TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED MESA TYPE

## 2SC5411

## HORIZONTAL DEFLECTION OUTPUT FOR HIGH RESOLUTION

DISPLAY, COLOR TV
HIGH SPEED SWITCHING APPLICATIONS

- High Voltage
- Low Saturation Voltage $: \mathrm{V}_{\mathrm{CBO}}=1500 \mathrm{~V}$
- High Speed
$: \mathrm{VCE}_{\text {(sat) }}=3 \mathrm{~V}$ (Max.)
- Collector Metal (Fin) is Fully Covered with Mold Resin.


## MAXIMUM RATINGS (Tc = $\mathbf{2 5}^{\circ} \mathrm{C}$ )

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
| :--- | :---: | :---: | :---: |
| Collector-Base Voltage | $\mathrm{V}_{\mathrm{CBO}}$ | 1500 | V |
| Collector-Emitter Voltage | $\mathrm{V}_{\text {CEO }}$ | 600 | V |
| Emitter-Base Voltage | $\mathrm{V}_{\text {EBO }}$ | 5 | V |
| Collector Current | DC | $\mathrm{I}_{\mathrm{C}}$ | 14 |
|  |  |  |  |
|  | Pulse | $\mathrm{I}_{\mathrm{CP}}$ | 28 |
| Base Current | $\mathrm{I}_{\mathrm{B}}$ | 7 | A |
| Collector Power Dissipation | $\mathrm{P}_{\mathrm{C}}$ | 60 | W |
| Junction Temperature | $\mathrm{T}_{\mathrm{j}}$ | 150 | ${ }^{\circ} \mathrm{C}$ |
| Storage Temperature Range | $\mathrm{T}_{\text {stg }}$ | $-55 \sim 150$ | ${ }^{\circ} \mathrm{C}$ |

Unit: mm


Weight: 5.5 g (typ.)

ELECTRICAL CHARACTERISTICS (Tc = $\mathbf{2 5}^{\circ} \mathrm{C}$ )

| CHARACTERISTIC |  | SYMBOL | TEST CONDITION | MIN | TYP. | MAX | UNIT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Collector Cut-off Current |  | ICBO | $\mathrm{V}_{\mathrm{CB}}=1500 \mathrm{~V}, \mathrm{I}_{\mathrm{E}}=0$ | - | - | 1 | mA |
| Emitter Cut-off Current |  | IEBO | $\mathrm{V}_{\text {Eb }}=5 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=0$ | - | - | 10 | $\mu \mathrm{A}$ |
| Emitter-Base Breakdown Voltage |  | $V$ (BR) CEO | $\mathrm{I}_{\mathrm{C}}=10 \mathrm{~mA}, \mathrm{I}_{\mathrm{B}}=0$ | 600 | - | - | V |
| DC Current Gain |  | $\mathrm{h}_{\text {FE (1) }}$ | $\mathrm{V}_{\mathrm{CE}}=5 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=2 \mathrm{~A}$ | 10 | - | 40 |  |
|  |  | $\mathrm{h}_{\text {FE ( }}$ (2) | $\mathrm{V}_{\mathrm{CE}}=5 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=11 \mathrm{~A}$ | 4 | - | 8 |  |
| Collector-Emitter Saturation Voltage |  | $\mathrm{V}_{\text {CE }}$ (sat) | $\mathrm{I}_{\mathrm{C}}=11 \mathrm{~A}, \mathrm{I}_{\mathrm{B}}=2.75 \mathrm{~A}$ | - | - | 3 | V |
| Base-Emitter Saturation Voltage |  | $\mathrm{V}_{\text {BE (sat) }}$ | $\mathrm{I}_{\mathrm{C}}=11 \mathrm{~A}, \mathrm{I}_{\mathrm{B}}=2.75 \mathrm{~A}$ | - | 1.0 | 1.5 | V |
| Transition Frequency |  | $\mathrm{f}_{\mathrm{T}}$ | $\mathrm{V}_{\mathrm{CE}}=10 \mathrm{~V}, \mathrm{I}_{\mathrm{C}}=0.1 \mathrm{~A}$ | - | 2 | - | MHz |
| Collector Output Capacitance |  | $\mathrm{C}_{\text {ob }}$ | $\mathrm{V}_{\mathrm{CB}}=10 \mathrm{~V}, \mathrm{I}_{\mathrm{E}}=0, \mathrm{f}=1 \mathrm{MHz}$ | - | 190 | - | pF |
| Switching Time | Storage Time | $\mathrm{t}_{\text {stg }}$ | $\begin{aligned} & \mathrm{I}_{\mathrm{CP}}=8.5 \mathrm{~A}, \mathrm{I}_{\mathrm{B} 1}(\mathrm{end})=1.6 \mathrm{~A} \\ & \mathrm{f}_{\mathrm{H}}=64 \mathrm{kHz} \end{aligned}$ | - | 2.5 | 3.5 | $\mu \mathrm{s}$ |
|  | Fall Time | $\mathrm{t}_{\mathrm{f}}$ |  | - | 0.15 | 0.3 |  |












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