

isc Silicon NPN Darlington Power Transistor

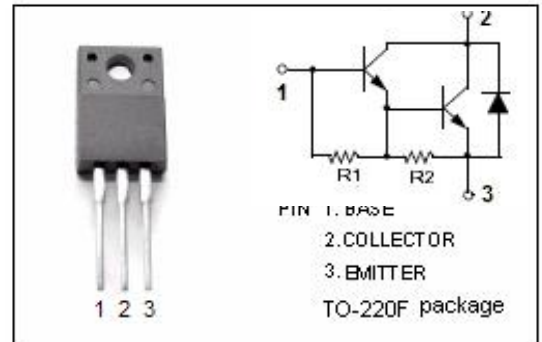
2SD1789

DESCRIPTION

- Collector-Emitter Sustaining Voltage-
: $V_{CEO(SUS)} = 200V$ (Min.)
- High Switching Speed
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

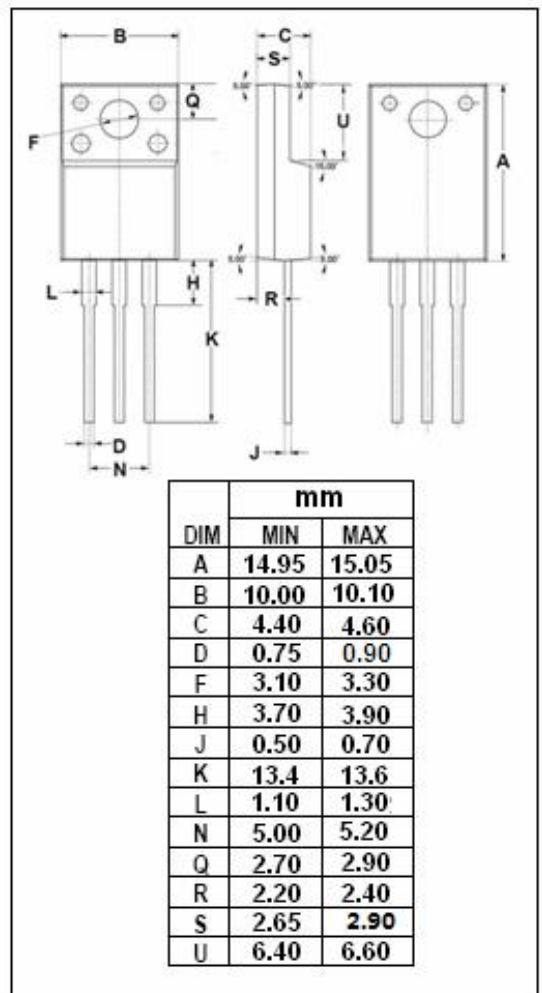
APPLICATIONS

- Designed for audio frequency power amplifier and low speed high current switching industrial use.



ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ C$)

| SYMBOL | PARAMETER | VALUE | UNIT |
|-----------|---|---------|------------|
| V_{CEO} | Collector-Emitter Voltage | 200 | V |
| V_{CBO} | Collector-Base Voltage | 200 | V |
| V_{EBO} | Emitter-Base Voltage | 7 | V |
| I_C | Collector Current-Continuous | 4 | A |
| I_{CM} | Collector Current-Peak | 6 | A |
| I_B | Base Current-Continuous | 0.3 | A |
| I_{BM} | Base Current-Peak | 0.5 | A |
| P_C | Collector Power Dissipation @ $T_c=25^\circ C$ | 25 | W |
| T_j | Junction Temperature | 150 | $^\circ C$ |
| T_{stg} | Storage Temperature Range | -55~150 | $^\circ C$ |



THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | MAX | UNIT |
|--------------|--------------------------------------|-----|--------------|
| $R_{th j-c}$ | Thermal Resistance, Junction to Case | 5.0 | $^\circ C/W$ |

isc Silicon NPN Darlington Power Transistor**2SD1789****ELECTRICAL CHARACTERISTICS** $T_C=25^{\circ}\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---------------|--------------------------------------|--|------|------|-------|------|
| $V_{CE(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C= 30\text{mA}; I_B= 0$ | 200 | | | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C= 1\text{A}; I_B= 2\text{mA}$ | | | 1.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C= 1\text{A}; I_B= 2\text{mA}$ | | | 2.0 | V |
| I_{CBO} | Collector Cutoff Current | $V_{CB}= 200\text{V}; I_E= 0$ | | | 0.1 | mA |
| I_{CEO} | Collector Cutoff Current | $V_{CE}= 200\text{V}; I_B= 0$ | | | 0.1 | mA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB}= 7\text{V}; I_C= 0$ | | | 5 | mA |
| h_{FE} | DC Current Gain | $I_C= 1\text{A}, V_{CE}= 3\text{V}$ | 1500 | | 30000 | |
| f_T | Current-Gain—Bandwidth Product | $I_C= 0.4\text{A}; V_{CE}= 10\text{V}$ | | 20 | | MHz |

Switching Times; Resistive Load

| | | | | | | |
|----------|--------------|--|--|--|----|---------------|
| t_{on} | Turn-On Time | $I_C= 1\text{A}; I_{B1}= -I_{B2}= 2\text{mA}$ $V_{BB2}= 4\text{V}; R_L= 25\ \Omega$ | | | 2 | μs |
| t_s | Storage Time | | | | 12 | μs |
| t_f | Fall Time | | | | 5 | μs |

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