

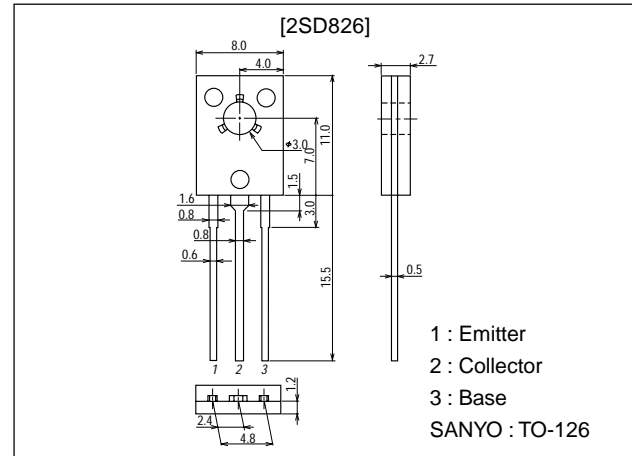
**2SD826****20V/5A Switching Applications****Features**

- Low saturation voltage.
- High  $h_{FE}$ .
- Large current capacity.

**Package Dimensions**

unit:mm

2009A

**Specifications****Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$** 

| Parameter                    | Symbol    | Conditions             | Ratings     | Unit             |
|------------------------------|-----------|------------------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CB0}$ |                        | 60          | V                |
| Collector-to-Emitter Voltage | $V_{CE0}$ |                        | 20          | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |                        | 6           | V                |
| Collector Current            | $I_C$     |                        | 5           | A                |
| Collector Current (Pulse)    | $I_{CP}$  | 100ms, 1 pulse         | 8           | A                |
| Collector Dissipation        | $P_C$     |                        | 1.0         | W                |
|                              |           | $T_c=25^\circ\text{C}$ | 10          | W                |
| Junction Temperature         | $T_J$     |                        | 150         | $^\circ\text{C}$ |
| Storage Temperature          | $T_{stg}$ |                        | -55 to +150 | $^\circ\text{C}$ |

**Electrical Characteristics at  $T_a = 25^\circ\text{C}$** 

| Parameter                | Symbol    | Conditions                                | Ratings |     |      | Unit          |
|--------------------------|-----------|---|---------|-----|------|---------------|
|                          |           |   | min     | typ | max  |               |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}=50\text{V}, I_E=0$                |         |     | 1.0  | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=5\text{V}, I_C=0$                 |         |     | 1.0  | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE1}$ | $V_{CE}=2\text{V}, I_C=0.5\text{A}$       | 120*    |     | 560* |               |
|                          | $h_{FE2}$ | $V_{CE}=2\text{V}, I_C=3\text{A (Pulse)}$ | 95      |     |      |               |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE}=10\text{V}, I_C=50\text{mA}$      |         | 120 |      | MHz           |
| Output Capacitance       | $C_{ob}$  | $V_{CB}=10\text{V}, f=1\text{MHz}$        |         | 45  |      | pF            |

\* : The 2SD826 is classified by 0.5A  $h_{FE}$  as follows.

Continued on next page.

|     |   |     |     |   |     |     |   |     |
|-----|---|-----|-----|---|-----|-----|---|-----|
| 120 | E | 200 | 160 | F | 320 | 280 | G | 560 |
|-----|---|-----|-----|---|-----|-----|---|-----|

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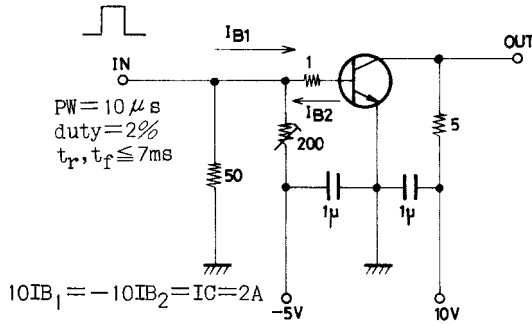
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# 2SD826

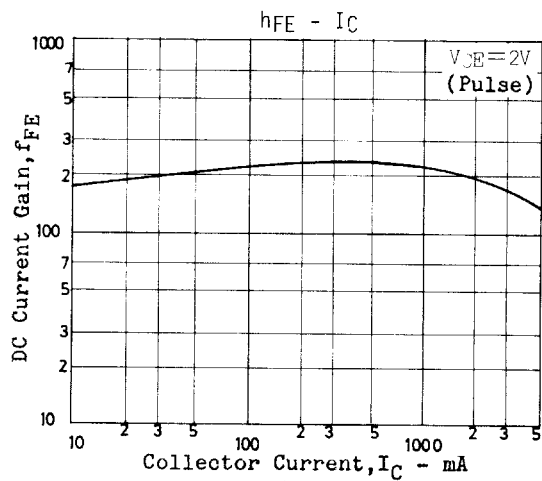
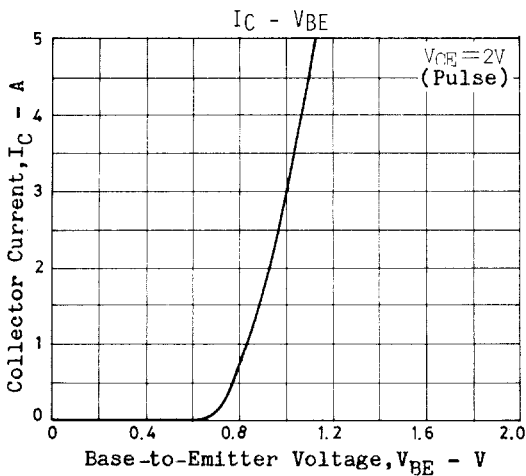
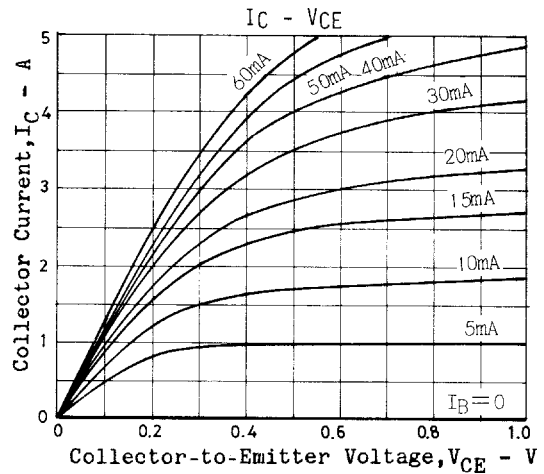
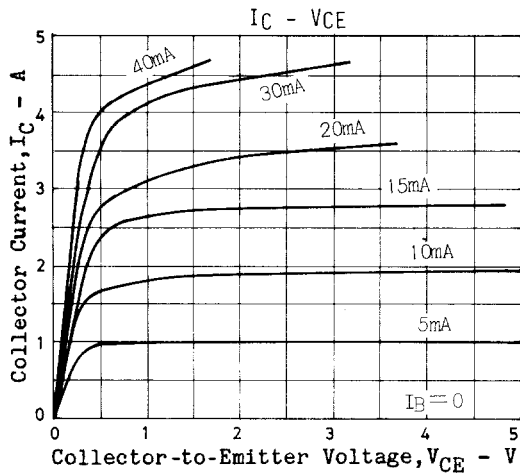
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| Parameter                               | Symbol        | Conditions                  | Ratings |     |     | Unit |
|---|---------------|-----------------------------|---------|-----|-----|------|
|   |               |                             | min     | typ | max |      |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=3A, I_B=60mA$ (Pulse)  |         |     | 0.5 | V    |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=3A, I_B=60mA$ (Pulse)  |         |     | 1.5 | V    |
| Turn-ON Time                            | $t_{on}$      | See specified test circuit. |         | 30  |     | ns   |
| Storage Time                            | $t_{stg}$     | See specified test circuit. |         | 300 |     | ns   |
| Fall Time                               | $t_f$         | See specified test circuit. |         | 40  |     | ns   |

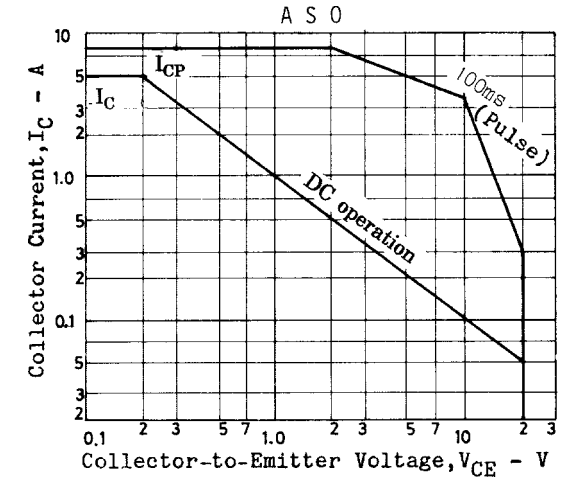
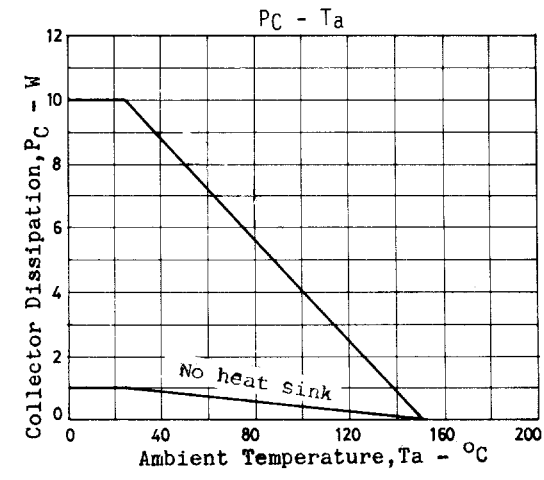
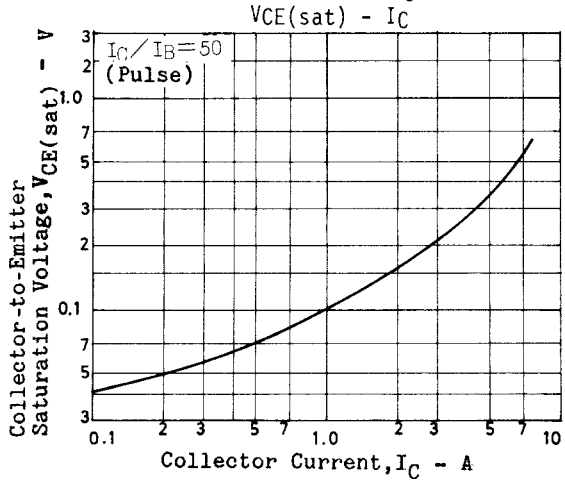
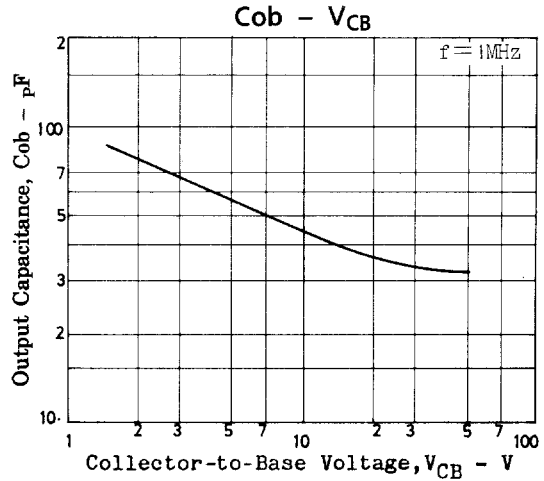
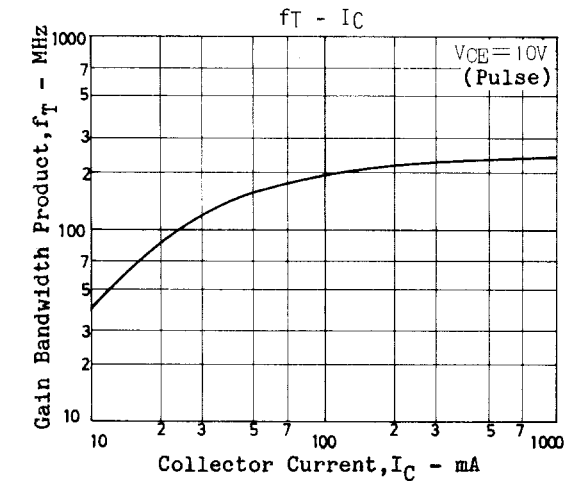
## Switching Time Test Circuit



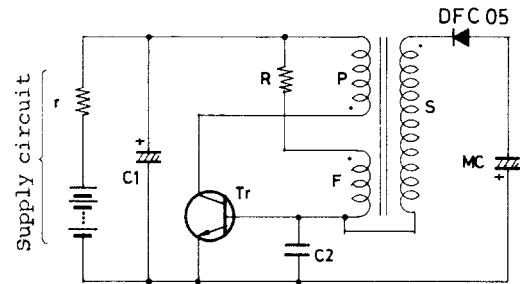
Unit (resistance :  $\Omega$ , capacitance : F)



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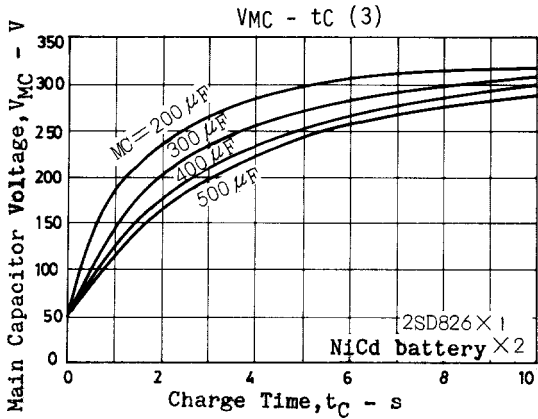
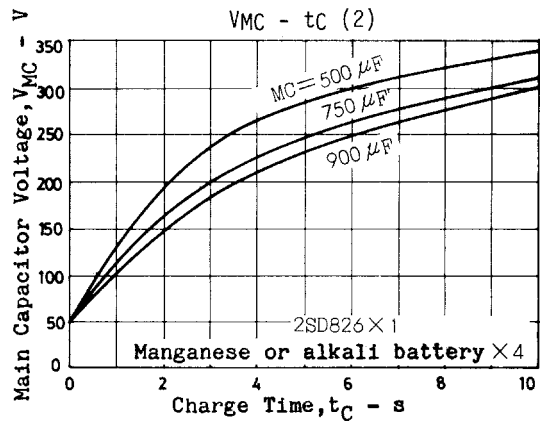
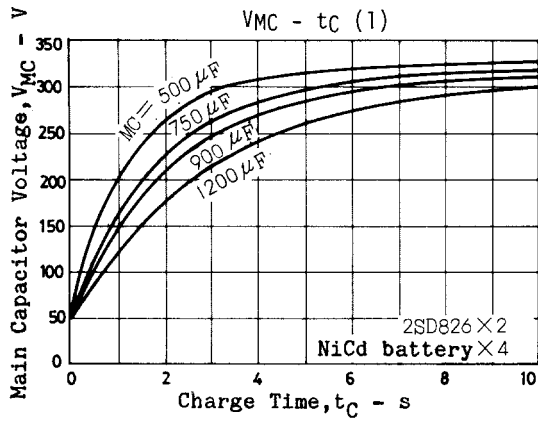


## Sample Application Circuit 1 : Electronic flash set

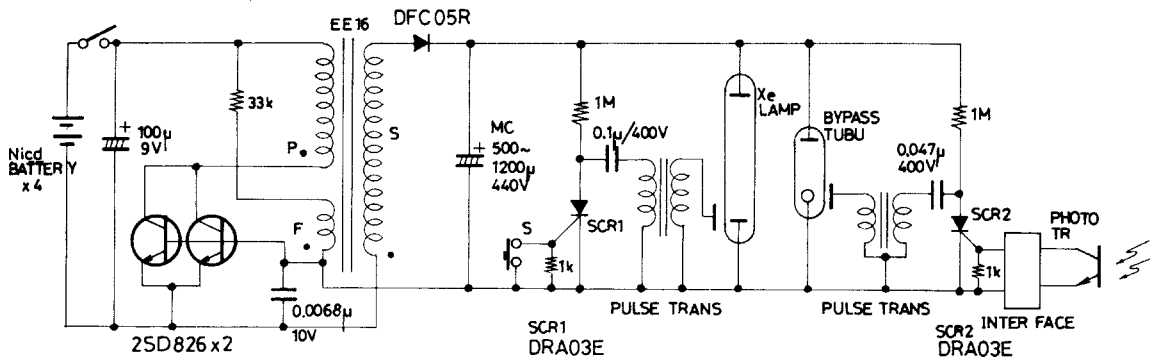


|                           | E[V] | r[Ω] | MC[μF]         | C1[μF] | R[kΩ] | C2[μF] | Tr             | P  | F  | S               | Core |
|---------------------------|------|------|----------------|--------|-------|--------|----------------|--|--|-----------------|------|
| NiCd<br>×2                | 2.7  | 0.15 | to 500         | 100    | 2.2   | 0.01   | 2SD826<br>FG   | 0.55ø×<br>10 <sup>3</sup> / <sub>4</sub> T | 0.23ø×<br>12 <sup>3</sup> / <sub>4</sub> T | 0.07ø×<br>1350T | EE13 |
| Alkali or<br>manganese ×4 | 6.0  | 1.2  | 500 to<br>900  | 100    | 4.7   | 0.015  | 2SD826<br>EFG  | 0.6ø×<br>22 <sup>3</sup> / <sub>4</sub> T  | 0.23ø×<br>20 <sup>3</sup> / <sub>4</sub> T | 0.08ø×<br>1390T | EE16 |
| NiCd<br>×4                | 5.4  | 0.3  | 500 to<br>1200 | 100    | 33    | 0.0068 | 2SD826<br>EF×2 | 0.6ø×<br>22 <sup>3</sup> / <sub>4</sub> T  | 0.23ø×<br>20 <sup>3</sup> / <sub>4</sub> T | 0.08ø×<br>1390T | EE16 |

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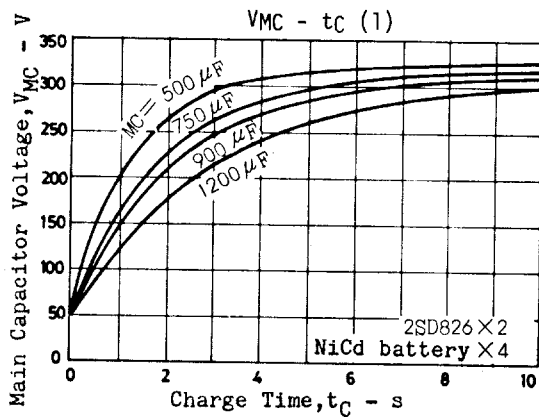
## Sample Application Circuit 2 : High-grade electronic flash set



### DC/DC CONVERTER TRANS

- P: 0.6  $\phi$  22 <sup>3</sup>/<sub>4</sub>T
- F: 0.23  $\phi$  20 <sup>3</sup>/<sub>4</sub>T
- S: 0.08  $\phi$  1390T
- CORE: EE16

Unit (resistance :  $\Omega$ , capacitance : F)



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