SCOPE: 100mA CMOS SWITCHED-CAPACITOR VOLTAGE CONVERTER 1.5V TO 5.5V

Device Type	Generic Number	SMD Number
01	MAX660(x)/883B	5962-94632

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

Outline Letter		Mil-Std-1835	Case Outline	Package Code
Maxim	SMD			
JA	P	GDIP1-T08 or CDIP2-T08	8 LEAD CERDIP	J08
LP	2	CQCC1-N20	20 Leadless chip carrier	L20

Absolute Maximum Ratings

Voltage Referenced to V^-

Supply Voltage (V+ to GND, or GND to OUT) ..... +6V
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 (Note 1) ..... 1 sec

Lead Temperature (soldering, 10 seconds) ..... +300°C
Storage Temperature ..... -65°C to +150°C

Continuous Power Dissipation ..... T_A=+70°C
8 lead CERDIP(derate 8.0mW/°C above +70°C) 640mW
20 lead LCC(derate 9.09mW/°C above +70°C) 727mW
Junction Temperature T_J ..... +150°C
Thermal Resistance, Junction to Case, ΘJC:
Case Outline 8 lead CERDIP..... 55°C/W
Case Outline 20 lead LCC ..... 20°C/W
Thermal Resistance, Junction to Ambient, ΘJA:
Case Outline 8 lead CERDIP..... 125°C/W
Case Outline 20 lead LCC ..... 110°C/W

Recommended Operating Conditions

Ambient Operating Range (T_A) ..... -55°C to +125°C
Inverter mode V+ to GND ..... +1.5V dc to +5.5V dc
Doubler mode GND to V_{OUT} ..... +2.5V dc to +5.5V dc

NOTE 1: OUT may be shorted to GND for 1 sec without damage, 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:

TEST	Symbol	CONDITIONS -55 °C ≤T_A≤ +125°C 2/ V^+=5.0V, 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	All	3.0 1.5 2.5	5.5 5.5 5.5	V
Supply Current		No load, FC=open No load, FC=V+	1,2,3	All		0.5 3.0	mA
Output Current		OUT more negative than -4V	1,3	All	100		mA
		OUT more negative than -3.8V	2				
Output Resistance NOTE 3	R_{OUT}	I_L=100mA I_L=100mA	1,3 2	All		10 12	Ω
Oscillator Frequency	f_{OSC}	FC=open	1,2,3	All	5		kHz
		FC=V+	1,2,3	All	40		
Power Efficiency	P_{EFF}	R_L=1kΩ, connected between V^+ and OUT	1,2,3	All	96		%
		RL=500Ω connected between OUT and GND	1,2,3	All	92		
Voltage Conversion Efficiency	VC_{EFF}	No Load	1	All	99		%

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.

Package	ORDERING INFORMATION:	SMD Number
8 pin CERDIP	MAX660MJA/883B	5962-9463201MPA
20 pin LCC	MAX660MLP/883B	5962-9463201M2C

TERMINAL CONNECTIONS:

	J8	L20		L20
1	FC	NC	11	OUT
2	CAP+	FC	12	NC
3	GND	NC	13	NC
4	CAP-	CAP+	14	NC
5	OUT	GND	15	LV
6	LV	GND	16	NC
7	OSC	NC	17	OSC
8	V+	CAP-	18	NC
9		NC	19	NC
10		NC	20	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.