银河微电子
Galaxy
Microelectronics

# Digital Transistor
# UMC4N

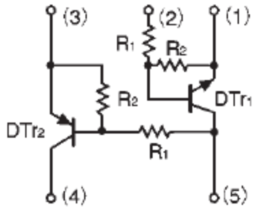
## Features

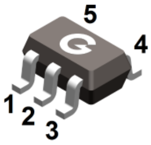
- DTA114Y and DTC144E transistors are built-in a package
- Ideal for power switch circuits
- Mounting cost and area can be cut in half

**HF**

## Mechanical Data

- Case: SOT-353
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208





SOT-353

## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| UMC4N | SOT-353 | 3000 pcs / Tape & Reel | C4 |

## Maximum Ratings (@ $T_A$ = 25°C unless otherwise specified)

| Symbol | Parameter | Value | | Unit |
|---|---|---|---|---|
| | | DTr1 | DTr2 | |
| $V_{CC}$ | Supply Voltage | 50 | -50 | V |
| $V_{IN}$ | Input Voltage | -10 to +40 | +6 to -40 | V |
| $I_O$ | Output Current | 100 | -70 | mA |
| $I_{CM}$ | Output Current | 100 | -100 | mA |

## Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation | $P_D$ | 150 | mW |
| Operating Junction Temperature Range | $T_J$ | -55 ~ +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 ~ +150 | °C |

## Electrical Characteristics-DTR1 (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Voltage | $V_{I(off)}$ | $V_{CC}$ = 5V, $I_O$ = 100μA | 0.5 | - | - | V |
| | $V_{I(on)}$ | $V_O$ = 0.3V, $I_O$ = 2mA | - | - | 3 | V |
| Output Voltage | $V_{O(on)}$ | Io = 10mA, $I_I$ = 0.5mA | - | - | 0.3 | V |
| Input Current | $I_I$ | $V_I$ = 5V | - | - | 0.18 | mA |
| Output Current | $I_{O(off)}$ | $V_{CC}$ = 50V, $V_I$ = 0V | - | - | 0.5 | μA |
| DC Current Gain | $G_I$ | $V_O$ = 5V, $I_O$ = 5mA | 68 | - | - | - |
| Input Resistor | $R_1$ | | 32.9 | 47 | 61.1 | kΩ |
| Resistance ratio | R2/R1 | | 0.8 | 1 | 1.2 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$ = 10V, $I_E$ = -5mA, f = 100MHz | - | 250 | - | MHz |

## Electrical Characteristics-DTR2 (@ $T_A$ = 25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Voltage | $V_{I(off)}$ | $V_{CC}$ = -5V, $I_O$ = -100μA | -0.3 | - | - | V |
| | $V_{I(on)}$ | $V_O$ = -0.3V, $I_O$ = -1mA | - | - | -1.4 | V |
| Output Voltage | $V_{O(on)}$ | Io = -5mA, $I_I$ = -0.25mA | - | - | -0.3 | V |
| Input Current | $I_I$ | $V_I$ = -5V | - | - | -0.88 | mA |
| Output Current | $I_{O(off)}$ | $V_{CC}$ = -50V, $V_I$ = 0V | - | - | -0.5 | μA |
| DC Current Gain | $G_I$ | $V_O$ = -5V, $I_O$ = -10mA | 68 | - | - | - |
| Input Resistor | $R_1$ | | 7 | 10 | 13 | kΩ |
| Resistance ratio | R2/R1 | | 3.7 | 4.7 | 5.7 | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$ = -10V, $I_E$ = 5mA, f = 100MHz | - | 250 | - | MHz |

## Ratings and Characteristic Curves-DTR1 (@ $T_A$ = 25°C unless otherwise specified)

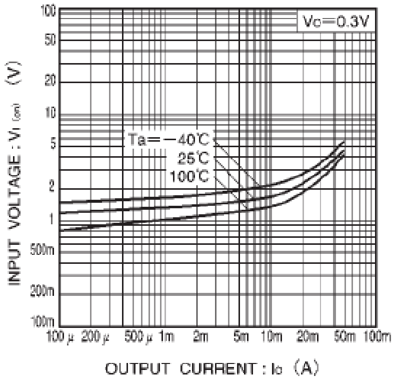


Fig.1 Input voltage vs. output current (ON characteristics)

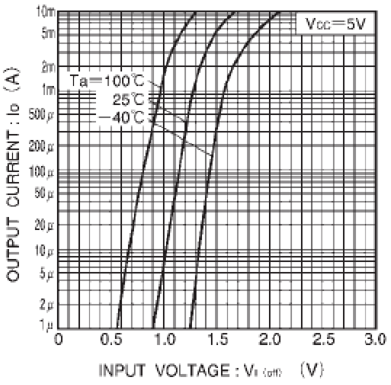


Fig.2 Output current vs. input voltage (OFF characteristics)

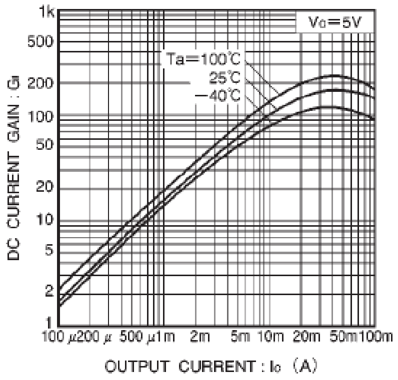


Fig.3 DC current gain vs. output current

## Ratings and Characteristic Curves-DTR2 (@ $T_A$ = 25°C unless otherwise specified)

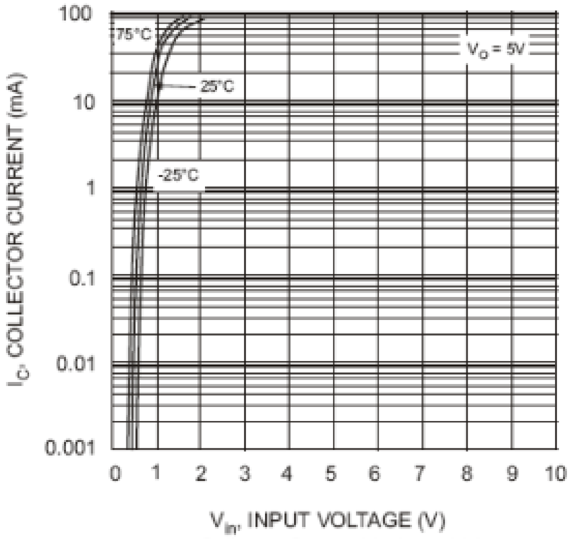


Fig. 1 Collector Current Vs. Input Voltage

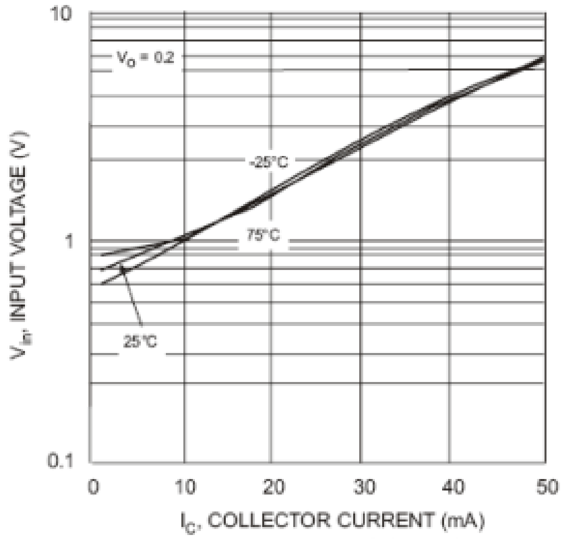


Fig. 2 Input Voltage vs. Collector Current

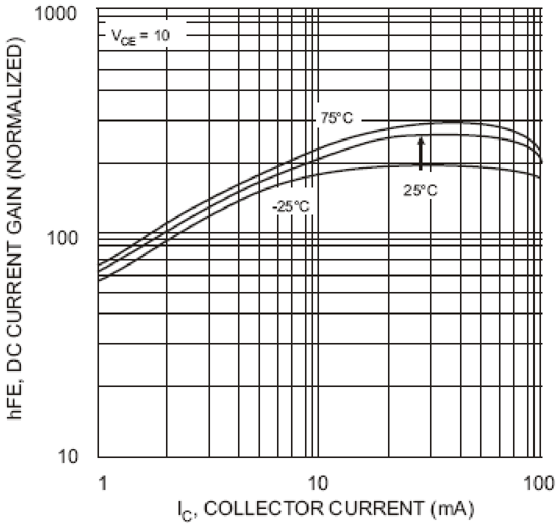


Fig. 3 DC CURRENT GAIN

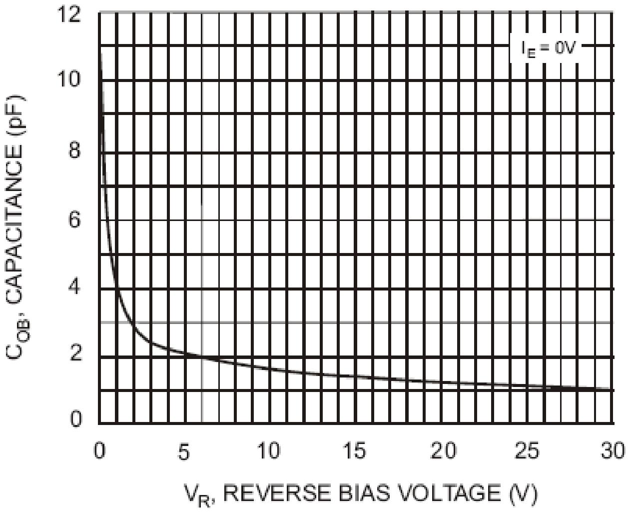


Fig. 4 Output Capacitance

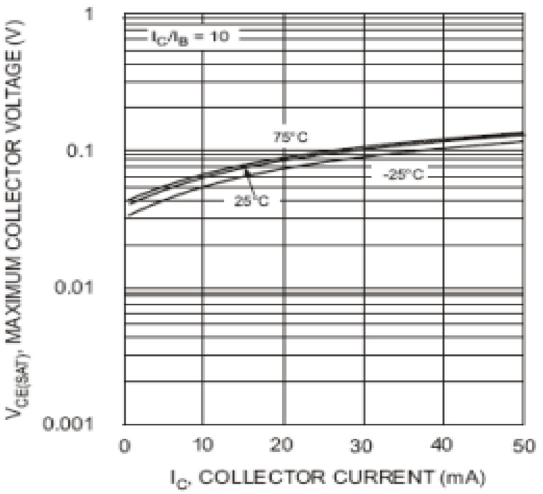
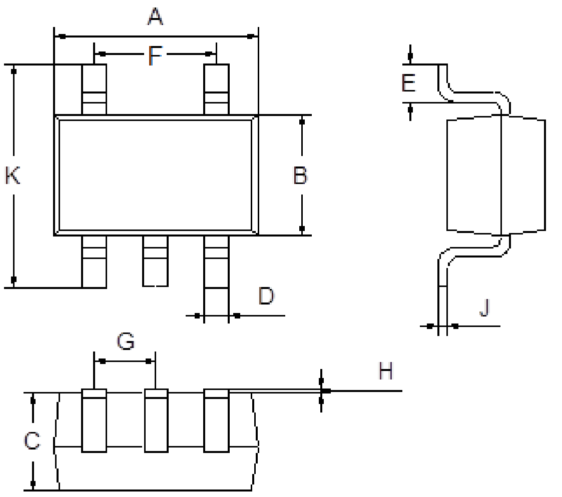


Fig. 5 $V_{CE(SAT)}$ vs. $I_C$

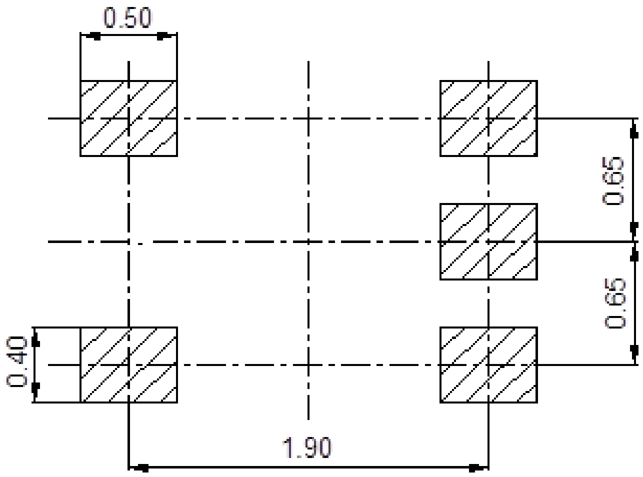
## Package Outline Dimensions (Unit: mm)



| SOT-353 | | |
|---|---|---|
| **Dimension** | **Min.** | **Max.** |
| A | 2.00 | 2.20 |
| B | 1.15 | 1.35 |
| C | 0.85 | 1.05 |
| D | 0.15 | 0.35 |
| E | 0.25 | 0.40 |
| F | 1.20 | 1.40 |
| G | 0.60 | 0.70 |
| H | 0.02 | 0.10 |
| J | 0.05 | 0.15 |
| K | 2.20 | 2.40 |

## Mounting Pad Layout (Unit: mm)

**SOT-353**



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