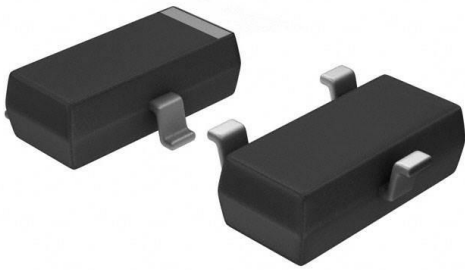


# DTC123YCA-HF Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	DTC123YCA-HF-DG
Manufacturer	<a href="#">Comchip Technology</a>
Manufacturer Product Number	DTC123YCA-HF
Description	TRANS PREBIAS NPN 50V SOT23-3
Detailed Description	Pre-Biased Bipolar Transistor (BJT) NPN - Pre-Biased 50 V 100 mA 250 MHz 200 mW Surface Mount SOT-23-3



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

DiGi is a global authorized distributor of electronic components.

## Purchase and inquiry

Manufacturer Product Number:

DTC123YCA-HF

Series:

DTC123YCA-HF

Transistor Type:

NPN - Pre-Biased

Voltage - Collector Emitter Breakdown (Max):

50 V

Resistor - Emitter Base (R2):

10 kOhms

Vce Saturation (Max) @ Ib, Ic:

300mV @ 500µA, 10mA

Frequency - Transition:

250 MHz

Mounting Type:

Surface Mount

Supplier Device Package:

SOT-23-3

Manufacturer:

Comchip Technology

Product Status:

Active

Current - Collector (Ic) (Max):

100 mA

Resistor - Base (R1):

2.2 kOhms

DC Current Gain (hFE) (Min) @ Ic, Vce:

33 @ 10mA, 5V

Current - Collector Cutoff (Max):

500nA

Power - Max:

200 mW

Package / Case:

TO-236-3, SC-59, SOT-23-3

Base Product Number:

DTC123

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

ECCN:

EAR99

Moisture Sensitivity Level (MSL):

1 (Unlimited)

HTSUS:

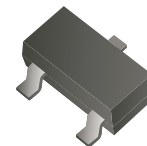
8541.21.0075

# Digital Transistor



## DTCxxxxCA-HF Series

RoHS Device  
Halogen Free



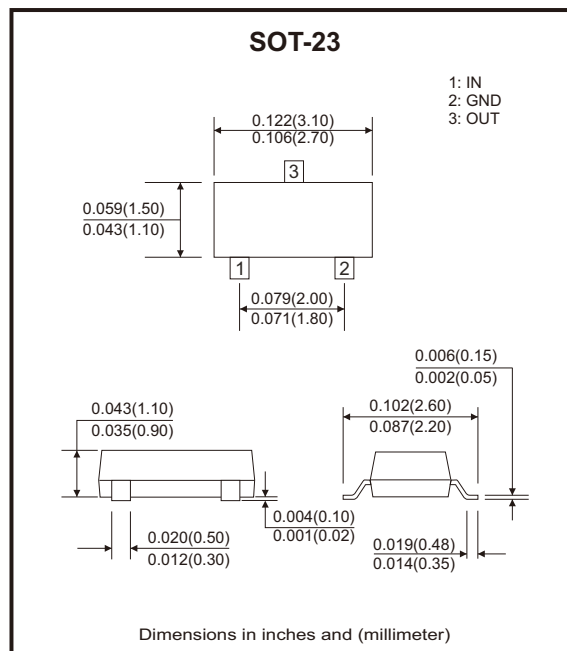
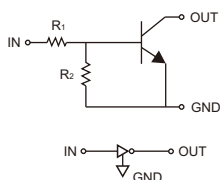
### Features

- Epitaxial planar die construction.
- Built-in biasing resistors,  $R_1 \neq R_2$ .

### Mechanical data

- Case: SOT-23, molded plastic.

### Circuit Diagram



### Maximum Ratings (at $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Units
Supply voltage	$V_{CC}$	50	V
Input voltage	$V_{IN}$	-5 to +10 -10 to +30 -6 to +40 -5 to +12 -5 to +12 -7 to +20 -5 to +30	V
Output current	$I_o$	100 100 70 100 100 100 100	mA
Output current	$I_c$ (Max.)	100	mA
Power dissipation	$P_b$	200	mW
Thermal resistance, junction to ambient air	$R_{\theta JA}$	625	$^\circ\text{C}/\text{W}$
Operating and storage and temperature range	$T_j, T_{STG}$	-55 to +150	$^\circ\text{C}$

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# Digital Transistor



## Electrical Characteristics (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Test conditions	Min	Typ	Max	Units
Input voltage	DTC113ZCA-HF DTC114WCA-HF DTC114YCA-HF DTC123JCA-HF DTC123YCA-HF DTC143XCA-HF DTC143ZCA-HF	$V_{I(off)}$ $V_{CC} = 5V, I_o = 100\mu A$	0.3			V
			0.8			
			0.3			
			0.5			
			0.3			
			0.3			
			0.5			
Input voltage	DTC113ZCA-HF DTC114WCA-HF DTC114YCA-HF DTC123JCA-HF DTC123YCA-HF DTC143XCA-HF DTC143ZCA-HF	$V_{I(on)}$ $V_o = 0.3V, I_o = 20mA$ $V_o = 0.3V, I_o = 2mA$ $V_o = 0.3V, I_o = 1mA$ $V_o = 0.3V, I_o = 5mA$ $V_o = 0.3V, I_o = 20mA$ $V_o = 0.3V, I_o = 20mA$ $V_o = 0.3V, I_o = 5mA$			3.0	V
					3.0	
					1.4	
					1.1	
					3.0	
					2.5	
					1.3	
Output voltage	DTC123JCA-HF DTC143ZCA-HF DTC114YCA-HF All others	$V_{O(on)}$ $I_o / I_i = 5mA / 0.25mA$		0.1	0.3	V
			$I_o / I_i = 10mA / 0.5mA$			
Input current	DTC113ZCA-HF DTC114WCA-HF DTC114YCA-HF DTC123JCA-HF DTC123YCA-HF DTC143XCA-HF DTC143ZCA-HF	$I_i$ $V_i = 5V$			7.2	mA
					0.88	
					0.88	
					3.6	
					3.8	
					1.8	
					1.8	
Output current	$I_{O(off)}$	$V_{CC} = 50V, V_i = 0V$			0.5	$\mu A$
DC current gain	DTC113ZCA-HF DTC114WCA-HF DTC114YCA-HF DTC123JCA-HF DTC123YCA-HF DTC143XCA-HF DTC143ZCA-HF	$G_I$ $V_o = 5V, I_o = 10mA$	33			
			24			
			68			
			80			
			33			
			30			
			80			
Input resistor	DTC113ZCA-HF DTC114WCA-HF DTC114YCA-HF DTC123JCA-HF DTC123YCA-HF DTC143XCA-HF DTC143ZCA-HF	$R_1(R_2)$	0.7	1(10)	1.3	k $\Omega$
			7	10(4.7)	13	
			7	10(47)	13	
			1.54	2.2(47)	2.86	
			1.54	2.2(10)	2.86	
			3.29	4.7(10)	6.11	
			3.29	4.7(47)	6.11	
Input resistor ( $R_1$ ) tolerance	$\Delta R_1$		-30		+30	%
Resistance ratio tolerance	$\Delta R_2/R_1$		-20		+20	%
Gain-bandwidth product	$f_T$	$V_{CE} = 10V, I_E = 5mA, f = 100MHz$		250		MHz

# Digital Transistor



## Rating and Characteristic Curves (DTCxxxxCA-HF Series)

Fig.1 - Derating Curve

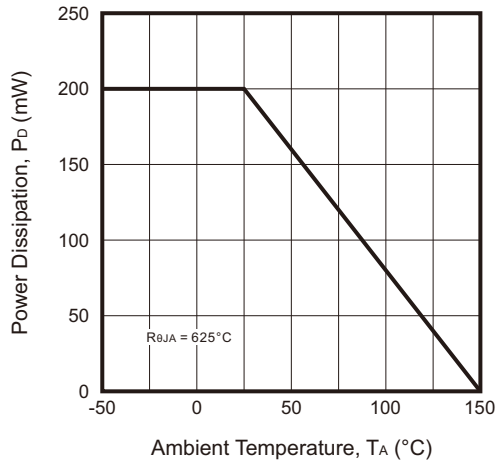


Fig.2 -  $V_{CE(SAT)}$  vs.  $I_c$

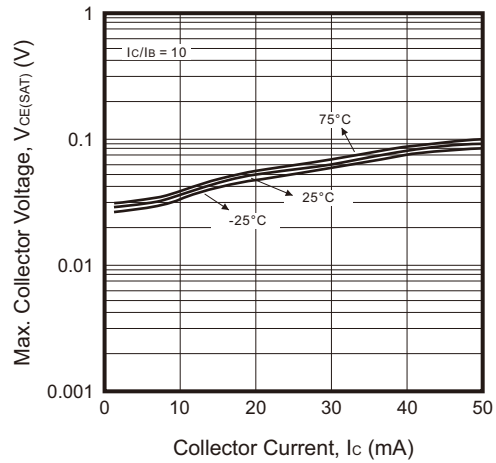


Fig.3 - DC Current Gain

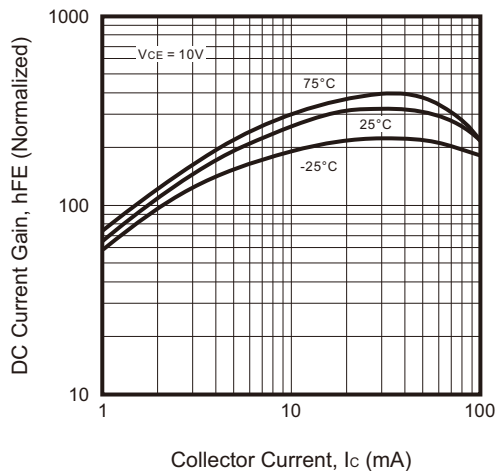


Fig.4 - Output Capacitance

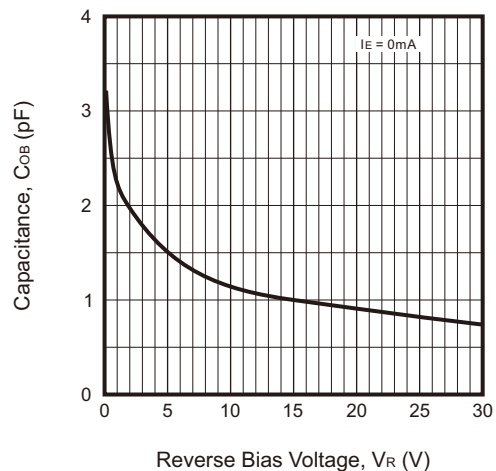


Fig.5 - Collector Current vs. Input Voltage

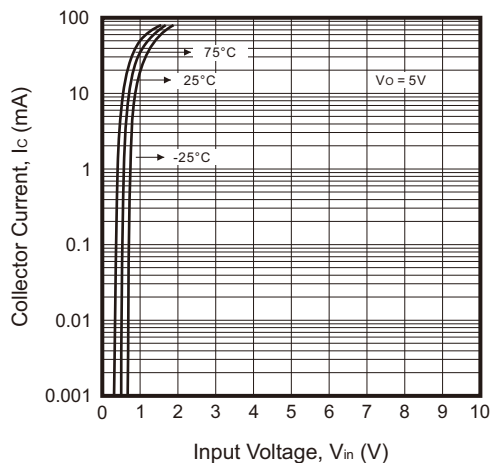
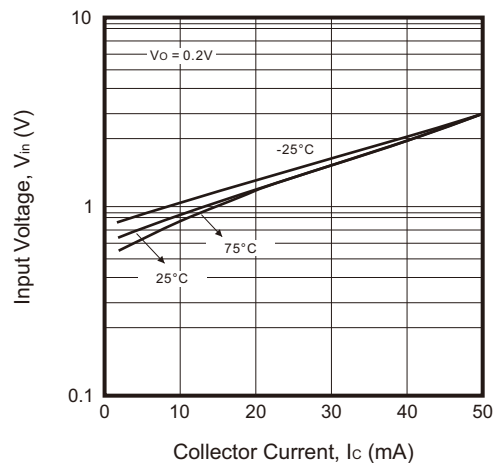


Fig.6 - Input Voltage vs. Collector Current



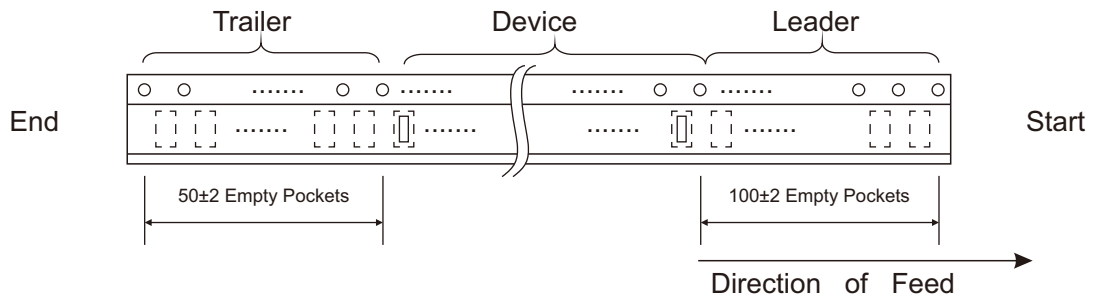
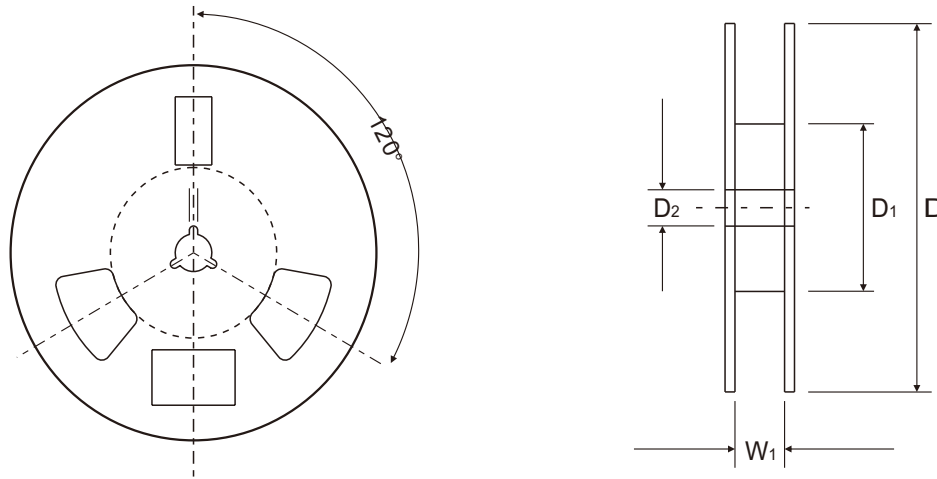
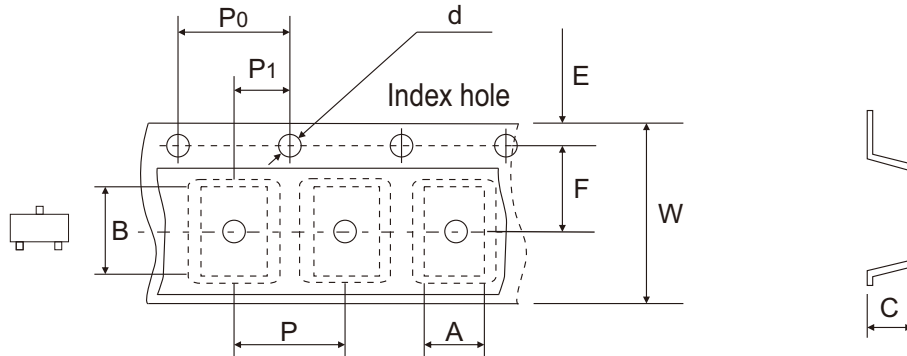
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# Digital Transistor



## Reel Taping Specification



SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 1.00	54.00 ± 0.50	13.00 ± 0.50
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.039	2.126 ± 0.020	0.512 ± 0.020

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 + 0.30 - 0.10	9.50 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.315 + 0.012 - 0.004	0.374 ± 0.039

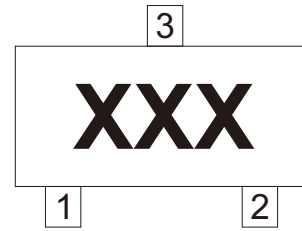
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# Digital Transistor

## Marking Code

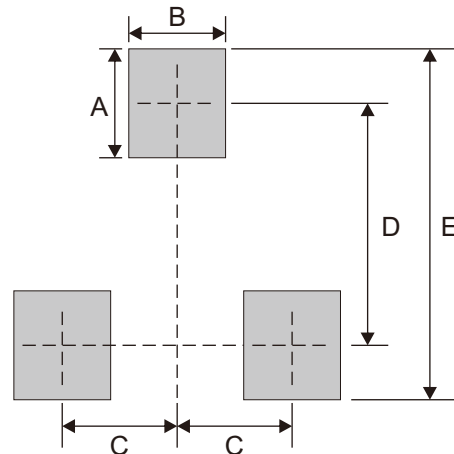
Part Number	Marking Code
DTC113ZCA-HF	E21
DTC114WCA-HF	84
DTC114YCA-HF	64
DTC123JCA-HF	E42
DTC123YCA-HF	62
DTC143XCA-HF	43•
DTC143ZCA-HF	E23



xx/xxx = Product type marking code

## Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114



Note: 1. The pad layout is for reference purposes only.

## Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7

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