

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

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

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>
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, θ_{JC} :

Case Outline 8 lead Cerdip..... 55°C/W

Case Outline 20 lead LCC 20°C/W

Thermal Resistance, Junction to Ambient, θ_{JA} :

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.

-----	Electrical Characteristics of MAX660/883B for /883B and SMD 5962-94632	19-0251 Page 2 of 5	Rev. C
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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	1,3	All		10	Ω
		I _L =100mA	2			12	
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		%
		R _L =500Ω connected between OUT and GND	1,2,3	All	92		
Voltage Conversion Efficiency	V _{C_{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.