

DDTC114EE-7 Datasheet



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

DiGi Electronics Part Number	DDTC114EE-7-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DDTC114EE-7
Description	TRANS PREBIAS NPN 50V SOT523
Detailed Description	Pre-Biased Bipolar Transistor (BJT) NPN - Pre-Biased 50 V 100 mA 250 MHz 150 mW Surface Mount SOT-523



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DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

DDTC114EE-7

Series:

-

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-523

Manufacturer:

Diodes Incorporated

Product Status:

Discontinued at Digi-Key

Current - Collector (Ic) (Max):

100 mA

Resistor - Base (R1):

10 kOhms

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

30 @ 5mA, 5V

Current - Collector Cutoff (Max):

500nA

Power - Max:

150 mW

Package / Case:

SOT-523

Base Product Number:

DDTC114

Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0075

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

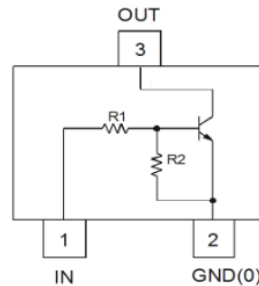
- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208
- Weight: 0.002 grams (Approximate)

Part Number	R1, R2 (NOM)
DDTC123EE	2.2k Ω
DDTC143EE	4.7k Ω
DDTC114EE	10k Ω
DDTC124EE	22k Ω
DDTC144EE	47k Ω
DDTC115EE	100k Ω

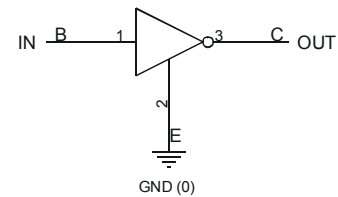
SOT523



Top View



Device Schematic



Equivalent Inverter Circuit

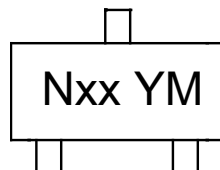
Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDTC123EE-7-F	Standard	N04	7	8	3000
DDTC143EE-7-F	Standard	N08	7	8	3000
DDTC114EE-7-F	Standard	N13	7	8	3000
DDTC124EE-7-F	Standard	N17	7	8	3000
DDTC144EE-7-F	Standard	N20	7	8	3000
DDTC115EE-7-F	Standard	N24	7	8	3000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

SOT523



NXX = Product Type Marking Code (See Ordering Information)

YM = Date Code Marking

Y or \bar{Y} = Year (ex: I = 2021)M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	O	P	R	S	T	U

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>	V_{CC}	50	V
Input Voltage <Pin: (1) to (2)>	V_i	-10 to +12 -10 to +30 -10 to +40 -10 to +40 -10 to +40 -10 to +40	V
Output Current	I_o	100 100 50 30 100 20	mA
Output Current	I_C (Max)	100	mA

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 5 & 6)	P_D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	833	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: 5. Mounted on FR-4 PC Board with minimum recommended pad layout.

6. 150mW per element must not be exceeded.

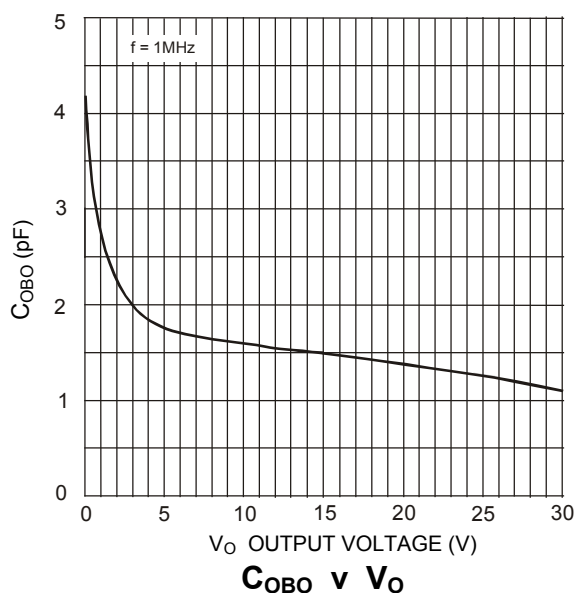
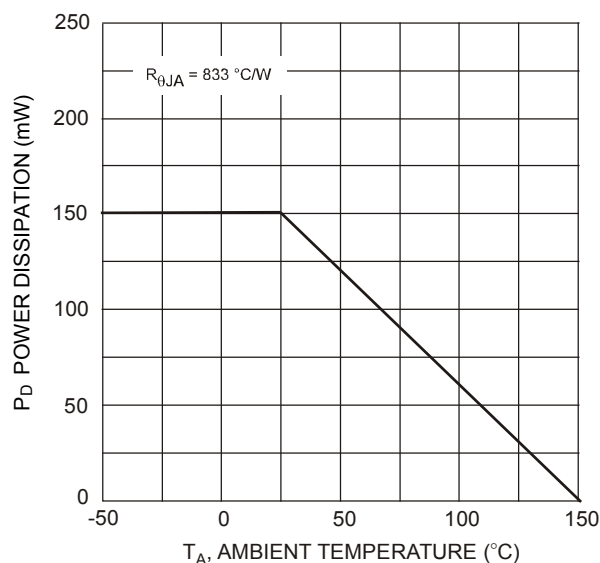


DDTC (R1 = R2 SERIES) EE

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		$V_{I(off)}$ (Note 7)	0.5	1.1	—	V	$V_{CC} = 5V, I_O = 100\mu\text{A}$ $V_O = 0.3V, I_O = 20\text{mA}$, DDTC123EE $V_O = 0.3V, I_O = 20\text{mA}$, DDTC143EE $V_O = 0.3V, I_O = 10\text{mA}$, DDTC114EE $V_O = 0.3V, I_O = 5\text{mA}$, DDTC124EE $V_O = 0.3V, I_O = 2\text{mA}$, DDTC144EE $V_O = 0.3V, I_O = 1\text{mA}$, DDTC115EE
		$V_{I(on)}$ (Note 8)	—	1.9	3		
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	$I_O/I_I = 10\text{mA}/0.5\text{mA}$, DDTC123EE $I_O/I_I = 10\text{mA}/0.5\text{mA}$, DDTC143EE $I_O/I_I = 10\text{mA}/0.5\text{mA}$, DDTC114EE $I_O/I_I = 10\text{mA}/0.5\text{mA}$, DDTC124EE $I_O/I_I = 10\text{mA}/0.5\text{mA}$, DDTC144EE $I_O/I_I = 5\text{mA}/0.25\text{mA}$, DDTC115EE
Input Current	DDTC123EE DDTC143EE DDTC114EE DDTC124EE DDTC144EE DDTC115EE	I_I	—	—	3.8 1.8 0.88 0.36 0.18 0.15	mA	$V_I = 5V$
Output Current		$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50V, V_I = 0V$
DC Current Gain	DDTC123EE DDTC143EE DDTC114EE DDTC124EE DDTC144EE DDTC115EE	G_I	20 20 30 56 68 82	—	—	—	$V_O = 5V, I_O = 20\text{mA}$ $V_O = 5V, I_O = 10\text{mA}$ $V_O = 5V, I_O = 5\text{mA}$ $V_O = 5V, I_O = 5\text{mA}$ $V_O = 5V, I_O = 5\text{mA}$ $V_O = 5V, I_O = 5\text{mA}$
Input Resistor Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	0.8	1	1.2	%	—
Transition frequency (Note 9)		f_T	—	250	—	MHz	$V_{CE} = -10V, I_E = 5\text{mA}$, $f = 100\text{MHz}$

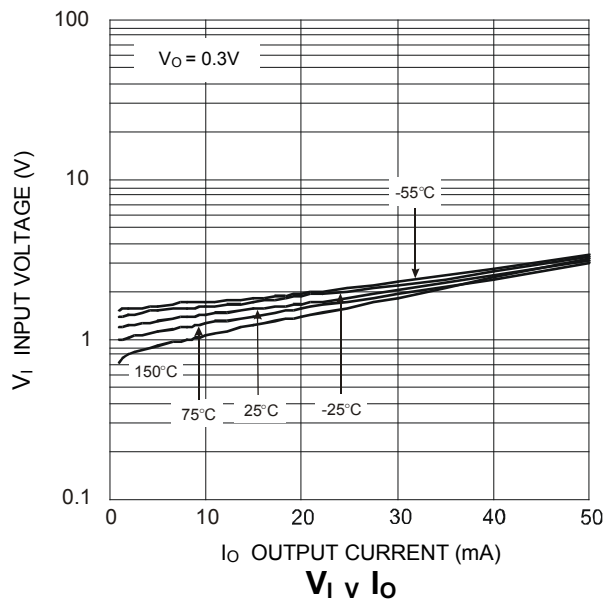
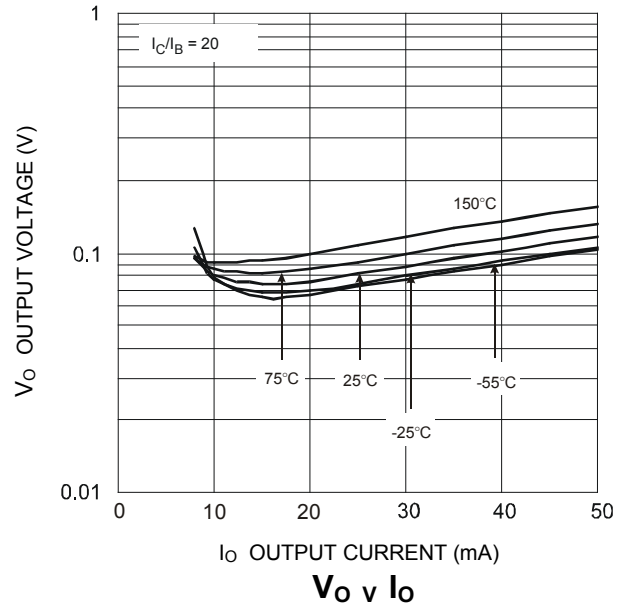
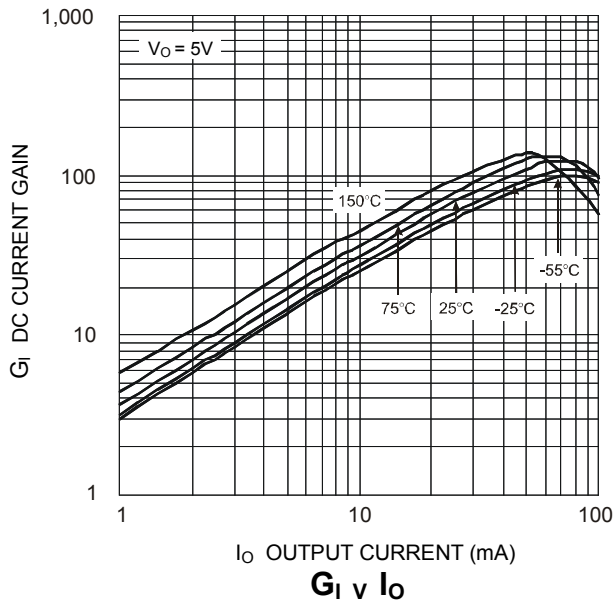
Notes: 7. Guarantees that the device will be switched OFF if the Input Voltage is less than 0.5V.
8. Guarantees that the device will be switched ON if the Input Voltage is more than 3V.
9. Transistor only.

Typical Electrical Characteristics




DDTC (R1 = R2 SERIES) EE

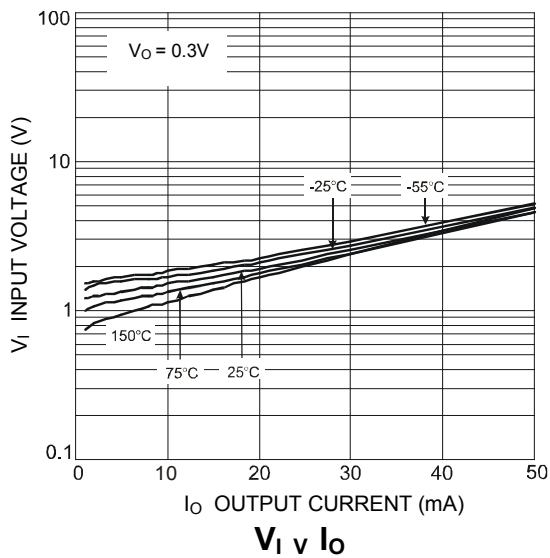
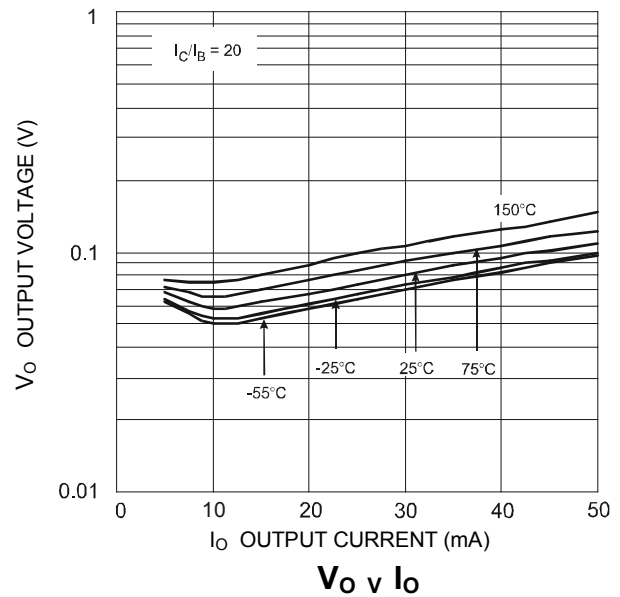
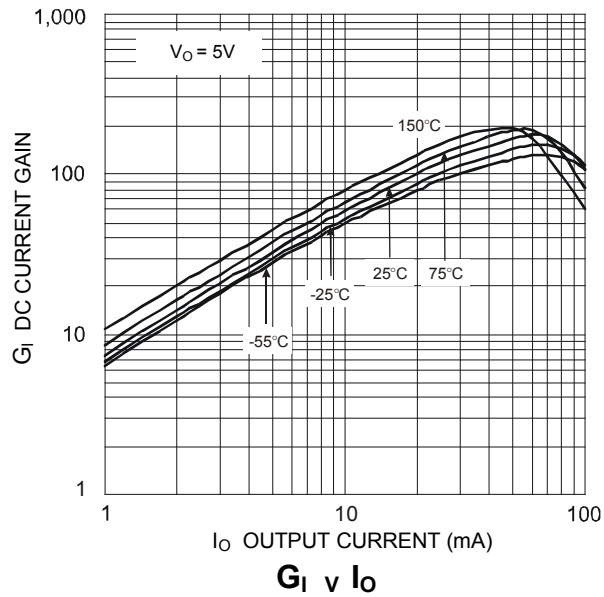
Typical Electrical Characteristics – DDTC123EE





DDTC (R1 = R2 SERIES) EE

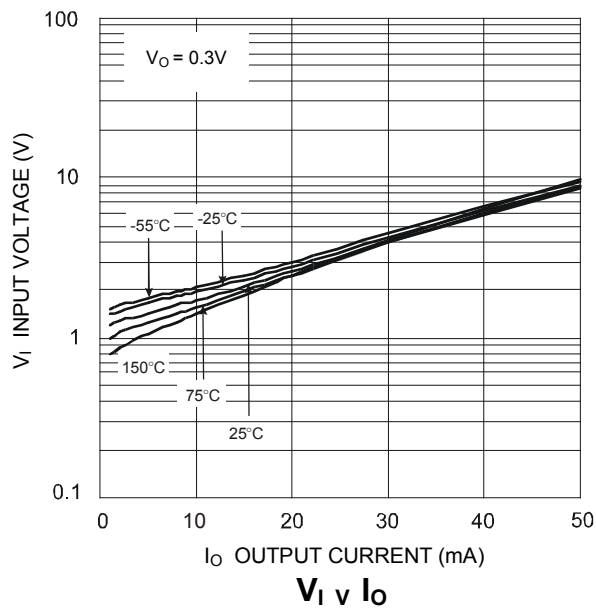
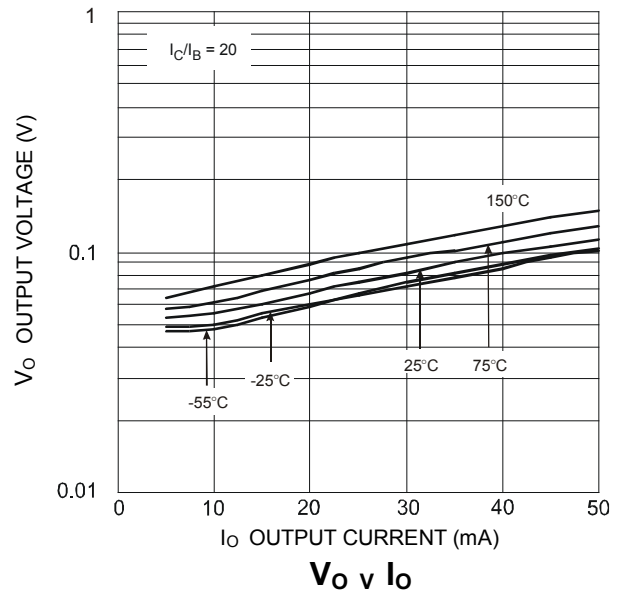
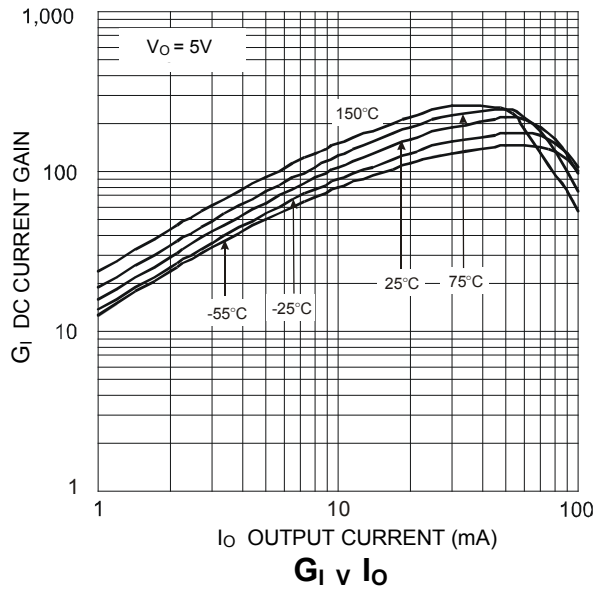
Typical Electrical Characteristics – DDTC143EE





DDTC (R1 = R2 SERIES) EE

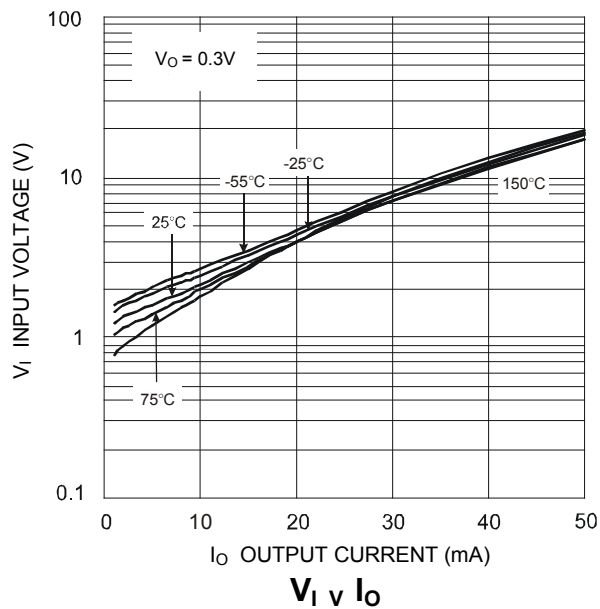
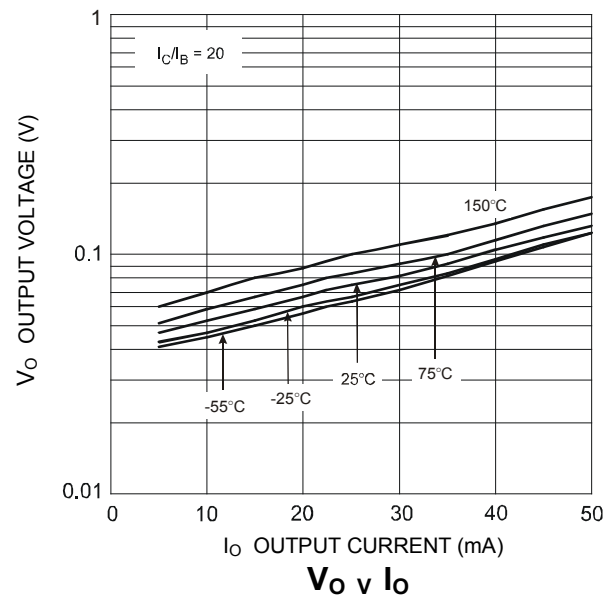
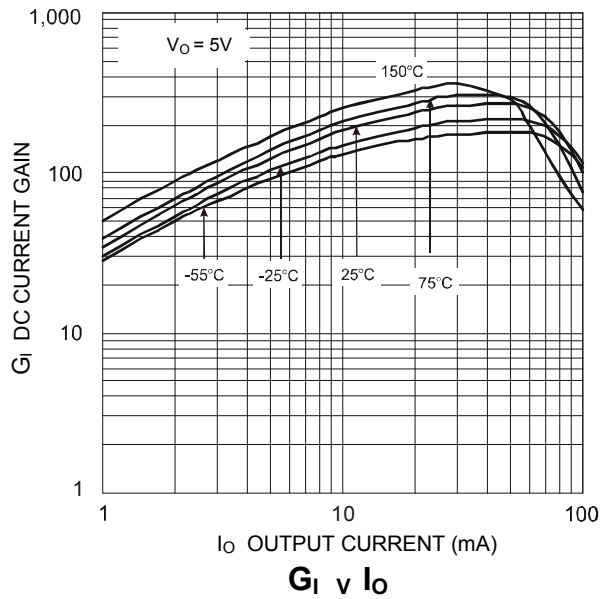
Typical Electrical Characteristics – DDTC114EE





DDTC (R1 = R2 SERIES) EE

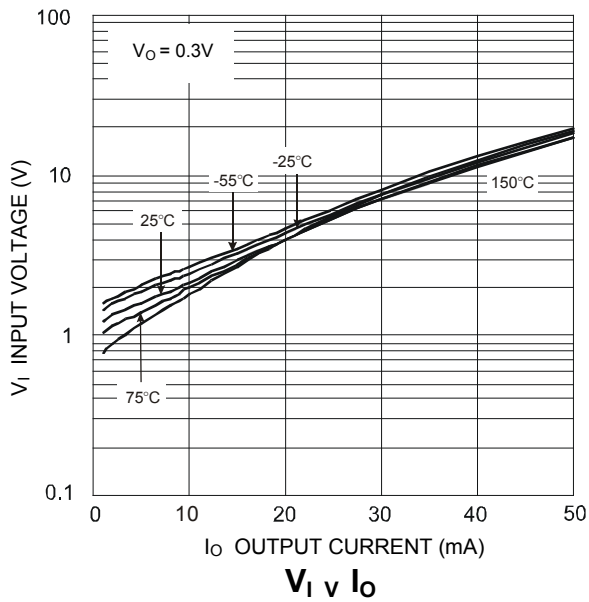
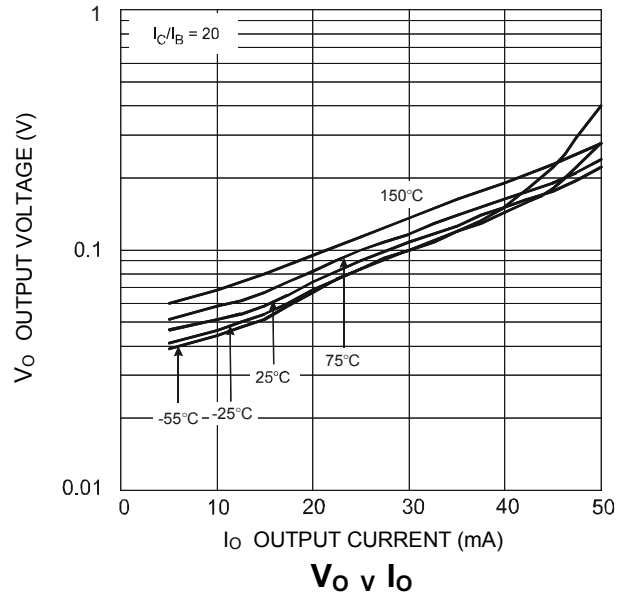
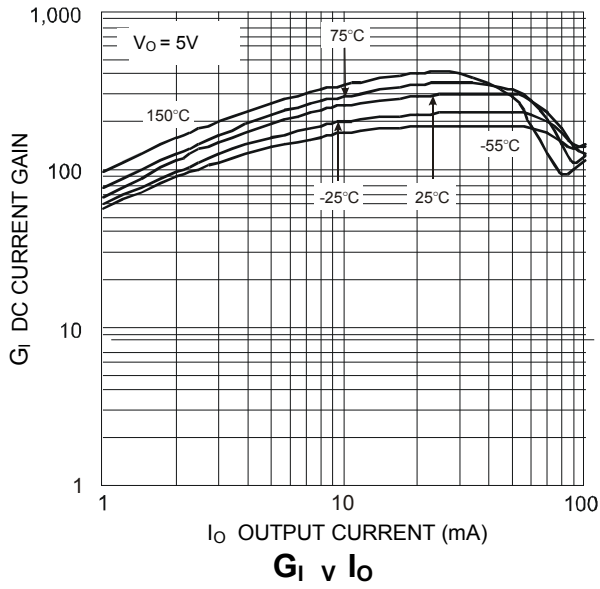
Typical Electrical Characteristics – DDTC124EE





DDTC (R1 = R2 SERIES) EE

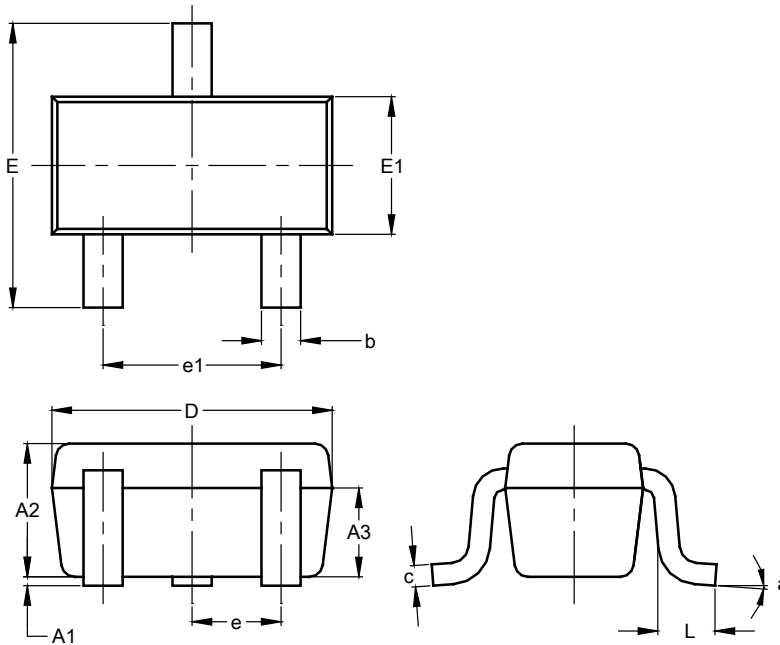
Typical Electrical Characteristics – DDTC144EE



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT523

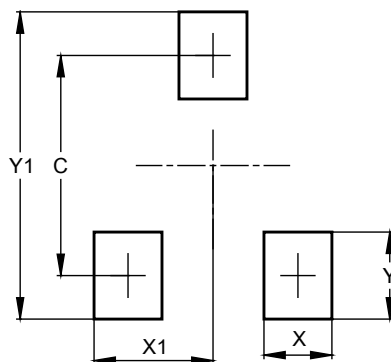


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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