- Rugged Triple-Diffused Planar Construction
- 9 A Continuous Collector Current
- 1000 Volt Blocking Capability

**absolute maximum ratings at 25°C case temperature (unless otherwise noted)**

<table>
<thead>
<tr>
<th>RATING</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector-emitter voltage ($V_{BE} = -2.5$ V)</td>
<td>$V_{CEX}$</td>
<td>850</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000</td>
<td>V</td>
</tr>
<tr>
<td>Collector-emitter voltage ($R_{BE} = 10$ Ω)</td>
<td>$V_{CER}$</td>
<td>850</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000</td>
<td>V</td>
</tr>
<tr>
<td>Collector-emitter voltage ($I_B = 0$)</td>
<td>$V_{CEO}$</td>
<td>400</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>450</td>
<td>V</td>
</tr>
<tr>
<td>Continuous collector current</td>
<td>$I_C$</td>
<td>9</td>
<td>A</td>
</tr>
<tr>
<td>Peak collector current (see Note 1)</td>
<td>$I_{CM}$</td>
<td>15</td>
<td>A</td>
</tr>
<tr>
<td>Continuous base current</td>
<td>$I_B$</td>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td>Peak base current</td>
<td>$I_{BM}$</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>Continuous device dissipation at (or below) 25°C case temperature</td>
<td>$P_{Dsat}$</td>
<td>120</td>
<td>W</td>
</tr>
<tr>
<td>Operating junction temperature range</td>
<td>$T_J$</td>
<td>-65 to +150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>$T_{stg}$</td>
<td>-65 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

**NOTE 1:** This value applies for $t_p \leq 5$ ms, duty cycle $\leq 2\%$. 
electrical characteristics at 25°C case temperature (unless otherwise noted)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{CEO(sus)} )</td>
<td>Collector-emitter sustaining voltage</td>
<td>( I_C = 200 \text{ mA} ) ( L = 25 \text{ mH} ) (see Note 2)</td>
<td>400</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>( V_{BR(EBO)} )</td>
<td>Base-emitter breakdown voltage</td>
<td>( I_E = 50 \text{ mA} ) ( I_C = 0 ) (see Note 3)</td>
<td>7</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>( I_{CES} )</td>
<td>Collector-emitter cut-off current</td>
<td>( V_{CE} = 850 \text{ V} ) ( V_{BE} = 0 )</td>
<td>BUV47</td>
<td></td>
<td>0.15</td>
</tr>
<tr>
<td>( I_{CER} )</td>
<td>Collector-emitter cut-off current</td>
<td>( V_{CE} = 850 \text{ V} ) ( R_{BE} = 10 \Omega )</td>
<td>BUV47</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>( I_{EBO} )</td>
<td>Emitter cut-off current</td>
<td>( V_{EB} = 5 \text{ V} ) ( I_C = 0 )</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>( V_{CE(sat)} )</td>
<td>Collector-emitter saturation voltage</td>
<td>( I_B = 1 \text{ A} ) ( I_C = 5 \text{ A} ) (see Notes 3 and 4)</td>
<td>1.5</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>( V_{BE(sat)} )</td>
<td>Base-emitter saturation voltage</td>
<td>( I_B = 1 \text{ A} ) ( I_C = 5 \text{ A} ) (see Notes 3 and 4)</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( f_t )</td>
<td>Current gain bandwidth product</td>
<td>( V_{CE} = 10 \text{ V} ) ( I_C = 0.5 \text{ A} ) ( f = 1 \text{ MHz} )</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( C_{Ob} )</td>
<td>Output capacitance</td>
<td>( V_{CB} = 20 \text{ V} ) ( I_C = 0 ) ( f = 0.1 \text{ MHz} )</td>
<td>105</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

thermal characteristics

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_{JIC} )</td>
<td>Junction to case thermal resistance</td>
<td></td>
<td>1</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

resistive-load-switching characteristics at 25°C case temperature

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS †</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t_{on} )</td>
<td>Turn on time</td>
<td>( I_C = 5 \text{ A} ) ( I_{B(on)} = 1 \text{ A} ) ( I_{B(off)} = -1 \text{ A} )</td>
<td>1.0</td>
<td></td>
<td>3.0</td>
</tr>
<tr>
<td>( t_s )</td>
<td>Storage time</td>
<td>( V_{CC} = 150 \text{ V} ) (see Figures 1 and 2)</td>
<td></td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>( t_f )</td>
<td>Fall time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† Voltage and current values shown are nominal; exact values vary slightly with transistor parameters.

inductive-load-switching characteristics at 25°C case temperature (unless otherwise noted)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS †</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t_{sv} )</td>
<td>Voltage storage time</td>
<td>( I_C = 5 \text{ A} ) ( I_{B(on)} = 1 \text{ A} ) ( V_{BE(off)} = -5 \text{ V} )</td>
<td>4.0</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>( t_{if} )</td>
<td>Current fall time</td>
<td>( T_C = 100\text{°C} ) (see Figures 3 and 4)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PARAMETER MEASUREMENT INFORMATION

Figure 1. Resistive-Load Switching Test Circuit

- $t_p = 20 \mu\text{s}$
- Duty cycle = 1%
- $V_1 = 15 \text{ V}$, Source Impedance = $50 \Omega$

$V_{cc} = 250 \text{ V}$

BD135

$100 \Omega$

680 $\mu\text{F}$

BD136

47 $\Omega$

15 $\Omega$

82 $\Omega$

100 $\mu\text{F}$

Figure 2. Resistive-Load Switching Waveforms

- $I_C$
- $I_B$
- $dI_B/dt \geq 2 \text{ A/\mu s}$
- $I_{B(on)}$
- $I_{B(off)}$

A - B = $t_d$
B - C = $t_r$
E - F = $t_f$
D - E = $t_s$
A - C = $t_{on}$
D - F = $t_{off}$

$A - C = t_{on}$
$D - F = t_{off}$

$A - B = t_d$
$B - C = t_r$
$E - F = t_f$
$D - E = t_s$
$A - C = t_{on}$
$D - F = t_{off}$
**PARAMETER MEASUREMENT INFORMATION**

Adjust $p_w$ to obtain $I_C$

For $I_C < 6 \, A$  $V_{CC} = 50 \, V$
For $I_C \geq 6 \, A$  $V_{CC} = 100 \, V$

**Figure 3. Inductive-Load Switching Test Circuit**

- $V_{Gen}$
- $68 \, \Omega$
- $0.02 \, \mu F$
- $270 \, \Omega$
- $1 \, k \, \Omega$
- $33 \, \Omega$
- $1 \, p F$
- $+5V$
- $V_{BE}(off)$
- $1 \, k \, \Omega$
- $2N2222$
- $2N2904$
- $D45H11$
- $D44H11$
- $TUT$
- $100 \, \Omega$
- $5X \, BY205-400$
- $V_{clamp} = 400 \, V$
- $5X \, BY205-400$
- $V_{cc}$

**Figure 4. Inductive-Load Switching Waveforms**

- $I_{B(on)}$
- $I_B$
- $V_{CE}$
- $I_C(on)$

**NOTES:**
A. Waveforms are monitored on an oscilloscope with the following characteristics: $t_r < 15 \, ns$, $R_{in} > 10 \, \Omega$, $C_{in} < 11.5 \, pF$.
B. Resistors must be noninductive types.
BUV47, BUV47A
NPN SILICON POWER TRANSISTORS

AUGUST 1978 - REVISED MARCH 1997

TYPICAL CHARACTERISTICS

TYPICAL DC CURRENT GAIN
vs COLLECTOR CURRENT

Figure 5.

Collector Current - A

0·1 1·0 10

h

FE

Typical DC Current Gain

1·0

10

TCP762AA

Figure 6.

Collector-Emitter Saturation Voltage - V

0·1 1·0 2·0 3·0 4·0 5·0

TCP762AB

Collector-Emitter Saturation Voltage vs Base Current

h

BC

Typical Collector-Emitter Saturation Voltage

0·1

0·2

0·3

0·4

0·5

TCP762AK

COLLECTOR-EMITTER SATURATION VOLTAGE
vs BASE CURRENT

Figure 7.

Collector-Emitter Saturation Voltage - V

0·001 0·01 0·1 1·0 10

TCP762AC

Collector Cut-Off Current vs Case Temperature

Collector Cut-off Current - µA

0·001 0·01 0·1 1·0 10

Figure 8.

Case Temperature - °C

-80 -60 -40 -20 0 20 40 60 80 100 120 140

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PRODuct INFORMATION
MAXIMUM SAFE OPERATING REGIONS

Figure 9.

THERMAL INFORMATION

THERMAL RESPONSE JUNCTION TO CASE
VS
POWER PULSE DURATION

Figure 10.
**MECHANICAL DATA**

**SOT-93**

*3-pin plastic flange-mount package*

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.

**NOTE A:** The centre pin is in electrical contact with the mounting tab.

---

**SOT-93**

![SOT-93 Diagram](image)

ALL LINEAR DIMENSIONS IN MILLIMETERS

**MDXXAW**
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