SCOPE: +5V-Powered Multi-Channel RS-232 Drivers/Receivers

Device Type	Generic Number	Pkg Code
01	MAX232M(x)/883B	J16 & L20
02	MAX230MJP/883B	J20
03	MAX231MJD/883B	J14
04	MAX234MJE/883B	J16
05	MAX236MRG/883B	R24
06	MAX237MRG/883B	R24
07	MAX238MRG/883B	R24
08	MAX239MRG/883B	R24

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
JD	GDIP1-T14 or CDIP2-T14	14 LEAD CERDIP	J14
JE	GDIP1-T16 or CDIP2-T16	16 LEAD CERDIP	J16
JP	GDIP1-T20 or CDIP2-T20	20 LEAD CERDIP	J20
RG	GDIP1-T24 or CDIP2-T24	24 LEAD CERDIP	R24
LP	CQCC1-N20	20 Leadless Chip Carrier	L20

Absolute Maximum Ratings

V_{CC} ..... -0.3V to +6V
V+ ..... (V_{CC}-0.3V) to +14V
V- ..... +0.3V to -14V
Input Voltages:
T_{IN} ..... -0.3V to (V_{CC} +0.3V)
R_{IN} ..... ±30V
Output Voltages:
T_{OUT} ..... (V+ +0.3V) to (V- -0.3V)
R_{OUT} ..... -0.3V to (V_{CC} +0.3V)
Short-Circuit Duration, T_{OUT}..... Continuous
Lead Temperature (soldering, 10 seconds) ..... +300°C
Storage Temperature ..... -65°C to +160°C

Continuous Power Dissipation ..... T_A=+70°C
14 pin CERDIP(derate 9.1mW/°C above +70°C) 727mW
16 pin CERDIP(derate 10mW/°C above +70°C) 800mW
20 pin CERDIP(derate 11.1mW/°C above +70°C) 889mW
24 pin CERDIP(derate 12.5mW/°C above +70°C) 1000mW
20 pin LCC(derate 9.1mW/°C above +70°C) 727mW
Junction Temperature T_J ..... +150°C
Thermal Resistance, Junction to Case, ΘJC
14 pin CERDIP..... 55°C/W
16 pin CERDIP..... 50°C/W
20 pin CERDIP..... 40°C/W
24 pin CERDIP..... 40°C/W
20 pin LCC ..... 20°C/W
Thermal Resistance, Junction to Ambient, ΘJA:
14 pin CERDIP..... 110°C/W
16 pin CERDIP..... 100°C/W
20 pin CERDIP..... 90°C/W
24 pin CERDIP..... 80°C/W
20 pin LCC ..... 110°C/W

Recommended Operating Conditions

Ambient Operating Range (T_A) ..... -55°C to +125°C
Supply Voltage Range ..... -30V to 30V

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 1/ Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
Output Voltage Swing	V_{OUT}	All transmitter outputs loaded with 3kΩ to Gnd	1,2,3	All	±5.0		V
V_{CC} Power-Supply Current		No load	1	01		10	mA
				02,04,05, 06,07		15	
				03,08		1	
V+ Power-Supply Current		No load	1	03		5	mA
				08		15	
Shutdown Supply Current			1	02,05		10	µA
RS-232 TRANSMITTERS							
Input Logic Threshold Low	V_{IL}	T_{IN}	1,2,3	All		0.8	V
		$\overline{EN}$		05,08		0.8	
		SHDN		02,05		0.8	
Input Logic Threshold High	V_{IN}	T_{IN}	1,2,3	All	2.0		V
		$\overline{EN}$		05,08	2.4		
		SHDN		02,05	2.4		
Logic Pull-up/Current Low	I_{IL}	T_{IN}=0V	1,2,3	All		200	µA
Output short circuit current	I_{OST}	V_{OUT}=0V, Sourcing current	1	01		±25	mA
		V_{OUT}=0V, Sinking current		02,03,04, 05,06,07, 08		±45	
Transmitter Output Resistance	R_{TOUT}	V_{CC}=V+=V-=0V, V_{OUT}=±2V	1,2,3	All	300		Ω
RS-232 RECEIVERS							
Receiver Input Voltage Operating Range			1,2,3	01,03,05, 06,07,08	-30	+30	V
RS-232 Input Threshold Low	V_{IL}	Normal Operation	1	01,03,05, 06,07,08	0.8		V
		V_{CC}=5V	2,3		0.4		
RS-232 Input Threshold High	V_{IH}	Normal Operation	1	01,03,05, 06,07,08		2.4	V
		V_{CC}=5V	2,3			3.0	
RS-232 Input Hysteresis	V_{TH}	V_{CC}=5V	1,2,3	01,03,05, 06,07,08	0.2	1.0	V
RS-232 Input Resistance	R_{IN}	V_{CC}=5V	1,2,3	01,03,05, 06,07,08	3.0	7.0	kΩ

TEST	Symbol	CONDITIONS -55 °C <=T_A<= +125°C 1/ Unless otherwise specified	Group A Subgroup	Device type	Limits Min	Limits Max	Units
TTL/CMOS Output Voltage Low	V_{OL}	I_{OUT}=3.2mA	1,2,3	01,03		0.4	V
		I_{OUT}=1.6mA		05,06 07,08		0.4	
TTL/CMOS Output Voltage High	V_{OH}	I_{OUT}=1.0mA	1,2,3	01,03,05, 06,07,08	3.5		V
TTL/CMOS Output Leakage Current		0V≤R_{OUT}≤V_{CC}, $\overline{EN}$=V_{CC}	1,2,3	05,08		±10	µA
Receiver Output Enable Time		NOTE 2		05,08		400	ns
Receiver Output Disable Time		NOTE 2		05,08		250	ns
Propagation Delay		RS-232 IN to TTL/CMOS OUT, C_L=150pF	9,10,11	01,03,05, 06,07,08		10	µs
Transition Region Slew Rate	tSLEW	C_L=50pF to 2500pF, RL=3kΩ-7kΩ, VCC=5V measured from +3V to -3V or -3V to +3V	9	02,04,05, 06,07,08	3.0	30	V/µs
				01,03	1.5	30	

NOTE 1: V_{CC}=+5V ±10% for MAX230, MAX232, MAX234, MAX236, MAX237 or MAX238.
for dash 02, 01, 04, 05, 06, 07 respectively.
V_{CC}=+5V ±10%, V+=9.0V to 13.2V for MAX231 and MAX239 or for dash 03 and 08 respectively.
NOTE 2: Typical design limit.

TERMINAL CONNECTIONS FOR 01, 02, 03, 04, 05, 06, 07, 08

	02	03	01	01 LCC	04	05	06	07	08
1	$T3_{OUT}$	C+	C1+	NC	$T1_{OUT}$	$T3_{OUT}$	$T3_{OUT}$	$T2_{OUT}$	$R1_{OUT}$
2	$T1_{OUT}$	C-	V+	C1+	$T2_{OUT}$	$T1_{OUT}$	$T1_{OUT}$	$T1_{OUT}$	$R1_{IN}$
3	$T2_{OUT}$	V-	C1-	V+	$T2_{IN}$	$T2_{OUT}$	$T2_{OUT}$	$R2_{IN}$	GND
4	$T2_{IN}$	$T2_{OUT}$	C2+	C1-	$T1_{IN}$	$R1_{IN}$	$R1_{IN}$	$R2_{OUT}$	V_{CC}
5	$T1_{IN}$	$R2_{IN}$	C2-	C2+	GND	$R1_{OUT}$	$R1_{OUT}$	$T1_{IN}$	V+
6	GND	$R2_{OUT}$	V-	NC	V_{CC}	$T2_{IN}$	$T2_{IN}$	$R1_{OUT}$	C+
7	V_{CC}	$T2_{IN}$	$T2_{OUT}$	C2-	C1+	$T1_{IN}$	$T1_{IN}$	$R1_{IN}$	C-
8	C1+	$T1_{IN}$	$R2_{IN}$	V-	V+	GND	GND	GND	V-
9	V+	$R1_{OUT}$	$R2_{OUT}$	$T2_{OUT}$	C1-	V_{CC}	V_{CC}	V_{CC}	$R5_{IN}$
10	C1-	$R1_{IN}$	$T2_{IN}$	$R2_{IN}$	C2+	C1+	C1+	C1+	$R5_{OUT}$
11	C2+	$T1_{OUT}$	$T1_{IN}$	NC	C2-	V+	V+	V+	$R4_{OUT}$
12	C2-	GND	$R1_{OUT}$	$R2_{OUT}$	V-	C1-	C1-	C1-	$R4_{IN}$
13	V-	V_{CC}	$R1_{IN}$	$T2_{IN}$	$T3_{IN}$	C2+	C2+	C2+	$T3_{OUT}$
14	$T3_{IN}$	V+	$T1_{OUT}$	$T1_{IN}$	$T4_{IN}$	C2-	C2-	C2-	$\overline{EN}$
15	$T4_{IN}$		GND	$R1_{OUT}$	$T4_{OUT}$	V-	V-	V-	NC
16	$T5_{OUT}$		V_{CC}	NC	$T3_{OUT}$	$R3_{IN}$	$R3_{IN}$	$R4_{IN}$	$T3_{IN}$
17	SHDN			$R1_{IN}$		$R3_{OUT}$	$R3_{OUT}$	$R4_{OUT}$	$R3_{OUT}$
18	NC			$T1_{OUT}$		$T3_{IN}$	$T3_{IN}$	$T2_{IN}$	$R3_{IN}$
19	$T5_{IN}$			GND		$T4_{IN}$	$T4_{IN}$	$T3_{IN}$	$T1_{OUT}$
20	$T4_{OUT}$			V_{CC}		$\overline{EN}$	$T5_{OUT}$	$T4_{OUT}$	$T2_{OUT}$
21						SHDN	$T5_{IN}$	$T4_{IN}$	$R2_{IN}$
22						$R2_{OUT}$	$R2_{OUT}$	$R3_{OUT}$	$R2_{OUT}$
23						$R2_{IN}$	$R2_{IN}$	$R3_{IN}$	$T2_{IN}$
24						$T4_{OUT}$	$T4_{OUT}$	$T3_{OUT}$	$T1_{IN}$

	Package	ORDERING INFORMATION:	SMD Number
01	16 pin CERDIP	MAX232MJE/883B	5962-8987701EA
01	20 pin LCC	MAX232MLP/883B	5962-89877012C
02	20 pin CERDIP	MAX230MJP/883B	5962-8987702RA
03	14 pin CERDIP	MAX231MJD/883B	5962-8987703CA
04	16 pin CERDIP	MAX234MJE/883B	5962-8987704EA
05	24 pin CERDIP	MAX236MRG/883B	5962-8987705JA
06	24 pin CERDIP	MAX237MRG/883B	5962-8987706JA
07	24 pin CERDIP	MAX238MRG/883B	5962-8987707JA
08	24 pin CERDIP	MAX239MRG/883B	5962-8987708JA

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, 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.

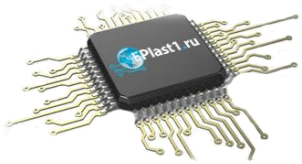
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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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