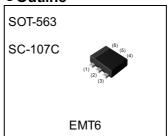


## Complex Digital Transistors (Bias Resistor Built-in Transistors)

Parameter	DTr1 and DTr2		
V <sub>CC</sub>	-50V		
I <sub>C(MAX.)</sub>	-100mA		
R <sub>1</sub>	10kΩ		
R <sub>2</sub>	47kΩ		

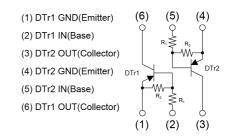
### Outline



### Features

- 1)Two DTA014Y chips in a EMT package.
- 2)Mounting possible with EMT3 automatic mounting machines.
- 3)Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

### •Inner circuit



# Application

SWITCHING CIRCUIT, INVERTER CIRCUIT, INTERFACE CIRCUIT

# Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
EMB59	SOT-563 (EMT6)	1616	T2R	180	8	8000	B59

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

### <For DTr1 and DTr2 in common>

Parameter	Symbol	Values	Unit
Supply voltage	$V_{CC}$	-50	V
Input voltage	V <sub>IN</sub>	-40 to 6	V
Output current	Io	-70	mA
Collector current	I <sub>C(MAX)</sub> *1	-100	mA
Power dissipation	P <sub>D</sub> *2*3	150	mW/TOTA
Junction temperature	Tj	150	°C
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C

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

<For DTr1 and DTr2 in common>

Darameter	Cumbal	Conditions	Values			Unit	
Parameter	Symbol	Conditions	Min.	Тур.	Max.	Orill	
Input valtage	$V_{I(off)}$	$V_{CC} = -5V, I_{O} = -100 \mu A$	-	-	-0.5	V	
Input voltage	V <sub>I(on)</sub>	$V_O = -0.3V$ , $I_O = -5mA$	-1.7	-	-	V	
Output voltage	V <sub>O(on)</sub>	I <sub>O</sub> = -5mA, I <sub>I</sub> = -0.5mA	-	-70	-150	mV	
Input current	I <sub>I</sub>	V <sub>I</sub> = -5V	-	-	-880	μA	
Output current	I <sub>O(off)</sub>	$V_{CC} = -50V, V_{I} = 0V$	-	-	-500	nA	
DC current gain		$V_{O} = -10V, I_{O} = -5mA$	80	-	1	-	
Input resistance	R <sub>1</sub>	-	7	10	13	kΩ	
Resistance ratio	R <sub>2</sub> /R <sub>1</sub>	-	3.7	4.7	5.7	-	
Transition frequency	f <sub>T</sub> *1	V <sub>CE</sub> = -10V, I <sub>E</sub> = 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.

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

<For DTr1 and DTr2 in common>

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

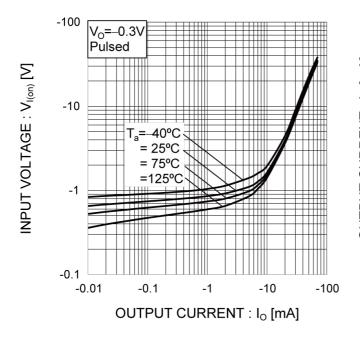


Fig.2 Output current vs. input voltage (OFF characteristics)

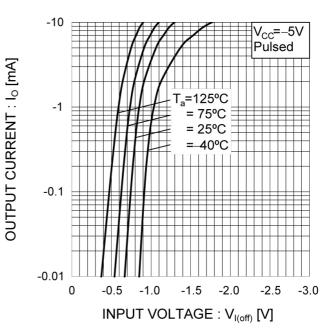


Fig.3 Output current vs. output voltage

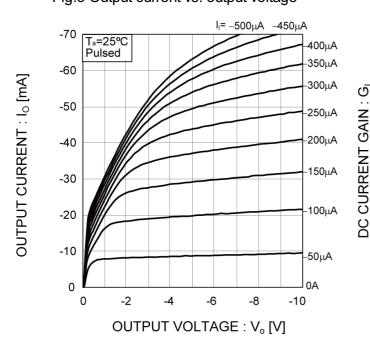
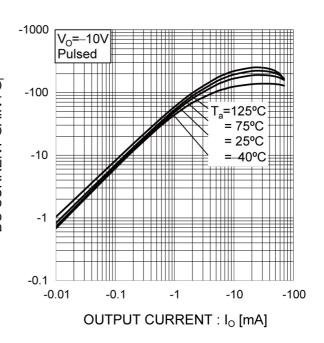


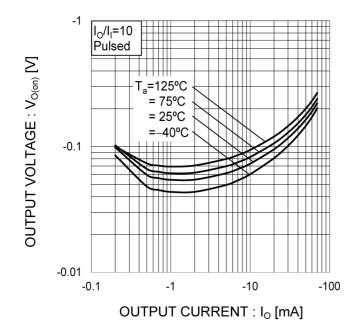
Fig.4 DC current gain vs. output current



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

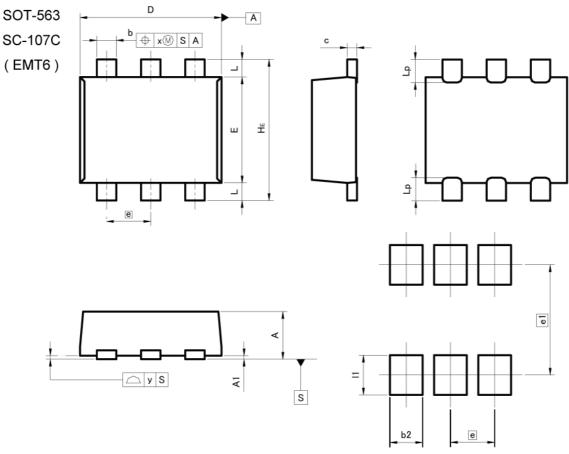
<For DTr1 and DTr2 in common>

Fig.5 Output voltage vs. output current



**ROHM** 

### Dimensions



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

DIM	MILIM	ETERS	INCHES		
DIM	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	0.020		
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		0.049			
- 11	-	0.45	-	0.018		

Dimension in mm/inches



# **Notice**

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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

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

- 2. ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
  - [a] Installation of protection circuits or other protective devices to improve system safety
  - [b] Installation of redundant circuits to reduce the impact of single or multiple circuit failure
- 3. Our Products are designed and manufactured for use under standard conditions and not under any special or extraordinary environments or conditions, as exemplified below. Accordingly, ROHM shall not be in any way responsible or liable for any damages, expenses or losses arising from the use of any ROHM's Products under any special or extraordinary environments or conditions. If you intend to use our Products under any special or extraordinary environments or conditions (as exemplified below), your independent verification and confirmation of product performance, reliability, etc, prior to use, must be necessary:
  - [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.
- You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. 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 such information.

#### **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.

### **Precaution for Foreign Exchange and Foreign Trade act**

Since concerned goods might be fallen under listed items of export control prescribed by Foreign exchange and Foreign trade act, please consult with ROHM in case of export.

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