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

## DTA115EM / DTA115EE / DTA115EUA / DTA115EKA / DTA115ESA

### ●Applications

Inverter, Interface, Driver

### ●Features

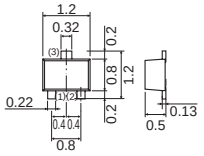
1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input, and parasitic effects are almost completely eliminated.
3) Only the on/off conditions need to be set for operation, making the device design easy.
4) Higher mounting densities can be achieved.

### ●Structure

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

### ●External dimensions (Unit : mm)

DTA115EM

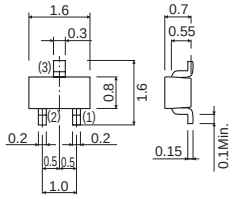



ROHM : VMT3

(1) IN
(2) GND
(3) OUT

Abbreviated symbol : 19

DTA115EE

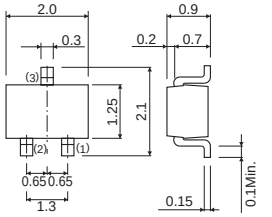



ROHM : EMT3

(1) GND
(2) IN
(3) OUT

Abbreviated symbol : 19

DTA115EUA



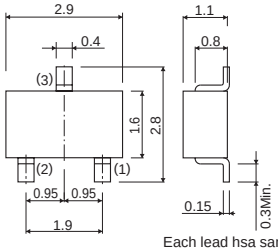

ROHM : UMT3
EIAJ : SC-70

(1) GND
(2) IN
(3) OUT

Each lead hsa same dimensions

Abbreviated symbol : 19

DTA115EKA



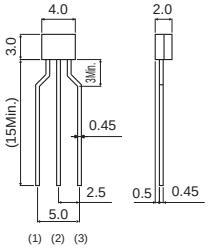

ROHM : SMT3
EIAJ : SC-59

(1) GND
(2) IN
(3) OUT

Each lead hsa same dimensions

Abbreviated symbol : 19

DTA115ESA




ROHM : SPT
EIAJ : SC-72

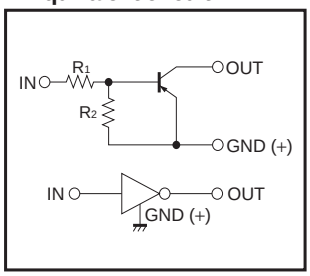
(1) GND
(2) OUT
(3) IN

Abbreviated symbol : A115ES

## ●Packaging specifications

| Part No. | Package | VMT3 | EMT3 | UMT3 | SMT3 | SPT |
|---|---|---|---|---|---|---|
| | Packging type | Taping | Taping | Taping | Taping | Taping |
| | Code | T2L | TL | T106 | T146 | TP |
| | Basic ordering unit (pieces) | 8000 | 3000 | 3000 | 3000 | 5000 |
| DTA115EM | | ○ | – | – | – | – |
| DTA115EE | | – | ○ | – | – | – |
| DTA115EUA | | – | – | ○ | – | – |
| DTA115EKA | | – | – | – | ○ | – |
| DTA115ESA | | – | – | – | – | ○ |

## ●Equivalent circuit




$R_1$=$R_2$=100kΩ

## ●Absolute maximum ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Supply voltage | | $V_{CC}$ | –50 | V |
| Input voltage | | $V_I$ | –40 to +10 | V |
| Output current | | $I_O$ | –20 | mA |
| | | $I_{C(Max.)}$ | –100 | |
| Power dissipation | DTA115EM / DTA115EE | $P_D$ | 150 | mW |
| | DTA115EUA / DTA115EKA | | 200 | |
| | DTA115ESA | | 300 | |
| Junction temperature | | Tj | 150 | °C |
| Storage temperature | | Tstg | –55 to +150 | °C |

## ●Electrical characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Input voltage | $V_{I(off)}$ | – | – | –0.5 | V | $V_{CC}$= –5V, $I_O$= –100μA |
| | $V_{I(on)}$ | –3 | – | – | | $V_O$= –0.3V, $I_O$= –1mA |
| Output voltage | $V_{O(on)}$ | – | –0.1 | –0.3 | V | $I_O$= –5mA, $I_I$= –0.25mA |
| Input current | $I_I$ | – | – | –0.15 | mA | $V_I$= –5V |
| Output current | $I_{O(off)}$ | – | – | –0.5 | μA | $V_{CC}$= –50V, $V_I$=0V |
| DC current gain | $G_I$ | 82 | – | – | – | $I_O$= –5mA, $V_O$= –5V |
| Input resistance | $R_1$ | 70 | 100 | 130 | kΩ | – |
| Resistance ratio | $R_2/R_1$ | 0.8 | 1 | 1.2 | – | – |
| Transition frequency | $f_T$ * | – | 250 | – | MHz | $V_{CE}$= –10V, $I_E$=5mA, f=100MHz |

* Characteristics of built-in transistor

●**Electrical characteristics curves**

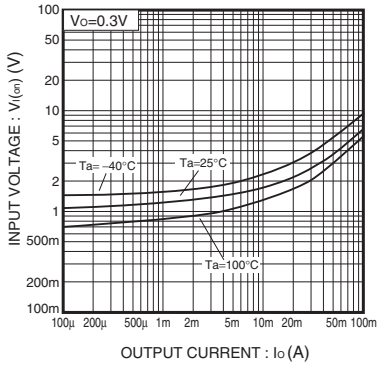



Fig.1 Input voltage vs. Output current (ON characteristics)

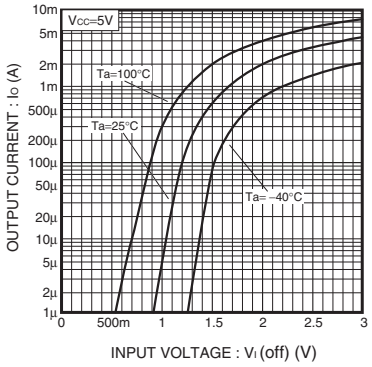



Fig.2 Output current vs. Input voltage (OFF characteristics)

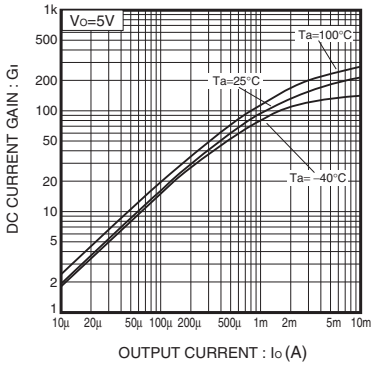



Fig.3 DC current gain vs. Output current

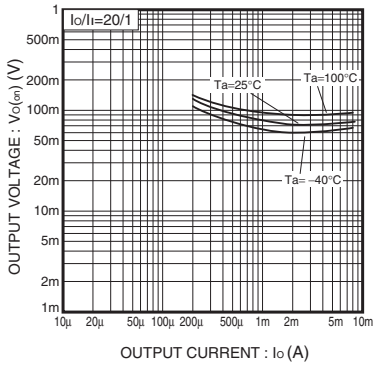



Fig.4 Output voltage vs. Output current

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