Jameco Part Number 2057027

19-3894; Rev 3; 10/94

CONTACT FACTORY FOR COMPLETE DATA SHEET

MAXIM

+5V/Programmable Low-Dropout Voltage Regulator

General Description

The MAX667 low-dropout, positive, linear voltage regulator supplies up to 250mA of output current. With no load, it has a typical quiescent current of 20µA. At 200mA of output current, the input/output voltage differential is typically 150mV. Other features include a low-voltage detector to indicate power failure, as well as early-warning and low-dropout detectors to indicate an imminent loss of output voltage regulation. A shutdown control disables the output and puts the circuit into a low quiescent-current mode.

The MAX667 employs Dual Mode™ operation. One mode uses internally trimmed feedback resistors to produce +5V. In the other mode, the output may be varied from +1.3V to +16V by connecting two external resistors.

The MAX667 is a pin-compatible upgrade to the MAX666 in most applications where the input voltages are above +3.5V. Choose the MAX667 when high output currents and/or low dropout voltages are desired, as well as for improved performance at higher temperatures.

Applications

Battery-Powered Devices

Pagers and Radio Control Receivers

Portable Instruments

Solar-Powered Instruments

Features

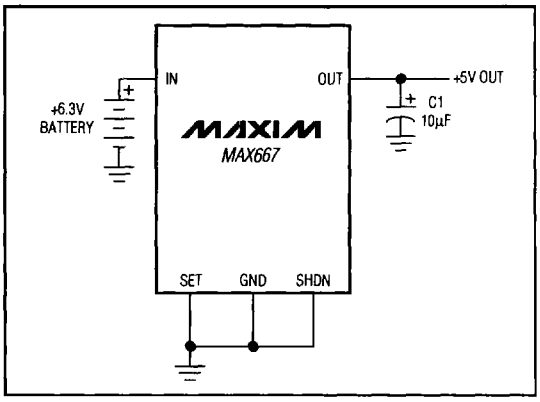
- **350mV Max Dropout at 200mA**
- **250mA Output Current**
- **Normal Mode: 20µA Typ Quiescent Current**
  Shutdown Mode: 0.2µA Typ Quiescent Current
- **Low-Battery Detector**
- **Fixed +5V (Min Component Count) or Adjustable Output**
- **+3.5V to +16.5V Input**
- **Dropout Detector Output**
- **10µF Output Capacitor**

Ordering Information

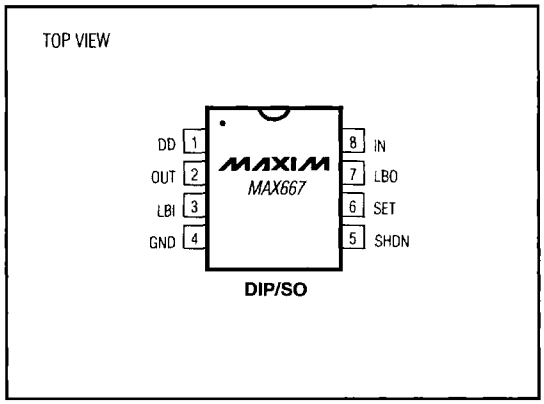
PART	TEMP. RANGE	PIN-PACKAGE
MAX667CPA	0°C to +70°C	8 Plastic DIP
MAX667CSA	0°C to +70°C	8 SO
MAX667C/D	0°C to +70°C	Dice*
MAX667EPA	-40°C to +85°C	8 Plastic DIP
MAX667ESA	-40°C to +85°C	8 SO
MAX667MJA	-55°C to +125°C	8 CERDIP

** Contact factory for dice specifications.*

Typical Operating Circuit



Pin Configuration



™ Dual Mode is a trademark of Maxim Integrated Products.

+5V/Programmable Low-Dropout Voltage Regulator

ABSOLUTE MAXIMUM RATINGS

Input Supply Voltage ..... +18V
Output Short Circuited to Ground 1sec
LBO Output Sink Current 50mA
LBO Output Voltage ..... GND to V_{OUT}
SHDN Input Voltage ..... -0.3V to (V_{IN} + 0.3V)
Input Voltages LBI, SET ..... -0.3V to (V_{IN} - 1.0V)
Continuous Power Dissipation
Plastic DIP (derate 9.09mW/°C above +70°C) 727mW
SO (derate 5.88mW/°C above +70°C) 471mW
CERDIP (derate 8.00mW/°C above +70°C) 640mW
Operating Temperature Ranges
MAX667C_A ..... 0°C to +70°C
MAX667E_A ..... -40°C to +85°C
MAX667MJA ..... -55°C to +125°C
Storage Temperature Range ..... -65°C to +160°C
Lead Temperature (soldering, 10sec) ..... +300°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

(GND = 0V, V_{IN} = +9V, V_{OUT} = +5V, C1 = 10µF, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		T_A = +25°C MIN	TYP	MAX	T_A = T_{MIN} to T_{MAX} MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}						3.5		16.5	V
Output Voltage	V_{OUT}	V_{SET} = 0V, V_{IN} = 6V, I_{OUT} = 10mA, T_A = -40°C to +85°C			5		4.8		5.2	V
		V_{SET} = 0V, V_{IN} = 6V, I_{OUT} = 10mA, T_A = -55°C to +125°C			5		4.75		5.25	
Maximum Output Current	I_{OUT}	V_{IN} = 6V, 4.5V < V_{OUT} < 5.5V		250			250			mA
Quiescent Current	I_Q	V_{SHDN} = 2V			0.2	1			2	µA
		V_{SHDN} = 0V, V_{SET} = 0V	I_{OUT} = 0µA		20	25			35	µA
			I_{OUT} = 100µA		20	30			50	
			I_{OUT} = 200mA		5	15			20	mA
Dropout Voltage (Note1)		I_{OUT} = 100µA			5	60			75	mV
		I_{OUT} = 200mA			150	250			350	
Load Regulation		I_{OUT} = 10mA to 200mA			50	100			250	mV
Line Regulation		V_{IN} = 6V to 10V, I_{OUT} = 10mA			5	10			15	mV
SET Reference Voltage	V_{SET}				1.225		1.20		1.25	V
SET Input Leakage Current	I_{SET}	V_{SET} = 1.5V			0.01	±10			±1000	nA
Output Leakage Current	I_{OUT}	V_{SHDN} = 2V			0.1				1	µA
Short-Circuit Current	I_{OUT}	(Note 2)				400			450	mA
Low-Battery Detector Reference Voltage	V_{LBI}				1.225		1.195		1.255	V
Low-Battery Detector Input Leakage Current	I_{LBI}	V_{LBI} = 1.5V			0.01	±10			±1000	nA
Low-Battery Detector Output Voltage	V_{LBO}	V_{IN} = 9V, V_{LBI} = 2V, I_{LBO} = 10mA				0.25			0.4	V
SHDN Threshold	V_{SHDN}	V_{IH}		1.5			1.5			V
		V_{IL}				0.3			0.3	
SHDN Leakage Current	I_{SHDN}	V_{SHDN} = 0V to V_{IN}			0.01	±10			±1000	nA
Dropout Detector Output Voltage	V_{DD}	V_{SET} = 0V, V_{SHDN} = 0V, R_{DD} = 100kΩ, I_{OUT} = 10mA	V_{IN} = 7V						0.25	V
			V_{IN} = 4.5V				3.5			

Note 1: Dropout Voltage is V_{IN}-V_{OUT} when V_{OUT} falls to 0.1V below its value at V_{IN} = V_{OUT} + 2V.
Note 2: Short-Circuit Current is pulse tested to maintain junction temperature. Short-circuit duration is limited by package dissipation.