SILICON NPN TRIPLE DIFFUSED TYPE
(DARLINGTON POWER)

# 2SD683
# 2SD683A

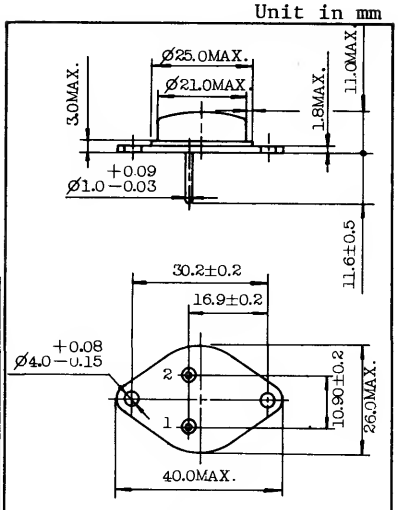
HIGH VOLTAGE AND HIGH POWER SWITCHING APPLICATIONS.
MOTOR DRIVE APPLICATIONS.

INDUSTRIAL APPLICATIONS

FEATURES :

- High DC Current Gain : $h_{FE}$=500(Min.)($V_{CE}$=5V, $I_C$=5A)
- High Voltage : $V_{CEO(SUS)}$=450V (2SD683A)
- Monolithic Construction With Built-In Base-Emitter Shunt Resistor.

Unit in mm




1. BASE
2. EMITTER
COLLECTOR (CASE)

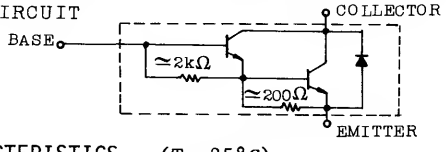
| | |
|---|---|
| JEDEC | TO − 3 |
| EIAJ | TC − 3, TB − 3 |
| TOSHIBA | 2 − 21A1A |

Mounting Kit No. AC73
Weight : 12.9g

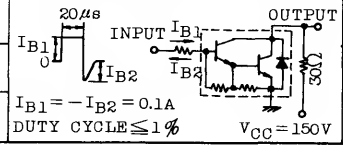
MAXIMUM RATINGS (Ta=25°C)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|---|---|---|---|
| Collector-Base Voltage | | $V_{CBO}$ | 600 | V |
| Collector-Emitter Voltage | 2SD683 | $V_{CEO}$ | 400 | V |
| | 2SD683A | | 450 | |
| Emitter-Base Voltage | | $V_{EBO}$ | 5 | V |
| Collector Current | | $I_C$ | 15 | A |
| Base Current | | $I_B$ | 2 | A |
| Collector Power Dissipation (Tc=25°C) | | $P_C$ | 150 | W |
| Junction Temperature | | Tj | 150 | °C |
| Storage Temperature Range | | $T_{stg}$ | -65∿150 | °C |

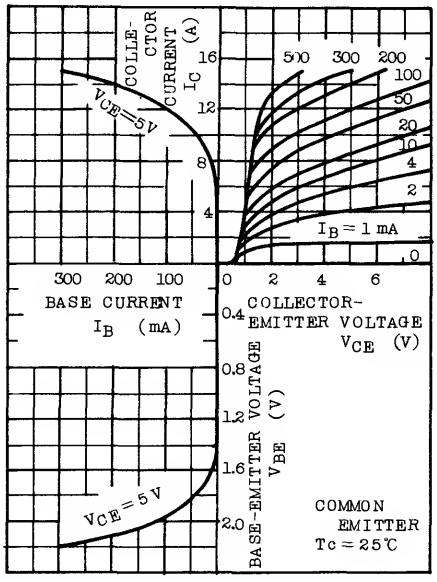
EQUIVALENT CIRCUIT



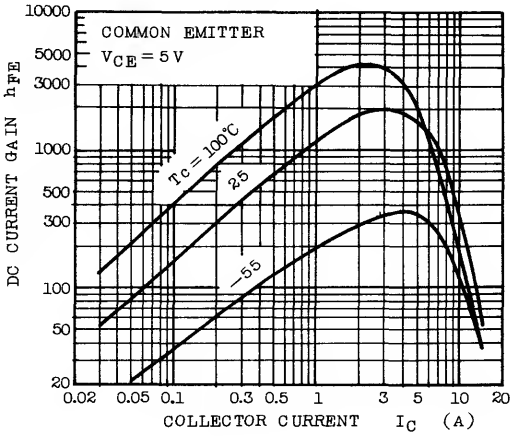

ELECTRICAL CHARACTERISTICS (Ta=25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Collector Cut-off Current | | $I_{CBO}$ | $V_{CB}$=600V, $I_E$=0 | - | - | 0.5 | mA |
| Emitter Cut-off Current | | $I_{EBO}$ | $V_{EB}$=5V, $I_C$=0 | - | - | 30 | mA |
| Collector-Emitter Sustaining Voltage | 2SD683 | $V_{CEO(SUS)}$ | $I_C$=5A, L=10mH | 400 | - | - | V |
| | 2SD683A | | | 450 | - | - | |
| DC Current Gain | | $h_{FE(1)}$ | $V_{CE}$=5V, $I_C$=5A | 500 | - | - | |
| | | $h_{FE(2)}$ | $V_{CE}$=5V, $I_C$=15A | 30 | - | - | |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | $I_C$=10A, $I_B$=0.2A | - | - | 2.0 | V |
| Base-Emitter Saturation Voltage | | $V_{BE(sat)}$ | $I_C$=10A, $I_B$=0.2A | - | - | 2.5 | V |
| Emitter-Collector Forward Voltage | | $V_{ECF}$ | $I_E$=10A, $I_B$=0 | - | - | 3.0 | V |
| Collector Output Capacitance | | $C_{ob}$ | $V_{CB}$=50V, $I_E$=0, f=1MHz | - | 100 | - | pF |
| Switching Time | Turn-on Time | $t_{on}$ |  | - | 0.4 | - | µs |
| | Storage Time | $t_{stg}$ | | - | 15 | - | |
| | Fall Time | $t_f$ | | - | 3 | - | |

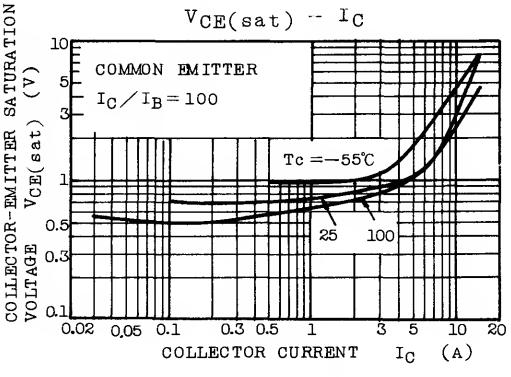
STATIC CHARACTERISTICS



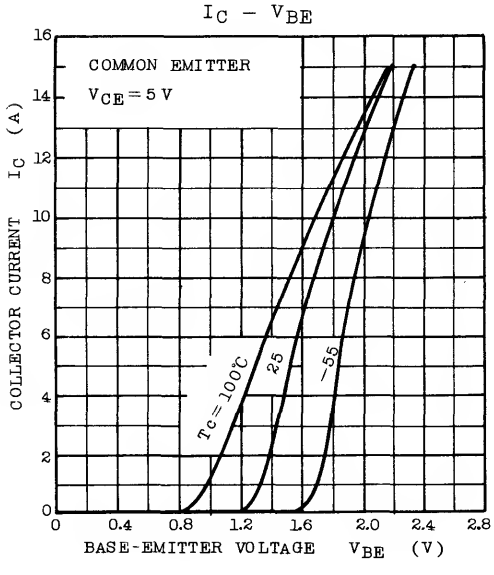

$h_{FE}$ – $I_C$



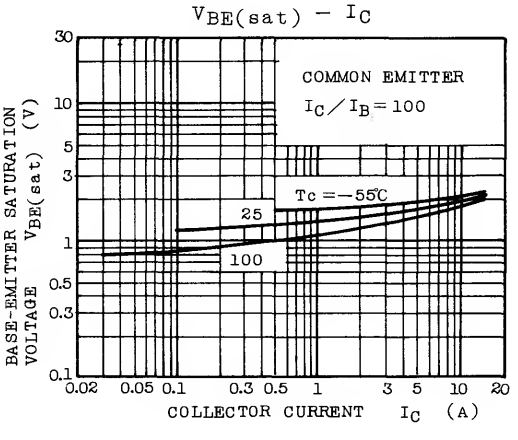

$V_{CE(sat)}$ – $I_C$



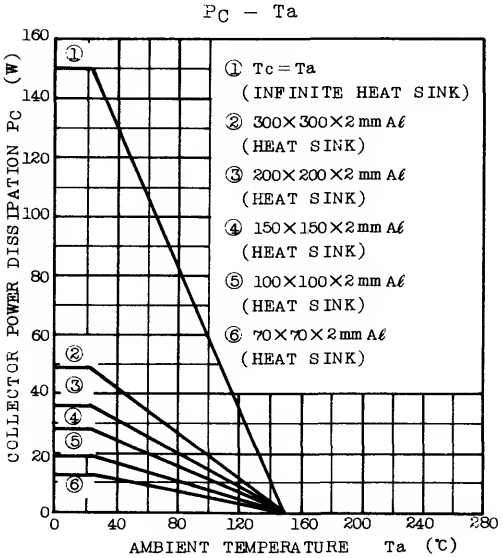

$I_C$ – $V_{BE}$




$V_{BE(sat)}$ – $I_C$



$P_C$ – Ta




SAFE OPERATING AREA