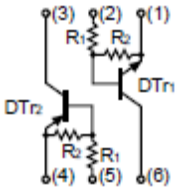
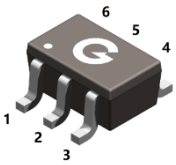
# Digital Transistor
# UMD15N

## Features

- Both the DTA143E and DTC143E in SOT-363 package
- Reduces board space
- Reduces component count
- Surface mount package suited for automated assembly
- RoHS compliant with Halogen-free

HF




SOT-363

## Mechanical Data

- Case: SOT-363
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

## Ordering Information

| Part Number | Package | Shipping Quantity | Marking Code |
|---|---|---|---|
| UMD15N | SOT-363 | 3000 pcs / Tape & Reel | D15 |

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

| Parameter | Symbol | Value | | Unit |
|---|---|---|---|---|
| | | $DT_{r1}$ | $DT_{r2}$ | |
| Supply Voltage | $V_{CC}$ | 50 | -50 | V |
| Input Voltage | $V_{IN}$ | -10 to +30 | +10 to -30 | V |
| Output Current | $I_O$ | 100 | -100 | mA |
| Collector Current | $I_{C\ (Max.)}$ | 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-DT$_{r1}$ (@ $T_A$ = 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, $I_O$ = 20mA | - | - | 3 | V |
| Output Voltage | $V_{O(on)}$ | Io = 10mA, $I_I$ = 0.5mA | - | - | 0.3 | V |
| Input Current | $I_I$ | $V_I$ = 5V | - | - | 1.8 | 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 | 20 | - | - | - |
| Input Resistor | $R_1$ | | 3.29 | 4.7 | 6.11 | kΩ |
| Resistance ratio | $R_2/R_1$ | | 0.8 | 1 | 1.2 | - |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$ = 10V, $I_E$ = 5mA, f = 100MHz | - | 250 | - | MHz |

## Electrical Characteristics-DT$_{r2}$ (@ $T_A$ = 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, $I_O$ = -20mA | - | - | -3 | V |
| Output Voltage | $V_{O(on)}$ | Io = -10mA, $I_I$ = -0.5mA | - | - | -0.3 | V |
| Input Current | $I_I$ | $V_I$ = -5V | - | - | -1.8 | 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 | 20 | - | - | - |
| Input Resistor | $R_1$ | | 3.29 | 4.7 | 6.11 | kΩ |
| Resistance ratio | $R_2/R_1$ | | 0.8 | 1 | 1.2 | - |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$ = -10V, $I_E$ = -5mA, f = 100MHz | - | 250 | - | MHz |

## Ratings and Characteristics Curves-DTr1 (@ $T_A$ = 25°C unless otherwise specified)

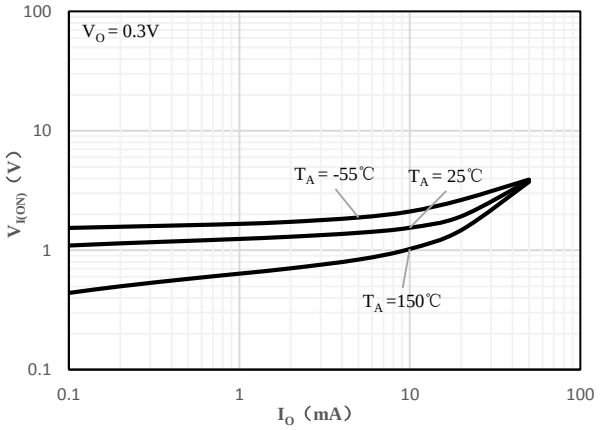



Fig 1 Input Voltage vs Output Current

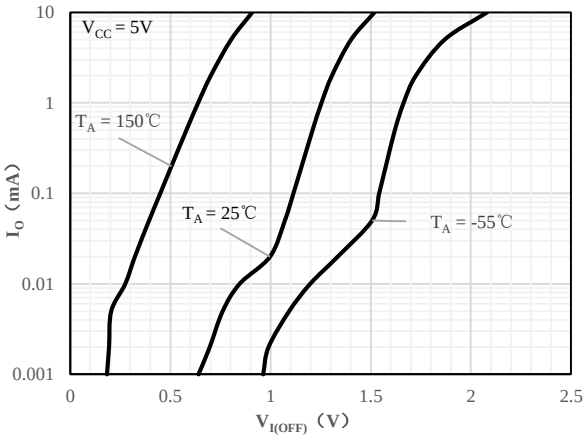



Fig 2 Output Current vs Input Voltage

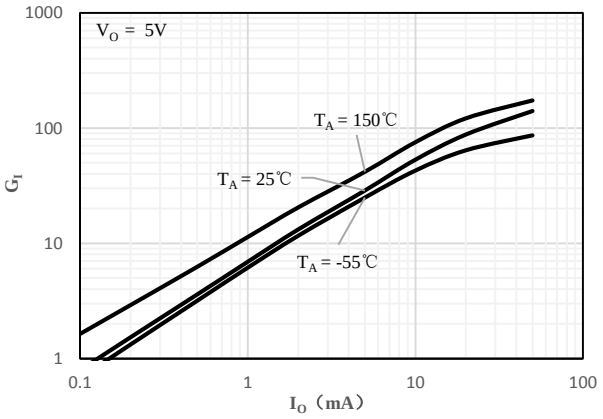



Fig 3 DC Current Gain vs Output Current

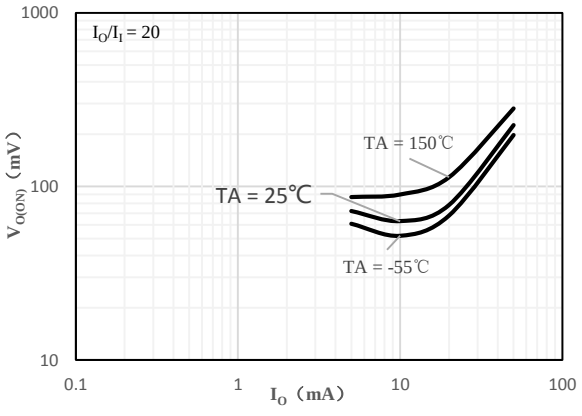



Fig 4 Output Voltage vs Output Current

## Ratings and Characteristics Curves-DT$_{r2}$ (@ $T_A$ = 25°C unless otherwise specified)

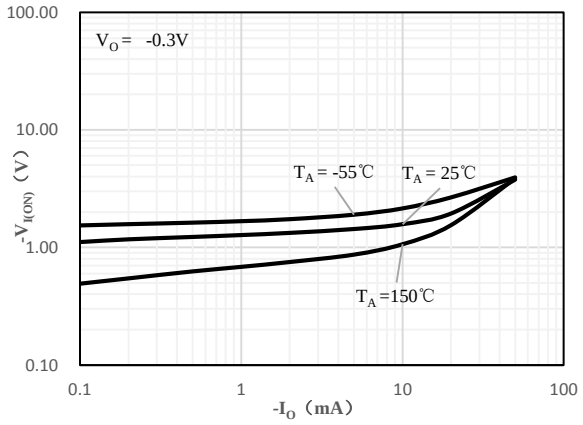



Fig 1 Input Voltage vs Output Current

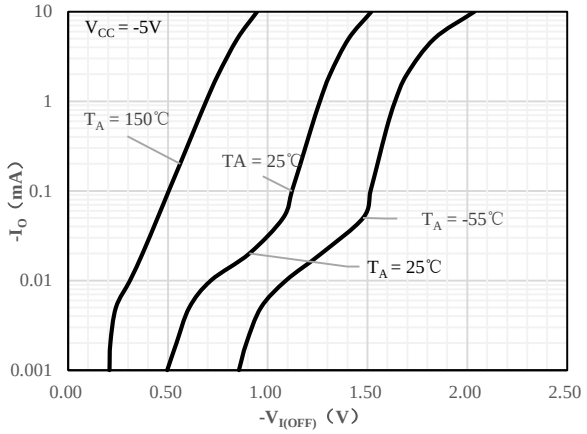



Fig 2 Output Current vs Input Voltage

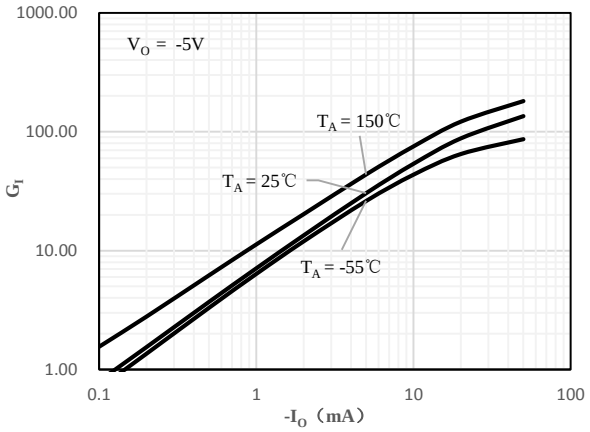



Fig 3 DC Current Gain vs Output Current

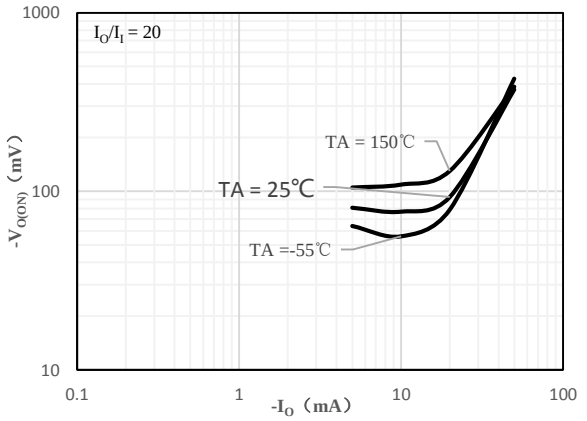
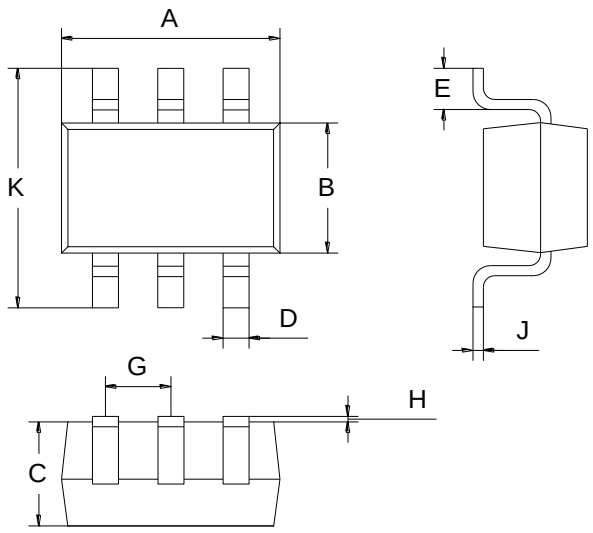



Fig 4 Output Voltage vs Output Current

## Package Outline Dimensions (Unit: mm)




| SOT-363 | | |
|---|---|---|
| **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 |
| 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-363

