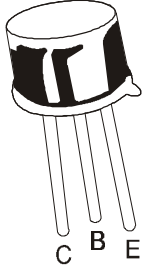


## NPN SILICON PLANAR TRANSISTOR

2N3053 / 2N3053A



TO-39  
Metal Can Package

### General Purpose Transistors

#### ABSOLUTE MAXIMUM RATINGS

| DESCRIPTION  | SYMBOL         | 2N3053       | 2N3053A | UNIT       |
|--|----------------|--------------|---------|------------|
| Collector Emitter Voltage  | $V_{CEO}$      | 40           | 60      | V          |
| Collector Base Voltage   | $V_{CBO}$      | 60           | 80      | V          |
| Emitter Base Voltage   | $V_{EBO}$      | 5.0          |         | V          |
| Collector Current Continuous   | $I_C$          | 0.7          |         | A          |
| Power Dissipation at $T_c=25^\circ\text{C}$<br>Derate Above $25^\circ\text{C}$ | $P_D$          | 5.0          | 28.6    | W<br>mW/°C |
| Operating and Storage Junction<br>Temperature Range                            | $T_j, T_{stg}$ | - 65 to +200 |         | °C         |
| Lead Temperature 1/16", $\pm$ 1/32" from<br>Case for 10s                       | $T_L$          | +235         |         | °C         |

#### THERMAL RESISTANCE

|                  |               |    |      |
|------------------|---------------|----|------|
| Junction to Case | $R_{th(j-c)}$ | 35 | °C/W |
|------------------|---------------|----|------|

#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ unless specified otherwise )

| DESCRIPTION                          | SYMBOL         | TEST CONDITION   | 2N3053   | 2N3053A   | UNIT |
|--------------------------------------|----------------|--|----------|-----------|------|
| Collector Emitter Voltage            | $V_{CEO}$      | $I_C=1\text{mA}, I_B=0$                                    | >40      | >60       | V    |
| Collector Emitter Voltage            | $V_{CER}$      | $I_C=1\text{mA}, R_{BE}=10\Omega$                          | >50      | >70       | V    |
| Collector Base Voltage               | $V_{CBO}$      | $I_C=100\mu\text{A}, I_E=0$                                | >60      | >80       | V    |
| Emitter Base Voltage                 | $V_{EBO}$      | $I_E=100\mu\text{A}, I_C=0$                                | >5.0     |           | V    |
| Collector Cut Off Current            | $I_{CEX}$      | $V_{CE}=30\text{V}, I_E=0, V_{BE}(\text{off})=1.5\text{V}$ | <250     |           | nA   |
|                                      |                | $V_{CE}=60\text{V}, I_E=0, V_{BE}(\text{off})=1.5\text{V}$ |          | <250      | nA   |
| Emitter Cut Off Current              | $I_{EBO}$      | $V_{EB}=4\text{V}, I_C=0$                                  |          | <250      | nA   |
| Base Cut Off Current                 | $I_{BL}$       | $V_{CE}=60\text{V}, I_E=0, V_{BE}(\text{off})=1.5\text{V}$ |          | <250      | nA   |
| DC Current Gain                      | $h_{FE}$       | $I_C=150\text{mA}, V_{CE}=2.5\text{V}$                     | >25      |           |      |
|                                      |                | $I_C=150\text{mA}, V_{CE}=10\text{V}$                      | 50 - 250 |           |      |
| Collector Emitter Saturation Voltage | $*V_{CE(sat)}$ | $I_C=150\text{mA}, I_B=15\text{mA}$                        | <1.4     | <0.3      | V    |
| Base Emitter Saturation Voltage      | $*V_{BE(sat)}$ | $I_C=150\text{mA}, I_B=15\text{mA}$                        | <1.7     | 0.6 - 1.0 | V    |
| Base Emitter On Voltage              | $*V_{BE(on)}$  | $I_C=150\text{mA}, V_{CE}=2.5\text{V}$                     | <1.7     | <1.0      | V    |

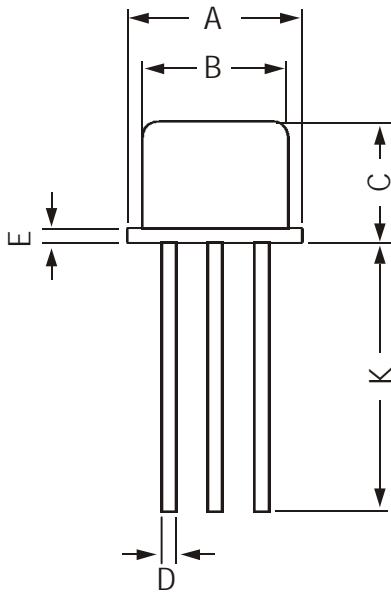
#### SMALL SIGNAL CHARACTERISTICS

|                                |          |  |      |     |
|--------------------------------|----------|--|------|-----|
| Current Gain Bandwidth Product | $f_T$    | $I_C=50\text{mA}, V_{CE}=10\text{V}, f=20\text{MHz}$ | >100 | MHz |
| Output Capacitance             | $C_{ob}$ | $V_{CB}=10\text{V}, I_E=0, f=140\text{KHz}$          | <15  | pF  |
| Input Capacitance              | $C_{ib}$ | $V_{EB}=0.5\text{V}, I_C=0, f=140\text{KHz}$         | <80  | pF  |

\*Pulse Test: Pulse Width  $\leq$  300ms, Duty Cycle  $\leq$  2%

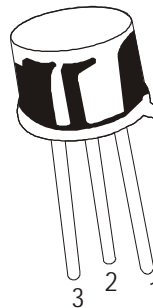
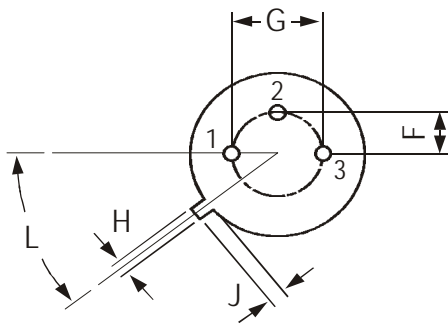
2N3053\_A Rev\_1 040406E

TO-39 Metal Can Package



All dimensions are in mm

| DIM | MIN    | MAX    |
|-----|--------|--------|
| A   | 8.50   | 9.39   |
| B   | 7.74   | 8.50   |
| C   | 6.09   | 6.60   |
| D   | 0.40   | 0.53   |
| E   | —      | 0.88   |
| F   | 2.41   | 2.66   |
| G   | 4.82   | 5.33   |
| H   | 0.71   | 0.86   |
| J   | 0.73   | 1.02   |
| K   | 12.70  | —      |
| L   | 42 DEG | 48 DEG |



PIN CONFIGURATION

1. EMITTER
2. BASE
3. COLLECTOR

Packing Detail

| PACKAGE | STANDARD PACK   |                | INNER CARTON BOX |     | OUTER CARTON BOX  |     |        |
|---------|-----------------|----------------|------------------|-----|-------------------|-----|--------|
|         | Details         | Net Weight/Qty | Size             | Qty | Size              | Qty | Gr Wt  |
| TO-39   | 500 pcs/polybag | 540 gm/500 pcs | 3" x 7.5" x 7.5" | 20K | 17" x 15" x 13.5" | 32K | 40 kgs |

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

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