DDTC (R1 = R2 SERIES) UA

NPN PRE-BIASED SMALL SIGNAL SOT-323 SURFACE MOUNT TRANSISTOR

Lead-free Green

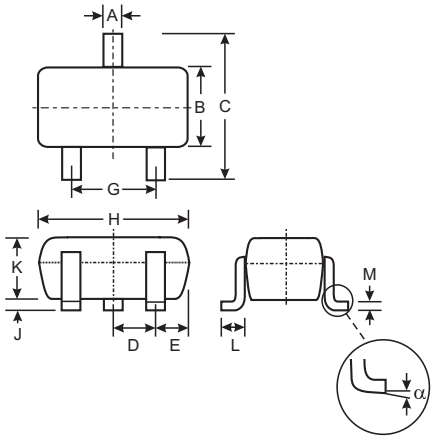
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

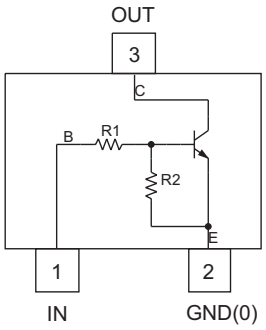
Mechanical Data

- Case: SOT-323
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking: Date Code and Type Code, See Page 2
- Ordering Information (See Page 2)
- Type Code: See Table Below
- Weight: 0.006 grams (approximate)

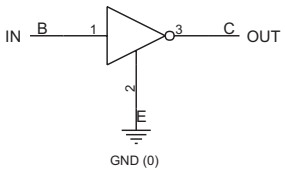
P/N	R1, R2 (NOM)	Type Code
DDTC123EUA	2.2KΩ	N04
DDTC143EUA	4.7KΩ	N08
DDTC114EUA	10KΩ	N13
DDTC124EUA	22KΩ	N17
DDTC144EUA	47KΩ	N20
DDTC115EUA	100KΩ	N24



SOT-323		
Dim	**Min**	**Max**
A	0.25	0.40
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
E	0.30	0.40
G	1.20	1.40
H	1.80	2.20
J	0.0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.18
α	0°	8°
All Dimensions in mm		



Schematic and Pin Configuration



Equivalent Inverter Circuit

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (2)		V_{CC}	50	V
Input Voltage, (1) to (2)	DDTC123EUA DDTC143EUA DDTC114EUA DDTC124EUA DDTC144EUA DDTC115EUA	V_{IN}	-10 to +12 -10 to +30 -10 to +40 -10 to +40 -10 to +40 -10 to +40	V
Output Current	DDTC123EUA DDTC143EUA DDTC114EUA DDTC124EUA DDTC144EUA DDTC115EUA	I_O	100 100 50 30 100 20	mA
Output Current	All	I_C (Max)	100	mA
Power Dissipation		P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)		$R_{\theta JA}$	625	°C/W
Operating and Storage and Temperature Range		T_j, T_{STG}	-55 to +150	°C

Note: 1. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com/datasheets/ap02001.pdf.
2. No purposefully added lead.
3. Diodes Inc.'s "Green" Policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
4. Product manufactured with date code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to date code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		$V_{I(off)}$	0.5	1.1	—	V	V_{CC} = 5V, I_O = 100μA
		$V_{I(on)}$	—	1.9	3		V_O = 0.3V, I_O = 20mA, DDTC123EUA V_O = 0.3V, I_O = 20mA, DDTC143EUA V_O = 0.3V, I_O = 10mA, DDTC114EUA V_O = 0.3V, I_O = 5mA, DDTC124EUA V_O = 0.3V, I_O = 2mA, DDTC144EUA V_O = 0.3V, I_O = 1mA, DDTC115EUA
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	I_O/I_I =10mA/0.5mA, DDTC123EUA I_O/I_I =10mA/0.5mA, DDTC143EUA I_O/I_I =10mA/0.5mA, DDTC114EUA I_O/I_I =10mA/0.5mA, DDTC124EUA I_O/I_I =10mA/0.5mA, DDTC144EUA I_O/I_I =5mA/0.25mA, DDTC115EUA
Input Current	DDTC123EUA DDTC143EUA DDTC114EUA DDTC124EUA DDTC144EUA DDTC115EUA	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	DDTC123EUA DDTC143EUA DDTC114EUA DDTC124EUA DDTC144EUA DDTC115EUA	G_I	20 20 30 56 68 82	—	—	—	V_O = 5V, I_O = 20mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 5mA
Input Resistor (R_1) Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio		R_2/R_1	0.8	1	1.2	—	—
Gain-Bandwidth Product*		f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

* Transistor - For Reference Only

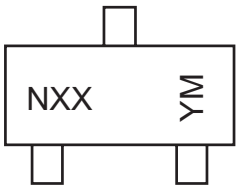
Ordering Information (Note 4 & 5)

Device	Packaging	Shipping
DDTC123EUA-7-F	SOT-323	3000/Tape & Reel
DDTC143EUA-7-F	SOT-323	3000/Tape & Reel
DDTC114EUA-7-F	SOT-323	3000/Tape & Reel
DDTC124EUA-7-F	SOT-323	3000/Tape & Reel
DDTC144EUA-7-F	SOT-323	3000/Tape & Reel
DDTC115EUA-7-F	SOT-323	3000/Tape & Reel

Notes: 4. Product manufactured with date code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to date code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

5. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



NXX = Product Type Marking Code, See Table on Page 1
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	P	R	S	T	U	V	W	X	Y	Z

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

TYPICAL CURVES - DDTC143EUA

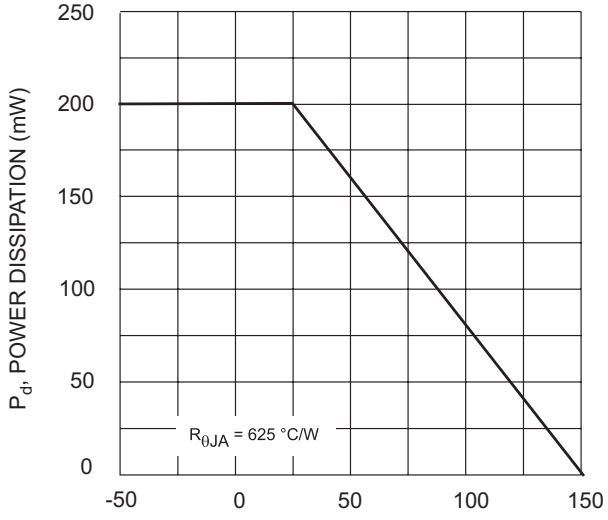


Fig. 1 Derating Curve

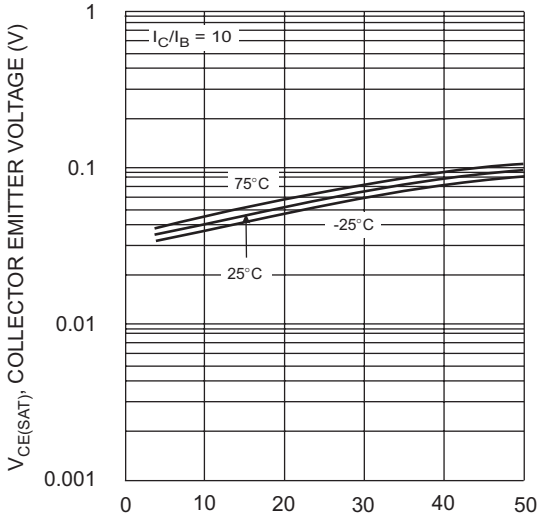


Fig. 2 $V_{CE(SAT)}$ vs. I_C

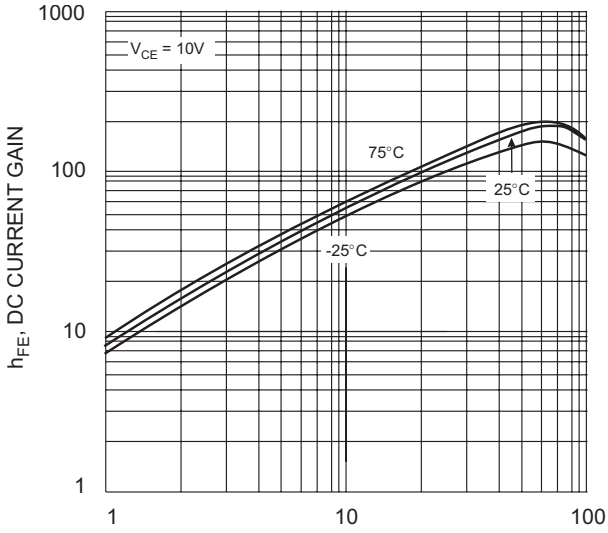


Fig. 3 DC CURRENT GAIN

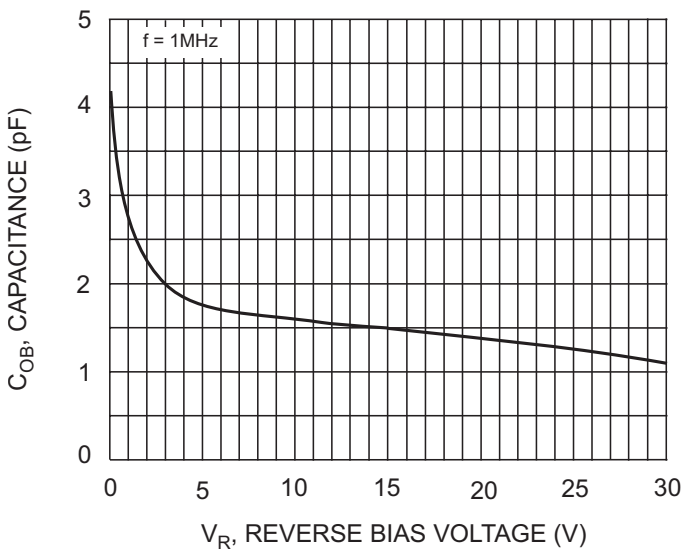


Fig. 4 Output Capacitance

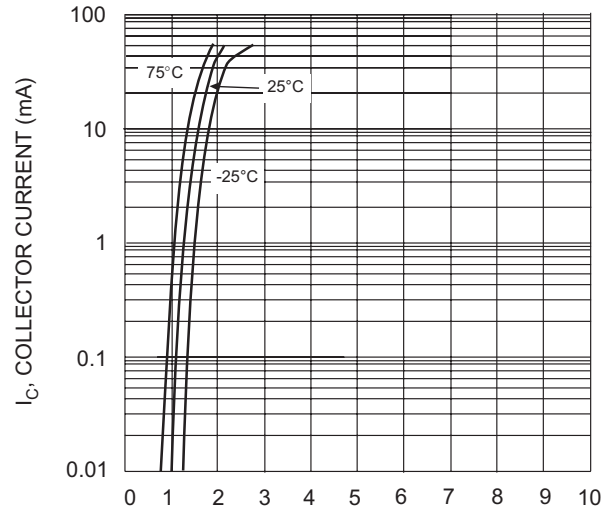


Fig. 5 Collector Current Vs. Input Voltage

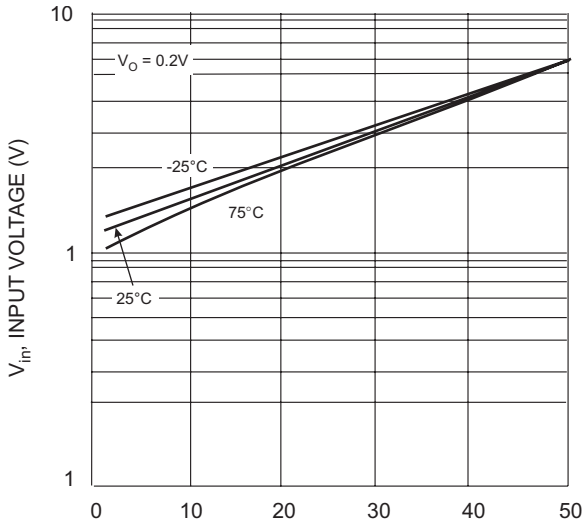


Fig. 6 Input Voltage vs. Collector Current

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