

2N2920
2N2920A

**SILICON
DUAL NPN TRANSISTORS**



TO-78 CASE



www.centrasemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N2920 and 2N2920A are dual silicon NPN transistors manufactured by the epitaxial planar process utilizing two individual chips mounted in a hermetically sealed metal case designed for differential amplifier applications.

MARKING: FULL PART NUMBER

MAXIMUM RATINGS: ($T_A=25^\circ\text{C}$)

| | | | |
|--|----------------|-------------|------------------|
| Collector-Base Voltage | V_{CB0} | 60 | V |
| Collector-Emitter Voltage | V_{CEO} | 60 | V |
| Emitter-Base Voltage | V_{EBO} | 6.0 | V |
| Continuous Collector Current | I_C | 30 | mA |
| Power Dissipation (One Die) | P_D | 300 | mW |
| Power Dissipation (Both Dice) | P_D | 500 | mW |
| Power Dissipation (One Die, $T_C=25^\circ\text{C}$) | P_D | 750 | mW |
| Power Dissipation (Both Dice, $T_C=25^\circ\text{C}$) | P_D | 1.5 | W |
| Operating and Storage Junction Temperature | T_J, T_{stg} | -65 to +200 | $^\circ\text{C}$ |

SYMBOL

| | | |
|----------------|-------------|--|
| V_{CB0} | 60 | |
| V_{CEO} | 60 | |
| V_{EBO} | 6.0 | |
| I_C | 30 | |
| P_D | 300 | |
| P_D | 500 | |
| P_D | 750 | |
| P_D | 1.5 | |
| T_J, T_{stg} | -65 to +200 | |

UNITS

| |
|------------------|
| V |
| V |
| V |
| mA |
| mW |
| mW |
| mW |
| W |
| $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS PER TRANSISTOR: ($T_A=25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | TEST CONDITIONS | MIN | MAX | UNITS |
|---------------|---|-----|------|-------|
| I_{CBO} | $V_{CB}=45\text{V}$ | | 2.0 | nA |
| I_{CEO} | $V_{CE}=5.0\text{V}$ | | 2.0 | nA |
| I_{EBO} | $V_{EB}=5.0\text{V}$ | | 2.0 | nA |
| BV_{CB0} | $I_C=10\mu\text{A}$ | 60 | | V |
| BV_{CEO} | $I_C=10\text{mA}$ | 60 | | V |
| BV_{EBO} | $I_E=10\mu\text{A}$ | 6.0 | | V |
| $V_{CE(SAT)}$ | $I_C=1.0\text{mA}, I_B=100\mu\text{A}$ | | 0.35 | V |
| $V_{BE(ON)}$ | $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$ | | 0.70 | V |
| h_{FE} | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ | 150 | 600 | |
| h_{FE} | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, T_A=-55^\circ\text{C}$ | 40 | | |
| h_{FE} | $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$ | 225 | | |
| h_{FE} | $V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$ | 300 | | |
| f_T | $V_{CE}=5.0\text{V}, I_C=500\mu\text{A}, f=20\text{MHz}$ | 60 | | MHz |
| C_{ob} | $V_{CB}=5.0\text{V}, I_E=0, f=140\text{kHz}$ | | 6.0 | pF |
| NF | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, R_S=10\text{k}\Omega, f=1.0\text{kHz}, BW=200\text{Hz}$ | | 3.0 | dB |

R1 (4-April 2014)

2N2920
2N2920A

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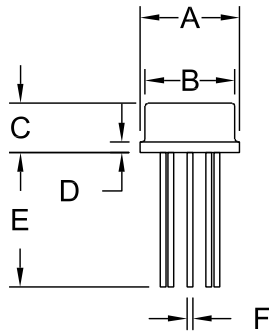


MATCHING CHARACTERISTICS: ($T_A=25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | TEST CONDITIONS | 2N2920 | | 2N2920A | | UNITS |
|---------------------------|---|--------|-----|---------|-----|-------|
| | | MIN | MAX | MIN | MAX | |
| h_{FE1}/h_{FE2}^* | $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$ | 0.9 | 1.0 | 0.9 | 1.0 | |
| $ V_{BE1}-V_{BE2} $ | $V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ | - | 5.0 | - | 2.0 | mV |
| $ V_{BE1}-V_{BE2} $ | $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$ | - | 3.0 | - | 1.5 | mV |
| $\Delta(V_{BE1}-V_{BE2})$ | $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}, T_A=-55^\circ\text{C}$ to $+25^\circ\text{C}$ | - | 0.8 | - | - | mV |
| $\Delta(V_{BE1}-V_{BE2})$ | $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}, T_A=+25^\circ\text{C}$ to $+125^\circ\text{C}$ | - | 1.0 | - | - | mV |

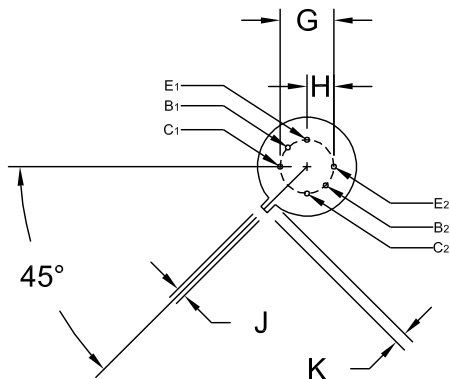
*The lowest reading is taken as h_{FE1} .

TO-78 CASE - MECHANICAL OUTLINE



| SYMBOL | DIMENSIONS | | | |
|---------|------------|-------|-------------|------|
| | INCHES | | MILLIMETERS | |
| | MIN | MAX | MIN | MAX |
| A (DIA) | 0.335 | 0.370 | 8.51 | 9.40 |
| B (DIA) | 0.305 | 0.335 | 7.75 | 8.51 |
| C | 0.150 | 0.185 | 3.81 | 4.70 |
| D | - | 0.040 | - | 1.02 |
| E | 0.500 | - | 12.70 | - |
| F (DIA) | 0.016 | 0.021 | 0.41 | 0.53 |
| G | 0.200 | | 5.08 | |
| H | 0.100 | | 2.54 | |
| J | 0.028 | 0.034 | 0.71 | 0.86 |
| K | 0.029 | 0.045 | 0.74 | 1.14 |

TO-78 (REV: R1)



R1

MARKING: FULL PART NUMBER

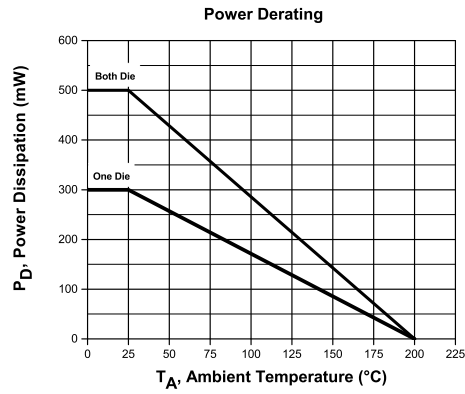
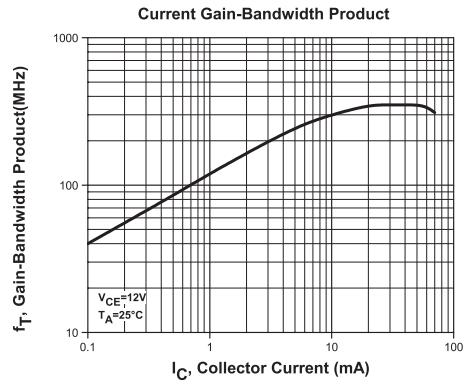
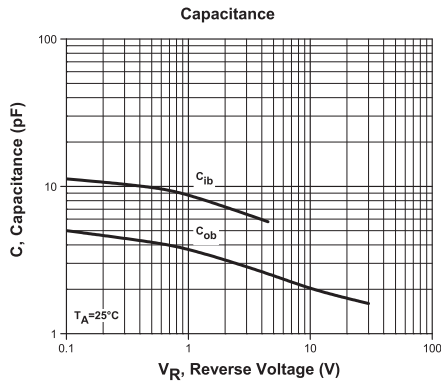
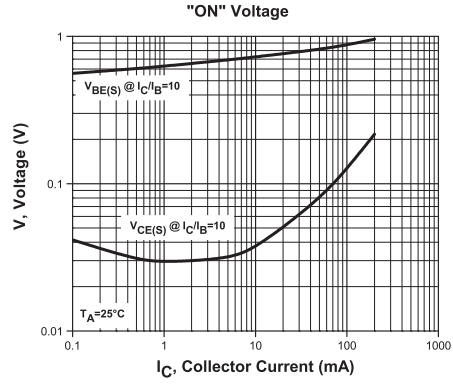
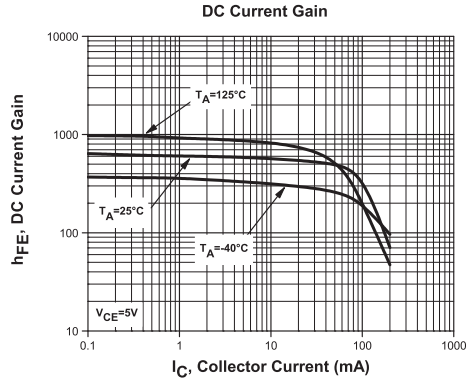
R1 (4-April 2014)

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TYPICAL ELECTRICAL CHARACTERISTICS



R1 (4-April 2014)

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 (2nd 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

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www.centalsemi.com

Worldwide Field Representatives:
www.centalsemi.com/wwreps

Worldwide Distributors:
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Product End of Life Notification

| | |
|--------------------|----------|
| PDN ID: | PDN01061 |
| Notification Date: | 1/17/17 |
| Last Buy Date: | 7/17/17 |
| Last Shipment Date | 1/17/18 |

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 ***

DISCLAIMER: This End of Life (EOL) notification is in accordance with JEDEC standard JESD48 - Product Discontinuance. Central Semiconductor Corp. will make every effort to offer life-time buy (LTB) opportunities and/or offer replacement devices to existing customers for discontinued devices, however, one or both may not be possible for all devices. Please contact your local Central Semiconductor sales representative for LTB opportunities/additional information.

Product End of Life Notification

| | |
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| <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 ***

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<http://www.centrasemi.com>

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Central Part Number Replacement

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.

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