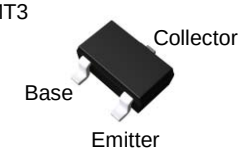
DTD123TK

NPN 500mA 40V Digital Transistors (Bias Resistor Built-in Transistors) Datasheet

Parameter	Value
V_{CEO}	40V
I_C	500mA
R	2.2kΩ

●Outline

SMT3

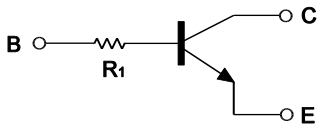


DTD123TK
SOT-346 (SC-59)

●Features

1) Built-In Biasing Resistors
2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit).
3) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of completely eliminating parasitic effects.
4) Only the on/off conditions need to be set for operation, making the circuit design easy.
5) Complementary PNP Types :DTB123TK
6) Lead Free/RoHS Compliant.

●Inner circuit



●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

●Packaging specifications

Part No.	Package	Package size (mm)	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit (pcs)	Marking
DTD123TK	SMT3	2928	T146	180	8	3,000	F02

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●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Values	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	40	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	500	mA
Power dissipation	P_d *2	200	mW
Junction temperature	T_j	150	°C
Range of storage temperature	T_{stg}	−55 to +150	°C

●Electrical characteristics(Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	BV_{CBO}	I_C= 50μA	50	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C= 1mA	40	-	-	V
Emitter-base breakdown voltage	BV_{EBO}	I_E= 50μA	5	-	-	V
Collector cut-off current	I_{CBO}	V_{CB} = 50V	-	-	0.5	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 4V	-	-	0.5	μA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C / I_B= 50mA / 2.5mA	-	-	0.3	V
DC current gain	h_{FE}	V_{CE}= 5V , I_C= 50mA	100	250	600	-
Emitter-base resistance	R	-	1.54	2.2	2.86	kΩ
Transition frequency	f_T *1	V_{CE} = 10V, I_E = −50mA, f = 100MHz	-	200	-	MHz

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference footprint

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●**Electrical characteristic curves**(Ta = 25°C)

Fig.1 Grounded emitter propagation characteristics

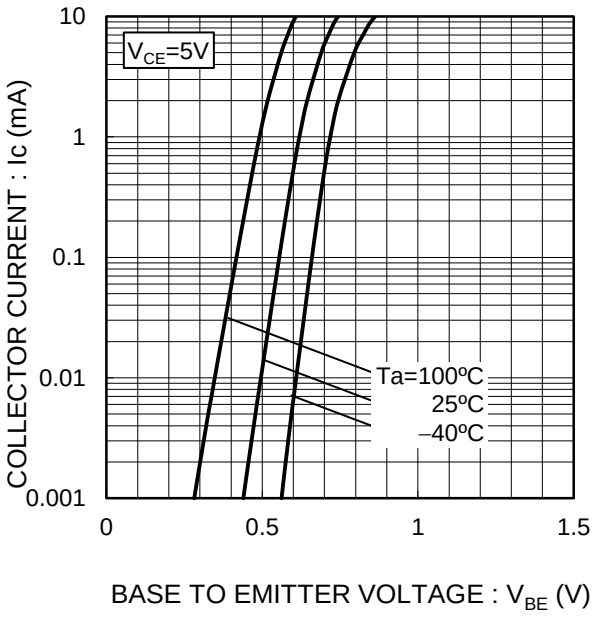


Fig.2 Grounded emitter output characteristics

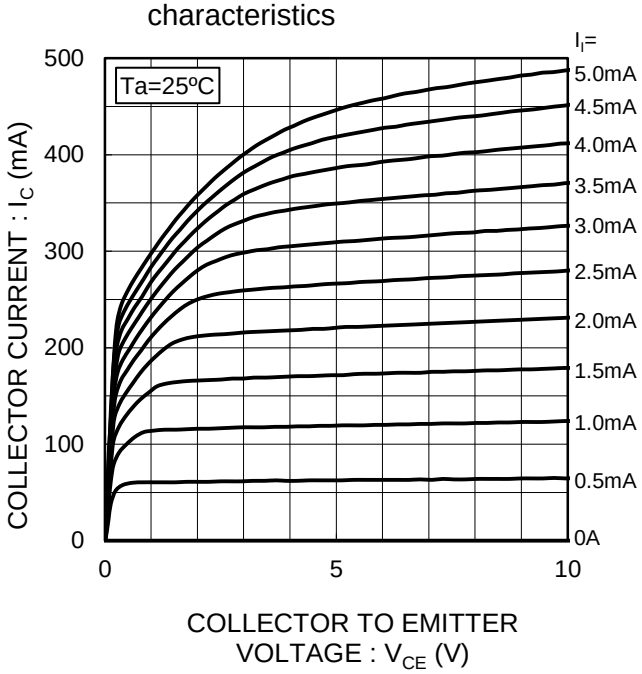


Fig.3 DC Current gain vs. Collector Current

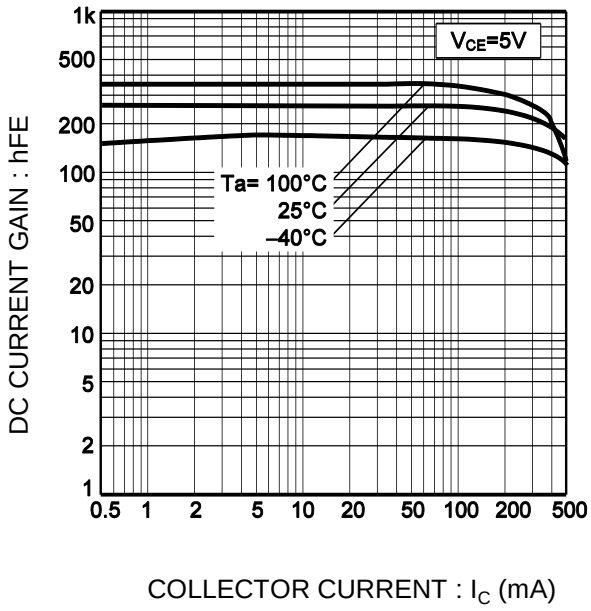
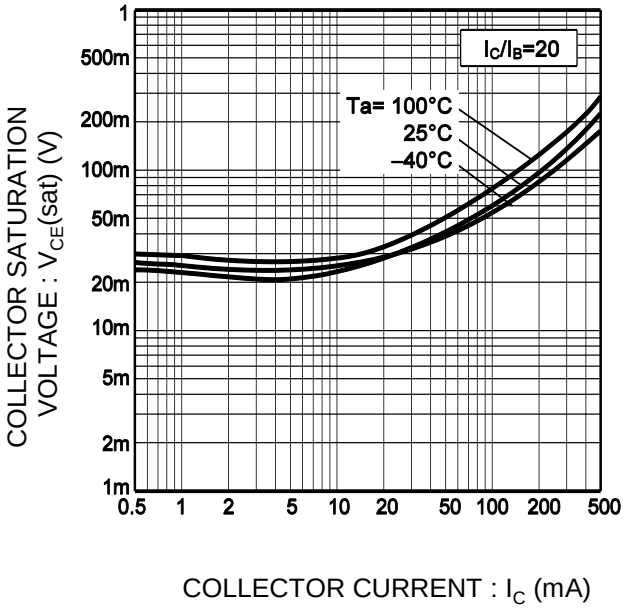


Fig.4 Collector-emitter saturation voltage vs. Collector Current

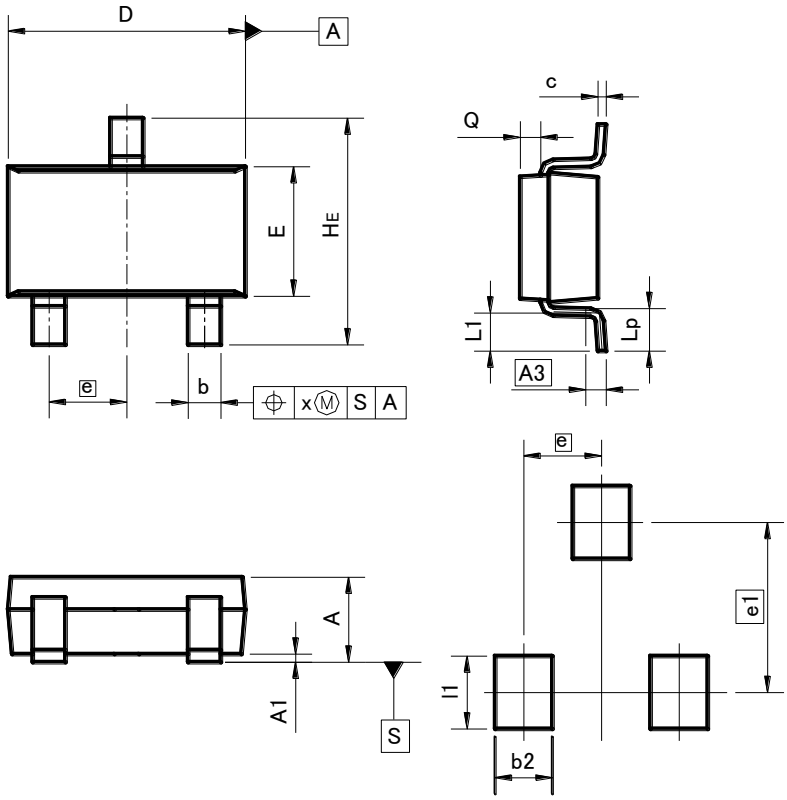


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●**Dimensions** (Unit : mm)

SMT3



Patterm of terminal position areas

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	–	0.051
A1	0.00	0.10	0	0.004
A3	0.25		0.01	
b	0.35	0.50	0.014	0.02
c	0.09	0.25	0.004	0.01
D	2.80	3.00	0.11	0.118
E	1.50	1.80	0.059	0.071
e	0.95		0.04	
HE	2.60	3.00	0.102	0.118
L1	0.30	0.60	0.012	0.024
Lp	0.40	0.70	0.016	0.028
Q	0.20	0.30	0.008	0.012
x	–	0.10	–	0.004
y	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
e1	2.10		0.08	
b2		0.60	–	0.024
l1	–	0.90	–	0.035

Dimension in mm/inches

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