Multiple Regulator
Monolithic IC MM1792□ Series

Outline

This IC has been developed as a multiple-output power supply IC and is composed of three positive voltage regulator circuits. The output voltage of the regulator can be programmed between 1.5V and 5.0V upon request. The output capacitor is a ceramic capacitor.

Features

1. Current consumption (no load connected to $V_{IN}1$ and $V_{IN}2$)	1.2mA typ.
2. High accuracy output voltage	±2.0%
3. Dropout voltage	0.15V typ. (Io=100mA)
4. High ripple rejection	80dB typ.
5. Operating temperature range	−40 to +85°C
6. Output voltage	1.5 to 5.0V (0.1V steps)
7. Output capacitor	1μF (Ceramic)

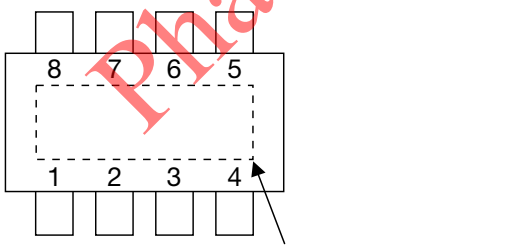
Package

HSOP-8A

Applications

1. Cordless phones
2. Portable equipment
3. DVD equipment

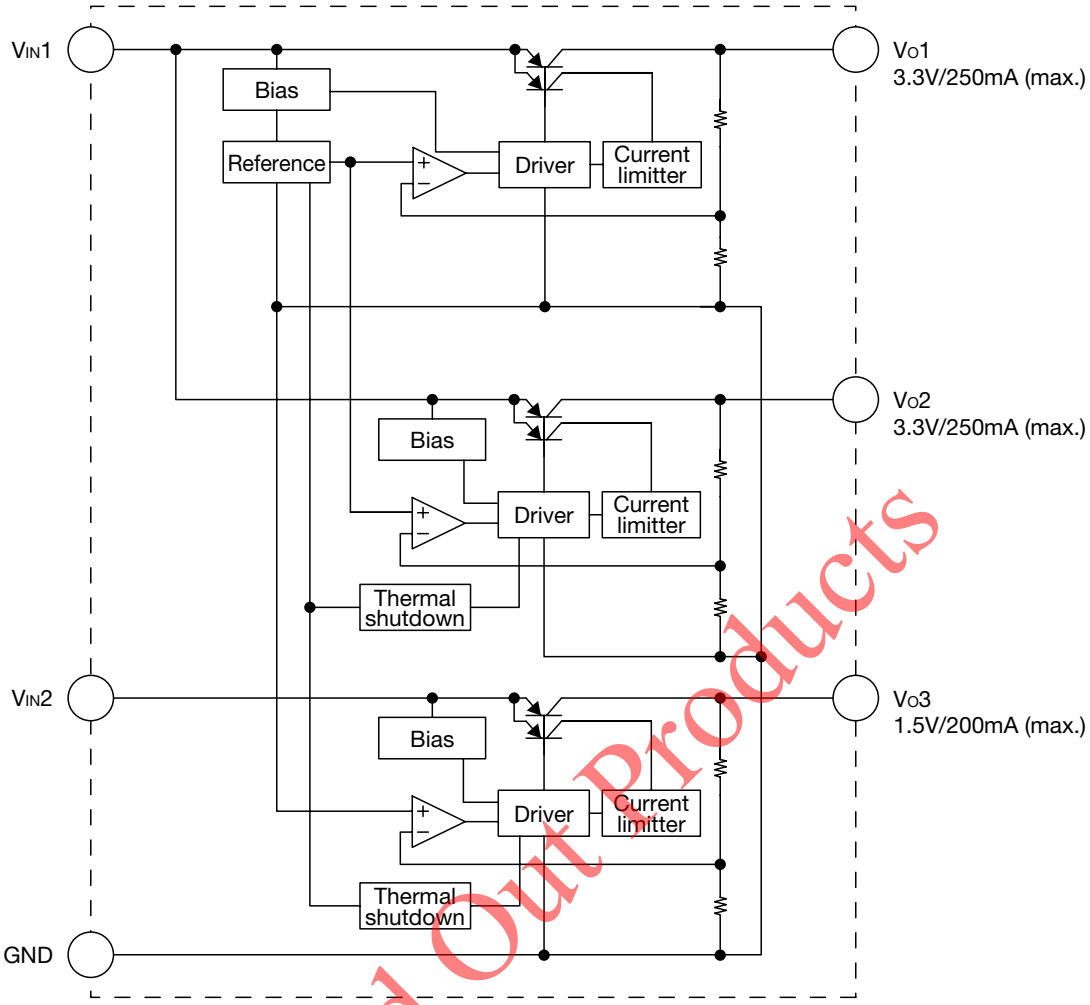
Pin Assignment



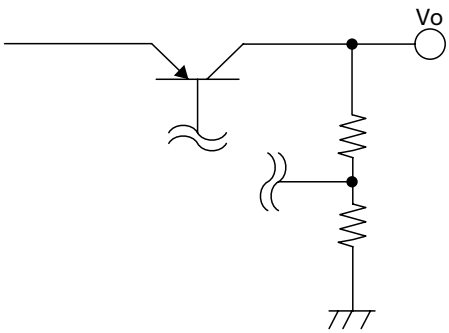
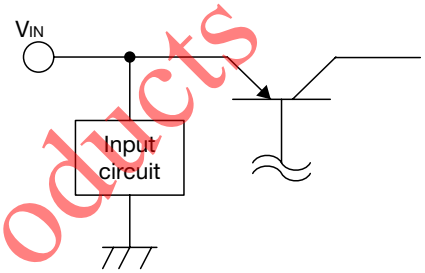
HSOP-8A
(TOP VIEW)

1	V_O1
2	V_O2
3	GND
4	V_O3
5	$V_{IN}2$
6	NC
7	NC
8	$V_{IN}1$

Block Diagram



Pin Description

Pin No.	Pin name	Function	Internal equivalent circuit diagram
1 2 4	Vo1 Vo2 Vo3	Output pin The output capacitor is recommended to be 1μF. The capacitor must be connected with the output pin more than 1μF.	
3	GND	Ground	
5 8	VIN	Input pin The capacitor is required to be connected with the input pin about 1μF.	
6 7	NC	No connection	

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	TSTG	–55~+150	°C
Supply voltage	VIN	–0.3~+12	V
Output current 1, 2	IOUT1,2	300	mA
Output current 3	IOUT3	250	mA
Power dissipation	Pd	780 (*1)	mW

Note1: *1 Attached on PC board (40 ×40 ×1.6mm)

Recommended Operating Conditions (Ta=25°C)

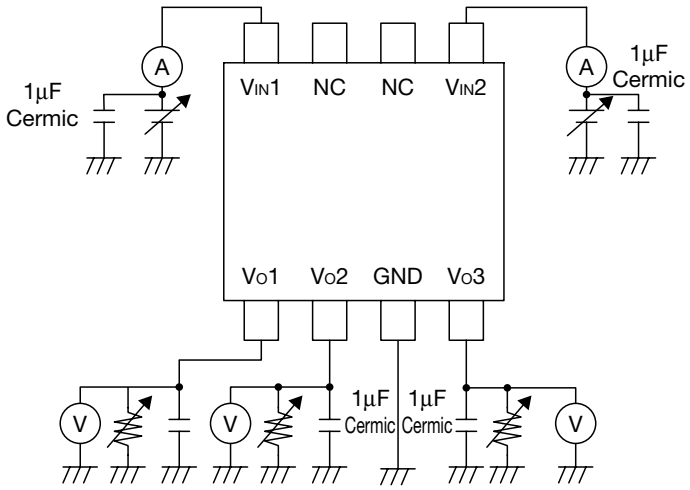
Item	Symbol	Ratings	Units
Operating temperature	TOPR	–40~+85	°C
Operating voltage	VOP	Vo 0.5~10	V
Output current 1, 2	IOUT1,2	0~250	mA
Output current 3	IOUT3	0~200	mA

Electrical Characteristics (Except where noted otherwise, Ta=25°C, $V_{IN}1=V_{IN}2=V_O$ (Typ.) +1V, $I_O1=I_O2=I_O3=1mA$)

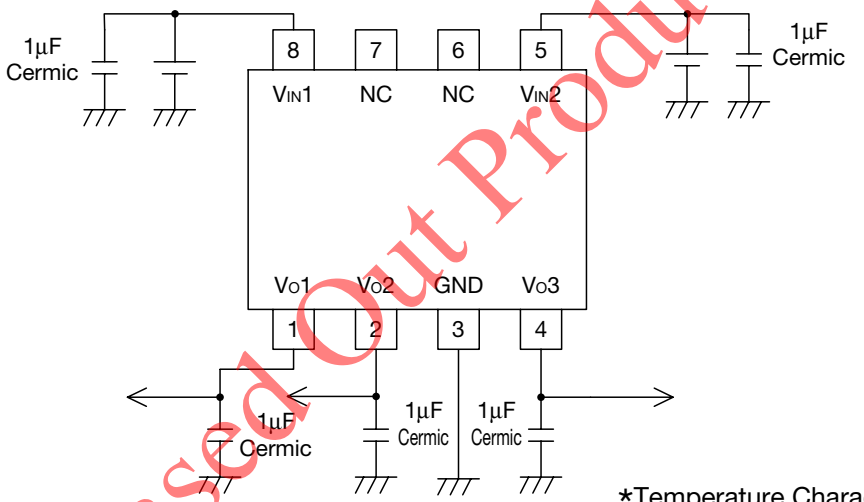
Item	Symbol	Measurement conditions	Min.	Typ.	Max.	Units
V_{IN} input current 1	Iccq1	$I_{OUT}1=I_{OUT}2=0mA$		1	2	mA
V_{IN} input current 2	Iccq2	$I_{OUT}3=0mA$		0.2	0.6	mA
Regulator 1 (I_O1=250mA)						
Output voltage 1	V_{O1}		3.234	3.30	3.366	V
Dropout voltage 1	V_{IO1}	$V_{IN}1=3.1V$, $I_{OUT}1=100mA$		0.15	0.3	V
Line regulation 1	ΔV_1	$V_{IN}1=4.3\sim5.3V$		1	20	mV
Load regulation 1	ΔV_2	$I_O1=1\sim250mA$		20	120	mV
V_O temperature coefficient 1 *1	$\Delta V_{O1}/\Delta T$	Tj=−40~+85°C		100		ppm/°C
Ripple rejection 1 *1	RR_1	f=1kHz Vripple=1V	50	80		dB
Output noise voltage1 *1	V_{n1}	f_{BW}=20~80kHz		100		µVrms
Regulator 2 (I_O2=250mA)						
Output voltage 2	V_{O2}		3.234	3.30	3.366	V
Dropout voltage 2	V_{IO2}	$V_{IN}1=3.1V$, $I_{OUT}1=100mA$		0.15	0.3	V
Line regulation 2	ΔV_2	$V_{IN}1=4.3\sim5.3V$		1	20	mV
Load regulation 2	ΔV_2	$I_O2=1\sim250mA$		20	120	mV
V_O temperature coefficient 2 *1	$\Delta V_{O2}/\Delta T$	Tj=−40~+85°C		100		ppm/°C
Ripple rejection 2 *1	RR_2	f=1kHz Vripple=1V	50	80		dB
Output noise voltage2 *1	V_{n2}	f_{BW}=20~80kHz		100		µVrms
Regulator 3 (I_O2=200mA)						
Output voltage 3	V_{O3}		1.47	1.5	1.53	V
Line regulation 3	ΔV_3	$V_{IN}2=2.5\sim3.5V$		1	20	mV
Load regulation 3	ΔV_3	$I_O3=1\sim200mA$		20	120	mV
V_O temperature coefficient 3 *1	$\Delta V_{O3}/\Delta T$	Tj=−40~+85°C		100		ppm/°C
Ripple rejection 3 *1	RR_3	f=1kHz Vripple=1V	50	80		dB
Output noise voltage3 *1	V_{n3}	f_{BW}=20~80kHz		100		µVrms

Note 1: *1 The parameter is guaranteed by desigh.

Measuring Circuit



Application Circuit



*Temperature Characteristics: B Type

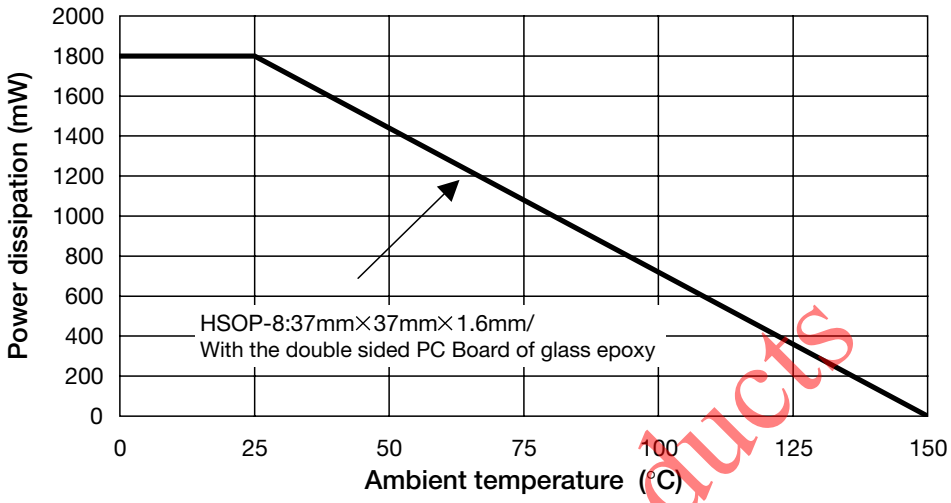
Note

1. The output capacitor is required between output and GND to prevent the oscillation.
2. The output capacitor must be used in ESR stable area.
   It is possible to use a ceramic capacitor without ESR resistance for output.
   The ceramic capacitor must be used more than 1µF and B type temperature characteristics.
3. The wire of V_{CC} and GND is required to print full ground plane for noise and stability.
4. The input capacitor must be connected in 1cm from input the pin.

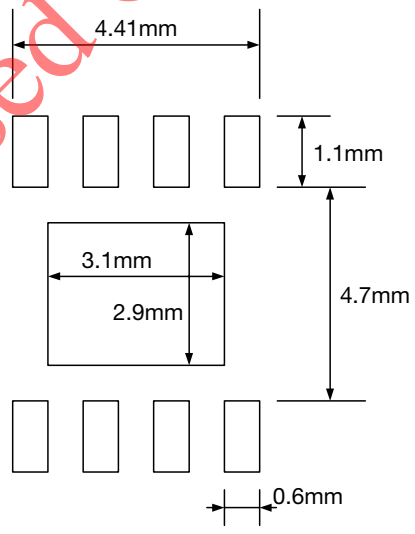
Power Dissipation

This IC's GND pin and Heat Spreader Bottom effectively radiate heat. By increasing these copper foil pattern area of PCB, power dissipation improves. Please kindly design PCB pattern taking care of above features about the power dissipation.

Power Dissipation

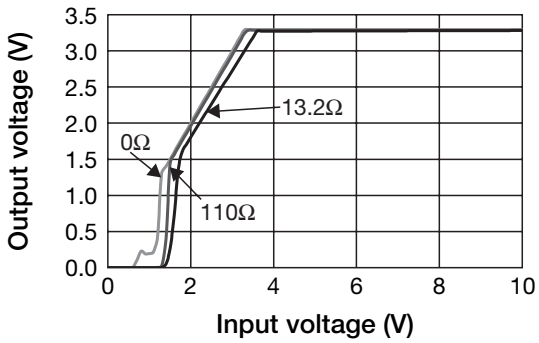


Land Pattern Recommendation

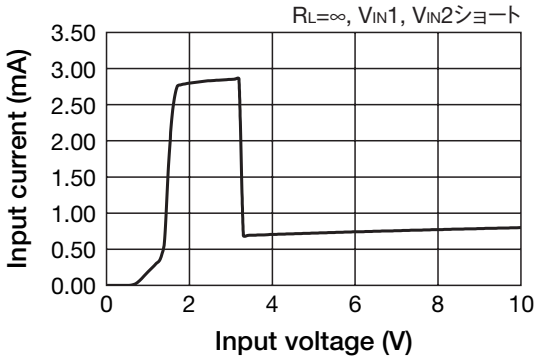


Characteristics (Except where noted otherwise, Ta=25°C, VIN=5V, CIN=1μF, Co=1μF)

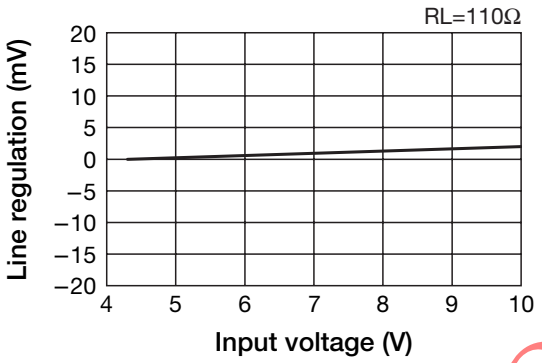
Output Voltage-Input Voltage Vo1



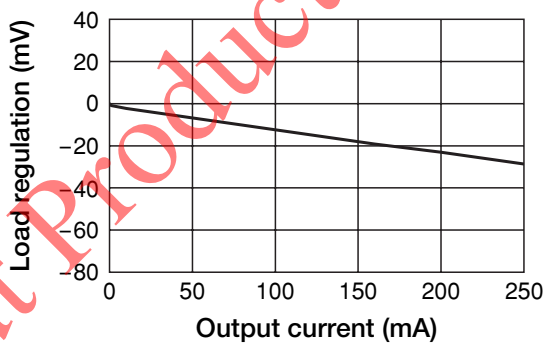
Input current-Input Voltage



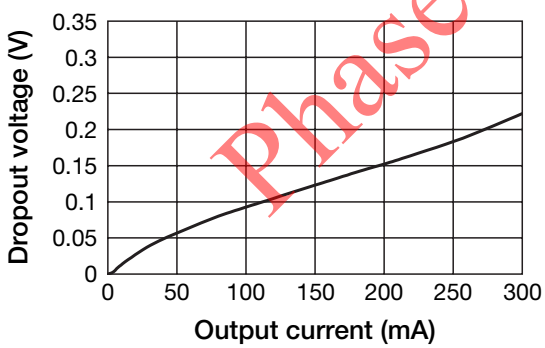
Line Regulation Vo1



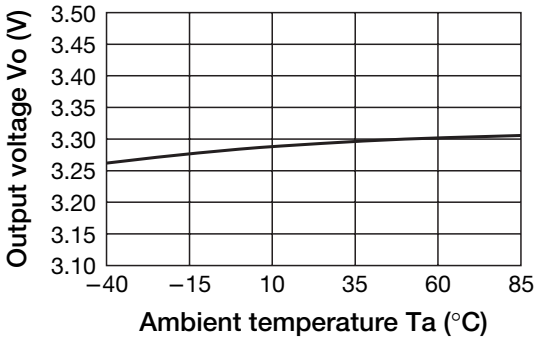
Load Regulation Vo1



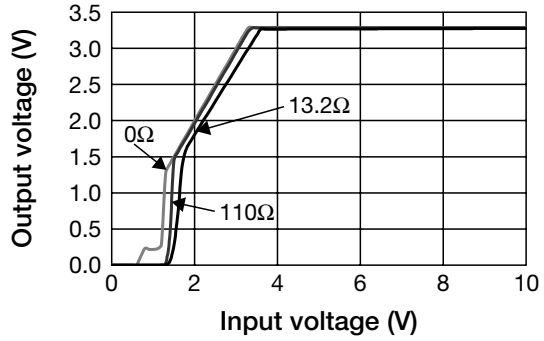
Dropout Voltage-Output Current Vo1



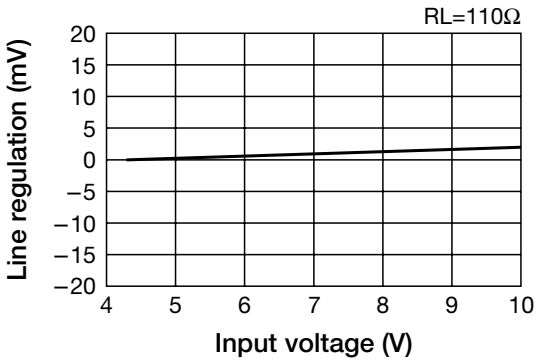
Vo1 Output Voltage-Ambient Temperature



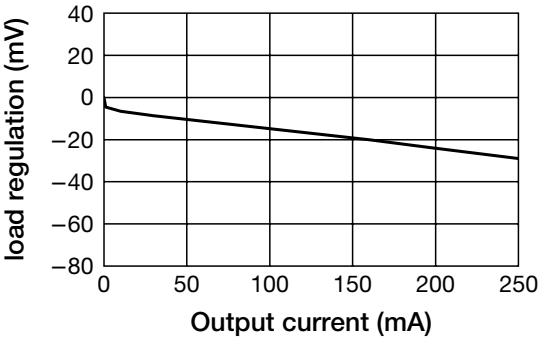
Output Voltage-Input Voltage Vo2



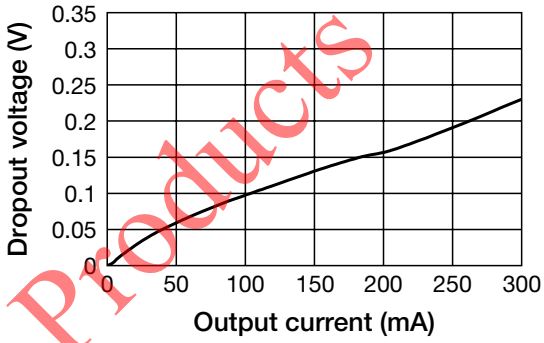
Line Regulation Vo2



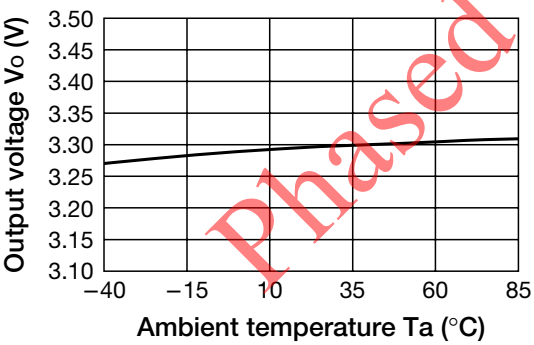
Load Regulation Vo2



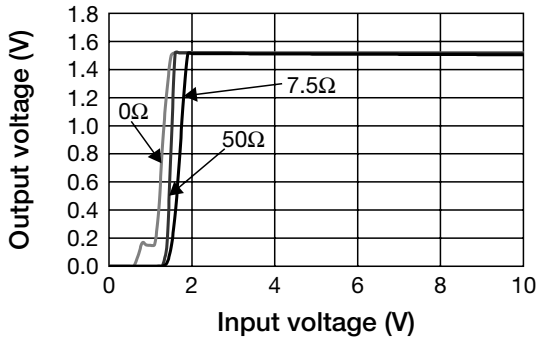
Dropout Voltage-Output Current Vo2



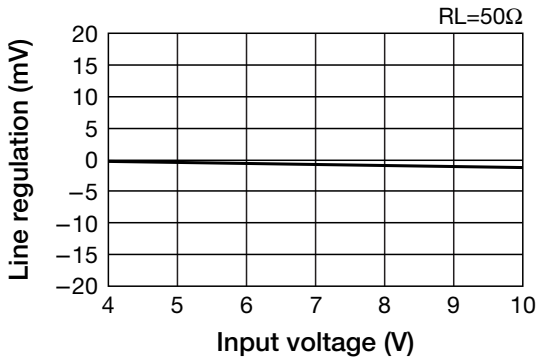
Vo2 Output Voltage-Ambient Temperature



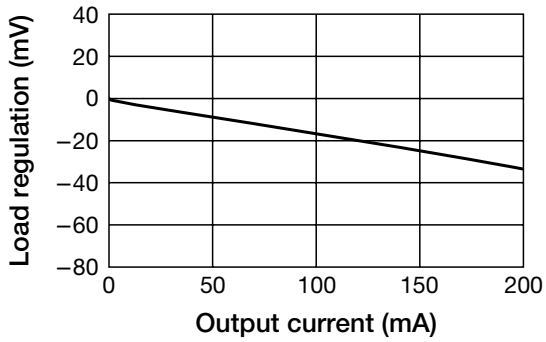
Output Voltage-Input Voltage Vo3



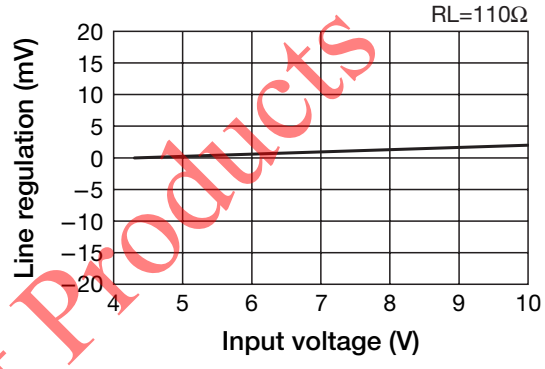
Line Regulation Vo3



Load Regulation Vo3



Line Regulation Vo1



Vo3 Output Voltage-Ambient Temperature