

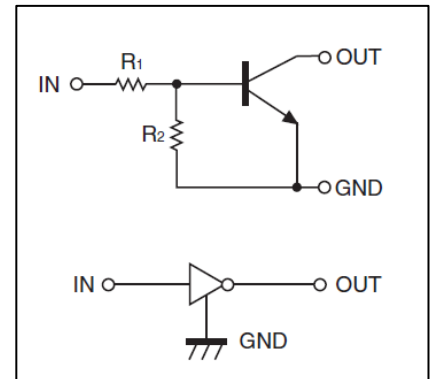
Digital Transistors (Built-in Resistors)

DIGITAL TRANSISTOR (NPN)

FEATURES

- ◆ Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
- ◆ The bias resistors consist of thin-film resistors with complete isolation to allow negative 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



Part Number	MARKING	Package
DTC113ZE	E21	SOT-523
DTC113ZUA	E21	SOT-323
DTC113ZKA	E21	SOT23-3L
DTC113ZCA	E21	SOT-23

PIN CONNENCTIONS and MARKING

DTC113ZE SOT-523 1. IN 2. GND 3. OUT	DTC113ZUA SOT-323 1. IN 2. GND 3. OUT
DTC113ZKA SOT23-3L 1. IN 2. GND 3. OUT	DTC113ZCA SOT-23 1. IN 2. GND 3. OUT

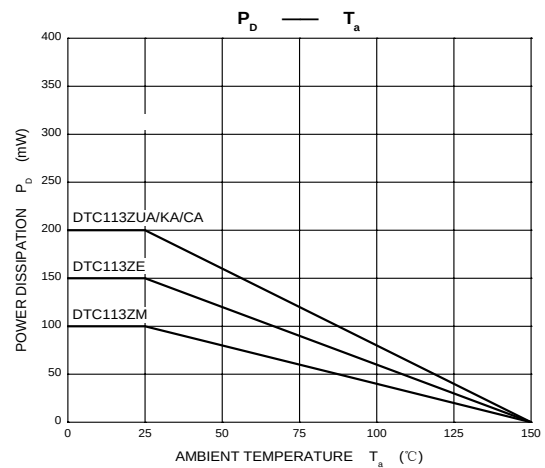
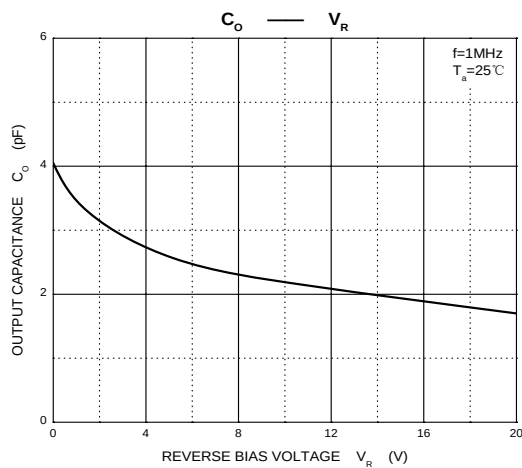
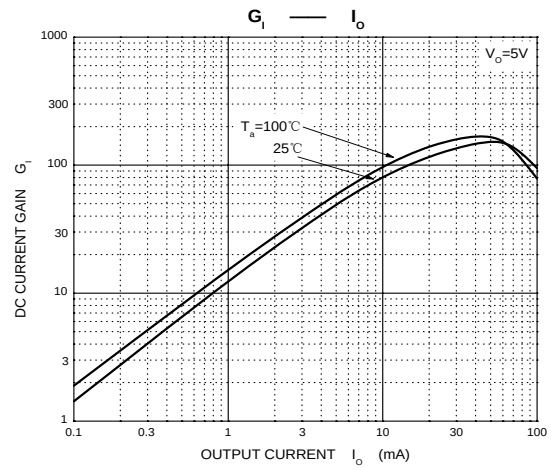
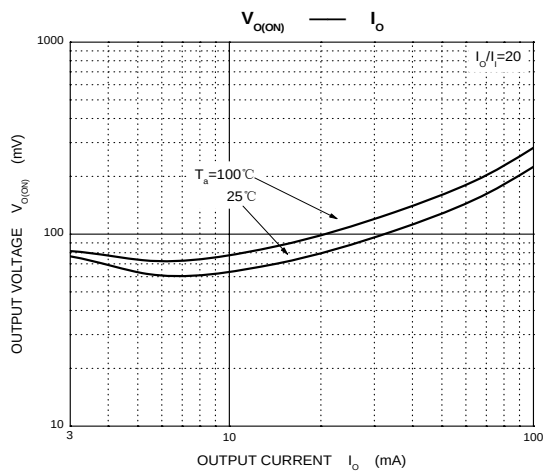
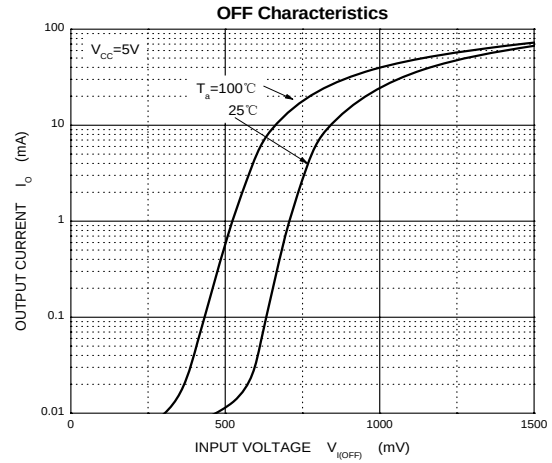
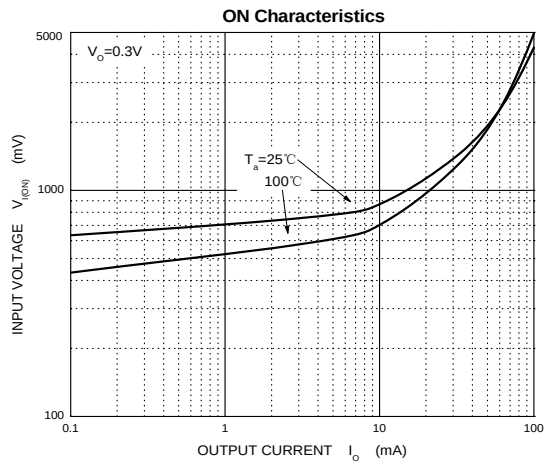
MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

Parameter	Symbol	Limits(DTC113Z□)					Unit
		E	UA	CA	KA	SA	
Supply Voltage	V_{CC}	50					V
Input Voltage	V_{IN}	-5~+10					V
Output Current	I_O	100					mA
Power Dissipation	P_D	150	200	200	200	300	mW
Operation Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150					°C

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Input voltage	$V_{CC}=5V, I_O=100\mu A$	$V_{I(off)}$	0.3			V
	$V_O=0.3V, I_O=20mA$	$V_{I(on)}$			3	V
Output voltage	$I_O/I_I=10mA/0.5mA$	$V_{O(on)}$			0.3	V
Input current	$V_I=5V$	I_I			7.2	mA
Output current	$V_{CC}=50V, V_I=0$	$I_{O(off)}$			0.5	μA
DC current gain	$V_O=5V, I_O=5mA$	G_I	33			
Input resistance		R_1	0.7	1	1.3	kΩ
Resistance ratio		R_2/R_1	8	10	12	
Transition frequency	$V_O=10V, I_O=5mA, f=100MHz$	f_T		250		MHz

Typical Characteristics



Ordering information

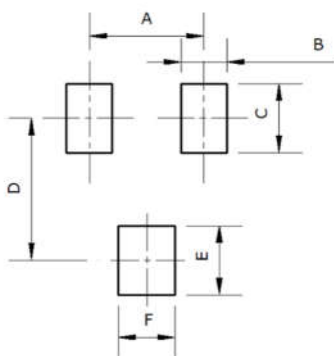
Package	Packing Description	Base Quantity	Packing Quantity
SOT-523	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT-523

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	1.50	1.70	59	67
B	0.75	0.85	30	33
C	1.45	1.75	57	69
D	0.50TYP		0.020TYP	
E	0.90	1.10	35	43
G	0.00	0.10	0	4
H	0.60	0.80	24	31
J	0.10	0.20	4	8
K	0.15	0.35	6	14
L	0.26	0.46	10	18

The recommended mounting pad size



Millimeter (mm)	
Dim.	TYP
A	1.00
B	0.40
C	0.60
D	1.24
E	0.60
F	0.50

Ordering information

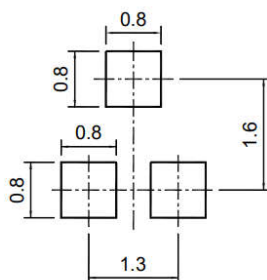
Package	Packing Description	Base Quantity	Packing Quantity
SOT-323	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT-323

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.8	1.1	32	43
A1	0.1		4	
bp	0.3	0.4	12	16
C	0.10	0.25	4	10
D	1.8	2.2	71	87
E	1.15	1.35	45	53
E	1.3		51	
E1	0.65		26	
HE	2.0	2.2	79	87
Lp	0.15	0.45	6	18
Q	0.13	0.23	5.1	9
v	0.2		8	
W	0.2		8	

The recommended mounting pad size



Ordering information

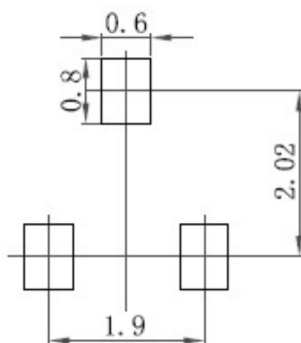
Package	Packing Description	Base Quantity	Packing Quantity
SOT23-3L	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT23-3L

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	1.05	1.25	41	49.2
A1	0.10		3.93	
A2	1.05	1.15	41	45
b	0.30	0.50	12	20
c	0.10	0.20	3.93	7.9
D	2.82	3.02	111	119
E	1.50	1.70	59	67
E1	2.65	2.95	104	116
e	0.95		37.4	
e1	1.80	2.00	71	78
L	0.30	0.066	12	26
Θ	8°			

The recommended mounting pad size



Ordering information

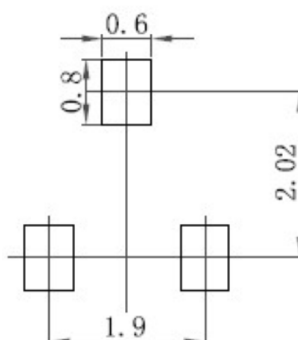
Package	Packing Description	Base Quantity	Packing Quantity
SOT-23	Tape/Reel, 7" reel	3000pcs/Reel	24000PCS/Box 120000PCS/Carton

Package Dimensions

SOT-23

Dim.	Millimeter (mm)		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.15	35	45
A1	0.1		3.9	
bp	0.38	0.48	15	19
C	0.09	0.15	3.54	5.9
D	2.8	3.0	110	118
E	1.2	1.4	47	55
E	1.9		75	
E1	0.95		37	
HE	2.1	2.55	83	100
Lp	0.15	0.45	5.9	18
Q	0.45	0.55	18	22
v	0.2		7.9	
W	0.1		4	

The recommended mounting pad size



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