DTC125T series

NPN 100mA 50V Digital Transistors (Bias Resistor Built-in Transistors) Datasheet

Parameter	Value
V_{CEO}	50V
I_C	100mA
R_1	200kΩ

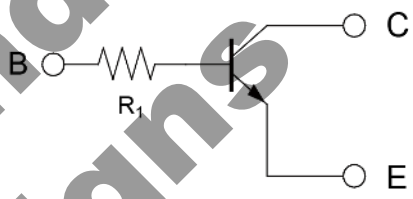
●Outline

UMT3	SMT3
	
DTC125TUA SOT-323(SC-70)	DTC125TKA SOT-346(SC-59)

●Features

1) Built-In Biasing Resistor
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: DTA125T series
6) Lead Free/RoHS Compliant.

●Inner circuit



B: BASE
C: COLLECTOR
E: EMITTER

●Application

Switching circuit, Inverter circuit, Interface circuit, Driver circuit

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTC125TUA	UMT3	2021	T106	180	8	3000	0A
DTC125TKA	SMT3	2928	T146	180	8	3000	0A

●Absolute maximum ratings (T_a = 25°C)

Parameter		Symbol	Values	Unit
Collector-base voltage		V_{CBO}	50	V
Collector-emitter voltage		V_{CEO}	50	V
Emitter-base voltage		V_{EBO}	5	V
Collector current		I_C	100	mA
Power dissipation	DTC125TUA	P_D*1	200	mW
	DTC125TKA		200	
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	-	-	V
Collector-emitter breakdown voltage	BV_{CEO}	I_C = 1mA	50	-	-	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 = 0.5mA / 0.05mA	-	-	0.3	V
DC current gain	h_{FE}	V_{CE} = 5V, I_C = 1mA	100	250	600	-
Input resistance	R_1	-	140	200	260	kΩ
Transition frequency	f_T*2	V_{CE} = 10V, I_E = -5mA, f = 100MHz	-	250	-	MHz

*1 Each terminal mounted on a reference footprint

*2 Characteristics of built-in transistor

●Electrical characteristic curves (T_a =25°C)

Fig.1 Grounded emitter propagation characteristics

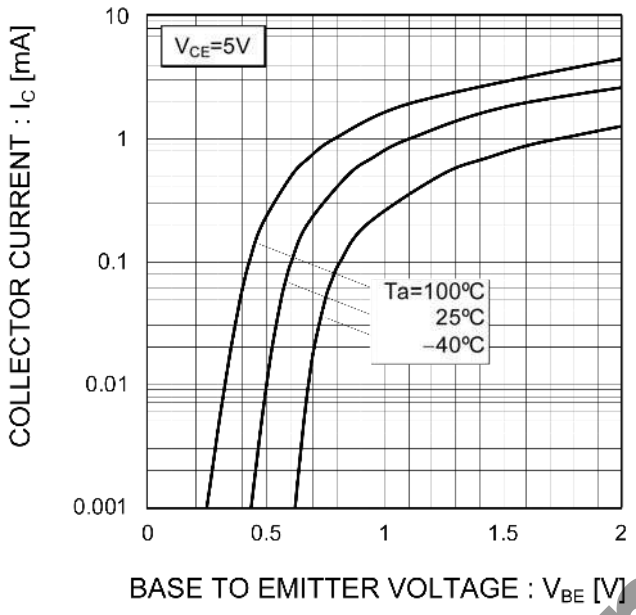


Fig.2 Grounded emitter output characteristics

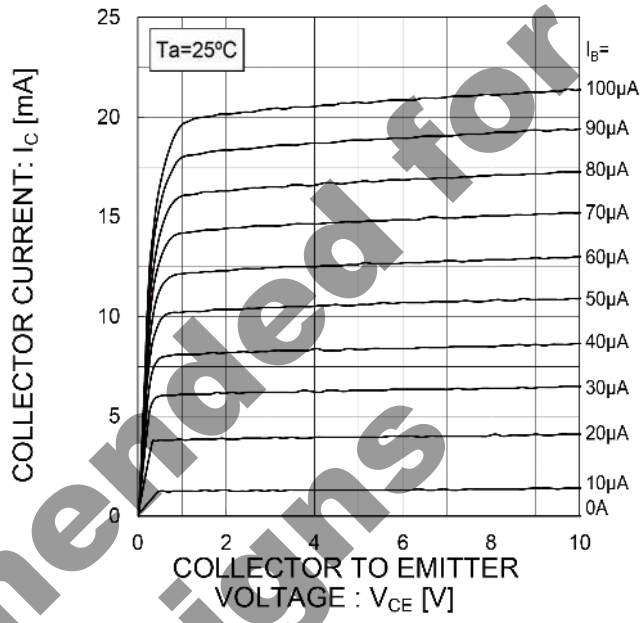


Fig.3 DC Current gain vs. Collector Current

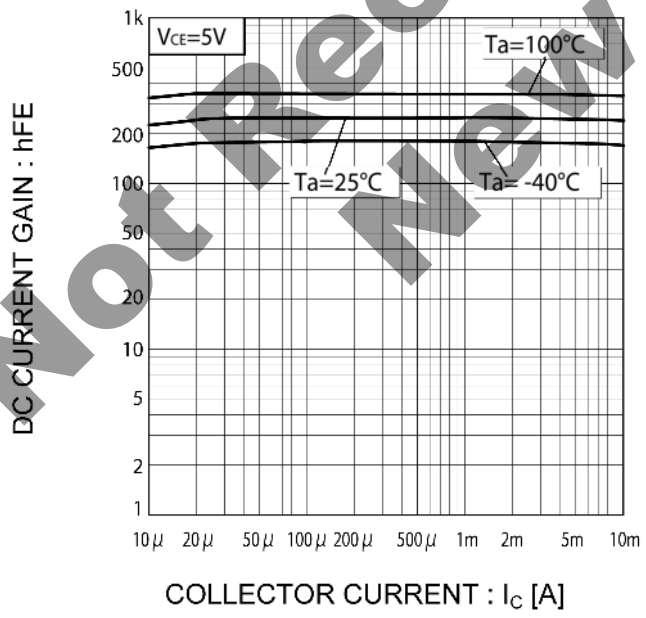
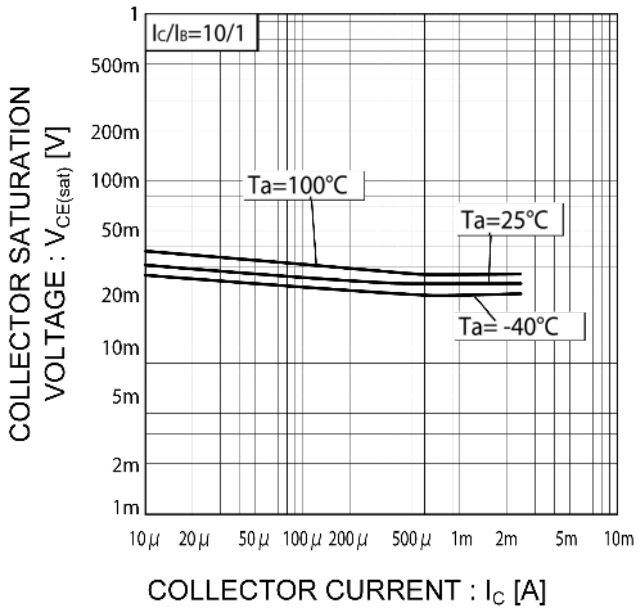
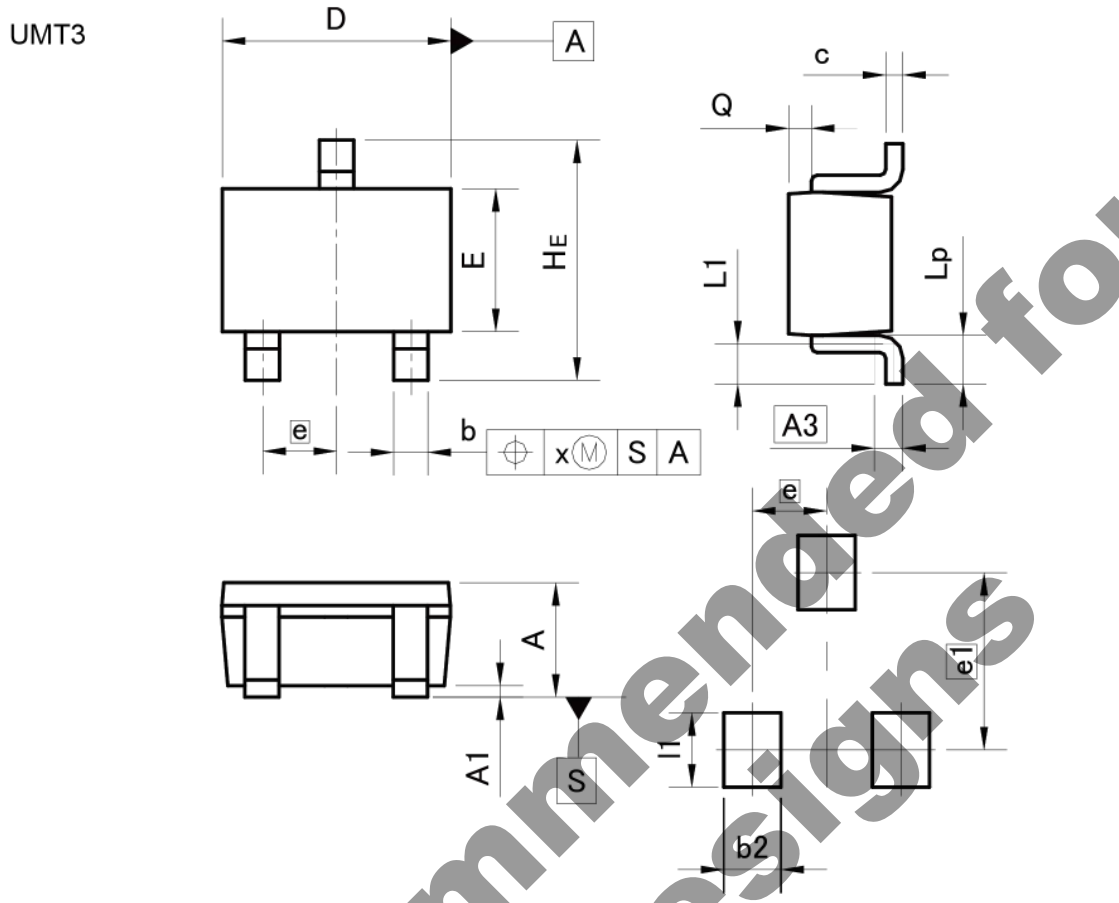


Fig.4 Collector-emitter saturation voltage vs. Collector Current



●Dimensions

UMT3



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

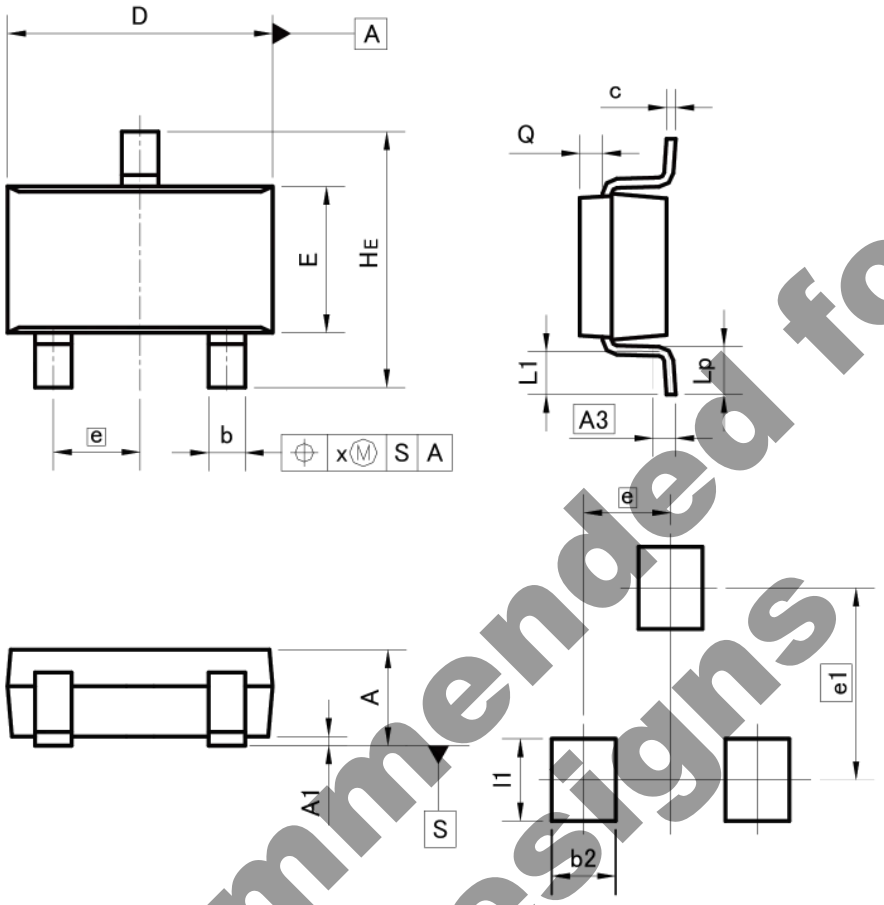
DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
x	–	0.10	–	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	–	0.50	–	0.020
e1	1.55		0.061	
l1	–	0.65	–	0.026

Dimension in mm/inches

●Dimensions

SMT3



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

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.35	0.50	0.014	0.020
c	0.09	0.25	0.004	0.010
D	2.80	3.00	0.110	0.118
E	1.50	1.80	0.059	0.071
e	0.95		0.037	
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
b2	–	0.60	–	0.024
e1	2.10		0.083	
l1	–	0.90	–	0.035

Dimension in mm/inches

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