



DTC115E series Digital Transistor (Bias Resistor Built-in Transistor)

Parameter	Value
V_{CC}	50V
$I_{C(MAX.)}$	100mA
R_1	100k Ω
R_2	100k Ω







●Features

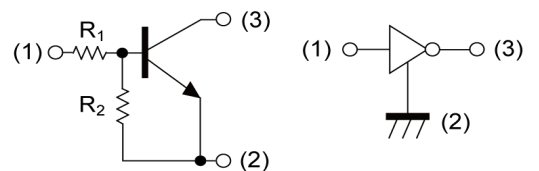
- 1) Built-In Biasing Resistors, $R_1 = R_2 = 100k\Omega$
- 2) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see inner circuit) .
- 3) Only the on/off conditions need to be set for operation, making the circuit design easy.
- 4) Complementary PNP Types: DTA115E series

●Application

INVERTER, INTERFACE, DRIVER

●Outline

SOT-723  DTC115EM (VMT3)	SOT-416FL  DTC115EEB (EMT3F)
SOT-416  DTC115EE (EMT3)	SOT-323FL  DTC115EUB (UMT3F)
SOT-323  DTC115EUA (UMT3)	SOT-346  DTC115EKA (SMT3)



- (1) IN (BASE)
 (2) GND (EMITTER)
 (3) OUT (COLLECTOR)

●Packaging specifications

Part No.	Package	Package size	Taping code	Reel size (mm)	Tape width (mm)	Basic ordering unit.(pcs)	Marking
DTC115EM	SOT-723	1212	T2L	180	8	8000	29
DTC115EEB	SOT-416FL	1616	TL	180	8	3000	29
DTC115EE	SOT-416	1616	TL	180	8	3000	29
DTC115EUB	SOT-323FL	2021	TL	180	8	3000	29
DTC115EUA	SOT-323	2021	T106	180	8	3000	29
DTC115EKA	SOT-346	2928	T146	180	8	3000	29



● Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Values	Unit
Supply voltage		V_{CC}	50	V
Input voltage		V_{IN}	-10 to 40	V
Output current		I_O	20	mA
Collector current		$I_{C(MAX)}^{*1}$	100	mA
Power dissipation	DTC115EM	P_D^{*2}	150	mW
	DTC115EEB		150	
	DTC115EE		150	
	DTC115EUB		200	
	DTC115EUA		200	
	DTC115EKA		200	
Junction temperature		T_j	150	$^\circ\text{C}$
Range of storage temperature		T_{stg}	-55 to +150	$^\circ\text{C}$

● Electrical characteristics ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input voltage	$V_{I(off)}$	$V_{CC} = 5V, I_O = 100\mu\text{A}$	-	-	0.5	V
	$V_{I(on)}$	$V_O = 0.3V, I_O = 1\text{mA}$	3.0	-	-	
Output voltage	$V_{O(on)}$	$I_O = 5\text{mA}, I_I = 0.25\text{mA}$	-	100	300	mV
Input current	I_I	$V_I = 5V$	-	-	150	μA
Output current	$I_{O(off)}$	$V_{CC} = 50V, V_I = 0V$	-	-	500	nA
DC current gain	G_I	$V_O = 5V, I_O = 5\text{mA}$	82	-	-	-
Input resistance	R_1	-	70	100	130	k Ω
Resistance ratio	R_2/R_1	-	0.8	1.0	1.2	-
Transition frequency	f_T^{*1}	$V_{CE} = 10V, I_E = -5\text{mA}, f = 100\text{MHz}$	-	250	-	MHz

*1 Characteristics of built-in transistor

*2 Each terminal mounted on a reference land



● Electrical characteristic curves ($T_a = 25^\circ\text{C}$)

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

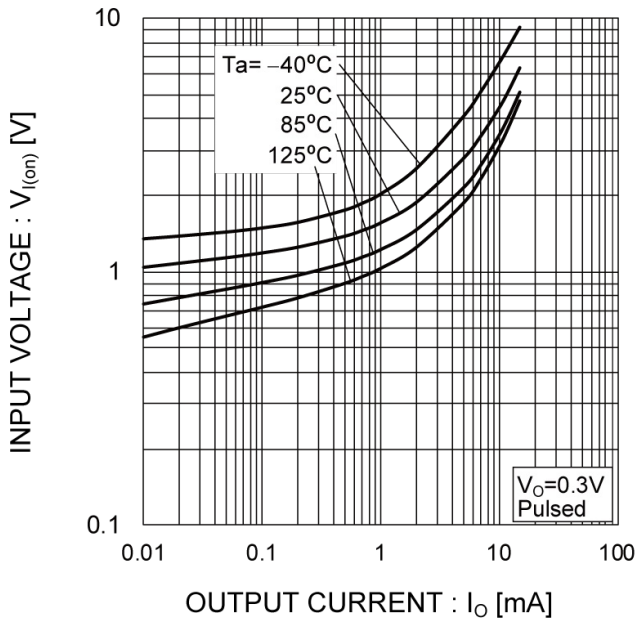


Fig.2 Output current vs. input voltage (OFF characteristics)

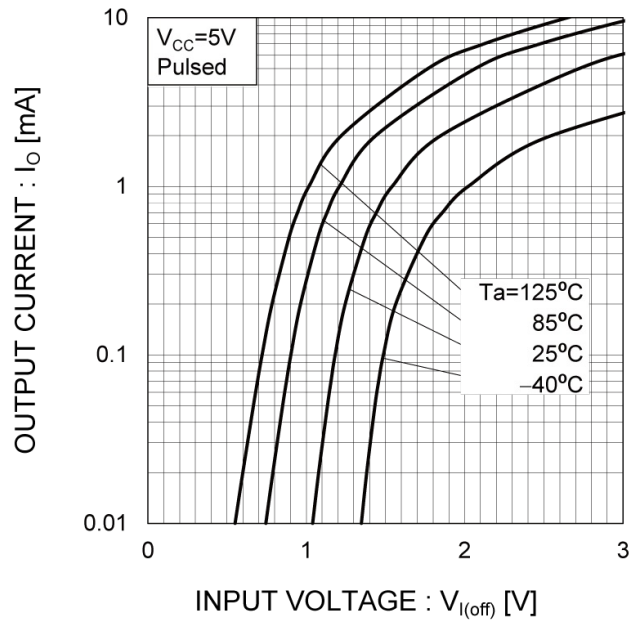


Fig.3 Output current vs. output voltage

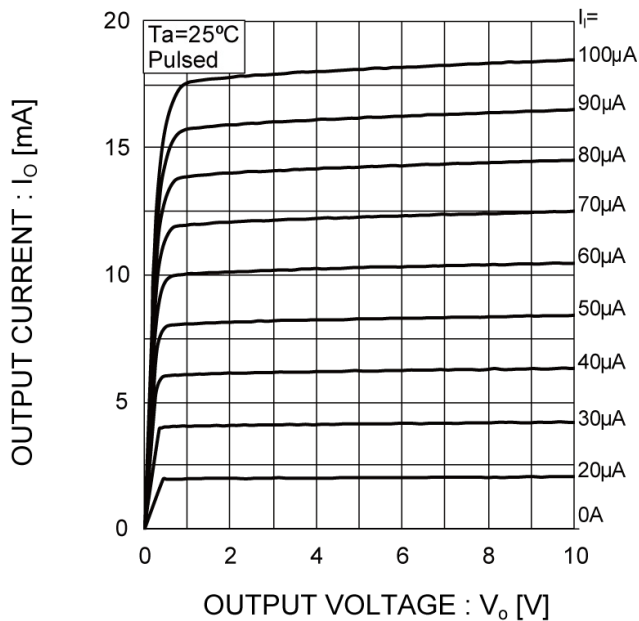
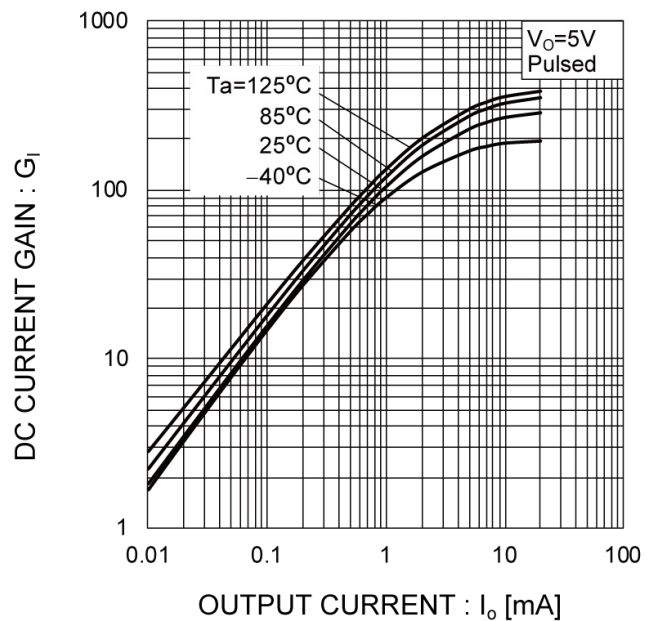
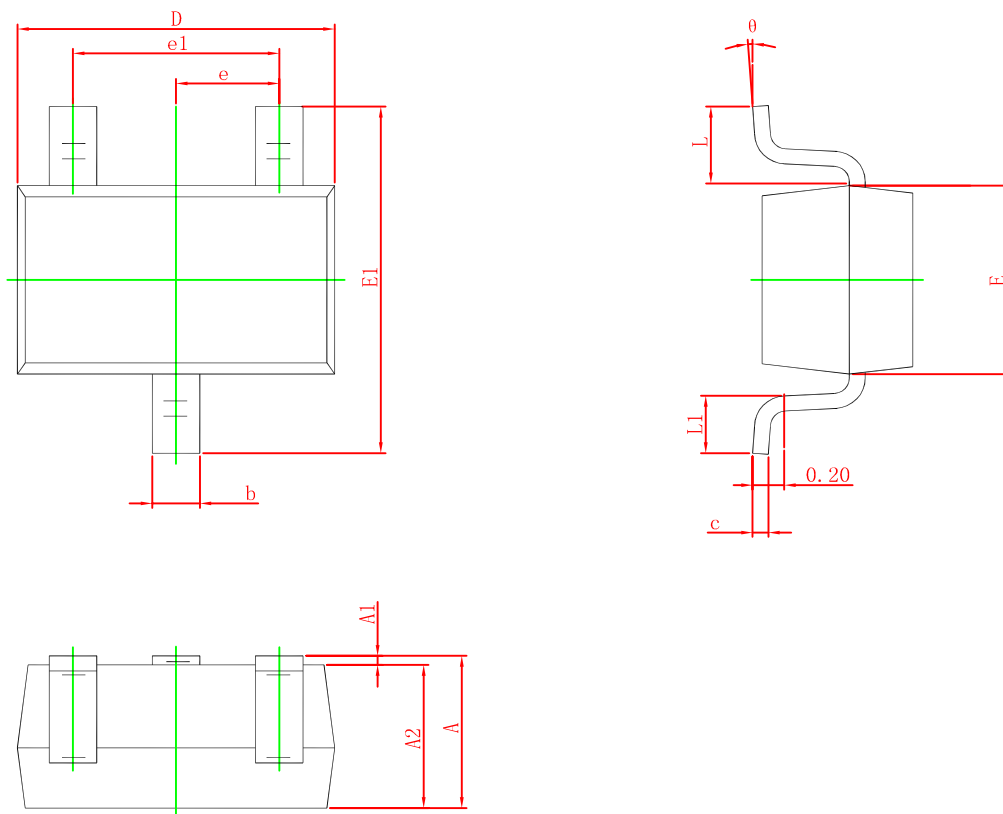


Fig.4 DC current gain vs. output current





SOT-323 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°