



MMBTA42

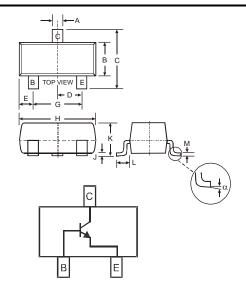
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (MMBTA92)
- Ideal for Low Power Amplification and Switching
- Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 4 and 5)
- 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): K3M
- 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							
E	0.45	0.60							
G	1.78	2.05 3.00 0.10							
Н	2.80								
J	0.013								
K	0.903	1.10							
L	0.45	0.61							
М	0.085	0.180							
α	0°	8°							
All Dimensions in mm									

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit	
Collector-Base Voltage	V _{CBO}	300	V	
Collector-Emitter Voltage	V _{CEO}	300	V	
Emitter-Base Voltage	V _{EBO}	6.0	V	
Collector Current (Note 1) (Note 3)	Ic	500	mA	
Power Dissipation (Note 1)	P _d	300	mW	
Thermal Resistance, Junction to Ambient (Note 1)	$R_{ hetaJA}$	417	°C/W	
Operating and Storage and Temperature Range	T _i , T _{STG}	-55 to +150	°C	

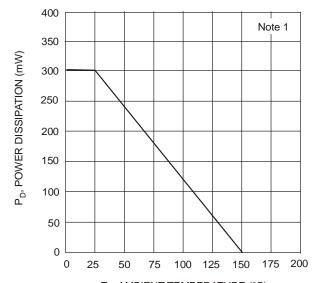
Electrical Characteristics @TA = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition			
OFF CHARACTERISTICS (Note 2)								
Collector-Base Breakdown Voltage	V _{(BR)CBO}	300		V	$I_C = 100 \mu A, I_E = 0$			
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	300		٧	$I_C = 1.0 \text{mA}, I_B = 0$			
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6.0	_	V	$I_E = 100 \mu A, I_C = 0$			
Collector Cutoff Current	I _{CBO}	_	100	nA	$V_{CB} = 200V, I_{E} = 0$			
Collector Cutoff Current	I _{EBO}	_	100	nA	$V_{CE} = 6.0V, I_{C} = 0$			
ON CHARACTERISTICS (Note 2)								
		25			$I_C = 1.0 \text{mA}, V_{CE} = 10 \text{V}$			
DC Current Gain	h _{FE}	40 40	_		$I_C = 10mA, V_{CE} = 10V$			
					$I_C = 30mA, V_{CE} = 10V$			
Collector-Emitter Saturation Voltage	V _{CE(SAT)}		0.5	V	$I_C = 20 \text{mA}, I_B = 2.0 \text{mA}$			
Base- Emitter Saturation Voltage	V _{BE(SAT)}	_	0.9	V	$I_C = 20 \text{mA}, I_B = 2.0 \text{mA}$			
SMALL SIGNAL CHARACTERISTICS	•		,					
Output Capacitance	C _{cb}	_	3.0	pF	$V_{CB} = 20V, f = 1.0MHz, I_E = 0$			
Current Gain-Bandwidth Product	f _T	50	_	MHz	$V_{CE} = 20V, I_{C} = 10mA,$ f = 100MHz			

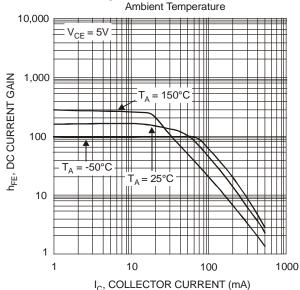
Notes:

- 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 pulse test used to minimize self-heating effect.
- When operated under collector-emitter saturation conditions within the safe operating area defined by the thermal resistance rating (R_{0JA}), power dissipation rating (P_d) and power derating curve (figure 1).
- 4. No purposefully added lead. Halogen and Antimony Free.
- Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb₂O₃ Fire Retardants.





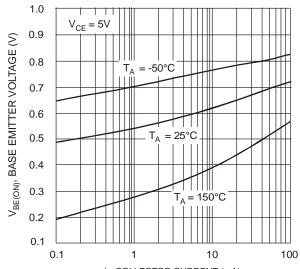
T_A, AMBIENT TEMPERATURE (°C) Fig. 1, Max Power Dissipation vs



I_C, COLLECTOR CURRENT (mA) Fig. 5, Gain Bandwidth Product vs Collector Current

2.0 1.8 \overline{I}_B 1.6 V_{CE(SAT)}, COLLECTOR TO EMITTER SATURATION VOLTAGE (V) $T_A = 150^{\circ}C$ 1.4 1.2 1.0 8.0 0.6 0.4 $T_A = -50$ °C 0.2 0 1000 10 100 1

I_c, COLLECTOR CURRENT (mA) Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current



 $\rm I_c$, COLLECTOR CURRENT (mA) Fig. 4, Base Emitter Voltage vs Collector Current

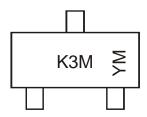


Ordering Information (Note 6)

Device	Packaging	Shipping			
MMBTA 42-7-F	SOT-23	3000/Tape & Reel			

Notes: 6. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



K3M = 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	2010	2011	2012
Code	J	K	L	М	N	Р	R	S	Т	U	V	W	X	Y	Z
Month			Jan	Feb	Mar	Apr	May	Jun	Ju	ı A	ug :	Sep	Oct	Nov	Dec
	Code		1	2	3	4	5	6	7		3	9	0	N	D

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