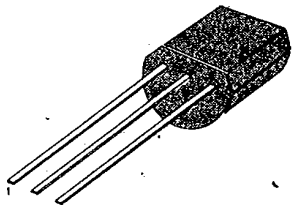
# MPSA10 NPN EPITAXIAL SILICON TRANSISTOR

T-29-21

## AMPLIFIER TRANSISTOR

- Collector-Emitter Voltage: $V_{CEO}$=40V
- Collector Dissipation: $P_C$ (max)=625mW

TO-92



1. Emitter 2. Base 3. Collector

## ABSOLUTE MAXIMUM RATINGS ($T_a$=25°C)

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 40 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 4 | V |
| Collector Current | $I_C$ | 100 | mA |
| Collector Dissipation | $P_C$ | 625 | mW |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature | Tstg | −55~150 | °C |

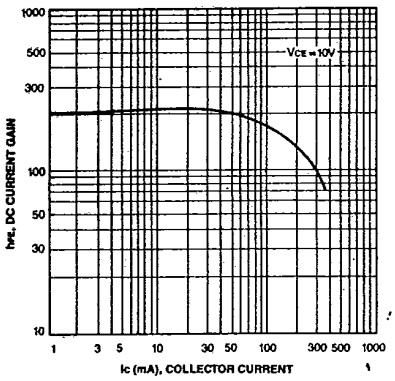
## ELECTRICAL CHARACTERISTICS ($T_a$=25°C)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $BV_{CEO}$ | $I_C$=1mA, $I_B$=0 | 40 | | | V |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | $I_E$=100μA, $I_C$=0 | 4 | | | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | | 100 | nA |
| DC Current Gain | $h_{FE}$ | $I_C$=5mA, $V_{CE}$=10V | 40 | | 400 | |
| Current Gain Bandwidth Product | $f_T$ | $I_C$=5mA, $V_{CE}$=10V f=100MHz | 125 | | | MHz |
| Output Capacitance | Cob | $V_{CB}$=10V, $I_E$=0 f=100KHz | | | 4 | pF |

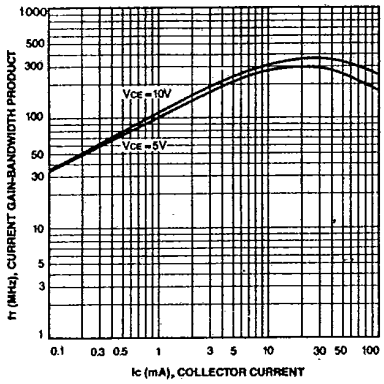
# MPSA10 PNP EPITAXIAL SILICON TRANSISTOR

T-29-21

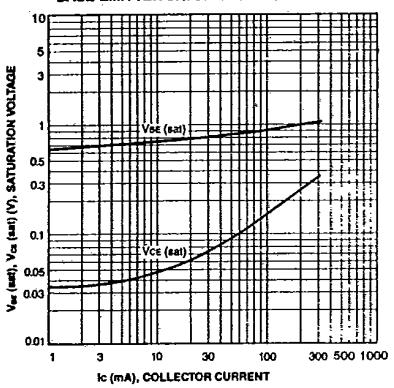
DC CURRENT GAIN



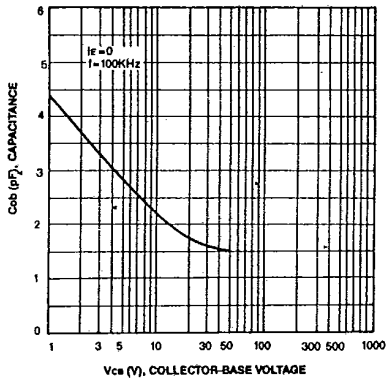

CURRENT GAIN-BANDWIDTH




COLLECTOR-EMITTER SATURATION VOLTAGE
BASE-EMITTER SATURATION VOLTAGE




OUTPUT CAPACITANCE

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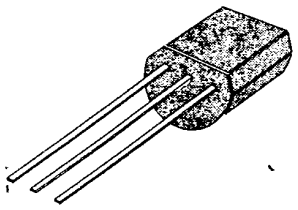
# MPSA12

# NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

## DARLINGTON TRANSISTOR

- **Collector-Emitter Voltage: $V_{CES}$=20V**
- **Collector Dissipation: $P_C$ (max)=625mW**

TO-92



1. Emitter 2. Base 3. Collector

## ABSOLUTE MAXIMUM RATINGS ($T_a$=25°C)

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CES}$ | 20 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 10 | V |
| Collector Dissipation | $P_C$ | 625 | mW |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature | Tstg | −55 ~ 150 | °C |

- Refer to 2N6427 for graphs

## ELECTRICAL CHARACTERISTICS ($T_a$=25°C)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $BV_{CES}$ | $I_C$=100μA, $I_B$=0 | 20 | | | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=15V, $I_E$=0 | | | 100 | nA |
| Collector Cut-off Current | $I_{CES}$ | $V_{CE}$=15V, $I_B$=0 | | | 100 | nA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{BE}$=10V, $I_C$=0 | | | 100 | nA |
| DC Current Gain | $h_{FE}$ | $I_C$=10mA, $V_{CE}$=5V | 20K | | | |
| Collector-Emitter Saturation Voltage | $V_{CE}$ (sat) | $I_C$=10mA, $I_B$=0.01mA | | | 1 | V |
| Base-Emitter On Voltage | $V_{BE}$ (on) | $I_C$=10mA, $V_{CE}$=5V | | | 1.4 | V |

# MPSA14

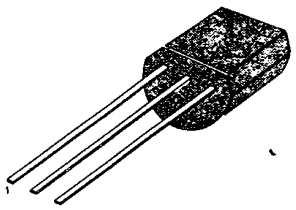
# NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

T-29-29

## DARLINGTON TRANSISTOR

- **Collector-Emitter Voltage: $V_{CES}$=30V**
- **Collector Dissipation: $P_C$ (max)=625mW**

TO-92



1. Emitter 2. Base 3. Collector

## ABSOLUTE MAXIMUM RATINGS

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 30 | V |
| Collector-Emitter Voltage | $V_{CES}$ | 30 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 10 | V |
| Collector Current | $I_C$ | 500 | mA |
| Collector Dissipation | $P_C$ | 625 | mW |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature | Tstg | −55~150 | °C |

* Refer to 2N6427 for graphs

## ELECTRICAL CHARACTERISTICS ($T_a$=25°C)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $BV_{CES}$ | $I_C$=100μA, $I_B$=0 | 30 | | | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | | 100 | nA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{BE}$=10V, $I_C$=0 | | | 100 | nA |
| *DC Current Gain | $h_{FE}$ | $I_C$=10mA, $V_{CE}$=5V | 10K | | | |
| | | $I_C$=100mA, $V_{CE}$=5V | 20K | | | |
| *Collector-Emitter Saturation Voltage | $V_{CE}$ (sat) | $I_C$=100mA, $I_B$=0.1mA | | | 1.5 | V |
| Current Gain Bandwidth Product | $f_T$ | $I_C$=10mA, $V_{CE}$=5V f=100MHz | 125 | | | MHz |
| *Base-Emitter On Voltage | $V_{BE}$ (on) | $I_C$=100mA, $V_{CE}$=5V | | | 2 | V |

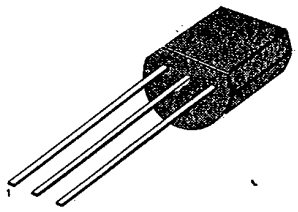
* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

# MPSA20 NPN EPITAXIAL SILICON TRANSISTOR

## AMPLIFIER TRANSISTOR

- **Collector-Emitter Voltage: $V_{CEO}$=40V**
- **Collector Dissipation: $P_C$ (max)=625mW**

TO-92



1. Emitter 2. Base 3. Collector

## ABSOLUTE MAXIMUM RATINGS ($T_a$=25°C)

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 40 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 4 | V |
| Collector Current | $I_C$ | 100 | mA |
| Collector Dissipation | $P_C$ | 625 | mW |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature | Tstg | −55~150 | °C |

- Refer to MPSA10 for graphs

## ELECTRICAL CHARACTERISTICS ($T_a$=25°C)

| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| *Collector-Emitter Breakdown Voltage | $BV_{CEO}$ | $I_C$=1mA, $I_B$=0 | 40 | | | V |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | $I_E$=100μA, $I_C$=0 | 4 | | | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | | 100 | nA |
| *DC Current Gain | $h_{FE}$ | $I_C$=5mA, $V_{CE}$=10V | 40 | | 400 | |
| •Current Gain Bandwidth Product | $f_T$ | $I_C$=5mA, $V_{CE}$=10V f=100MHz | 125 | | | MHz |
| Collector-Emitter Saturation Voltage | $V_{CE}$ (sat) | $I_C$=10mA, $I_B$=1mA | | | 0.25 | V |
| Output Capacitance | Cob | $V_{CB}$=10V, $I_E$=0 f=100KHz | | | 4 | pF |

* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

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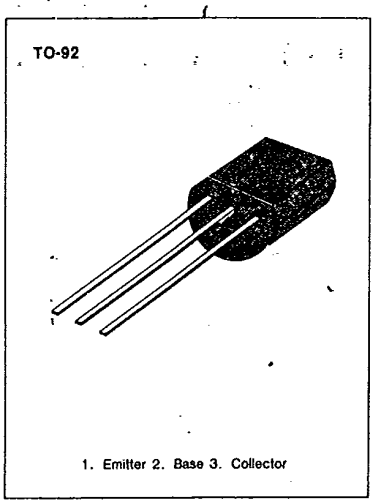
# MPSA25

# NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

## DARLINGTON TRANSISTOR

- Collector-Emitter Voltage: $V_{CES}$=40V
- Collector Dissipation: $P_C$ (max)=625mW




1. Emitter 2. Base 3. Collector

## ABSOLUTE MAXIMUM RATINGS ($T_a$=25°C)

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CES}$ | 40 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 10 | V |
| Collector Current | $I_C$ | 500 | mA |
| Collector Dissipation | $P_C$ | 625 | mW |
| Junction Temperature | Tj | 150 | °C |
| Storage Temperature | Tstg | −55~150 | °C |

## ELECTRICAL CHARACTERISTICS ($T_a$=25°C)

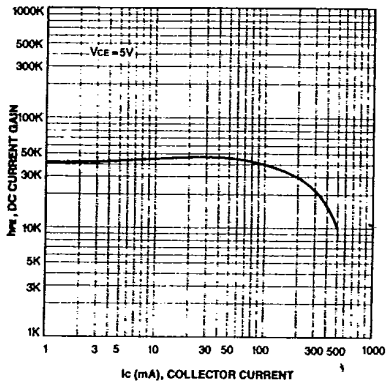
| Characteristic | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector-Emitter Breakdown Voltage | $BV_{CES}$ | $I_C$=100μA, $V_{BE}$=0 | 40 | | | V |
| Collector-Base Breakdown Voltage | $BV_{CBO}$ | $I_C$=100μA, $I_E$=0 | 40 | | | V |
| Collector Cut-off Current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | | 100 | nA |
| Emitter Cut-off Current | $I_{EBO}$ | $V_{BE}$=10V, $I_C$=0 | | | 100 | nA |
| Collector Cut-off Current | $I_{CES}$ | $V_{CE}$=30V, $V_{BE}$=0 | | | 500 | nA |
| *DC Current Gain | $h_{FE}$ | $I_C$=10mA, $V_{CE}$=5V | 10K | | | |
| | | $I_C$=100mA, $V_{CE}$=5V | 10K | | | |
| *Collector-Emitter Saturation Voltage | $V_{CE}$ (sat) | $I_C$=100mA, $I_B$=0.1mA | | | 1.5 | V |
| *Base-Emitter On Voltage | $V_{BE}$ (on) | $I_C$=100mA, $V_{CE}$=5V | | | 2 | V |

*Pulse Test: Width ≤300μs, Duty Cycle ≤2%

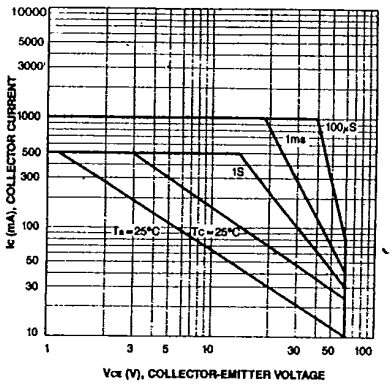
# MPSA25 NPN EPITAXIAL SILICON DARLINGTON TRANSISTOR

T-29-29

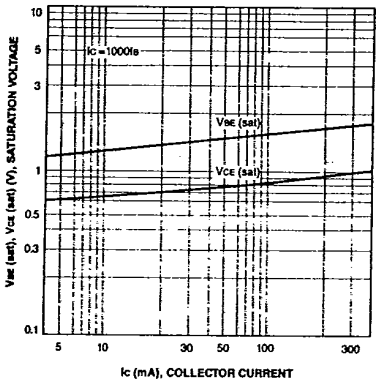
DC CURRENT GAIN



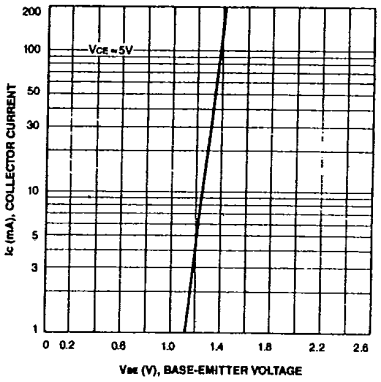

SAFE OPERATING AREA




BASE-EMITTER SATURATION VOLTAGE
COLLECTOR-EMITTER SATURATION VOLTAGE




BASE-EMITTER ON VOLTAGE

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