National Semiconductor

# MICROCIRCUIT DATA SHEET

## MJLM120-5-H REV 0BL

Original Creation Date: 07/06/95
Last Update Date: 09/26/96
Last Major Revision Date: 07/06/95

# VOLTAGE REGULATOR -5 VOLTS AT .5A

### Industry Part Number

LM120

### NS Part Numbers

JL120-5BXA
JL120-5SXA

### Prime Die

LM120

### Controlling Document

38510/11501, AMEND.1 REV A

---

### Processing

MIL-STD-883, Method 5004

### Quality Conformance Inspection

MIL-STD-883, Method 5005

| Subgrp | Description | Temp (°C) |
|---|---|---|
| 1 | Static tests at | +25 |
| 2 | Static tests at | +125 |
| 3 | Static tests at | -55 |
| 4 | Dynamic tests at | +25 |
| 5 | Dynamic tests at | +125 |
| 6 | Dynamic tests at | -55 |
| 7 | Functional tests at | +25 |
| 8A | Functional tests at | +125 |
| 8B | Functional tests at | -55 |
| 9 | Switching tests at | +25 |
| 10 | Switching tests at | +125 |
| 11 | Switching tests at | -55 |

# Electrical Characteristics

## DC PARAMETERS

| SYMBOL | PARAMETER | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|---|---|---|---|---|---|---|---|---|
| Vout | Output Voltage | Vin = -8V, Il = 5mA | | | -5.25 | -4.75 | V | 1, 2, 3 |
| | | Vin = -8V, Il = 500mA | | | -5.25 | -4.75 | V | 1, 2, 3 |
| | | Vin = -20V, Il = 5mA | | | -5.25 | -4.75 | V | 1, 2, 3 |
| | | Vin = -20V, Il = 500mA | | | -5.25 | -4.75 | V | 1, 2, 3 |
| | | Vin = -30V, Il = 5mA | | | -5.25 | -4.75 | V | 1, 2, 3 |
| | | Vin = -30V, Il = 50mA | | | -5.25 | -4.75 | V | 1, 2, 3 |
| Vrline | Line Regulation | -30V ≤ Vin ≤ -8V, Il = 50mA | | | -150 | 150 | mV | 1, 2, 3 |
| | | -25V ≤ Vin ≤ -8V, Il = 350mA | | | -50 | 50 | mV | 1, 2, 3 |
| Vrload | Load Regulation | Vin = -10V, 5mA ≤ Il ≤ 500mA | | | -100 | 100 | mV | 1, 2, 3 |
| | | Vin = -30V, 5mA ≤ Il ≤ 50mA | | | -150 | 150 | mV | 1, 2, 3 |
| Iscd | Standby Current Drain | Vin = -10V, Il = 5mA | | | 0.5 | 3 | mA | 1, 2, 3 |
| | | Vin = -30V, Il = 5mA | | | 0.5 | 4 | mA | 1, 2, 3 |
| Delta Iscd(line) | Standby Current Drain Change (vs. Line Current) | -30V ≤ Vin ≤ -8V, Il = 5mA | | | -1 | 1 | mA | 1, 2, 3 |
| Delta Iscd(load) | Standby Current Drain Change (vs. Load Current) | 5mA ≤ Il ≤ 500mA, Vin = -10V | | | -0.5 | 0.5 | mA | 1, 2, 3 |
| Ios | Output Short Circuit Current | Vin = -25V | | | 0 | 1.5 | A | 1, 2, 3 |
| | | Vin = -30V | | | 0 | 1 | A | 1, 2, 3 |
| Ipk | Peak Output Current | Forced Delta Vout = 0.48V, Vin = -8V | | | 0.5 | 2 | A | 1, 2, 3 |
| Vstart | Voltage Startup | Vin = -20V, Rl = 10 Ohms | | | -5.25 | -4.75 | V | 1, 2, 3 |
| Vrth | Thermal Regulation | Vin = -15V, Il = 500mA | | | -50 | 50 | mV | 1 |
| Vout | Output Voltage | Vin = -10V, Il = 5mA | 1, 4 | | -5.3 | -4.7 | V | 2 |

# Electrical Characteristics

## AC PARAMETERS

| SYMBOL | PARAMETER | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|---|---|---|---|---|---|---|---|---|
| Delta Vin/Delta Vout | Ripple Rejection | Vin = -10V, Il = 125mA, ei = 1Vrms at f = 2400Hz | | | 45 | | dB | 4, 5, 6 |
| Vno | Output Noise Voltage | Vin = -10V, Il = 50mA | | | | 250 | uVrms | 7 |
| Delta Vout/Delta Vin | Line Transient Response | Vin = -10V, Vpulse = -3V, Il = 5mA | 2 | | | 90 | mV | 7 |
| Delta Vout/Delta Il | Load Transient Response | Vin = -10V, Il = 50mA, Delta Il = 200mA | 3 | | | 0.5 | V | 7 |

## DC PARAMETERS: DRIFT VALUES

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: "Delta calculations performed on JAN S and QMLV devices at group B, subgroup 5 only".

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Vout | Output Voltage | Vin = -8V, Il = 5mA | | | -0.05 | 0.05 | V | 1 |
| | | Vin = -8V, Il = 500mA | | | -0.05 | 0.05 | V | 1 |
| | | Vin = -20V, Il = 5mA | | | -0.05 | 0.05 | V | 1 |
| | | Vin = -20V, Il = 500mA | | | -0.05 | 0.05 | V | 1 |
| | | Vin = -30V, Il = 5mA | | | -0.05 | 0.05 | V | 1 |
| | | Vin = -30V, Il = 50mA | | | -0.05 | 0.05 | V | 1 |
| Iscd | Standby Current Drain | Vin = -30V, Il = 5mA | | | -20 | 20 | % | 1 |

Note 1: Tested at +125 C, correlated at +150C.
Note 2: S/S limit of 30mV/V is equivalent to 90mV.
Note 3: S/S limit of 2.5mV/mA is equivalent to .5V.
Note 4: Vout = +150 C at Subgroup 2.

## Graphics and Diagrams

| GRAPHICS# | DESCRIPTION |
|---|---|
| 09107HR | (blank) |
| H03ARB | (blank) |

**See attached graphics following this page.**