

**SOT-23 BIPOLAR TRANSISTORS
TRANSISTOR(PNP)**

FEATURES

- * Power dissipation
P_{CM}: 0.3 W(T_{amb}=25°C)
- * Collector current
I_{CM}: -0.6 A
- * Collector-base voltage
V_{(BR)CBO}: -160 V
- * Operating and storage junction temperature range
T_J, T_{stg}: -55°C to +150°C

MECHANICAL DATA

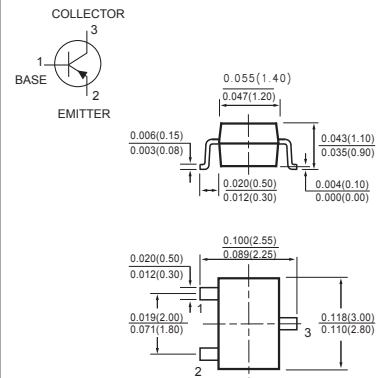
- * Case: Molded plastic
- * Epoxy: UL 94V-O rate flame retardant
- * Lead: MIL-STD-202E method 208C guaranteed
- * Mounting position: Any
- * Weight: 0.008 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°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



MAXIMUM RATINGS (@ T_A = 25°C unless otherwise noted)

RATINGS	SYMBOL	VALUE	UNITS
Max. Steady State Power Dissipation ⁽¹⁾ @T _A =25°C Derate above 25°C	P _D	300	mW
Max. Operating Temperature Range	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

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

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal Resistance Junction to Ambient	R _{θJA}	-	-	417	°C/W

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

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = -1.0 \text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	-150	-	Vdc
Collector-Base Breakdown Voltage ($I_C = -100 \mu\text{A}$, $I_E = 0$)	$V_{(BR)CBO}$	-160	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = -10 \mu\text{A}$, $I_C = 0$)	$V_{(BR)EBO}$	-5.0	-	Vdc
Collector Cutoff Current ($V_{CB} = -120 \text{ Vdc}$, $I_E = 0$)	I_{CES}	-	-50	nA
($V_{CE} = -120 \text{ Vdc}$, $I_E = 0$, $T_A = 100^\circ\text{C}$)		-	-50	μA

ON CHARACTERISTICS

DC Current Gain ($I_C = -1.0 \text{ mA}$, $V_{CE} = -5.0 \text{ Vdc}$)	hFE	50	-	-
($I_C = -10 \text{ mA}$, $V_{CE} = -5.0 \text{ Vdc}$)		60	240	
($I_C = -50 \text{ mA}$, $V_{CE} = -5.0 \text{ Vdc}$)		50	-	
Collector-Emitter Saturation Voltage ($I_C = -10 \text{ mA}$, $I_B = -1.0 \text{ mA}$)	$V_{CE(sat)}$	-	-0.2	Vdc
($I_C = -50 \text{ mA}$, $I_B = -5.0 \text{ mA}$)		-	-0.5	
Base-Emitter Saturation Voltage ($I_C = -10 \text{ mA}$, $I_B = -1.0 \text{ mA}$)	$V_{BE(sat)}$	-	-1.0	Vdc
($I_C = -50 \text{ mA}$, $I_B = -5.0 \text{ mA}$)		-	-1.0	

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = -10 \text{ mA}$, $V_{CE} = -10 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	100	300	MHz
Output Capacitance ($V_{CB} = -10 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{obo}	-	6.0	pF
Small-Signal Current Gain ($V_{CE} = -10 \text{ Vdc}$, $I_C = -1.0 \text{ mA}$, $f = 1.0 \text{ kHz}$)	h_{fe}	40	200	-
Noise Figure ($V_{CE} = -5.0 \text{ Vdc}$, $I_C = -200 \mu\text{A}$, $R_S = 10 \Omega$, $f = 1.0 \text{ kHz}$)	NF	-	8.0	dB

RATING AND CHARACTERISTICS CURVES (MMBT5401)

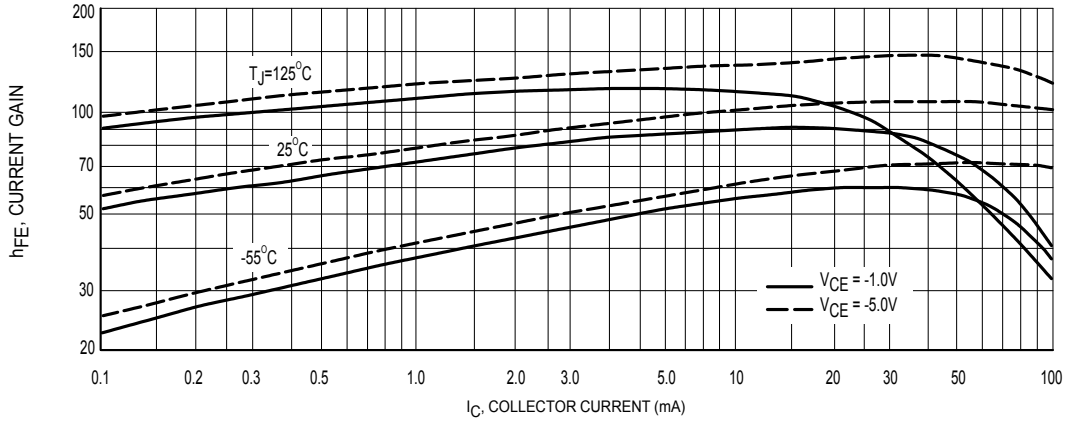


Figure 1. DC Current Gain

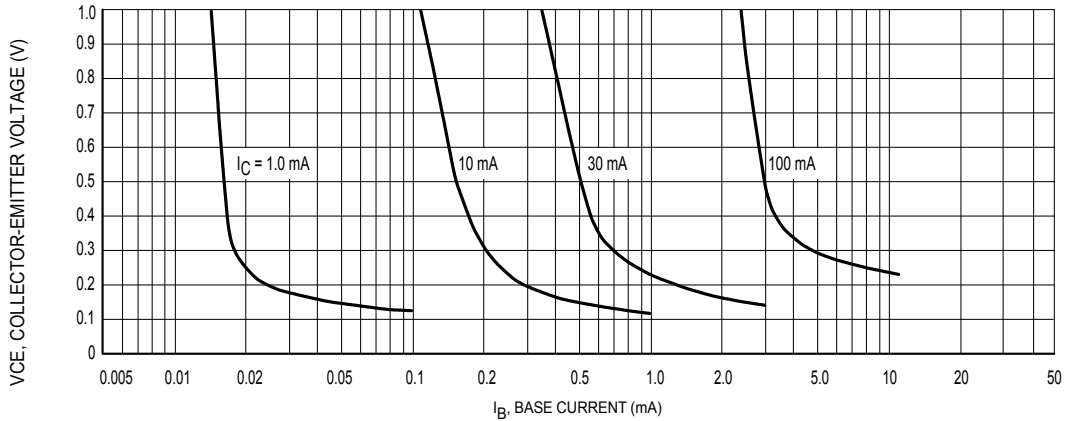


Figure 2. Collector Saturation Region

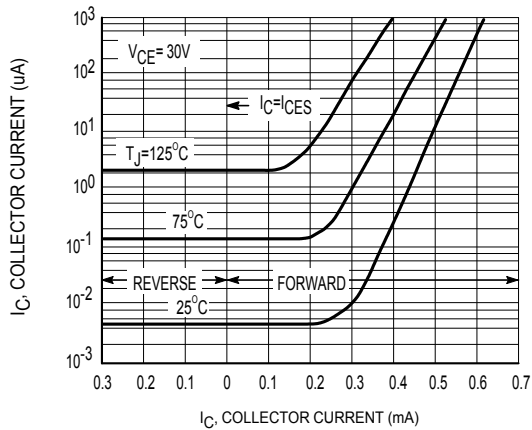


Figure 3. Collector Cut-Off Region

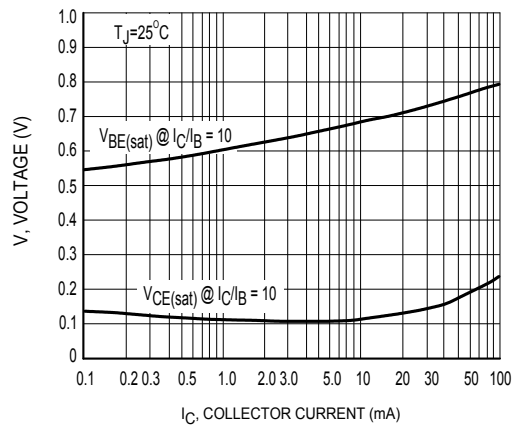


Figure 4. "On" Voltages

RATING AND CHARACTERISTICS CURVES (MMBT5401)

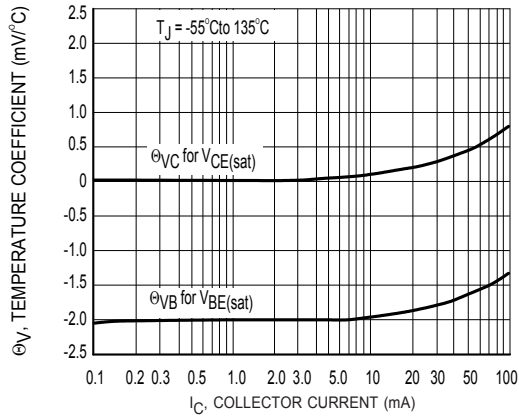


Figure 5. Temperature Coefficients

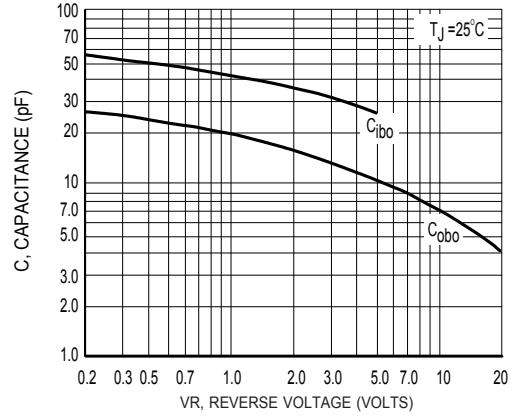


Figure 6. Capacitances

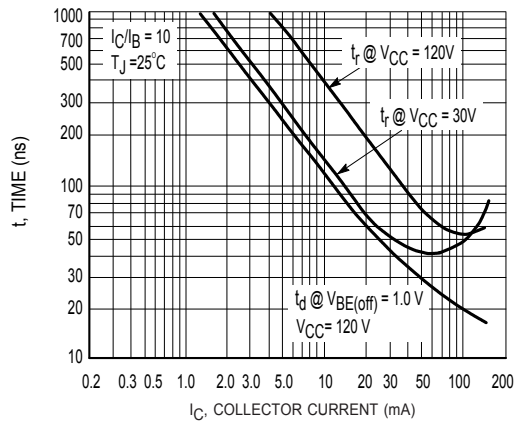


Figure 7. Turn-On Time

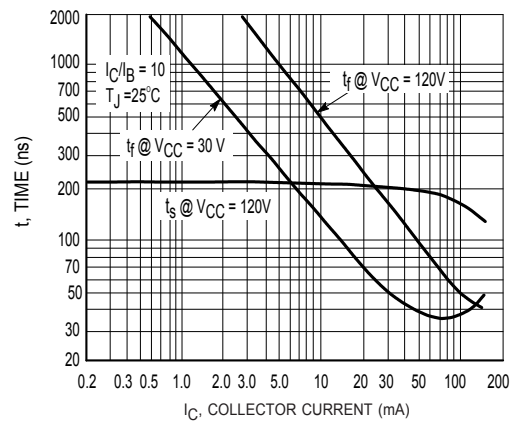


Figure 8. Turn-Off Time

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