N-Channel Enhancement Mode Field Effect Transistor

2N7000, 2N7002, NDS7002A

Description
These N-channel enhancement mode field effect transistors are produced using onsemi’s proprietary, high cell density, DMOS technology. These products have been designed to minimize on-state resistance while providing rugged, reliable, and fast switching performance. These products are particularly suited for low-voltage, low-current applications, such as small servo motor control, power MOSFET gate drivers, and other switching applications.

Features
- High Density Cell Design for Low $R_{DS(on)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable
- High Saturation Current Capability
- ESD Protection Level: HBM > 100 V, CDM > 2 kV
- This Device is Pb-Free and Halogen Free

MARKING DIAGRAM

$Y&Z&M$

2N

7000

SY = onsemi Logo
&Z = Assembly Plant Code
&M = Date Code
2N7000 = Specific Device Code

1 – Gate
2 – Source
3 – Drain

SOT–23 CASE 318–08

MARKING DIAGRAM

702M$

702 = Specific Device Code
M = Date Code
• = Pb–Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION
See detailed ordering and shipping information on page 7 of this data sheet.
# ABSOLUTE MAXIMUM RATINGS

Values are at $T_C = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>2N7000</th>
<th>2N7002</th>
<th>NDS7002A</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{DSS}$</td>
<td>Drain–to–Source Voltage</td>
<td>60</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$V_{DGR}$</td>
<td>Drain–Gate Voltage ($R_{GS} \leq 1$ MW)</td>
<td>60</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$V_{GSS}$</td>
<td>Gate–Source Voltage – Continuous</td>
<td>±20</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>Gate–Source Voltage – Non Repetitive (tp &lt; 50 ms)</td>
<td>±40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_D$</td>
<td>Maximum Drain Current – Continuous</td>
<td>200</td>
<td>115</td>
<td>280</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>Maximum Drain Current – Pulsed</td>
<td>500</td>
<td>800</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>$P_D$</td>
<td>Maximum Power Dissipation Derated above 25°C</td>
<td>400</td>
<td>200</td>
<td>300</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2</td>
<td>1.6</td>
<td>2.4</td>
<td>mW/°C</td>
</tr>
<tr>
<td>$T_J, T_{STG}$</td>
<td>Operating and Storage Temperature Range</td>
<td>−55 to 150</td>
<td></td>
<td>−65 to 150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_L$</td>
<td>Maximum Lead Temperature for Soldering Purposes, 1/16–inch from Case for 10 s</td>
<td>300</td>
<td></td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

## THERMAL CHARACTERISTICS

Values are at $T_C = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>2N7000</th>
<th>2N7002</th>
<th>NDS7002A</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{\theta JA}$</td>
<td>Thermal Resistance, Junction to Ambient</td>
<td>312.5</td>
<td>625</td>
<td>417</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

## ELECTRICAL CHARACTERISTICS

Values are at $T_C = 25^\circ C$ unless otherwise noted.

### OFF CHARACTERISTICS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Type</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_{V_DSS}$</td>
<td>Drain–Source Breakdown Voltage</td>
<td>$V_GS = 0$ V, $I_D = 10$ μA</td>
<td>All</td>
<td>60</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$I_DSS$</td>
<td>Zero Gate Voltage Drain Current</td>
<td>$V_D = 48$ V, $V_GS = 0$ V</td>
<td>2N7000</td>
<td>−</td>
<td>−</td>
<td>1</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_D = 48$ V, $V_GS = 0$ V, $T_C = 125^\circ C$</td>
<td></td>
<td>−</td>
<td>−</td>
<td>1</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_D = 60$ V, $V_GS = 0$ V</td>
<td>2N7002</td>
<td>−</td>
<td>−</td>
<td>1</td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_D = 60$ V, $V_GS = 0$ V, $T_C = 125^\circ C$</td>
<td>NDS7002A</td>
<td>−</td>
<td>−</td>
<td>0.5</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{GSSF}$</td>
<td>Gate – Body Leakage, Forward</td>
<td>$V_GS = 15$ V, $V_D = 0$ V</td>
<td>2N7000</td>
<td>−</td>
<td>−</td>
<td>10</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_GS = 20$ V, $V_D = 0$ V</td>
<td>2N7002</td>
<td>−</td>
<td>−</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>NDS7002A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{GSSR}$</td>
<td>Gate – Body Leakage, Reverse</td>
<td>$V_GS = -15$ V, $V_D = 0$ V</td>
<td>2N7000</td>
<td>−</td>
<td>−</td>
<td>−10</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_GS = -20$ V, $V_D = 0$ V</td>
<td>2N7002</td>
<td>−</td>
<td>−</td>
<td>−100</td>
<td></td>
</tr>
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### ON CHARACTERISTICS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Type</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{GS(th)}$</td>
<td>Gate Threshold Voltage</td>
<td>$V_D = V_GS$, $I_D = 1$ mA</td>
<td>2N7000</td>
<td>0.8</td>
<td>2.1</td>
<td>3</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_D = V_GS$, $I_D = 250$ μA</td>
<td>2N7002</td>
<td>1</td>
<td>2.1</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>
## ELECTRICAL CHARACTERISTICS (continued)

Values are at \( T_C = 25^\circ C \) unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Type</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_{DS(on)} )</td>
<td>Static Drain–Source On–Resistance</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA} )</td>
<td>2N7000</td>
<td>–</td>
<td>1.2</td>
<td>5</td>
<td>( \Omega )</td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA}, T_C = 125^\circ C )</td>
<td>–</td>
<td>1.9</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 4.5 \text{ V}, I_D = 75 \text{ mA} )</td>
<td>–</td>
<td>1.8</td>
<td>5.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA} )</td>
<td>2N7002</td>
<td>–</td>
<td>1.2</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA}, T_C = 100^\circ C )</td>
<td>–</td>
<td>1.7</td>
<td>13.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 5 \text{ V}, I_D = 50 \text{ mA} )</td>
<td>–</td>
<td>1.7</td>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 5 \text{ V}, I_D = 50 \text{ mA}, T_C = 100^\circ C )</td>
<td>–</td>
<td>2.4</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA} )</td>
<td>NDS7002A</td>
<td>–</td>
<td>1.2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA}, T_C = 125^\circ C )</td>
<td>–</td>
<td>2</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 5 \text{ V}, I_D = 50 \text{ mA} )</td>
<td>–</td>
<td>1.7</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R_{DS(on)} )</td>
<td>( V_{GS} = 5 \text{ V}, I_D = 50 \text{ mA}, T_C = 125^\circ C )</td>
<td>–</td>
<td>2.8</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_{DS(on)} )</td>
<td>Drain–Source On–Voltage</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA} )</td>
<td>2N7000</td>
<td>–</td>
<td>0.6</td>
<td>2.5</td>
<td>( V )</td>
</tr>
<tr>
<td>( V_{DS(on)} )</td>
<td>( V_{GS} = 4.5 \text{ V}, I_D = 75 \text{ mA} )</td>
<td>–</td>
<td>0.14</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA} )</td>
<td>2N7002</td>
<td>–</td>
<td>0.6</td>
<td>3.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_{DS(on)} )</td>
<td>( V_{GS} = 5.0 \text{ V}, I_D = 50 \text{ mA} )</td>
<td>–</td>
<td>0.09</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_{DS(on)} )</td>
<td>( V_{GS} = 10 \text{ V}, I_D = 500 \text{ mA} )</td>
<td>NDS7002A</td>
<td>–</td>
<td>0.6</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_{DS(on)} )</td>
<td>( V_{GS} = 5.0 \text{ V}, I_D = 50 \text{ mA} )</td>
<td>–</td>
<td>0.09</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g( _{FS} )</td>
<td>Forward Transconductance</td>
<td>( V_{DS} = 10 \text{ V}, I_D = 200 \text{ mA} )</td>
<td>2N7000</td>
<td>100</td>
<td>320</td>
<td>–</td>
<td>mS</td>
</tr>
<tr>
<td>g( _{FS} )</td>
<td>( V_{DS} \geq 2 \text{ V}_{DS(on)}, I_D = 200 \text{ mA} )</td>
<td>2N7002</td>
<td>80</td>
<td>320</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g( _{FS} )</td>
<td>( V_{DS} \geq 2 \text{ V}_{DS(on)}, I_D = 200 \text{ mA} )</td>
<td>NDS7002A</td>
<td>80</td>
<td>320</td>
<td>–</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DYNAMIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Type</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>C( _{iss} )</td>
<td>Input Capacitance</td>
<td>( V_{DD} = 25 \text{ V}, V_{GS} = 0 \text{ V}, f = 1.0 \text{ MHz} )</td>
<td>All</td>
<td>–</td>
<td>20</td>
<td>50</td>
<td>pF</td>
</tr>
<tr>
<td>C( _{oss} )</td>
<td>Output Capacitance</td>
<td>All</td>
<td>–</td>
<td>11</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C( _{rss} )</td>
<td>Reverse Transfer Capacitance</td>
<td>All</td>
<td>–</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I( _{on} )</td>
<td>Turn–On Time</td>
<td>( V_{DD} = 15 \text{ V}, R_L = 25 \text{ \Omega}, I_D = 500 \text{ mA}, V_{GS} = 10 \text{ V}, R_{GEN} = 25 \text{ \Omega} )</td>
<td>2N7000</td>
<td>–</td>
<td>–</td>
<td>10</td>
<td>ns</td>
</tr>
<tr>
<td>I( _{on} )</td>
<td>( V_{DD} = 30 \text{ V}, R_L = 150 \text{ \Omega}, I_D = 200 \text{ mA}, V_{GS} = 10 \text{ V}, R_{GEN} = 25 \text{ \Omega} )</td>
<td>2N7002</td>
<td>–</td>
<td>–</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I( _{off} )</td>
<td>Turn–Off Time</td>
<td>( V_{DD} = 15 \text{ V}, R_L = 25 \text{ \Omega}, I_D = 500 \text{ mA}, V_{GS} = 10 \text{ V}, R_{GEN} = 25 \text{ \Omega} )</td>
<td>2N7000</td>
<td>–</td>
<td>–</td>
<td>10</td>
<td>ns</td>
</tr>
<tr>
<td>I( _{off} )</td>
<td>( V_{DD} = 30 \text{ V}, R_L = 150 \text{ \Omega}, I_D = 200 \text{ mA}, V_{GS} = 10 \text{ V}, R_{GEN} = 25 \text{ \Omega} )</td>
<td>2N7002</td>
<td>–</td>
<td>–</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DRAIN–SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I( _{S} )</td>
<td>Maximum Continuous Drain–Source Diode Forward Current</td>
<td>2N7002</td>
<td>–</td>
<td>–</td>
<td>115</td>
<td>mA</td>
</tr>
<tr>
<td>I( _{S} )</td>
<td>NDS7002A</td>
<td>–</td>
<td>–</td>
<td>280</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2N7000, 2N7002, NDS7002A

ELECTRICAL CHARACTERISTICS (continued)
Values are at $T_C = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Type</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{SM}$</td>
<td>Maximum Pulsed Drain–Source Diode Forward Current</td>
<td></td>
<td>2N7002</td>
<td>–</td>
<td>–</td>
<td>0.8</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NDS7002A</td>
<td>–</td>
<td>–</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>$V_{SD}$</td>
<td>Drain–Source Diode Forward Voltage</td>
<td>$V_{GS} = 0 , V, , I_S = 115 , mA$ (Note 1)</td>
<td>2N7002</td>
<td>–</td>
<td>0.88</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{GS} = 0 , V, , I_S = 400 , mA$ (Note 1)</td>
<td>NDS7002A</td>
<td>–</td>
<td>0.88</td>
<td>1.2</td>
<td></td>
</tr>
</tbody>
</table>

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2 \%$

TYPICAL PERFORMANCE CHARACTERISTICS

**Figure 1. On–Region Characteristics**

**Figure 2. On–Resistance Variation with Gate Voltage and Drain Current**

**Figure 3. On–Resistance Variation with Temperature**

**Figure 4. On–Resistance Variation with Drain Current and Temperature**
TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

Figure 5. Transfer Characteristics

Figure 6. Gate Threshold Variation with Temperature

Figure 7. Breakdown Voltage Variation with Temperature

Figure 8. Body Diode Forward Voltage Variation with Temperature

Figure 9. Capacitance Characteristics

Figure 10. Gate Charge Characteristics
TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

Figure 11. Switching Test Circuit

Figure 12. Switching Waveforms

Figure 13. 2N7000 Maximum Safe Operating Area

Figure 14. 2N7002 Maximum Safe Operating Area

Figure 15. NDS7002A Maximum Safe Operating Area
2N7000, 2N7002, NDS7002A

TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

Figure 16. TO–92, 2N7000 Transient Thermal Response Curve

Figure 17. SOT–23, 2N7002 / NDS7002A Transient Thermal Response Curve

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Marking</th>
<th>Package</th>
<th>Packing Method†</th>
<th>Min Order Qty / Immediate Pack Qty</th>
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<tbody>
<tr>
<td>2N7000</td>
<td>2N7000</td>
<td>TO–92 3L</td>
<td>Bulk</td>
<td>10000 / 1000</td>
</tr>
<tr>
<td>2N7000–D75Z</td>
<td></td>
<td></td>
<td>Tape and Reel</td>
<td>2000 / 2000</td>
</tr>
<tr>
<td>2N7002</td>
<td>702</td>
<td>SOT–23 3L</td>
<td>Tape and Reel</td>
<td>3000 / 3000</td>
</tr>
<tr>
<td>NDS7002A</td>
<td>712</td>
<td>(Pb–Free)</td>
<td></td>
<td>3000 / 3000</td>
</tr>
</tbody>
</table>

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.
TO-92 3 4.825x4.76
CASE 135AN
ISSUE 0

DATE 31 JUL 2016

NOTES: UNLESS OTHERWISE SPECIFIED
A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-2009.

DOCUMENT NUMBER: 98AON13880G
DESCRIPTION: TO-92 3 4.825X4.76

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TO-92 3 4.83x4.76 LEADFORMED
CASE 135AR
ISSUE 0

DATE 30 SEP 2016

NOTES: UNLESS OTHERWISE SPECIFIED
A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-1994
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

SOT-23 (TO-236)
CASE 318
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DATE 01 MAR 2023

NOTES:
2. CONTROLLING DIMENSION MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

<table>
<thead>
<tr>
<th>DIM</th>
<th>MILLIMETERS</th>
<th>INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.89 - 1.00</td>
<td>0.035 - 0.039 - 0.044</td>
</tr>
<tr>
<td>Al</td>
<td>0.01 - 0.06</td>
<td>0.000 - 0.002 - 0.004</td>
</tr>
<tr>
<td>b</td>
<td>0.37 - 0.44</td>
<td>0.015 - 0.017 - 0.020</td>
</tr>
<tr>
<td>c</td>
<td>0.08 - 0.14</td>
<td>0.003 - 0.006 - 0.008</td>
</tr>
<tr>
<td>D</td>
<td>2.80 - 2.90</td>
<td>0.110 - 0.114 - 0.120</td>
</tr>
<tr>
<td>E</td>
<td>1.20 - 1.30</td>
<td>0.047 - 0.051 - 0.055</td>
</tr>
<tr>
<td>e</td>
<td>1.78 - 1.90</td>
<td>0.070 - 0.075 - 0.080</td>
</tr>
<tr>
<td>L</td>
<td>0.30 - 0.43</td>
<td>0.012 - 0.017 - 0.022</td>
</tr>
<tr>
<td>L1</td>
<td>0.35 - 0.54</td>
<td>0.014 - 0.021 - 0.027</td>
</tr>
<tr>
<td>H2</td>
<td>2.10 - 2.40</td>
<td>0.083 - 0.094 - 0.104</td>
</tr>
<tr>
<td>T</td>
<td>0° - 10°</td>
<td>0° - 10°</td>
</tr>
</tbody>
</table>

XXX = Specific Device Code
M = Date Code
* = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking.
Pb-Free indicator, “G” or microdot “*”, may or may not be present. Some products may not follow the Generic Marking.

STYLES ON PAGE 2

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MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

SOT–23 (TO–236)
CASE 318
ISSUE AT

DATE 01 MAR 2023

STYLE 1 THRU 5:
CANCELLED
PIN 1. ANODE
2. CATHODE
3. ANODE

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 7:
PIN 1. EMITTER
2. BASE
3. NO CONNECTION

STYLE 8:
PIN 1. ANODE
2. COLLECTOR
3. CATHODE

STYLE 9:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 10:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 11:
PIN 1. ANODE
2. CATHODE
3. CATHODE–ANODE

STYLE 12:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 13:
PIN 1. GATE
2. NO CONNECTION
3. ANODE

STYLE 14:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 15:
PIN 1. GATE
2. CATHODE
3. ANODE

STYLE 16:
PIN 1. CATHODE
2. NO CONNECTION
3. CATHODE

STYLE 17:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 18:
PIN 1. NO CONNECTION
2. CATHODE
3. ANODE

STYLE 19:
PIN 1. CATHODE
2. ANODE
3. CATHODE

STYLE 20:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 21:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 22:
PIN 1. RETURN
2. OUTPUT
3. INPUT

STYLE 23:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 24:
PIN 1. ANODE
2. DRAIN
3. CATHODE

STYLE 25:
PIN 1. ANODE
2. CATHODE
3. NO CONNECTION

STYLE 26:
PIN 1. CATHODE
2. ANODE
3. NO CONNECTION

STYLE 27:
PIN 1. ANODE
2. CATHODE
3. CATHODE

STYLE 28:
PIN 1. ANODE
2. ANODE
3. ANODE

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

98ASB42226B

SOT–23 (TO–236)

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