## COMPLEMENTARY POWER TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- SURFACE-MOUNTING TO-252 (DPAK) POWER PACKAGE IN TAPE \& REEL (SUFFIX "T4")
- ELECTRICALLY SIMILAR TO MJE2955T AND MJE3055T


## APPLICATIONS

- GENERAL PURPOSE SWITCHING AND AMPLIFIER


## DESCRIPTION

The MJD2955 and MJD3055 form complementary PNP-NPN pairs. They are manufactured using Epitaxial Base technology for cost-effective performance.


## INTERNAL SCHEMATIC DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter |  | Value | Unit |
| :---: | :---: | :---: | :---: | :---: |
|  |  | NPN | MJD3055 |  |
|  |  | PNP | MJD2955 |  |
| $\mathrm{V}_{\text {CBO }}$ | Collector-Base Voltage ( $\mathrm{I}_{\mathrm{E}}=0$ ) |  | 70 | V |
| $\mathrm{V}_{\text {CEO }}$ | Collector-Emitter Voltage ( $\mathrm{I}_{\mathrm{B}}=0$ ) |  | 60 | V |
| $\mathrm{V}_{\text {ebo }}$ | Emitter-Base Voltage ( $\mathrm{Ic}_{\mathrm{c}}=0$ ) |  | 5 | V |
| $\mathrm{I}_{\mathrm{C}}$ | Collector Current |  | 10 | A |
| $\mathrm{I}_{\mathrm{B}}$ | Base Current |  | 6 | A |
| $\mathrm{P}_{\text {tot }}$ | Total Dissipation at $\mathrm{T}_{\mathrm{c}}=25^{\circ} \mathrm{C}$ |  | 20 | W |
| $\mathrm{T}_{\text {stg }}$ | Storage Temperature |  | -65 to 150 | ${ }^{\circ} \mathrm{C}$ |
| $\mathrm{T}_{\mathrm{j}}$ | Max. Operating Junction Temperature |  | 150 | ${ }^{\circ} \mathrm{C}$ |

For PNP type voltage and current values are negative.

## THERMAL DATA

| $\mathrm{R}_{\text {thj-case }}$ | Therma | Resistance | Junction-case | Max | 6.25 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{R}_{\text {thj-amb }}$ | Therma | Resistance | Junction-ambient | Max | 100 | ${ }^{\circ} \mathrm{C} / \mathrm{W}$ |

ELECTRICAL CHARACTERISTICS ( $\mathrm{T}_{\text {case }}=25^{\circ} \mathrm{C}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions |  | Min. | Typ. | Max. | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $I_{\text {CEX }}$ | Collector Cut-off Current ( $\mathrm{V}_{\mathrm{BE}}=-1.5 \mathrm{~V}$ ) | $\begin{aligned} & \mathrm{V}_{\mathrm{CE}}=70 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CE}}=70 \mathrm{~V} \end{aligned}$ | $\mathrm{T}_{\mathrm{j}}=150{ }^{\circ} \mathrm{C}$ |  |  | $\begin{gathered} \hline 20 \\ 2 \end{gathered}$ | $\begin{aligned} & \mu \mathrm{A} \\ & \mathrm{~mA} \end{aligned}$ |
| $I_{\text {cbo }}$ | Collector Cut-off Current ( $\mathrm{I}_{\mathrm{E}}=0$ ) | $\begin{aligned} & \mathrm{V}_{\mathrm{CB}}=70 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CB}}=70 \mathrm{~V} \end{aligned}$ | $\mathrm{T}_{\mathrm{j}}=150{ }^{\circ} \mathrm{C}$ |  |  | $\begin{gathered} 20 \\ 2 \end{gathered}$ | $\begin{aligned} & \mu \mathrm{A} \\ & \mathrm{~mA} \end{aligned}$ |
| ICEO | Collector Cut-off Current ( $\mathrm{I}_{\mathrm{B}}=0$ ) | $\mathrm{V}_{\text {CE }}=30 \mathrm{~V}$ |  |  |  | 50 | $\mu \mathrm{A}$ |
| $\mathrm{I}_{\text {ebo }}$ | Emitter Cut-off Current $\left(\mathrm{I}_{\mathrm{C}}=0\right)$ | $\mathrm{V}_{\mathrm{EB}}=5 \mathrm{~V}$ |  |  |  | 0.5 | mA |
| $\mathrm{V}_{\text {CEO }}$ (sus)* | Collector-Emitter Sustaining Voltage $\left(\mathrm{I}_{\mathrm{B}}=0\right)$ | $\mathrm{IC}_{\mathrm{C}}=30 \mathrm{~mA}$ |  | 60 |  |  | V |
| $\mathrm{V}_{\mathrm{CE} \text { (sat)* }}$ | Collector-Emitter Saturation Voltage | $\begin{aligned} & \mathrm{IC}=4 \mathrm{~A} \\ & \mathrm{IC}=10 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & \mathrm{I}_{\mathrm{B}}=0.4 \mathrm{~A} \\ & \mathrm{I}_{\mathrm{B}}=3.3 \mathrm{~A} \end{aligned}$ |  |  | $\begin{gathered} \hline 1.1 \\ 8 \end{gathered}$ | $\begin{aligned} & \hline \mathrm{V} \\ & \mathrm{~V} \end{aligned}$ |
| $\mathrm{V}_{\mathrm{BE} \text { (on)* }}$ | Base-Emitter Voltage | $\mathrm{I}_{\mathrm{C}}=4 \mathrm{~A}$ | $\mathrm{V}_{\text {CE }}=4 \mathrm{~V}$ |  |  | 1.8 | V |
| $\mathrm{h}_{\text {FE* }}$ * | DC Current Gain | $\begin{aligned} & \mathrm{I}=4 \mathrm{~A} \\ & \mathrm{IC}=10 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & \mathrm{V}_{\mathrm{CE}}=4 \mathrm{~V} \\ & \mathrm{~V}_{\mathrm{CE}}=4 \mathrm{~V} \end{aligned}$ | $\begin{gathered} 20 \\ 5 \end{gathered}$ |  | 100 |  |
| $\mathrm{f}_{T}$ | Transition Frequency | $\mathrm{I}_{\mathrm{C}}=0.5 \mathrm{~A}$ | $\mathrm{V}_{\text {CE }}=10 \mathrm{~V} \mathrm{f}=500 \mathrm{KHz}$ | 2 |  |  | MHz |

* Pulsed: Pulse duration $=300 \mu \mathrm{~s}$, duty cycle $1.5 \%$ For PNP type voltage and current values are negative.


Derating Curves


DC Current Gain (NPN type)


DC Transconductance (NPN type)


Collector-Emitter Saturation Voltage (NPN type)


DC Current Gain (PNP type)


DC Transconductance (PNP type)


Collector-Emitter Saturation Voltage (PNP type)

Base-Emitter Saturation Voltage (NPN type)


Transition Frequency (NPN type)


Base-Emitter Saturation Voltage (PNP type)


Transition Frequency (PNP type)


## TO-252 (DPAK) MECHANICAL DATA

| DIM. | mm |  |  | inch |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 2.20 |  | 2.40 | 0.087 |  | 0.094 |
| A1 | 0.90 |  | 1.10 | 0.035 |  | 0.043 |
| A2 | 0.03 |  | 0.23 | 0.001 |  | 0.009 |
| B | 0.64 |  | 0.90 | 0.025 |  | 0.035 |
| B2 | 5.20 |  | 5.40 | 0.204 |  | 0.213 |
| C | 0.45 |  | 0.60 | 0.018 |  | 0.024 |
| C2 | 0.48 |  | 0.60 | 0.019 |  | 0.024 |
| D | 6.00 |  | 6.20 | 0.236 |  | 0.244 |
| E | 6.40 |  | 6.60 | 0.252 |  | 0.260 |
| G | 4.40 |  | 4.60 | 0.173 |  | 0.181 |
| H | 9.35 |  | 10.10 | 0.368 |  | 0.398 |
| L2 |  |  |  |  | 0.031 |  |
| L4 | 0.60 |  | 1.00 | 0.024 |  | 0.039 |
| V2 | $0^{\circ}$ |  | $8^{\circ}$ | $0^{\circ}$ |  | $0^{\circ}$ |



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