

SCOPE: MICROPROCESSOR SUPERVISORY CIRCUIT WITH BATTERY BACKUP

<u>Device Type</u>	<u>Generic Number</u>
01	MAX703MJA/883B
02	MAX704MJA/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

Terminal Voltages (with respect to GND)

V_{CC} -0.3V to +6V

V_{BATT} -0.3V to +6V

All other Inputs (NOTE 1) -0.3V to (V_{CB} +0.3V)

Input Current

V_{CC} 200mA

V_{BATT} 50mA

GND..... 20mA

Output Current

V_{OUT} Short-Circuit protected for up to 10 sec.

All other Outputs 20mA

Rate-of Rise, V_{CC} , V_{BATT} 100V/ μ s

Continuous Power Dissipation T_A = +70°C

Lead Temperature (soldering, 10 seconds) +300°C

Storage Temperature -65°C to +160°C

8 lead Cerdip(derate 8.00mW/°C above +70°C) 640mW

Junction Temperature T_J +150°C

Thermal Resistance, Junction to Case, θ_{JC} :

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

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

Case Outline 8 lead Cerdip..... 125°C/W

Recommended Operating Conditions.

Ambient Operating Range (T_A) -55°C to 125°C

NOTE 1: V_{CB} is the greater of V_{CC} and V_{BATT} . The input voltage limits on PFI and MR may be exceeded if the current into these pins is limited to less than 10mA.

Stresses above the absolute maximum rating 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 ≤ +125° C MAX703: V _{CC} =+4.75V to +5.5V, V _{BATT} =+2.8V MAX704: V _{CC} =+4.5V to +5.5V, V _{BATT} =+2.8V Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
Operating Voltage Range V _{CC} , V _{BATT}		NOTE 1	1,2,3	All	0	5.5	V
Supply Current (Excluding I _{OUT})	I _{SUPPLY}		1,2,3	All		500	μA
I _{SUPPLY} in Battery-Backup Mode (Excluding I _{OUT})		V _{CC} =0V, V _{BATT} =2.8V	1 2,3	All		1.0 5.0	μA
V _{BATT} Standby Current NOTE 2		5.5V > V _{CC} > V _{BATT} +0.2V	1 2,3	All	-0.1 -1.0	0.02 0.02	μA
V _{OUT} Output		I _{OUT} =5mA I _{OUT} =50mA	1,2,3	All	V _{CC} -0.05 V _{CC} -0.5		V
V _{OUT} in Battery-Backup Mode		I _{OUT} =250μA, V _{CC} <V _{BATT} -0.2V	1,2,3	All	V _{BATT} - 0.1		V
RESET Threshold	V _{RST}	MAX703 MAX704	1,2,3	01 02	4.50 4.25	4.75 4.50	V
RESET Pulse Width	t _{RST}		9,10,11	All	140	280	ms
RESET Output Voltage	VOH VOL	I _{SOURCE} =800μA I _{SINK} =3.2mA V _{CC} =1.2V, V _{CC} falling, V _{BATT} =0V, I _{SINK} =100μA	1,2,3	All	V _{CC} -1.5	0.4 0.3	V
MR Input Threshold Low High	VIL VIH		1,2,3	All	2.0	0.8	V
MR Pulse Width	tMR		9,10,11	All	150		ns
MR to RESET Delay	tMD		9,10,11	All		250	ns
MR Pull-Up Current		MR=0V	1,2,3	All	100	600	μA
PFI Input Threshold		V _{CC} =5V	1,2,3	All	1.20	1.30	V
PFI Input Current			1,2,3	All	-25	25	nA
PFO Output Voltage	V _{OH} V _{OL}	I _{SOURCE} =800μA I _{SINK} =3.2mA	1,2,3	All	V _{CC} -1.5	0.4	V

NOTE 1: Either V_{CC} or V_{BATT} can go to 0V if the other is greater than 2.0V.

NOTE 2: “-” = battery-charging current, “+” = battery-discharging current.

TEST	Symbol	CONDITIONS -55° C ≤ T ≤ +125° C MAX703: V _{CC} = +4.75V to +5.5V, V _{BATT} = +2.8V MAX704: V _{CC} = +4.5V to +5.5V, V _{BATT} = +2.8V Unless otherwise specified	Device type	Typical Limits 3/	Units
Battery-Switch Threshold (V _{CC} -V _{BATT})		V _{CC} < V _{RST} Power-Up V _{CC} < V _{RST} Power-Down	All	20 -20	mV
Battery-Switchover Hysteresis			All	40	mV
RESET Threshold Hysteresis			All	40	mV

NOTE 3: Typical values, not production tested.

	MAX703	MAX704	MAX705	MAX707
Nominal Reset Threshold	4.65V	4.40V	4.65V	4.65V
Minimum Reset Pulse Width	140ms	140ms	140ms	140ms
Nominal Watchdog Timeout Period	NA	NA	1.6	NA
Backup-Battery Switch	yes	yes	no	no
CE Write Protect	no	no	no	no
Power-Fail Comparator	yes	yes	yes	yes
Manual Reset Input	yes	yes	yes	yes
Watchdog Output	no	no	yes	no
Low-Line Output	no	no	no	no
Active High Reset	no	no	no	yes
BATT On Output	no	no	no	no

NOTE: MAX705 and MAX707 are available as SMD 5962-9326701MPA and 5962-9326703MPA

Figure 1. Terminal Connections

CASE OUTLINE	J8	
TERMINAL NUMBER	TERMINAL SYMBOL	
1	V _{OUT}	Supply Output for CMOS RAM. When V _{CC} is above the reset threshold, V _{OUT} connects to V _{CC} through a P-channel MOSFET switch. When V _{CC} is below the reset threshold, the higher of V _{CC} or V _{BATT} is connected to V _{OUT} .
2	V _{CC}	+5V Supply Input.
3	GND	Ground
4	PFI	Power-Fail Comparator Input. When PFI is less than 1.25V, PFO goes low; otherwise PFO remains high. Connect PFI to GND or V _{CC} when not used.
5	PFO	Power-Fail Output goes low and sinks current when PFI is less than 1.25V; otherwise PFO remains high.
6	MR	Manual-Reset Input generates a reset pulse when pulled below 0.8V. This active-low input is TTL/CMOS compatible and can be shorted to ground with a switch. It has an internal 250μA pull-up current. Leave floating when not used.
7	RESET	Reset Output remains low while V _{CC} is below the reset threshold. It remains low for 200ms after V _{CC} rises above the reset threshold or MR goes from low to high.
8	V _{BATT}	Backup-Battery Input. When V _{CC} falls below the reset threshold, V _{BATT} is switched to V _{OUT} if V _{BATT} is 20mV greater than V _{CC} . When V _{CC} rises 20mV above V _{BATT} , V _{CC} is switched to V _{OUT} . The 40mV hysteresis prevents repeated switching if V _{CC} falls slowly.

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 = +125C 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 = +125C, 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, 9, 10, 11
Group A Test Requirements Method 5005	1, 2, 3, 9, 10, 11
Group C and D End-Point Electrical Parameters Method 5005	1

* PDA applies to Subgroup 1 only.