DDTA (R1≠R2 SERIES)

PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

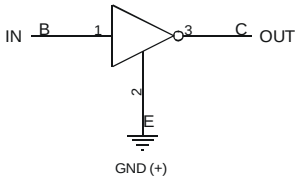
Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating) Solderable per MIL-STD-202, Method 208
- Weight: 0.002 grams (approximate)

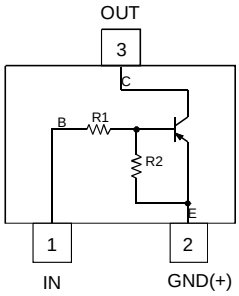
Part Number	R1 (NOM)	R2 (NOM)	Marking
DDTA113ZE	1KΩ	10KΩ	P02
DDTA123YE	2.2KΩ	10KΩ	P05
DDTA123JE	2.2KΩ	47KΩ	P06
DDTA143XE	4.7KΩ	10KΩ	P09
DDTA143FE	4.7KΩ	22KΩ	P10
DDTA143ZE	4.7KΩ	47KΩ	P11
DDTA114YE	10KΩ	47KΩ	P14
DDTA114WE	10KΩ	4.7KΩ	P15
DDTA124XE	22KΩ	47KΩ	P18
DDTA144VE	47KΩ	10KΩ	P21
DDTA144WE	47KΩ	22KΩ	P22

SOT523

Top View



Device Schematic



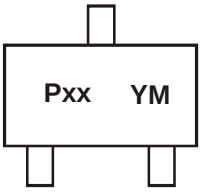
Package Pin Out Configuration

Ordering Information (Note 3)

Part Number	Case	Packaging
DDTA113ZE-7-F	SOT523	3000/Tape & Reel
DDTA123YE-7-F	SOT523	3000/Tape & Reel
DDTA123JE-7-F	SOT523	3000/Tape & Reel
DDTA143XE-7-F	SOT523	3000/Tape & Reel
DDTA143FE-7-F	SOT523	3000/Tape & Reel
DDTA143ZE-7-F	SOT523	3000/Tape & Reel
DDTA114YE-7-F	SOT523	3000/Tape & Reel
DDTA114WE-7-F	SOT523	3000/Tape & Reel
DDTA124XE-7-F	SOT523	3000/Tape & Reel
DDTA144VE-7-F	SOT523	3000/Tape & Reel
DDTA144WE-7-F	SOT523	3000/Tape & Reel

Notes: 1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com.
3. For packaging details, go to our website at http://www.diodes.com.

Marking Information



Pxx = Product Type Marking Code (See Features Table)
YM = Date Code Marking
Y = Year (ex: T = 2006)
M = Month (ex: 9 = September)

Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	S	T	U	V	W	X	Y	Z	A	B	C

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

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage, (2) to (3)		V_{CC}	-50	V
Input Voltage, (1) to (2)	DDTA113ZE	V_{IN}	+5 to -10	V
	DDTA123YE		+5 to -12	
	DDTA123JE		+5 to -12	
	DDTA143XE		+7 to -20	
	DDTA143FE		+6 to -30	
	DDTA143ZE		+5 to -30	
	DDTA114YE		+6 to -40	
	DDTA114WE		+10 to -30	
	DDTA124XE		+10 to -40	
	DDTA144VE		+15 to -40	
	DDTA144WE		+10 to -40	
Output Current	DDTA113ZE	I_O	-100	mA
	DDTA123YE		-100	
	DDTA123JE		-100	
	DDTA143XE		-100	
	DDTA143FE		-100	
	DDTA143ZE		-100	
	DDTA114YE		-70	
	DDTA114WE		-100	
	DDTA124XE		-50	
	DDTA144VE		-30	
	DDTA144WE		-30	
Output Current	All	$I_{C(MAX)}$	-100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 4)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDTA113ZE	$V_{I(OFF)}$	-0.3	—	—	V	V_{CC} = -5V, I_O = -100μA
	DDTA123YE		-0.3				
	DDTA123JE		-0.5				
	DDTA143XE		-0.3				
	DDTA143FE		-0.3				
	DDTA143ZE		-0.5				
	DDTA114YE		-0.3				
	DDTA114WE		-0.8				
	DDTA124XE		-0.4				
	DDTA144VE		-1.0				
	DDTA144WE		-0.8				
	DDTA113ZE	$V_{I(ON)}$	—	—	-3.0		V_O = -0.3V, I_O = -20mA
	DDTA123YE				-3.0		V_O = -0.3V, I_O = -20mA
	DDTA123JE				-1.1		V_O = -0.3V, I_O = -5mA
	DDTA143XE				-2.5		V_O = -0.3V, I_O = -20mA
	DDTA143FE				-1.3		V_O = -0.3V, I_O = -3mA
	DDTA143ZE				-1.3		V_O = -0.3V, I_O = -5mA
	DDTA114YE				-1.4		V_O = -0.3V, I_O = -1mA
	DDTA114WE				-3.0		V_O = -0.3V, I_O = -2mA
	DDTA124XE				-2.5		V_O = -0.3V, I_O = -2mA
	DDTA144VE				-5.0		V_O = -0.3V, I_O = -2mA
	DDTA144WE				-4.0		V_O = -0.3V, I_O = -2mA
Output Voltage		$V_{O(ON)}$	—	-0.1	-0.3	V	I_O/I_I = -5mA/-0.25mA DDTA123E I_O/I_I = -5mA/-0.25mA DDTA143E I_O/I_I = -5mA/-0.25mA DDTA114E I_O/I_I = -10mA/-0.5mA All Others
Input Current	DDTA113ZE	I_I	—	—	-7.2	mA	V_I = -5V
	DDTA123YE				-3.8		
	DDTA123JE				-3.6		
	DDTA143XE				-1.8		
	DDTA143FE				-1.8		
	DDTA143ZE				-1.8		
	DDTA114YE				-0.88		
	DDTA114WE				-0.88		
	DDTA124XE				-0.36		
	DDTA144VE				-0.16		
	DDTA144WE				-0.16		
Output Current		$I_{O(OFF)}$	—	—	-0.5	μA	V_{CC} = -50V, V_I = 0V
DC Current Gain	DDTA113ZE	G_I	33	—	—	—	V_O = -5V, I_O = -10mA
	DDTA123YE		33				
	DDTA123JE		80				
	DDTA143XE		30				
	DDTA143FE		68				
	DDTA143ZE		80				
	DDTA114YE		68				
	DDTA114WE		24				
	DDTA124XE		68				
	DDTA144VE		33				
	DDTA144WE		56				
Input Resistor Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance		$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product*		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz

* Transistor – For Reference Only

Notes: 4. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com.

Typical Curves – DDTA123JE

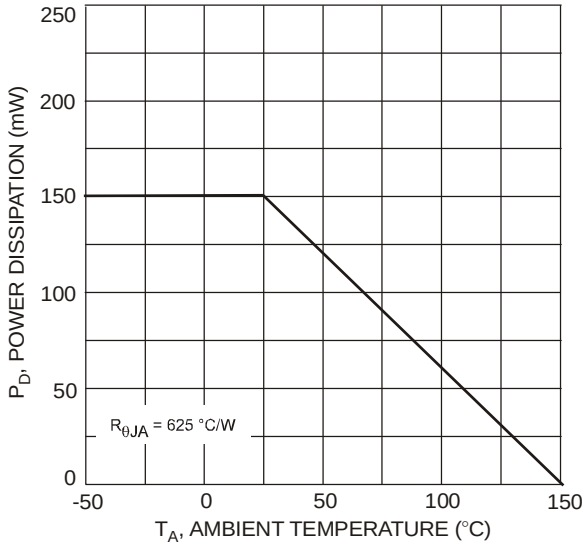


Fig. 1 Power Dissipation vs. Ambient Temperature

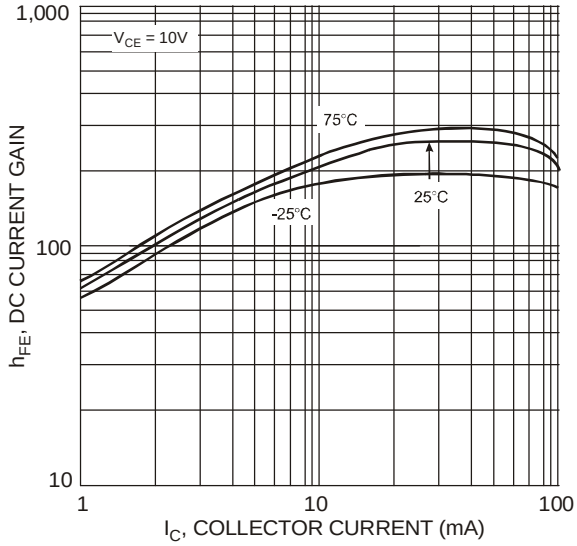


Fig. 2 Typical DC Current Gain vs. Collector Current

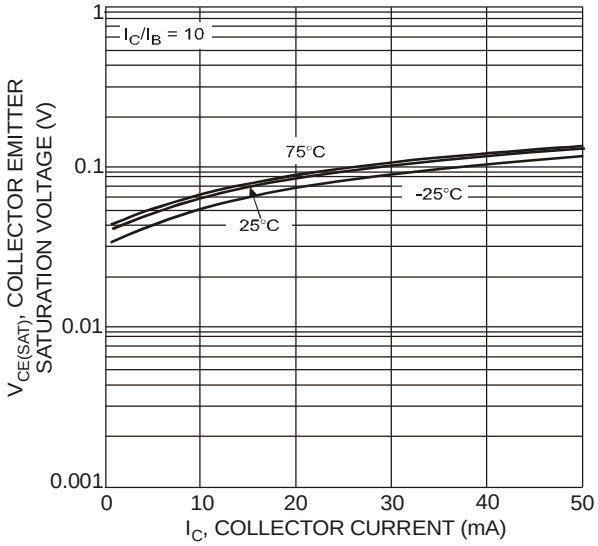


Fig. 3 Collector Emitter Saturation Voltage vs. Collector Current

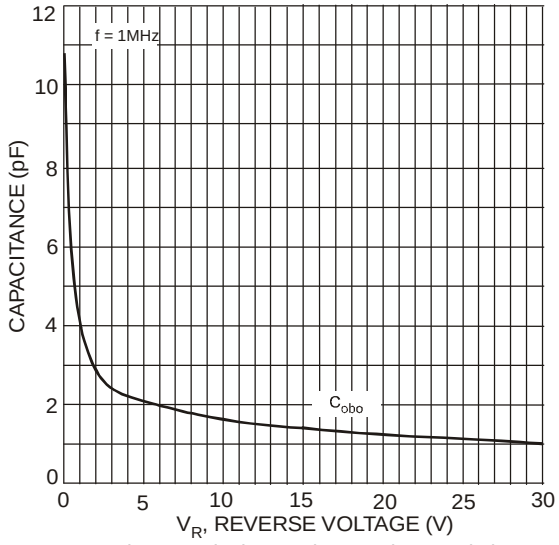


Fig. 4 Typical Capacitance Characteristics

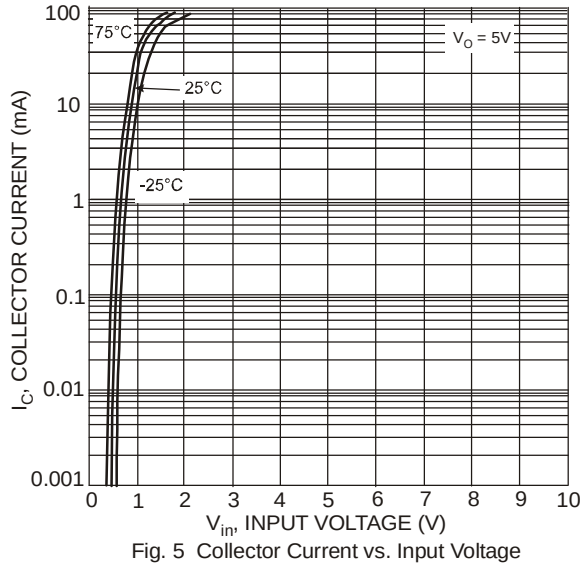


Fig. 5 Collector Current vs. Input Voltage

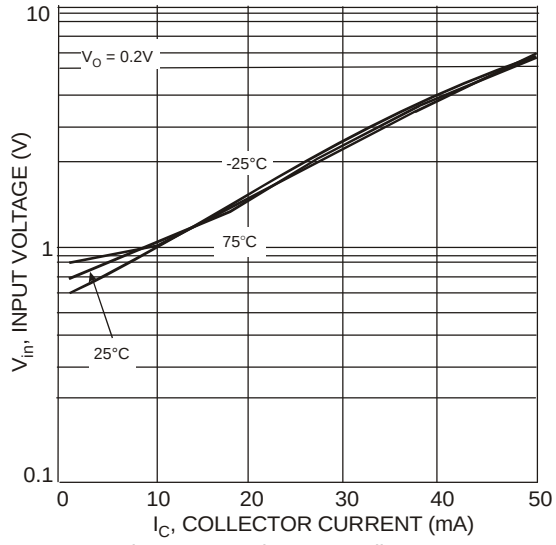
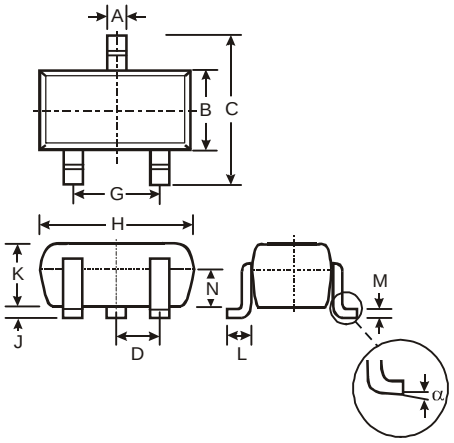


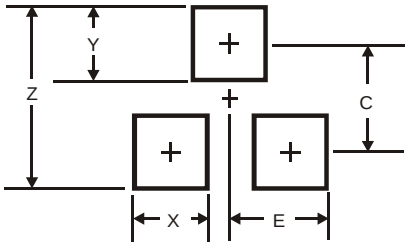
Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions



SOT523			
Dim	**Min**	**Max**	**Typ**
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
α	0°	8°	—
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	1.8
X	0.4
Y	0.51
C	1.3
E	0.7

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