

## COMPLEMENTARY SILICON PLASTIC POWER TRANSISTORS

... designed for use in general purpose power amplifier and switching applications.

### FEATURES:

\* Collector-Emitter Sustaining Voltage -

$V_{CEO(sus)}$  = 45V(Min)- BD905, BD906  
 60V(Min)- BD907, BD908  
 80V(Min)- BD909, BD910  
 100V(Min)- BD911, BD912

\* DC Current Gain  $hFE = 40(\text{Min}) @ I_C = 0.5A$

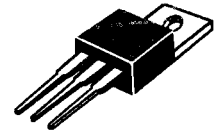
\* Current Gain-Bandwidth Product  $fT = 3.0 \text{ MHz} (\text{Min}) @ I_C = 500mA$

| NPN   | PNP   |
|-------|-------|
| BD905 | BD906 |
| BD907 | BD908 |
| BD909 | BD910 |
| BD911 | BD912 |

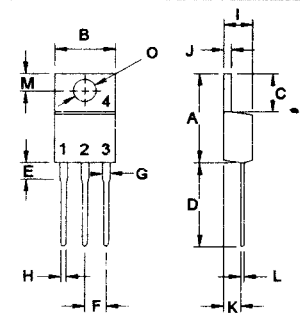
15 AMPERE  
 COMPLEMENTARY SILICON  
 POWER TRANSISTORS  
 45 -100 VOLTS  
 90 WATTS

### MAXIMUM RATINGS

| Characteristic  | Symbol         | BD905<br>BD906 | BD907<br>BD908 | BD909<br>BD910 | BD911<br>BD912 | Unit               |
|---|----------------|----------------|----------------|----------------|----------------|--------------------|
| Collector-Emitter Voltage   | $V_{CEO}$      | 45             | 60             | 80             | 100            | V                  |
| Collector-Base Voltage  | $V_{CBO}$      | 45             | 60             | 80             | 100            | V                  |
| Emitter-Base Voltage  | $V_{EBO}$      | 5.0            |                |                |                | V                  |
| Collector Current - Continuous<br>- Peak                                  | $I_C$          | 15<br>20       |                |                |                | A                  |
| Base Current  | $I_B$          | 5.0            |                |                |                | A                  |
| Total Power Dissipation @ $T_C = 25^\circ C$<br>Derate above $25^\circ C$ | $P_D$          | 90<br>0.72     |                |                |                | W<br>W/ $^\circ C$ |
| Operating and Storage Junction<br>Temperature Range                       | $T_J, T_{STG}$ | -65 to +150    |                |                |                | $^\circ C$         |



TO-220



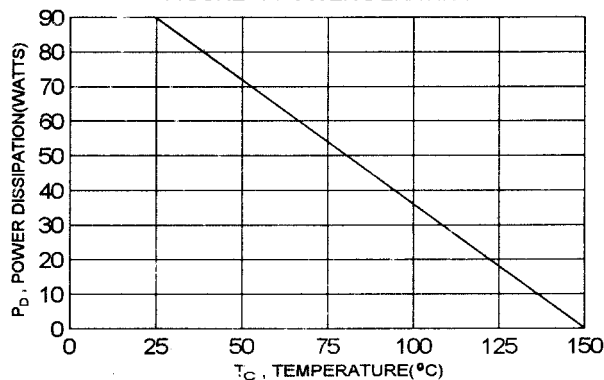
PIN 1.BASE  
 2.COLLECTOR  
 3.EMITTER  
 4.COLLECTOR(CASE)

### THERMAL CHARACTERISTICS

| Characteristic                      | Symbol          | Max  | Unit         |
|-------------------------------------|-----------------|------|--------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 1.38 | $^\circ C/W$ |

| DIM | MILLIMETERS |       |
|-----|-------------|-------|
|     | MIN         | MAX   |
| A   | 14.68       | 15.31 |
| B   | 9.78        | 10.42 |
| C   | 5.01        | 6.52  |
| D   | 13.06       | 14.62 |
| E   | 3.57        | 4.07  |
| F   | 2.42        | 3.66  |
| G   | 1.12        | 1.36  |
| H   | 0.72        | 0.96  |
| I   | 4.22        | 4.98  |
| J   | 1.14        | 1.38  |
| K   | 2.20        | 2.97  |
| L   | 0.33        | 0.55  |
| M   | 2.48        | 2.98  |
| O   | 3.70        | 3.90  |

FIGURE -1 POWER DERATING



**BD905, BD907, BD909, BD911 NPN / BD906, BD908, BD810, BD912 PNP**

**ELECTRICAL CHARACTERISTICS (  $T_c = 25^\circ\text{C}$  unless otherwise noted )**

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

**OFF CHARACTERISTICS**

|   |  |                |                          |    |
|---|--|----------------|--------------------------|----|
| Collector-Emitter Sustaining Voltage(1)<br>( $I_C = 50\text{ mA}$ , $I_B = 0$ )   | BD905, BD906<br>BD907, BD908<br>BD909, BD910<br>BD911, BD912 | $V_{CEO(sus)}$ | 45<br>60<br>80<br>100    | V  |
| Collector Cutoff Current<br>( $V_{CE} = 30\text{ V}$ , $I_B = 0$ )<br>( $V_{CE} = 30\text{ V}$ , $I_B = 0$ )<br>( $V_{CE} = 40\text{ V}$ , $I_B = 0$ )<br>( $V_{CE} = 50\text{ V}$ , $I_B = 0$ )  | BD905, BD906<br>BD907, BD908<br>BD909, BD910<br>BD911, BD912 | $I_{CEO}$      | 1.0<br>1.0<br>1.0<br>1.0 | mA |
| Collector Cutoff Current<br>( $V_{CB} = 45\text{ V}$ , $I_E = 0$ )<br>( $V_{CB} = 60\text{ V}$ , $I_E = 0$ )<br>( $V_{CB} = 80\text{ V}$ , $I_E = 0$ )<br>( $V_{CB} = 100\text{ V}$ , $I_E = 0$ ) | BD905, BD906<br>BD907, BD908<br>BD909, BD910<br>BD911, BD912 | $I_{CBO}$      | 0.5<br>0.5<br>0.5<br>0.5 | mA |
| Emitter Cutoff Current<br>( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )   |  | $I_{EBO}$      | 1.0                      | mA |

**ON CHARACTERISTICS (1)**

|  |               |                 |            |   |
|--|---------------|-----------------|------------|---|
| DC Current Gain<br>( $I_C = 0.5\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )<br>( $I_C = 5.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )<br>( $I_C = 10\text{ A}$ , $V_{CE} = 4.0\text{ V}$ ) | $h_{FE}$      | 40<br>15<br>5.0 | 250<br>150 |   |
| Collector-Emitter Saturation Voltage<br>( $I_C = 5.0\text{ A}$ , $I_B = 0.5\text{ A}$ )<br>( $I_C = 10\text{ A}$ , $I_B = 2.5\text{ A}$ )  | $V_{CE(sat)}$ |                 | 1.0<br>3.0 | V |
| Base-Emitter Saturation Voltage<br>( $I_C = 10\text{ A}$ , $I_B = 2.5\text{ A}$ )  | $V_{BE(sat)}$ |                 | 2.5        | V |
| Base-Emitter On Voltage<br>( $I_C = 5.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )  | $V_{BE(on)}$  |                 | 1.5        | V |

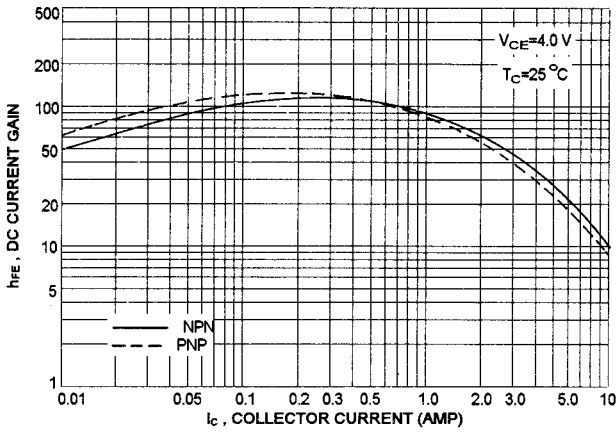
**DYNAMIC CHARACTERISTICS**

|  |       |     |  |     |
|--|-------|-----|--|-----|
| Current Gain-Bandwidth Product (2)<br>( $I_C = 500\text{ mA}$ , $V_{CE} = 4.0\text{ V}$ , $f = 1\text{ MHz}$ ) | $f_T$ | 3.0 |  | MHz |
|--|-------|-----|--|-----|

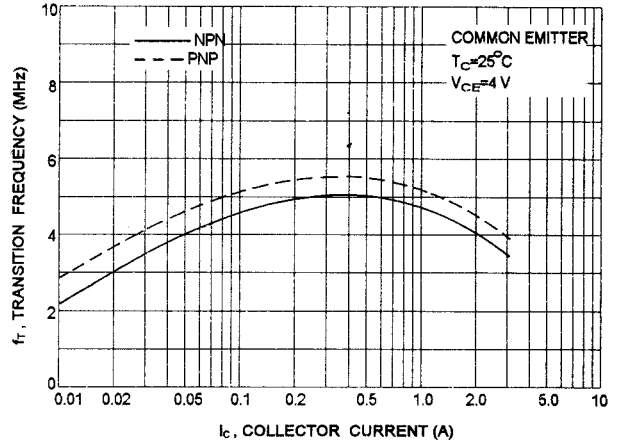
(1) Pulse Test: Pulse width = 300 us , Duty Cycle  $\leq 2.0\%$

(2)  $f_T = |h_{re}| \cdot f_{test}$

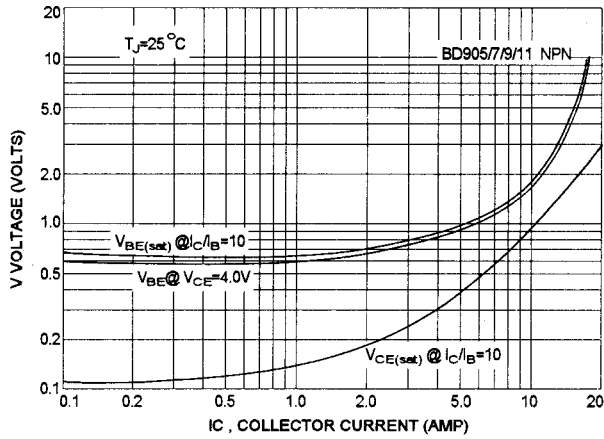
DC CURRENT GAIN



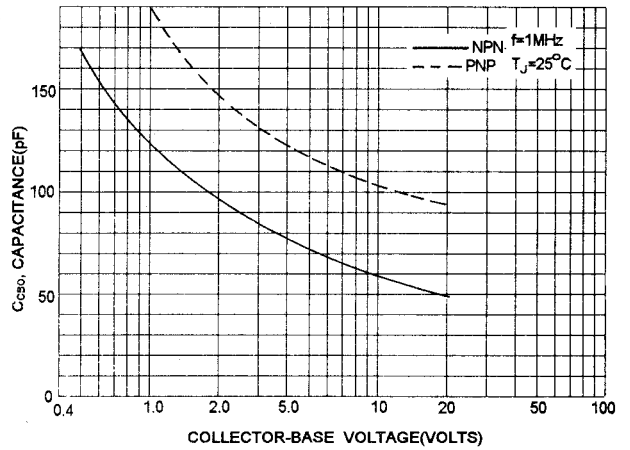
$f_T - I_C$



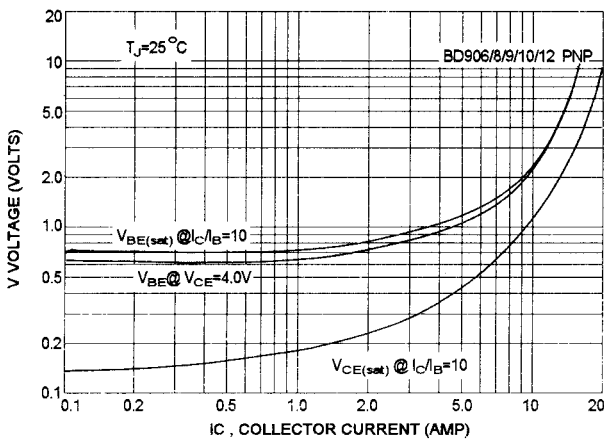
"ON" VOLTAGES



COLLECTOR-BASE CAPACITANCES



"ON" VOLTAGES



ACTIVE REGION SAFE OPERATING AREA(SOA)

