Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

MMBT3906

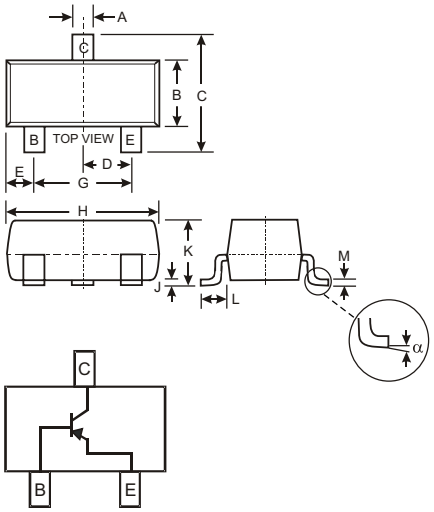
PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available
- (MMBT3904)
- Ideal for Medium Power Amplification and Switching
- 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
- Marking (See Page 2): K3N
- 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	MMBT3906	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Collector Current - Continuous (Note 1)	I_C	-200	mA
Power Dissipation (Note 1)	P_d	300	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	417	°C/W
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	°C

Notes: 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.

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

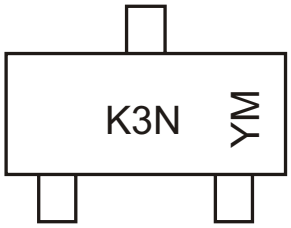
Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40	—	V	I_C = -10μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-40	—	V	I_C = -1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	—	V	I_E = -10μA, I_C = 0
Collector Cutoff Current	I_{CEX}	—	-50	nA	V_{CE} = -30V, $V_{EB(OFF)}$ = -3.0V
	I_{CBO}	—	-50	nA	V_{CB} = -30V, I_E = 0
Base Cutoff Current	I_{BL}	—	-50	nA	V_{CE} = -30V, $V_{EB(OFF)}$ = -3.0V
ON CHARACTERISTICS (Note 2)					
DC Current Gain	h_{FE}	60 80 100 60 30	— — 300 — —	—	I_C = -100μA, V_{CE} = -1.0V I_C = -1.0mA, V_{CE} = -1.0V I_C = -10mA, V_{CE} = -1.0V I_C = -50mA, V_{CE} = -1.0V I_C = -100mA, V_{CE} = -1.0V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	-0.25 -0.40	V	I_C = -10mA, I_B = -1.0mA I_C = -50mA, I_B = -5.0mA
Base- Emitter Saturation Voltage	$V_{BE(SAT)}$	-0.65 —	-0.85 -0.95	V	I_C = -10mA, I_B = -1.0mA I_C = -50mA, I_B = -5.0mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	4.5	pF	V_{CB} = -5.0V, f = 1.0MHz, I_E = 0
Input Capacitance	C_{ibo}	—	10	pF	V_{EB} = -0.5V, f = 1.0MHz, I_C = 0
Input Impedance	h_{ie}	2.0	12	kΩ	V_{CE} = 10V, I_C = 1.0mA, f = 1.0kHz
Voltage Feedback Ratio	h_{re}	0.1	10	x 10^{-4}	
Small Signal Current Gain	h_{fe}	100	400	—	
Output Admittance	h_{oe}	3.0	60	μS	
Current Gain-Bandwidth Product	f_T	250	—	MHz	V_{CE} = -20V, I_C = -10mA, f = 100MHz
Noise Figure	NF	—	4.0	dB	V_{CE} = -5.0V, I_C = -100μA, R_S = 1.0kΩ, f = 1.0kHz
SWITCHING CHARACTERISTICS					
Delay Time	t_d	—	35	ns	V_{CC} = -3.0V, I_C = -10mA, $V_{BE(off)}$ = 0.5V, I_{B1} = -1.0mA
Rise Time	t_r	—	35	ns	
Storage Time	t_s	—	225	ns	V_{CC} = -3.0V, I_C = -10mA, I_{B1} = I_{B2} = -1.0mA
Fall Time	t_f	—	75	ns	

Ordering Information (Note 3)

Device	Packaging	Shipping
MMBT3906 -7	SOT-23	3000/Tape & Reel

Notes: 2. Short duration test pulse used to minimize self-heating effect.
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: MMBT3906-7-F.

Marking Information



K3N = Product Type Marking Code
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

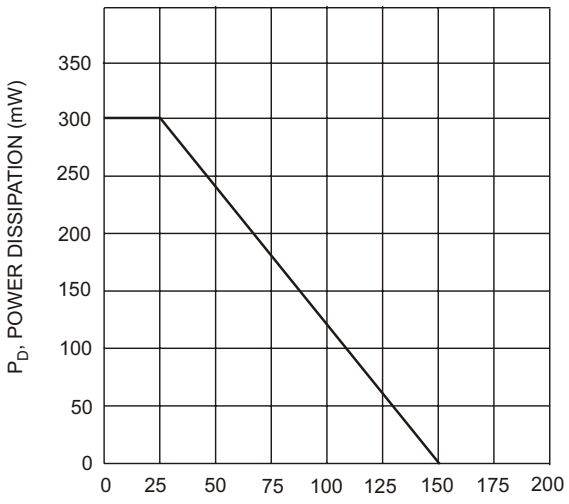


Fig. 1, Max Power Dissipation vs Ambient Temperature

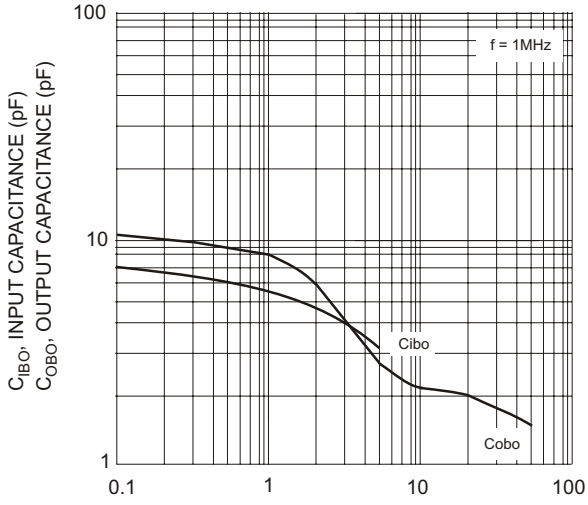


Fig. 2, Input and Output Capacitance vs. Collector-Base Voltage

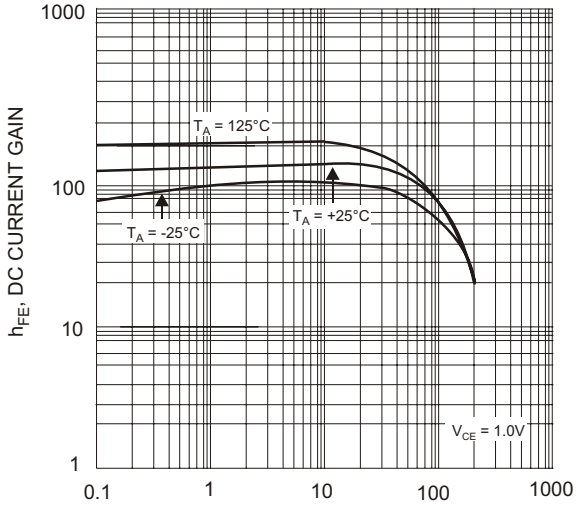


Fig. 3, Typical DC Current Gain vs Collector Current

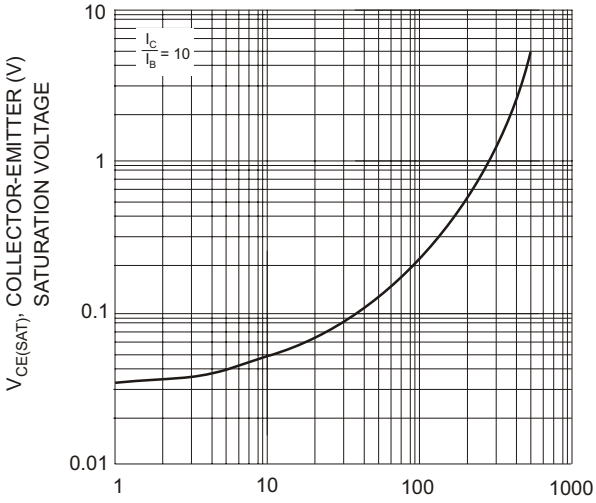


Fig. 4, Typical Collector-Emitter Saturation Voltage vs. Collector Current

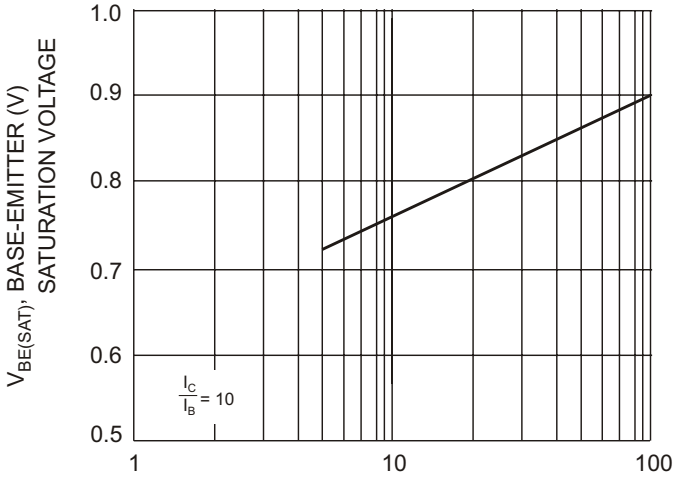


Fig. 5, Typical Base-Emitter Saturation Voltage vs. Collector Current