

# Dual Transistors

## TO-78 Case

$P_D @ T_A=25^{\circ}C=600mW$  Total (Both Die Equal Power)



| TYPE NO. | DESCRIPTION     | $I_C$<br>(mA) | $V_{CBO}$<br>(V) | $V_{CEO}$<br>(V) | $h_{FE}$ |     | $@ I_C$<br>(mA) | $@ V_{CE}$<br>(V) | $V_{CE(SAT)}$<br>(V) | $@ I_C$<br>(mA) | $f_T$<br>(MHz) | MATCHING      |                  |
|----------|-----------------|---------------|------------------|------------------|----------|-----|-----------------|-------------------|----------------------|-----------------|----------------|---------------|------------------|
|          |                 | MAX           | MIN              | MIN              | MIN      | MAX |                 |                   |                      |                 | *TYP<br>MIN    | $h_{FE}$<br>% | $V_{BE}$<br>(mV) |
| 2N2060   | NPN AMPL/SWITCH | 500           | 100              | 60               | 50       | 150 | 10              | 5.0               | 1.2                  | 50              | 60             | 10            | 5.0              |
| 2N2060A  | NPN AMPL/SWITCH | 500           | 100              | 60               | 50       | 150 | 10              | 5.0               | 0.6                  | 50              | 60             | 10            | 3.0              |
| 2N2223   | NPN AMPL/SWITCH | 500           | 100              | 60               | 50       | 200 | 10              | 5.0               | 1.2                  | 50              | 50             | 20            | 15               |
| 2N2223A  | NPN AMPL/SWITCH | 500           | 100              | 60               | 50       | 200 | 10              | 5.0               | 1.2                  | 50              | 50             | 10            | 5.0              |
| 2N2453   | NPN LOW NOISE   | 50            | 60               | 30               | 150      | 600 | 1.0             | 5.0               | 1.0                  | 5.0             | 60             | 10            | 3.0              |
| 2N2453A  | NPN LOW NOISE   | 50            | 80               | 50               | 150      | 600 | 1.0             | 5.0               | 1.0                  | 5.0             | 60             | 10            | 3.0              |
| 2N2480   | NPN AMPL/SWITCH | 500           | 75               | 40               | 30       | 350 | 1.0             | 5.0               | 1.3                  | 50              | 50             | 20            | 10               |
| 2N2480A  | NPN AMPL/SWITCH | 500           | 80               | 40               | 50       | 200 | 1.0             | 5.0               | 1.2                  | 50              | 50             | 20            | 5.0              |
| 2N2639   | NPN LOW NOISE   | 30            | 45               | 45               | 50       | 300 | 0.01            | 5.0               | 1.0                  | 10              | 40             | 10            | 5.0              |
| 2N2640   | NPN LOW NOISE   | 30            | 45               | 45               | 50       | 300 | 0.01            | 5.0               | 1.0                  | 10              | 40             | 20            | 10               |
| 2N2641   | NPN LOW NOISE   | 30            | 45               | 45               | 50       | 300 | 0.01            | 5.0               | 1.0                  | 10              | 40             | --            | --               |
| 2N2642   | NPN LOW NOISE   | 30            | 45               | 45               | 100      | 300 | 0.01            | 5.0               | 1.0                  | 10              | 40             | 10            | 5.0              |
| 2N2643   | NPN LOW NOISE   | 30            | 45               | 45               | 100      | 300 | 0.01            | 5.0               | 1.0                  | 10              | 40             | 20            | 10               |
| 2N2644   | NPN LOW NOISE   | 30            | 45               | 45               | 100      | 300 | 0.01            | 5.0               | 1.0                  | 10              | 40             | --            | --               |
| 2N2652   | NPN AMPL/SWITCH | 500           | 100              | 60               | 50       | 200 | 1.0             | 5.0               | 1.2                  | 50              | 60             | 15            | 3.0              |
| 2N2652A  | NPN AMPL/SWITCH | 500           | 100              | 60               | 50       | 200 | 1.0             | 5.0               | 1.2                  | 50              | 60             | 10            | 3.0              |
| 2N2722   | NPN LOW NOISE   | 40            | 45               | 45               | 50       | 250 | 0.001           | 5.0               | 1.0                  | 10              | 100            | 10            | 5.0              |
| 2N2903   | NPN LOW NOISE   | 50            | 60               | 30               | 125      | 625 | 1.0             | 5.0               | 1.0                  | 5.0             | 60             | 20            | 10               |
| 2N2903A  | NPN LOW NOISE   | 50            | 60               | 30               | 125      | 625 | 1.0             | 5.0               | 1.0                  | 5.0             | 60             | 10            | 5.0              |
| 2N2913   | NPN LOW NOISE   | 30            | 45               | 45               | 60       | 240 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | --            | --               |
| 2N2914   | NPN LOW NOISE   | 30            | 45               | 45               | 150      | 600 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | --            | --               |
| 2N2915   | NPN LOW NOISE   | 30            | 45               | 45               | 60       | 240 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 3.0              |
| 2N2915A  | NPN LOW NOISE   | 30            | 45               | 45               | 60       | 240 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 1.5              |
| 2N2916   | NPN LOW NOISE   | 30            | 45               | 45               | 150      | 600 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 3.0              |
| 2N2916A  | NPN LOW NOISE   | 30            | 45               | 45               | 150      | 600 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 1.5              |
| 2N2917   | NPN LOW NOISE   | 30            | 45               | 45               | 60       | 240 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 20            | 5.0              |
| 2N2918   | NPN LOW NOISE   | 30            | 45               | 45               | 150      | 600 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 20            | 5.0              |
| 2N2919   | NPN LOW NOISE   | 30            | 60               | 60               | 60       | 240 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 3.0              |
| 2N2919A  | NPN LOW NOISE   | 30            | 60               | 60               | 60       | 240 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 1.5              |
| 2N2920   | NPN LOW NOISE   | 30            | 60               | 60               | 150      | 600 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 3.0              |
| 2N2920A  | NPN LOW NOISE   | 30            | 60               | 60               | 150      | 600 | 0.01            | 5.0               | 0.35                 | 1.0             | 60             | 10            | 1.5              |
| 2N3726   | PNP LOW NOISE   | 300           | 45               | 45               | 135      | 350 | 1.0             | 5.0               | 0.25                 | 50              | 200            | 10            | 5.0              |
| 2N3727   | PNP LOW NOISE   | 300           | 45               | 45               | 135      | 350 | 1.0             | 5.0               | 0.25                 | 50              | 200            | 10            | 2.5              |
| 2N3806   | PNP LOW NOISE   | 50            | 60               | 60               | 150      | 450 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | --            | --               |
| 2N3807   | PNP LOW NOISE   | 50            | 60               | 60               | 300      | 900 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | --            | --               |
| 2N3808   | PNP LOW NOISE   | 50            | 60               | 60               | 150      | 450 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | 20            | 5.0              |
| 2N3809   | PNP LOW NOISE   | 50            | 60               | 60               | 300      | 900 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | 20            | 5.0              |
| 2N3810   | PNP LOW NOISE   | 50            | 60               | 60               | 150      | 450 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | 10            | 3.0              |
| 2N3810A  | PNP LOW NOISE   | 50            | 60               | 60               | 150      | 450 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | 5.0           | 1.5              |
| 2N3811   | PNP LOW NOISE   | 50            | 60               | 60               | 300      | 900 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | 10            | 3.0              |
| 2N3811A  | PNP LOW NOISE   | 50            | 60               | 60               | 300      | 900 | 1.0             | 5.0               | 0.2                  | 0.1             | 100            | 5.0           | 1.5              |
| 2N4015   | PNP AMPL/SWITCH | 300           | 60               | 60               | 135      | 350 | 1.0             | 5.0               | 0.25                 | 50              | 200            | 10            | 5.0              |
| 2N4016   | PNP AMPL/SWITCH | 300           | 60               | 60               | 135      | 350 | 1.0             | 5.0               | 0.25                 | 50              | 200            | 10            | 2.5              |
| 2N5794   | NPN AMPL/SWITCH | 600           | 75               | 40               | 100      | 300 | 150             | 10                | 0.3                  | 150             | 250            | --            | --               |
| 2N5796   | PNP AMPL/SWITCH | 600           | 60               | 60               | 100      | 300 | 150             | 10                | 0.4                  | 150             | 200            | --            | --               |
| MD708    | NPN SAT SWITCH  | 200           | 40               | 15               | 40       | 200 | 10              | 1.0               | 0.5                  | 100             | 300            | --            | --               |
| MD708A   | NPN SAT SWITCH  | 200           | 40               | 15               | 40       | 200 | 10              | 1.0               | 0.5                  | 100             | 300            | 10            | 5.0              |
| MD708B   | NPN SAT SWITCH  | 200           | 40               | 15               | 40       | 200 | 10              | 1.0               | 0.5                  | 100             | 300            | 20            | 10               |

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



---

### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

---

### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

---

### CONTACT US

#### Corporate Headquarters & Customer Support Team

Central Semiconductor Corp.  
145 Adams Avenue  
Hauppauge, NY 11788 USA  
Main Tel: (631) 435-1110  
Main Fax: (631) 435-1824  
Support Team Fax: (631) 435-3388  
[www.centalsemi.com](http://www.centalsemi.com)

**Worldwide Field Representatives:**  
[www.centalsemi.com/wwreps](http://www.centalsemi.com/wwreps)

**Worldwide Distributors:**  
[www.centalsemi.com/wwdistributors](http://www.centalsemi.com/wwdistributors)

---

For the latest version of Central Semiconductor's **LIMITATIONS AND DAMAGES DISCLAIMER**, which is part of Central's Standard Terms and Conditions of sale, visit: [www.centalsemi.com/terms](http://www.centalsemi.com/terms)

Summary: All transistors manufactured in the TO-78 package are discontinued and now classified as End of Life (EOL).

Although Central Semiconductor Corp. makes every effort to continue to produce devices that have been proclaimed EOL (End of Life) by various manufacturers, it is an accepted industry practice to discontinue certain devices when customer demand falls below a minimum level of sustainability. Accordingly, the following product(s) have been transitioned to End of Life status as part of Central's Product Management Process. Any replacement product will be noted below. The effective date for placing the last purchase order will be six(6) months from the date of this notice and twelve(12) months from the notice date for final shipments; this may be extended if inventory is available.

| <u>Central Part Number</u> | <u>Replacement</u> |
|----------------------------|--------------------|
| CEN876                     | N/A                |
| CEN894                     | N/A                |
| CEN895                     | N/A                |
| CEN896                     | N/A                |
| CEN911                     | N/A                |
| CEN947                     | N/A                |
| CEN955 W/DATA              | N/A                |
| MD2219A                    | N/A                |
| MD2369                     | N/A                |
| MD2369A                    | N/A                |
| MD2369B                    | N/A                |
| MD2905                     | N/A                |
| MD2905A                    | N/A                |
| MD5179                     | N/A                |
| MD7000                     | N/A                |
| MD7001                     | N/A                |
| MD7003                     | N/A                |
| MD7003A                    | N/A                |
| MD7003B                    | N/A                |
| MD8002                     | N/A                |
| MD8003                     | N/A                |
| MD918                      | N/A                |
| MD918A                     | N/A                |
| MD918B                     | N/A                |
| MD984                      | N/A                |
| 2N2060                     | N/A                |
| 2N2060A                    | N/A                |
| 2N2060M                    | N/A                |
| 2N2223                     | N/A                |
| 2N2223A                    | N/A                |
| 2N2453                     | N/A                |
| 2N2453A                    | N/A                |
| 2N2480                     | N/A                |
| 2N2480A                    | N/A                |
| 2N2639                     | N/A                |
| 2N2640                     | N/A                |
| 2N2641                     | N/A                |
| 2N2642                     | N/A                |

\*\*\* CONTINUED \*\*\*

\*\*\* CONTINUED FROM PRIOR PAGE \*\*\*

| <u>Central Part Number</u> | <u>Replacement</u> |
|----------------------------|--------------------|
| 2N2643                     | N/A                |
| 2N2644                     | N/A                |
| 2N2652                     | N/A                |
| 2N2652A                    | N/A                |
| 2N2720                     | N/A                |
| 2N2721                     | N/A                |
| 2N2722                     | N/A                |
| 2N2903                     | N/A                |
| 2N2903A                    | N/A                |
| 2N2913                     | N/A                |
| 2N2914                     | N/A                |
| 2N2915                     | N/A                |
| 2N2915A                    | N/A                |
| 2N2916                     | N/A                |
| 2N2916A                    | N/A                |
| 2N2917                     | N/A                |
| 2N2918                     | N/A                |
| 2N2919                     | N/A                |
| 2N2919A                    | N/A                |
| 2N2920                     | N/A                |
| 2N2920A                    | N/A                |
| 2N3726                     | N/A                |
| 2N3727                     | N/A                |
| 2N3806                     | N/A                |
| 2N3807                     | N/A                |
| 2N3808                     | N/A                |
| 2N3809                     | N/A                |
| 2N3810                     | N/A                |
| 2N3810A                    | N/A                |
| 2N3811                     | N/A                |
| 2N3811A                    | N/A                |
| 2N4015                     | N/A                |
| 2N4016                     | N/A                |
| 2N4854                     | N/A                |
| 2N4937                     | N/A                |
| 2N4938                     | N/A                |
| 2N4939                     | N/A                |
| 2N5793                     | N/A                |
| 2N5794                     | N/A                |
| 2N5796                     | N/A                |
| 2N5912                     | N/A                |
| 2N6502                     | N/A                |

\*\*\* CONTINUED \*\*\*



<http://www.centrasemi.com>

PDN01061

1/17/17

7/17/17

1/17/18

\*\*\* CONTINUED FROM PRIOR PAGE \*\*\*

| <u>Central Part Number</u> | <u>Replacement</u> |
|----------------------------|--------------------|
|----------------------------|--------------------|

Central would be happy to assist you by providing additional information or technical data to help locate an alternate source if we have no replacement available. Please email your requests to [engineering@centrasemi.com](mailto:engineering@centrasemi.com).