



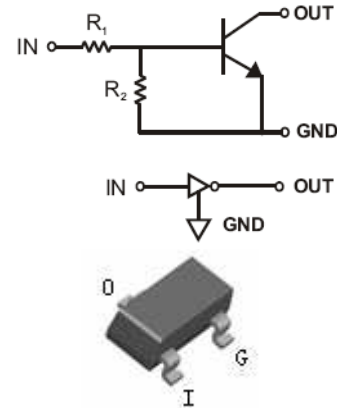
## Digital Transistor DTC(R<sub>1</sub>=R<sub>2</sub> SERIES)CA

### FEATURES

- Epitaxial planar die construction.
- Complementary PNP types available(DTA).
- Built-in biasing resistors,R<sub>1</sub>=R<sub>2</sub>.
- Also available in lead free version.

### APPLICATIONS

- The NPN style digital transistor.



**SOT-23**

### ORDERING INFORMATION

| Type No.  | Marking | Package Code |
|-----------|---------|--------------|
| DTC114ECA | 24      | SOT-23       |
| DTC124ECA | 25      | SOT-23       |
| DTC143ECA | 23      | SOT-23       |
| DTC144ECA | 26      | SOT-23       |

### MAXIMUM RATING @ Ta=25°C unless otherwise specified

| Symbol                            | Parameter                                   | Value  | Units  |      |
|-----------------------------------|---|--|--|------|
| V <sub>CC</sub>                   | Supply Voltage                              | 50   | V  |      |
| V <sub>IN</sub>                   | Input Voltage                               | DTC114ECA<br>DTC124ECA<br>DTC143ECA<br>DTC144ECA | -10 to+40<br>-10 to+40<br>-10 to+30<br>-10 to+40 | V    |
| I <sub>O</sub>                    | Output Current                              | DTC114ECA<br>DTC124ECA<br>DTC143ECA<br>DTC144ECA | 50<br>30<br>100<br>100                           | mA   |
| I <sub>C</sub> (Max.)             | Output current                              | ALL  | 100  | mA   |
| P <sub>D</sub>                    | Power Dissipation                           |  | 200  | mW   |
| R <sub>θJA</sub>                  | Thermal Resistance, Junction to Ambient Air |  | 625  | °C/W |
| T <sub>j</sub> , T <sub>stg</sub> | Operating and Storage and Temperature Range |  | -55 to +150                                      | °C   |



### ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

| Parameter              | Symbol       | Test conditions                       | MIN | TYP | MAX       | UNIT       |      |
|------------------------|--------------|---------------------------------------|-----|-----|-----------|------------|------|
| Input Voltage          | $V_{I(off)}$ | $V_{CC}=5V, I_O=100\mu A$             | 0.5 | 1.1 | -         | V          |      |
| Input Voltage          | $V_{I(on)}$  | DTC114ECA<br>$V_O=0.3V, I_O=10mA$     | -   | 1.9 | 3         |            |      |
|                        |              | DTC124ECA<br>$V_O=0.2V, I_O=5mA$      |     |     |           |            |      |
|                        |              | DTC143ECA<br>$V_O=0.3V, I_O=20mA$     |     |     |           |            |      |
|                        |              | DTC144ECA<br>$V_O=0.3V, I_O=2mA$      |     |     |           |            |      |
| Output Voltage         | $V_{O(on)}$  | $I_O/I_I=10mA/0.5mA,$                 | -   | 0.1 | 0.3       | V          |      |
| Input Current          | $I_I$        | $V_I=5V$                              | -   | -   | 0.88      | mA         |      |
|                        |              |                                       |     |     | DTC124ECA |            | 0.36 |
|                        |              |                                       |     |     | DTC143ECA |            | 1.8  |
|                        |              |                                       |     |     | DTC144ECA |            | 0.18 |
| Output Current         | $I_{O(off)}$ | $V_{CC}=50V, V_I=0V$                  | -   | -   | 0.5       | $\mu A$    |      |
| DC Current Gain        | $G_I$        | $V_O=5V, I_O=5mA$                     | -   | -   | 30        |            |      |
|                        |              |                                       |     |     | DTC124ECA |            | 56   |
|                        |              |                                       |     |     | DTC143ECA |            | 20   |
|                        |              |                                       |     |     | DTC144ECA |            | 68   |
| Input Resistor         | $R_1(R_2)$   |                                       |     |     | 7         | k $\Omega$ |      |
|                        |              |                                       |     |     | DTC124ECA |            | 15.4 |
|                        |              |                                       |     |     | DTC143ECA |            | 3.29 |
|                        |              |                                       |     |     | DTC144ECA |            | 32.9 |
| Resistance Ratio       | $R_2/R_1$    | -                                     | 0.8 | 1   | 1.2       |            |      |
| Gain-Bandwidth Product | $f_T$        | $V_{CE}=10V, I_E=-5mA,$<br>$f=100MHz$ | -   | 250 | -         | MHz        |      |

### TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

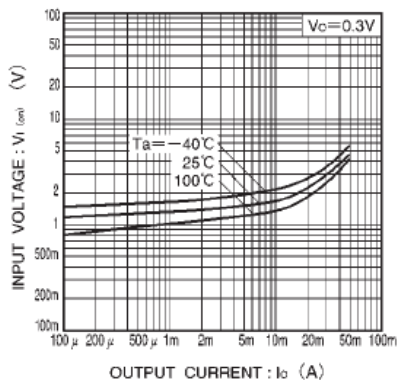


Fig.1 Input voltage vs. output current (ON characteristics)

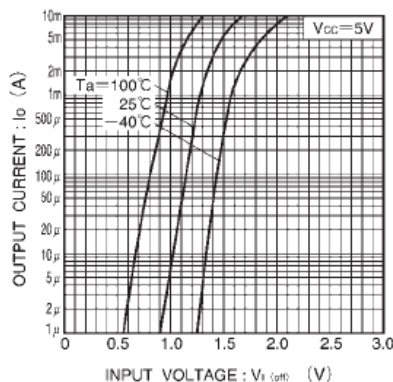


Fig.2 Output current vs. input voltage (OFF characteristics)

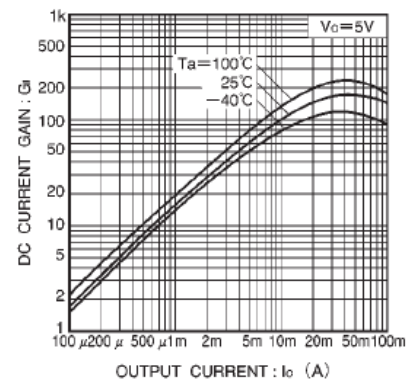


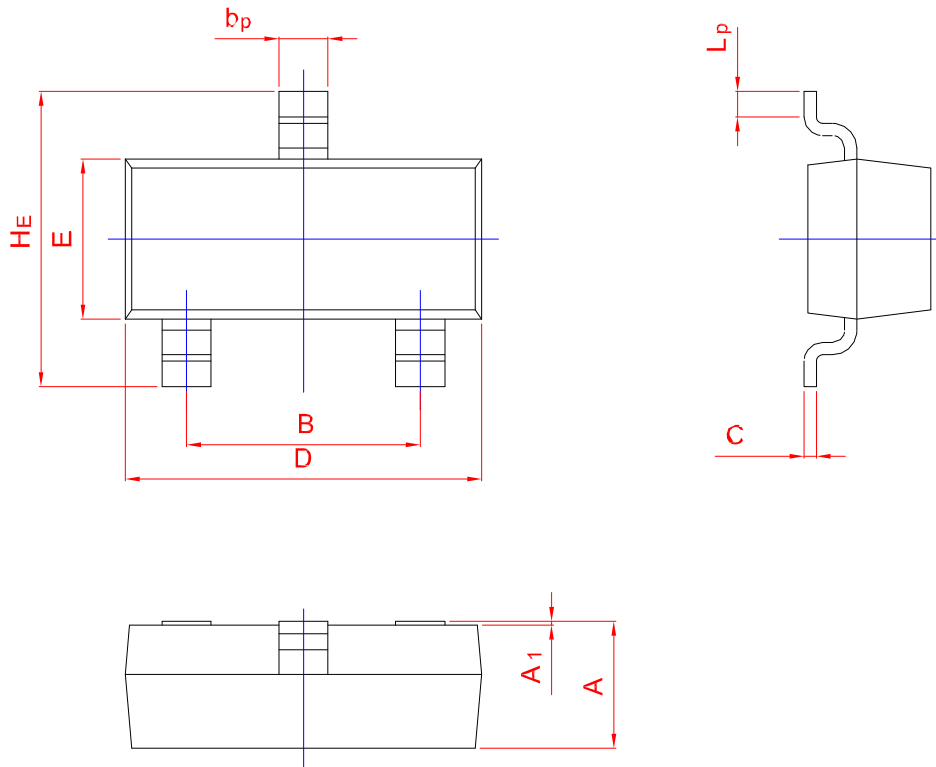
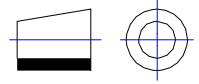
Fig.3 DC current gain vs. output current



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



| UNIT | A    | B    | b <sub>p</sub> | C    | D    | E    | H <sub>E</sub> | A <sub>1</sub> | L <sub>p</sub> |
|------|------|------|----------------|------|------|------|----------------|----------------|----------------|
| mm   | 1.40 | 2.04 | 0.50           | 0.19 | 3.10 | 1.65 | 3.00           | 0.100          | 0.50           |
|      | 0.95 | 1.78 | 0.35           | 0.08 | 2.70 | 1.20 | 2.20           | 0.013          | 0.20           |