MMBTA13 / MMBTA14

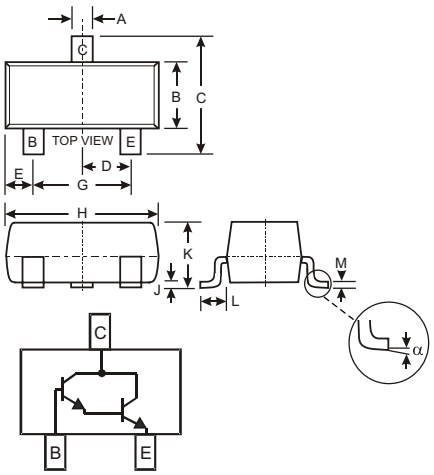
NPN SURFACE MOUNT DARLINGTON TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (MMBTA63 /MMBTA64)
- Ideal for Medium Power Amplification and Switching
- High Current Gain
- **Available in Lead Free/RoHS Compliant Version (Note 3)**

Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic. 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
- Also Available in Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Please see Ordering Information, Note 5, on Page 2
- MMBTA13 Marking (See Page 2): K2D, K3D
- MMBTA14 Marking (See Page 2): K3D
- Ordering & Date Code Information: See Page 2
- Weight: 0.008 grams (approximate)



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 MMBTA14 MMBTA13 MMBTA14	h_{FE}	5,000 10,000 10,000 20,000	—	—	I_C = 10mA, V_{CE} = 5.0V I_C = 10mA, V_{CE} = 5.0V I_C = 100mA, V_{CE} = 5.0V 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

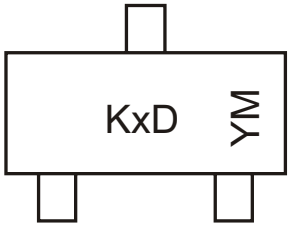
Note: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
2. Short duration test pulse used to minimize self-heating effect.
3. No purposefully added lead.

Ordering Information (Note 4)

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

Notes: 4. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.
5. For Lead Free/RoHS Compliant version part numbers, please add "-F" suffix to the part numbers 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

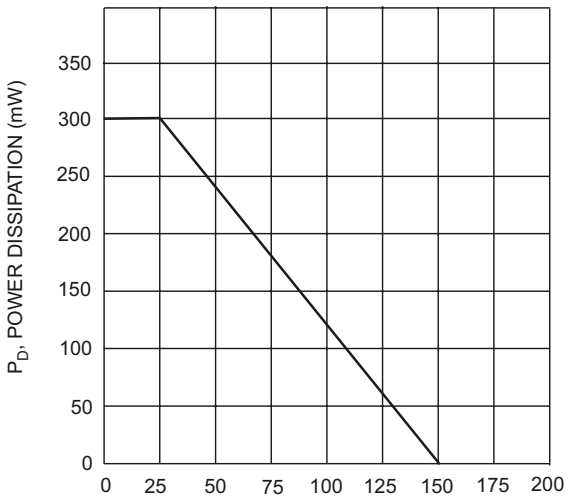


Fig. 1, Max Power Dissipation vs Ambient Temperature

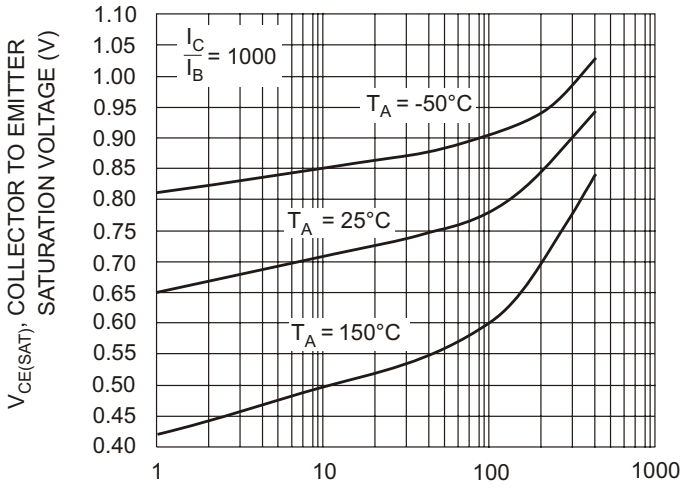


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current

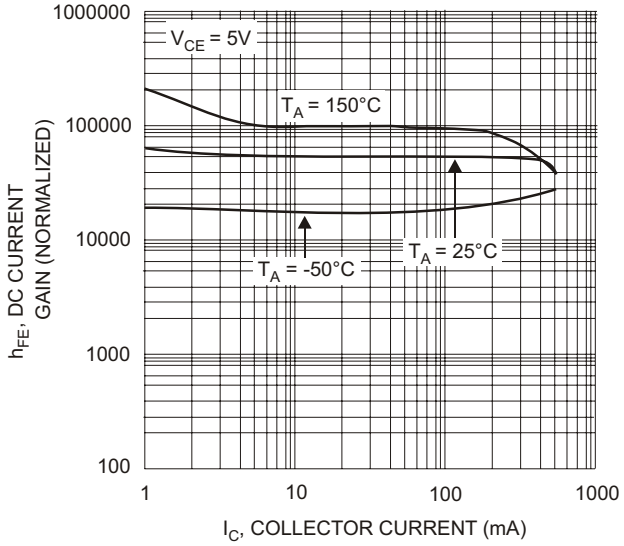


Fig. 3, DC Current Gain vs Collector Current

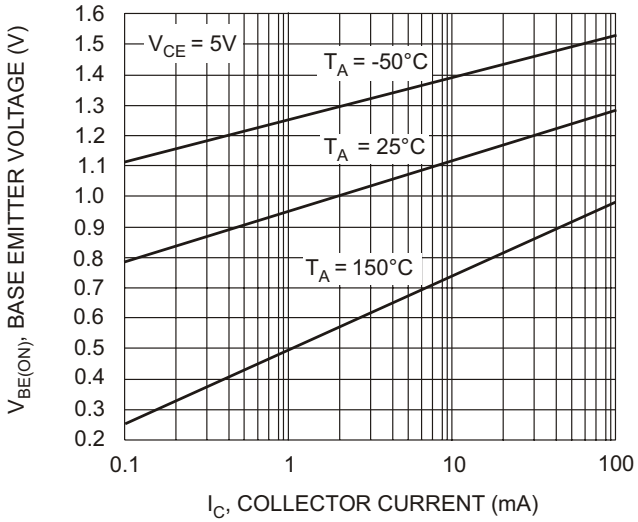


Fig. 4, Base Emitter Voltage vs. Collector Current

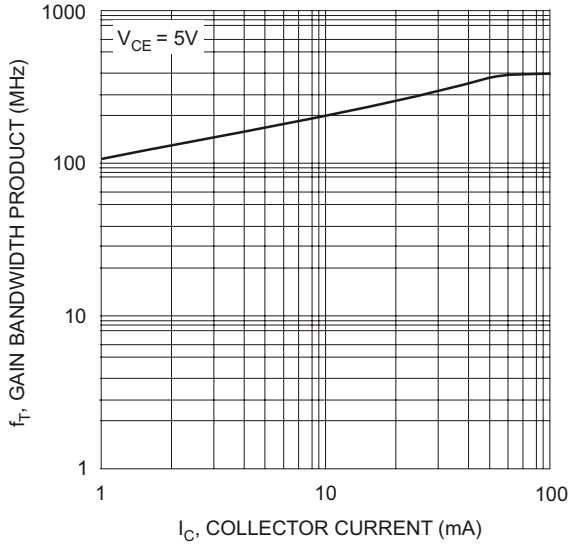


Fig. 5, Gain Bandwidth Product vs Collector Current