RECTRON SEMICONDUCTOR

TECHNICAL SPECIFICATION

MMBT4403

SOT-23 BIPOLAR TRANSISTORS TRANSISTOR(PNP)

FEATURES

* Power dissipation
  P_{CM}: 0.3 W(Tamb=25°C)
* Collector current
  I_{CM}: - 0.6 A
* Collector-base voltage
  $V_{(BR)CBO}$: - 40 V
* Operating and storage junction temperature range
 T_J,Tstg: -55°C to+150°C

MECHANICAL DATA

* Case: Molded plastic
* Epoxy: UL 94V-O rate flame retardant
* Lead: MIL-STD-202E method 208C guaranteed
* Mounting position: Any
* Weight: 0.008 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 ^{o}C ambient temperature unless otherwise specified.

Single phase, half wave, 60 Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

SOT-23

Dimensions in inches and (millimeters)
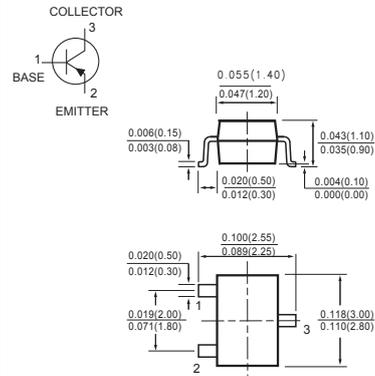
MAXIMUM TATINGES (@ T_A = 25°C unless otherwise noted)

RATINGS	SYMBOL	VALUE	UNITS
Max. Steady State Power Dissipation (1) @TA=25°C Derate above 25°C	P_D	300	mW
Max. Operating Temperature Range	T_J	150	^{o}C
Storage Temperature Range	T_{STG}	-55 to +150	^{o}C

ELECTRICAL CHARACTERISTICS (@ T_A = 25°C unless otherwise noted)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	-	-	417	^{o}C/W

Notes :1. Alumina=0.4*0.3*0.024in.99.5% alumina
2. "Fully ROHS Compliant", "100% Sn plating (Pb-free)".

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ELECTRICAL CHARACTERISTICS (@TA=25°C unless otherwise noted)

Chatacteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage(1) (I_C= -1.0 mAdc, I_B= 0)	$V_{(BR)CEO}$	-40	-	Vdc
Collector-Base Breakdown Voltage (I_C= -0.1mAdc, I_E= 0)	$V_{(BR)CBO}$	-40	-	Vdc
Emitter-Base Breakdown Voltage (I_E= -0.1mAdc, I_C= 0)	$V_{(BR)EBO}$	-5.0	-	Vdc
Base Cutoff Current (V_{CE}= -35Vdc, $V_{BE(off)}$= -0.4Vdc)	I_{BEV}	-	-0.1	uAdc
Collector Cutoff Current (V_{CE}= -35Vdc, V_{EB}= -0.4Vdc)	I_{CEX}	-	-0.1	uAdc
ON CHARACTERISTICS (1)				
DC Current Gain (I_C= -0.1mAdc, V_{CE}= -1.0Vdc)		30	-	
(I_C= -1.0mAdc, V_{CE}= -1.0Vdc)		60	-	
(I_C= -10mAdc, V_{CE}= -1.0Vdc)	hFE	100	-	-
(I_C= -150mAdc, V_{CE}= -2.0Vdc)		100	300	
(I_C= -500mAdc, V_{CE}= -2.0Vdc)		20	-	
Collector-Emitter Saturation Voltage (1) (I_C= -150mAdc, I_B= -15mAdc)	$V_{CE(sat)}$	-	-0.4	Vdc
(I_C= -500mAdc, I_B= -50mAdc)		-	-0.75	
Base-Emitter Saturation Voltage (1) (I_C= -150mAdc, I_B= -15mAdc)	$V_{BE(sat)}$	-0.75	-0.95	Vdc
(I_C= -500mAdc, I_B= -50mAdc)		-	-1.3	
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain-Bandwidth Product (I_C= -20mAdc, V_{CE}= -10Vdc, f= 100MHz)	f_T	200	-	MHz
Output Capacitance (V_{CB}= -10Vdc, I_E= 0, f= 1.0MHz)	C_{cb}	-	8.5	pF
Input Capacitance (V_{EB}= -0.5Vdc, I_C= 0, f= 1.0MHz)	C_{eb}	-	30	pF
Input Impedance (V_{CE}= -10Vdc, I_C= -1.0mAdc, f= 1.0kHz)	h_{ie}	1.5	15	kohms
Voltage Feedback Ratio (V_{CE}= -10Vdc, I_C= -1.0mAdc, f= 1.0kHz)	h_{re}	0.1	8.0	X 10^{-4}
Small-Signal Current Gain (V_{CE}= -10Vdc, I_C= -1.0mAdc, f= 1.0kHz)	h_{fe}	60	500	-
Output Admittance (V_{CE}= -10Vdc, I_C= -1.0mAdc, f= 1.0kHz)	h_{oe}	1.0	100	umhos
SWITCHING CHARACTERISTICS				
Delay Time (V_{CC}= -30Vdc, V_{EB}= -2.0Vdc, I_C= -150mAdc, I_{B1}= -15mAdc)	t_d	-	15	ns
Rise Time	t_r	-	20	
Storage Time (V_{CC}= -30Vdc, I_C= -150mAdc, I_{B1}= I_{B2}= -15mAdc)	t_s	-	225	ns
Fall Time	t_f	-	30	

Note : Pulse Test: Pulse Width≦300ms,Duty Cycle≦2.0%

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RATING AND CHARACTERISTICS CURVES (MMBT4403)

—— 25°C　　— — 100°C
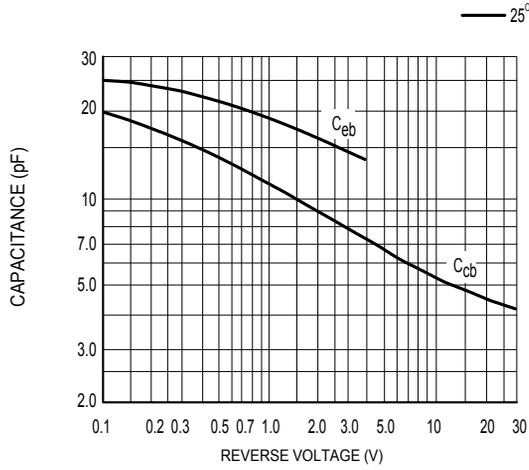
Figure 1. Capacitances
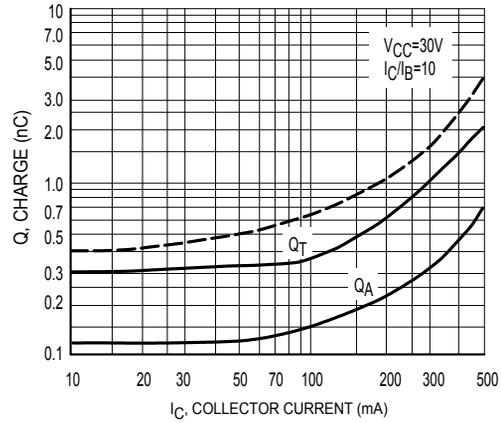

Figure 2. Charge Data
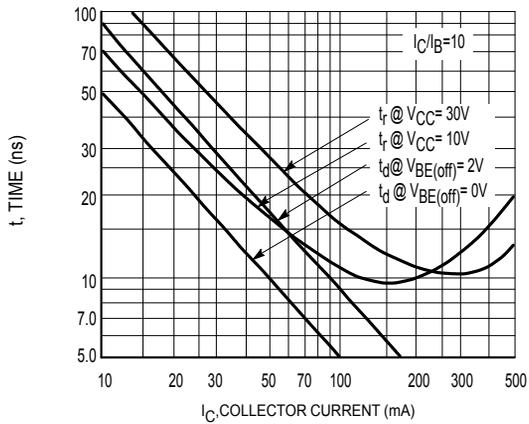

Figure 3. Turn-On Time
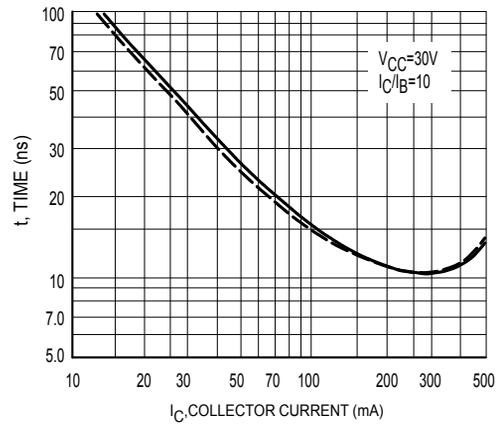
Figure 4. Rise Times
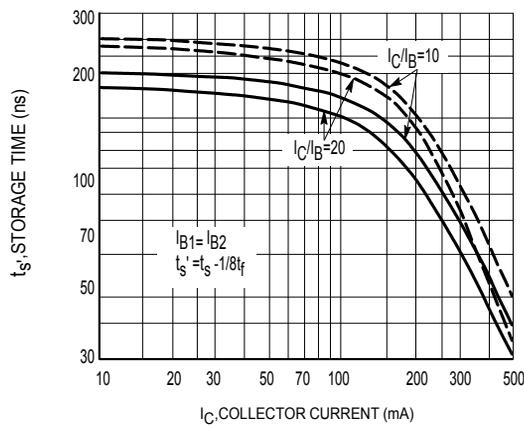
Figure 5. Storage Time

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RATING AND CHARACTERISTICS CURVES (MMBT4403)

V_{CE} = -10Vdc, T_A = 25°C

Bandwidth = 1.0Hz
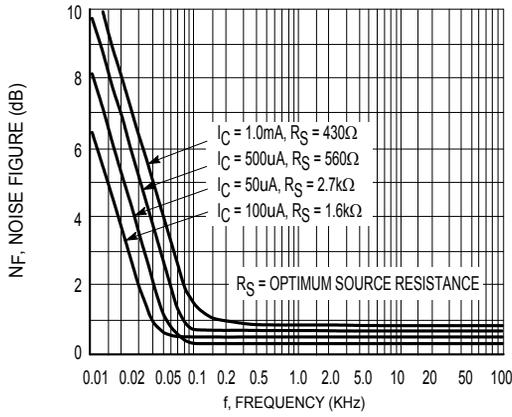
Figure 6.Frequency Effects
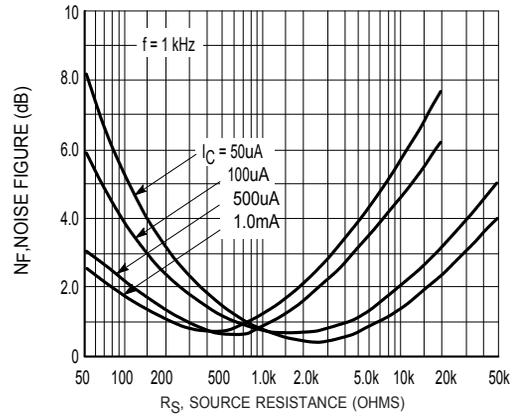
**Figure 7.Source Resistance Effects**
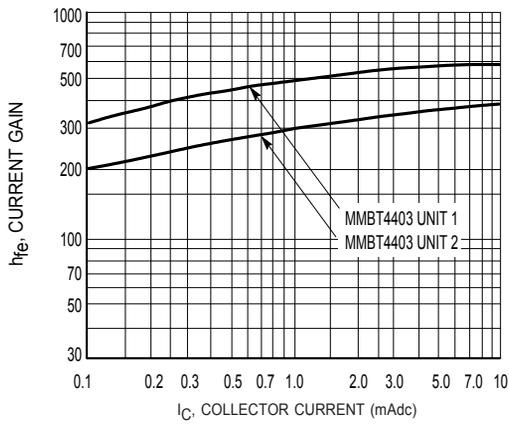
Figure 8.Cuttent Gain
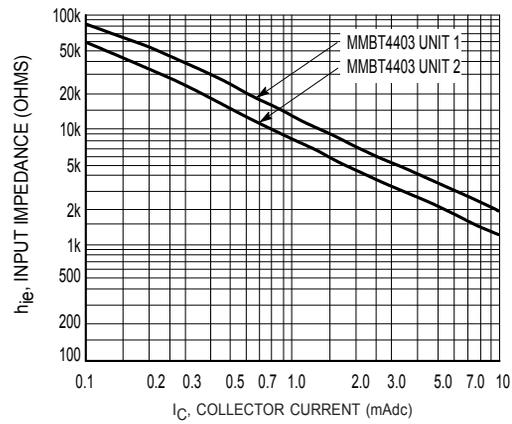
Figure 9.Input Impedance
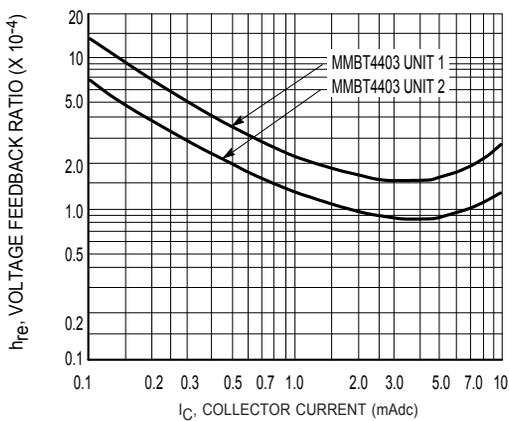
Figure 10.Voltage Feedback Ratio
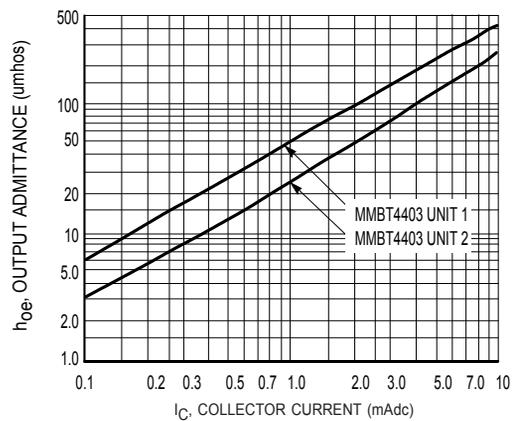
Figure 11.Temperature Coefficients

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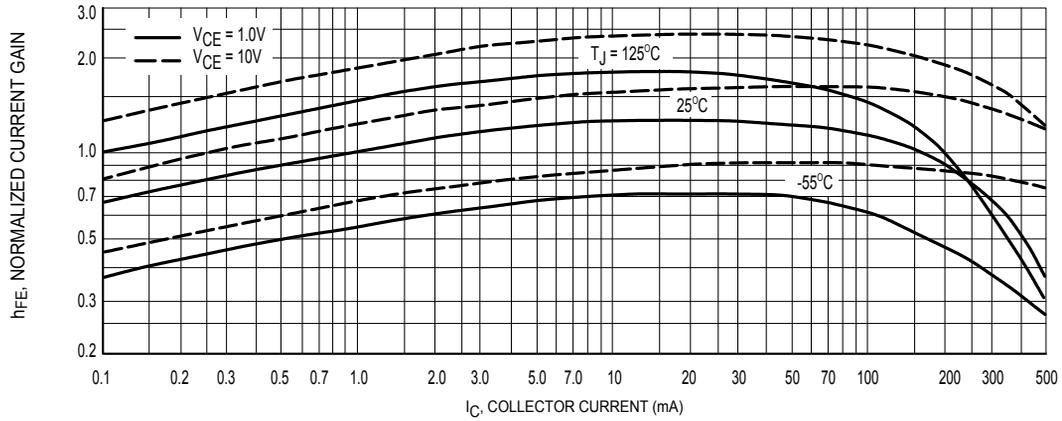
Figure 12. DC Current Gain
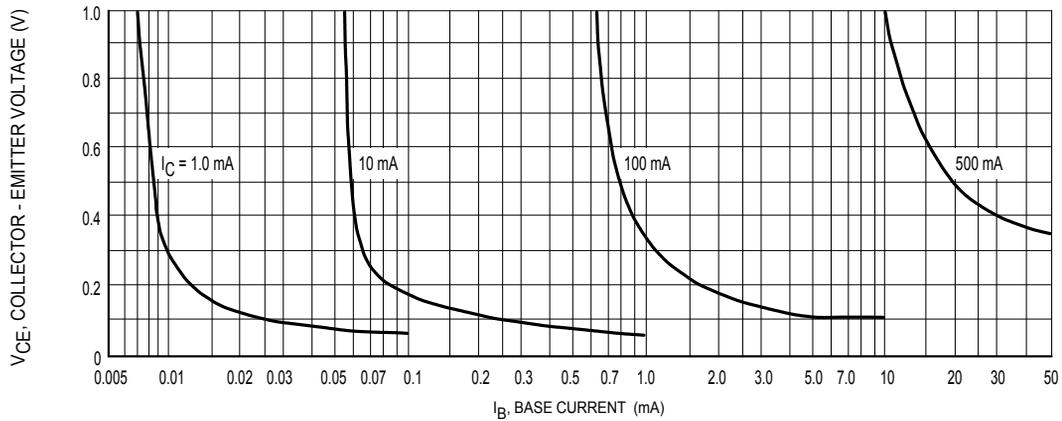
Figure 13. Collector Saturation Region
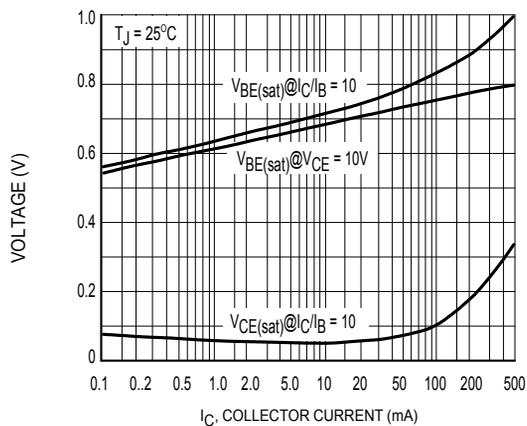
Figure 14. "ON" Voltages
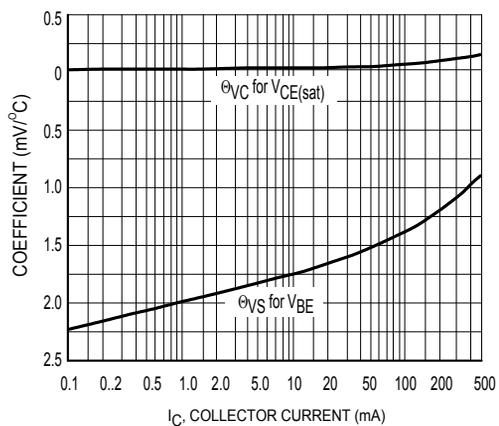
Figure 15. Temperature Coefficients

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