



DTC124E

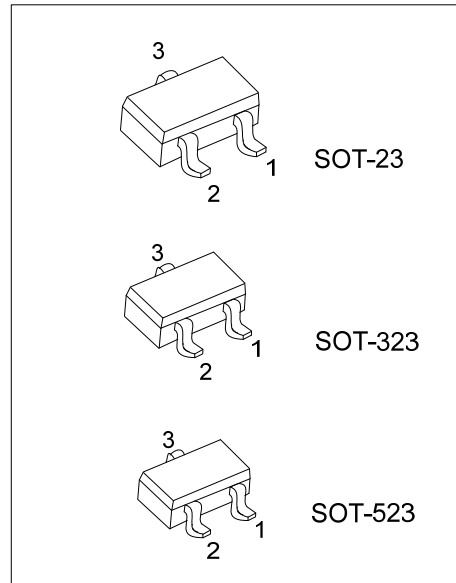
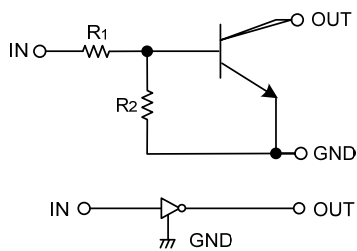
NPN EPITAXIAL SILICON TRANSISTOR

NPN DIGITAL TRANSISTOR (BUILT-IN RESISTORS)

■ FEATURES

- *Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see the equivalent circuit).
- *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.
- *Only the on / off conditions need to be set for operation, making device design easy.

■ EQUIVALENT CIRCUIT



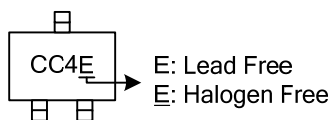
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
DTC124EL-AE3-R	DTC124EG-AE3-R	SOT-23	G	I	O	Tape Reel
DTC124EL-AL3-R	DTC124EG-AL3-R	SOT-323	G	I	O	Tape Reel
DTC124EL-AN3-R	DTC124EG-AN3-R	SOT-523	G	I	O	Tape Reel

Note: Pin Assignment: G: GND I: IN O: OUT

<p>DTC124EL-AE3-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p>	<p>(1) R: Tape Reel (2) AE3: SOT-23, AL3: SOT-323, AN3: SOT-523 (3) G: Halogen Free, L: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified.)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	50	V
Input Voltage		V_{IN}	-10 ~ +40	V
Output Current		I_C	100	mA
		I_O	30	
Power Dissipation	SOT-23/SOT-323	P_D	200	mW
	SOT-523		150	
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-40 ~ +150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	$V_{I(OFF)}$	$V_{CC} = 5V, I_{OUT} = 100\mu\text{A}$			0.5	V
	$V_{I(ON)}$	$V_{OUT} = 0.2V, I_{OUT} = 5\text{mA}$	3			
Output Voltage	$V_{O(ON)}$	$I_{OUT}/I_{IN} = 10\text{mA} / 0.5\text{mA}$		0.1	0.3	V
Input Current	I_I	$V_{IN} = 5V$			0.36	mA
Output Current	$I_{O(OFF)}$	$V_{CC} = 50V, V_{IN} = 0V$			0.5	μA
DC Current Gain	G_I	$V_{OUT} = 5V, I_{OUT} = 5\text{mA}$	56			
Input Resistance	R1		15.4	22	28.6	k Ω
Resistance Ratio	R2/R1		0.8	1	1.2	
Transition Frequency	f_T	$V_{CE} = 10V, I_E = -5\text{mA}, f = 100\text{MHz}$ (Note)		250		MHz

Note: Transition frequency of the device

■ TYPICAL CHARACTERISTICS

Fig.1 Input voltage vs.output current (ON characteristics)

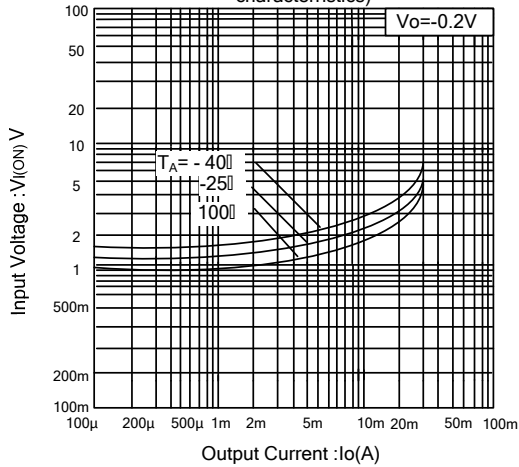


Fig.2 Output current vs Input voltage (OFF characteristics)

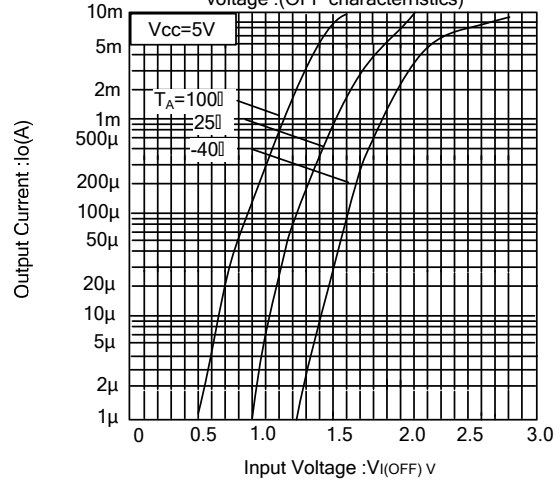


Fig.3 DC current gain vs.output current

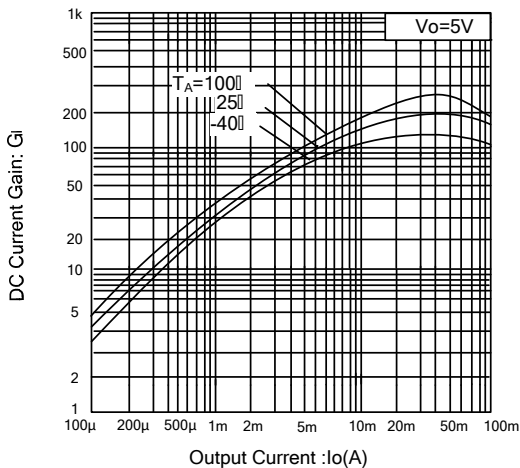
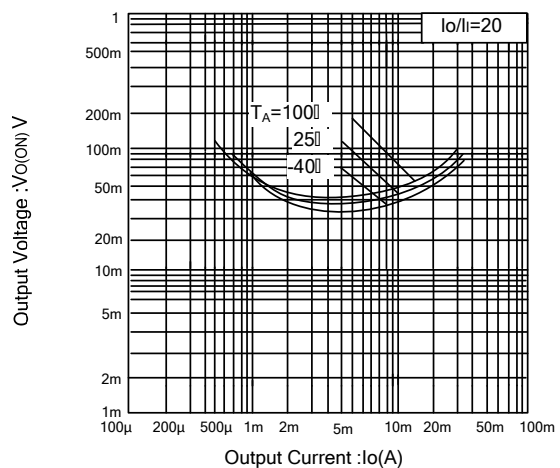


Fig.4 Output voltage vs.output current



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