

-100mA / -50V Digital transistors (with built-in resistors)

DTA143TM / DTA143TE / DTA143TUA DTA143TKA / DTA143TSA

●Applications

Inverter, Interface, Driver

●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- 3) Only the on/off conditions need to be set for operation, making the device design easy.

●Structure

PNP epitaxial planar silicon transistor (Resistor built-in type)

●External dimensions (Unit : mm)

DTA143TM ROHM : VMT3 Abbreviated symbol : 93 (1) Base (2) Emitter (3) Collector	DTA143TE ROHM : EMT3 Abbreviated symbol : 93 (1) Emitter (2) Base (3) Collector
DTA143TUA ROHM : UMT3 EIAJ : SC-70 Abbreviated symbol : 93 Each lead has same dimensions (1) Emitter (2) Base (3) Collector	DTA143TKA ROHM : SMT3 EIAJ : SC-59 Abbreviated symbol : 93 Each lead has same dimensions (1) Emitter (2) Base (3) Collector
DTA143TSA ROHM : SPT EIAJ : SC-72 Abbreviated symbol : A143TS (1) Emitter (2) Collector (3) Base	

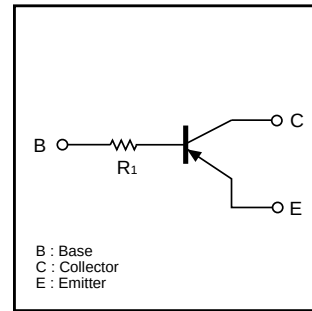
DTA143TM / DTA143TE / DTA143TUA DTA143TKA / DTA143TSA

Transistors

●Packaging specifications

Part No.	Package	VMT3	EMT3	UMT3	SMT3	SPT
	Packaging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTA143TM		○	—	—	—	—
DTA143TE		—	○	—	—	—
DTA143TUA		—	—	○	—	—
DTA143TKA		—	—	—	○	—
DTA143TSA		—	—	—	—	○

●Equivalent circuit



$R_1 = 4.7k\Omega$

●Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Limits					Unit
		DTA143TM	DTA143TE	DTA143TUA	DTA143TKA	DTA143TSA	
Collector-base voltage	V_{CB0}	-50					V
Collector-emitter voltage	V_{CE0}	-50					V
Emitter-base voltage	V_{EB0}	-5					V
Collector current	I_C	-100					mA
Collector power dissipation	P_C	150		200		300	mW
Junction temperature	T_j	150					$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150					$^\circ\text{C}$

●Electrical characteristics ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CB0}	-50	—	—	V	$I_C = -50\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CE0}	-50	—	—	V	$I_C = -1\text{mA}$
Emitter-base breakdown voltage	BV_{EB0}	-5	—	—	V	$I_E = -50\mu\text{A}$
Collector cutoff current	I_{CB0}	—	—	-0.5	μA	$V_{CB} = -50\text{V}$
Emitter cutoff current	I_{EB0}	—	—	-0.5	μA	$V_{EB} = -4\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	—	-0.3	V	$I_C/I_B = -5\text{mA}/-0.25\text{mA}$
DC current transfer ratio	h_{FE}	100	250	600	—	$I_C = -1\text{mA}$, $V_{CE} = -5\text{V}$
Input resistance	R_1	3.29	4.7	6.11	$k\Omega$	—
Transition frequency	f_T *	—	250	—	MHz	$V_{CE} = -10\text{V}$, $I_E = 5\text{mA}$, $f = 100\text{MHz}$

* Characteristics of built-in transistor

●Electrical characteristic curves

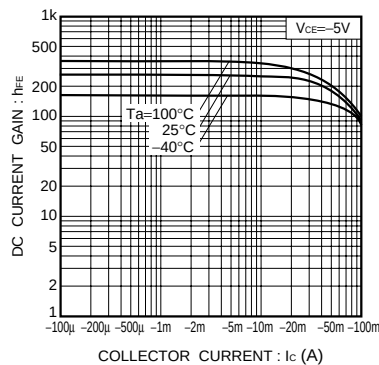


Fig.1 DC current gain vs. collector current

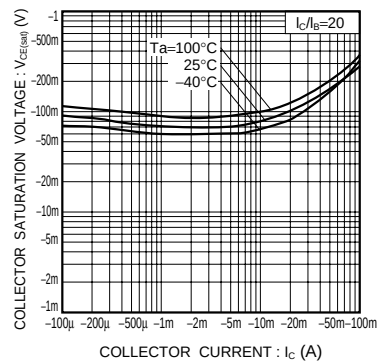


Fig.2 Collector-emitter saturation voltage vs. collector current

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