



## SILICON CONTROLLED RECTIFIER

Qualified per MIL-PRF-19500/276

Devices

2N2323 2N2324 2N2326 2N2328 2N2323S 2N2324S 2N2326S 2N2328S 2N2329 2N2323A 2N2324A 2N2326A 2N2328A 2N2329S 2N2323AS 2N2324AS 2N2326AS 2N2328AS

Qualified Level

JAN JANTX JANTXV

#### MAXIMUM RATINGS

| Ratings   Sym   2N2323,S/   2N2324,S/   2N2326,S/   2N2328,S/   2N2329,S   Unit |                  |                        |                        |                        |                        |                    |          |
|---|------------------|------------------------|------------------------|------------------------|------------------------|--------------------|----------|
| Ratings   | Sym              | 2N2323,S/<br>2N2323A,S | 2N2324,S/<br>2N2324A,S | 2N2326,S/<br>2N2326A,S | 2N2328,S/<br>2N2328A,S | 2N2329,S           | Unit     |
| Reverse Voltage   | $V_{RM}$         | 50                     | 100                    | 200                    | 300                    | 400                | Vdc      |
| Working Peak Reverse Voltage  | $V_{RM}$         | 75                     | 150                    | 300                    | 400                    | 500                | Vpk      |
| Forward Blocking Voltage  | $V_{FBXM}$       | 50 <sup>(3/4)</sup>    | $100^{(3/4)}$          | $200^{(3/4)}$          | $300^{(3/4)}$          | 400 <sup>(3)</sup> | Vpk      |
| Average Forward Current (1)   | $I_{\mathrm{O}}$ | 0.22                   |                        |                        |                        |                    | Adc      |
| Forward Current Surge Peak <sup>(2)</sup>                                       | $I_{FSM}$        | 15                     |                        |                        |                        |                    | Adc      |
| Cathode-Gate Current  | $V_{KGM} \\$     | 6                      |                        |                        |                        |                    | Vpk      |
| Operating Temperature   | Top              | -65 to +125            |                        |                        |                        |                    | $^{0}C$  |
| Storage Junction Temp   | Т                | -65 to +150            |                        |                        |                        |                    | $^{0}$ C |

- This average forward current is for an ambient temperature of 80°C and 180 electrical degrees of conduction.
- Surge current is non-recurrent. The rate of rise of peak surge current shall not exceed 40 A during the first 5 µs after switching from the 'off' (blocking) to the 'on' (conducting) state. This is measured from the point where the thyristor voltage has decayed to 90% of its initial blocking value.
- 3) Gate connected to cathode through 1,000 ohm resistor.
- 4) Gate connected to cathode through 2,000 ohm resistor.



\*See appendix A for package outline

#### **ELECTRICAL CHARACTERISTICS**

| Characteristics          |                        | Symbol     | Min. | Max. | Unit |
|--------------------------|------------------------|------------|------|------|------|
| SUBGROUP 2 TESTING       |                        |            |      |      |      |
| Reverse Blocking Current |                        |            |      |      |      |
| $R_2 = 1 \text{ k}\mu$   | 2N2323 thru 2N2329     |            |      |      |      |
|                          | 2N2323S thru 2N2329S   |            |      |      |      |
| $R_2 = 2 \text{ k}\mu$   | 2N2323A thru 2N2328A   |            |      |      |      |
|                          | 2N2323AS thru 2N2328AS | т          |      | 10   | μAdc |
| $V_R = 50 \text{ Vdc}$   | 2N2323, S, A, AS       | $I_{RBX1}$ |      | 10   | μΑασ |
| $V_R = 100 \text{ Vdc}$  | 2N2324, S, A, AS       |            |      |      |      |
| $V_R = 200 \text{ Vdc}$  | 2N2326, S, A, AS       |            |      |      |      |
| $V_R = 300 \text{ Vdc}$  | 2N2328, S, A, AS       |            |      |      |      |
| $V_R = 400 \text{ Vdc}$  | 2N2329, S,             |            |      |      |      |

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### 2N2323, A, AS, S; 2N2324, A, AS, S; 2N2326, A, AS, S; 2N2328, A, AS, S; 2N232, S JAN SERIES

# ELECTRICAL CHARACTERISTICS (con't)

| Characteristics                                   |                          | Symbol                      | Min. | Max. | Unit |
|---|--------------------------|-----------------------------|------|------|------|
| Forward Blocking Current                          |                          |                             |      |      |      |
| $R_2 = 1 k\Omega$                                 | 2N2323 thru 2N2329       |                             |      |      |      |
|   | 2N2323S thru 2N2329S     |                             |      |      |      |
| $R_2 = 2 k\Omega$                                 | 2N2323A thru 2N2328A     |                             |      |      |      |
|   | 2N2323AS thru 2N2328AS   | $I_{FBX1}$                  |      | 10   | μAdc |
| $V_R = 50 \text{ Vdc}$                            | 2N2323, S, A, AS         | FBXI                        |      | 10   | μΑας |
| $V_R = 100 \text{ Vdc}$                           | 2N2324, S, A, AS         |                             |      |      |      |
| $V_R = 200 \text{ Vdc}$                           | 2N2326, S, A, AS         |                             |      |      |      |
| $V_R = 300 \text{ Vdc}$                           | 2N2328, S, A, AS         |                             |      |      |      |
| $V_R = 400 \text{ Vdc}$                           | 2N2329, S                |                             |      |      |      |
| Reverse Gate Current                              |                          | $I_{KG}$                    |      | 200  | μAdc |
| $V_{KG} = 6 \text{ Vdc}$                          |                          | 1KG                         |      | 200  | μΑας |
| Gate Trigger Voltage and Current                  |                          |                             |      |      |      |
| $V_2 = V_{FBX} = 6 \text{ Vdc}; R_L = 100 \Omega$ |                          |                             |      |      |      |
| $R_e = 1 \ k\Omega$                               | 2N2323 thru 2N2329 and   | $V_{\mathrm{GT1}}$          | 0.35 | 0.80 | Vdc  |
|   | 2N2323S thru 2N2329S     | $\mathbf{I}_{\mathrm{GT1}}$ |      | 200  | μAdc |
| $R_e = 2 k\Omega$                                 | 2N2323A thru 2N2328A and | $V_{\mathrm{GT1}}$          | 0.35 | 0.60 | Vdc  |
|   | 2N2323AS thru 2N2328AS   | $I_{\mathrm{GT1}}$          |      | 20   | μAdc |

### SUBGROUP 4 TESTING

| Exponential Rate of Voltage Rise $T_A = 125^{\circ}C$                              |                          |              |     |     |       |
|--|--------------------------|--------------|-----|-----|-------|
| $50 \Omega \le R_L \le 400 \Omega$ , C = 0.1 to 1.0 μF, repetition rate = 60 pps,  |                          |              |     |     |       |
| test duration = 15 seconds   |                          |              |     |     |       |
| $dv/dt = 1.8 \text{ v/}\mu\text{s}, R_3 = 1 \text{ k}\Omega$                       | 2N2323 thru 2N2329 and   |              |     |     |       |
|  | 2N2323S thru 2N2329S     |              |     |     |       |
| $dv/dt = 0.7 \text{ v/}\mu\text{s}, R_3 = 2 \text{ k}\Omega$                       | 2N2323A thru 2N2328A and | V            |     |     | Vdc   |
| ·  | 2N2323AS thru 2N2328AS   | $V_{ m FBX}$ |     |     |       |
| $V_{AA} = 50 \text{ Vdc}$  | 2N2323, S, A, AS         |              | 47  |     |       |
| $V_{AA} = 100 \text{ Vdc}$   | 2N2324, S, A, AS         |              | 95  |     |       |
| $V_{AA} = 200 \text{ Vdc}$   | 2N2326, S, A, AS         |              | 190 |     |       |
| $V_{AA} = 300 \text{ Vdc}$   | 2N2328, S, A, AS         |              | 285 |     |       |
| $V_{AA} = 400 \text{ Vdc}$   | 2N2329, S                |              | 380 |     |       |
| Forward "on" Voltage   |                          |              |     |     |       |
| $i_{FM} = 4a$ (pk) (pulse), pulse width = 8.5 ms, max; duty cycle = 2% max         |                          | $V_{FM}$     |     | 2.2 | V(pk) |
| Holding Current  |                          |              |     |     |       |
| $V_{AA} = 24 \text{ Vdc max}, I_{F1} = 100 \text{ mAdc}, I_{F2} = 10 \text{ mAdc}$ |                          | 1            |     | 2.0 | mAdc  |
| Gate trigger source voltage = 6 Vdc,   |                          |              |     |     |       |
| trigger pulse width = 25 $\mu$ s min., $R_2$ = 330 $\Omega$                        |                          |              |     |     |       |
| $R_3 = 1 k\Omega$  | 2N2323 thru 2N2329 and   | $I_{HOX}$    |     | 2.0 | made  |
|  | 2N2323S thru 2N2329S     |              |     |     |       |
| $R_3 = 2 k\Omega$  | 2N2323A thru 2N2328A and |              |     |     |       |
|  | 2N2323AS thru 2N2328AS   |              |     |     |       |

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