

**COLLMER SEMICONDUCTOR**  
**14368 PROTON ROAD**  
**DALLAS, TEXAS 75244**  
**1-800-527-0251**                      **214-233-1589**

**1 High speed switching transistors**

- Suitable for 50kHz class switching regulators.
- Allows transformers to be reduced in size.

| Device type | V <sub>ceo</sub> | V <sub>ceo</sub> | V <sub>ceo</sub> | I <sub>c</sub> | P <sub>c</sub> | h <sub>FE</sub> | I <sub>c</sub> | V <sub>ce</sub> | Switching time (Typical) |                      |                      | Package  | Net weight grams |
|-------------|------------------|------------------|------------------|----------------|----------------|-----------------|----------------|-----------------|--------------------------|----------------------|----------------------|----------|------------------|
|             | volts            | volts            | (sus) volts      | cont. amps.    | watts          | min.            | amps.          | volts           | t <sub>on</sub> μsec.    | t <sub>s</sub> μsec. | t <sub>f</sub> μsec. |          |                  |
| 2SC2929     | 500              | 400              | 400              | 3              | 60             | 20              | 0.5            | 5               | 0.5                      | 1.0                  | 0.3                  | TO-220AB | 2                |
| 2SC2767     | 300              | 200              | 200              | 5              | 60             | 20              | 1              | 5               | 0.5                      | 1.0                  | 0.5                  | TO-220AB | 2                |
| 2SC2243     | 650              | 400              | 400              | 5              | 120            | 10              | 2              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3     | 17               |
| 2SC2542     | 650              | 400              | 400              | 5              | 60             | 10              | 2              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-220AB | 2                |
| 2SC2624     | 650              | 400              | 400              | 5              | 100            | 10              | 2              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3P    | 6                |
| 2SC2769     | 300              | 200              | 200              | 10             | 100            | 20              | 2              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3P    | 6                |
| 2SC2245     | 650              | 400              | 400              | 10             | 120            | 10              | 4              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3     | 17               |
| 2SC2625     | 650              | 400              | 400              | 10             | 100            | 10              | 2              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3P    | 6                |
| 2SC2246     | 650              | 400              | 400              | 15             | 120            | 10              | 6              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3     | 17               |
| 2SC2623     | 650              | 400              | 400              | 20             | 120            | 10              | 8              | 5               | 0.5                      | 1.0                  | 0.3                  | TO-3     | 17               |
| 2SC3047     | 850              | 500              | 500              | 6              | 40             | 15              | 0.5            | 5               | 0.5                      | 1.0                  | 0.4                  | TO-220AB | 2                |
| ET206       | 850              | 500              | 500              | 10             | 80             | 15              | 1              | 5               | 0.5                      | 1.5                  | 0.3                  | TO-3P    | 6                |

**2 Super high speed switching transistors**

- t<sub>on</sub>: 0.2μsec., t<sub>f</sub>: 0.07μsec.
- Suitable for 100kHz class switching regulators

| Device type | V <sub>ceo</sub> | V <sub>ceo</sub> | V <sub>ceo</sub> | I <sub>c</sub> | P <sub>c</sub> | h <sub>FE</sub> | I <sub>c</sub> | V <sub>ce</sub> | Switching time (Typical) |                      |                      | Package  | Net weight grams |
|-------------|------------------|------------------|------------------|----------------|----------------|-----------------|----------------|-----------------|--------------------------|----------------------|----------------------|----------|------------------|
|             | volts            | volts            | (sus) volts      | cont. amps.    | watts          | min.            | amps.          | volts           | t <sub>on</sub> μsec.    | t <sub>s</sub> μsec. | t <sub>f</sub> μsec. |          |                  |
| 2SC3317     | 600              | 400              | 400              | 5              | 60             | 10              | 2              | 5               | 0.2                      | 1.0                  | 0.07                 | TO-220AB | 2                |
| 2SC3318     | 600              | 400              | 400              | 10             | 100            | 10              | 5              | 5               | 0.2                      | 1.0                  | 0.07                 | TO-3P    | 6                |
| 2SC3319     | 600              | 400              | 400              | 10             | 120            | 10              | 5              | 5               | 0.2                      | 1.0                  | 0.07                 | TO-3     | 17               |
| 2SC3320     | 600              | 400              | 400              | 15             | 100            | 10              | 6              | 5               | 0.2                      | 1.0                  | 0.07                 | TO-3P    | 6                |
| 2SC3321     | 600              | 400              | 400              | 15             | 120            | 10              | 6              | 5               | 0.2                      | 1.0                  | 0.07                 | TO-3     | 17               |

**3 Large SOA switching transistors**

- An especially wide SOA with high-speed switching.
- Excellent surge resistant characteristics
- Suitable for switching regulators, series regulators, electronic ignitors and similar devices.

| Device type | V <sub>ceo</sub> | V <sub>ceo</sub> | V <sub>ceo</sub> | I <sub>c</sub> | P <sub>c</sub> | h <sub>FE</sub> | I <sub>c</sub> | V <sub>ce</sub> | Switching time (Typical) |                      |                      | Package | Net weight grams |
|-------------|------------------|------------------|------------------|----------------|----------------|-----------------|----------------|-----------------|--------------------------|----------------------|----------------------|---------|------------------|
|             | volts            | volts            | (sus) volts      | cont. amps.    | watts          | min.            | amps.          | volts           | t <sub>on</sub> μsec.    | t <sub>s</sub> μsec. | t <sub>f</sub> μsec. |         |                  |
| 2SC2437     | 650              | 400              | 400              | 7              | 120            | 10              | 3              | 4               | 1.0                      | 2.0                  | 1.0                  | TO-3    | 18               |
| 2SC2686     | 650              | 400              | 400              | 7              | 100            | 10              | 3              | 4               | 1.0                      | 2.0                  | 1.0                  | TO-3P   | 6                |

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#### 4. High voltage high speed switching transistors

- The  $V_{CSO}$  is 900 volts and the transistor is best suited for use with 240VAC input switching regulators.
- Switching time is as  $t_f$ : 0.8 $\mu$ s.
- Can operate within the 30kHz range.

| Device type | $V_{CSO}$<br>volts | $V_{CEO}$<br>volts | $V_{CSO}$<br>(sus)<br>volts | $I_C$<br>cont.<br>amps. | $P_C$<br>watts | $h_{FE}$<br>min. | $I_C$<br>amps. | $V_{CE}$<br>volts | Switching time (Max.)  |                     |                     | Package  | Net weight<br>grams | Darling-<br>ton |
|-------------|--------------------|--------------------|-----------------------------|-------------------------|----------------|------------------|----------------|-------------------|------------------------|---------------------|---------------------|----------|---------------------|-----------------|
|             |                    |                    |                             |                         |                |                  |                |                   | $t_{on}$<br>$\mu$ sec. | $t_s$<br>$\mu$ sec. | $t_f$<br>$\mu$ sec. |          |                     |                 |
| 2SC3030     | 900                | 800                | 800                         | 7                       | 80             | 8                | 3              | 5                 | 0.5                    | 2.5                 | 0.8                 | TO-3P    | 6                   | Fig. I          |
| 2SC3031     | 900                | 800                | 800                         | 7                       | 80             | 8                | 3              | 5                 | 0.5                    | 2.5                 | 0.8                 | TO-3     | 17                  | Fig. I          |
| 2SC3032     | 900                | 700                | 700                         | 7                       | 80             | 8                | 3              | 5                 | 0.5                    | 2.5                 | 0.8                 | TO-3P    | 6                   | Fig. I          |
| 2SC3033     | 900                | 700                | 700                         | 7                       | 80             | 8                | 3              | 5                 | 0.5                    | 2.5                 | 0.8                 | TO-3     | 17                  | Fig. I          |
| 2SC3549     | 900                | 800                | 800                         | 3                       | 40             | 10               | 1              | 5                 | 1.0                    | 4.0                 | 0.8                 | TO-220AB | 2                   | —               |
| 2SC3550     | 900                | 800                | 800                         | 3                       | 80             | 10               | 1              | 5                 | 1.0                    | 4.0                 | 0.8                 | TO-3P    | 6                   | —               |
| 2SC3551     | 900                | 800                | 800                         | 5                       | 80             | 10               | 2              | 5                 | 1.0                    | 4.0                 | 0.8                 | TO-3P    | 6                   | —               |

#### 5. Low voltage high current switching transistors

- High speed switching performance
- $V_{CEO}$  (sus): 80 – 120 volts
- $I_C$  cont: 25 Amps
- Suitable for motor control applications such as DC-DC converters, golf carts, fork-lifts and industrial sewing machines using battery power supply.

| Device type | $V_{CSO}$<br>volts | $V_{CEO}$<br>volts | $V_{CSO}$<br>(sus)<br>volts | $I_C$<br>cont.<br>amps. | $P_C$<br>watts | $h_{FE}$<br>min. | $I_C$<br>amps. | $V_{CE}$<br>volts | Switching time (Max.)  |                     |                     | Package | Net weight<br>grams |
|-------------|--------------------|--------------------|-----------------------------|-------------------------|----------------|------------------|----------------|-------------------|------------------------|---------------------|---------------------|---------|---------------------|
|             |                    |                    |                             |                         |                |                  |                |                   | $t_{on}$<br>$\mu$ sec. | $t_s$<br>$\mu$ sec. | $t_f$<br>$\mu$ sec. |         |                     |
| 2SD913      | 200                | 80                 | 80                          | 25                      | 150            | 20               | 25             | 5                 | 0.5                    | 1.5                 | 0.2                 | TO-3    | 19                  |
| 2SD1049     | 120                | 80                 | 80                          | 25                      | 100            | 25               | 25             | 5                 | 0.5                    | 1.5                 | 0.2                 | TO-3P   | 6                   |
| 2SD914      | 200                | 120                | 120                         | 25                      | 150            | 20               | 25             | 5                 | 0.5                    | 1.5                 | 0.2                 | TO-3    | 19                  |

#### 6. Ultra high $\beta$ transistors (UBT)

- The DC current gain is extraordinarily high (min. 700).
- $h_{FE} - I_C$  characteristics are linear.
- Transistors for drive use not required.
- Ideally suited for series regulators, color TV, power supplies and similar devices.

| Device type | $V_{CSO}$<br>volts | $V_{CEO}$<br>volts | $V_{CSO}$<br>(sus)<br>volts | $I_C$<br>cont.<br>amps. | $P_C$<br>watts | $h_{FE}$<br>min. | $I_C$<br>amps. | $V_{CE}$<br>volts | Switching time (Max.)  |                     |                     | Package  | Net weight<br>grams | Darling-<br>ton |
|-------------|--------------------|--------------------|-----------------------------|-------------------------|----------------|------------------|----------------|-------------------|------------------------|---------------------|---------------------|----------|---------------------|-----------------|
|             |                    |                    |                             |                         |                |                  |                |                   | $t_{on}$<br>$\mu$ sec. | $t_s$<br>$\mu$ sec. | $t_f$<br>$\mu$ sec. |          |                     |                 |
| 2SD1128     | 150                | 100                | 100                         | 5                       | 40             | 700              | 1              | 4                 | —                      | —                   | —                   | TO-220AB | 2                   | Fig. E          |
| 2SD920      | 250                | 200                | 200                         | 5                       | 120            | 700              | 1              | 4                 | —                      | —                   | —                   | TO-3     | 17                  | Fig. E          |
| 2SD921      | 250                | 200                | 200                         | 5                       | 100            | 700              | 1              | 4                 | —                      | —                   | —                   | TO-3P    | 6                   | Fig. E          |
| 2SD929      | 250                | 200                | 200                         | 5                       | 100            | 700              | 1              | 4                 | —                      | —                   | —                   | TO-3     | 17                  | Fig. E          |
| 2SD930      | 250                | 200                | 200                         | 5                       | 40             | 700              | 0.7            | 4                 | —                      | —                   | —                   | TO-220AB | 2                   | Fig. E          |
| 2SD931      | 250                | 200                | 200                         | 5                       | 60             | 700              | 1              | 4                 | —                      | —                   | —                   | TO-3     | 17                  | Fig. E          |
| 2SD981      | 250                | 200                | 200                         | 5                       | 150            | 700              | 1              | 4                 | —                      | —                   | —                   | TO-3     | 13                  | Fig. E          |
| 2SD982      | 250                | 200                | 200                         | 5                       | 60             | 700              | 1              | 4                 | —                      | —                   | —                   | TO-220AB | 2                   | Fig. E          |
| 2SD983      | 150                | 100                | 100                         | 6                       | 60             | 700              | 1              | 4                 | —                      | —                   | —                   | TO-220AB | 2                   | Fig. E          |
| 2SD922      | 150                | 100                | 100                         | 10                      | 120            | 700              | 3              | 4                 | —                      | —                   | —                   | TO-3     | 17                  | Fig. E          |
| 2SD923      | 150                | 100                | 100                         | 10                      | 100            | 700              | 1              | 4                 | —                      | —                   | —                   | TO-3P    | 6                   | Fig. E          |

Darlington circuit schematic: See page 21