
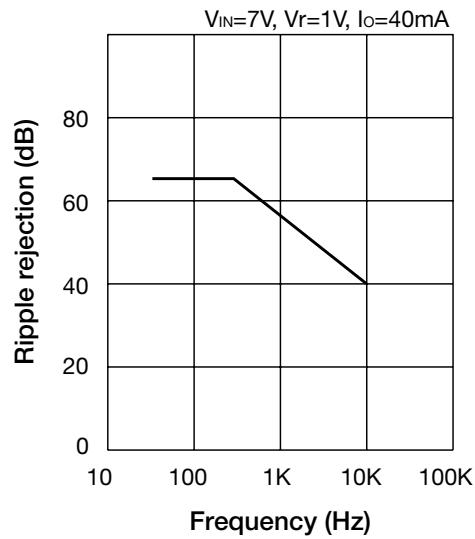


■ Output voltage characteristic



■ Line regulation



■ Load transient response**■ Line transient response****■ Ripple rejection****■ Output current characteristic**