



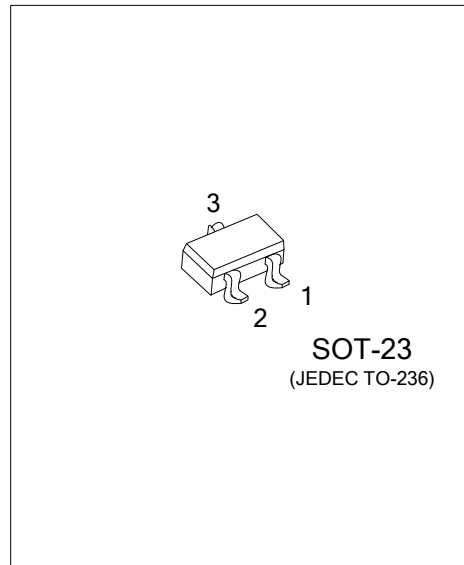
## MMBTA44/45

## NPN SILICON TRANSISTOR

### HIGH VOLTAGE TRANSISTORS

#### FEATURES

- \*Collector-Emitter voltage:  $V_{CE0}=400V$  (UTC **MMBTA44**)  
 $V_{CE0}=350V$  (UTC **MMBTA45**)
- \*Collector current up to 300mA
- \*Complement to UTC **MMBTA94/93**
- \*Power Dissipation:  $P_D(\max)=350mW$



#### ORDERING INFORMATION

Ordering Number	Package	Pin Assignment			Packing
		1	2	3	
MMBTA44G-AE3-R	SOT-23	E	B	C	Tape Reel
MMBTA45G-AE3-R	SOT-23	E	B	C	Tape Reel

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

<p>MMBTA44G-AE3-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) AE3: SOT-23</p> <p>(3) G: Halogen Free and Lead Free</p>
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#### MARKINGS

MMBTA44	MMBTA45
<p>3DG</p>	<p>35G</p>

### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Collector-Base Voltage	MMBTA44	$V_{CBO}$	500	V
	MMBTA45		400	V
Collector-Emitter Voltage	MMBTA44	$V_{CEO}$	400	V
	MMBTA45		350	V
Emitter-Base Voltage		$V_{EBO}$	6	V
Collector Current		$I_C$	300	mA
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	350	mW
	$T_C=25^\circ\text{C}$		1.5	W
Junction Temperature		$T_J$	+150	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-40 ~ +150	$^\circ\text{C}$

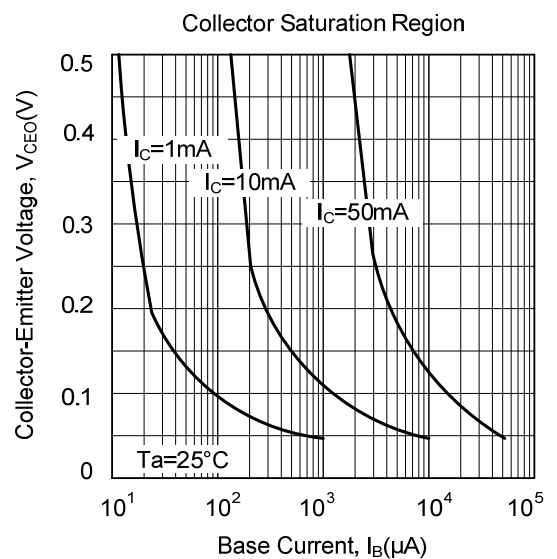
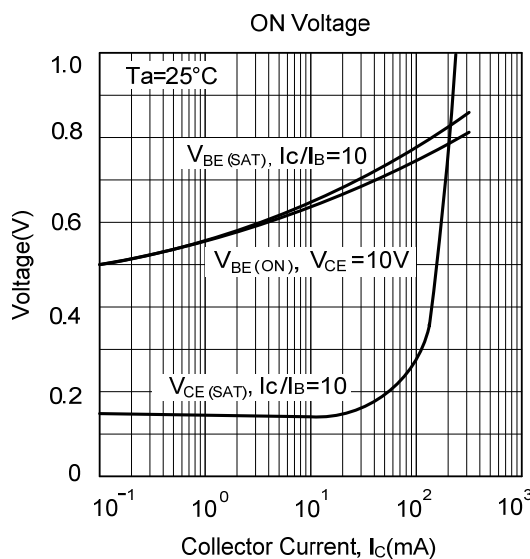
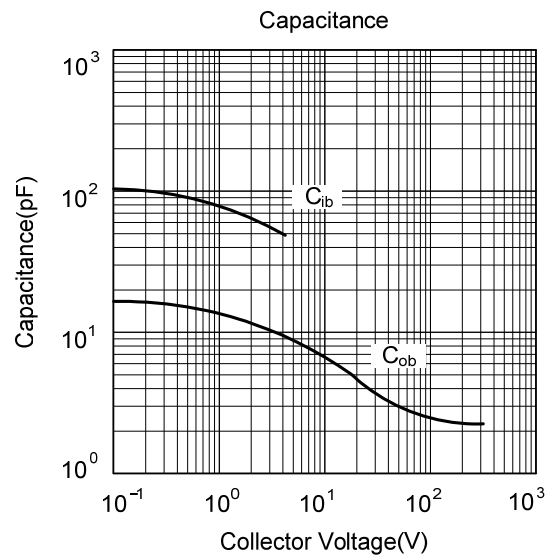
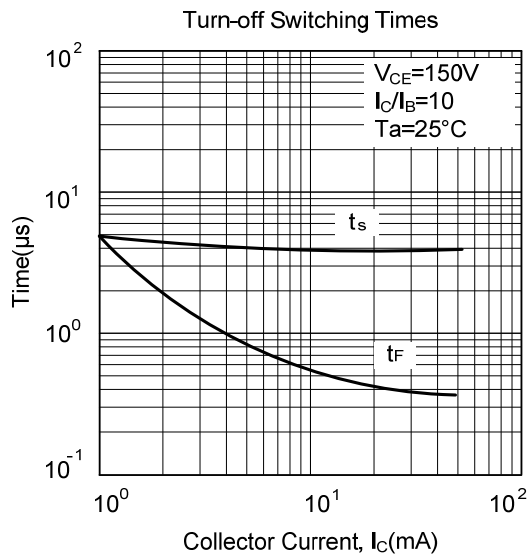
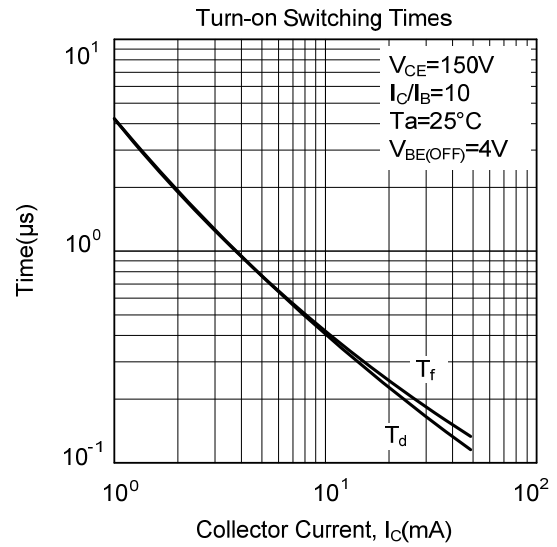
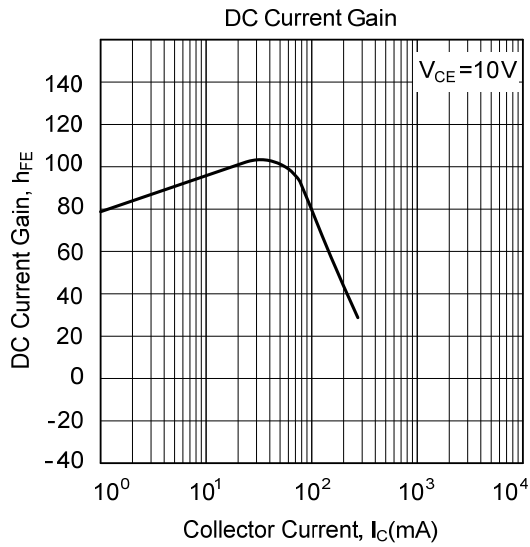
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

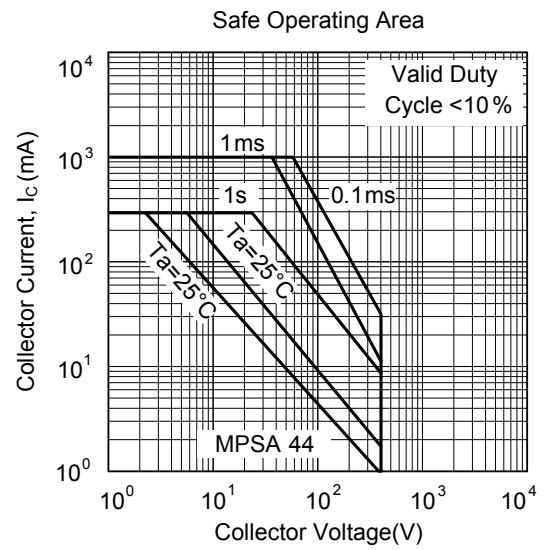
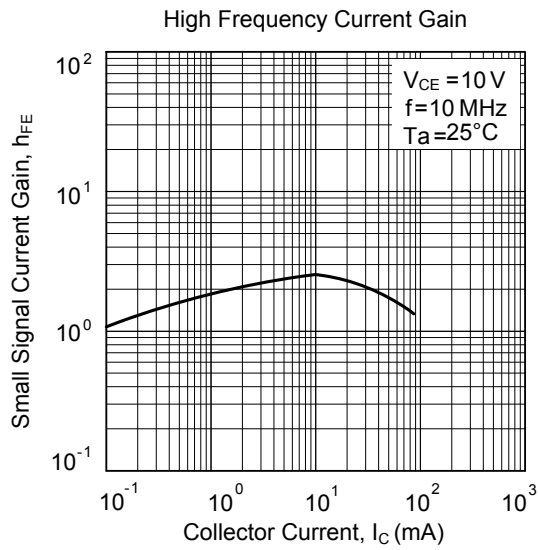
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	MMBTA44	$BV_{CBO}$	$I_C=100\mu\text{A}, I_B=0$	500			V
	MMBTA45			400			V
Collector-Emitter Breakdown Voltage	MMBTA44	$BV_{CEO}$	$I_C=1\text{mA}, I_B=0$	400			V
	MMBTA45			350			V
Emitter-Base Breakdown Voltage		$BV_{EBO}$	$I_E=100\mu\text{A}, I_C=0$	6			V
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	$I_C=1\text{mA}, I_B=0.1\text{mA}$			0.4	V
			$I_C=10\text{mA}, I_B=1\text{mA}$			0.5	V
			$I_C=50\text{mA}, I_B=5\text{mA}$			0.75	V
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	$I_C=10\text{mA}, I_B=1\text{mA}$			0.75	V
Collector Cut-off Current	MMBTA44	$I_{CBO}$	$V_{CB}=400\text{V}, I_E=0$			0.1	$\mu\text{A}$
	MMBTA45		$V_{CB}=320\text{V}, I_E=0$			0.1	$\mu\text{A}$
Collector Cut-off Current	MMBTA44	$I_{CES}$	$V_{CE}=400\text{V}, I_B=0$			0.5	$\mu\text{A}$
	MMBTA45		$V_{CE}=320\text{V}, I_B=0$			0.5	$\mu\text{A}$
Emitter Cut-off Current		$I_{EBO}$	$V_{EB}=4\text{V}, I_C=0$			0.1	$\mu\text{A}$
DC Current Gain (Note)		$h_{FE1}$	$V_{CE}=10\text{V}, I_C=1\text{mA}$	40			
			$V_{CE}=10\text{V}, I_C=10\text{mA}$	50		240	
			$V_{CE}=10\text{V}, I_C=50\text{mA}$	45			
			$V_{CE}=10\text{V}, I_C=100\text{mA}$	40			
Current Gain Bandwidth Product		$f_T$	$V_{CE}=20\text{V}, I_C=10\text{mA}$ $f=100\text{MHz}$	50			MHz
Output Capacitance		$C_{ob}$	$V_{CB}=20\text{V}, I_E=0, f=1\text{MHz}$			7	pF

Note: Pulse test:  $P_W < 300\mu\text{s}$ , Duty Cycle  $< 2\%$

## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(cont.)



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