500mA/50V Digital transistor (with built-in resistors)

Parameter	Value
V _{CC}	50V
I _C	500mA
R ₁	1kΩ
R ₂	10kΩ

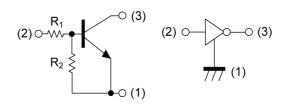
Outline SOT-323

SC-70 (UMT3)

Features

- 1) Built-In Biasing Resistors, $R_1 = 1k\Omega$, $R_2 = 10k\Omega$
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary PNP Type: DTB113ZU

•Inner circuit



- (1) GND (EMITTER)
- (2) IN (BASE)
- (3) OUT (COLLECTOR)

Application

INVERTER, INTERFACE, DRIVER

Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTD113ZU	SOT-323 (UMT3)	2021	T106	180	8	3000	G21

● Absolute maximum ratings (T_a = 25°C)

Parameter	Symbol	Values	Unit
Supply voltage	V _{CC}	50	V
Input voltage	V _{IN}	-5 to 10	V
Collector current	I _C *1	500	mA
Power dissipation	P _D *2	200	mW
Junction temperature	T _j	150	°C
Range of storage temperature	T _{stg}	-55 to +150	°C

● Electrical characteristics (T_a = 25°C)

Damandan	C: reele el	Conditions	Values			11.20	
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit	
Input valtage	$V_{I(off)}$	V _{CC} = 5V, I _O = 100μA	-	-	0.3	- v	
Input voltage	V _{I(on)}	$V_O = 0.3V$, $I_O = 20mA$	1.5	-	-		
Output voltage	V _{O(on)}	I _O = 50mA, I _I = 2.5mA	-	100	300	mV	
Input current	I _I	V _I = 5V	-	-	7.2	mA	
Output current	I _{O(off)}	$V_{CC} = 50V, V_{I} = 0V$	-	-	500	nA	
DC current gain	G _I *3	$V_{O} = 5V, I_{O} = 50mA$	82	-	-	-	
Input resistance	R ₁	-	0.7	1	1.3	kΩ	
Resistance ratio	R ₂ /R ₁	-	8	10	12	-	
Transition frequency	f _T *1	V _{CE} = 10V, I _E = -50mA, f = 100MHz	-	200	-	MHz	

^{*1} Characteristics of built-in transistor

^{*2} Each terminal mounted on a reference land

^{*3} Pulsed

● Electrical characteristic curves (T_a =25°C)

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

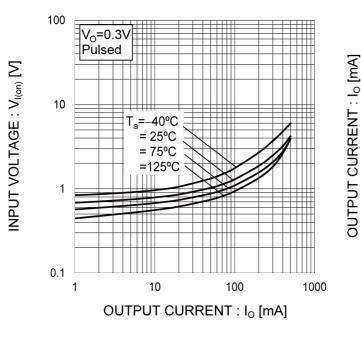


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

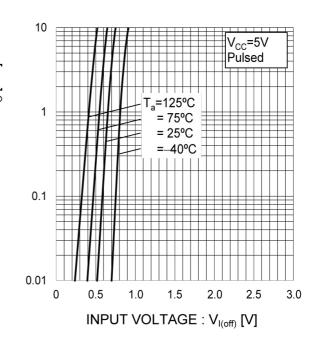


Fig.3 Output Current vs. Output Voltage

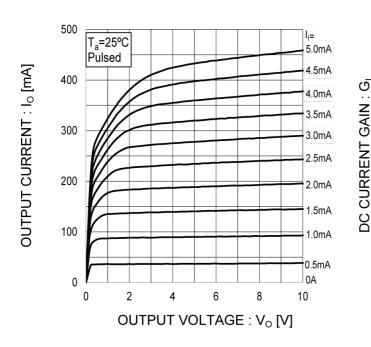
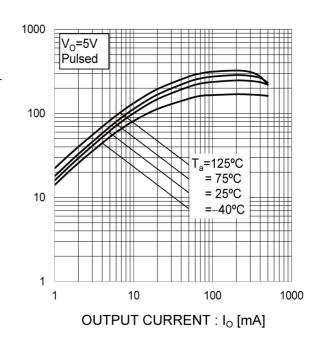
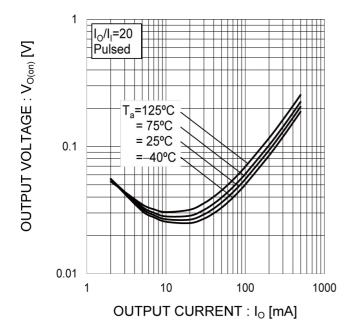


Fig.4 DC Current Gain vs. Output Current

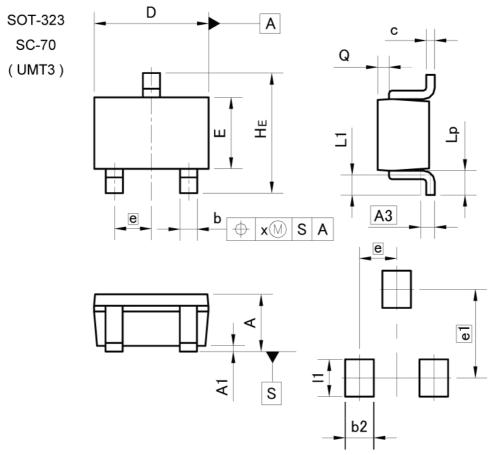


●Electrical characteristic curves (T_a =25°C)

Fig.5 Output Voltage vs. Output Current



Dimensions



Pattern of terminal position areas [Not a pattern of soldering pads]

DIM MILIMETERS		INC	HES	
DIM	MIN	MAX	MIN	MAX
Α	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.5	25	0.0	10
b	0.25	0.40	0.010	0.016
С	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.	65	0.026	
HE	2.00	2.20	0.079	0.087
L1	0.10	0.40	0.004	0.016
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
х	_	0.10	-	0.004

DIM MILIMETERS		INCHES		
DIM	MIN MAX		MIN	MAX
b2	_	0.50	_	0.020
e1	1.55		0.0	61
- 11	-	0.65	-	0.026

Dimension in mm/inches



Notice

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(Note1) Medical Equipment Classification of the Specific Applications

JÁPAN	USA	EU	CHINA
CLASSⅢ	CL ACCIII	CLASS II b	CL ACCIII
CLASSIV	CLASSⅢ	CLASSⅢ	CLASSⅢ

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 - [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
 - [e] Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Sealing or coating our Products with resin or other coating materials
 - [g] Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
 - [h] Use of the Products in places subject to dew condensation
- 4. The Products are not subject to radiation-proof design.
- 5. Please verify and confirm characteristics of the final or mounted products in using the Products.
- 6. In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- 7. De-rate Power Dissipation depending on ambient temperature. When used in sealed area, confirm that it is the use in the range that does not exceed the maximum junction temperature.
- 8. Confirm that operation temperature is within the specified range described in the product specification.
- 9. ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

- 1. When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- 2. In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

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- 1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
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Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of lonizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

- 1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
 - [a] the Products are exposed to sea winds or corrosive gases, including Cl2, H2S, NH3, SO2, and NO2
 - [b] the temperature or humidity exceeds those recommended by ROHM
 - [c] the Products are exposed to direct sunshine or condensation
 - [d] the Products are exposed to high Electrostatic
- Even under ROHM recommended storage condition, solderability of products out of recommended storage time period
 may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is
 exceeding the recommended storage time period.
- 3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
- 4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

Precaution for Product Label

A two-dimensional barcode printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

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