



## DTD113Z

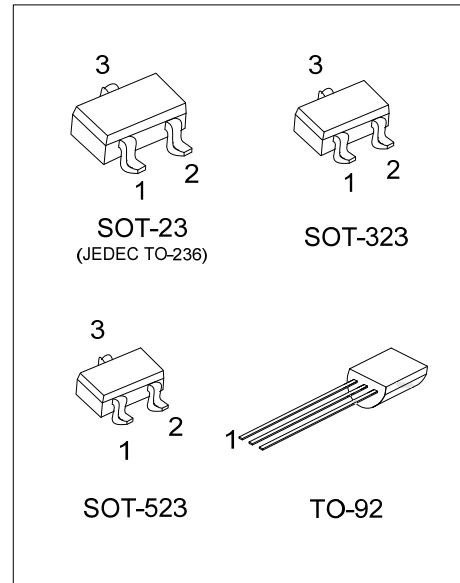
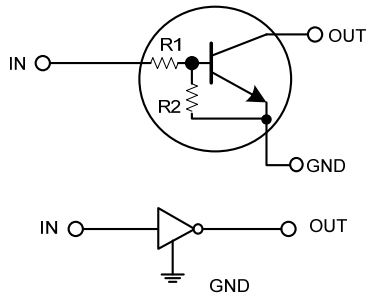
## NPN SILICON TRANSISTOR

### NPN DIGITAL TRANSISTOR (BUILT-IN BIAS RESISTORS)

#### FEATURES

- \* Built-in bias resistors that implies easy ON/OFF applications.
- \* The bias resistors are thin-film resistors with complete isolation to allow negative input.

#### EQUIVALENT CIRCUIT



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
DTD113ZL-AE3-R	DTD113ZG-AE3-R	SOT-23	I	G	O	Tape Reel
DTD113ZL-AL3-R	DTD113ZG-AL3-R	SOT-323	I	G	O	Tape Reel
DTD113ZL-AN3-R	DTD113ZG-AN3-R	SOT-523	I	G	O	Tape Reel
DTD113ZL-T92-B	DTD113ZG-T92-B	TO-92	G	O	I	Tape Box
DTD113ZL-T92-K	DTD113ZG-T92-K	TO-92	G	O	I	Bulk

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

<p>DTD113ZG-AE3-R</p>	<p>(1) B: Tape Box, K: Bulk, R: Tape Reel  (2) AE3: SOT-23, AL3: SOT-323, AN3: SOT-523  T92: TO-92  (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING

SOT-23 / SOT-323 / SOT-523	TO-92

■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless others specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V <sub>CC</sub>	50	V
Input Voltage		V <sub>IN</sub>	-5 ~ +10	V
Output Current		I <sub>OUT</sub>	500	mA
Power Dissipation	SOT-23/SOT-323	P <sub>C</sub>	200	mW
	SOT-523		150	mW
	TO-92		625	mW
Junction Temperature		T <sub>J</sub>	+150	°C
Storage Temperature		T <sub>STG</sub>	-55 ~ +150	°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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	625	°C/W

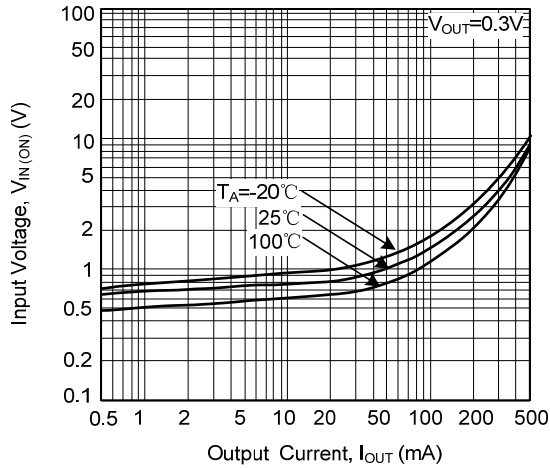
■ ELECTRICAL SPECIFICATIONS (T<sub>A</sub>=25°C, unless others specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	V <sub>IN(OFF)</sub>	V <sub>CC</sub> = 5V, I <sub>OUT</sub> = 100μA			0.3	V
	V <sub>IN(ON)</sub>	V <sub>OUT</sub> = 0.3V, I <sub>OUT</sub> = 20mA	1.5			
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> = 50V			100	nA
Collector Cut-off Current	I <sub>CEO</sub>	V <sub>CE</sub> = 50V			0.5	μA
Output Voltage	V <sub>OUT(ON)</sub>	I <sub>OUT</sub> /I <sub>IN</sub> = 50mA/2.5mA		0.1	0.3	V
Input Current	I <sub>IN</sub>	V <sub>IN</sub> = 5V			7.2	mA
Output Current	I <sub>OUT(OFF)</sub>	V <sub>CC</sub> = 50V, V <sub>IN</sub> = 0V			0.5	μA
DC Current Gain	h <sub>FE</sub>	V <sub>OUT</sub> = 5V, I <sub>OUT</sub> = 50mA	82			
Input Resistance	R <sub>1</sub>		0.7	1	1.3	KΩ
Resistor Ratio	R <sub>2</sub> /R <sub>1</sub>		8	10	12	
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> = 10V, I <sub>E</sub> = -50mA, f = 100MHz (Note)		200		MHz

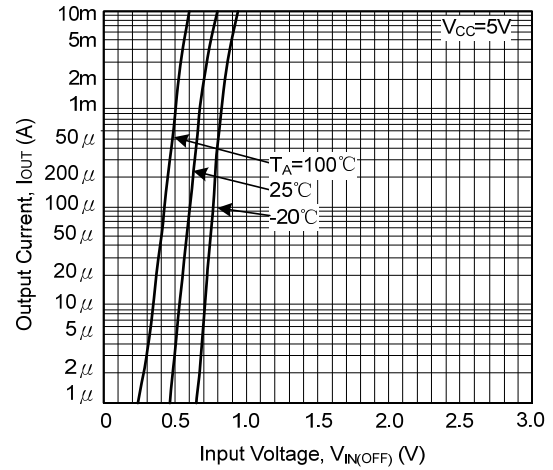
Note: Transition frequency of the device.

## TYPICAL CHARACTERISTICS

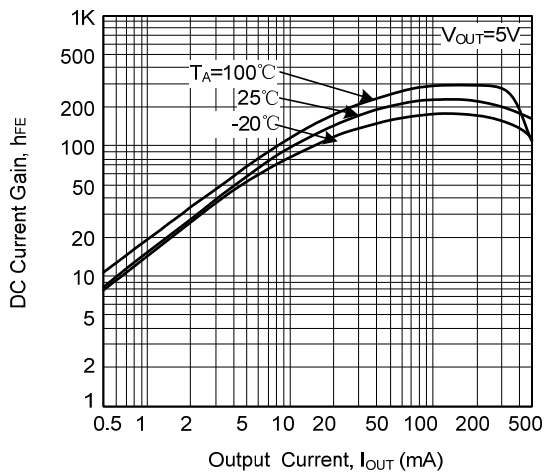
Input Voltage vs. Output Current  
(ON Characteristics)



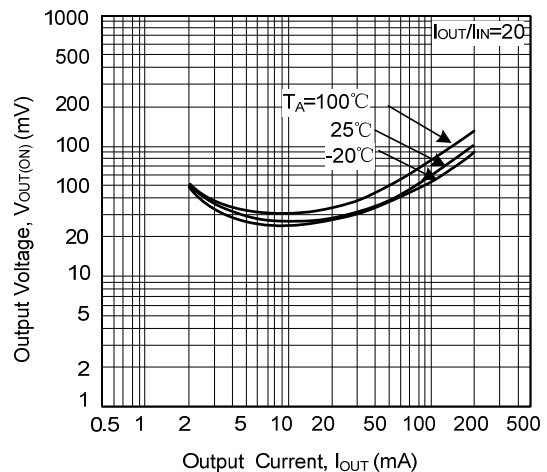
Output Current vs. Input Voltage  
(OFF Characteristics)



DC Current Gain vs. Output Current



Output Voltage vs. Output Current



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