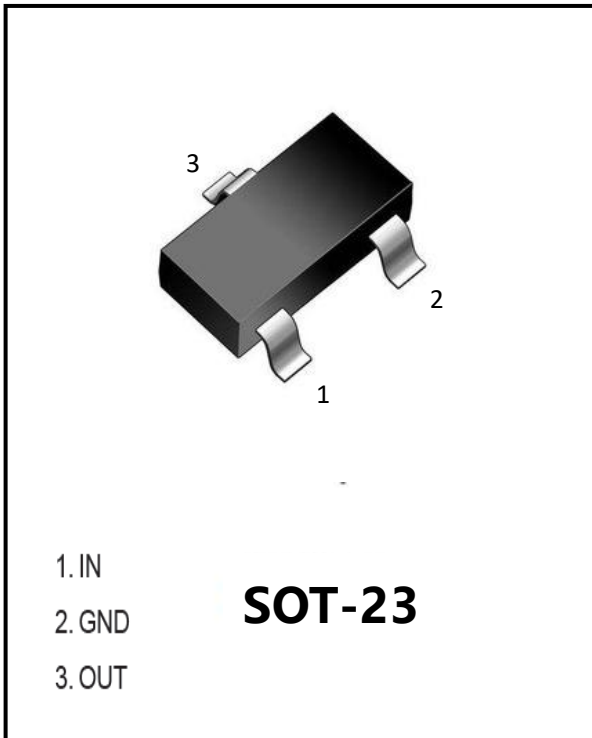


NPN Digital Transistors (Built-in Resistors)



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

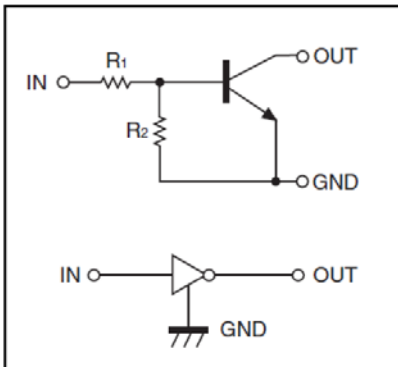
Application

- Control of IC inputs、Switching loads、Digital system

Mechanical Data

- **Package:** SOT-23
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** E42

■Equivalent circuit





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■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
Output 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	$I_{O(off)}$	μA	$V_{CC}=50V, V_I=0$			0.5
DC current gain	G_I		$V_O=5V, I_O=10mA$	80		
Input resistance	R_1	k Ω		1.54	2.2	2.86
Resistance ratio	R_2/R_1			17	21	26
Transition frequency	fT	MHz	$V_{CE}=10V, I_C=5mA, f=100MHz$		250	

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
DTC123JCAQ	F2	Approximate 0.009	3000	30000	120000	7" reel



■ Characteristics (Typical)

Fig.1 - ON Characteristics

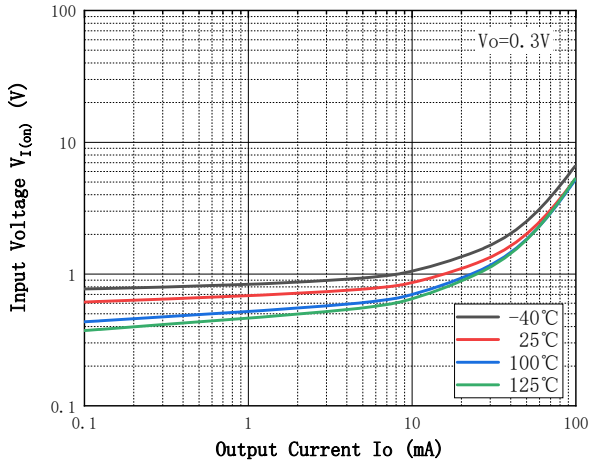


Fig.2 - OFF Characteristics

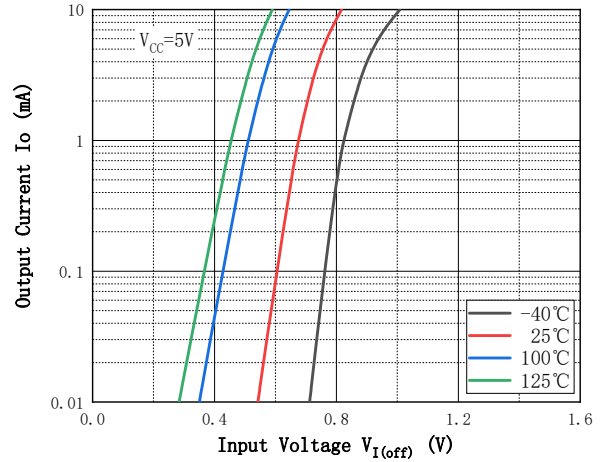


Fig.3 - Output Voltage Characteristics

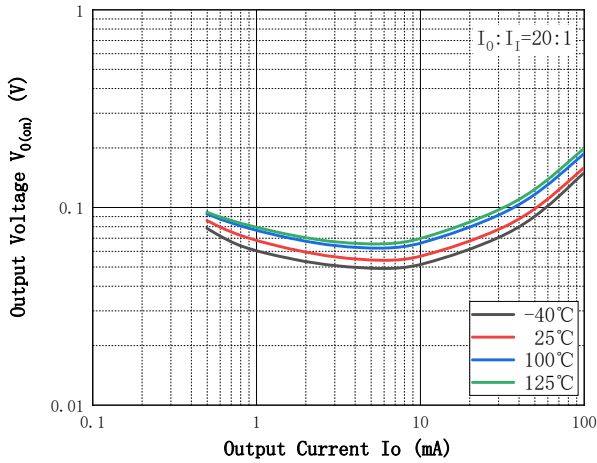


Fig.4 - DC Current Gain Characteristics

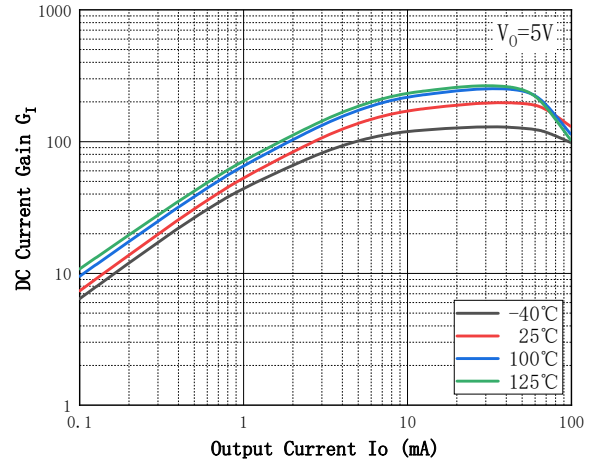


Fig.5 - $C_o - V_{CB}$

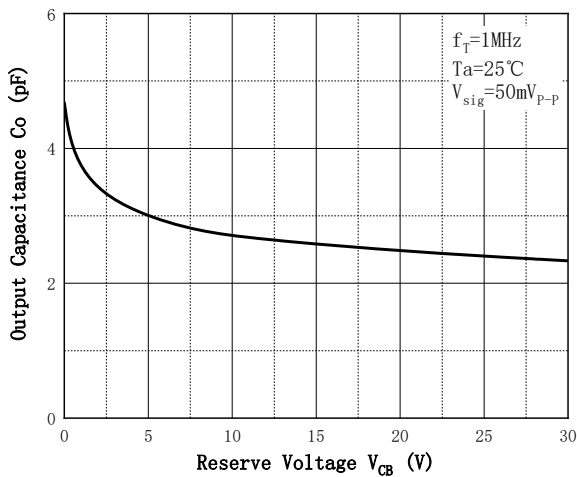
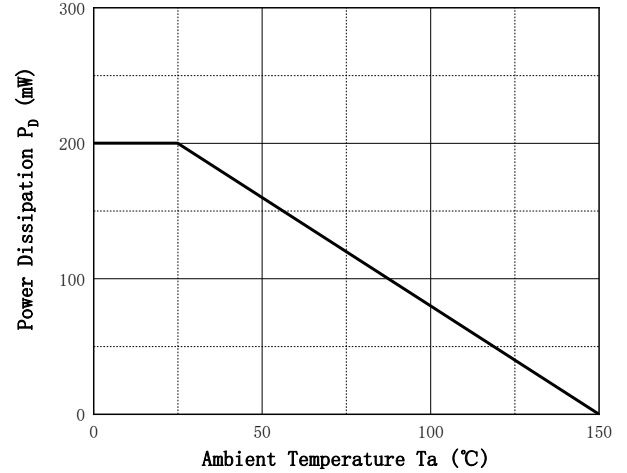


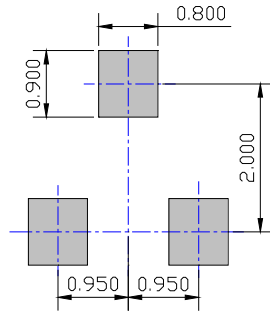
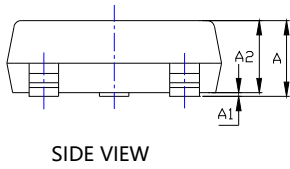
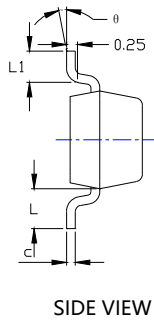
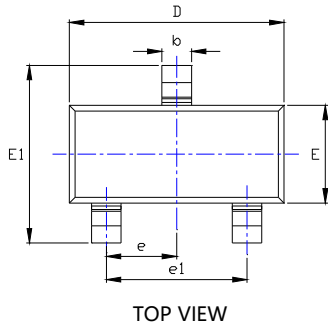
Fig.6 - Power Derating Curve





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■SOT-23 Package Outline Dimensions & Suggested Pad Layout



UNIT: mm

SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.045	0.900	1.150
A1	0.000	0.004	0.000	0.100
A2	0.035	0.041	0.900	1.050
b	0.012	0.020	0.300	0.500
c	0.004	0.008	0.100	0.200
D	0.110	0.118	2.800	3.000
E	0.047	0.055	1.200	1.400
E1	0.089	0.100	2.250	2.550
e	0.037TYP		0.950TYP	
e1	0.071	0.079	1.800	2.000
L	0.022REF		0.550REF	
L1	0.012	0.020	0.300	0.500
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.



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