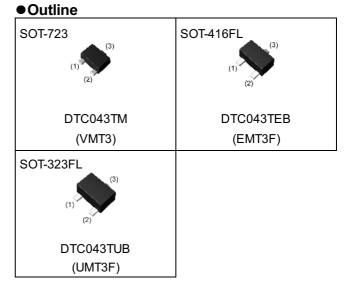


NPN 100mA 50V Digital Transistor (Bias Resistor Built-in Transistor)

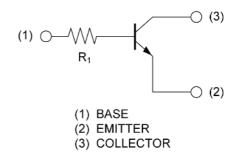
Parameter	Value
V <sub>CEO</sub>	50V
I <sub>C</sub>	100mA
R <sub>1</sub>	4.7kΩ

#### Features

- 1) Built-In Biasing Resistors,  $R_1 = 4.7 k\Omega$
- 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 Types: DTA043T series



#### •Inner circuit



### Application

INVERTER, INTERFACE, DRIVER

## Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTC043TM	SOT-723 (VMT3)	1212	T2L	180	8	8000	49
DTC043TEB	SOT-416FL (EMT3F)	1616	TL	180	8	3000	49
DTC043TUB	SOT-323FL (UMT3F)	2021	TL	180	8	3000	49

# • Absolute maximum ratings ( $T_a = 25$ °C)

F	Parameter	Symbol	Values	Unit
Collector-base voltage			50	V
Collector-emitter voltage			50	V
Emitter-base voltage			5	V
Collector current			100	mA
	DTC043TM		150	mW
Power dissipation	DTC043TEB	P <sub>D</sub> *1	150	
DTC043TUB			200	
Junction temperature			150	°C
Range of storage tempera	Range of storage temperature			°C

## ● Electrical characteristics (T<sub>a</sub> = 25°C)

Davamatav	Cymahal	Canditions		Values			
Parameter	Symbol Conditions —		Min.	Тур.	Max.	Unit	
Collector-base breakdown voltage	BV <sub>CBO</sub>	I <sub>C</sub> = 50μA	50	-	-	V	
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	I <sub>C</sub> = 1mA	50	-	-	V	
Emitter-base breakdown voltage	BV <sub>EBO</sub>	I <sub>E</sub> = 50μA	5	-	-	V	
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = 50V	-	-	500	nA	
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = 4V	-	-	500	nA	
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.5mA	-	50	150	mV	
DC current gain	h <sub>FE</sub>	$V_{CE} = 10V, I_{C} = 5mA$	100	-	600	-	
Input resistance	R <sub>1</sub>	-	3.29	4.7	6.11	kΩ	
Transition frequency	f <sub>T</sub> *2	V <sub>CE</sub> = 10V, I <sub>E</sub> = -5mA, f = 100MHz	-	250	-	MHz	

<sup>\*1</sup> Each terminal mounted on a reference land.

<sup>\*2</sup> Characteristics of built-in transistor

## ● Electrical characteristic curves (T<sub>a</sub> =25°C)

Fig.1 Grounded emitter propagation characteristics

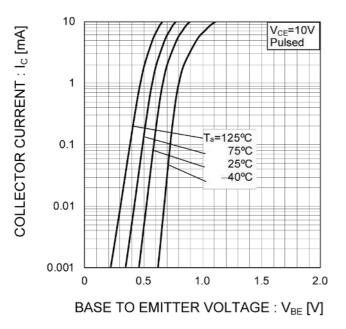


Fig.2 Grounded emitter output characteristics

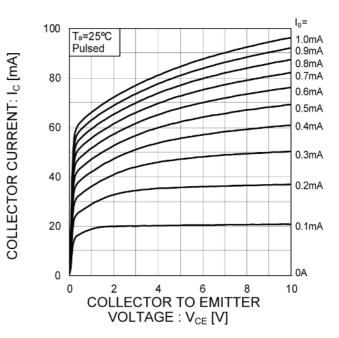


Fig.3 DC Current gain vs. Collector Current

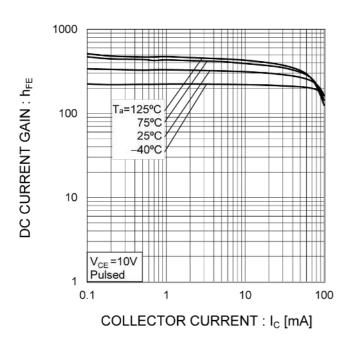
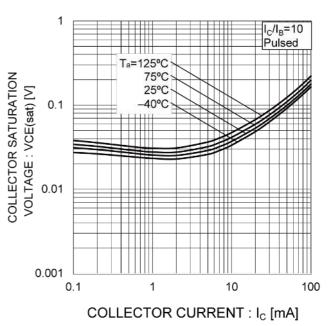
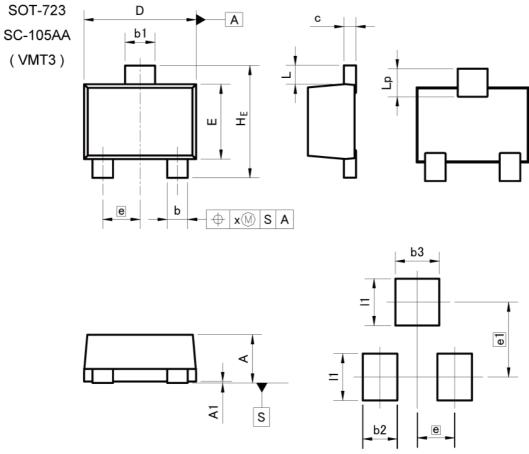


Fig.4 Collector-emitter saturation voltage vs. Collector Current



## Dimensions



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

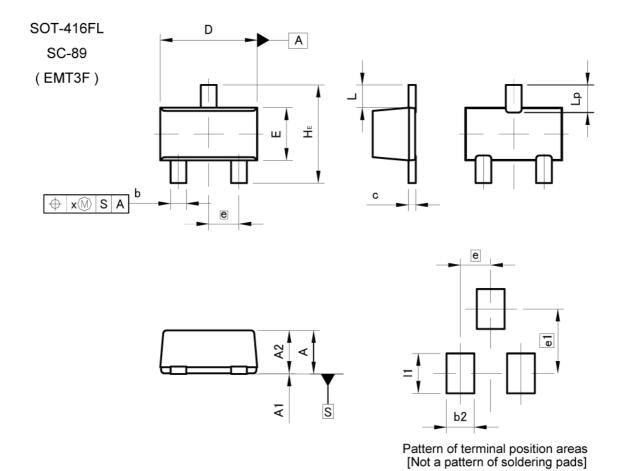
DIM -	MILIM	ETERS	INC	HES
DIM L	MIN	MAX	MIN	MAX
Α	0.45	0.55	0.018	0.022
A1	0.00	0.10	0.000	0.004
b	0.17	0.27	0.007	0.011
b1	0.27	0.37	0.011	0.015
С	0.08	0.18	0.003	0.007
D	1.10	1.30	0.043	0.051
E	0.70	0.90	0.028	0.035
е	0.4	40	0.0	02
HE	1.10	1.30	0.043	0.051
L	0.10	0.30	0.004	0.012
Lp	0.20	0.40	0.008	0.016
х	=	0.10	-	0.004

DIM	MILIMETERS		INC	HES
DIM	MIN	MAX	MIN	MAX
b2	- <u> </u>	0.37	-	0.015
b3	크	0.47	( <u>210</u>	0.019
e1	0.80		0.0	031
11	=0	0.50	72 <del>55</del>	0.020

Dimension in mm/inches



## Dimensions



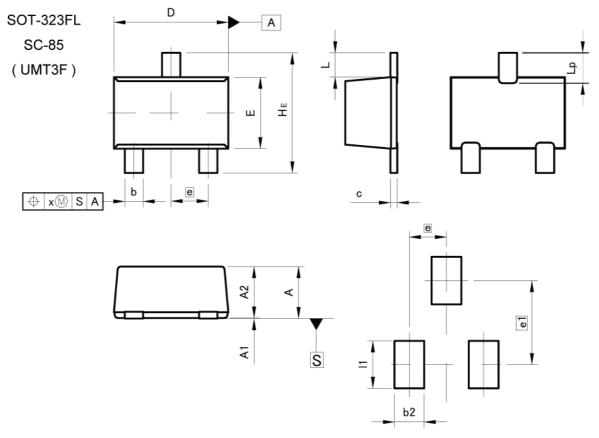
DIM -	MILIM	ETERS	INC	HES
DIM [	MIN	MAX	MIN	MAX
Α	0.65	0.85	0.026	0.033
A1	0.00	0.10	0.000	0.004
A2	0.60	0.80	0.024	0.031
b	0.21	0.36	0.008	0.014
С	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
Е	0.76	0.96	0.030	0.038
е	0.50		0.0	20
HE	1.50	1.70	0.059	0.067
L	0.37		0.0	15
Lp	0.35	0.55	0.014	0.022
х	<del>sa</del> á	0.10	_	0.004

DIM -	MILIMETERS		INC	INCHES	
DIM [	MIN	MAX	MIN	MAX	
b2	=:	0.46	<u>-</u>	0.018	
e1	<u></u>	1.05	=	0.041	
11	=	0.65		0.026	

Dimension in mm/inches



## Dimensions



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

DIM	MILIM	ETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	0.85	1.05	0.033	0.041
A1	0.00	0.10	0.000	0.004
A2	0.80	1.00	0.031	0.039
b	0.27	0.42	0.011	0.017
С	0.08	0.18	0.003	0.007
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
е	0.0	65	0.0	26
HE	2.00	2.20	0.079	0.087
L	0.4	25	0.0	17
Lp	0.43	0.63	0.017	0.025
х	=4	0.10	-	0.004

DIM -	MILIMETERS		INC	HES
DIM	MIN	MAX	MIN	MAX
b2	=	0.52	-	0.020
e1	1.47		0.0	58
11	=,	0.83		0.033

Dimension in mm/inches



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1. Our Products are designed and manufactured for application in ordinary electronic equipments (such as AV equipment, OA equipment, telecommunication equipment, home electronic appliances, amusement equipment, etc.). If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment (Note 1), transport equipment, traffic equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASSⅢ	CL ACCIII	CLASSIIb	CL ACCTI
CLASSIV	CLASSII	CLASSⅢ	CLASSIII

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  - [a] Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
  - [b] Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
  - [c] Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, and NO<sub>2</sub>
  - [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

#### **Precautions Regarding Application Examples and External Circuits**

- 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.

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

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