

# PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

### **Features**

**Epitaxial Planar Die Construction** 

Complementary NPN Type Available (MMBTA42)

Ideal for Medium Power Amplification and Switching

Lead Free/RoHS Compliant (Note 4)

Qualified to AEC-Q101 Standards for High Reliability

### **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

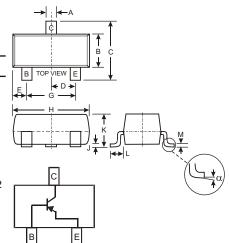
Lead Free Plating (Matte Tin Finish annealed over Alloy 42

leadframe).

Marking (See Page 2): K3R

Ordering & Date Code Information: See Page 2

Weight: 0.008 grams (approximate)



SOT-23									
Dim	Min	Max							
Α	0.37	0.51							
В	1.20	1.40							
С	2.30	2.50							
D	0.89	1.03							
Е	0.45	0.60							
G	1.78	2.05							
Н	2.80	3.00							
J	0.013	0.10							
K	0.903	1.10							
L	0.45	0.61							
M	0.085	0.180							
0 8									
All Dimensions in mm									

## Maximum Ratings @ T<sub>A</sub> = 25 C unless otherwise specified

Characteristic	Symbol	MMBTA92	Unit	
Collector-Base Voltage	V <sub>CBO</sub>	-300	V	
Collector-Emitter Voltage	V <sub>CEO</sub>	-300	V	
Emitter-Base Voltage	V <sub>EBO</sub>	-5.0	V	
Collector Current (Note 1) (Note 3)	Ic	-500	mA	
Power Dissipation (Note 1)	Pd	300	mW	
Thermal Resistance, Junction to Ambient (Note 1)	R JA	417	C/W	
Operating and Storage and Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	С	

### Electrical Characteristics @ TA = 25 C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 2)	,				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-300		V	I <sub>C</sub> = -100 A, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	-300		V	$I_C = -1.0 \text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-5.0		V	I <sub>E</sub> = -100 A, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CBO</sub>		-250	nA	V <sub>CB</sub> = -200V, I <sub>E</sub> = 0
Collector Cutoff Current	I <sub>EBO</sub>		-100	nA	V <sub>CE</sub> = -3.0V, I <sub>C</sub> = 0
ON CHARACTERISTICS (Note 2)					
DC Current Gain	h <sub>FE</sub>	25 40 25			I <sub>C</sub> = -1.0mA, V <sub>CE</sub> = -10V I <sub>C</sub> = -10mA, V <sub>CE</sub> = -10V I <sub>C</sub> = -30mA, V <sub>CE</sub> = -10V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>		-0.5	V	I <sub>C</sub> = -20mA, I <sub>B</sub> = -2.0mA
Base- Emitter Saturation Voltage	V <sub>BE(SAT)</sub>		-0.9	V	I <sub>C</sub> = -20mA, I <sub>B</sub> = -2.0mA
SMALL SIGNAL CHARACTERISTICS			,		
Output Capacitance	C <sub>cb</sub>		6.0	pF	V <sub>CB</sub> = -20V, f = 1.0MHz, I <sub>E</sub> = 0
Current Gain-Bandwidth Product	f <sub>T</sub>	50		MHz	V <sub>CE</sub> = -20V, I <sub>C</sub> = -10mA, f = 100MHz

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.
- 2. Short duration test pulse used to minimize self-heating effect.
- 3. When operated under collector-emitter saturation conditions within the safe operating area defined by the thermal resistance rating (R <sub>JA</sub>), power dissipation rating (P<sub>d</sub>) and power derating curve (figure 1).
- 4. No purposefully added lead.

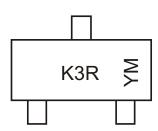


### **Ordering Information** (Note 5)

Device	Packaging	Shipping			
MMBTA92-7-F	SOT-23	3000/Tape & Reel			

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

# **Marking Information**

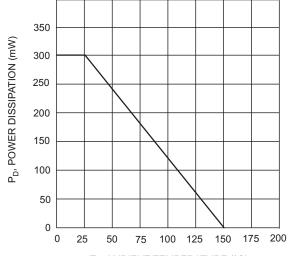


K3R = Product Type Marking Code YM = Date Code Marking Y = Year ex: N = 2002 M = Month ex: 9 = September

#### Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Code	J	K	L	М	N	Р	R	S	Т	U	V	W
		1										1

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



T<sub>A</sub>, AMBIENT TEMPERATURE (°C) Fig. 1, Max Power Dissipation vs Ambient Temperature

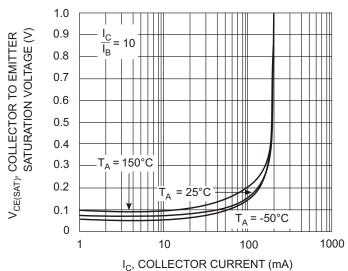
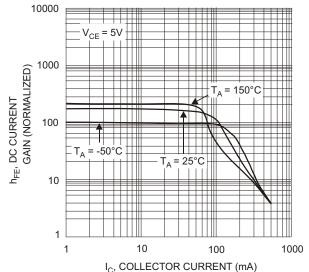


Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current





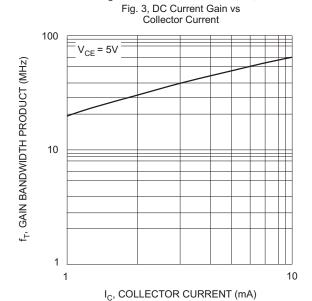


Fig. 5, Gain Bandwidth Product vs Collector Current

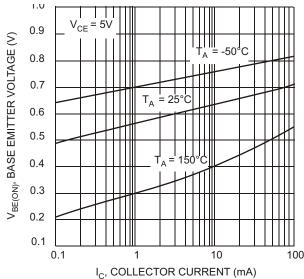


Fig. 4, Base Emitter Voltage vs Collector Current

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