



MMBT2222AT

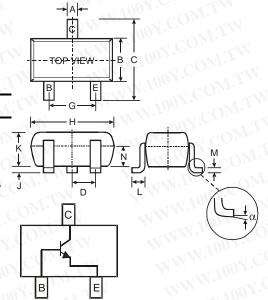
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (MMBT2907AT)
- Ultra-Small Surface Mount Package
- Lead Free/RoHS Compliant (Note 2)
- "Green" Device (Note 3 and 4)

Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking Information: 1P, See Page 4
- Ordering & Date Code Information: See Page 4
- Weight: 0.002 grams (approximate)



	SOT-523								
Dim	Min	Max	Тур						
Α	0.15	0.30	0.22						
В	0.75	0.85	0.80						
С	1.45	1.75	1.60						
D	_	_	0.50						
G	0.90	1.10	1.00						
H	1.50	1.70	1.60						
7	0.00	0.10	0.05						
K	0.60	0.80	0.75						
L	0.10	0.30	0.22						
М	0.10	0.20	0.12						
N	0.45	0.65	0.50						
α	0°	8°	_						
All C	imens	ions in	mm						

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	WWW	Symbol	Value	Unit
Collector-Base Voltage	1000	V _{CBO}	75	COV
Collector-Emitter Voltage	W.10	V _{CEO}	40	CONV
Emitter-Base Voltage	MA	V_{EBO}	6.0	V
Collector Current - Continuous	MMM	. Clc	600	mA mA
Power Dissipation	(Note 1)	Pd	150	C mW
Thermal Resistance, Junction to Ambient	(Note 1)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	MM	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.
- 2. No purposefully added lead
- 3. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
- 4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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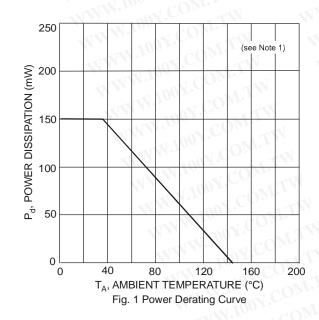
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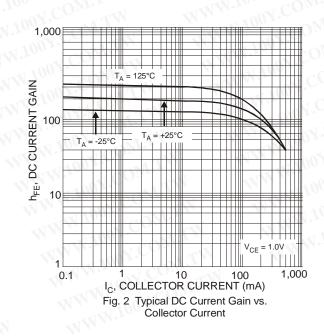
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Electrical Characteristics @TA = 25°C unless otherwise specified

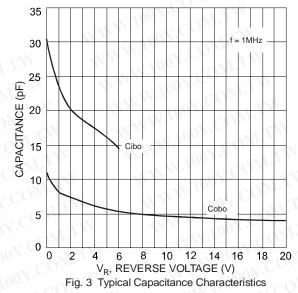
Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)	MITW	AA .	XI 100		1.3
Collector-Base Breakdown Voltage	V _{(BR)CBO}	75	= 00	V	$I_C = 10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	40	Min	V	$I_C = 10 \text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6.0	A.1	V	$I_E = 10\mu A, I_C = 0$
Collector Cutoff Current	I _{CEX}	_ 1	10	nA	$V_{CE} = 60V, V_{EB(OFF)} = 3.0V$
Base Cutoff Current	I _{BL}		20	nA	$V_{CE} = 60V, V_{EB(OFF)} = 3.0V$
ON CHARACTERISTICS (Note 5)	COM		TO VI	Jan	COMP
DC Current Gain	ONY C ONT	35 50 75 100 40		A.700 A.700	$I_{C} = 100\mu A, V_{CE} = 10V$ $I_{C} = 1.0mA, V_{CE} = 10V$ $I_{C} = 10mA, V_{CE} = 10V$ $I_{C} = 150mA, V_{CE} = 10V$ $I_{C} = 500mA, V_{CE} = 10V$
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	$\frac{\Delta M}{\Delta M}$	0.3 1.0	WV.	$I_C = 150$ mA, $I_B = 15$ mA $I_C = 500$ mA, $I_B = 50$ mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	0.6	1.2 2.0	V	$I_C = 150$ mA, $I_B = 15$ mA $I_C = 500$ mA, $I_B = 50$ mA
SMALL SIGNAL CHARACTERISTICS	AM. CO	W		WW	TY CONTRACTOR
Output Capacitance	C _{obo}	DNT.	_. 8	pF	$V_{CB} = 10V, f = 1.0MHz, I_{E} = 0$
Input Capacitance	C _{ibo}	OVIT	30	pF	$V_{EB} = 0.5V$, $f = 1.0MHz$, $I_C = 0$
Current Gain-Bandwidth Product	1 (fr)	300	W_	MHz	$V_{CE} = 20V, I_{C} = 20mA,$ f = 100MHz
Input Impedance	h _{ie}	0.25	1.25	kΩ	$V_{CE} = 10 \text{ Vdc}$, $I_C = 10 \text{ mAdc}$, $f = 1.0 \text{kHz}$
Voltage Feedback Ratio	h _{re}	I.Co.	4.0	X 10 ⁻⁴	$V_{CE} = 10 \text{ Vdc}$, $I_{C} = 10 \text{ mAdc}$, $f = 1.0 \text{kHz}$
Small-Signal Current Gain	h _{fe}	75	375	_	$V_{CE} = 10 \text{ Vdc}$, $I_C = 10 \text{ mAdc}$, $f = 1.0 \text{kHz}$
Output Admittance	h _{oe}	25	200	μS	V _{CE} = 10 Vdc, I _C = 10 mAdc, f = 1.0kHz
SWITCHING CHARACTERISTICS	M. A.	WY.	WILL		W. TIOOT.
Delay Time	t _d	~ C	10	ns	$V_{CC} = 30V, I_C = 150mA,$
Rise Time	tr	Inn	25	ns	$V_{BE(off)} = -0.5V, I_{B1} = 15mA$
Storage Time	t _s	100 X.	225	ns	$V_{CC} = 30V, I_C = 150mA,$
Fall Time	t _f	-0V	60	ns	$I_{B1} = I_{B2} = 15\text{mA}$

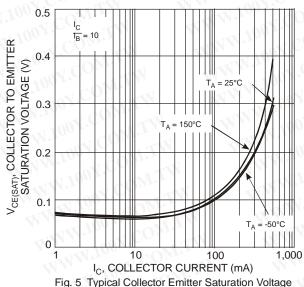
Notes: 5. Short duration pulse test used to minimize self-heating effect.



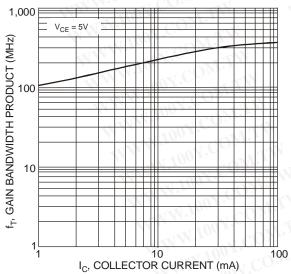


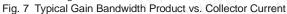






vs. Collector Current





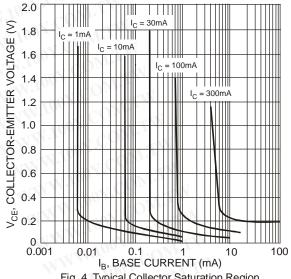
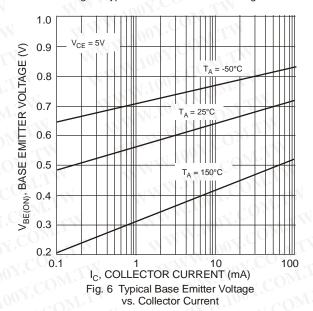


Fig. 4 Typical Collector Saturation Region



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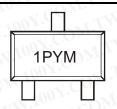


Ordering Information (Note 6)

Device	Packaging	Shipping
MMBT2222AT-7-F	SOT-523	3000/Tape & Reel

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

Marking Information



1P = Product Type Marking Code YM = Date Code Marking Y = Year (ex: N = 2002)M = Month (ex: 9 = September)

Year Code	1998	1999 K	2000	2001	2002	2003	2004	2005	2006	2007	2008 ∨	2009 W	2010 X	2011 Y	2012 Z
Month	Jan	Fe	b Ni	Mar	Apr	May	Ju	n	Jul	Aug	Sep	Oc	t I	lov	Dec
Code	1	2	43	3	4	5	6		7	8	9	0	TW.	N	D

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