DTDG14GPD

60V /1A Digital Transistor (with built-in resistor and zener diode)

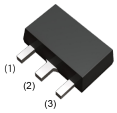
Datasheet

Parameter	Value
V_{CEO}	60±10V
I_C	1A
R	10kΩ

●Outline

SOT-89

SC-62



(MPT3)

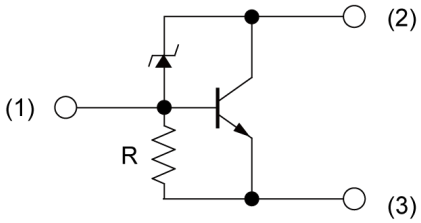
●Features

1)High h_{FE} 300(Min.) (V_{CE}/I_C=2V/500mA)

2)Low saturation voltage.
($V_{CE(sat)}$=400mV at I_C/I_B=500mA/5mA)

3)Built-in zener diode gives strong protection against reverse surge by L-load (an inductive load).

●Inner circuit



(1) BASE
(2) COLLECTOR
(3) EMITTER

●Application

DRIVER

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Quantity (pcs)	Marking
DTDG14GPD	SOT-89 (MPT3)	4540	T100	180	12	1000	E03

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●Absolute maximum ratings (T_a = 25°C)

Parameter	Symbol	Values	Unit
Collector-base voltage	V_{CBO}	60±10	V
Collector-emitter voltage	V_{CEO}	60±10	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	1	A
	I_{CP}*1	2	A
Power dissipation	P_D*2	0.5	W
	P_D*3	2.0	W
Junction temperature	T_j	150	℃
Range of storage temperature	T_{stg}	-55 to +150	℃

●Electrical characteristics (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector-base breakdown voltage	BV_{CBO}	I_C = 50μA	50	-	70	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C = 1mA	50	-	70	V
Emitter-base breakdown voltage	BV_{EBO}	I_E = 720μA	5	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = 40V	-	-	500	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 4V	300	-	580	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 500mA, I_B = 5mA	-	-	400	mV
DC current gain	h_{FE}	V_{CE} = 2V, I_C=500mA	300	-	-	-
Emitter-base resistance	R	-	7	10	13	kΩ
Transition frequency	f_T*4	V_{CE} = 5V, I_E = -100mA, f = 30MHz	-	80	-	MHz

*1 Pw≦10ms, duty=1/2

*2 Each terminal mounted on a reference land.

*3 Mounted on a 40×40×0.7mm ceramic board.

*4 Characteristics of built-in transistor.

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●Electrical characteristic curves (T_a =25°C)

Fig.1 Ground Emitter Propagation Characteristics

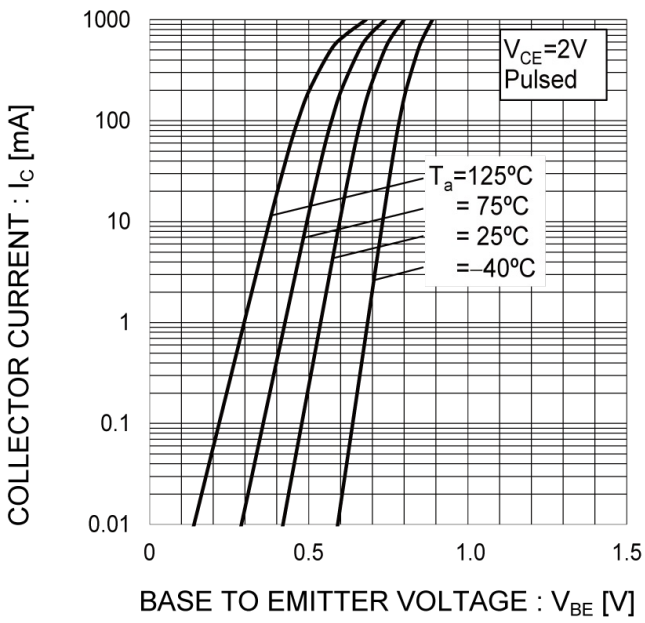


Fig.2 Typical Output Characteristics

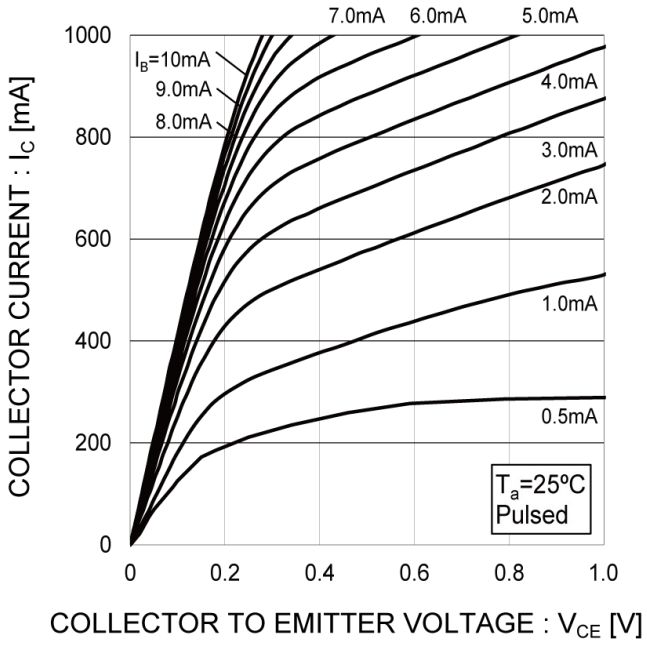


Fig.3 DC Current Gain vs. Collector Current

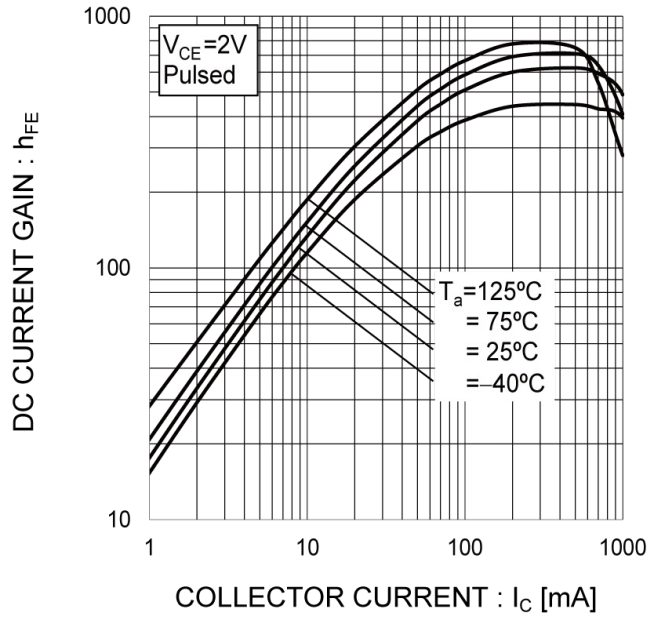
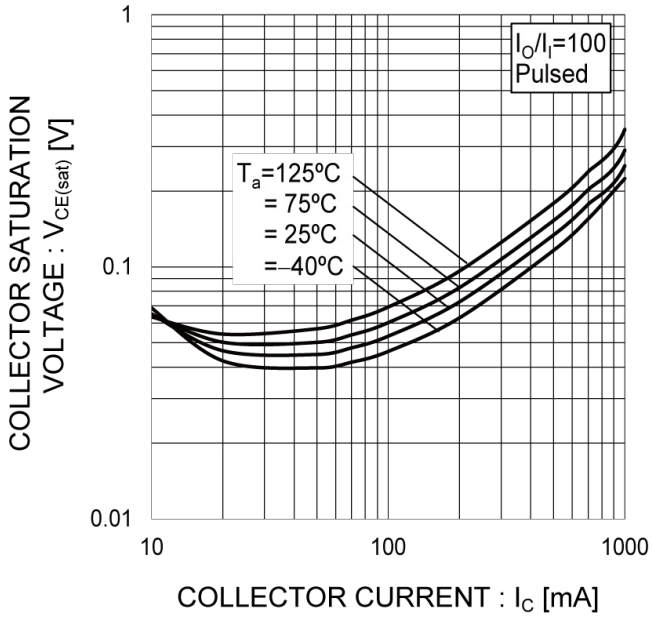


Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current(I)



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●Electrical characteristic curves (T_a =25°C)

Fig.5 Collector-Emitter Saturation Voltage vs. Collector Current(II)

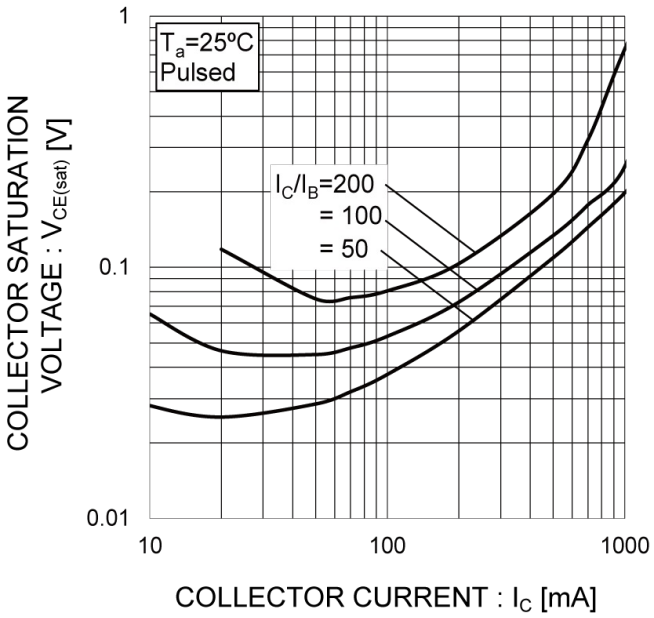
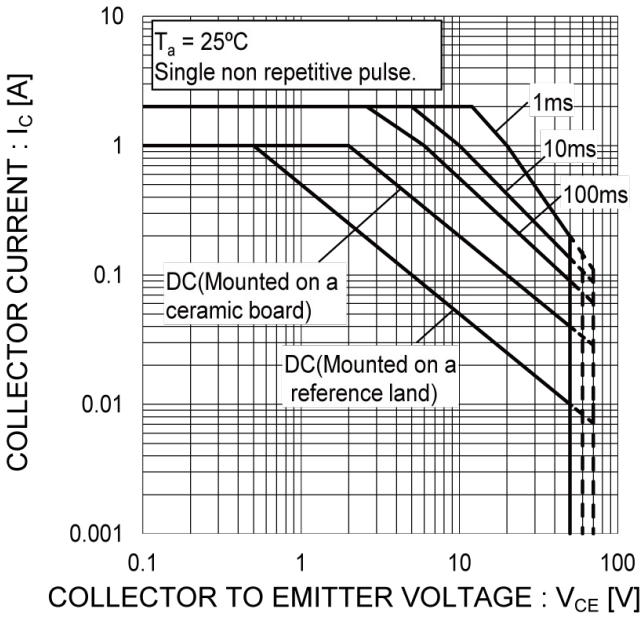


Fig.6 Safe Operating Area



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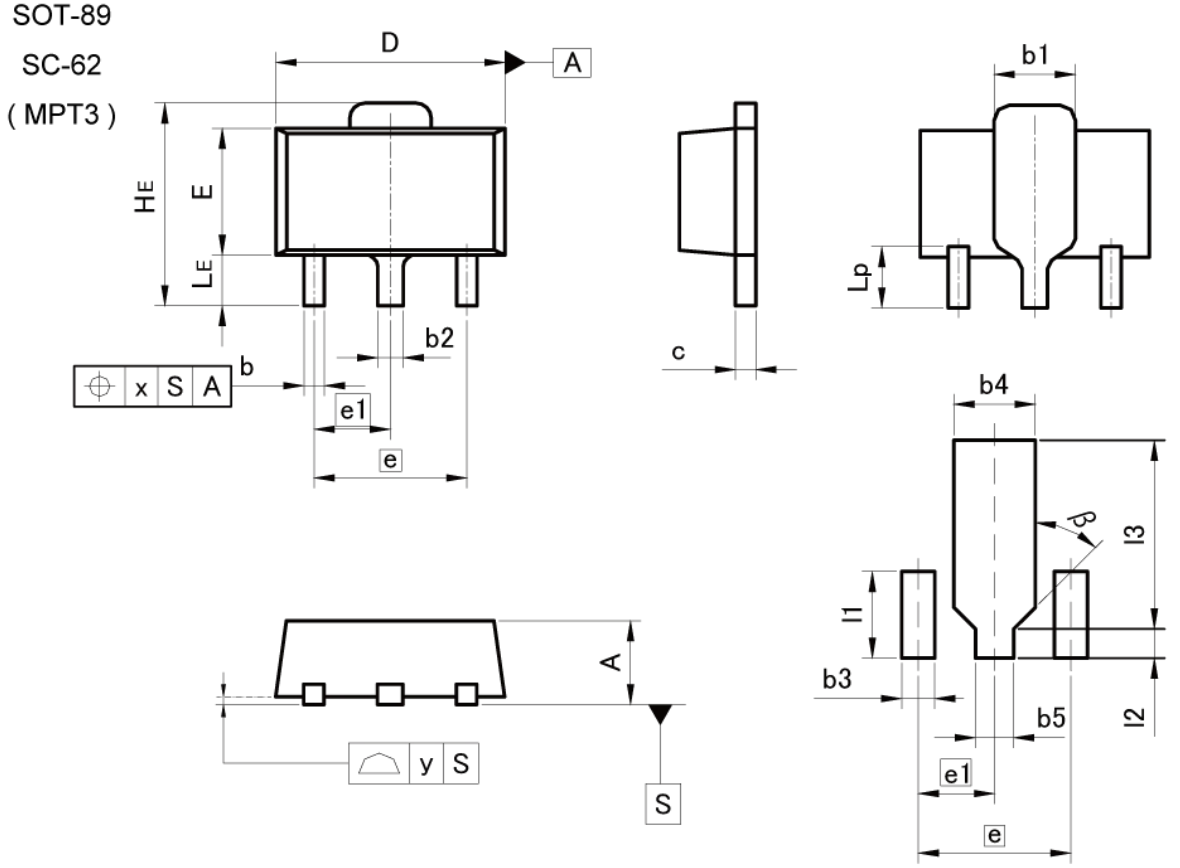
●Dimensions

SOT-89
SC-62
(MPT3)



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.40	1.60	0.055	0.063
b	0.30	0.50	0.012	0.020
b1	1.50	1.70	0.059	0.067
b2	0.40	0.60	0.016	0.024
c	0.35	0.50	0.014	0.020
D	4.40	4.70	0.173	0.185
E	2.40	2.70	0.094	0.106
e	3.00		0.118	
e1	1.50		0.059	
HE	3.70	4.30	0.146	0.169
LE	0.80	1.20	0.031	0.047
Lp	1.01	1.41	0.040	0.056
x	–	0.15	–	0.006
y	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b3	–	0.65	–	0.026
b4	–	1.70	–	0.067
b5	–	0.75	–	0.030
l1	–	1.71	–	0.067
l2	–	0.58	–	0.023
l3	–	3.72	–	0.146
β	45°		45°	

Dimension in mm/inches

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(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASSⅢ	CLASSⅢ	CLASSⅡb	CLASSⅢ
CLASSⅣ		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_2, H_2S, NH_3, SO_2, and NO_2
   [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 (Exclude cases where no-clean type fluxes is used. However, recommend sufficiently about the residue.) ; 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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2. 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 Ionizer, 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 Cl_2, H_2S, NH_3, SO_2, and NO_2
   [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

2. 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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