Low-Noise, Low-Satulation 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

1. Input voltage   16V max.
2. Input / output differential voltage   0.2V typ. (Io=40mA)
3. Output noise voltage   100μVrms typ.
4. Maximum output current   100mA max.
5. No-load input current   300μA typ.
6. With thermal shutdown circuit
7. Output rank   G : 5.0V±4%   J : 3.0V±4%
                                            I : 4.0V±4%   Z : 3.3V±4%
                                            H : 4.5V±4%   C : 4.8V±4% (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.
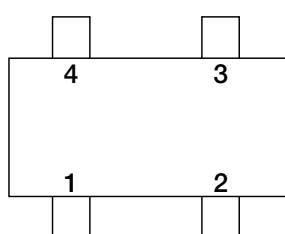
Applications
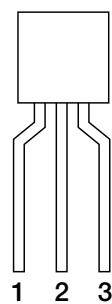
1. Handheld computers
2. Handy transceivers
3. Cordless phones
4. Portable equipment with battery

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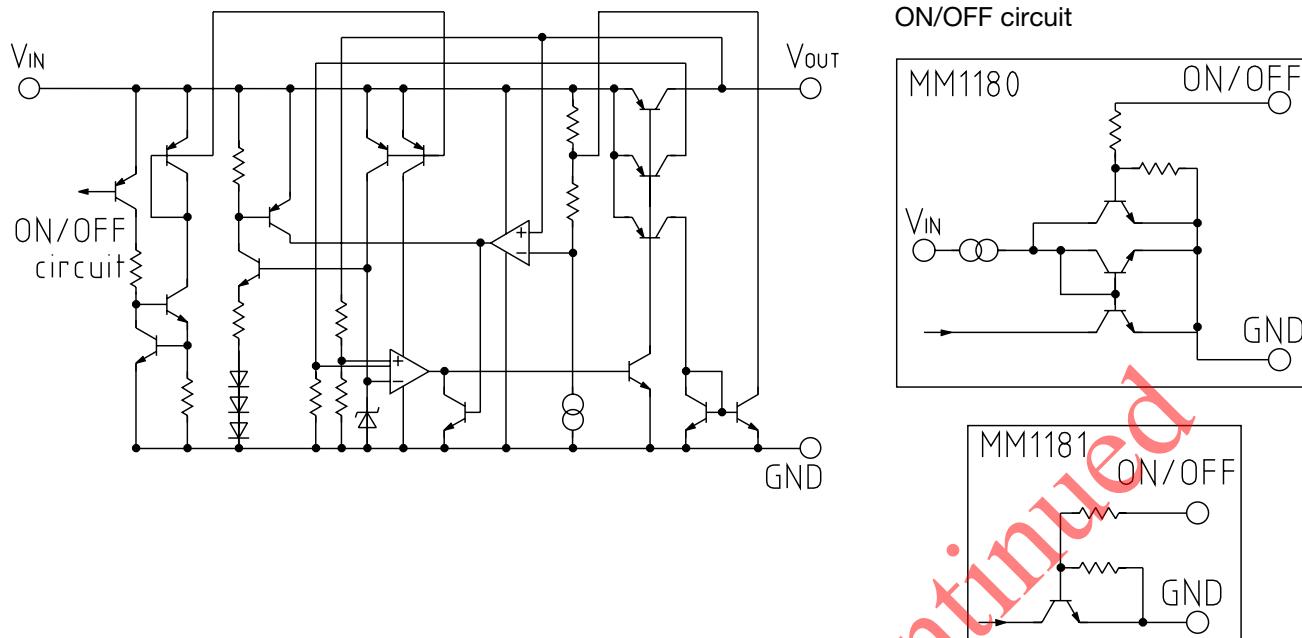
1	V$_{OUT}$
2	V$_{IN}$
3	ON/OFF terminal
4	GND

MMP-4A
(TOP VIEW)

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

TO-92A

Equivalent Circuit Diagram

ON/OFF circuit

Absolute Maximum Ratings

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

Electrical Characteristics (Ta=25°C)

Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
Output voltage	Vo	V_{IN}=Vo+1V Io=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	Iccq	V_{IN}=Vo+1V, Io=0µA		300	450	µA
Min Input / output differential voltage	Vd min.	V_{IN}=Vo min., Io=40mA		0.2	0.3	V
Line regulation	△V2	V_{IN}=(Vo+1V)~16V, Io=40mA		±0.01	±0.1	%/V
Load regulation	△V1	V_{IN}=Vo+1V, Io=0~100mA		±0.01	±0.03	%/mA
Output voltage temperature coefficient	△Vo/T	Ta=−20~+75°C		±100		ppm/°C
Ripple rejection rate	RR	V_{IN}=Vo+2V, f=120Hz, Io=40mA V_{RIPPLE}=1V	50	60		dB

MM1180

Off input current	Iccq2	$V_{IN}=Vo+1V$		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	Iccq2	$V_{IN}=Vo+1V$		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
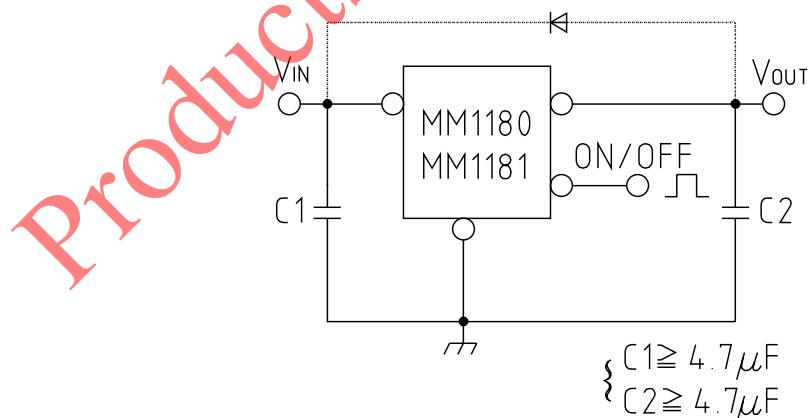
Thermal Shutdown

Fall		$V_{IN}=Vo+1V$	135	145	155	°C
Rise		$V_{IN}=Vo+1V$		80		°C

Current Limit (drooping type)

| Current Limit		$V_{IN}=Vo+1V$	150	200		mA
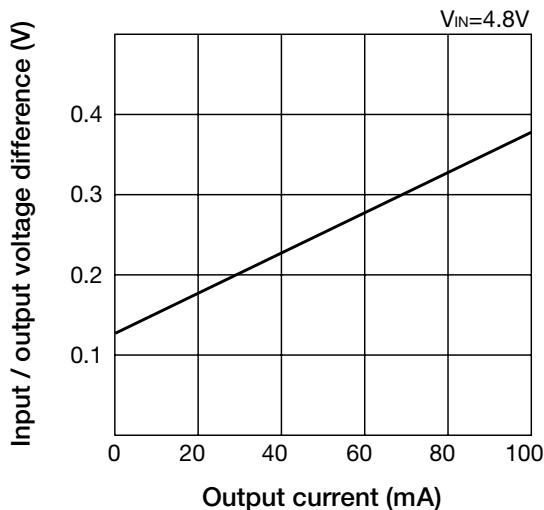
Measuring Circuit
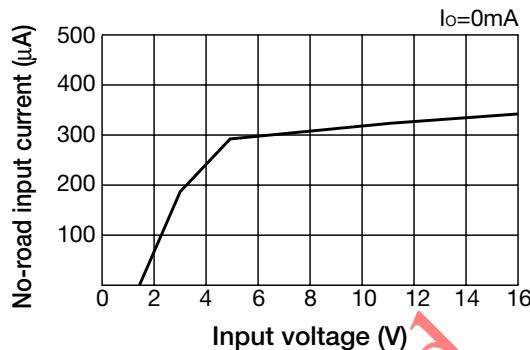
Note : The cause of oscillation is due to set wiring and capacitance changes in capacitor caused by
       temperatures changes, so please take extra care in placing the wires.

Characteristics (MM1180G)

■ Input / output voltage difference

V_{IN}=4.8V

Input / output voltage difference (V) vs Output current (mA)

■ No-load input current

I_O=0mA
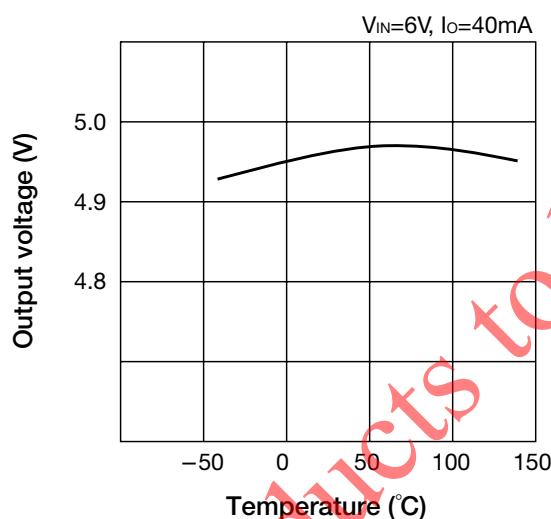
No-road input current (μA) vs Input voltage (V)
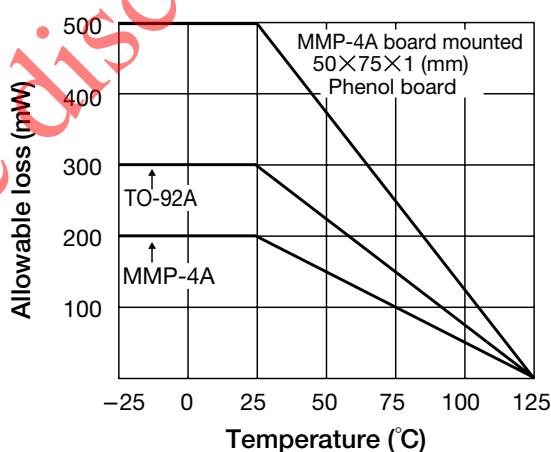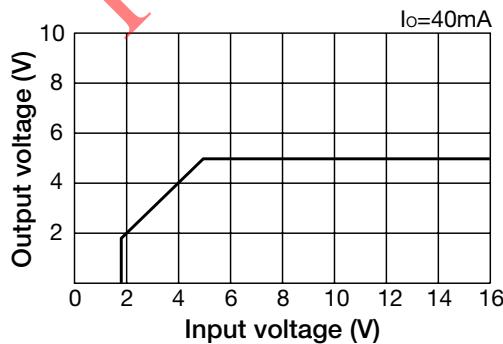
■ Output voltage temperature characteristic

V_{IN}=6V, I_O=40mA

Output voltage (V) vs Temperature (°C)

■ Allowable loss

Allowable loss (mW) vs Temperature (°C)

MMP-4A board mounted
50×75×1 (mm)
Phenol board

TO-92A

MMP-4A
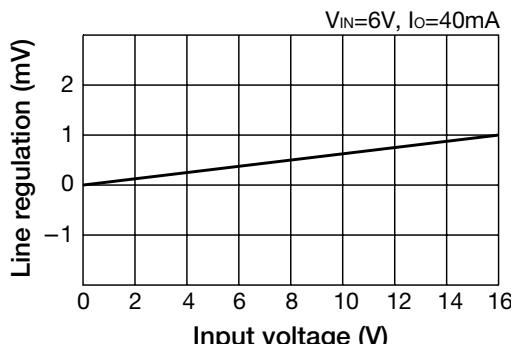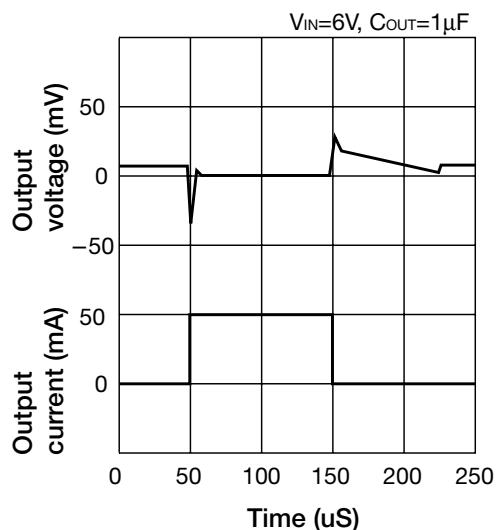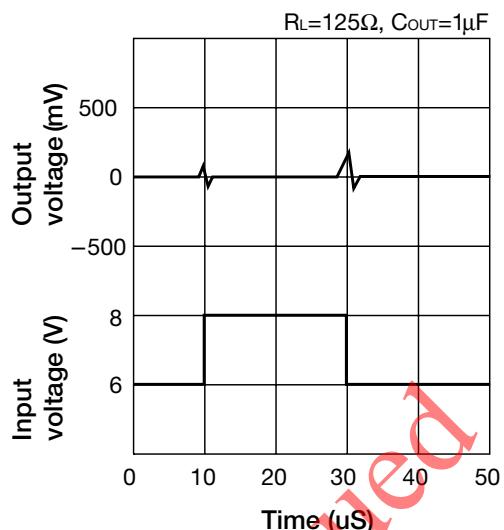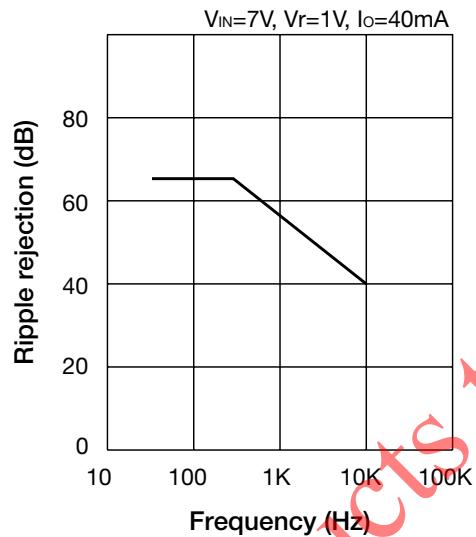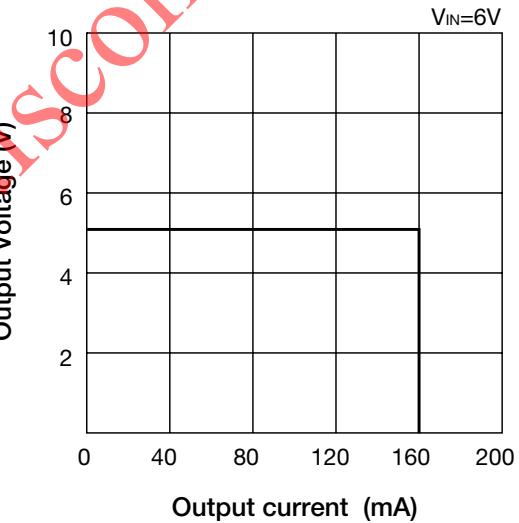
■ Output voltage characteristic

I_O=40mA

Output voltage (V) vs Input voltage (V)

■ Line regulation

V_{IN}=6V, I_O=40mA

Line regulation (mV) vs Input voltage (V)

■ **Load transient response**

V$_{IN}$=6V, C$_{OUT}$=1μF

Output voltage (mV)

Output current (mA)

Time (uS)

■ **Line transient response**

R$_{L}$=125Ω, C$_{OUT}$=1μF

Output voltage (mV)

Input voltage (V)

Time (uS)

■ **Ripple rejection**

V$_{IN}$=7V, Vr=1V, I$_{O}$=40mA

Ripple rejection (dB)

Frequency (Hz)

■ **Output current characteristic**

V$_{IN}$=6V

Output Voltage (V)

Output current (mA)