MMBTA13 / MMBTA14

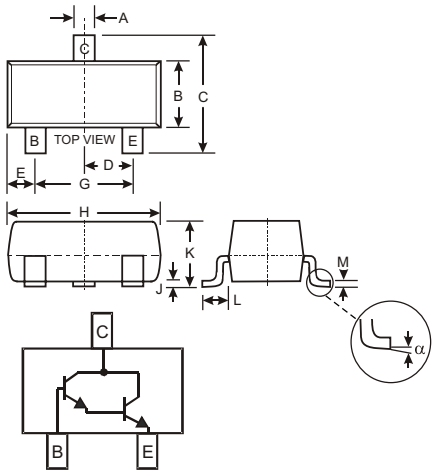
NPN SURFACE MOUNT DARLINGTON TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (MMBTA63 / MMBTA64)
- Ideal for Medium Power Amplification and Switching
- High Current Gain
- Also Available in Lead Free Version

Mechanical Data

- Case: SOT-23, Molded Plastic
- Case material - UL Flammability Rating Classification 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 4, on Page 2
- Terminal Connections: See Diagram
- MMBTA13 Marking (See Page 2): K2D, K3D
- MMBTA14 Marking (See Page 2): K3D
- Ordering & Date Code Information: See Page 2
- Weight: 0.008 grams (approx.)



SOT-23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	MMBTA13	MMBTA14	Unit
Collector-Base Voltage	V_{CBO}	30		V
Collector-Emitter Voltage	V_{CEO}	30		V
Emitter-Base Voltage	V_{EBO}	10		V
Collector Current - Continuous (Note 1)	I_C	300		mA
Power Dissipation (Note 1)	P_d	300		mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	417		°CW
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150		°C

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)						
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	30	—	V	I_C = 100μA V_{BE} = 0V
Collector Cutoff Current		I_{CBO}	—	100	nA	V_{CB} = 30V, I_E = 0
Emitter Cutoff Current		I_{EBO}	—	100	nA	V_{EB} = 10V, I_C = 0
ON CHARACTERISTICS (Note 2)						
DC Current Gain	MMBTA13	h_{FE}	5,000	—	—	I_C = 10mA, V_{CE} = 5.0V
	MMBTA14		10,000			I_C = 10mA, V_{CE} = 5.0V
	MMBTA13		10,000			I_C = 100mA, V_{CE} = 5.0V
	MMBTA14		20,000			I_C = 100mA, V_{CE} = 5.0V
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	—	1.5	V	I_C = 100mA, I_B = 100μA
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	—	2.0	V	I_C = 100mA, V_{CE} = 5.0V
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance		C_{obo}	8.0 Typical		pF	V_{CB} = 10V, f = 1.0MHz, I_E = 0
Input Capacitance		C_{ibo}	15 Typical		pF	V_{EB} = 0.5V, f = 1.0MHz, I_C = 0
Current Gain-Bandwidth Product		f_T	125	—	MHz	V_{CE} = 5.0V, I_C = 10mA, f = 100MHz

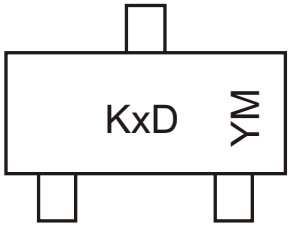
Note: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
2. Short duration test pulse used to minimize self-heating effect.

Ordering Information (Note 3)

Device	Packaging	Shipping
MMBTA13-7 MMBTA14-7	SOT-23	3000/Tape & Reel

Notes: 3. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.
4. For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above. Example: MMBTA14-7-F.

Marking Information



KxD = Product Type Marking Code, ex: K2D = MMBTA13
YM = Date Code Marking
Y = Year ex: N = 2002
M = Month ex: 9 = September

Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Code	J	K	L	M	N	P	R	S	T	U	V	W

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

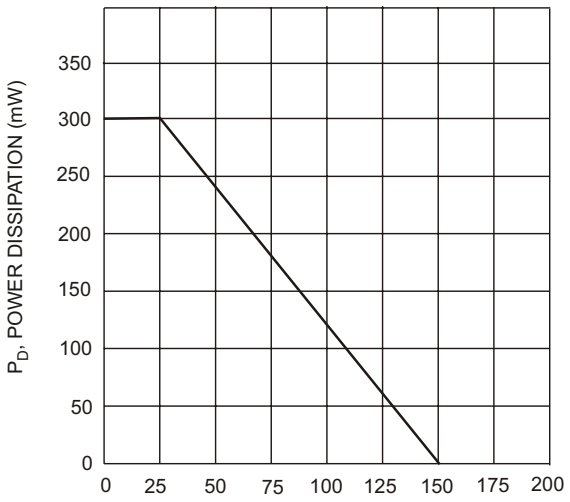


Fig. 1, Max Power Dissipation vs Ambient Temperature

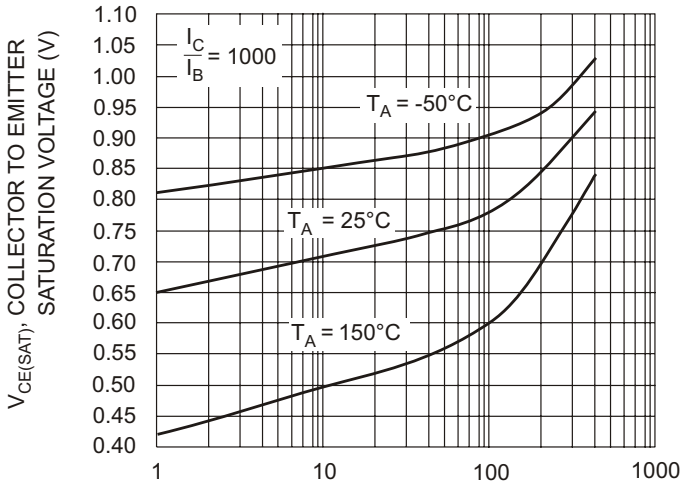


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

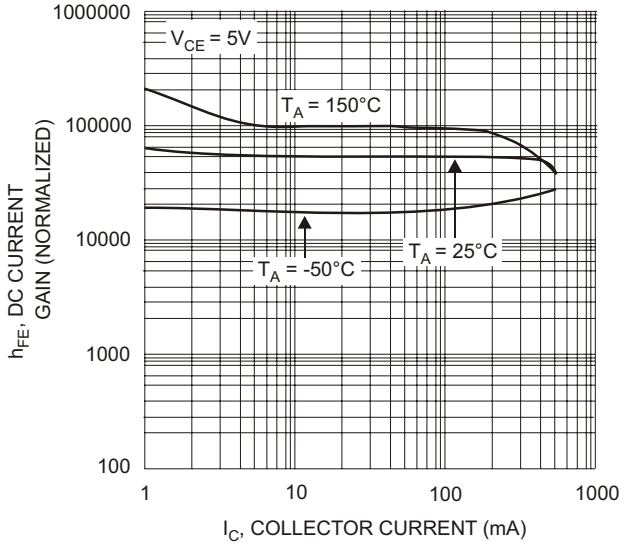


Fig. 3, DC Current Gain vs Collector Current

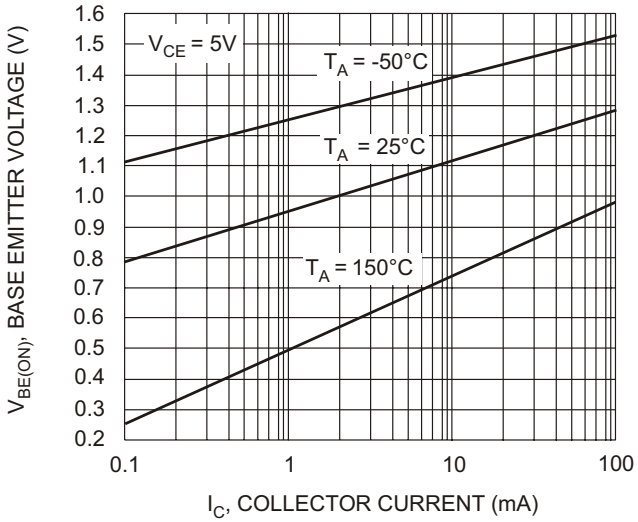


Fig. 4, Base Emitter Voltage vs. Collector Current

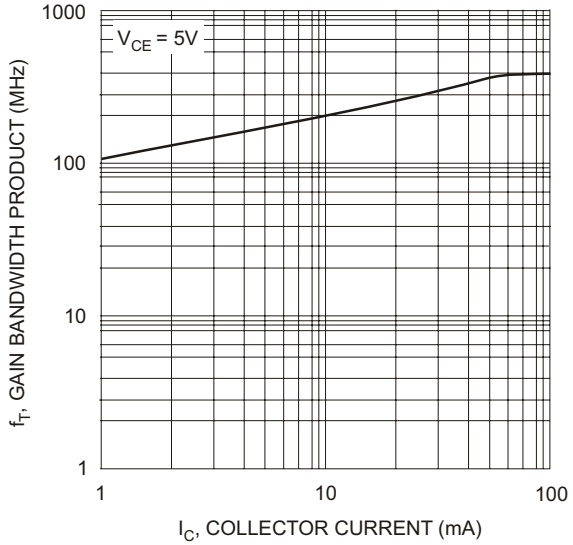


Fig. 5, Gain Bandwidth Product vs Collector Current