DTC114YCA-Q1

List

DTC114YCA-Q1

NPN Silicon Epitaxial Planar Digital Transistor

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, marking device design easy.
- -Q1 for automotive and other applications requiring unique site an control change requirements; AEC-Q101 qualified and PPAP capable.
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. DTC114YCA-Q1-H.

Applications

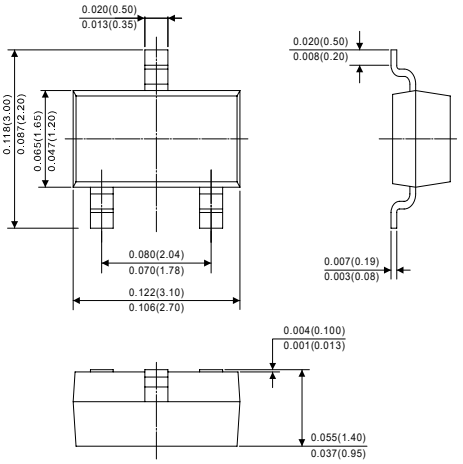
- Inverter, Interface, Driver.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.
- Weight : Approximated 0.008 gram.

Package outline

SOT-23



Dimensions in inches and (millimeters)

Maximum ratings (At T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector to emitter voltage	V_{CEO}	50	V
Input voltage	V_I	-6 to +40	V
Collector current	I_C	70	mA
Peak collector current	I_{CM}	100	mA
Power dissipation	P_{tot}	200	mW
Junction temperature	T_j	150	℃
Storage temperature range	T_{stg}	-55 to +150	℃

Electrical characteristics (At T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Input voltage	V_{CE}=5V, I_C=100μA	$V_{I(off)}$			0.3	V
	V_o=0.3V, I_O=1mA	$V_{I(on)}$	1.4			V
Output voltage	I_O/I_I=5mA/0.25mA	$V_{O(on)}$			0.3	V
Input current	V_I=5V	I_I			0.88	mA
Output current	V_{CC}=50V, V_I=0V	$I_{O(off)}$			0.5	μA
DC current gain	V_O=5V, I_O=5mA	h_{FE}	68			
Transition frequency	V_{CE}=10V, I_O=5mA, f=100MHz	f_T		250		MHZ
Input resistance		R_1	7	10	13	KΩ
Resistance ratio		R_2 / R_1	3.7	4.7	5.7	

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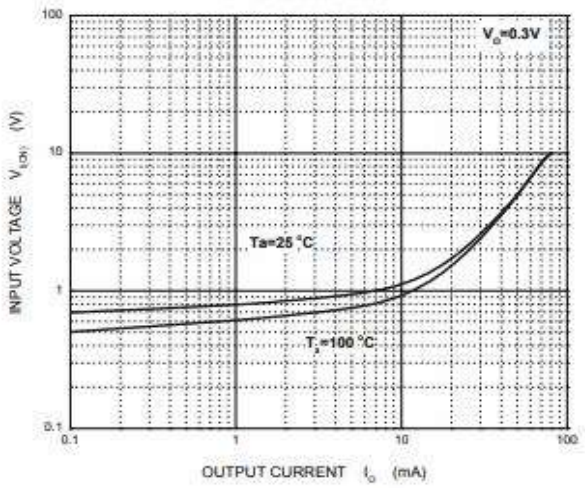
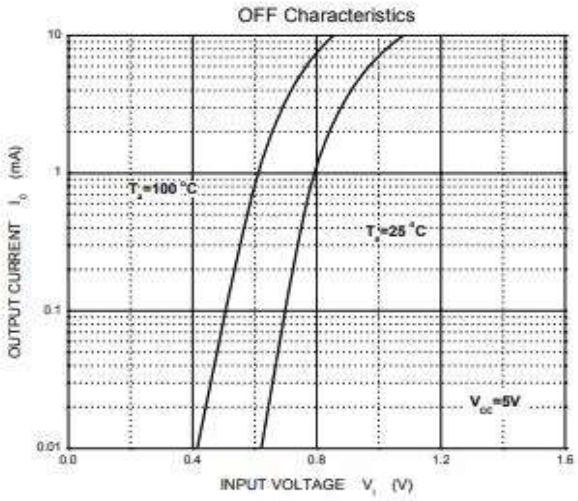
Rating and characteristic curves

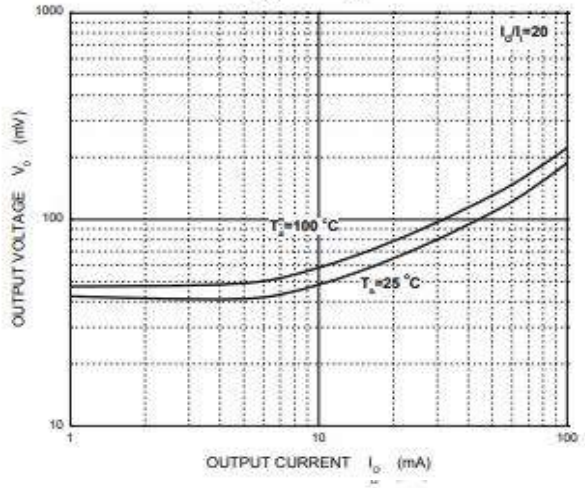
ON Characteristics



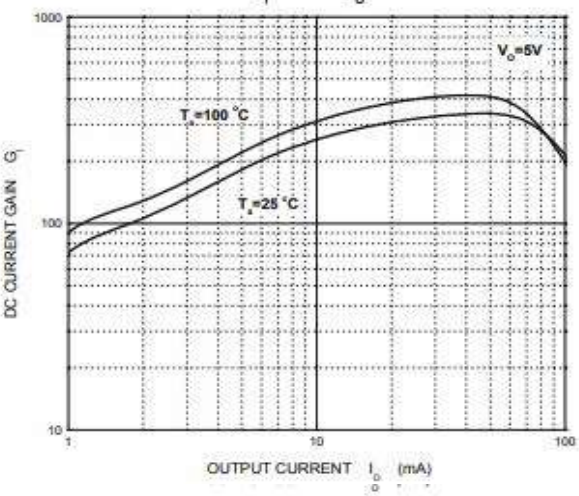
OFF Characteristics



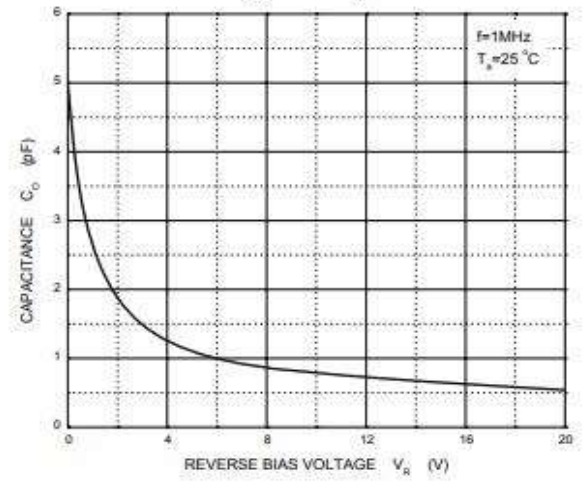
V_O — I_O



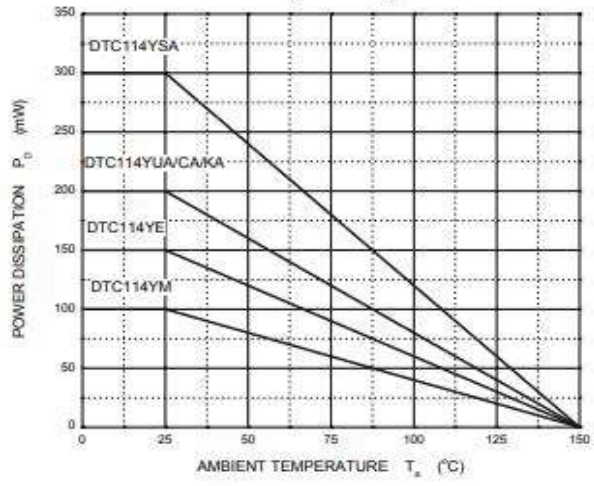
G_I — I_O



C_O — V_R



P_D — T_a



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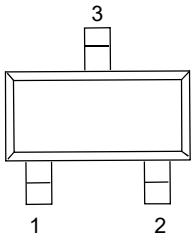
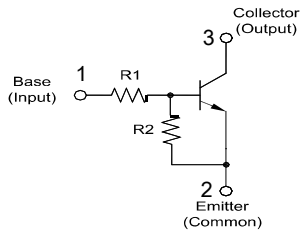
Pinning information

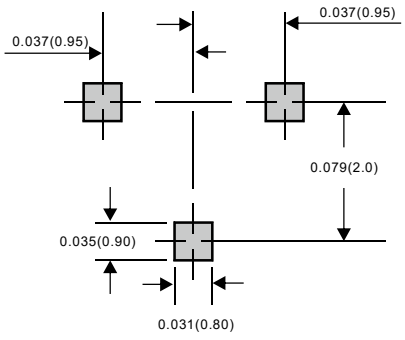
Pin	Simplified outline	Symbol
Pin1 Base Pin2 Emitter Pin3 Collector		

Marking and resistor values

Type Number	Marking Code
DTC114YCA-Q1	64

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)

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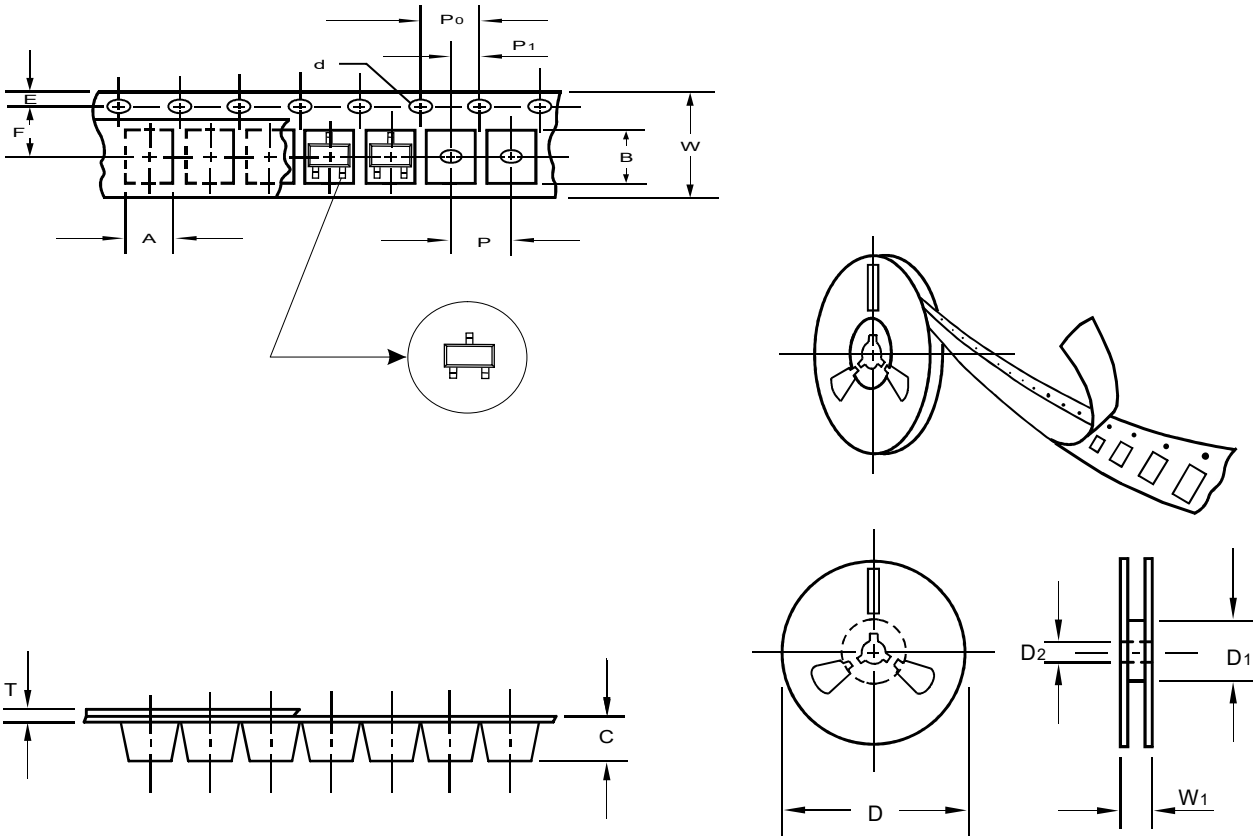
Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	54.40
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	11.40

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

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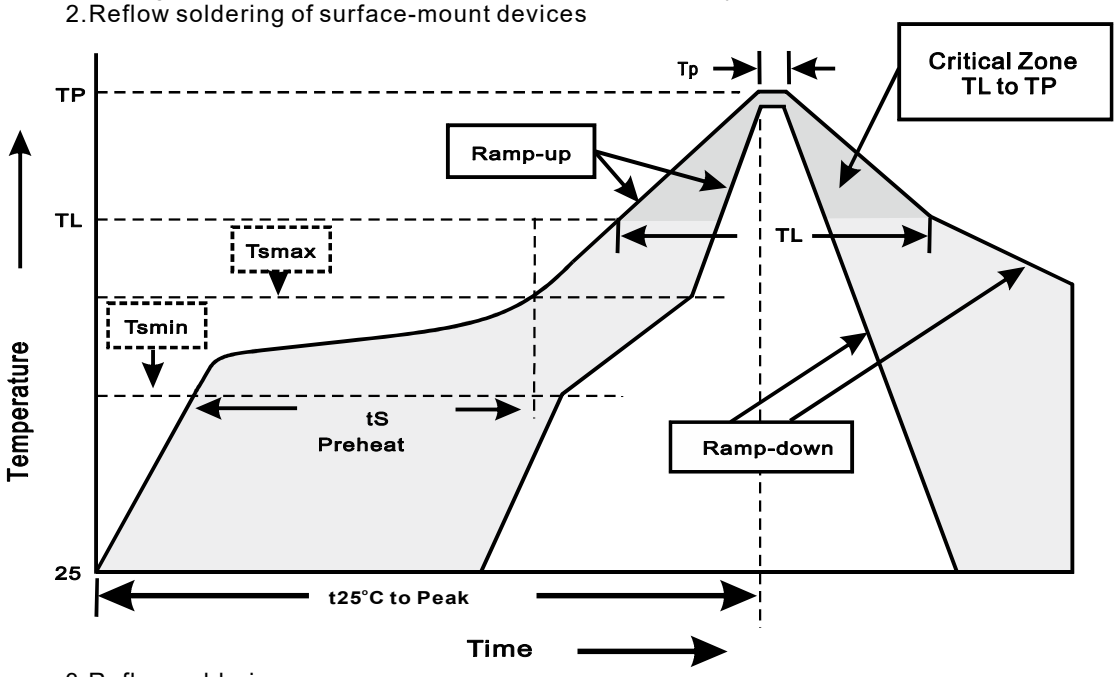
Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%

2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	 <3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes