

SCOPE: 100mA CMOS SWITCHED-CAPACITOR VOLTAGE CONVERTER 1.5V TO 8V

| | |
|--------------------|-----------------------|
| <u>Device Type</u> | <u>Generic Number</u> |
| 01 | MAX665M(x)/883B |

Case Outline(s). The case outlines shall be designated in Mil-Std-1835 and as follows:

| | | | |
|-----------------------|----------------------|---------------------|---------------------|
| <u>Outline Letter</u> | <u>Mil-Std-1835</u> | <u>Case Outline</u> | <u>Package Code</u> |
| JA | GDIP1-T8 or CDIP2-T8 | 8 LEAD CERDIP | J8 |

Absolute Maximum Ratings

| | |
|--|---|
| Supply Voltage (V ⁺ to GND, or GND to OUT) | +8.5V |
| LV Input Voltage | OUT -0.3V to V ⁺ +0.3V |
| FC and OSC Input Voltages | (the least negative of OUT -0.3V or V ⁺ -6V) to V ⁺ +0.3V |
| OUT and V ⁺ Continuous Output Current | 120mA |
| Output Short-circuit Duration to GND <u>1</u> / | 1 sec |
| Lead Temperature (soldering, 10 seconds) | +300°C |
| Storage Temperature | -65°C to +160°C |
| Continuous Power Dissipation | T _A =+70°C |
| 8 lead CERDIP(derate 8.0mW/°C above +70°C) | 640mW |
| Junction Temperature, T _J | +150°C |
| Thermal Resistance, Junction to Case, Θ _{JC} : | 55°C/W |
| Thermal Resistance, Junction to Ambient, Θ _{JA} : | 125°C/W |

Recommended Operating Conditions.

| | |
|---|----------------------|
| Ambient Operating Range (T _A) | -55°C to +125°C |
| Inverter mode V ⁺ to GND | +1.5V dc to +8.0V dc |
| Doubler mode GND to V _{OUT} | +2.5V dc to +8.0V dc |

NOTE 1: OUT may be shorted to GND for 1 sec without damage only if the input supply is limited to less than 200mA, but shorting OUT to V⁺ may damage the device and should be avoided. Also, for temperatures above +85°C, OUT must not be shorted to GND or V⁺, even instantaneously, or device damage may result.

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.

TABLE 1 ELECTRICAL TESTS

| PARAMETER | Symbol | CONDITIONS -55 °C ≤ T _A ≤ +125°C 2/ V ⁺ =5V, C1, C2=150μF, FC=open Unless otherwise specified | Group A Subgroup | Device type | Limits Min | Limits Max | Units |
|-------------------------------|--------|--|---------------------|----------------|-------------------|-------------------|-------|
| Operating Supply Voltage | | R _L =1kΩ, Inverter, LV=open R _L =1kΩ, Inverter, LV=GND R _L =1kΩ, Doubler, LV=OUT | 1,2,3 | 01 | 3.0 1.5 2.5 | 8.0 8.0 8.0 | V |
| Supply Current | | No Load, FC=open No Load, FC=V ⁺ | 1,2,3 | 01 | | 0.5 3.0 | mA |
| Output Current | | OUT more negative than -4V OUT more negative than -3.8V | 1,3 2 | 01 | 100 | | mA |
| Output Resistance NOTE 3 | | I _L =100mA | 1,3 2 | 01 | | 10 12 | Ω |
| Power Efficiency | | R _L =1kΩ connected between V ⁺ and OUT R _L =500Ω connected between OUT and GND | 1,2,3 1,2,3 | 01 | 96 92 | | % |
| Voltage Conversion Efficiency | | No Load | 1,2,3 | 01 | 99 | | % |
| Power Efficiency | | I _L =100mA to GND NOTE 4 | TYPICAL | 01 | 88 | | % |
| Oscillator Frequency | | FC=open NOTE 4 FC=V ⁺ NOTE 4 | TYPICAL | 01 | 10 45 | | kHz |
| OSC Input Current | | FC=open NOTE 4 FC=V ⁺ NOTE 4 | TYPICAL | 01 | ±1.1 ±5.0 | | μA |

NOTE 2: In the test circuit, capacitors C1 and C2 are 150μF, 0.2Ω maximum ESR, aluminum electrolytics (Maxim part # MAXC001). Capacitors with higher ESR may reduce output voltage and efficiency.

NOTE 3: Specified output resistance is a combination of internal switch resistance and capacitor ESR.

NOTE 4: Characteristics supplied for use as a typical design limit but not production tested.

| ORDERING INFORMATION | | |
|----------------------|----|----------------|
| 01 | J8 | MAX665MJA/883B |

| TERMINAL NUMBER | 01 |
|-----------------|----------------|
| 1 | FC |
| 2 | CAP+ |
| 3 | GND |
| 4 | CAP- |
| 5 | OUT |
| 6 | LV |
| 7 | OSC |
| 8 | V ⁺ |

QUALITY ASSURANCE

Sampling and inspection procedures shall be in accordance with MIL-Prf-38535, Appendix A as specified in Mil-Std-883.

Screening shall be in accordance with Method 5004 of Mil-Std-883. Burn-in test Method 1015:

1. Test Condition, A, B, C, or D.
2. TA = +125°C minimum.
3. Interim and final electrical test requirements shall be specified in Table 2.

Quality conformance inspection shall be in accordance with Method 5005 of Mil-Std-883, including Groups A, B, C, and D inspection.

Group A inspection:

1. Tests as specified in Table 2.
2. Selected subgroups in Table 1, Method 5005 of Mil-Std-883 shall be omitted.

Group C and D inspections:

- a. End-point electrical parameters shall be specified in Table 1.
- b. Steady-state life test, Method 1005 of Mil-Std-883:
 1. Test condition A, B, C, D.
 2. TA = +125°C, minimum.
 3. Test duration, 1000 hours, except as permitted by Method 1005 of Mil-Std-883.

TABLE 2. ELECTRICAL TEST REQUIREMENTS

| Mil-Std-883 Test Requirements | Subgroups per Method 5005, Table 1 |
|--|---------------------------------------|
| Interim Electric Parameters Method 5004 | 1 |
| Final Electrical Parameters Method 5005 | 1*, 2, 3 |
| Group A Test Requirements Method 5005 | 1, 2, 3 |
| Group C and D End-Point Electrical Parameters Method 5005 | 1 |

* PDA applies to Subgroup 1 only.

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