

DTC143XE

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DTC143XE

NPN Digital Transistor (Built - In-Resistor)

Features

- With built-in bias resistors.
- Simplify circuit design.
- Reduce a quantity of parts and manufacturing process.
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. DTC143XE-H.

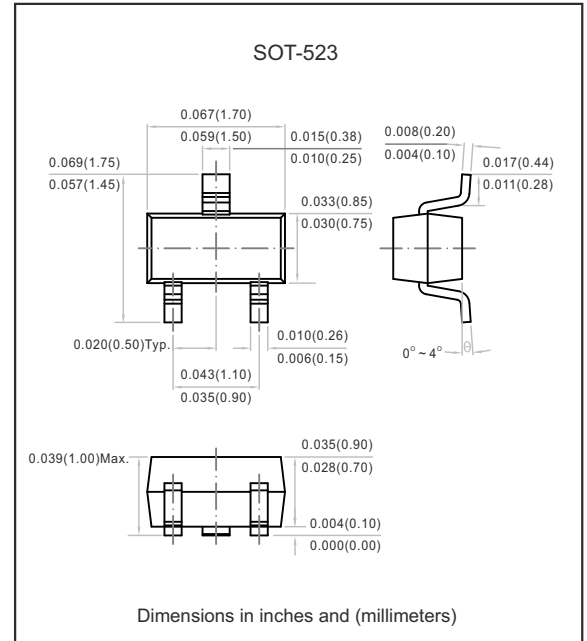
Applications

- Inverter, Interface, Driver

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-523
- 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_{CEO}	50	V
Input voltage	V_{IN}	-7 to +20	V
Collector current	I_{OUT}	100	mA
Power dissipation	P_D	150	mW
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

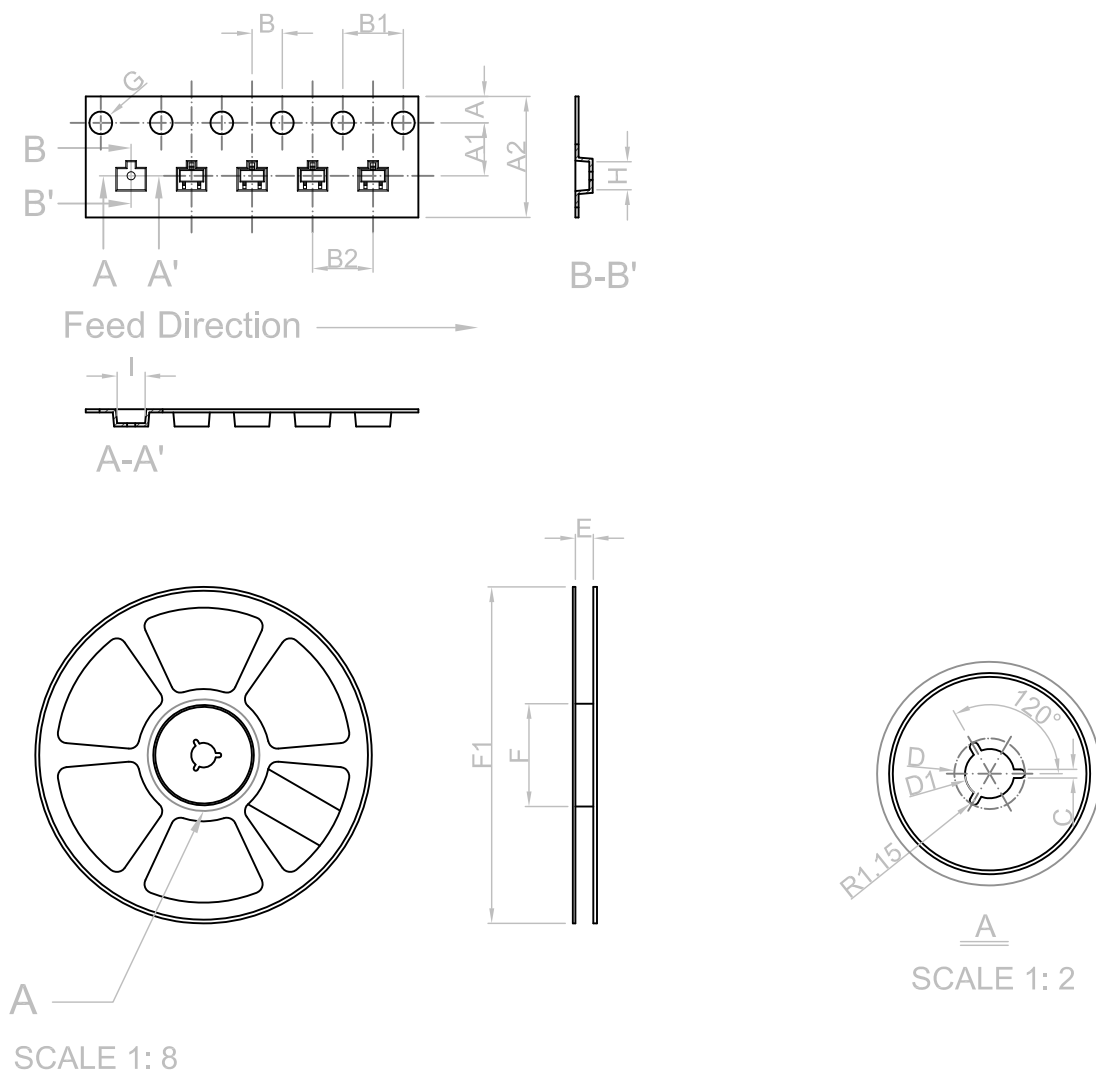
Electrical characteristics (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Input voltage	$V_{CC}=5V, I_{OUT}=100\mu A$	$V_{IN(OFF)}$			0.3	V
	$V_{OUT}=0.3V, I_{OUT}=20mA$	$V_{IN(ON)}$	2.5			
Output voltage	$I_{OUT} / I_{IN}=10mA / 0.5mA$	$V_{OUT(ON)}$		0.1	0.3	V
Input current	$V_{IN}=5V$	I_{IN}			1.8	mA
Output current	$V_{CC}=50V, V_{IN}=0V$	$I_{O(OFF)}$			0.5	μA
DC current gain	$V_{OUT}=5V, I_{OUT}=10mA$	h_{FE}	30			
Input resistance		R_1	3.29	4.7	6.11	K Ω
Resistance ratio		R_2 / R_1	1.7	2.1	2.6	
Transition frequency	$V_{CE}=10V, I_E=5mA, f=100MHz$ (Note)	f_T		250		MHZ

Note : Transition frequency of the device.

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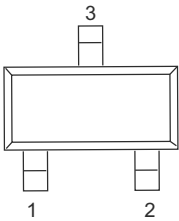
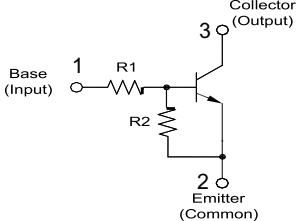
Packing information



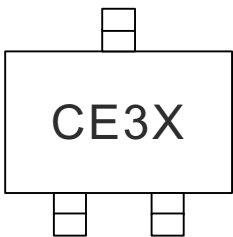
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.65	1.85	0.065	0.073
A1	3.45	3.55	0.136	0.140
A2	7.90	8.20	0.311	0.323
B	1.95	2.05	0.077	0.081
B1	3.90	4.10	0.154	0.161
B2	3.90	4.10	0.154	0.161
C	1.50	3.00	0.059	0.118
D	21.00	22.00	0.827	0.866
D1	12.50	13.50	0.492	0.531
E	8.50	9.50	0.335	0.374
F	53.90	54.90	2.122	2.161
F1	177.00	179.00	6.969	7.047
G	1.50	1.60	0.059	0.063
H	1.80	1.90	0.071	0.075
I	1.80	1.90	0.071	0.075

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Pinning information

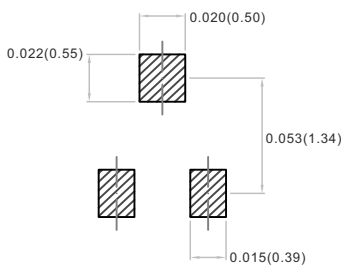
Pin	Simplified outline	Symbol
Pin1 Base Pin2 Emitter Pin3 Collector		

Marking and resistor values



Suggested solder pad layout

SOT-523



Dimensions in inches and (millimeters)

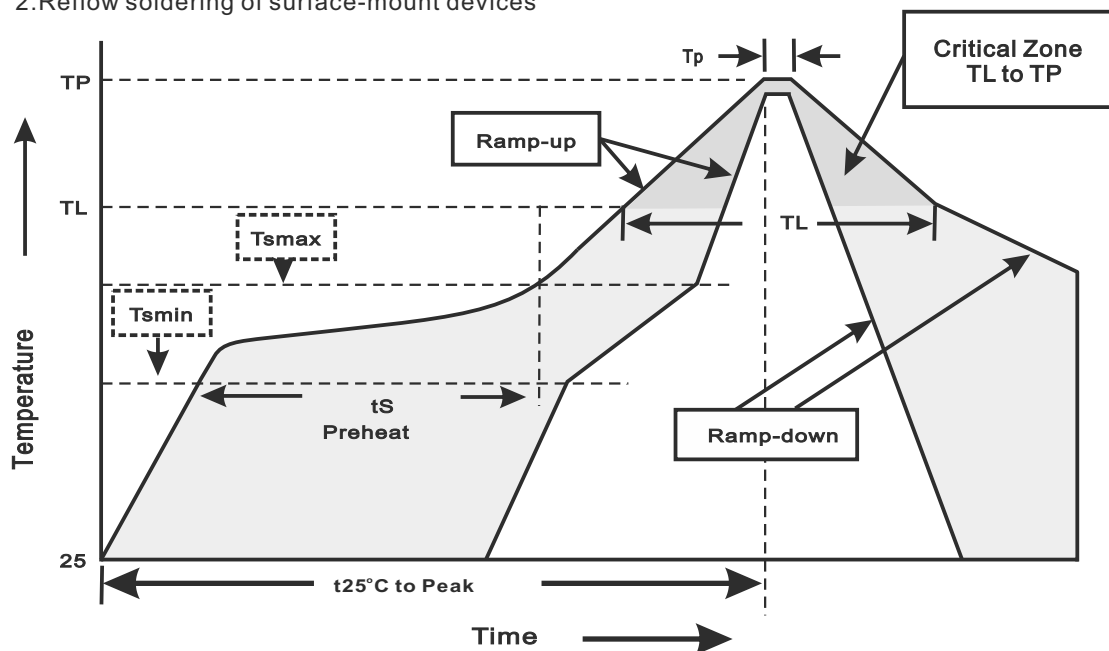
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Reel packing

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-523	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