

DTA114ECA

List

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings.....	2
Electrical characteristics.....	3
Rating and characteristic curves.....	3
Pinning information.....	4
Marking.....	4
Suggested solder pad layout.....	4
Packing information.....	5
Reel packing.....	6
Suggested thermal profiles for soldering processes.....	6
High reliability test capabilities.....	7

DTA114ECA

PNP Silicon Epitaxial Planar Digital Transistor

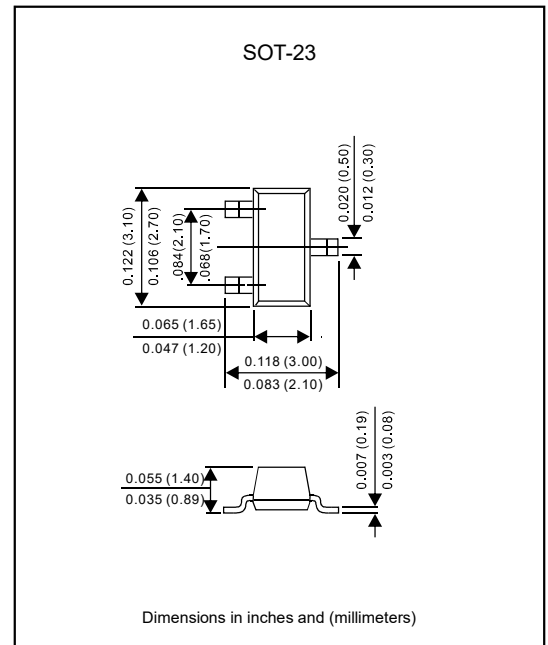
Features

- Epitaxial planar die construction.
- Built-in biasing resistors, $R_1=R_2$.
- Built-in bias resistors enable the configuration of an inverter circuit without external input resistors (see equivalent circuit).
- The bias resistors consist of thin-film resistors with complete isolation to allow negative bias of the input. There is also the advantage of almost completely eliminating parasitic effects.
- Only the on/off conditions need to be set for operation, it makes the device designed easily.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. DTA114ECA-H.

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



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

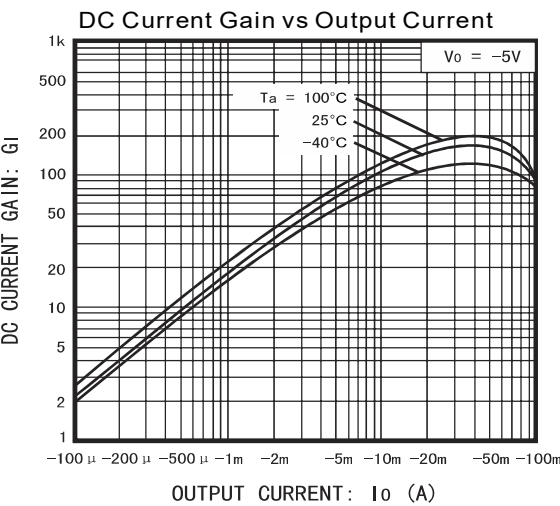
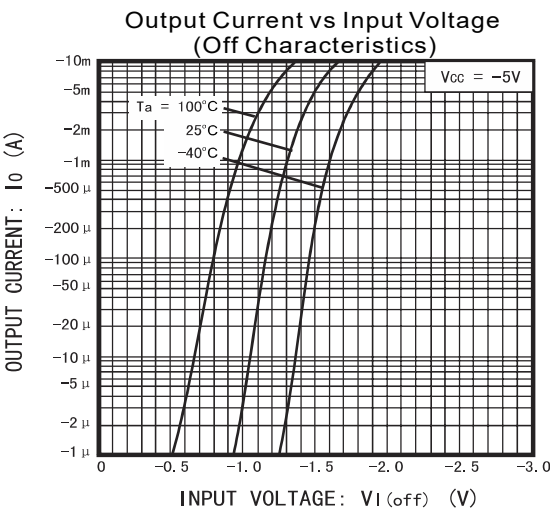
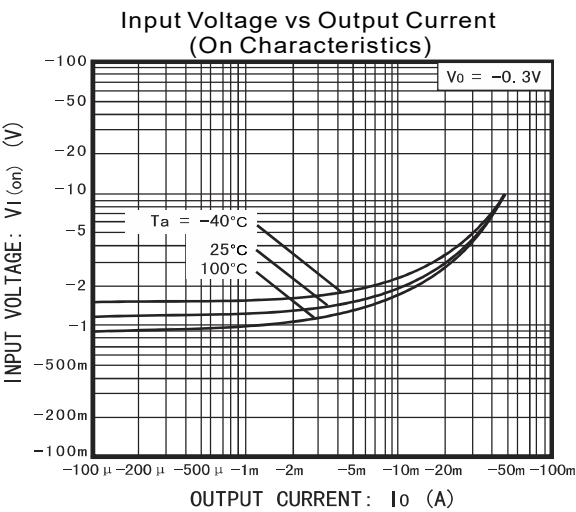
Parameter	Symbol	Value	Unit
Supply voltage	$-V_{CC}$	50	V
Input voltage	V_{IN}	-40 to +10	V
Output current	$-I_O$	50	mA
Peak collector current	$-I_{C(MAX)}$	100	mA
Power dissipation	P_D	200	mW
Thermal resistance junction to ambient	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating junction temperature range	T_J	150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

DTA114ECA

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

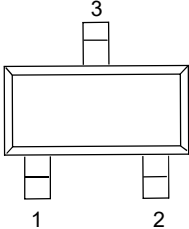
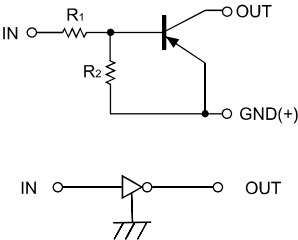
Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Input voltage	$-V_{CC}=5\text{V}, -I_O=100\mu\text{A}$	$-V_{I(\text{OFF})}$	0.5	1.1		V
Input voltage	$-V_O=0.3\text{V}, -I_O=10\text{mA}$	$-V_{I(\text{ON})}$		1.9	3	
Output voltage	$-I_O/-I_I=10\text{mA} / 0.5\text{mA}$	$-V_{O(\text{ON})}$		0.1	0.3	V
Input current	$-V_I=5\text{V}$	$-I_I$			0.88	mA
Output current	$-V_{CC}=50\text{V}, V_I=0\text{V}$	$-I_{O(\text{OFF})}$			0.5	μA
DC current gain	$-V_O=5\text{V}, -I_O=5\text{mA}$	G_I	30			
Input resistance		$R_1(R_2)$	7	10	13	$\text{k}\Omega$
Resistance ratio		R_2/R_1	0.8	1	1.2	
Gain-bandwidth product	$-V_{CE}=10\text{V}, I_E=5\text{mA}, f=100\text{MHz}$	f_T		250		MHz

Rating and characteristic curves



DTA114ECA

Pinning information

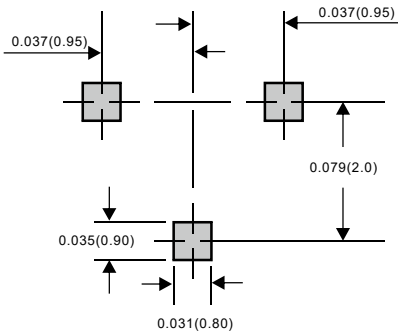
Pin	Simplified outline	Symbol
Pin1 IN Pin2 GND Pin3 OUT		

Marking

Type number	Marking code
DTA114ECA	14

Suggested solder pad layout

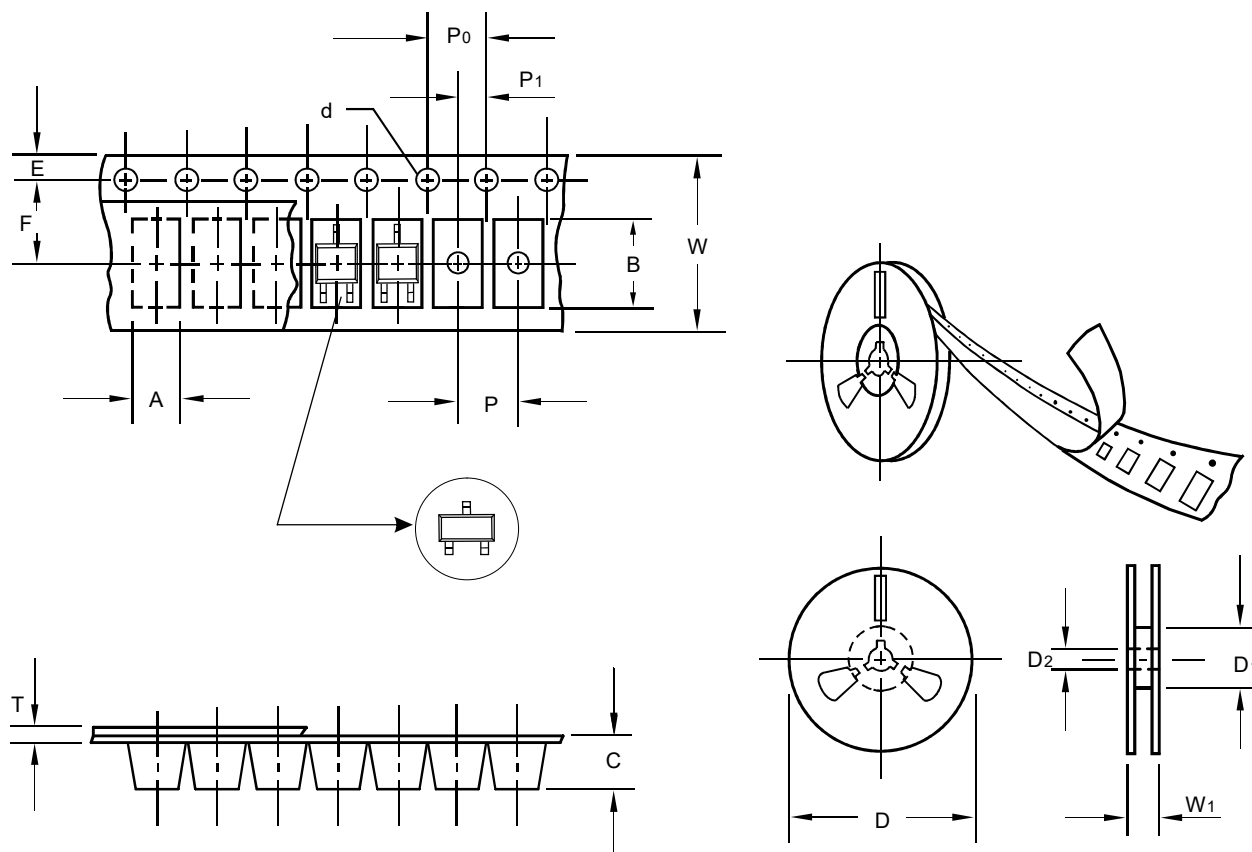
SOT-23



Dimensions in inches and (millimeters)

DTA114ECA

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.30
Carrier length	B	0.1	3.20
Carrier depth	C	0.1	1.50
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	54.40
Feed hole diameter	D2	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	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.0

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

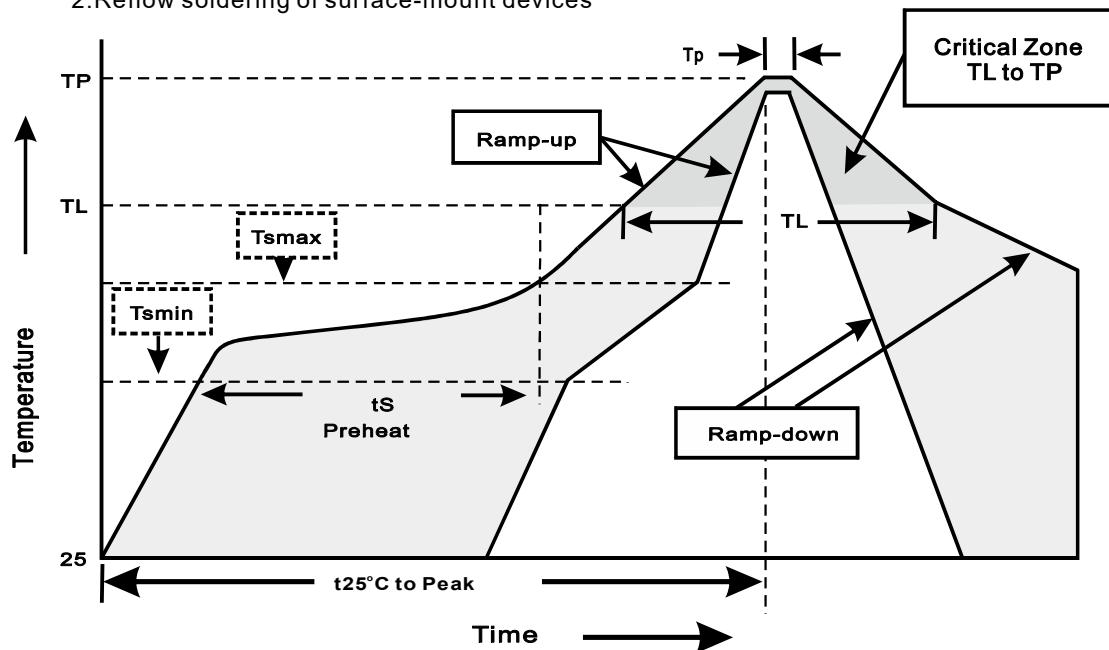
DTA114ECA

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(T _{Smin}) - Temperature Max(T _{Smax}) - Time(min to max)(t _S)	150°C 200°C 60~120sec
T _{Smax} 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

DTA114ECA

High reliability test capabilities

Item Test

Conditions

- | | |
|--|---|
| 1. Steady State Operating Life | $T_A=25^{\circ}\text{C}$ $P_D=200\text{mW}$ Test Duration:1000hrs |
| 2. High Temperature Reverse Bias | $T_J=150^{\circ}\text{C}$, $V_{CE}=80\%$ related volage, Test Duration:1000hrs |
| 3. Temperature Cycle | $-55^{\circ}\text{C}(15\text{min})$ to $150^{\circ}\text{C}(15\text{min})$ Air to Air Transition Time<20sec
Test Cycles: 1000cycle |
| 4. Autoclave | $P=2\text{atm}$ $T_a=121^{\circ}\text{C}$ $\text{RH}=100\%$ Test Duration:96hrs |
| 5. High Temperature Storage Life | $T_a=150^{\circ}\text{C}$ Test Duration: 1000hrs |
| 6. Solderability | 245°C ,Test Duration:5sec |
| 7. High Temperature High Humidity Reverse Bias | $T_a=85^{\circ}\text{C}$, 85%RH, $V_{CE}=80\%$ related volage, Test Duration: 1000hrs |
| 8. Resistance to Soldering Heat | 260°C ,Test Duration: 10sec |
| 10. Solvent Resistance | |