

# General purpose (Dual digital transistor)

## **AEC-Q101 Qualified**

#### <For DTr1(NPN)>

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

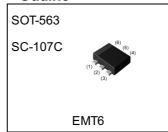
#### <For DTr2(PNP)>

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

#### Features

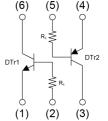
- 1)Both the DTA143T chip and DTC143T chip in an EMT6 package.
- 2)Mounting possible with EMT3 automatic mounting machines.
- 3)Transistor elements are independent, eliminating interference.
- 4) Mounting cost and area can be cut in half.

#### Outline



#### •Inner circuit

- (1) DTr1 Emitter
- (2) DTr1 Base
- (3) DTr2 Collector
- (4) DTr2 Emitter
- (5) DTr2 Base
- (6) DTr1 Collector



## Application

INVERTER, INTERFACE, DRIVER

## Packaging specifications

11 13 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
EMD6 FHA	SOT-563 (EMT6)	1616	T2R	180	8	8000	D6

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

Parameter	Symbol	DTr1(NPN)	DTr2(PNP)	Unit
Collector-base voltage	$V_{CBO}$	50	-50	V
Collector-emitter voltage	V <sub>CEO</sub>	50	-50	V
Emitter-base voltage	V <sub>EBO</sub>	5	-5	V
Collector current	I <sub>C</sub>	100	-100	mA
Power dissipation	P <sub>D</sub> *1*2	150 mV		mW/Total
Junction temperature	Tj	150		°C
Range of storage temperature	T <sub>stg</sub>	-55 to	°C	

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

	0 1 1	0 100		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	$BV_{EBO}$	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>	$I_{C} = 5\text{mA}, I_{B} = 250\mu\text{A}$	-	-	300	mV	
DC current gain	h <sub>FE</sub>	$V_{CE}$ = 5V, $I_C$ = 1mA	100	250	600	-	
Input resistance	R <sub>1</sub>	-	3.29	4.7	6.11	kΩ	
Transition frequency	f <sub>T</sub> *3	$V_{CE} = 10V, I_{E} = -5mA,$ f = 100MHz	-	250	-	MHz	

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

Davamatav	Cumphal	Conditions	Values			1.1
Parameter	Symbol Conditions —		Min.	Тур.	Max.	Unit
Collector-base breakdown voltage	$BV_CBO$	I <sub>C</sub> = -50μA	-50	-	1	V
Collector-emitter breakdown voltage	BV <sub>CEO</sub>	I <sub>C</sub> = -1mA	-50	-	-	V
Emitter-base breakdown voltage	$BV_{EBO}$	I <sub>E</sub> = -50μA	-5	-	1	V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> = -50V	1	-	-500	nA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> = -4V	1	-	-500	nA
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	$I_C = -5mA$ , $I_B = -0.25mA$	-	-	-300	mV
DC current gain	h <sub>FE</sub>	$V_{CE} = -5V, I_{C} = -1mA$	100	250	600	-
Input resistance	R <sub>1</sub>	-	3.29	4.7	6.11	kΩ
Transition frequency	f <sub>T</sub> *3	$V_{CE} = -10V, I_{E} = 5mA,$ f = 100MHz	-	250	-	MHz

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



<sup>\*2 120</sup>mW per element must not be exceeded.

<sup>\*3 200</sup>mW per element must not be exceeded.

<sup>\*4</sup> Characteristics of built-in transistor.

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

Fig.1 Grounded emitter propergation characteristics

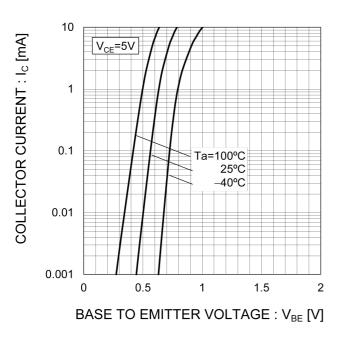


Fig.2 Grounded emitter output characteristics

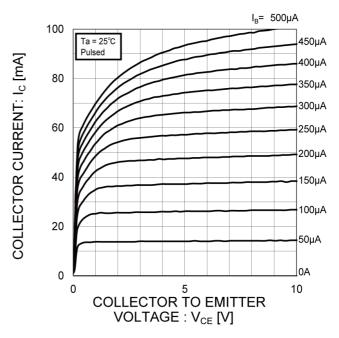


Fig.3 DC current gain vs. collector current

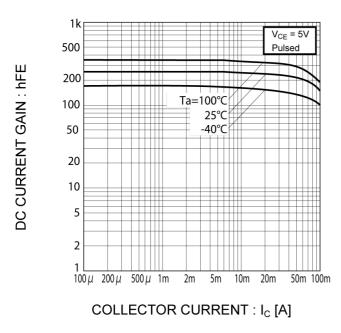
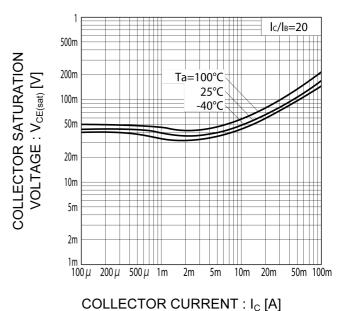


Fig.4 Collector-emitter saturation voltage vs. collector current



# ● Electrical characteristic curves(T<sub>a</sub> = 25°C) < For DTR2(PNP)>

Fig.1 Grounded emitter propergation characteristics

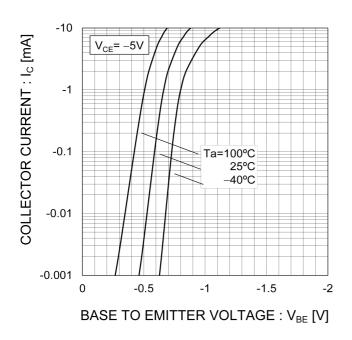


Fig.2 Grounded emitter output characteristics

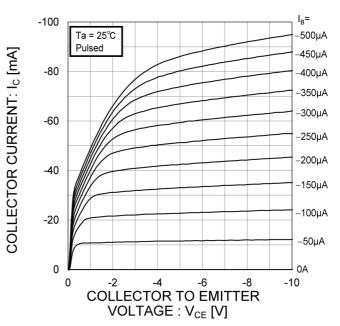


Fig.3 DC current gain vs. collector current

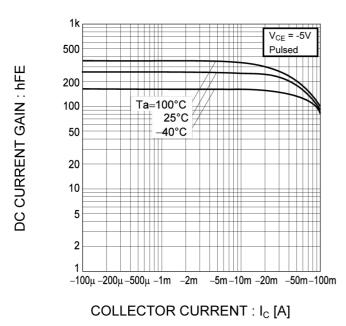
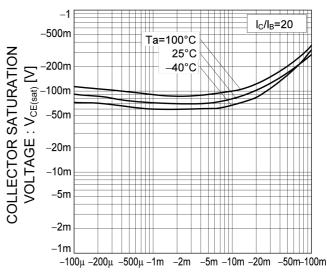
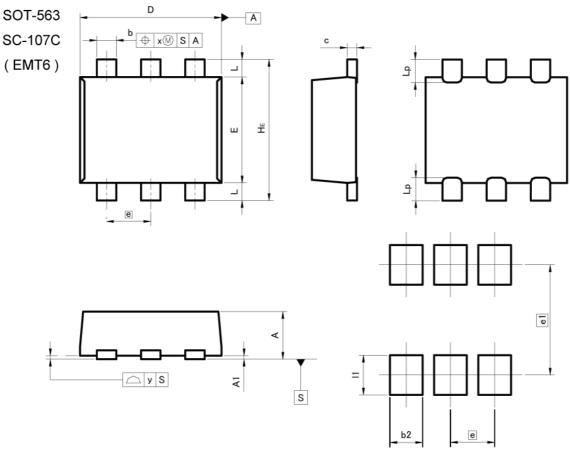


Fig.4 Collector-emitter saturation voltage vs. collector current



COLLECTOR CURRENT: Ic [A]

# Dimensions



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

	MILIMETERS		INCHES		
DIM	IVIILLIVI	LILNO	INCHES		
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	0.020		
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		
MIN		MAX	MIN	MAX	
b2	-	0.37	_	0.015	
e1	1.25		0.0	49	
- 11	-	0.45	-	0.018	

Dimension in mm/inches



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Ī	JAPAN	USA	EU	CHINA
ĺ	CLASSⅢ	CLACCIII	CLASS II b	СГУССШ
Ī	CLASSIV	CLASSⅢ	CLASSⅢ	CLASSⅢ

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  - [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
  - If 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.
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- 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.
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- 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).

#### **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.

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