

DTC144EUA-Q1

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DTC144EUA-Q1

100mA 50V Digital Transistors (Built-in Resistors) NPN Silicon

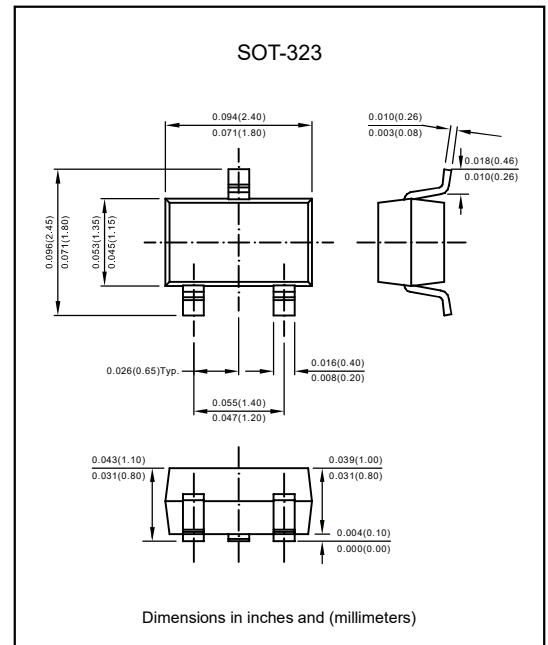
Features

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistor.
- The bias resistors are thin-film resistors with complete isolation to allow negative biasing of the input.
- Qualified to AEC-Q101 standards for high reliability
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. DTC144EUA-Q1-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-323.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_A=25^\circ\text{C}$ unless otherwise noted)

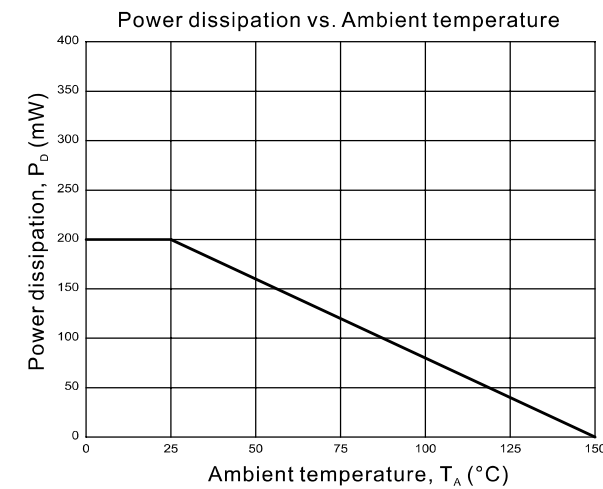
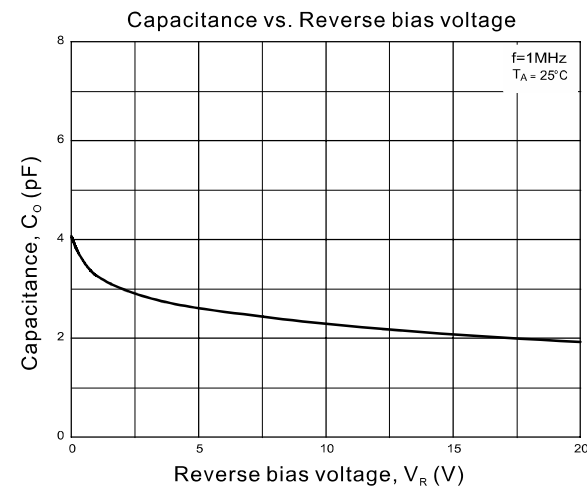
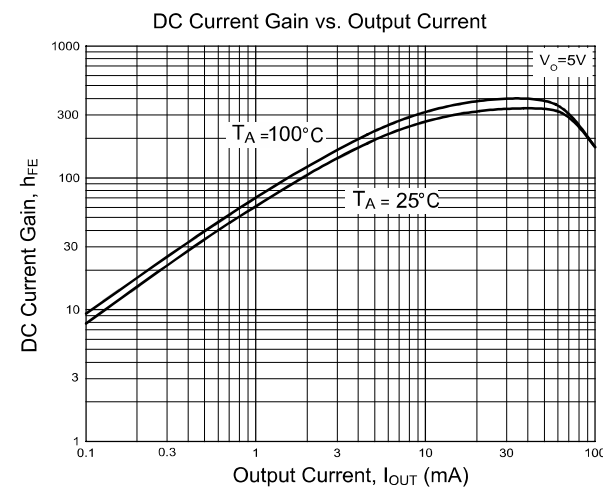
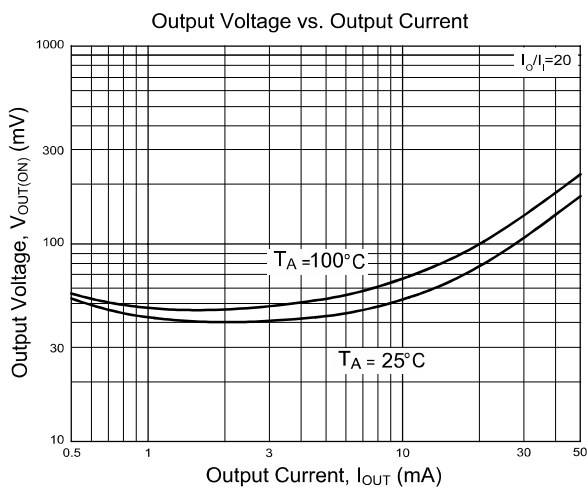
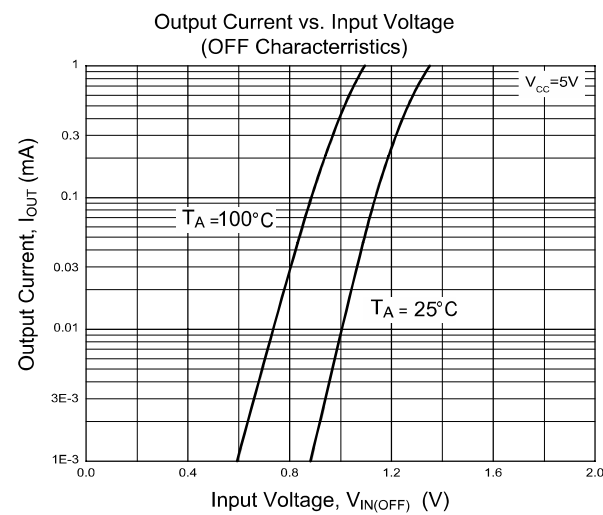
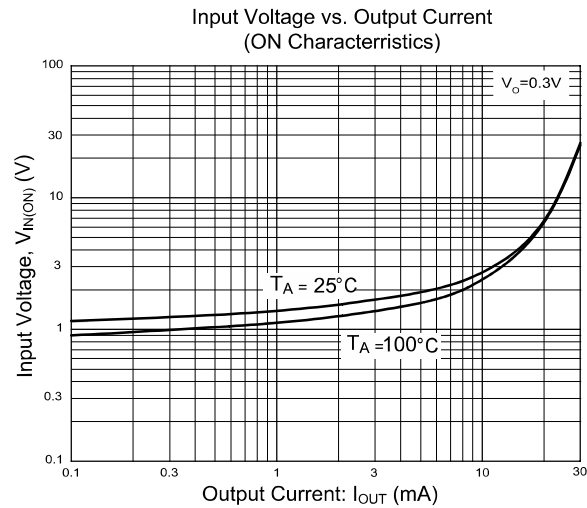
Parameter	Symbol	Value	Unit
Collector to emitter voltage	V_{CC}	50	V
Input voltage	V_{IN}	-10 to +40	V
Output current	I_{OUT}	100	mA
Peak collector current	I_{CM}	100	mA
Power dissipation	P_D	200	mW
Junction temperature	T_J	+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical characteristics (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Input voltage	$V_{CC}=5V, I_{OUT}=100\mu A$	$V_{IN(OFF)}$	0.5			V
	$V_{OUT}=0.3V, I_{OUT}=2mA$	$V_{IN(ON)}$			3	V
Output voltage	$I_{OUT} / I_{IN}=10mA/0.5mA$	$V_{OUT(ON)}$			0.3	V
Input current	$V_{IN}=5V$	I_{IN}			0.18	mA
Output current	$V_{CC}=50V, V_{IN}=0V$	$I_{OUT(OFF)}$			0.5	μA
DC current gain	$V_{OUT}=5V, I_{OUT}=5mA$	h_{FE}	68			
Transition frequency	$V_{CE}=10V, I_E=5mA, f=100MHz$	f_T		250		MHz
Input resistance		R_1	32.9	47	61.1	K Ω
Resistance ratio		R_2 / R_1	0.8	1	1.2	

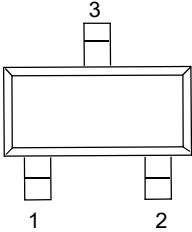
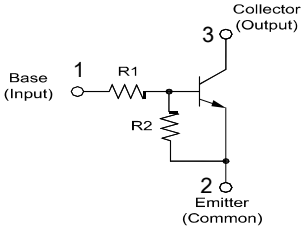
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Rating and characteristic curves (DTC144EUA-Q1)

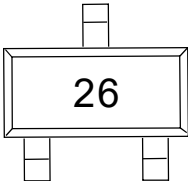


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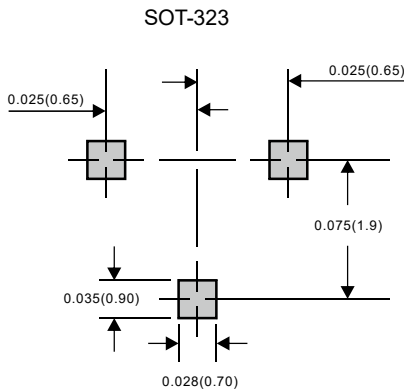
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Base Pin 2 Emitter Pin 3 Collector		

Marking

Type number	Marking code
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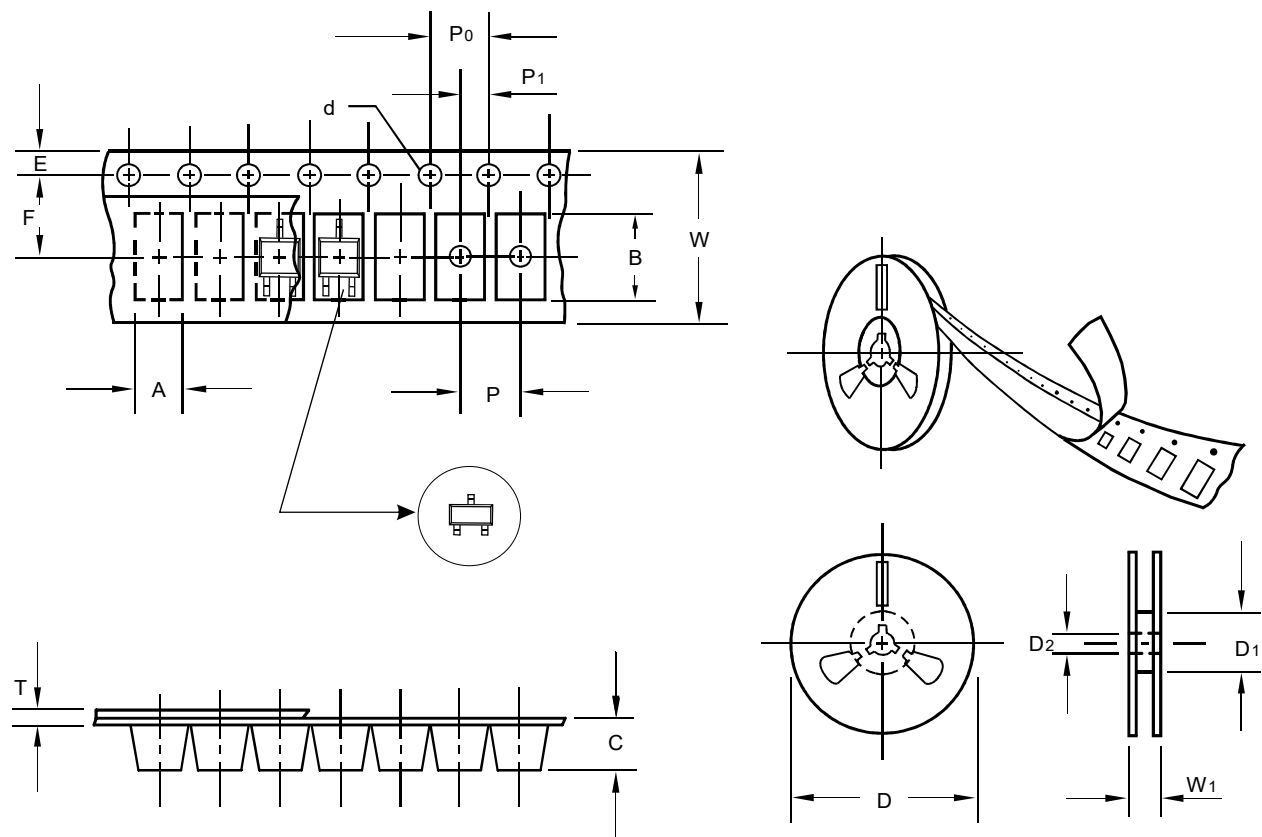
Suggested solder pad layout



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	2.30
Carrier length	B	0.1	2.55
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	54.40
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.30

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

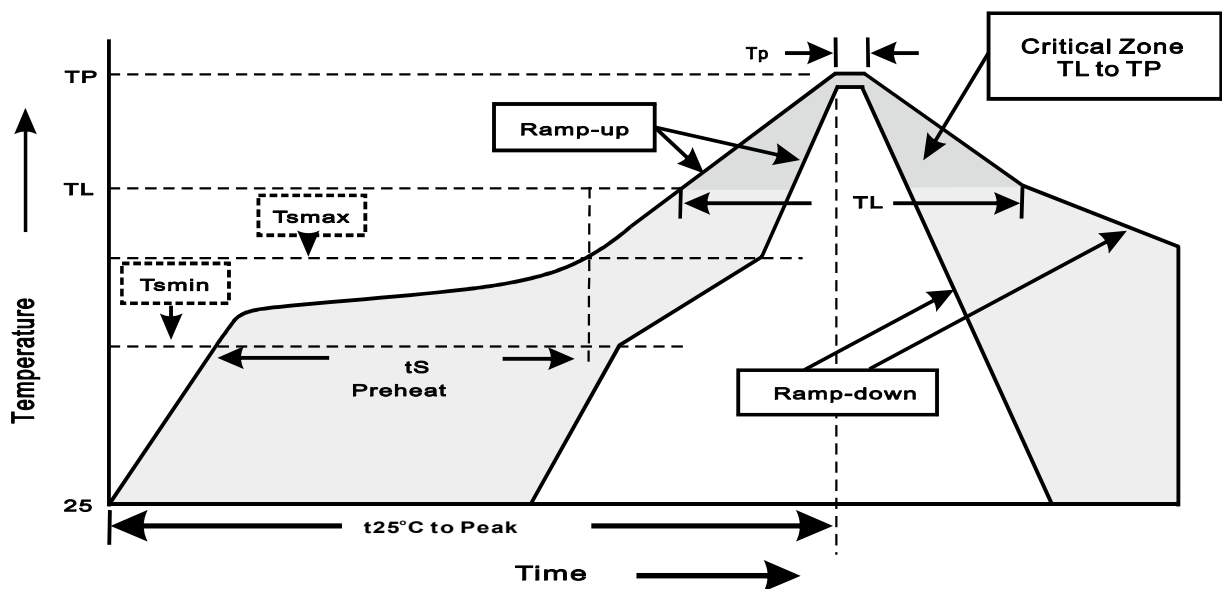
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-323	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.5

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat - Temperature Min(T_{smin}) - Temperature Max(T_{smax}) - Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} to T_L - Ramp-upRate	<3°C/sec
Time maintained above: - Temperature(T_L) - Time(t_L)	217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes