



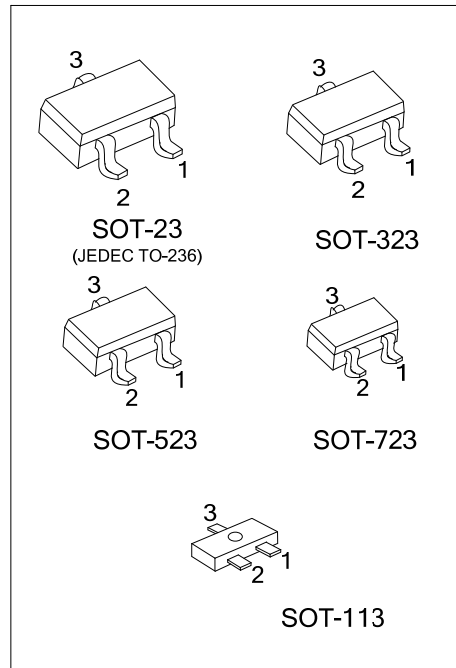
# MMBT1015

## PNP SILICON TRANSISTOR

### LOW FREQUENCY PNP AMPLIFIER TRANSISTOR

■ FEATURES

- \* Collector-Emitter Voltage:  $BV_{CEO} = -50V$
- \* Collector current up to 150mA
- \* High  $h_{FE}$  linearity
- \* Complement to MMBT1815



■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
MMBT1015G-x-AC3-R	SOT-113	E	B	C	Tape Reel
MMBT1015G-x-AE3-R	SOT-23	E	B	C	Tape Reel
MMBT1015G-x-AL3-R	SOT-323	E	B	C	Tape Reel
MMBT1015G-x-AN3-R	SOT-523	E	B	C	Tape Reel
MMBT1015G-x-AQ3-R	SOT-723	E	B	C	Tape Reel

Note: Pin assignment: E: Emitter B: Base C: Collector

<p>MMBT1015G-x-AC3-R</p>	<p>(1) R: Tape Reel                  (2) AC3: SOT-113, AE3: SOT-23, AL3: SOT-323, AN3: SOT-523, AQ3: SOT-723, T92: TO-92                  (3) x: refer to Classification of <math>h_{FE1}</math>                  (4) G: Halogen Free and Lead Free</p>
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■ MARKING

PACKAGE	MARKING		
SOT-23	Y	GR	BL
	SOT-113 / SOT-323 / SOT-523		
		SOT-723	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage		$V_{CBO}$	-50	V
Collector-Emitter Voltage		$V_{CEO}$	-50	V
Emitter-Base Voltage		$V_{EBO}$	-5	V
Collector Dissipation	SOT-23	$P_C$	250	mW
	SOT-523/SOT-113/SOT-323		200	
	SOT-723		190	
Collector Current		$I_C$	-150	mA
Base Current		$I_B$	-50	mA
Junction Temperature		$T_J$	125	$^\circ\text{C}$
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 )

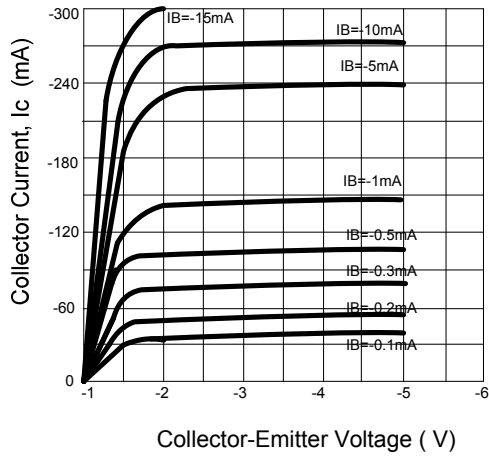
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C = -100\mu\text{A}$ , $I_E = 0$	-50			V
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C = -10\text{mA}$ , $I_B = 0$	-50			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E = -10\mu\text{A}$ , $I_C = 0$	-5			V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = -100\text{mA}$ , $I_B = -10\text{mA}$		-0.1	-0.3	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = -100\text{mA}$ , $I_B = -10\text{mA}$			-1.1	V
Collector Cut-off Current	$I_{CBO}$	$V_{CB} = -50\text{V}$ , $I_E = 0$			-100	nA
Emitter Cut-off Current	$I_{EBO}$	$V_{EB} = -5\text{V}$ , $I_C = 0$			-100	nA
DC Current Gain	$h_{FE1}$	$V_{CE} = -6\text{V}$ , $I_C = -2\text{mA}$	120		700	
	$h_{FE2}$	$V_{CE} = -6\text{V}$ , $I_C = -150\text{mA}$	25			
Transition Frequency	$f_T$	$V_{CE} = -10\text{V}$ , $I_C = -1\text{mA}$	80			MHz
Output Capacitance	$C_{OB}$	$V_{CB} = -10\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$		4.0	7.0	pF
Noise Figure	NF	$I_C = -0.1\text{mA}$ , $V_{CE} = -6\text{V}$ $R_G = 1\text{k}\Omega$ , $f = 100\text{Hz}$		0.5	6	dB

■ CLASSIFICATION OF  $h_{FE1}$

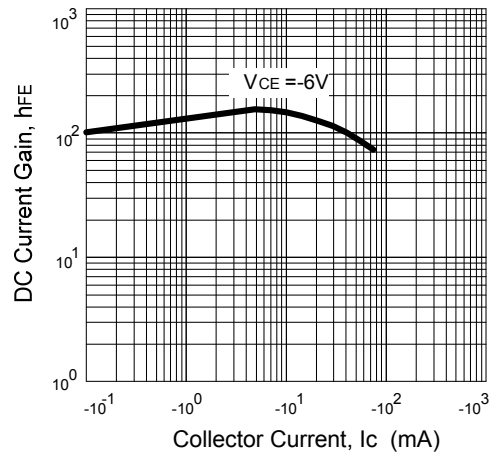
RANK	Y	GR	BL
RANGE	120-240	200-400	350-700

## ■ TYPICAL CHARACTERISTICS

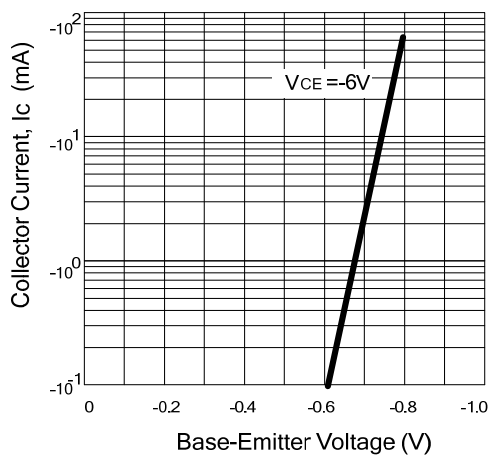
Static Characteristics



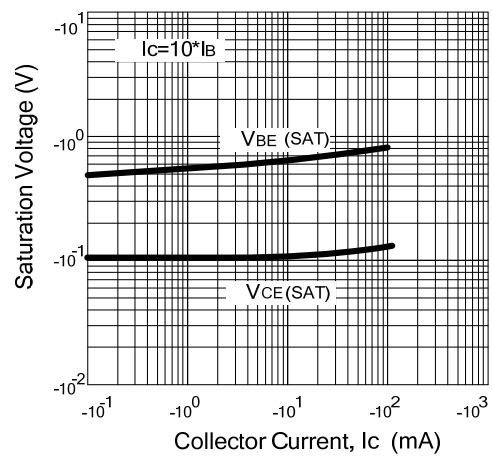
DC Current Gain



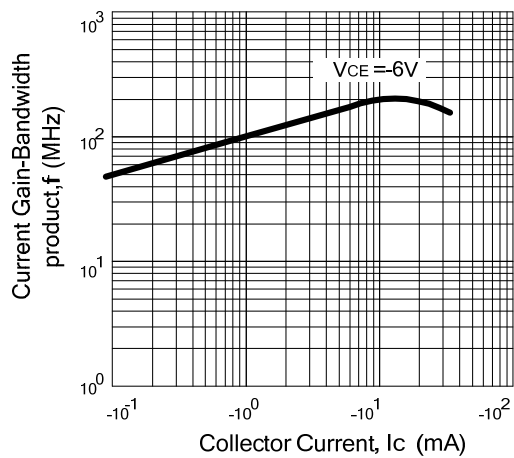
Base-Emitter on Voltage



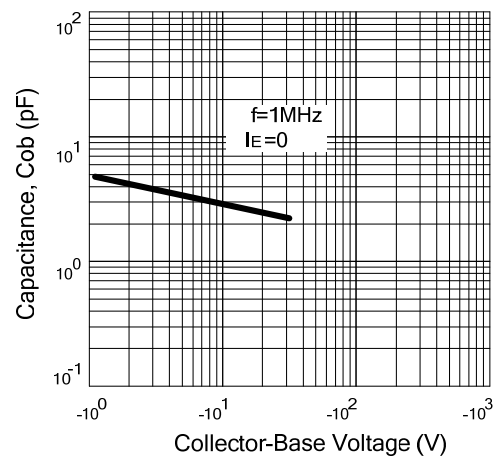
Saturation Voltage



Current Gain-Bandwidth Product



Collector Output Capacitance



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