

-100mA/-50V Digital transistors(with built-in resistors)

DTA014YM / DTA014YEB / DTA014YUB

●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors. (See Equivalent circuit)
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 3) Only the on/off conditions need to be set for operation, making the device design easy.

●Structure

PNP epitaxial planar silicon transistor
(Resistor built-in type)

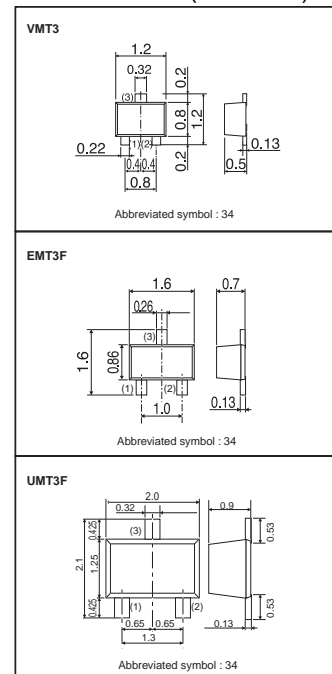
●Applications

Inverter, Interface, Driver

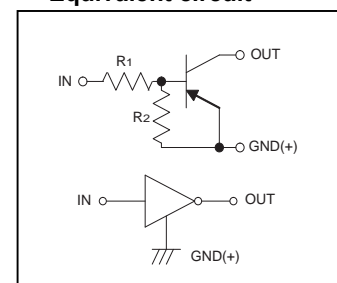
●Packaging specifications

| Type | Package | VMT3 | EMT3F | UMT3F |
|-----------|------------------------------|--------|--------|--------|
| | Packaging Type | Taping | Taping | Taping |
| | Code | T2L | TL | TL |
| | Basic ordering unit (pieces) | 8000 | 3000 | 3000 |
| DTA014YM | | ○ | - | - |
| DTA014YEB | | - | ○ | - |
| DTA014YUB | | - | - | ○ |

●Dimensions (Unit : mm)



●Equivalent circuit



R₁=10kΩ, R₂=47kΩ

●Absolute maximum (Ta=25°C)

| Parameter | Symbol | Limits(DTA014Y□) | | | Unit |
|------------------------------|---------------------|------------------|-------------|-----|------|
| | | M | EB | UB | |
| Supply voltage | V _{CC} | | -50 | | V |
| Input voltage | V _{IN} | | -40 | | V |
| | | | 6 | | V |
| Collector current *1 | I _{C(max)} | | -100 | | mA |
| Output current | I _O | | -70 | | mA |
| Power dissipation *2 | P _D | 150 | | 200 | mW |
| Junction temperature | T _j | | 150 | | °C |
| Range of storage temperature | T _{stg} | | -55 to +150 | | °C |

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference land

●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|------------------------|--------------|------|-------|-------|------|---------------------------------------|
| Input voltage | $V_{I(off)}$ | - | - | -0.5 | V | $V_{CC}=-5V / I_O=-100\mu A$ |
| | $V_{I(on)}$ | -1.7 | - | - | V | $V_O=-0.3V / I_O=-5mA$ |
| Output voltage | $V_{O(on)}$ | - | -0.07 | -0.15 | V | $I_O=-5mA / I_I=0.5mA$ |
| Input current | I_I | - | - | -0.88 | mA | $V_I=-5V$ |
| Output current | $I_{O(off)}$ | - | - | -500 | nA | $V_{CC}=-50V / V_I=0V$ |
| DC current gain | G_I | 80 | - | - | - | $V_O=-10V / I_O=-5mA$ |
| Transition frequency * | f_T | - | 250 | - | MHz | $V_{CE}=-10V / I_E=5mA$ $f=100MHz$ |
| Input resistance | R_1 | 7 | 10 | 13 | kΩ | |
| Resistance ratio | R_2/R_1 | 3.7 | 4.7 | 5.7 | - | |

* Characteristics of built-in transistor

●Electrical characteristics curves

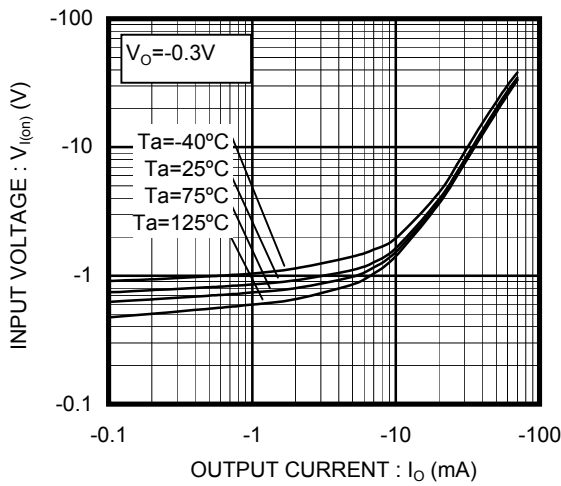


Fig.1 Input Voltage vs. Output Current (ON characteristics)

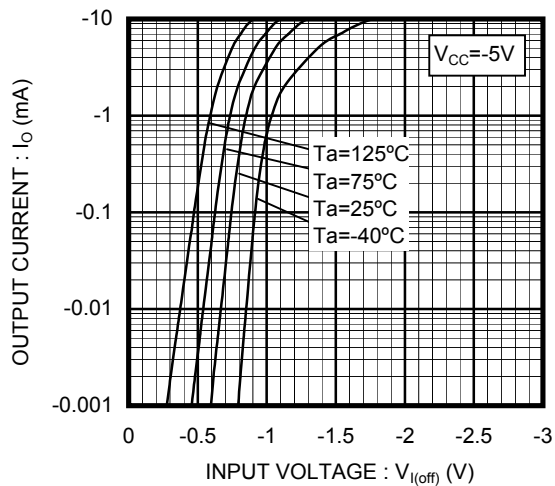


Fig.2 Input Voltage vs. Output Current (OFF characteristics)

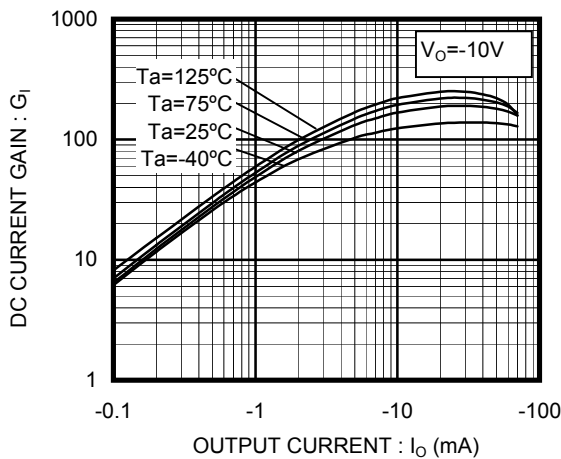


Fig.3 DC Current Gain vs. Output Current

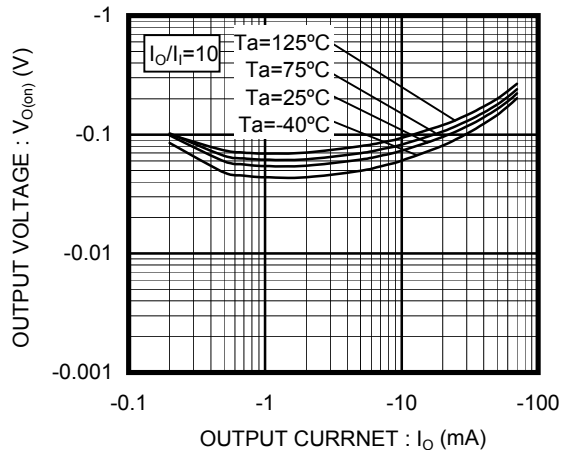


Fig.4 Output Voltage vs. Output Current

Notes

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