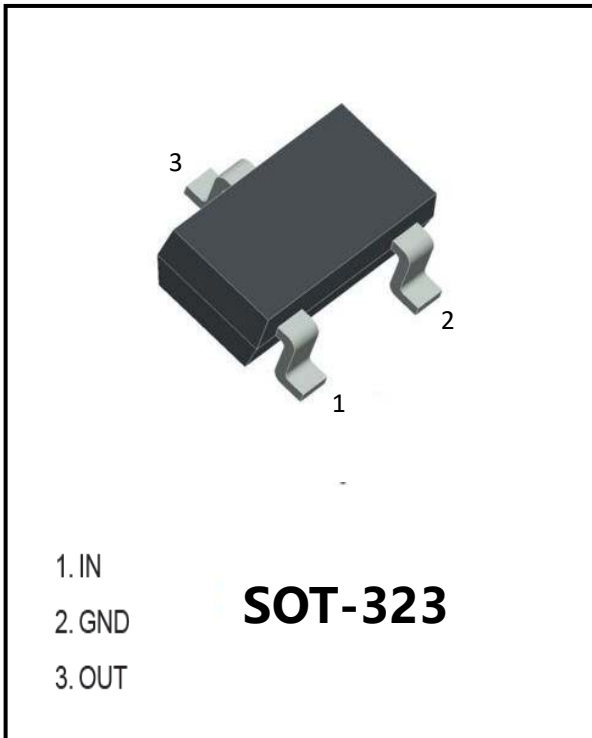


## NPN Digital Transistors (Built-in Resistors)



### Features

- Epoxy meets UL-94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors
- Only the on/off conditions need to be set for operation, making the circuit design easy
- Simplifies Circuit Design、 Reduces Board Space、 Reduces Component Count
- Part no. with suffix "Q" means AEC-Q101 qualified

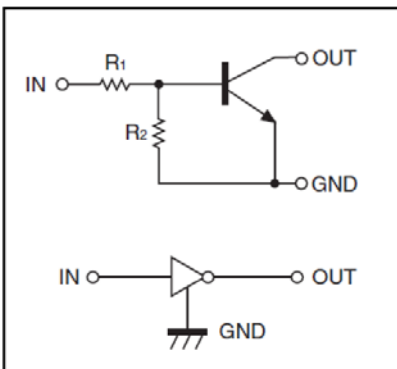
### Application

- Control of IC inputs、 Switching loads、 Digital system

### Mechanical Data

- **Package:** SOT-323
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** E42

### Equivalent circuit





# DTC123JUAQ

## ■Maximum Ratings (Ta=25°C Unless otherwise specified)

ITEM	SYMBOL	UNIT	VALUE
Collector-Emitter Voltage	$V_{CEO}$	V	50
Collector-Base Voltage	$V_{CBO}$	V	50
Emitter-Base Voltage	$V_{EBO}$	V	5
Supply Voltage	$V_{CC}$	V	50
Input Voltage	$V_{IN}$	V	-5 to +12
Collector Current	$I_C$	mA	100
Power Dissipation	$P_D$	mW	200
Thermal Resistance From Junction to Ambient (*)	$R_{\theta JA}$	°C/W	625
Junction Temperature	$T_j$	°C	-55 to +150
Storage Temperature	$T_{stg}$	°C	-55 to +150

(\*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch

## ■Electrical Characteristics (Ta=25°C unless otherwise specified)

ITEM	SYMBOL	UNIT	CONDITIONS	MIN	TYP	MAX
Input voltage	$V_{I(off)}$	V	$V_{CC}=5V, I_O=100\mu A$	0.5		
	$V_{I(on)}$	V	$V_O=0.3V, I_O=5mA$			1.1
Output voltage	$V_{O(on)}$	V	$I_O=5mA, I_I=0.25mA$			0.3
Input current	$I_I$	mA	$V_I=5V$			3.6
Output current	$I_{O(off)}$	$\mu A$	$V_{CC}=50V, V_I=0$			0.5
DC current gain	$G_I$		$V_O=5V, I_O=10mA$	80		
Input resistance	$R_I$	k $\Omega$		1.54	2.2	2.86
Resistance ratio	$R_2/R_1$			17	21	26
Transition frequency	$f_T$	MHz	$V_O=10V, I_O=5mA, f=100MHz$		250	

## ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
DTC123JUAQ	F2	Approximate 0.005	3000	30000	120000	7" reel



## ■ Characteristics (Typical)

Fig.1 - ON Characteristics

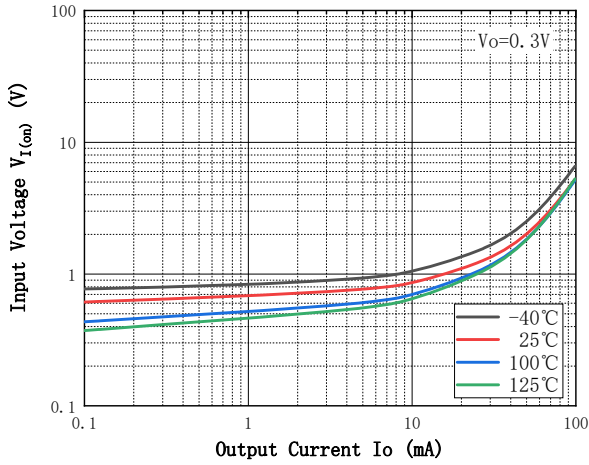


Fig.2 - OFF Characteristics

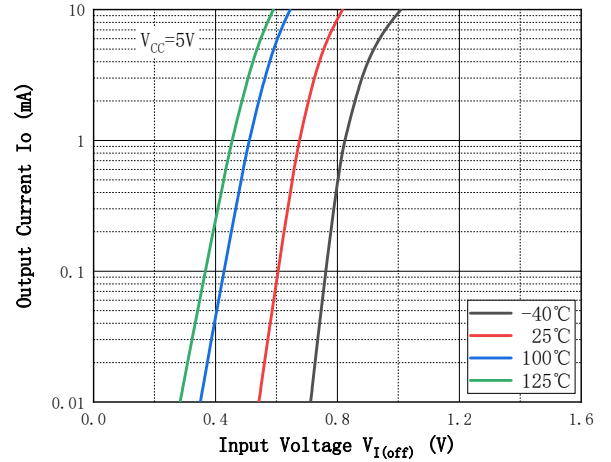


Fig.3 - Output Voltage Characteristics

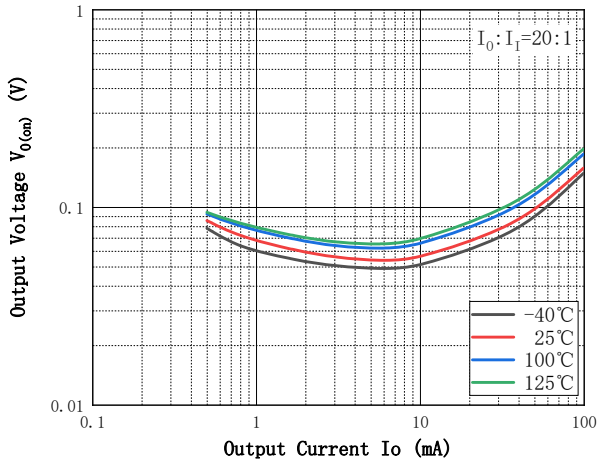


Fig.4 - DC Current Gain Characteristics

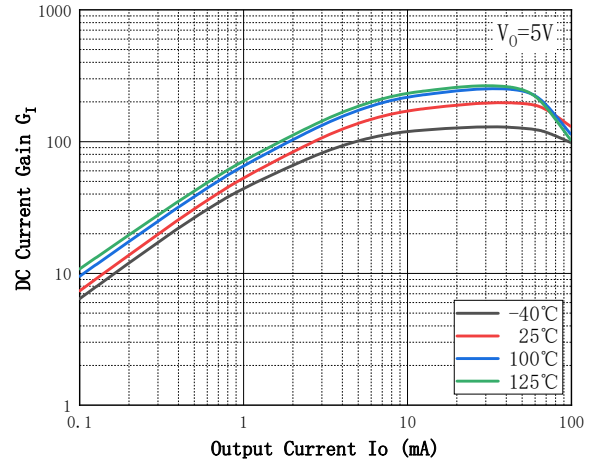


Fig.5 -  $C_o - V_{CB}$

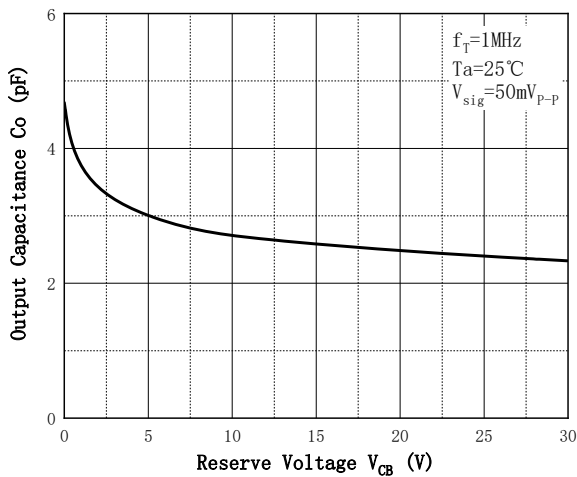
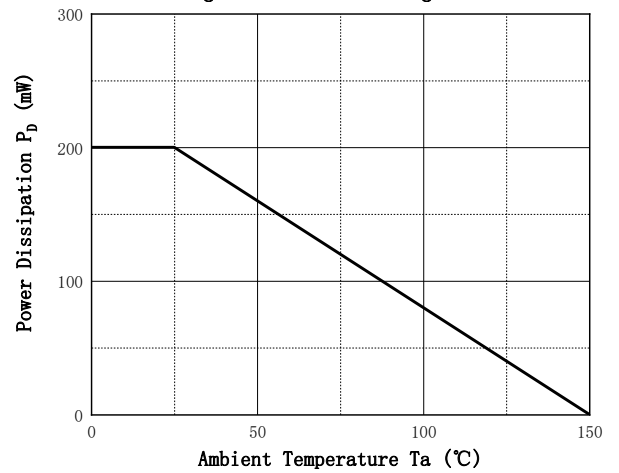


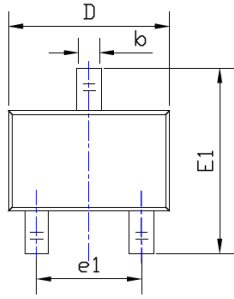
Fig.6 - Power Derating Curve



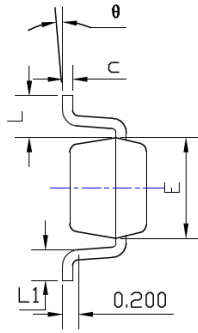


# DTC123JUAQ

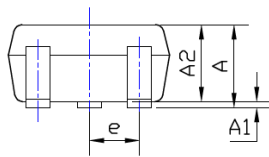
## ■ SOT-323 Package Outline Dimensions & Suggested Pad Layout



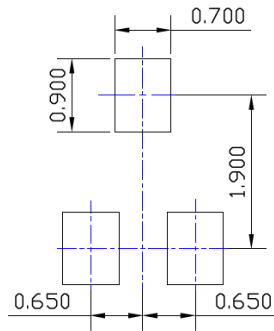
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
A2	0.035	0.039	0.900	1.000
b	0.006	0.016	0.150	0.400
c	0.004	0.010	0.100	0.250
D	0.071	0.087	1.800	2.200
E	0.045	0.053	1.150	1.350
E1	0.085	0.096	2.150	2.450
e	0.026TYP		0.650TYP	
e1	0.047	0.055	1.200	1.400
L	0.021REF		0.525REF	
L1	0.010	0.018	0.260	0.460
θ	0°	8°	0°	8°

**NOTE:**

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



## DTC123JUAQ

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