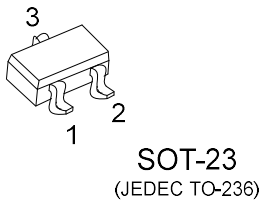
MMBTA44/45

NPN SILICON TRANSISTOR

HIGH VOLTAGE TRANSISTORS



SOT-23
(JEDEC TO-236)

■ FEATURES

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

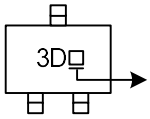
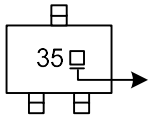
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
MMBTA44L-AE3-R	MMBTA44G-AE3-R	SOT-23	B	E	C	Tape Reel
MMBTA45L-AE3-R	MMBTA45G-AE3-R	SOT-23	B	E	C	Tape Reel

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

MMBTA44G-AE3-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE3: SOT-23 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKINGS

MMBTA44	MMBTA45
 3D□ → L: Lead Free G: Halogen Free	 35□ → L: Lead Free G: Halogen Free

■ 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 (Note 2)	T_A=25°C	P_D	350	mW
	T_C=25°C		1.5	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-40 ~ +150	°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. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

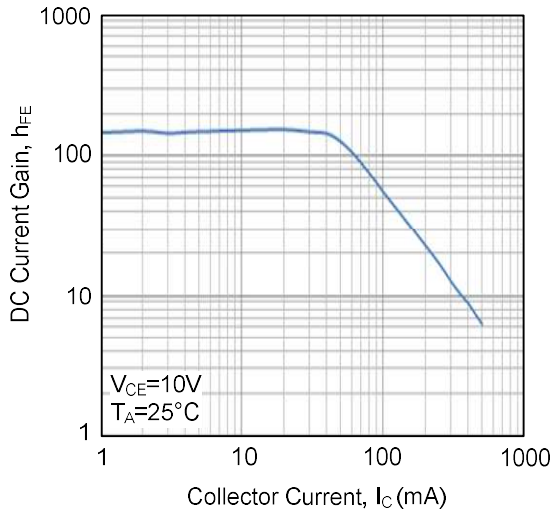
■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	MMBTA44	BV_{CBO}	I_C=100μA, I_B=0	500			V
	MMBTA45			400			V
Collector-Emitter Breakdown Voltage	MMBTA44	BV_{CEO}	I_C =1mA, I_B=0	400			V
	MMBTA45			350			V
Emitter-Base Breakdown Voltage		BV_{EBO}	I_E=100μA, I_C =0	6			V
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	I_C =1mA, I_B=0.1mA			0.4	V
			I_C =10mA, I_B=1mA			0.5	V
			I_C =50mA, I_B=5mA			0.75	V
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	I_C 10mA, I_B=1mA			0.75	V
Collector Cut-off Current	MMBTA44	I_{CBO}	V_{CB}=400V, I_E =0			0.1	μA
	MMBTA45		V_{CB}=320V, I_E =0			0.1	μA
Collector Cut-off Current	MMBTA44	I_{CES}	V_{CE} =400V, I_B=0			0.5	μA
	MMBTA45		V_{CE} =320V, I_B=0			0.5	μA
Emitter Cut-off Current		I_{EBO}	V_{EB}=4V, I_C =0			0.1	μA
DC Current Gain (Note)		h_{FE1}	V_{CE} =10V, I_C =1mA	40			
		h_{FE2}	V_{CE} =10V, I_C =10mA	50		240	
		h_{FE3}	V_{CE} =10V, I_C =50mA	45			
		h_{FE4}	V_{CE} =10V, I_C =100mA	40			
Current Gain Bandwidth Product		f_T	V_{CE} =20V, I_C =10mA f=100MHz	50			MHz
Output Capacitance		C_{ob}	V_{CB}=20V, I_E =0, f=1MHz			7	pF

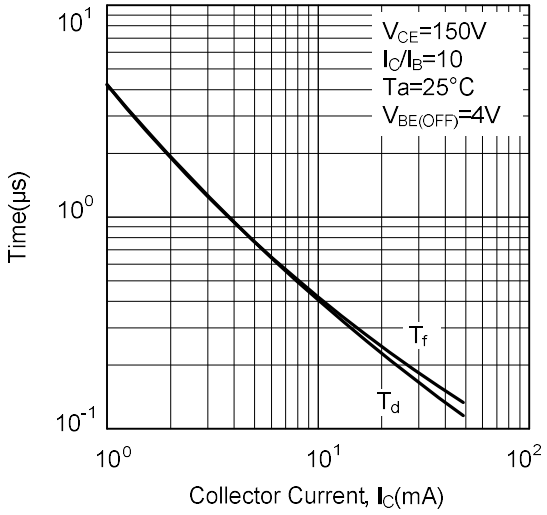
Note: Pulse test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

■ TYPICAL CHARACTERISTICS

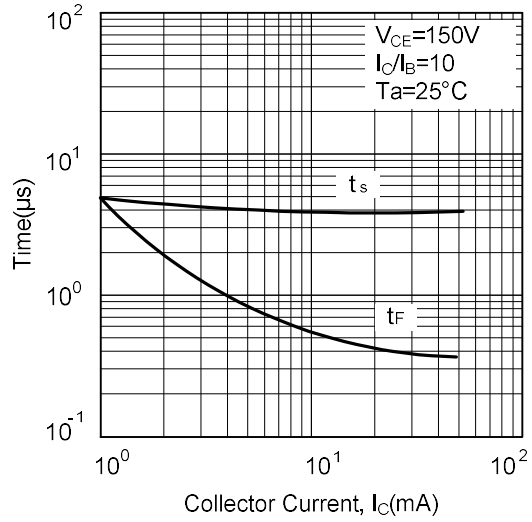
DC Current Gain vs. Collector Current



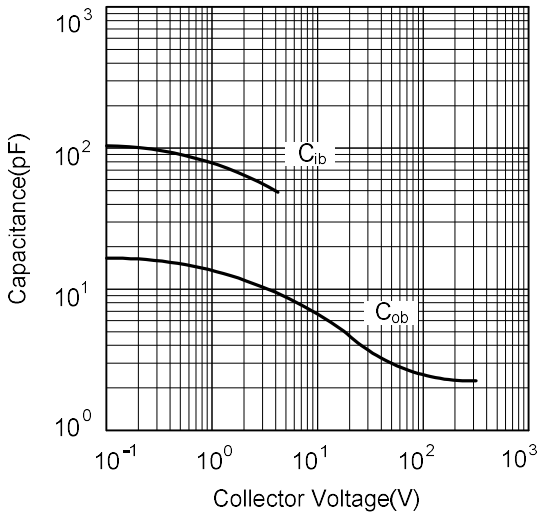
Turn-on Switching Times



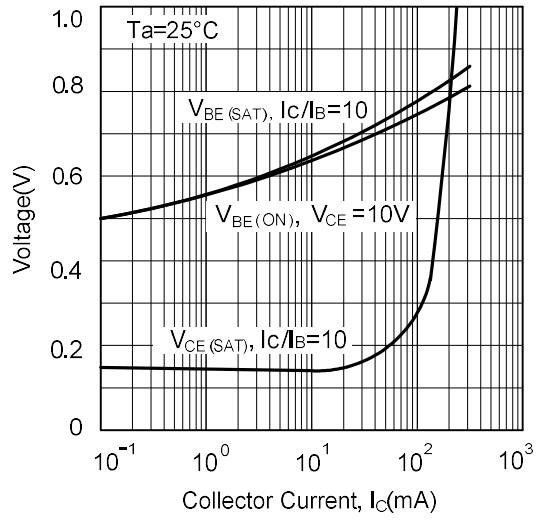
Turn-off Switching Times



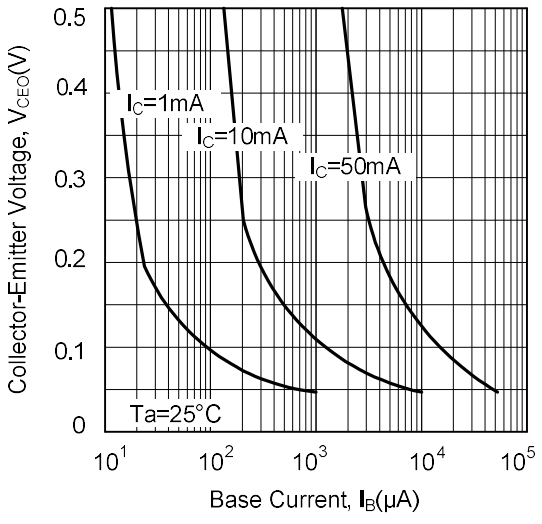
Capacitance



ON Voltage

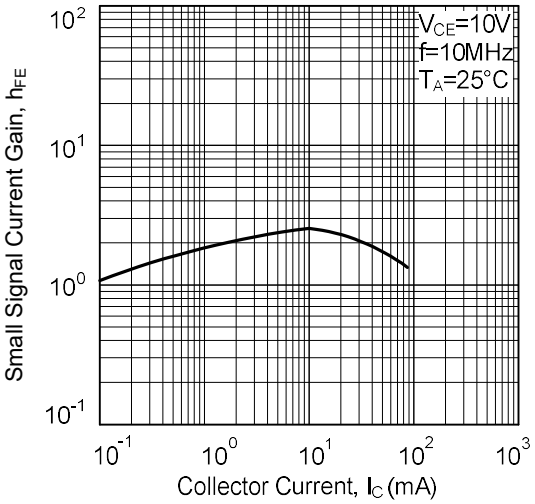


Collector Saturation Region



■ TYPICAL CHARACTERISTICS (Cont.)

High Frequency Current Gain



Safe Operating Area