Elektronische Bauelemente

# 2SD1760

**3A , 60V**

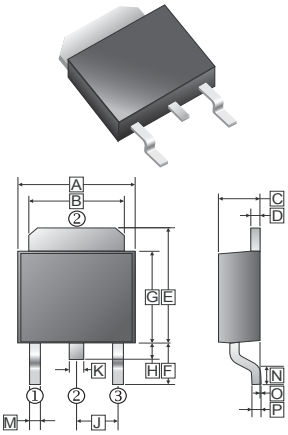
**NPN Epitaxial Planar Silicon Transistor**

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

## FEATURES

- Low $V_{CE(sat)}$. $V_{CE(sat)}$ = 0.5V(Typ.) ($I_C/I_B$ = 2A / 0.2A)
- Complements the 2SB1184

**D-Pack (TO-252)**



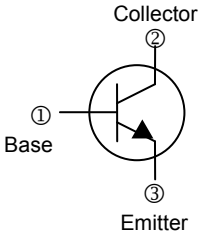

| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 6.4 | 6.8 | J | 2.30 REF. | |
| B | 5.20 | 5.50 | K | 0.70 | 0.90 |
| C | 2.20 | 2.40 | M | 0.50 | 1.1 |
| D | 0.45 | 0.58 | N | 0.9 | 1.6 |
| E | 6.8 | 7.3 | O | 0 | 0.15 |
| F | 2.40 | 3.0 | P | 0.43 | 0.58 |
| G | 5.40 | 6.2 | | | |
| H | 0.8 | 1.20 | | | |

## CLASSIFICATION OF $h_{FE}$

| Product-Rank | 2SD1760-P | 2SD1760-Q | 2SD1760-R |
|---|---|---|---|
| Range | 82~180 | 120~270 | 180~390 |

## PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---|---|---|
| TO-252 | 2.5K | 13' inch |




## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to Base Voltage | $V_{CBO}$ | 60 | V |
| Collector to Emitter Voltage | $V_{CEO}$ | 50 | V |
| Emitter to Base Voltage | $V_{EBO}$ | 5 | V |
| Collector Current -Continuous | $I_C$ | 3 | A |
| Collector Power Dissipation | $P_C$ | 1.5 | W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55 ~ 150 | ℃ |

## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | 60 | - | - | V | $I_C$=50μA, $I_E$=0 |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | 50 | - | - | V | $I_C$=1mA, $I_B$=0 |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | 5 | - | - | V | $I_E$=50μA, $I_C$=0 |
| Collector cut-off current | $I_{CBO}$ | - | - | 1 | μA | $V_{CB}$=40V, $I_E$=0 |
| Emitter cut-off current | $I_{EBO}$ | - | - | 1 | μA | $V_{EB}$=4V, $I_C$=0 |
| DC current gain | $h_{FE}$ | 82 | - | 390 | | $V_{CE}$=3V, $I_C$=500mA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | - | - | 1 | V | $I_C$=2A, $I_B$=200mA |
| Transition frequency | $f_T$ | - | 90 | - | MHz | $V_{CE}$=5V, $I_C$=500mA, f=30MHz |
| Collector Output Capacitance | $C_{OB}$ | - | 40 | - | pF | $V_{CB}$=10V, $I_E$=0, f=1MHz |

## CHARACTERISTIC CURVES

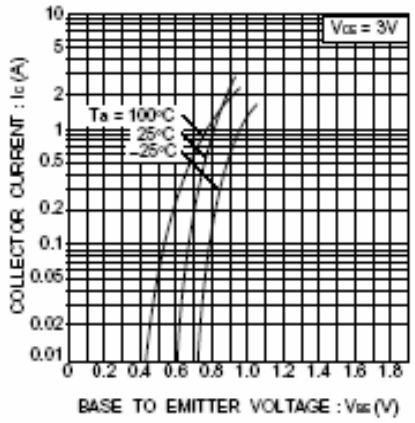



Fig.1 Grounded emitter propagation characteristics

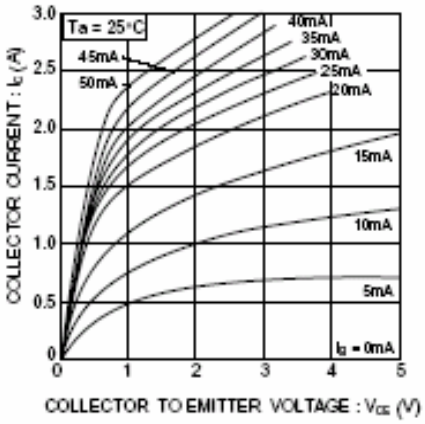



Fig.2 Grounded emitter output characteristics ( I )

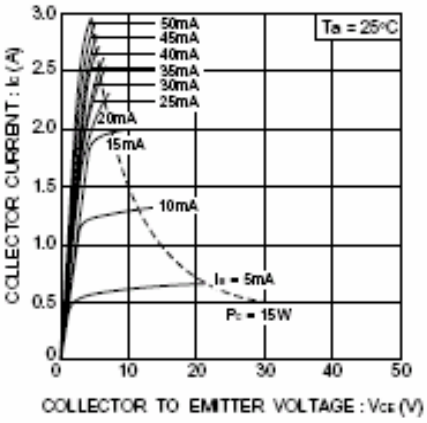



Fig.3 Grounded-emitter output characteristics( II )

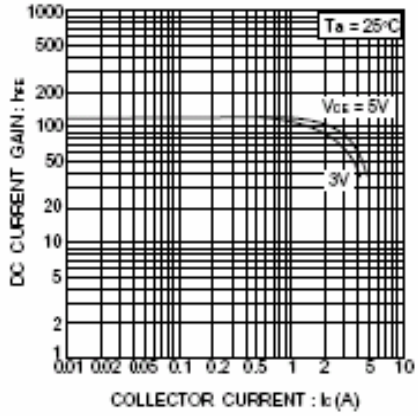



Fig.4 DC current gain vs. collector current( I )

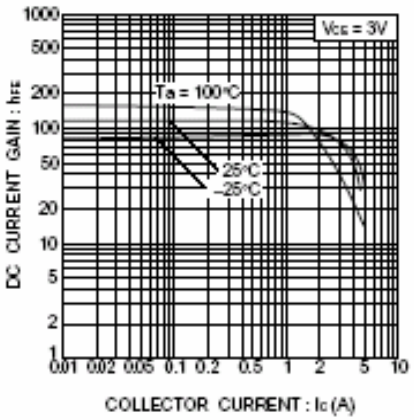



Fig.5 DC current gain vs. collector curren( II )

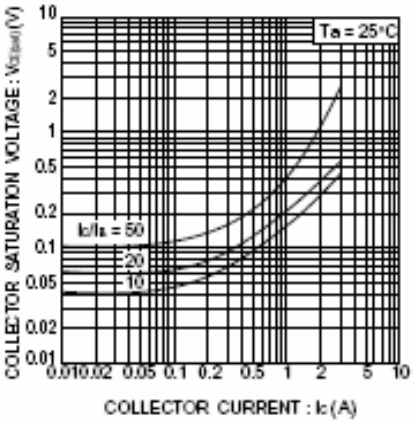



Fig.6 Collector-emitter saturation voltage vs. collector current

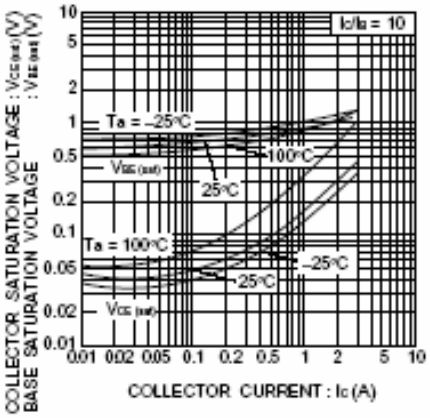



Fig.7 Collector-emitter saturation voltage vs. collector current Base-emitter saturation voltage vs. collector current

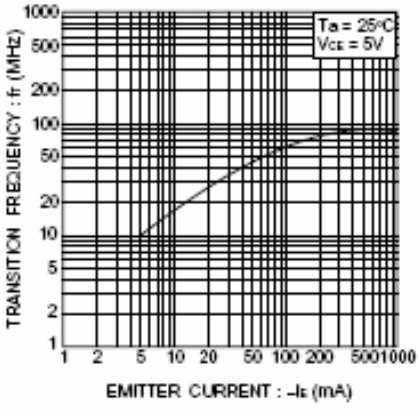



Fig.8 Gain bandwidth product vs. emitter current

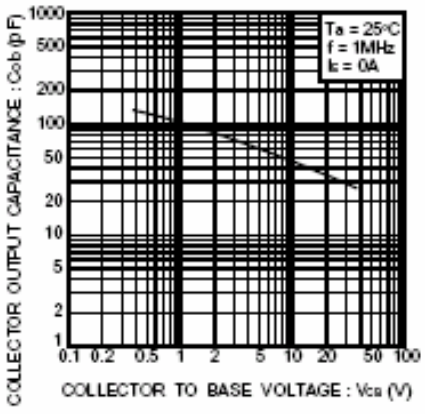



Fig.9 Collector output capacitance vs. collector-base voltage

## CHARACTERISTIC CURVES

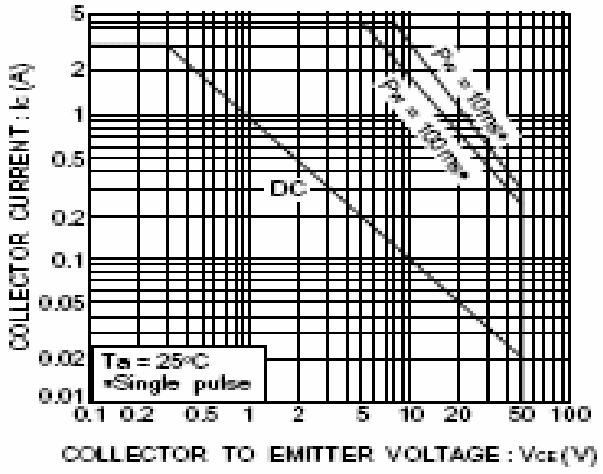



Fig.10 Safe operating area
(2SD1760)

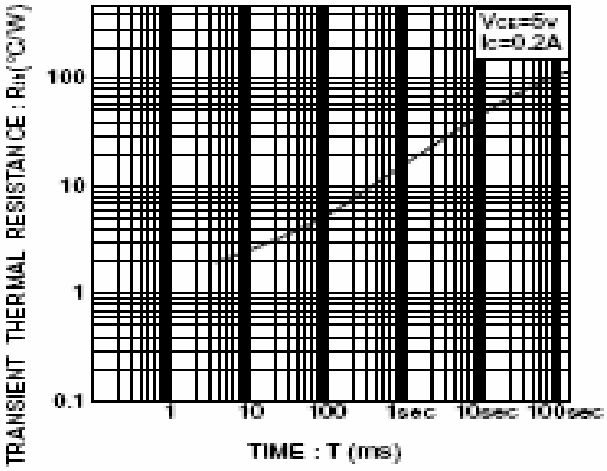



Fig.11 Transient thermal resistance
(2SD1760)