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

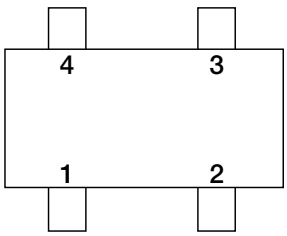
Package

TO-92A (MM1180□T, MM1181□T)
MMP-4A (MM1180□M, MM1181□M)
*The output voltage rank appears in the boxes.

Applications

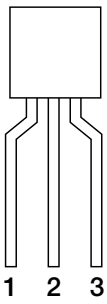
1. Handheld computers
2. Handy transceivers
3. Cordless phones
4. Portable equipment with battery

Pin Assignment



MMP-4A

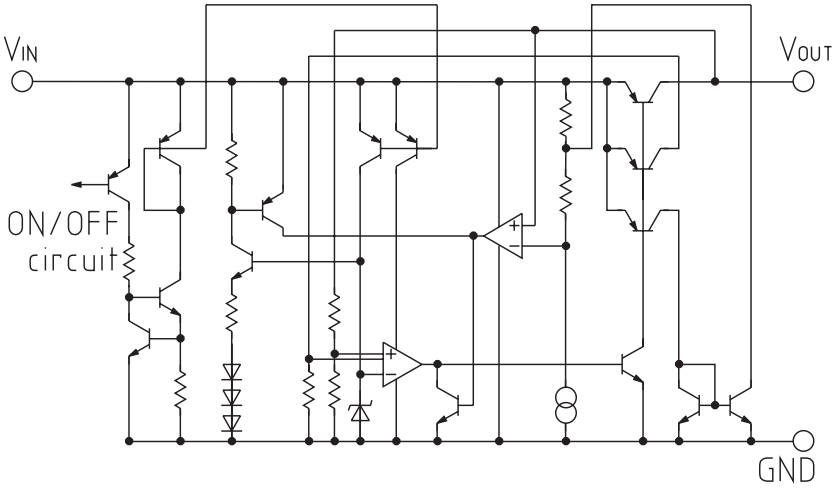
1	VOUT
2	VIN
3	ON/OFF terminal
4	GND



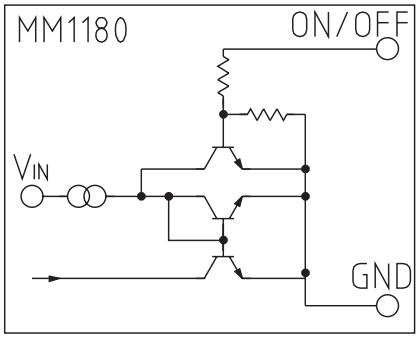
TO-92A

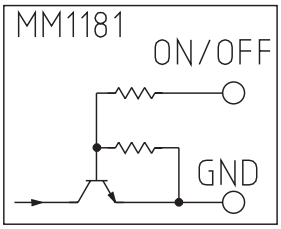
1	VIN
2	GND
3	VOUT

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	V_{CC} 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

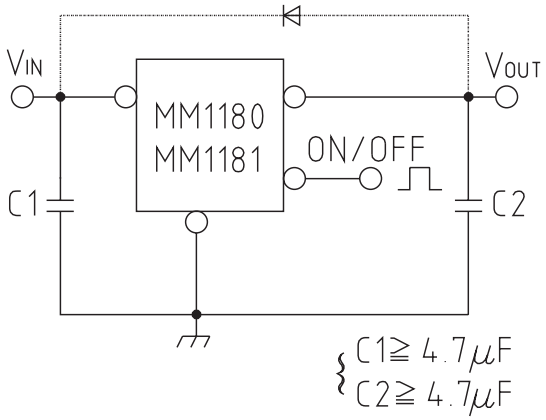
Thermal Shutdown

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

Current Limit (drooping type)

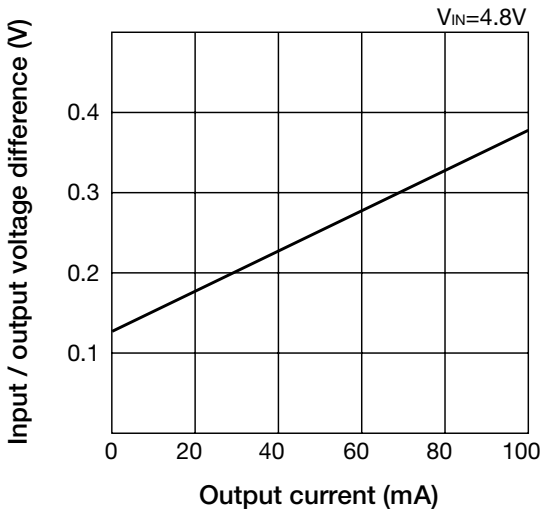
Current Limit		V_{IN}=Vo+1V	150	200		mA

Measuring Circuit

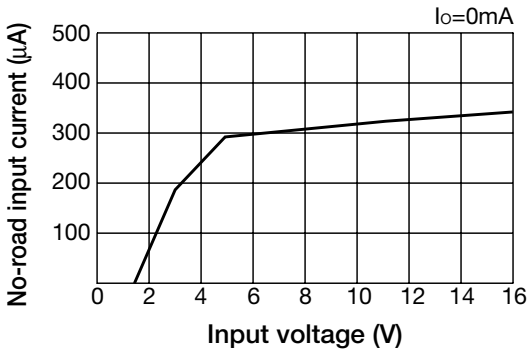


Characteristics (MM1180G)

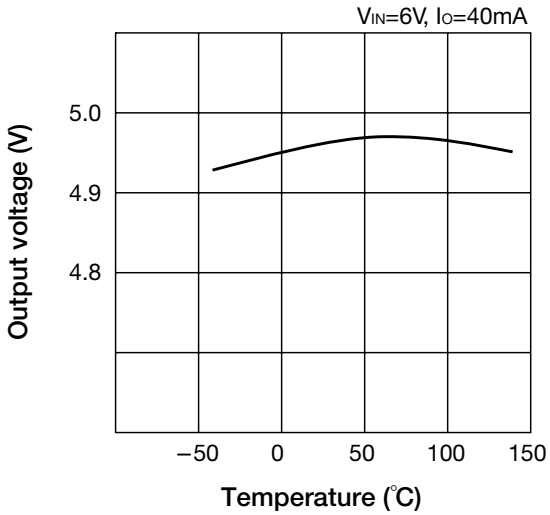
Input / output voltage difference



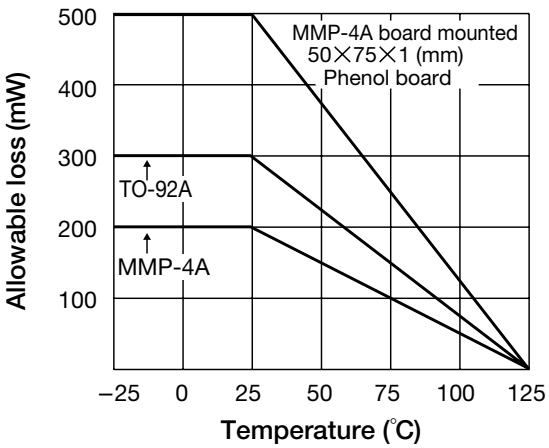
No-load input current



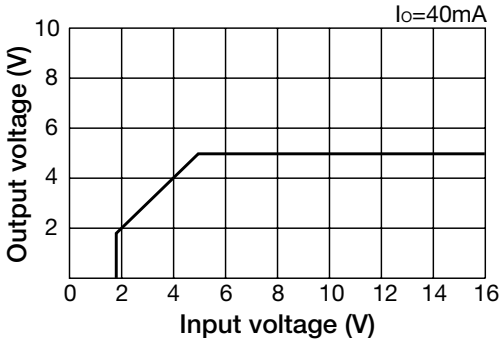
Output voltage temperature characteristic



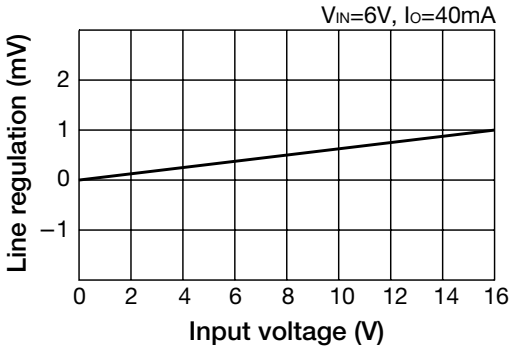
Allowable loss



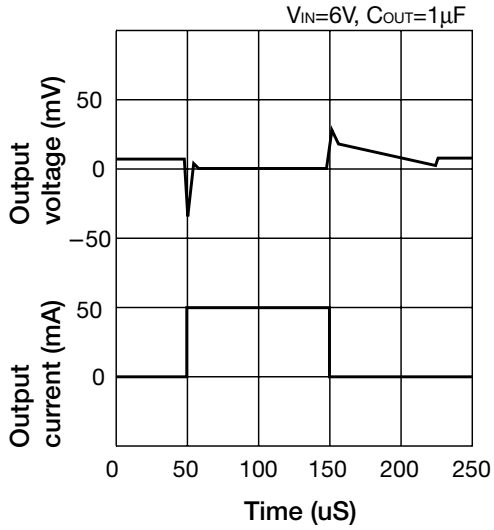
Output voltage characteristic



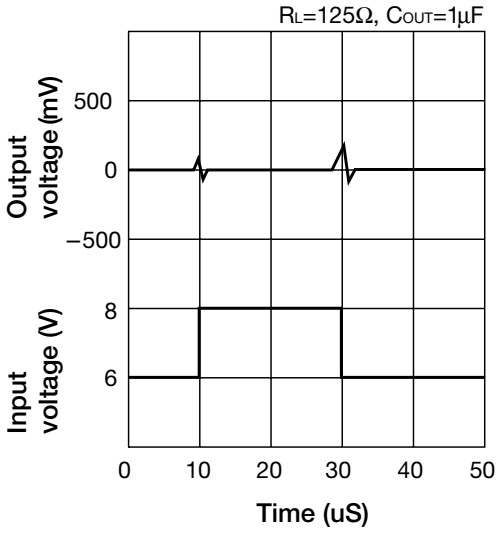
Line regulation



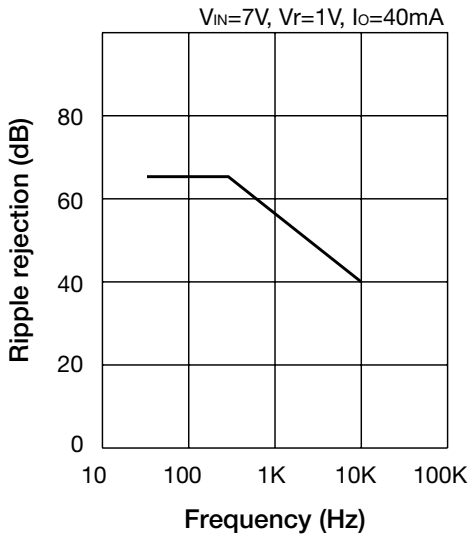
Load transient response



Line transient response



Ripple rejection



Output current characteristic

