GM6353

450mA ULTRA LOW DROPOUT POSITIVE VOLTAGE REGULATOR

Description

GM6353 series is a group of positive voltage output, three-pin regulators, that provide a high current even when the input/output voltage differential is small. Low power consumption and high accuracy is achieved through CMOS and programmable fuse technologies, with the output voltage range from 1.5V to 6.0V

GM6353 consists of a high precision voltage reference, an error correction circuit, and a current limited output driver. Transient response to load variations has been improved in comparison to the existing series. The GM6353 incorporates both over temperature and over current protection.

Features

- **Maximum output current up 450mA**
- **Output voltage from 1.5V to 6.0V in 0.1V increments**
- **Output voltage accuracy : ±2%**
- **CMOS low power consumption, typically 15μA**
- **Input stability: typically 0.2%/V**
- **Ultra low dropout voltage, 0.1V @ I_{OUT} = 100mA**

Application

Palmtops

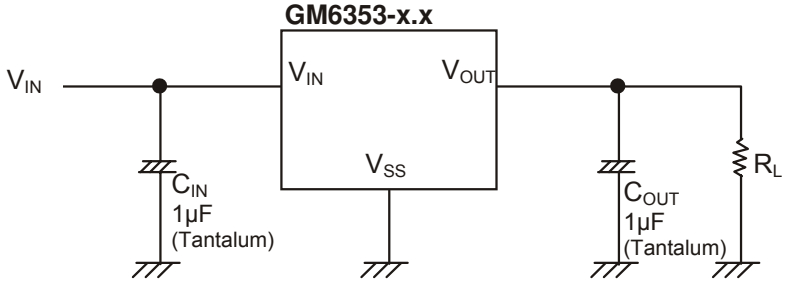
Portable Cameras

Video Recorders

Battery Powered Equipment

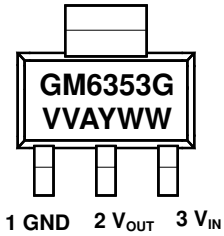
Reference Voltage Sources

Typical Application Circuits



Marking Information and Pin Configurations (Top View)

SOT223



G: Green Product
VV: Voltage suffix (18 = 1.8V, 50 = 5.0V…)
A: Assembly / Test Site Code
Y: Year
WW: Week

Pin Descriptions

Pin Number	Pin Name	Pin Function
1	GND	Ground
2	V_{OUT}	Regulated Voltage Output
3	V_{IN}	Unregulated Supply Voltage

Ordering Information

Ordering Number	Output Voltage	Package	Shipping
GM6353-1.5ST3RG	1.5V	SOT-223	2,500 Units/Tape and Reel
GM6353-1.8ST3RG	1.8V	SOT-223	2,500 Units/Tape and Reel
GM6353-2.5ST3RG	2.5V	SOT-223	2,500 Units/Tape and Reel
GM6353-3.3ST3RG	3.3V	SOT-223	3,000 Units/Tape and Reel
GM6353-5.0ST3RG	5.0V	SOT-223	3,000 Units/Tape and Reel

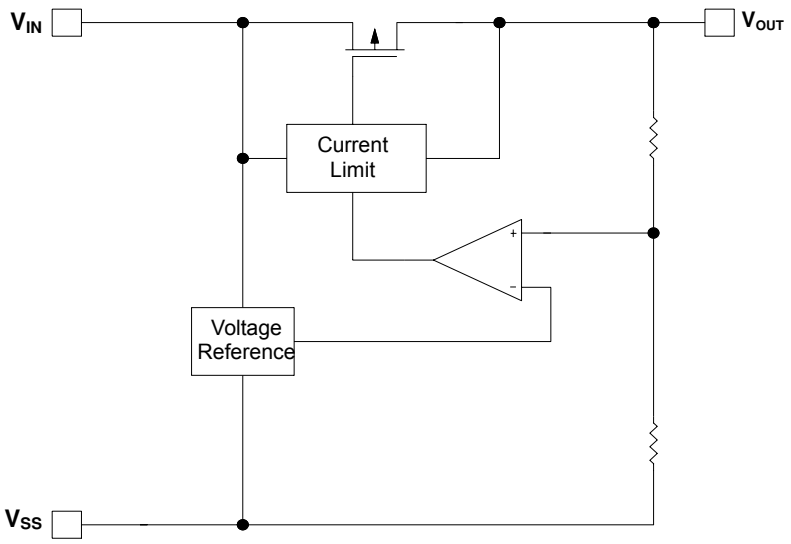
Absolute Maximum Ratings

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	6.5	V
Output Current		I_{OUT}	450	mA
Output Voltage		V_{OUT}	V_{SS} – 0.3 to V_{IN} +0.3	V
Thermal Resistance, Junction to Case	SOT-223	θ_{JA}	15	°C/W
Maximum Operating Junction Temperature		T_J	150	°C
Operating Ambient Temperature		T_A	- 40 to 125	°C
Storage Temperature		T_{stg}	- 65 to 150	°C
Lead Temperature (Soldering, 10 sec)			+ 260	°C

Recommended Operating Conditions

PARAMETER	SYMBOL	RATINGS
Input Voltage	V_{IN}	2V to 6.5V

Block Diagram



Electrical Characteristics (T_A = 25°C, V_{IN} = V_{OUT} + 0.5V unless otherwise noted)

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Output Voltage Accuracy		V_{OUT}	I_{OUT} = 1mA	-1.4		+1.4	%
			I_{OUT} = 0.1mA to 300mA	-3.0		+2.0	
Line Regulation		ΔV_{OI}	I_{OUT} = 1mA, V_{OUT} + 0.1V < V_{IN} < 6.5V Fig. 1		0.1	0.3	%/V
Load Regulation		ΔV_{OL}	V_{IN} = 6V, 0.1mA < I_{OUT} < 300mA C_{OUT} = 1µF, Fig. 2		0.005	0.04	%/mA
Maximum Output Current			V_{IN} = 5V, V_{OUT} > 0.96 X V_{RATING}	300	500		mA
Output Current Limit		I_{CL}		400			mA
Ground Pin Current		I_{GND}	Fig. 3		15	30	µA
Dropout Voltage	V_{OUT} > 2.5V	ΔV	I_{OUT} = 100mA		100	180	mV
			I_{OUT} = 300mA		300	550	
	2.0V <V_{OUT} ≤ 2.5V		I_{OUT} = 100mA		150	300	
			I_{OUT} = 300mA		450	800	
	V_{OUT} ≤ 2.0V		I_{OUT} = 100mA		200	400	
			I_{OUT} = 300mA		600	1100	
Power Supply Rejection Ration		PSRR	10kHz		60		dB

Note: Load Regulation is measured using pulse techniques with duty cycle < 5%

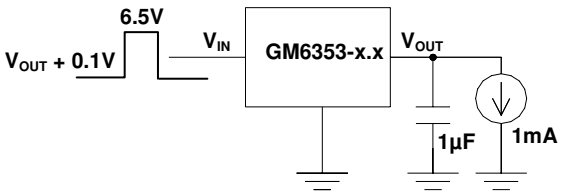


Figure 1. Line Regulation Test Circuit

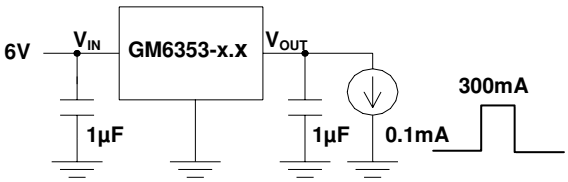


Figure 2. Load Regulation Test Circuit

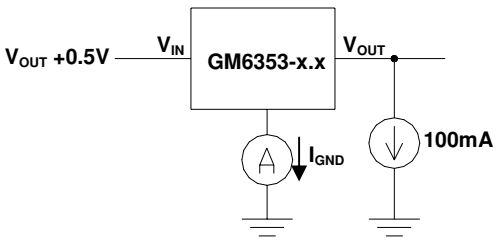
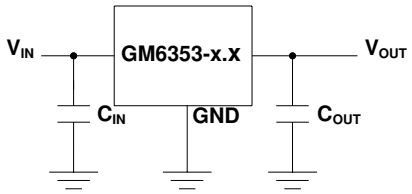


Figure 3. Ground Current Test Circuit

Application Information

The GM6353 is a precision, fixed output LDO. As the feature of CMOS technology, VOUT remains stable and within regulation over the entire operating load current range. A typical application circuit is shown as below:



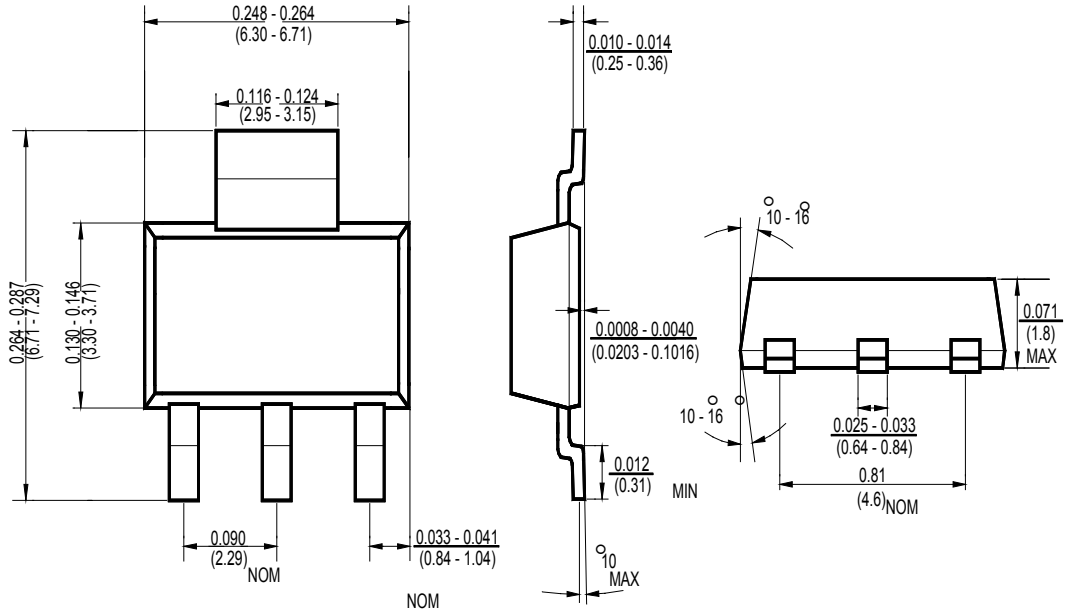
Output Capacitor Selection

The output capacitor (C_{OUT}) from V_{OUT} connected to ground is required. A minimum capacitance of 10μF is recommended. The output capacitor should have an effective series resistance (ESR) from 0.15Ω to 5.0Ω for electrolytic capacitors. However, GM6353 works with no problem by using ceramic capacitors, tantalum capacitors or MLCC as the output capacitors.

Input Capacitor Selection

A 1μF capacitor is suggested to be connected from V_{IN} to GND for most applications to have better supply noise rejection and transient response.

Package Outline Dimensions – SOT 223



Ordering Number

GM	6353	- 1.5	ST3	R	G
APM Gamma Micro	Circuit Type	Output Voltage	Package Type	Shipping Type	
		1.5 = 1.5V 2.5 = 2.5V 3.3 = 3.3V 5.0 = 5.0V	ST3: SOT223	R: Tape & Reel	Blank: Pb-free G:Green

Note:

Pb-free products:

- RoHS compliant and compatible with the current require-ments of IPC/JEDEC J-STD-020.
- Suitable for use in SnPb or Pb-free soldering processes with 100% matte tin (Sn) plating.

Green products:

- Lead-free (RoHS compliant)
- Halogen free(Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight)