**SCOPE: CMOS, TTL-COMPATIBLE ANALOG MULTIPLEXER**

| Device Type | Generic Number |
|---|---|
| 01 | DG528A(x)/883B |
| 02 | DG529A(x)/883B |

**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 |
|---|---|---|---|
| K | GDIP1-T18 or CDIP2-T18 | 18 LEAD CERDIP | J18 |
| Z | CQCC1-N20 | 20-Pin Ceramic LCC | L20 |

**Absolute Maximum Ratings**

Voltage Referenced to $V^-$

$V^+$ ..... 44V
GND ..... 25V
Digital Inputs, $V_S$, $V_D$ .....(-V) -2V to ($V^+$)+2V
or 20mA, whichever occurs first
Current, Any terminal except S or D ..... 30mA
Continuous Current, S or D ..... 20mA
Peak Current (Pulsed at 1ms, 10% duty cycle max) ..... 50mA
Lead Temperature (soldering, 10 seconds) ..... +300°C
Storage Temperature ..... -65°C to +150°C

Continuous Power Dissipation 1/..... $T_A$=+70°C
18 lead CERDIP(derate 10.5mW/°C above +70°C) ..... 842mW
20 lead LCC (derate 9.1mW/°C above +70°C) ..... 727mW
Junction Temperature $T_J$ ..... +150°C
Thermal Resistance, Junction to Case, ΘJC:
Case Outline 18 lead CERDIP..... 45°C/W
Case Outline 20 lead LCC ..... 20°C/W
Thermal Resistance, Junction to Ambient, ΘJA:
Case Outline 18 lead CERDIP..... 95°C/W
Case Outline 20 lead LCC ..... 110°C/W

**Recommended Operating Conditions.**

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

NOTE 1: All leads are soldered or wolded to PC board.

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<br>-55 °C <=$T_A$<= +125°C<br>__ V+=+15V, V-=-15V,___<br>RS=2.4V, GND=WR=0V,<br>$V_{AH}$=2.4V, $V_{AL}$=0.8V<br>Unless otherwise specified | Group A Subgroup | Device type | Limits Min | Limits Max | Units |
|---|---|---|---|---|---|---|---|
| **SWITCH** | | NOTE 2 | | | | | |
| Analog-Signal Range | $V_{ANALOG}$ | $V_S$=±15V<br>NOTE 3 | 1,2,3 | All | -15 | 15 | V |
| Drain-Source ON Resistance | $r_{DS(ON)}$ | $I_S$ =-200µA, $V_D$=±10V, $V_{AL}$=0.8V, $V_{AH}$=2.4V, Sequence each switch ON | 1,3<br>2 | All | | 400<br>500 | Ω |
| Source OFF Leakage Current | $I_{S(OFF)}$ | $V_S$ =10mA, $V_D$=-10V, $V_{EN}$=0V | 1<br>2 | All | -1<br>-50 | 1<br>50 | nA |
| Source OFF Leakage Current | $I_{S(OFF)}$ | $V_S$ =-10mA, $V_D$=10V, $V_{EN}$=0V | 1<br>2 | All | -1<br>-50 | 1<br>50 | nA |
| Drain OFF Leakage Current | $I_{D(OFF)}$ | $V_S$ =±10mA, $V_D$=±10V, $V_{EN}$=0V | 1<br>2<br>2 | All<br>01<br>02 | -10<br>-200<br>-100 | 10<br>200<br>-100 | nA |
| Drain ON Leakage Current | $I_{D(ON)}$ | $V_D$=$V_S$=±10V, $V_{AL}$=0.8V, $V_{AH}$=2.4V, $V_{EN}$=2.4V,<br>NOTE 3, 4 | 1<br>2<br>2 | All<br>01<br>02 | -10<br>-200<br>-100 | 10<br>200<br>100 | nA |
| **INPUT** | | | | | | | |
| Input Current/Voltage High | $I_{AH}$ | $V_{IN}$= 2.4V<br>$V_{IN}$=15V | 1,3<br>2<br>1,3<br>2 | All<br>All | -1<br>-30<br>-1 | 1<br>1<br>30 | µA |
| Input Current/Voltage Low | $I_{AL}$ | $V_{EN}$=0V, 2.4V; $V_A$=0V,<br>$V_A$=WR=RS=0V | 1,3<br>2 | All | -1<br>-30 | 1 | µA |
| **SUPPLY** | | | | | | | |
| Positive Supply Current | I+ | $V_{EN}$=$V_A$=0V | 1 | All | | 2.5 | mA |
| Negative Supply Current | I- | $V_{EN}$=$V_A$=0V | 1 | All | -1.5 | | mA |
| **DYNAMIC** | | | | | | | |
| Transition Time | $t_{RANS}$ | Figure 1 | 9<br>10,11 | All | | 1.0<br>1.5 | µs |
| Enable and Write Turn ON Time | $t_{ON}$ __ (EN,WR) | See Figures 2 and 3 | 9<br>10,11 | All | | 1.5<br>2.0 | µs |
| Enable and Write Turn OFF Time | $t_{OFF}$ __ (EN, RS) | See Figures 2 and 3 | 9<br>10,11 | All | | 1.5<br>2.0 | µs |

| TEST | Symbol | CONDITIONS<br>-55 °C <=$T_A$<= +125°C<br>V+=+15V, V-=-15V,<br>RS=2.4V, GND=WR=0V,<br>$V_{AH}$=2.4V, $V_{AL}$=0.8V<br>Unless otherwise specified | Group A Subgroup | Device type | Limits Min | Limits Max | Units |
|---|---|---|---|---|---|---|---|
| **MINIMUM INPUT TIMING** | | | | | | | |
| $\overline{WR}$ Pulse Width | $t_{WW}$ | Figure 7 | 9,10,11 | All | 300 | | ns |
| AX, EN Data valid to $\overline{WR}$ | $t_{DW}$ | (Stabilization Time) Figure 7 | 9,10,11 | All | 180 | | ns |
| AX, EN Data valid after $\overline{WR}$ | $t_{WD}$ | (Hold Time) Figure 7 | 9,10,11 | All | 30 | | ns |
| $\overline{RS}$ Pulse Width | $t_{\overline{RS}}$ | Figure 7; $V_S$=5V<br>NOTE 5 | 9,10,11 | All | 500 | | ns |

NOTE 2: Guaranteed by design.
NOTE 3: Sequence each switch on.
NOTE 4: ID(ON) is leakage drom driver into on switch
NOTE 5: Reset pulse period must be at least 50µs during and after power-on.

**TRUTH TABLE**

| A2 | A1 | A0 | EN | $\overline{WR}$ | $\overline{RS}$ | DG528A ON SWITCH |
|---|---|---|---|---|---|---|
| X | X | X | X | ↑ | 1 | * |
| X | X | X | X | X | 0 | ** |
| X | X | X | 0 | 0 | 1 | None |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 | 0 | 1 | 2 |
| 0 | 1 | 0 | 1 | 0 | 1 | 3 |
| 0 | 1 | 1 | 1 | 0 | 1 | 4 |
| 1 | 0 | 0 | 1 | 0 | 1 | 5 |
| 1 | 0 | 1 | 1 | 0 | 1 | 6 |
| 1 | 1 | 0 | 1 | 0 | 1 | 7 |
| 1 | 1 | 1 | 1 | 0 | 1 | 8 |
| | | | | | | |
| | | | | | | |
| | **A1** | **A0** | **EN** | $\overline{WR}$ | $\overline{RS}$ | **DG529A ON SWITCH** |
| | X | X | X | ↑ | 1 | * |
| | X | X | X | 0 | 1 | ** |
| | X | X | 0 | 0 | 1 | None |
| | 0 | 0 | 1 | 0 | 1 | 1 |
| | 0 | 1 | 1 | 0 | 1 | 2 |
| | 1 | 0 | 1 | 0 | 1 | 3 |
| | 1 | 1 | 1 | 0 | 1 | 4 |

**TERMINAL CONNECTION**

| TERMINAL NUMBER | 01 DG528A | 01 DG528A | 02 DG529A | 02 DG529A |
|---|---|---|---|---|
| | J18 | L20 | J18 | L20 |
| 1 | $\overline{WR}$ | NC | $\overline{WR}$ | NC |
| 2 | A0 | $\overline{WR}$ | A0 | $\overline{WR}$ |
| 3 | EN | A0 | EN | A0 |
| 4 | V- | EN | V- | EN |
| 5 | S1 | VSS | S1A | VSS |
| 6 | S2 | S1 | S2A | S1A |
| 7 | S3 | S2 | S3A | S2A |
| 8 | S4 | S3 | S4A | S3A |
| 9 | D | S4 | DA | S4A |
| 10 | S8 | D | DB | DA |
| 11 | S7 | NC | S4B | NC |
| 12 | S6 | S8 | S3B | DB |
| 13 | S5 | S7 | S2B | S4B |
| 14 | V+ | S6 | S1B | S3B |
| 15 | GND | S5 | V+ | S2B |
| 16 | A2 | VDD | GND | S1B |
| 17 | A1 | GND | A1 | VDD |
| 18 | $\overline{RS}$ | A2 | $\overline{RS}$ | GND |
| 19 | | A1 | | A1 |
| 20 | | $\overline{RS}$ | | $\overline{RS}$ |

NOTE: Logic "1": $V_{AH}$≥2.4V * LATCHING: Maintains previous switch conditions
Logic "0": $V_{AL}$≥0.8V **RESET: None (latches cleared)

| ORDERING INFORMATION: | |
|---|---|
| DG528AK/883B 18 CDIP | DG529AK/883B 18 CDIP |
| DG528AZ/883B 20 LCC | DG529AZ/883B 20 LCC |
| | |

**FIGURE 1: TRANSITION TIME TEST CIRCUIT:** See Commercial Data Sheet
**FIGURE 3: Enable $t_{ON}/t_{OFF}$ Test Time Circuit**: See Commercial Data Sheet
**FIGURE 4: Write Turn-On Time Test Circuit**: See Commerical Data Sheet
**FIGURE 5: Write Turn-Off Time Test Circuit**: See Commerical Data Sheet
**FIGURE 7: Typical Timing Diagrams**: See Commerical Data Sheet

**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 |
| 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.
** Subgroups 10 and 11, if not tested shall be guaranteed to the limits of Table 1.