

**SOT-23-3L DIGITAL TRANSISTOR  
TRANSISTORS(NPN)**

**FEATURES**

- \* Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors.(see equivalent circuit).
- \* The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- \* Only the on/off conditions need to be set for operation marking device design easy.

**MECHANICAL DATA**

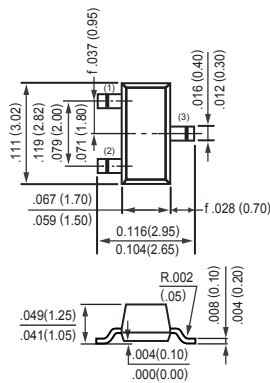
- \* Case: Molded plastic
- \* Epoxy: UL 94V-O rate flame retardant
- \* Lead: MIL-STD-202E method 208C guaranteed
- \* Mounting position: Any
- \* Weight: 0.009 gram

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25°C ambient temperature unless otherwise specified.



**SOT-23-3L**



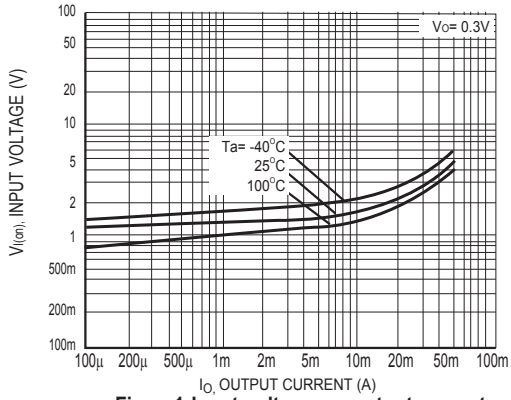
**MAXIMUM RATINGS** ( @ TA = 25°C unless otherwise noted )

| RATINGS              | SYMBOL              | LIMITS   | UNITS |
|----------------------|---------------------|----------|-------|
| Supply voltage       | V <sub>CC</sub>     | 50       | V     |
| Input voltage        | V <sub>IN</sub>     | -10~40   | V     |
| Output current       | I <sub>O</sub>      | 50       | mA    |
|                      | I <sub>C(MAX)</sub> | 100      |       |
| Power dissipation    | P <sub>d</sub>      | 200      | mW    |
| Junction temperature | T <sub>j</sub>      | 150      | °C    |
| Storage temperature  | T <sub>stg</sub>    | -55 ~150 | °C    |

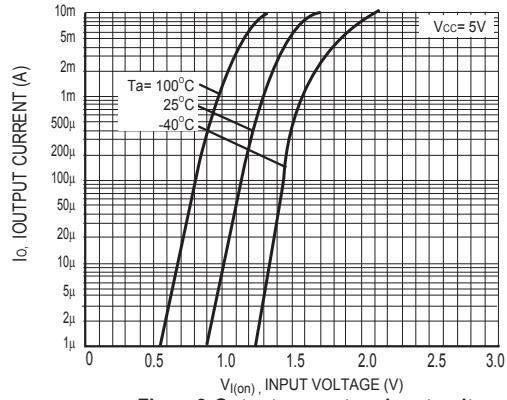
**ELECTRICAL CHARACTERISTICS** ( @ TA = 25°C unless otherwise noted )

| CHARACTERISTICS   | SYMBOL                          | MIN | TYP | MAX  | UNITS |
|---|---------------------------------|-----|-----|------|-------|
| Input voltage (V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA)                  | V <sub>I(off)</sub>             | -   | -   | 0.5  | V     |
| Input voltage (V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA)                  | V <sub>I(on)</sub>              | 3   | -   | -    |       |
| Output voltage (I <sub>O</sub> / I <sub>I</sub> = 10mA / 0.5mA)               | V <sub>O(on)</sub>              | -   | -   | 0.3  | V     |
| Input current (V <sub>I</sub> = 5V)   | I <sub>I</sub>                  | -   | -   | 0.88 | mA    |
| Output current (V <sub>CC</sub> = 50V, V <sub>I</sub> = 0)                    | I <sub>O(off)</sub>             | -   | -   | 0.5  | μA    |
| DC current gain (V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA)                   | G <sub>I</sub>                  | 30  | -   | -    | -     |
| Input resistance  | R <sub>1</sub>                  | 7   | 10  | 13   | KΩ    |
| Resistance ratio  | R <sub>2</sub> / R <sub>1</sub> | 0.8 | 1   | 1.2  | -     |
| Transition frequency (V <sub>O</sub> = 10V, I <sub>O</sub> = 5mA, f = 100MHz) | f <sub>T</sub>                  | -   | 250 | -    | MHz   |

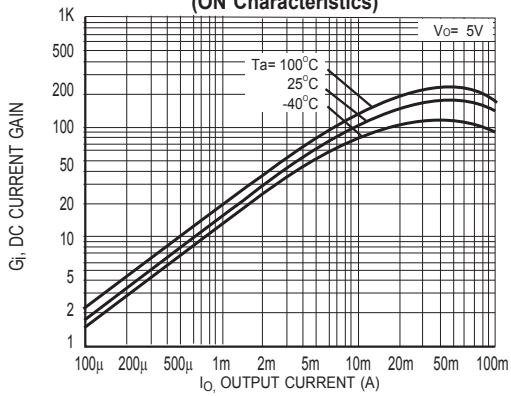
## RATING AND CHARACTERISTICS CURVES (DTC114EKA)



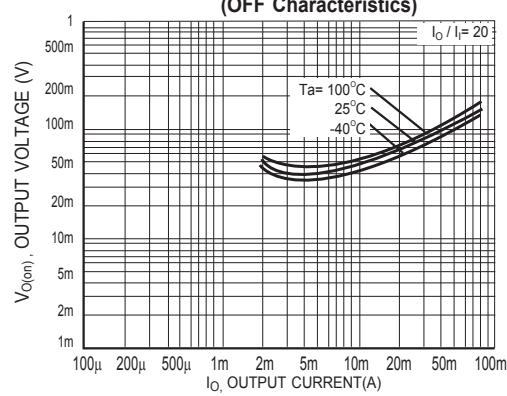
**Figure1 Input voltage vs. output current  
(ON Characteristics)**



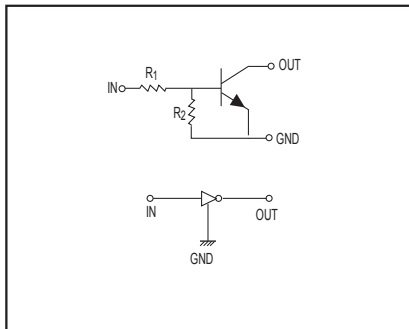
**Figure2 Output current vs input voltage  
(OFF Characteristics)**



**Figure3 DC current gain vs. output current**



**Figure 4 Output voltage vs. output current**



**Figure5 Equivalent circuit**

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