



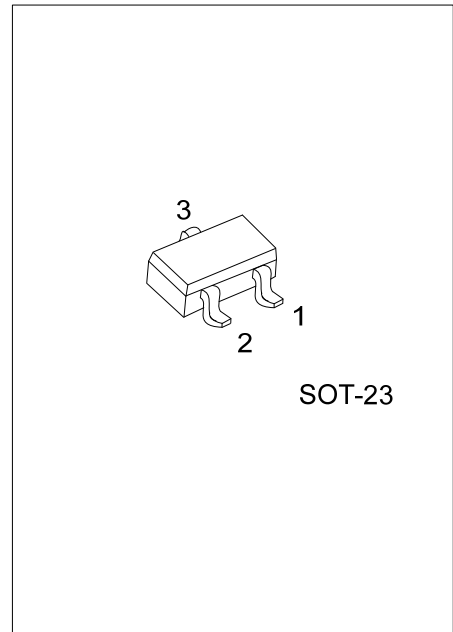
# MMBT9014

## NPN SILICON TRANSISTOR

### PRE-AMPLIFIER, LOW LEVEL & LOW NOISE

#### FEATURES

- \* High Total Power Dissipation. (450mW)
- \* Excellent  $h_{FE}$  Linearity.
- \* Complementary to UTC MMBT9015

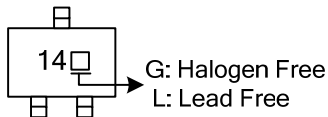


#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MMBT9014G-x-AE3-R	MMBT9014G-x-AE3-R	SOT-23	E	B	C	Tape Reel

<p>MMBT9014L-x-AE3-R</p> <p>(1) Packing Type (2) Package Type (3) Rank (4) Lead Free</p>	<p>(1) R: Tape Reel (2) AE3: SOT-23 (3) x: refer to Classification of <math>h_{FE}</math> (4) G: Halogen Free, L: Lead Free</p>
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#### MARKING



# MMBT9014

## NPN SILICON TRANSISTOR

### ■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	$V_{CEO}$	45	V
Collector-Base Voltage	$V_{CBO}$	50	V
Emitter Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	100	mA
Collector dissipation	$P_C$	225	mW
Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

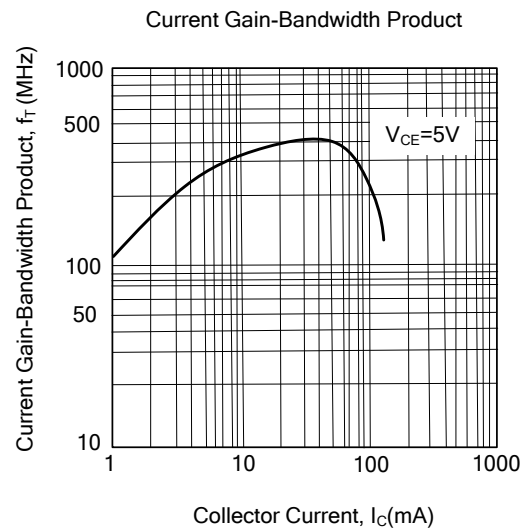
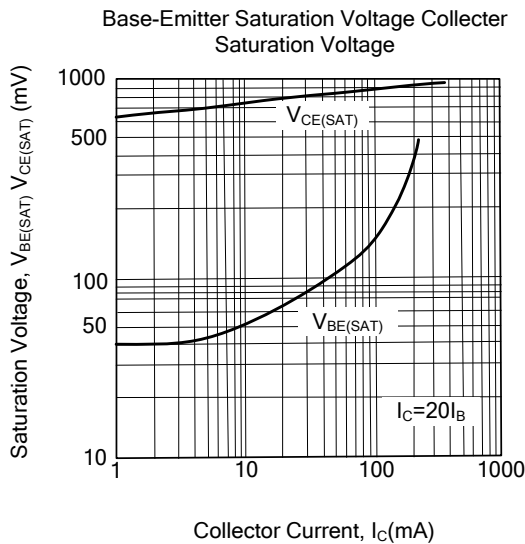
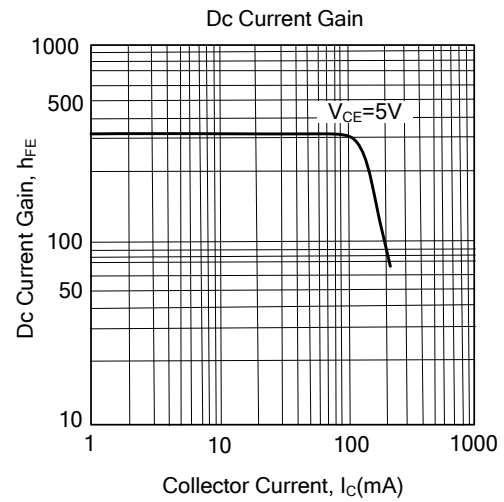
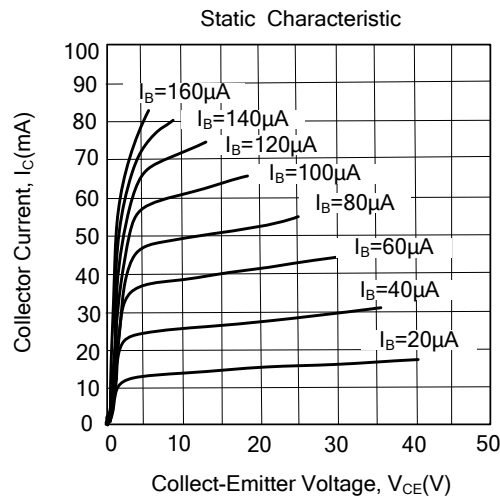
### ■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Emitter Voltage	$V_{CEO}$	$I_C=100\mu\text{A}, I_E=0$	50			V
Collector-Base Voltage	$V_{CBO}$	$I_C=1\text{mA}, I_B=0$	45			V
Emitter Base Voltage	$V_{EBO}$	$I_E=100\mu\text{A}, I_C=0$	5			V
Collector cutoff current	$I_{CBO}$	$V_{CB}=50\text{V}, I_E=0$			50	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=5\text{V}, I_C=0$			100	nA
DC Current Gain	$h_{FE}$	$V_{CE}=5\text{V}, I_C=1\text{mA}$	60	280	1000	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=100\text{mA}, I_B=5\text{mA}$		0.14	0.3	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=100\text{mA}, I_B=5\text{mA}$		0.84	1.0	V
Base-emitter on voltage	$V_{BE(ON)}$	$V_{CE}=5\text{V}, I_C=2\text{mA}$	0.58	0.63	0.7	V
Current-Gain-Bandwidth Product	$f_T$	$V_{CE}=5\text{V}, I_C=10\text{mA}$	150	270		MHz
Output Capacitance	$C_{OB}$	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		2.2	3.5	pF
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=0.2\text{mA}, f=1\text{KHz}, R_S=2\text{K}\Omega$		0.9	10	dB

### ■ CLASSIFICATION OF $h_{FE}$

RANK	A	B	C	D
RANGE	60-150	100-300	200-600	400-1000

### TYPICAL CHARACTERISTICS



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