

DTC114EUA-Q1

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DTC114EUA-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. DTC114EUA-Q1-H.

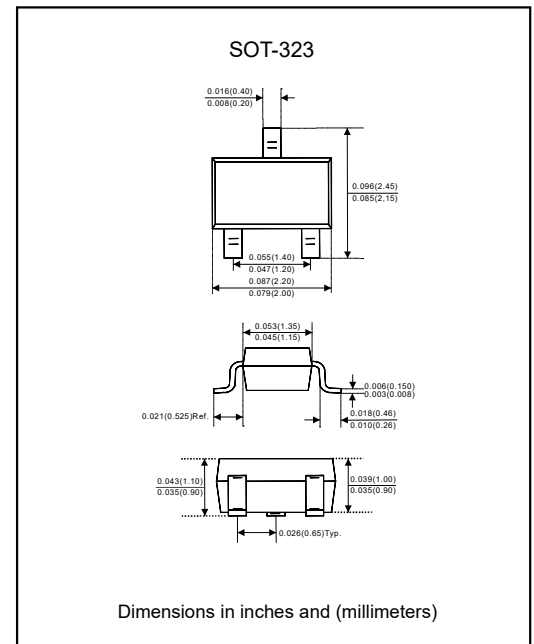
Applications

- Inverter, Interface, Driver

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-323
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any

Package outline



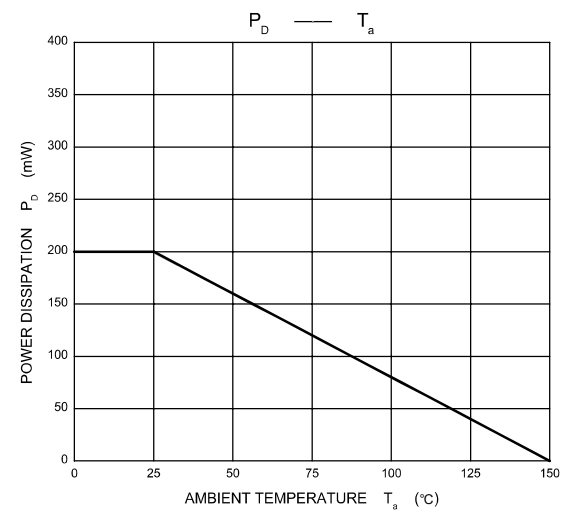
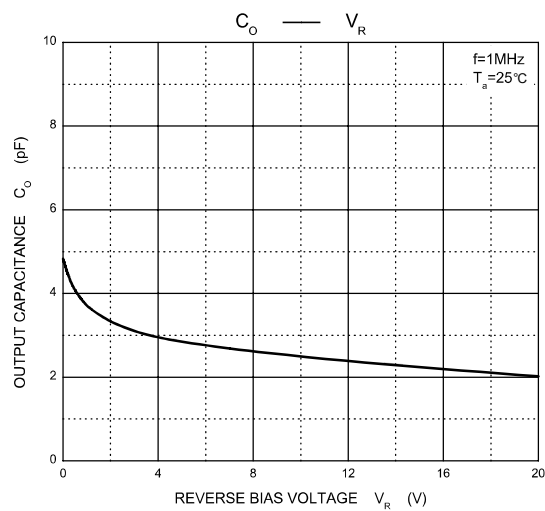
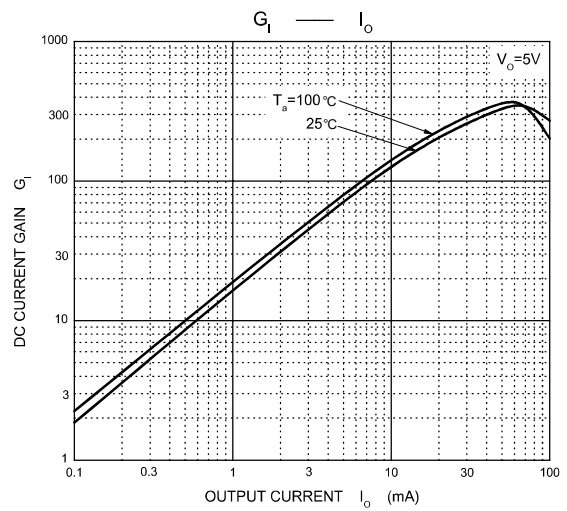
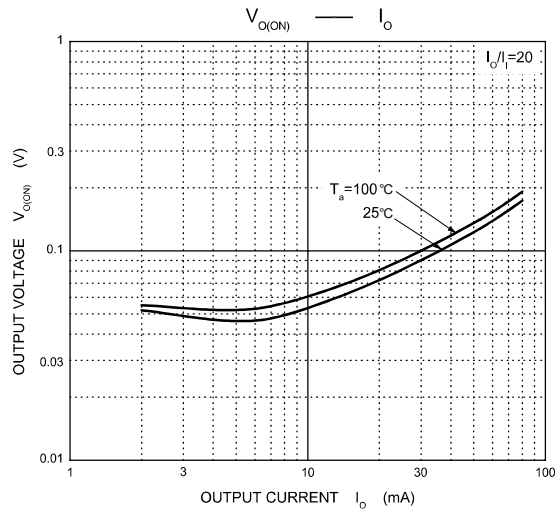
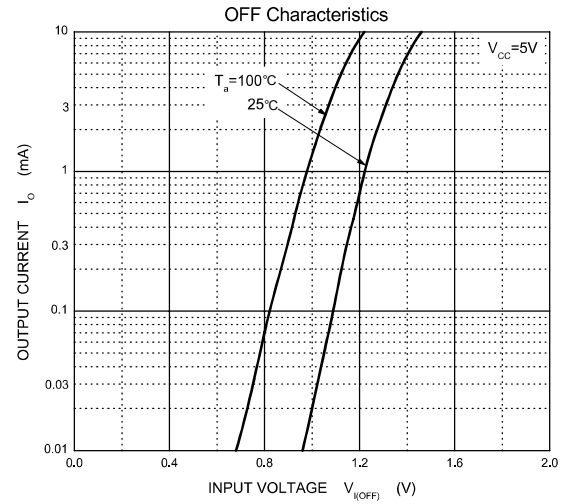
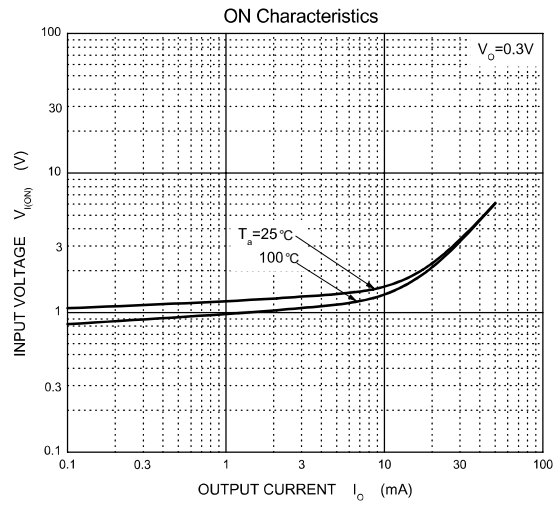
Maximum ratings (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector to emitter voltage	V_{CEO}	50	V
Input voltage	V_I	-10 to +40	V
Collector current	I_C	50	mA
Peak collector current	I_{CM}	100	mA
Power dissipation	P_{tot}	200	mW
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Electrical characteristics (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

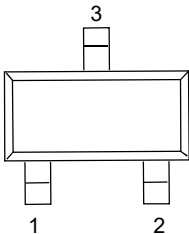
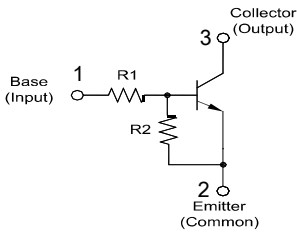
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Input voltage	$V_{CE}=5\text{V}, I_C=100\mu\text{A}$	$V_{I(off)}$	0.5			V
	$V_o=0.3\text{V}, I_o=10\text{mA}$	$V_{I(off)}$			3	V
Output voltage	$I_o/I_i=10\text{mA}/0.5\text{mA}$	$V_{O(on)}$			0.3	V
Input current	$V_I=5\text{V}$	I_i			0.88	mA
Output current	$V_{CC}=50\text{V}, V_I=0\text{V}$	$I_{O(off)}$			0.5	μA
DC current gain	$V_o=5\text{V}, I_o=5\text{mA}$	h_{FE}	30			
Transition frequency	$V_{CE}=10\text{V}, I_o=5\text{mA}, f=100\text{MHZ}$	f_T		250		MHZ
Input resistance		R_1	7	10	13	K Ω
Resistance ratio		R_2 / R_1	0.8	1	1.2	

Rating and characteristic curves (DTC114EUA-Q1)



DTC114EUA-Q1

Pinning information

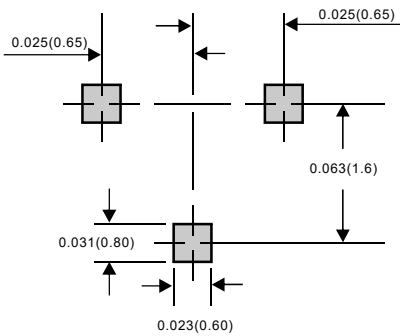
Pin	Simplified outline	Symbol
Pin1 BASE Pin2 EMITTER Pin3 COLLECTOR		

Marking and resistor values

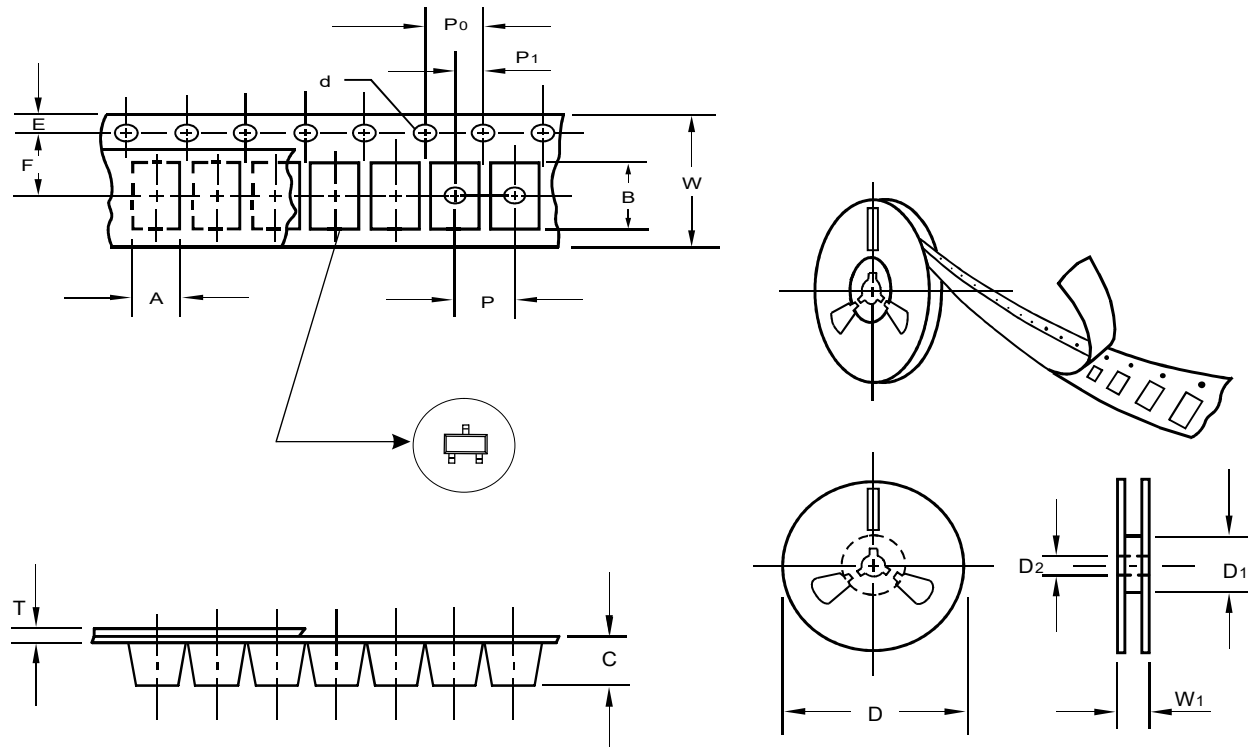
Type Number	Marking Code
DTC114EUA-Q1	24

Suggested solder pad layout

SOT-323



Dimensions in inches and (millimeters)

DTC114EUA-Q1**Packing information**

unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	1.47
Carrier length	B	0.1	2.95
Carrier depth	C	0.1	1.15
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	62.00
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 accordance with EIA standard RS-481-A and specifications listed above.

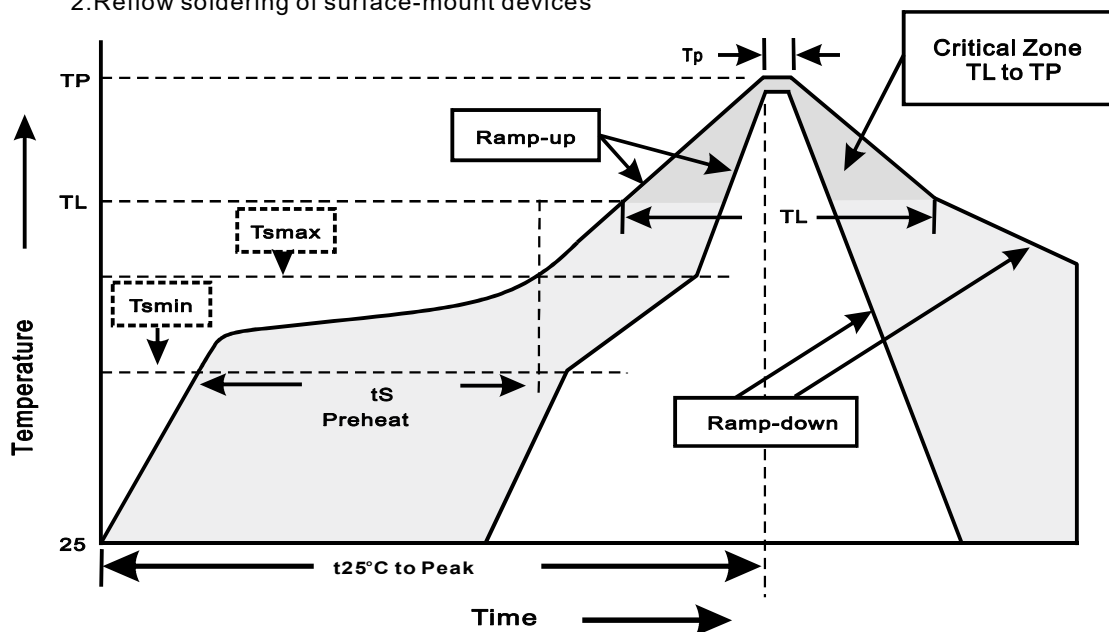
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Reel packing

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-323	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	9.5

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(T _{smín}) -Temperature Max(T _{smáx}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smáx} 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