



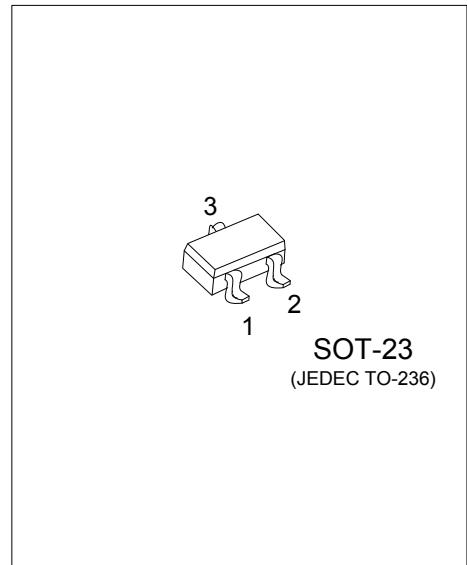
## MMBT1116/A

## PNP SILICON TRANSISTOR

### PNP EPITAXIAL SILICON TRANSISTOR

#### DESCRIPTION

Complement to UTC **MMBT1616/A**



#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MMBT1116L-x-AE3-R	MMBT1116G-x-AE3-R	SOT-23	B	E	C	Tape Reel
MMBT1116AL-x-AE3-R	MMBT1116AG-x-AE3-R	SOT-23	B	E	C	Tape Reel

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

<p>MMBT1116G-x-AE3-R</p>	<p>(1) R: Tape Reel  (2) AE3: SOT-23  (3) x: refer to Classification of <math>h_{FE1}</math>  (4) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING

UTC MMBT1116	UTC MMBT1116A

# MMBT1116/A

## PNP SILICON TRANSISTOR

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

PARAMETER	SYMBOL	RATINGS	UNIT
Collector to Base Voltage	MMBT1116	-60	V
	MMBT1116A	-80	
Collector to Emitter Voltage	MMBT1116	-50	V
	MMBT1116A	-60	
Emitter to Base Voltage	$V_{EBO}$	-6	V
Collector Current	DC	-1	A
	Pulse(Note2)	-2	A
Total Collector Dissipation	$P_C$	350	mW
Junction Temperature	$T_J$	+150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

Notes: 1. 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.

2. Pulse width  $\leq 10\text{ms}$ , Duty cycle  $\leq 50\%$ .

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

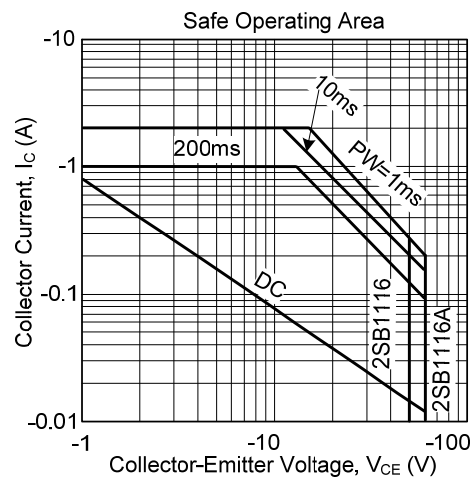
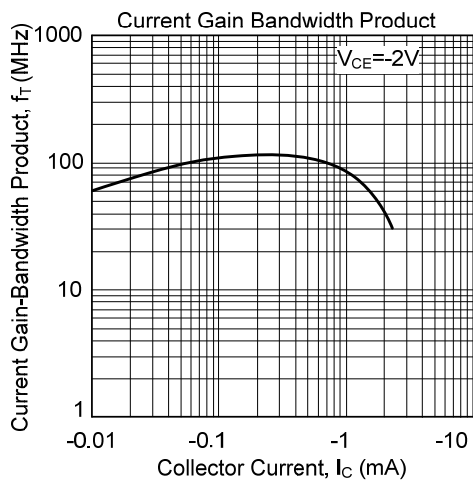
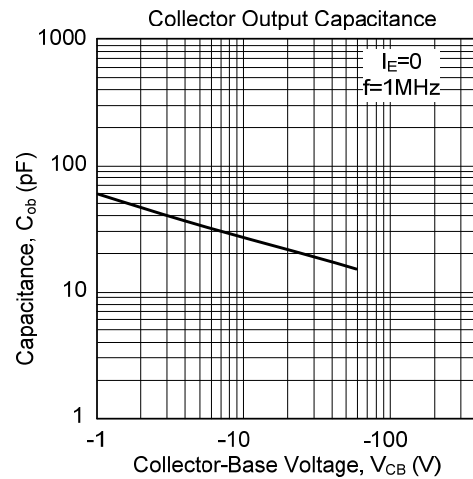
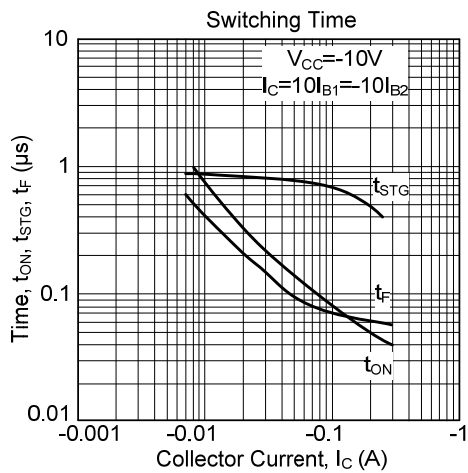
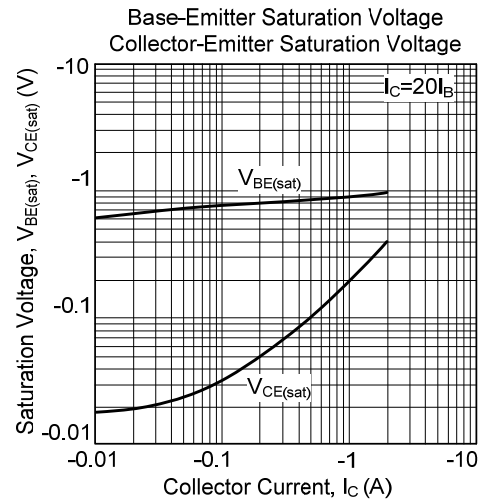
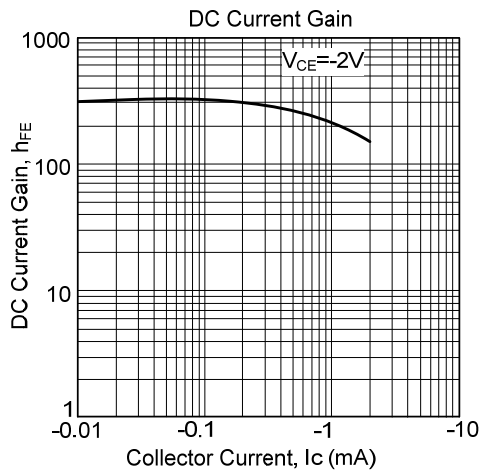
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Emitter Saturation Voltage(Note)	$V_{CE(SAT)}$	$I_C=-1\text{A}$ , $I_B=-50\text{mA}$		-0.2		V
Base-Emitter Saturation Voltage(Note)	$V_{BE(SAT)}$	$I_C=-1\text{A}$ , $I_B=-50\text{mA}$		-0.9	-1.2	V
Base Emitter On Voltage(Note)	$V_{BE(ON)}$	$V_{CE}=-2\text{V}$ , $I_C=-50\text{mA}$	-600	-650	-700	mV
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=-60\text{V}$ , $I_E=0$			-100	nA
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=-6\text{V}$ , $I_C=0$			-100	nA
DC Current Gain(Note)	$h_{FE1}$	$V_{CE}=-2\text{V}$ , $I_C=-100\text{mA}$	MMBT1116	135	600	
			MMBT1116A	135	400	
	$h_{FE2}$	$V_{CE}=-2\text{V}$ , $I_C=-1\text{A}$	81			
Transition Frequency	$f_T$	$V_{CE}=-2\text{V}$ , $I_C=-100\text{mA}$	70	120		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=-10\text{V}$ , $I_E=0$ , $f=1\text{MHz}$		25		pF
Turn On Time	$t_{ON}$	$V_{CC}=-10\text{V}$ , $I_C=-100\text{mA}$ $I_{B1}=-I_{B2}=-10\text{mA}$ , $V_{BE(OFF)}=2 \sim 3\text{V}$		0.07		$\mu\text{s}$
Storage Time	$t_{STG}$			0.7		$\mu\text{s}$
Fall Time	$t_F$			0.07		$\mu\text{s}$

Note: Pulse Test: Pulse width  $\leq 350\mu\text{s}$ , Duty cycle  $\leq 2\%$ .

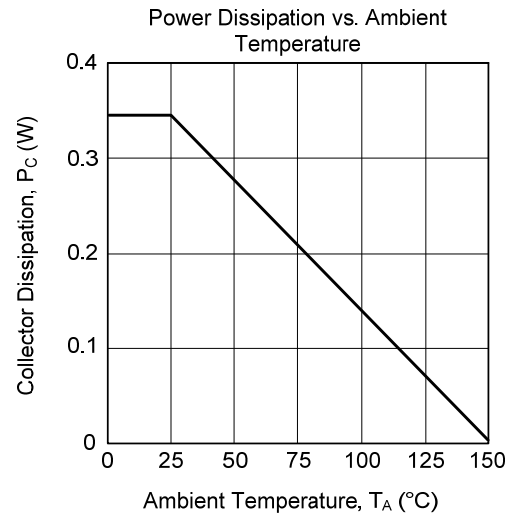
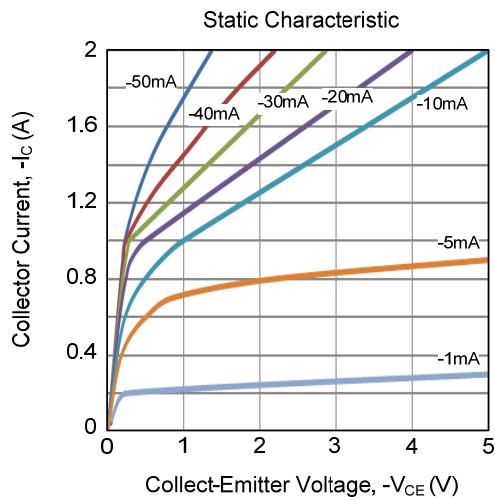
### ■ CLASSIFICATION OF $h_{FE1}$

RANK	Y	G	L
$h_{FE1}$	135 ~ 270	200 ~ 400	300 ~ 600

### TYPICAL CHARACTERISTICS



### ■ TYPICAL CHARACTERISTICS



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