

# General purpose (dual digital transistor)

## <For DTr1(NPN)>

Parameter	Value
V <sub>CC</sub>	50V
I <sub>C(MAX.)</sub>	100mA
R <sub>1</sub>	47kΩ
R <sub>2</sub>	47kΩ

### <For DTr2(PNP)>

Parameter	Value
V <sub>CC</sub>	-50V
I <sub>C(MAX.)</sub>	-100mA
R <sub>1</sub>	4.7kΩ
R <sub>2</sub>	10kΩ

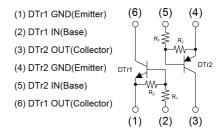
## Features

- 1)Both the DTA143X chip and DTC144E chip in an EMT6 or UMT6 package.
- 2)Mounting possible with EMT3 or UMT3 automatic mounting machines.
- 3)Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

## Outline

SOT-563	SOT-363
(1)(2)(3)	(1) (2) (3)
EMD5	UMD5N
(EMT6)	(UMT6)

## •Inner circuit



# Application

INVERTER, INTERFACE, DRIVER

# Packaging specifications

- I dokaging specifications							
Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
EMD5	SOT-563 (EMT6)	1616	T2R	180	8	8000	D5
UMD5N	SOT-363 (UMT6)	2021	TR	180	8	3000	D5

# ● Absolute maximum ratings (T<sub>a</sub> = 25°C)

Parameter			DTr1(NPN)	DTr2(PNP)	Unit
Supply voltage			50	-50	V
Input voltage			-10 to 40	-20 to 7	V
Output current			30	-100	mA
Collector current			100	-100	mA
Power dissipation EMD5/ UMD5N		P <sub>D</sub> *2*3	15	50	mW/Total
Junction temperature			15	50	°C
Range of storage temperature			-55 to	+150	°C

# ● Electrical characteristics (T<sub>a</sub> = 25°C) <For DTr1(NPN)>

Darameter	Cumbal	Conditions	Values			Unit	
Parameter	Symbol Conditions		Min.	Тур.	Max.	Orill	
Input voltage	$V_{I(off)}$	$V_{CC} = 5V, I_{O} = 100 \mu A$	-	-	0.5	V	
Input voltage	V <sub>I(on)</sub>	$V_O = 0.3V$ , $I_O = 2mA$	3.0	1	-	V	
Output voltage	V <sub>O(on)</sub>	I <sub>O</sub> = 10mA, I <sub>I</sub> = 0.5mA	-	100	300	mV	
Input current	I <sub>I</sub>	V <sub>I</sub> = 5V	-	-	180	μA	
Output current	I <sub>O(off)</sub>	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V	-	-	500	nA	
DC current gain	G <sub>I</sub>	$V_{O} = 5V, I_{O} = 5mA$	68	-	-	-	
Input resistance	R <sub>1</sub>	-	32.9	47	61.1	kΩ	
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	-	8.0	1.0	1.2	-	
Transition frequency	f <sub>T</sub> *1	$V_{CE} = 10V, I_{E} = -5mA,$ f = 100MHz	-	250	-	MHz	

# ullet Electrical characteristics (T<sub>a</sub> = 25°C) <For DTr2(PNP)>

Doromotor	Cumbal	Conditions	Values			Unit
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Uffil
lament voltage	$V_{I(off)}$	$V_{CC} = -5V, I_{O} = -100 \mu A$	-	-	-0.3	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Input voltage	V <sub>I(on)</sub>	$V_O = -0.3V$ , $I_O = -20$ mA	-2.5	-	-	V
Output voltage	V <sub>O(on)</sub>	$I_O = -10 \text{mA}, I_I = -0.5 \text{mA}$	-	-100	-300	mV
Input current	I <sub>1</sub>	V <sub>I</sub> = -5V	-	-	-1.8	mA
Output current	I <sub>O(off)</sub>	$V_{CC} = -50V, V_{I} = 0V$	-	-	-500	nA
DC current gain	G <sub>I</sub>	$V_O = -5V$ , $I_O = -10mA$	30	-	-	-
Input resistance	R <sub>1</sub>	-	3.29	4.7	6.11	kΩ
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	-	1.7	2.1	2.6	-
Transition frequency	f <sub>T</sub> *1	$V_{CE} = -10V, I_{E} = 5mA,$ f = 100MHz	-	250	-	MHz

<sup>\*1</sup> Characteristics of built-in transistor.



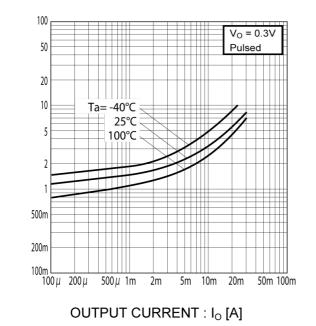
<sup>\*2</sup> Each terminal mounted on a reference land.

<sup>\*3 120</sup>mW per element must not be exceeded.

INPUT VOLTAGE: V<sub>(on)</sub> [V]

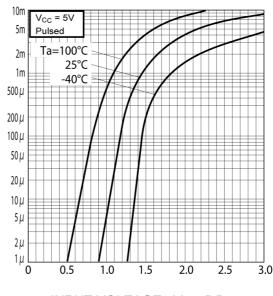
# ● Electrical characteristic curves(T<sub>a</sub> = 25°C) < For DTR1(NPN)>

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



OUTPUT CURRENT : Io [A]

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



INPUT VOLTAGE :  $V_{I(off)}[V]$ 

Fig.3 Output Current vs. Output Voltage

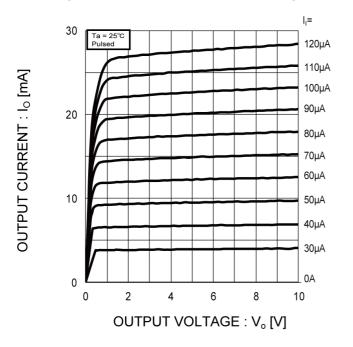
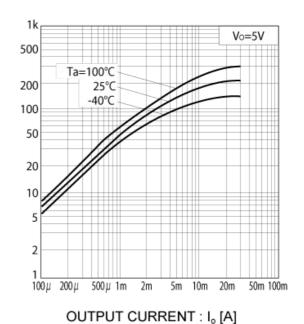


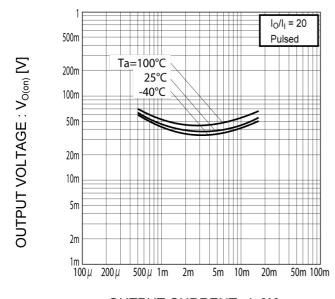
Fig.4 DC Current Gain vs. Output Current



DC CURRENT GAIN : G

# ● Electrical characteristic curves(T<sub>a</sub> = 25°C) < For DTR1(NPN)>

Fig.5 Output Voltage vs. Output Current



OUTPUT CURRENT : Io [A]

# ● Electrical characteristic curves(T<sub>a</sub>=25°C) < For DTr2(PNP)>

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

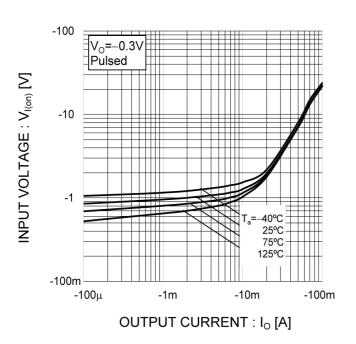


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

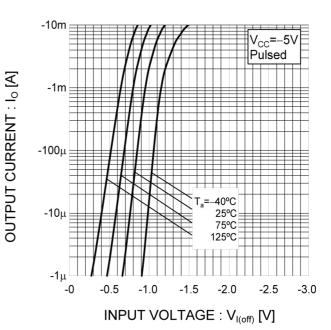


Fig.3 Output Current vs. Output Voltage

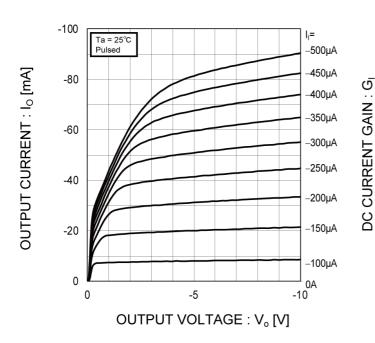
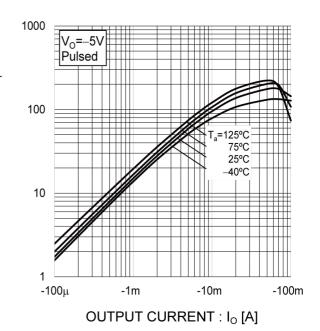
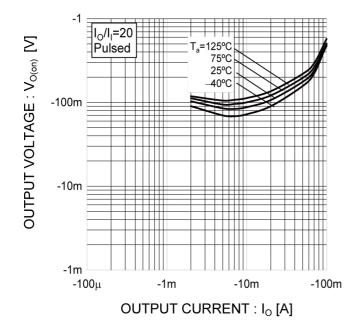


Fig.4 DC Current Gain vs. Output Current



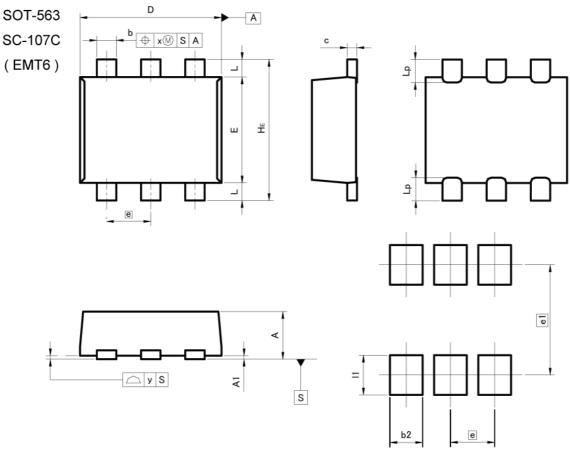
# ● Electrical characteristic curves(T<sub>a</sub>=25°C) < For DTr2(PNP)>

Fig.5 Output Voltage vs. Output Current





# Dimensions



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

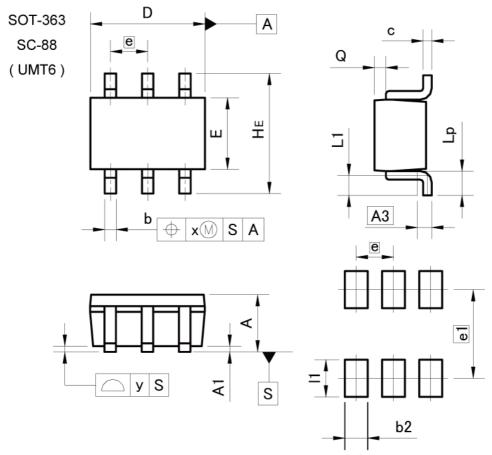
	MILIMETERS		INCHES	
DIM	IVITETIVI	ETERS	INC	ПЕЗ
Diw	MIN	MAX	MIN	MAX
Α	0.45	0.55	0.018	0.022
A1	0.00	0.10	0.000	0.004
b	0.17	0.27	0.007	0.011
С	0.08	0.18	0.003	0.007
D	1.50	1.70	0.059	0.067
E	1.10	1.30	0.043	0.051
е	0.	50	0.0	20
HE	1.50	1.70	0.059	0.067
L	0.10	0.30	0.004	0.012
Lp	_	0.35	_	0.014
х	-	0.10	_	0.004
У	_	0.10	-	0.004

DIM	MILIM	ETERS	INCHES		
DIM	MIN	MAX	MIN	MAX	
b2	_	0.37	_	0.015	
e1	1.25		0.0	49	
- 11	_	0.45	-	0.018	

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	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.3	25	0.0	10
b	0.15	0.30	0.006	0.012
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	0.0	65	0.0	26
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
х	-	0.10	,-	0.004
У		0.10	-	0.004

DIM	MILIM	ETERS	INCHES	
DIM	MIN	MAX	MIN	MAX
b2	- 7	0.40	-	0.016
e1	1.55		0.0	61
11	-	0.65	-	0.026

Dimension in mm/inches



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CLASSⅢ	CLACCIII	CLASSIIb	CI VCCIII
CLASSIV	CLASSII	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 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 (Pd) depending on Ambient temperature (Ta). When used in sealed area, confirm the actual ambient 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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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).

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- 1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
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  - [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
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- 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.

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- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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**Телефон:** 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина,

дом 2, корпус 4, литера А.